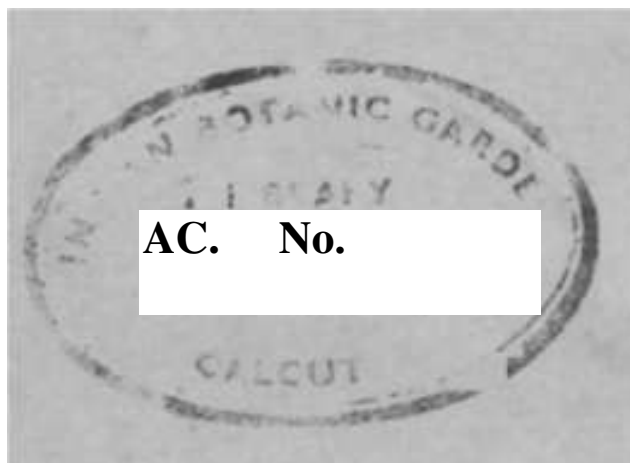


Indian Botanic Garden Library
BOTANICAL SURVEY OF INDIA

CLASS No505.....

BOOK No.....Jou-a-v-59



JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL

VOL. LIX.

PART II. (NATURAL HISTORY, &c.)

(Nos. I. to V. — 1890, with two Supplements.)

EDITED BY

W. L. SCLATER, ESQ., M. A., F. Z. S.

NATURAL HISTORY SECRETARY.

It will be the duty of all naturalists, zoologists, botanists, philologists, and men of science in different parts of India, to send their contributions to writing, and send them to the Asiatic Society of Calcutta. It will be such, if each one sends them, as will be lost and unsubmitted; and it will be away, if they shall entirely cease. S. W. JONES.

CALCUTTA.

PRINTED BY THE BANTON PRESS, TRINITY.

AND PUBLISHED BY THE

ASIATIC SOCIETY, 57, PARK STREET.

1891.

H. N., <i>commanding</i> —No. 17. <i>A List of Diamond Field Plants</i>	277
PLANK, Dr.,— <i>Noviciae Indicae. III. Some additional species of Labiales</i>	274
WANDER, A. A.,— <i>On some new or little-known Bat Species of South Borneo</i>	272
WALSH, J. H. TULL,— <i>A new Trap-door Spider from Orissa</i>	273
WATSON, E. Y.,— <i>Preliminary List of the Butterflies of Malacca</i>	275

Supplement No. 1.

ATKINSON, E. T.,— <i>Catalogue of the Insects of the Oriental Region. Order Coleoptera, Family Carabidae</i>	278
--	-----

Supplement No. 2 and General Index to Supplements.

ATKINSON, E. T.— <i>Catalogue of the Insects of the Oriental Region</i>			
Order Coleoptera, Family Dytiscidae			
31	31	32	Gyrinidae.....
31	31	31	Passeridae.....
31	31	31	Hydrophilidae.....
31	31	31	Silphidae.....
31	31	31	Corylophidae.....
31	31	31	Seymouridae.....
31	31	31	Psephenidae.....
31	31	31	Staphylinidae.....

Dates of issue of the different numbers of the Journal, Pt. II, 1890.

- No. 1.—Containing pp. 1—74, with Pls. I & II, was issued on May 17th, 1890.
No. 2.—Containing pp. 75—210, with Pls. III, IV, V, VI, VII & VIII, was issued on September 16th, 1890.
No. 3.—Containing pp. 211—270, was issued on December 10th, 1890.
No. 4.—Containing pp. 271—318, was issued on March 14th, 1891.
No. 5.—Containing Title page, Index &c., to the Volume was issued on May 9th, 1891.

Dates of issue of the different numbers of the Journal, Pt. II, Supplement, 1890.

- No. 1.—Containing pp. 1—120, was issued on April 7th, 1890.
No. 2.—Containing pp. 127—205, with General Index to Supplement (pp. i—xxx), was issued on March 30th, 1891.

JOURNAL
OF THE
ASIATIC SOCIETY OF BENGAL.

Part II.—NATURAL SCIENCE.

No. 1.—1890.

On the seasonal Variation of the Temperature-Relations between the Hills and Plains of Northern India.—By JOHN HENRY, an As. NAT. SCIENTIFIC REPORTER TO THE GOVERNMENT OF INDIA.

[Published by order of the Council—First December 4th, 1889.]

One of the more important features of the meteorology of the month of January 1889 in Northern India was the remarkable variations of the temperature relations between the hills and plains of Northern India and more especially of Upper India. Under normal conditions or degrees of temperature, virtually the temperature at the Punjab hill stations is about 10° to 20° lower than at the adjacent plain stations. The relation is sometimes reversed in the cold weather and the night temperatures are found to be several degrees higher at the hill stations than in the Punjab plains. Such variations or inversions of the ordinary temperature relations are of occasional occurrence in all mountain and adjacent valley districts. They have been observed in previous years in Northern India, but were larger and more prominent in Northern India in January 1889 than has been the case for many years.* The present issue appears to be a favourable period for discussing the

* Similar large and prolonged inversions of temperature occurred in the years 1878, 1880, and 1881 in Upper India.

The first of the three papers, on the subject of the temperature of the atmosphere, is by Mr. James Forbes, and is a very interesting and valuable contribution to the subject. It contains a detailed account of the observations made by him and his assistants, and a discussion of the results. The second paper, on the subject of the temperature of the sea, is by Mr. James Forbes, and is also a very interesting and valuable contribution to the subject. It contains a detailed account of the observations made by him and his assistants, and a discussion of the results. The third paper, on the subject of the temperature of the land, is by Mr. James Forbes, and is also a very interesting and valuable contribution to the subject. It contains a detailed account of the observations made by him and his assistants, and a discussion of the results.

The following extract from an article on Climate in the *Encyclopædia Britannica* (written by A. Buchan, Esq.), I believe, fairly represents the opinion of English meteorologists on this subject:—

"These results which only affect the mean daily temperature in different seasons, and which are due exclusively to differences of absolute height, though of the greatest possible practical importance, yet leave untouched a whole field of climatological research—a field embracing the mean temperature of different hours of the day at different heights, for an explanation of which we must look to the physical configuration of the earth's surface and to the nature of that surface, whether rock, sand, loess, soil, or covered with vegetation.

"Under this head by far the most important class of conditions are those which result in extraordinary modifications, amounting frequently to subversions of the law of the decrease of temperature with the height. This will perhaps be best explained by supposing an extent of country composed by plains, valleys, hills and table-lands to be under atmospheric conditions favourable to rapid cooling by nocturnal radiation. Each part being under the same meteorological conditions, it is evident that terrestrial radiation will proceed over all at the same rate, but the effects of radiation will be felt to different degrees and intensities in different places. As the air in contact with the declivities of hills and rising grounds becomes cooled by contact with the cooled surface, it obtains greater density and consequently flows down the slopes and accumulates on the low-lying ground at their base." It follows, therefore, that places on rising ground are never exposed to the full intensity of frost at night; and the higher they are situated relatively to the low-lying surrounding district the less are they exposed, since their relative elevation provides a ready escape downwards for the cold air inasmuch as speedily as it is produced. On the other hand, valleys surrounded by hills and high grounds not only retain their own cold of radiation, but also serve as reservoirs for the cold heavy air which pours down upon them from the neighbouring heights. Hence mist is frequently formed in low situations whilst alluring summits are clear. Along low-lying situations in the valleys of the Tweed and other rivers of Great Britain, laurels, arbutus, and other trees and shrubs were destroyed during the great frost of Christmas 1860, whereas the same species growing on relatively higher grounds escaped, thus showing by unmistakable proof the great and rapid increase of temperature with height at places rising above the lower parts of the valleys.

"This highly interesting subject has been admirably elucidated by numerous meteorological stations of Switzerland. It is there often found in calm weather in winter, when the ground becomes colder

than the air above it, that systems of descending currents of air set in over the whole face of the country. The direction and force of these descending currents follow the irregularities of the surface and, like currents of water, they tend to converge and unite in the valleys and gorges, down which they flow like rivers in their beds. Since the places of these air-currents must be taken by others, it follows that on such occasions the temperature of the tops of mountains and high grounds is relatively high, because the counter-currents come from a great height and are therefore warmer. Swiss villages are generally built on eminences rising out of the sides of the mountains with ravines on both sides. They are thus admirably protected from the extremes of cold in winter, because the descending cold air-currents are diverted aside into the ravines and the counter-currents are constantly supplying warmer air from the higher regions of the atmosphere.

"Though the space filled by the down-flowing current of cold air in the bottom of a valley is of greater extent than the bed of a river, is yet only a difference of degree, the space being in all cases limited and well defined, so that in rising above it in ascending the slope the increased warmth is readily felt, and, as we have seen, in extreme frost the destruction to trees and shrubs is seen rapidly to diminish. The gradual narrowing of a valley tends to a more rapid lowering of the temperature for the obvious reason that the valley thereby resembles a basin almost closed, being thus a receptacle for the cold air-currents which descend from all sides. The bitterly cold furious gusts of wind which are often encountered in mountainous regions during night are simply the outrush of cold air from such basins."

The most important recent contribution to the subject is a memoir on "Mountain Meteorology" by Professor William Morris Davis, Harvard College, Cambridge, U. S., in which he gives a summary of the facts up to date. In this he points out that examples of inversion of temperature relations are by no means rare in mountain districts in Europe and America, and that they are most common in winter. He quotes a monograph of Professor Hann's which states that the inversion is best shown in hill-enclosed valleys where the air stagnates and is not replaced by air from above. Such inversions, it is then pointed out, are most frequent during the passage of areas of high pressure or the prevalence of anti-cyclonic conditions. The unusual warmth in the hill regions is shown to be an effect of the compression of the descending air, whilst the cold in the valleys and low ground is due to other causes, and takes place in spite of the descent of air into it. A remarkable example in Europe of the inversion during the prevalence of anti-cyclonic conditions occurred in December

and was the subject of numerous investigations. Hanny, in his paper on *Die Temperatur Verhältnisse des Decembers 1879*, investigated the matter very thoroughly. He made in that paper a comparison between the temperature of Klagenfurth (in the valley) and Hohebor (at an elevation of 5215 ft. above Klagenfurth), and states that from December 6th to 18th it was continually warmer on the mountain than in the valley. The mean difference of the 7 a. m. temperatures for these thirteen days was 31.4° in favour of the mountain, at 2 p. m. 21.2° , and at 9 p. m. 13.6° F. Other examples are given in the same memoir of the abnormal vertical temperature conditions which occasionally obtain in Europe and America. Buchan, in a paper published in the *Journal of the Scottish Meteorological Society*, states that on the 31st December 1883 the temperature at the top of Ben Nevis was 4.5° higher than at Fort William. In this case the pressure was abnormally high. Woodcock, the Director of the Russian Meteorological Department, on the strength of certain evidence, believes there is a persistent inversion of temperature during the winter in Siberia. Inversion of temperature is also said to be of common occurrence on Mount Washington (in Massachusetts). It is also occasionally shown by the Pike's Peak Observations. That mountain has an elevation of 14134 feet and is 8840 feet higher than Denver. Professor Loomis gives 39 examples of higher temperature at the top of Pike's Peak than at Denver from four years' observations. In the most extreme cases the difference of temperature amounted to 15° and 16° . It may be noted that these inversions all occurred during the winter.

It is not necessary to quote from the earlier meteorological works of Hec. L. Buchan, Esq., as they only recognize the occasional occurrence of lower temperature at night in valleys than on the adjacent hills, and ascribe the effect chiefly to the flow of cold air down the sides of the hills.

Recent meteorological writings in some cases continue to ascribe the cooling almost entirely to the descent of the air from the mountain sides into the valleys, and state that the inversion of the vertical temperature relations is of comparatively frequent occurrence in mountainous districts. The facts about to be given, however, appear to indicate the probability that these inverse relations which are exhibited by the mountain observations are due to general conditions that prevail in plains as well as in mountain districts, and hence that similar relations may obtain much more generally and widely than is usually supposed. No distinct statement, however, occurs to this effect, so far as I am aware, and the evidence of inversion of the vertical temperature relations is, in the absence of suitable balloon observations, confined to differences be-

from mountain stations and the neighbouring valley or other low-lying stations. They are hence assumed to be phenomena restricted to hills and the neighbouring confined valleys and hence of limited extent. The explanation generally given, whilst making the inversion a phenomenon of terrestrial radiation, attaches much weight to the flow of cool air down the mountain sides into the valleys, and hence suggests that it is peculiar to mountain districts.

The present paper will, I believe, prove that inversion may occur over very large plain areas, and that it has, in some cases at least, little or nothing whatever to do with air motion between hills and valleys. It will also show that the vertical temperature relations during the cold weather in Northern India are much more variable and complicated than they have been hitherto supposed to be, and that the descensional motion which accompanies cooling of the air during the night in fine clear weather is almost entirely one of slow compression, and is not the opposite of the ascensional and convective movement which takes place largely during the day, or, in Professor Ferrel's suggestive words, "the effect of the heating of the earth's surface is not confined to the lower strata merely, as that of the cooling of the surface is, but as soon as the first stratum in contact with the earth is heated, the effect is carried to those above." The principle is, I believe, of great importance generally, and more especially in India, in connection with the production of the dry winds of the Gangetic plain during the hot weather months of March, April, and May.

The paper consists of three parts:—1st, a statement of the normal meteorological temperature conditions of the plain and hill districts of Upper India in the month of January and of certain meteorological conditions and actions upon which temperature mainly depends; 2nd, a statement of the more striking abnormal temperature relations of the month of January 1889 and of the cold weather period generally in Upper India; and 3rd, a discussion of the causes which produce these unusual temperature conditions and variations.

It may be premised that one or two of the actual observations quoted for the month of January 1889 appear to me to be somewhat doubtful. I have, however, thought it best to include them, as it is on the whole more probable that they are exaggerated examples of the peculiar temperature relations about to be discussed than that they represent instrumental or observational errors.

The following table gives the average maximum temperatures of the month of January of certain selected pairs of stations in Upper India, each pair consisting of a hill station and the nearest plain station at which there is an observatory:—

Names of pairs of stations.	Difference of elevations in feet.	Distance in miles.	Mean maximum temperature for January.		Difference of maximum temperature between hill and plain stations.	Average rate of change of temperature vertically at the foot of the hill per 1,000 feet.
			Hill station.	Plain station.		
Quetta	5300	163	51.6°	73.3°	21.7°	4.1°
Jacobabad						
Murre						
Rasulpindi	4700	9	37.8°	63.3°	25.5°	4.8°
Sirala						
Ludhiana						
Chakrata	6300	38	51.3°	67.5°	16.2°	2.7°
Roorkee						
Ranikhet						
Bareilly	5500	90	54.0°	70.1°	16.1°	2.0°
Dharsi						
Darjeeling						
Dehra	7600	116	44.5°	73.4°	28.9°	4.0°
Mount Abu						
Jaipur						
Washimghat	2500	48	67.1°	83.3°	16.2°	4.3°

A full description of these observations and of the more important local peculiarities of exposure will be found in Mr. Blanford's Report on the Meteorology of India for 1885. It will suffice here to point out that both Ranikhet and Sirala are situated at some distance within the first line of hills, whereas Murre and Chakrata are practically on the crest of the first line of elevations overlooking the plains. Assuming these as more typical of the relations between hills and plains, the preceding data show that in Upper India the temperature near the hills decreases vertically with elevation at the hottest time of the day in the month of January very nearly 5° in 1000 feet up to a height of 7000 feet at least. The remarkably low day temperature at Darjeeling during this period as shown by the table appears to be due to the following causes, of which the first is probably the most influential.

1st.—The great humidity and large amount of fog at that station (as in the Eastern Himalayan districts generally) in January, in which respects it contrasts strikingly with the hill stations of Upper India, where the air is, except in stormy weather, very dry and clear.

2nd.—The contiguity of the immense snow-mass of Kanchenjunga and neighbouring mountains, which include some of the highest peaks in the Himalayas. This area embraces an enormous extent of snow-covered ground, the southern edge of which (as mentioned) is at a distance at the crow line of not more than 30

or 35 miles from Darjeeling. The first line of snow is at a distance of at least 45 or 50 miles from Simla and Murree and at a distance of about 40 miles from Chakrata. The neighbouring areas of perpetual snow are of greater elevation and of considerably less extent in the case of all these stations than of Darjeeling and hence exercise a much smaller influence.

As the meteorological conditions of Darjeeling are thus essentially different from those of the hill stations of Upper India, it will be excluded from the final discussion, although data for it are given in the tables for the preliminary comparisons.

The following table gives the average minimum temperature data for the same pair of stations for the month of January.

Names of pairs of stations.	Difference of elevation.	Distance in miles.	Mean minimum temperatures for January.		Difference of minimum temperatures of plain and hill stations.	Average rate of decrease of temperature at the rate of the period of the distance 1000 ft.
			Hill station.	Plain station.		
Quetta ...	5300	163	29.2°	42.8°	13.6°	2.7°
Jacobabad ...	4700	30	35.5°	37.9°	2.4°	.9°
Murree ...	6200	80	36.4°	43.5°	7.1°	1.1°
Rawalpindi ...	6300	58	35.7°	44.2°	8.5°	1.4°
Simla ...	5500	90	39.5°	45.9°	6.4°	1.2°
Ludhiana ...	7300	116	34.6°	52.2°	18.2°	2.6°
Chakrata ...	3500	40	50.9°	51.1°	.2°	0
Deesa ...	2500	48	47.2°	52.5°	5.3°	2.1°
Mount Abu ...						
Pachmarhi ...						
Hoshangabad ...						

The table shows that at all these stations the average difference of temperature at night is much smaller than by day. The rate of difference is greatest in the case of Quetta and Jacobabad, Pachmarhi, and Hoshangabad, and Darjeeling and Dhubri, for which it averages about $\frac{1}{2}$ ° or less than half of the rate of difference for the maximum temperature. The result for Deesa and Mount Abu is so anomalous as to point to peculiar local conditions, the nature of which have, however, not yet been determined.* In the case of the pairs of stations in Upper India the average rate of change of temperature with

* I have recently (January 1890) visited these two stations; the temperature observations are carefully recorded, and are taken under the same conditions of ex-

Elevation at night in January varies from 0.5° for Murree and Rawalpindi to 1.4° for Chakrata and Haridwar, and averages 1° , that is little more than one third of the day rate of decrease of temperature vertically.

These two tables may hence be summarized as follows:—

(A). The rate of decrease of temperature with elevation at the time of maximum day temperature in the month of January averages 3° per 1,000 feet in the Western Himalayas and 4° per 1,000 feet in the Eastern Himalayas up to 7,000 feet and in the Aravalli and Vindhya Hills and perhaps also in Beluchistan.

(B). The rate of decrease of temperature with elevation at night or at the time of minimum temperature averages 1° per 1,000 feet in the Western Himalayas, 2° per 1,000 feet in the Eastern Himalayas and Vindhya, and $2\frac{1}{2}^{\circ}$ per 1,000 feet in Beluchistan.

An interesting point in connection with the night temperature in the plains of Upper India is shown by the data of the following table. The first column gives the average minimum temperature of the month of January at stations nearest to the hills and the second that of stations at a greater distance from either of the first column.

Plains stations near hills	Mean minimum temperature for January (A)	Plains stations at considerable distance from hills	Mean minimum temperature for January (B)	Difference between mean temperatures, time of the two stations for each pair. A - B.	Horizontal distance between pair of stations miles.
Rawalpindi	37.9	Peshawar	36.1	-1.8	100
Dehra Dun	42.0	Delhi	41.4	-0.6	75
Lucknow	42.5	Benares	41.4	-1.1	75
Haridwar	44.2	Muzaffargarh	44.4	+0.2	60
Rohtak	45.9	Patna	45.6	-0.3	120
Meerut	46.0	Allahabad	47.6	+1.6	125
Delhi	46.6	Benares	47.0	+0.4	100
Almora	44.5	Berhampur	45.4	+0.9	150

The geographical relations between Rawalpindi and Peshawar are quite different from those of the other pairs of stations, which are all situated in the great plain of Northern India stretching along the foot of the Himalayas from the North Punjab to East Bengal.

There are 31 plain stations in India. Several sets of hourly observations of temperature during the night have been recently taken, and, as they confirm the conclusions of the present paper, I hope to discuss them in a brief paper to be presented to the Society shortly.

This table establishes conclusively that the average direct heating power of the sun is greater at the hill stations in January than at the corresponding plain stations. And, if it might be assumed that the relative intensity in the two cases is, roughly speaking, proportional to the ratios given in the preceding table, the heating power of the sun at an elevation of 5000 feet in the Himalayas is on the average about one-fifth greater than at the level of the adjacent plains, or, in consequence of the absorbing action of the lower strata, the sun is one-sixth less powerful in heating the earth's surface at the level of the plains than it is at that of the hill stations of the Himalayas.

The following table gives similar data for nocturnal radiation from the Earth's surface:—

Names of pairs of stations	Average difference between gross radiation thermometer readings and those of minimum in shade thermometer for January.		Ratio of difference for hill station to that of corresponding plain station.
	Hill station. A.	Plain station. B.	
Dehra	10.1°	10.1°	1.0
Ranikhet	11.4	7.3°	1.6
Mussoorie	12.2	5.8°	1.3
Chakrata	9.5	7.2	1.3
Nauni	12.0	8.3	1.5
Haridwar	10.3°	6.9°	1.5
Yamunotri	17.1°	9.1	1.9
Dungra	12.0°	8.2°	1.5

These figures show that nocturnal radiation goes on much more rapidly at the hill stations than at the adjacent plain stations, and that the ratios as measured by the differences given in the preceding tables are much greater than the ratios in the corresponding tables for solar radiation. Taking the average of all the stations as a rough approximation, they appear to indicate that nocturnal radiation goes on, on an average of 50 per cent. more rapidly at the hill stations than at the adjacent plain stations.

This result is undoubtedly in part due to the greater length of the night (or period of effective terrestrial radiation) than of the day in the month of January in Northern India, and perhaps also to the greater clearness and homogeneity of the atmosphere arising from the stillness of the air and absence of wind at night as compared with the day. It will, however, be presently seen. It is probable that the mean monthly minimum temperature at the hill stations represent an average of conditions different from that at the plain stations and hence the figures given above are almost certainly of little value for the comparison of nocturnal radiation in the plains and hills of Northern India. It is, however, evident that the figures as a whole support the inferences based on the known laws of radiation from cooling bodies. It is certain therefore that in clear weather in January, if there were no other action than mere radiation and heating and cooling of the adjacent air by contact with the Earth's surface, the Earth's surface and adjacent air would be heated to a greater extent by day and cooled to a larger amount at night at the hill stations than at the plain stations and hence the daily range of temperature might be expected on this account alone to be considerably greater (probably from 10° to 20°) at the hill stations than at the plains.

The following table gives the average cloud amount during the month at the selected stations.

Names of pairs of stations.	Mean proportion of cloud in January.		Ratio of cloud proportion of hill station to plain station.
	Hill station A.	Plain station B.	
Quetta	44	26	1.7
Jacobabad	53	31	1.7
Murree	56	33	1.7
Rawalpindi	48	24	1.4
Sialkot	41	30	1.4
Ludhiana	55	17	3.2
Chakrata	36	22	1.2
Roorky	23	22	1.0
Bankhote			
Bareilly			
Darjeeling			
Dibrui			
Honk Aho			
Dumra			
Pachmarhi			
Jubbulpore			

Names

1



1

■W

i rLQ» 1 1 .

smaller average difference of the minimum temperature at the hills and at the adjacent plain stations (or of the small night vertical range of temperature compared with the day) must recognize:—

- (a.) That the air is on the average less humid at the hills than the adjacent plain stations in Upper India.
- (b.) That there is on the average more cloud at the hill stations.
- (c.) That the intensity of solar radiation is considerably greater at the hill stations, probably at least 20 per cent. greater.
- (d.) And that the intensity of radiation from the earth's surface at night is very considerably greater at the hills than at the adjacent plains.

We now proceed to give data for the same pairs of stations for January 1889.

The following tables give the comparative temperature data of eight hill stations in Northern India and of the eight nearest plain stations to which there are observations for that month.

The first table gives the maximum temperature of each day of the month of January 1889 and the variation from the normal. The variations are obtained from the daily means of the past eleven years (1878-88) smoothed so as to give a fairly regular series. The positive sign affixed to a number in this table indicates that the actual temperature was above the normal and a minus sign that it was below it.

The second table gives similar data for the minimum temperature of the same 16 stations for the same period.

The third table gives the daily difference of the maximum temperatures for each of eight pairs of stations consisting of a hill station and adjacent plain station. In every case the maximum temperature at the plain stations exceeds that at the neighbouring hill station.

The fourth table gives the difference between the minimum temperature registered at each of the eight selected hill stations and the neighbouring plain stations. In the majority of cases the minimum temperatures at the plain stations exceed those at the plain stations in which case no sign is prefixed to the number. In a few cases the latter temperatures are the greater and this is indicated by the minus sign prefixed to the number.

January.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.
1	27	-27	487	+0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0	52.4	+2.0
2	45	-45	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
3	50	-50	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
4	56	-56	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
5	60	-60	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
6	66	-66	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
7	78	-78	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
8	84	-84	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
9	90	-90	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
10	96	-96	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
11	102	-102	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
12	108	-108	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
13	114	-114	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
14	120	-120	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
15	126	-126	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
16	132	-132	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
17	138	-138	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
18	144	-144	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
19	150	-150	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
20	156	-156	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
21	162	-162	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
22	168	-168	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
23	174	-174	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
24	180	-180	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
25	186	-186	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
26	192	-192	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
27	198	-198	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
28	204	-204	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
29	210	-210	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
30	216	-216	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
31	222	-222	481	-3.7	73.4	-0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0
Mean	481	-3.7	73.4	+0.1	47.4	-0.7	635	+0.5	51.9	-0.3	697	+0.2	52.4	+2.0	52.4	+2.0	52.4	+2.0

1

q

*

■

1

1

$$\frac{f + 1}{+ +} -$$

■ "T

7

it

•i + + +

t-
+

Relations between the Hills and Plains of Northern India.

Date	Quetta.		Jacobabad.		Murree.		Rawalpindi.		Simla.		Lodhiana.		Musqueon.		Roosdon.	
	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.
1	20.8	-0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
2	21.8	+1.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
3	20.2	-1.6	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
4	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
5	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
6	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
7	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
8	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
9	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
10	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
11	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
12	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
13	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
14	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
15	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
16	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
17	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
18	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
19	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
20	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
21	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
22	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
23	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
24	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
25	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
26	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
27	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
28	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
29	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
30	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0
31	20.8	+0.0	9.0	+8.0	27.7	+8.0	30.9	+8.0	40.7	+8.0	41.0	+0.3	42.0	+0.0	38.0	-4.0

Table II.—Continued.

Date.	Rarsholm.		Bareilly.		Durriceiling.		Dhabel.		Ain.		Deesa.		Pachmarh.		Hoshangabad.	
	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.	Actual.	Variation.
1	45.0	+0.5	41.3	+2.7	35.8	-1.1	33.4	+0.1	51.0	-0.5	51.9	+1.0	50.3	-1.2	47.3	+4.4
2	50.0	+10.7	41.3	+2.0	35.2	+0.8	33.0	0	54.0	+3.7	51.9	+1.0	58.3	-0.9	42.5	-1.5
3	50.0	+16.5	39.8	-4.6	35.9	+1.3	33.0	+0.1	50.9	+9.0	50.9	-0.1	40.5	-5.3	44.6	-7.1
4	55.0	+16.0	40.8	+2.1	37.9	+3.3	32.5	-0.9	55.5	+4.8	51.4	+0.1	40.3	-2.0	48.3	-3.7
5	47.0	+7.1	40.8	+2.2	35.7	+1.1	34.9	+1.3	52.9	+1.5	52.4	+0.9	47.3	+0.9	48.8	-3.6
6	45.0	+4.0	47.3	+2.8	35.3	-0.1	34.9	+1.2	53.9	-3.4	50.4	-1.2	46.3	-0.3	59.3	-1.8
7	44.0	+3.1	45.3	+1.0	38.1	-0.8	33.9	+0.5	53.9	+5.4	56.4	+4.2	53.2	+6.5	57.8	+5.9
8	49.0	+8.0	40.3	+4.2	36.7	+0.6	33.5	+0.2	50.9	+8.7	50.8	+10.0	61.2	+14.3	53.3	+1.1
9	47.0	+5.8	40.8	-3.9	35.7	-0.7	33.5	+0.7	53.9	+6.0	58.9	+8.3	40.3	+1.5	54.8	+2.9
10	49.0	+8.0	45.8	+0.5	34.3	-2.3	33.5	+0.6	53.9	+9.4	59.9	+12.2	50.7	+2.0	56.3	+4.1
11	41.0	+0.8	50.3	+4.5	35.4	-1.9	34.4	+1.5	50.9	+6.8	56.9	+6.5	60.7	+2.0	54.3	+1.4
12	40.0	+0.5	46.3	+1.8	35.7	+0.7	33.0	-0.3	51.0	+1.1	57.4	+3.7	51.7	+0.1	57.3	+4.1
13	36.0	-3.0	52.3	+5.0	Not recorded		33.9	+0.6	51.0	+0.6	53.9	+2.3	55.2	+6.7	55.8	+2.6
14	34.0	-3.0	48.3	+1.5	37.3	+1.7	33.9	+5.8	49.5	-1.3	54.9	+2.8	49.7	+1.4	34.3	+0.9
15	40.0	+10	51.3	+4.5	35.1	-0.9	37.4	+4.2	48.0	-3.5	54.4	+0.9	49.2	+0.9	50.3	-0.1
16	40.0	+0.0	51.3	+4.5	35.2	-0.1	35.3	+2.3	50.5	-1.3	50.4	+3.3	52.2	-4.4	37.3	+4.3
17	38.0	-2.0	49.8	+3.2	Not recorded		34.9	+1.0	51.0	-0.4	55.1	+0.1	58.7	+10.1	61.3	+7.9
18	41.0	+1.0	50.3	+3.4	39.1	+3.3	34.9	+1.3	53.4	+1.2	56.9	+4.3	50.7	+8.3	57.8	+4.3
19	41.0	+1.2	50.3	+3.5	37.5	+3.0	35.4	+1.8	47.5	-4.8	50.9	-1.2	51.7	+3.8	56.3	+3.1
20	44.0	+4.4	41.3	-5.2	30.1	+3.8	36.9	+2.8	61.5	-0.5	55.9	+4.2	50.7	+3.2	60.3	+7.0
21	43.0	+4.0	44.3	-1.0	38.8	+4.7	34.9	-0.7	57.0	+5.9	53.9	+2.0	50.2	+2.1	55.8	+2.7
22	53.0	+12.2	42.8	-3.8	38.1	+4.9	34.9	+0.8	61.4	+0.4	56.4	+6.6	50.7	+3.5	55.3	+3.2
23	46.0	+6.0	53.8	+7.7	37.3	+3.9	33.0	-1.0	56.1	-4.1	61.6	+10.6	57.2	+10.3	56.8	+5.0
24	33.0	-6.1	53.7	+6.9	35.5	+2.4	33.9	+3.0	48.0	-4.1	58.4	+7.0	48.2	+0.4	57.3	+3.2
25	39.0	-0.1	42.3	-4.0	32.4	-1.2	34.9	+0.8	50.0	-1.1	49.5	-1.0	46.8	-1.0	56.8	+4.9
26	43.0	+4.4	40.3	+4.2	35.7	+2.3	33.0	-1.2	61.1	+4.8	53.9	+0.8	56.2	+8.2	67.8	+6.4
27	43.0	+4.5	47.3	+0.2	35.9	+2.0	33.0	-0.3	55.0	+0.5	60.9	+10.4	61.2	+14.3	59.3	+8.1
28	40.0	-8.0	50.3	+3.8	36.1	+2.7	35.9	+1.9	58.3	+1.7	53.3	+14.1	53.2	+6.7	58.8	+7.7
29	50.0	+2.1	50.8	+10.4	38.2	+4.7	35.4	+1.7	53.3	+4.9	60.4	+11.1	60.7	+15.0	60.8	+10.1
30	37.0	-0.9	38.8	+1.8	39.2	+0.3	30.4	+7.2	46.0	-2.8	57.9	+8.1	62.2	+16.8	60.3	+11.7
31	52.0	-6.3	52.3	-4.5	33.7	+1.4	35.4	+2.5	45.5	-7.5	57.9	+7.5	54.3	+8.6	50.3	+8.1

Year.	Jacobabad.	A. Bawal.	Lyallpore.	Rawal Pindi.	Shahpore.	Quetta.	Alwar.	Hoshiarpur.
Jan. 1	23.5	10.6	17.7	14.3	11.5	20.7	15.1	9.8
2	12.9	12.0	16.0	10.8	11.0	40.2	15.0	0.3
3	13.9	11.4	13.5	10.8	6.1	27.7	16.1	7.9
4	20.3	10.0	10.8	11.6	6.1	24.3	15.5	8.8
5	24.3	19.8	15.9	11.6	9.1	23.3	16.6	8.3
6	21.2	10.4	14.1	18.8	12.5	27.2	19.1	10.3
7	18.8	13.4	11.0	23.8	18.4	31.7	19.1	8.3
8	21.3	11.0	13.0	17.4	12.0	20.2	17.7	8.8
9	18.4	12.4	14.0	11.6	10.5	27.7	21.2	9.8
10	13.6	9.4	15.5	12.8	18.0	30.7	20.3	10.3
11	28.3	27.8	20.7	18.3	17.0	20.2	20.1	10.9
12	30.0	29.4	21.4	24.8	19.5	23.7	19.6	9.8
13	28.4	19.4	16.0	19.8	20.9	7	18.5	9.8
14	29.0	17.4	27.2	18.8	20.9	25.8	20.0	8.8
15	30.0	21.0	26.1	24.2	27.0	26.8	19.5	7.4
16	35.9	18.4	25.9	15.8	21.9	29.3	18.0	7.3
17	36.8	23.1	26.9	21.8	18.7	7	15.5	8.9
18	39.6	18.4	23.1	20.3	10.4	31.3	16.2	9.9
19	30.5	18.5	21.1	24.3	24.9	27.0	14.0	11.3
20	16.3	16.6	16.7	23.3	19.9	23.8	13.9	10.8
21	15.2	5.0	14.2	22.3	19.1	23.8	16.1	6.3
22	20.8	10.4	11.4	14.6	7.1	31.2	18.7	9.9
23	28.9	23.5	18.9	23.8	12.1	31.7	17.6	11.4
24	30.0	24.9	18.5	18.8	3.8	30.3	20.0	9.9
25	21.8	19.9	23.1	22.6	18.3	30.2	19.0	8.8
26	23.6	15.4	20.2	21.5	16.9	27.3	19.1	8.8
27	33.4	16.4	21.9	16.2	18.9	28.5	19.1	12.8
28	26.0	18.1	17.0	23.8	15.5	34.7	17.1	8.4
29	27.9	18.6	11.0	12.8	17.0	32.2	17.2	7.9
30	25.9	16.1	20.1	16.2	11.0	28.8	21.5	8.9
31	25.0	21.0	21.7	24.3	12.9	23.6	21.9	19.3
Mean	25.3	16.3	18.6	16.6	14.6	29.5	18.2	9.3
Not. mean	21.7	15.6	11.4	17.3	16.1	29.1	15.1	9.5
						30.4	4.2.1	10.2

1

Jan. 1

5

i:

7

8

-8

t

first period, and we shall therefore use chiefly the data of that period in our discussion.

During the first period extending from the 1st to the 4th the minimum temperature was on every night several degrees higher at the hill stations than at the adjacent plain stations. The minimum temperature on the night of the 3rd for example was $12\frac{1}{2}^{\circ}$ higher at Murree than at Rawalpindi, 3° higher at Simla than at Ludhiana, 5° higher at Mussoorie than at Roorkie, and 10° higher at Ranikhet than at Bareilly.

The following method of stating the facts will show that the inversion of the temperature relations was not confined to the neighbourhood of the hills only. On the night of the 3rd (or early morning of the 4th) the minimum temperature at Murree, Simla, Ranikhet, and Mussoorie was higher than at all the plain stations in the Panjab, North-Western Provinces (except Jhansi), Rajputana, Sind, Central India, and the greater part of Behar and Bengal and the Central Provinces.

The following statement gives exact data for representative stations in each province.

Station.	Minimum temperature 3rd January.	Province.	Plain station.	Minimum temperature 3rd January.	Difference between minima temp. of Murree and plain stations.	Difference between minima temp. of Simla and plain stations.	Difference between minima temp. of Ranikhet and plain stations.
Murree ...	49.2	Panjab	Rawalpindi	36.9	-12.4	-11.5	-12.1
Simla ...	65.4		Lahore	37.2	-12.1	-11.2	-12.8
			Sirsa	39.1	-10.2	-9.3	-10.2
			Jalandhar	38.6	-10.7	-9.8	-11.4
		Rajputana	Jaypore	42.2	-7.1	-6.2	-7.8
			Indore	41.5	-7.5	-6.6	-8.2
		Central Provinces	Nagpur	50.2	+0.2	+1.8	+0.2
			Khandwa	44.0	-5.3	-4.4	-6.0
			Jubbulpore	38.2	-10.4	-9.5	-11.1
		Sind	Alor	43.2	-6.1	-5.2	-6.8
			Hydrabad	44.5	-4.8	-3.9	-5.5
		N. W. Provinces	Poonah	49.0	-0.3	-0.6	-1.0
			Agra	43.6	-5.7	-4.8	-6.4
			Lucknow	41.0	-8.3	-7.4	-9.0
			Allahabad	42.7	-6.6	-5.7	-7.3
		Behar	Patna	44.0	-2.4	-1.5	-3.1
			Darbhanga	45.4	-1.1	-0.2	-0.4
			Hazratnagar	42.9	0	+0.9	-0.7
			Calcutta	42.8	-0.5	+0.4	-1.2
		Bengal	Burdwan	45.3	-1.0	0.1	-1.7
			Jessore	46.9	-2.1	-1.3	-2.9
			Burrial	40.1	-9.3	-8.7	-9.9
			Dacca	54.2	+4.9	+5.5	+4.2
		Assam	Saigon Island	51.2	+1.9	+2.8	+1.2
			Dhaka	53.2	+3.9	+4.8	+3.2

The minus sign in the preceding table indicates that the plain station to which it refers had a lower minimum temperature than the hill station with which it is compared and the plus sign that it had a higher temperature.

The preceding table shews over what an extensive area in Northern and Central India it is possible for the minimum temperature to be considerably (from 1° to 12°) below that of the hill stations in Upper India.

Table I. shews that the inversion of temperature obtained on at least eleven nights during the month. The following examples from previous years, which examination shews to be fairly average cases, will indicate to what extent the temperature variations of January 1889 were abnormal. In January 1888 the night temperature of Mussooree ranged from 3.6° above that of Roorkee to 21.8° below it (giving a total range of 27.4°). The average difference of temperature was 8.1° for the month, which is almost identical with the normal average (8.5°). The minimum temperature of Mussooree was in excess of that of Roorkee on only three nights of the month. In January 1886 the night or minimum temperature at Simla ranged from 2.8° above that at Ludhiana to 23.5° below (giving a total range of 26.3°) and was above that at Ludhiana on three nights only during the month. The difference between the minimum temperatures at these two stations averaged 10° . It is not necessary to multiply cases as all that have been examined give similar evidence. Hence it appears that in ordinary seasons the minimum temperature may be on two or three nights in January in slight excess at the hill stations of Upper India as compared with the adjacent plain stations of the Punjab and North-Western Provinces. These figures hence establish that, although inversion of the normal vertical temperature relations is not infrequently in the month of January in Upper India, it was of abnormal frequency in January 1889. It was undoubtedly related to or connected with the holding off of the winter rains in that month. Anticyclonic conditions prevailed in Upper India with unusual persistency, and it was not until the end of the month that general rain accompanying a depression and cold weather storm occurred in the plains and heavy general snow in the hills. Hence the high temperature was undoubtedly associated with anticyclonic conditions of pressure, as has been found to be the case in Europe and the United States during similar vertical temperature relations, and also with the protracted delay in the depression of the snow line in the hills during winter produced by general snowfall.

The preceding paragraphs have stated fully one important feature of the anomalous temperature conditions of January 1889. Before proceeding to discuss the other features, it is desirable to trace the varying temperature relations between the plains and the hills.

There I

weather conditions and relations in the hills and plains of Upper India during the cold weather. There are as follows:—

1st.—The prevalence of fine clear weather with light winds or calm in the hills and plains. These conditions accompany prolonged anticyclonic pressure conditions of moderate intensity in Upper India, and may be described as "ordinary anticyclonic conditions." They obtain frequently during the cold weather.

2nd.—The prevalence of disturbed or stormy weather in the hills and plain districts. This type of weather is due to the formation, passage, or existence of cold weather depressions. Storms are heavily clouded, rain falls more or less generally in the plains of Upper India, and heavy general snow is received in the higher mountain regions up to a level determined chiefly by the intensity of the storm. Winds are weak in the plains, but their directions usually indicate feebly marked cyclonic circulation about an ill-defined centre. The winds are on the hill land often strong or violent and the weather very stormy in the hills for periods varying in length from a few hours to several days. These periods may be described as those of "cold weather cyclonic storms."

3rd.—The prevalence of unusually bright clear cool weather such as may obtain over the whole of Northern India, after the breaking up of a large and well marked cold weather storm. In this case, a strong steady cool westerly current flows from Upper India and the adjacent hills over the whole of Northern India as far east as the Bengal Ganges. The air is remarkably dry and bracing. The change of condition is most marked in Bengal, where the weather during the previous unsettled period is usually damp, cloudy, and warm, with light southerly winds.

These are the three chief types of weather in Northern India during the cold weather period extending from November to February or March. They merge into each other, more especially (3) and (1). Again, it frequently happens that small depressions pass over Upper India which give a brief period of cloudy weather without rain in the plains, and light local rain or snow showers in the hills. The precipitation in this case is almost entirely confined to the higher elevations. This type of weather gives rise to somewhat different temperature relations than (2). They will, however, be included in (2) as it is hardly possible to differentiate between all the numerous varieties of cold weather storms.

The temperature conditions and relations in ordinary anticyclonic weather in Upper India will be sufficiently shown by the following data given in three small tables for the two pairs of stations, Murree and

Rawalpindi and Simla and Ludhiana. The first table gives the daily range of temperature at three pairs of stations on six days of January 1882, when anticyclonic conditions accompanying inversion of vertical temperature relations obtained in Upper India.

Day of month.	Marree.	Rawalpindi.	Simla.	Ludhiana.	Ranikhet.	Bareilly.
3rd	9.8°	35.6°	18.4°	29.6°	16.1°	31.4°
4th	12.8°	29.2°	20.8°	30.2°	15.1°	30.4°
8th	13.6°	35.7°	17.6°	28.0°	14.2°	34.7°
9th	14.9°	37.1°	16.9°	32.8°	15.2°	31.9°
21st	15.8°	34.2°	13.0°	31.8°	20.1°	27.4°
22nd	?	?	15.8°	29.6°	15.1°	30.4°
Mean daily range of selected periods	14.2°	33.8°	16.1°	31.0°	16.0°	31.4°
Normal daily range of selected periods	13.1°	27.0°	15.3°	25.0°	14.9°	24.4°
Difference	+1.1°	+6.8°	+0.8°	+6.0°	+1.1°	+7.0°

This table shows a considerable amount of irregularity at the stations in the daily range of temperature during these periods of inversion of night temperature. On the other hand the daily range of temperature at the level of the plains is always excessive and approximately uniform as shown by the Rawalpindi and Ludhiana data.

The following table gives the variations of the maximum and minimum temperature on the same days at the hill stations from their normal values at the same stations, a plus sign indicating that temperature in excess and a minus sign that it was below the normal.

Day of month.	Marree.		Simla.		Ranikhet.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
3rd	+ 9.7°	+12.6°	+ 9.5°	+11.6°	+10.7°	+10.6°
4th	+ 1.8°	+ 8.4°	+14.4°	+ 5.0°	+15.1°	+14.0°
8th	+ 3.8°	+ 3.5°	+ 5.2°	+ 2.8°	+ 7.2°	+ 5.0°
9th	+ 7.8°	+ 5.0°	+ 4.5°	+ 2.0°	+ 6.1°	+ 5.8°
21st	+16.8°	+10.1°	+ 8.5°	+10.9°	+11.2°	+ 4.9°
22nd	?	?	+11.6°	+10.8°	+13.7°	+12.2°
Mean variation from normal during periods	+9.5°	+6.1°	+9.6°	+7.9°	+10.8°	+9.7°

This table shows conclusively that during these periods of inversion of temperature relations temperature was excessive at the hill stations, the excess was nearly as marked in the night as in the day temperature.

The following gives similar data for the neighbouring plain sta-

Day of month.	Rawalpindi.		Indiana.		Barilly.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
3rd	+6.4°	+0.5°	+7.0°	+3.0°	+0.2°	-4.0°
4th	+4.3°	+3.1°	+9.6°	-0.6°	+1.7°	+2.1°
6th	+2.8°	-5.0°	+5.6°	+2.4°	+5.9°	-1.2°
9th	+7.8°	-2.0°	+5.2°	-2.5°	-2.7°	-3.9°
21st	+5.0°	-3.3°	+6.4°	-4.0°	+4.7°	-1.5°
22nd	...	...	+5.6°	-0.3°	+3.6°	-2.2°
Average ...	+5.3°	-1.3°	+6.6°	-0.4°	+3.1°	-2.6°
Range of variation ...	6.8°		7.0°		5.7°	

These figures are very consistent and establish that in these periods of discussion the day temperature was considerably above the average of the plain stations and the night temperature was generally below it but smaller amounts. They also show that what may be termed the range variation from the normal diminished from west to east in the plain of Northern India.

Hence it may be inferred that the temperature conditions of periods of ordinary anticyclonic weather in Upper India are:—

(a.)—Increased day and night temperatures at the hill stations, the increase being nearly as great in the night as it is in the day temperatures, so that practically the daily range is unaltered.

(b.)—Increased day and decreased night temperature and hence a greater daily range of temperature at the plain stations.

(c.)—When these conditions are most pronounced, in consequence of the opposite variations of the night temperatures at the hill and plain stations, the minimum temperature is occasionally during such periods several degrees higher at the hill stations than in the adjacent plains. The data for January 1899 also show that the low temperature in the plains, more especially when compared with the hill stations, is not a phenomenon of valleys or of the low lying districts in the immediate neighbourhood of the hills, but may extend over the whole of Northern and Central India, and therefore to a distance of some hundreds of miles from the mountains of Northern India.

The same tables (I to IV) also give three examples of very low temperature of the hill stations during stormy weather. These are:—

1st, the night of the 13th.

2nd, the night of the 23rd.

3rd, the nights of the 30th and 31st.

The last is the most striking example and is therefore best adapted to illustrate the temperature relations between the hills and plains during cold weather storms.

The following gives a brief description of the character of these disturbances taken from the India monthly weather report for January 1889.

"The barometer began to fall briskly on the afternoon of the 8th in Upper Sind and Beluchistan; and a very shallow depression was formed on the 9th, which followed the same course as the previous disturbance, and gave moderately heavy snow to the Punjab Himalayas on the 10th and brought the snow line down to below 9,000 feet. The weather continued somewhat disturbed in Northern India for three days longer, light showers fell at the hill stations on the 12th, and in Behar, Chhota Nagpore, and Central Bengal on the 13th. Pressure increased until the 17th, when very strongly marked anti-cyclonic conditions set in, fine, clear, cool weather and strong westerly or north-westerly winds prevailed over the whole of Northern India. The highest pressures of the month were recorded on the morning of the 17th, the absolute maximum being 30.38" at Peshawar. No change of importance occurred until the 22nd, when the barometer fell briskly in North-Western India. The disturbance then initiated differed considerably in character from the previous. There were two separate areas of disturbance in which the barometer fell rapidly, and more or less general rain was recorded. The first included the Punjab Himalayas and adjacent plains from Sealkot to Roorkie, and the second comprised the greater part of Rajputana and Indore. The disturbance in the Punjab passed away after giving moderate snow in the hills on the afternoon of the 23rd and light showers in the adjacent plains. That which originated in Rajputana drifted during the next two days eastward into East Bengal and Burma, and gave moderate general rain to the North-Western Province, Central India, and light local showers to Behar, Bengal, and Assam. A short interval of fine weather followed until the afternoon of the 27th, when the first large and important cold weather storm of the year was initiated. It was, like the previous, a double disturbance, consisted in part of a shallow depression which passed into Sind from Beluchistan on the 28th and advanced during the next three days in an east-south-east direction across the head of the Peninsula, into Upper Burma, to which it gave cloudy weather on the 1st February. It apparently filled up very slowly in that area and gave low pressure in Burma until the 3d. The appearance of this depression in Sind on the 28th

29th was followed on that day by a very rapid fall of the barometer in the North Punjab and the formation of an independent deep depression, the centre of which was to the north of Rawalpindi and Peshawar on the morning of the 29th. It intensified considerably during the day and marched slowly to the south-east along the hills, to which it gave very stormy weather and heavy snowfall during the next forty-eight hours. A very rapid rise of the barometer set in on the 31st, and the depression filled up very rapidly. This deep depression very largely modified the distribution of pressure over the whole of North-Western and Central India, and obscured the shallow depression in Central India on the 29th and 30th; but with the disappearance of the former on the 31st, the latter again became clearly marked and formed the chief feature of the weather during the next two days. The double disturbance gave a large general and much needed supply of rain to the greater part of Northern India, including the Punjab, Rajputana, Central India, the N.W. Provinces and Behar, and showers in Bengal."

The following gives the precipitation at the hill stations during the storm:

	January 1892					February 1892		Total fall during period
	27	28	29	30	31	1	2	
Murree	—	0.71	2.63	2.45	0.75	1.05	—	6.75
Simla	0.07	—	0.78	1.93	1.85	0.30	—	4.73
Chakrata	—	—	0.75	2.08	1.41	0.28	—	5.45
Dehra Dun	—	—	0.90	2.52	1.92	0.25	—	5.59

At the three first named stations rain and sleet fell during the earlier part of the disturbance, but it changed afterwards to snow, which fell steadily during the night of the 30th and the greater part of the 31st and 1st, when the weather cleared up rapidly. At Rānkhet little or no snow fell. The depth of snow at the end of the storm at Simla was quite three feet, at Chakrata about the same, and at Murree about five feet. The nights of the 30th and 31st were hence stormy with strong winds, thick cloud, and constant snowfall. The cloud canopy extended over the greater part of Northern India, or over the East Punjab, N.-W. Provinces, Behar, and East Rajputana.

The following gives the minimum temperature on these nights at Simla and at a large number of stations in the plains.

Date.	Hill station.	Minimum temperature. A. °	Plain station	Province.	Minimum temperature. B. °	Difference between hills and plains. B—A.
Night of 30th Jan. 1889.	Simla	28.6°	Ludhiana	Punjab	53.8°	25.2°
			Lahore		49.0°	20.4°
			Lucknow	N. W. P.	58.9°	30.3°
			Allahabad		59.2°	30.6°
			Patna	Bengal	52.5°	23.9°
			Calcutta		62.3°	33.7°
			Jeypore	Rajputana	54.1°	25.5°
			Nagpur	Central Provinces	62.3°	33.7°
			Dacca	Burmah	57.9°	29.3°
			Jacobabad	Sind	41.1°	12.5°
Do. of 31st Jan. 1889.	Simla	24.0°	Lahore	Punjab	43.1°	19.1°
			Lucknow	N. W. P.	50.9°	26.9°
			Allahabad		59.7°	35.7°
			Patna	Bengal	50.8°	26.8°
			Calcutta		61.5°	37.5°
			Jeypore	Rajputana	41.2°	17.2°
			Nagpur	Central Provinces	59.8°	35.8°
			Dacca	Burmah	57.9°	33.9°
			Jacobabad	Sind	42.4°	18.4°

These figures indicate that over the whole of the plains of Northern India the minimum night temperature was from 20° to 39° higher than at the hill stations of Upper India. These very large differences (in the opposite directions to those discussed in the previous case) were mainly due to the abnormally low temperature in the hills, and in part to the increased night temperature in the plains due to the presence of clouds diminishing radiation. The characteristic features of these periods will be best shown by examining the whole of the temperature data of the same stations as in the previous case.

Some of

The Chakrata observations at this period, it should be noted, were apparently vitiated by large occasional errors, but in examining their figures it should be taken into consideration that the only stormy weather which influenced Chakrata was that of the 30th and 31st.

The following table gives similar data for the adjacent plain stations.

Date.	Ludhiana.		Rawalpindi.		Bontloo.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
11th	+21°	+25°	+66°	+60°	+67°	+41°
12th	-04°	+11°	-21°	-36°	+21°	+10°
23rd	-16°	+74°	-14°	+53°	+67°	+157°
24th	-70°	+08°	+32°	-24°	-44°	+50°
30th	-43°	+103°	-94°	+73°	-75°	+102°
31st	-63°	+04°	-82°	-60°	-111°	-03°
Mean.	-25°	+43°	-15°	+33°	-25°	+11°

These data show that at the plain stations the range of temperature was diminished not only by decreased day temperature but also by increased night temperature to an equal or greater amount. Hence during these storms the temperature was reduced at the hill stations throughout, whereas at the plain stations it was raised at night by amounts nearly equal to the decrease in the daytime, and there was practically no alteration in the daily range at the hill stations, whereas it was largely reduced at the plain stations.

It hence follows that the temperature relations which obtain during stormy weather accompanied with snow in the hills and rain showers in the plains are:—

- 1st. Diminished temperature throughout the whole day at the hill stations and hence the maximum and minimum temperatures are reduced below the normal by nearly equal amounts and the daily range of temperature is only slightly affected.
- 2nd. At the plain stations temperature is below the normal to a moderate extent in the day, and is considerably above it at night, and hence the daily range of temperature is very considerably reduced.
- 3rd. In consequence of the decreased night temperature at the hill stations and increased night temperature at the plain stations, the differences of the minimum temperature at hill stations and adjacent plain stations are then exaggerated and are occasionally 10° to 15° greater than the average differences.

The third type of temperature relations which obtain in the cold

weather in Northern India are those which hold during the fine clear weather and strongly marked anticyclonic conditions that follow a severe cold weather storm. There is no marked example in the temperature data of January 1889. The conditions are shown in the weather which followed the snow storms of the 30th, 31st January, and 1st February in the hills of Upper India.

The account of the storm has been given in a preceding paragraph. The snowfall which it gave was far heavier in the Panjab Himalayas than in the N.-W. Provinces and Nepal hills. At Simla an average depth of 3 feet lay on the ground at the end of the storm. The weather cleared up in the Panjab on the 1st, and fine clear weather prevailed for some days. The skies cleared in the N.-W. Provinces on the 2nd and 3rd, and in Bengal on the 4th and 5th.

The two following tables give the maximum temperatures and their variations from the normal at eight typical stations in Northern India during the period from the 30th January to 5th February.

Station.	Maximum temperature.						
	Jan. 30th.	Jan. 31st.	Feby. 1st.	Feby. 2nd.	Feby. 3rd.	Feby. 4th.	Feby. 5th.
Simla	32.6°	34.1°	40.7°	42.7°	47.7°	53.7°	45.7°
Dehra	33.5°	38.5°	38.9°	38.5°	41.8°	51.7°	51.5°
Delhi	55.5°	60.5°	60.0°	58.0°	62.5°	63.5°	67.0°
Benares	58.2°	65.8°	62.8°	60.8°	62.4°	64.8°	68.2°
Lucknow	70.4°	70.1°	69.1°	67.1°	67.1°	68.0°	71.6°
Allahabad	65.2°	68.2°	67.7°	67.7°	70.2°	69.2°	68.2°
Varanasi	61.5°	64.0°	76.0°	76.0°	78.0°	74.0°	74.5°
Meerut	52.5°	60.5°	76.0°	72.5°	75.5°	73.5°	74.5°

Station.	Variation from normal of maximum temperature of						
	Jan. 30th.	Jan. 31st.	Feby. 1st.	Feby. 2nd.	Feby. 3rd.	Feby. 4th.	Feby. 5th.
Simla	-13.1°	-11.4°	-4.7°	-1.2°	+3.1°	+8.7°	+0.1°
Dehra	-9.8°	-20.8°	-12.2°	-12.4°	-8.2°	+6.7°	+0.1°
Delhi	-9.7°	-7.8°	-8.2°	-10.2°	-5.3°	-2.5°	-1.1°
Benares	-11.1°	-3.3°	-7.0°	-10.4°	-7.0°	-6.4°	-8.2°
Lucknow	-9.8°	-3.8°	-3.8°	-7.8°	-8.6°	-7.5°	-4.5°
Allahabad	-8.4°	-5.6°	-6.3°	-6.5°	-4.5°	-5.9°	-7.4°
Varanasi	+2.3°	+4.5°	-2.7°	-3.7°	-2.3°	-6.4°	-6.9°
Meerut	+4.9°	+5.3°	-1.6°	-5.5°	-3.8°	-5.7°	-5.2°

These observations show that on the 30th and 31st, when stormy weather prevailed in Upper India, but had not extended to Behar and

Bengal, the maximum temperature was considerably below the normal in some parts of Upper India (the deficiency being most marked at the hill stations), but was much above the average in Bengal, Behar, and the greater part of the North-Western Provinces. In the hill districts the maximum temperature was lowest on the last day of the storm and rapidly increased during the next few days, so that at Simla on the 5th, when the snow was nearly all melted except in sheltered spots, the maximum was slightly above the average. The most important fact is that the lowest day temperatures in the plains were not recorded during the passage of the cloudy weather of the storm, but on the first two days of cloudless skies and fine dry weather which followed the storm. The greatest depression of day temperature occurred at Lahore and Roorkhee on the 2nd, at Lucknow on the 3rd, at Baniwan and Calcutta on the 4th and 5th. This transmission of the cold wave corresponds to the manner of transmission of the storm itself, which roughly averaged from 25 to 300 miles per diem, or 10 to 12 miles an hour.

The two following tables give similar data for minimum temperature. (The data are of the night preceding 8 a. m. of the day named.)

Station.	Minimum temperature of night preceding 8 a. m. of						
	Jan'y. 30th.	Jan'y. 31st.	Feb'y. 1st.	Feb'y. 2nd.	Feb'y. 3rd.	Feb'y. 4th.	Feb'y. 5th.
Muttra	30.7°	28.7°	25.7°	26.7°	34.7°	36.7°	34.7°
Simla	24.0°	21.0°	20.5°	20.0°	21.4°	29.6°	29.5°
Lahore	32.1°	29.6°	32.1°	37.2°	36.2°	38.7°	41.6°
Roorkhee	43.1°	41.1°	44.1°	41.6°	42.6°	43.1°	50.3°
Lucknow	50.9°	48.0°	47.0°	50.2°	46.0°	42.0°	41.6°
Patna	50.8°	52.9°	47.9°	49.9°	48.0°	43.6°	48.9°
Baniwan	62.4°	61.4°	53.3°	51.3°	48.2°	43.2°	51.1°
Calcutta	61.8°	61.3°	52.3°	52.3°	68.3°	62.3°	49.3°

Station.	Variation of minimum temperature of date from the normal.						
	Jan'y. 30th.	Jan'y. 31st.	Feb'y. 1st.	Feb'y. 2nd.	Feb'y. 3rd.	Feb'y. 4th.	Feb'y. 5th.
Muttra	-0.6°	-3.0°	-0.6°	-0.4°	+2.6°	+4.1°	+1.6°
Simla	-3.7°	-13.1°	-5.2°	-3.8°	-3.6°	+2.9°	+3.1°
Lahore	-0.2°	-3.2°	-1.0°	-2.0°	-6.4°	-4.0°	-0.8°
Roorkhee	-0.3°	-2.9°	-0.7°	-3.7°	-2.6°	-2.6°	+4.7°
Lucknow	+10.8°	+1.5°	+0.4°	-2.2°	-1.2°	-5.6°	-3.6°
Patna	+10.3°	+3.9°	-1.1°	+0.3°	-0.8°	-3.6°	-1.0°
Baniwan	+7.7°	+3.8°	-1.1°	-3.4°	-11.7°	-12.0°	-4.1°
Calcutta	+6.2°	+5.3°	-3.2°	-2.6°	+2.3°	-3.7°	-7.6°

These figures show that the minimum temperature was greatly below the normal at the hill stations during the storm and largely above it in the plains on the 30th and in Bengal on the 30th and 31st, the excess being greatest in the North-Western Provinces. The night temperature slowly and steadily rose at the hill station from the 31st to the 4th, when it was above the normal. It was lowest in the Punjab on the 2nd and 3rd, in the N.-W. Provinces on the 3rd and 4th, and in Behar on the 4th and 5th, and in Bengal on the 5th. These facts are most neatly summarized by the statement that a wave of cold was transmitted eastwards across Northern India at the rate of about 300 to 400 miles per diem.

The humidity data of the same stations for the same period are even more interesting and instructive. The first of the two following tables gives the humidity at 8 A. M. and the second the aqueous vapour pressure at the stations named. The third table gives the amount of cloud at the same hour and illustrates the rapid and complete clearing of the skies which follows the cold weather storms of Northern India.

Station.	Humidity at 8 A. M.						
	Janv. 30th.	Janv. 31st.	Feby. 1st.	Feby. 2nd.	Feby. 3rd.	Feby. 4th.	Feby. 5th.
Haridwar	63	100	90	83	84	58	35
Dehra	54	81	19	47	42	58	27
Lahore	93	90	94	94	92	78	68
Rawalpindi	94	79	84	60	94	96	90
Calcutta	85	95	78	62	81	63	100
Bombay	91	90	50	85	88	51	89
Madras	83	64	82	62	73	59	67
Colombo	87	60	94	69	69	55	72

Station.	Vapour tension at 8 A. M.						
	Janv. 30th.	Janv. 31st.	Feby. 1st.	Feby. 2nd.	Feby. 3rd.	Feby. 4th.	Feby. 5th.
Haridwar	163	159	149	139	149	109	66
Dehra	94.9	94.3	91.7	98.7	107	148	103
Lahore	235	281	278	276	242	197	210
Rawalpindi	291	281	242	281	265	250	270
Calcutta	295	288	216	257	223	238	260
Bombay	273	323	263	308	294	207	278
Madras	205	224	290	283	351	302	299
Colombo	252	243	240	257	242	208	242

Station.	Cloud proportion at 8 a. m.						
	Jan'y. 30th.	Jan'y. 31st.	Feb'y. 1st.	Feb'y. 2nd.	Feb'y. 3rd.	Feb'y. 4th.	Feb'y. 5th.
Murree	10	10	10	4	0	10	6
Himala	10	1	2	9	0	0	4
Lahore	10	0	0	10	0	0	0
Roorkee	10	0	3	2	0	0	0
Locknow	7	8	0	0	3	0	0
Patna	10	10	0	0	0	0	0
Burdwan	5	8	0	0	0	0	0
Calcutta	0	0	0	0	0	7	0

The second table shows that the amount of aqueous vapour present in the air was greatest in the Punjab on the 30th and in the Gangetic plain on the 31st. A large decrease occurred on the 1st in the Punjab, on the 2nd in the Gangetic plain, and the decrease continued until the end of the period in Bengal. The lowest aqueous vapour present was registered in the North-Western Provinces on the 4th and in Bengal on the 5th, and the amount of vapour was only from one-half to one-third of that present in the air on the 31st. This very great change accompanied the extension of west and north-west winds across the Gangetic Valley into Bengal.

Two more remarkable illustrations might be given from the meteorology of recent years of the remarkable weather changes which occur in the rear of cold weather storms in Northern India and follow their disappearance (viz., the periods February 1st to 6th, 1886 and February 5th to 12th, 1887). The last week of January or first week of February is in at least two years out of three, one of stormy weather in the hill districts, and some of the most severe snow-storms of recent years have occurred during that fortnight. The second of these two periods, viz., February 5th to 12th, 1887 is selected in further illustration of the peculiar features of the fine weather immediately succeeding severe stormy weather in Northern India and the Himalayan region.

The disturbance which gave this stormy weather first appeared as a depression in the South-west Punjab on the 27th of January. It intensified on the 28th and moved eastwards. It passed into the Himalayan region of the North-Western Provinces on the 29th and 30th. Heavy snow fell in the North-West Himalayas and Afghan highlands at the same time, and extended eastwards to the Eastern or Assam Himalayas. Stormy and cloudy weather with much snow continued over the whole Upper Himalayan region until the 7th, when the weather suddenly cleared.

up, and fine bright clear and cool weather prevailed for some days over the whole of Northern India.

The following tables give data of the temperature, humidity, and other meteorological conditions of the period.

Maximum temperature.

Station.	February 1887.						
	7th.	8th.	9th.	10th.	11th.	12th.	13th.
Haridwar	57.6°	43.3°	40.8°	44.9°	41.0°	42.7°	40.3°
Rawalpindi	60.1°	63.2°	61.3°	63.2°	60.1°	64.1°	64.1°
Lahore	60.5°	67.0°	66.5°	68.2°	66.5°	68.0°	71.1°
Amritsar	70.9°	71.1°	70.1°	70.1°	72.4°	77.3°	79.7°
Delahabad	79.8°	72.5°	70.3°	68.5°	70.9°	74.0°	78.7°
Simla	77.8°	75.8°	71.7°	69.1°	70.6°	72.3°	79.3°
Dehra Dun	82.1°	82.5°	78.0°	72.3°	72.5°	72.8°	76.5°
Benares	82.1°	82.7°	81.1°	77.6°	77.0°	74.4°	76.3°

Minimum temperature.

Station.	February 1887.						
	7th.	8th.	9th.	10th.	11th.	12th.	13th.
Haridwar	15.5°	27.1°	25.6°	30.7°	29.2°	35.4°	29.7°
Rawalpindi	22.4°	32.9°	25.7°	33.4°	45.0°	42.0°	39.1°
Lahore	32.2°	31.7°	31.2°	34.2°	41.6°	45.0°	40.6°
Amritsar	46.6°	38.7°	36.7°	31.7°	41.6°	48.6°	49.2°
Delahabad	43.7°	41.6°	39.1°	39.6°	39.6°	41.7°	52.5°
Simla	50.9°	47.9°	44.7°	42.4°	43.8°	45.9°	53.4°
Dehra Dun	55.7°	50.8°	67.3°	52.8°	47.7°	47.7°	51.5°
Benares	59.5°	55.2°	53.9°	45.1°	49.6°	45.5°	50.0°

Diurnal range of Temperature.

Station.	February 1887.						
	7th.	8th.	9th.	10th.	11th.	12th.	13th.
Haridwar	12.1°	15.2°	15.2°	14.2°	11.7°	10.3°	10.8°
Rawalpindi	30.7°	36.3°	35.6°	30.1°	12.1°	22.1°	24.7°
Lahore	34.3°	35.3°	35.3°	34.3°	26.0°	27.0°	30.5°
Amritsar	27.0°	32.4°	32.3°	29.8°	30.8°	28.6°	30.5°
Delahabad	23.1°	31.8°	31.3°	29.2°	31.3°	32.3°	26.24
Simla	29.9°	27.9°	29.8°	23.8°	26.8°	25.4°	27.9°
Dehra Dun	15.4°	29.2°	29.7°	24.8°	24.8°	25.1°	24.7°
Benares	22.6°	27.5°	29.4°	25.1°	27.4°	28.9°	25.9°

Humidity at 10 hours.

Station.	February 1867.						
	7th.	8th.	9th.	10th.	11th.	12th.	13th.
Murree ...	62	55	50	61	79	50	62
Rawalpindi ...	37	30	44	61	45	55	42
Lahore ...	33	33	24	28	28	41	34
Agra ...	33	32	25	25	25	36	31
Allahabad ...	44	38	27	31	32	24	28
Patna ...	45	54	41	38	42	43	47
Calcutta ...	85	39	32	26	34	36	53
Dacca ...	90	33	28	22	46	42	53

Aqueous vapour pressure at 10 hours.

Station.	February 1867.						
	7th.	8th.	9th.	10th.	11th.	12th.	13th.
Murree ...	109	109	120	134	169	120	109
Rawalpindi ...	146	116	163	172	228	211	180
Lahore ...	140	135	108	146	160	133	139
Agra ...	123	155	141	150	145	207	208
Allahabad ...	238	128	136	174	189	174	153
Patna ...	208	229	226	214	228	277	212
Calcutta ...	550	261	208	168	205	207	327
Dacca ...	648	289	217	184	202	205	320

Amount of wind during 24 hours ending 4 p. m. February, 1867.

Station.	February, 1867.						
	7th.	8th.	9th.	10th.	11th.	12th.*	13th.
Murree ...	167	117	120	117	207	280	204
Rawalpindi ...	115	135	79	86	68	59	117
Lahore ...	90	96	75	60	43	25	100
Agra ...	92	95	85	121	69	65	100
Allahabad ...	56	43	114	108	47	97	100
Patna ...	43	62	88	94	50	200	100
Calcutta ...	94	55	126	125	80	125	200
Dacca ...	94	63	93	126	65	67	200

The following gives a brief summary of the chief conclusions from the data of [redacted] I:—

1st.—[redacted] temperatures were recorded at Murree and the hill stations just before the storm disappeared and at [redacted]

and iu

^ \ range
w. s

air motion, «
east*
is two or

of



The following hence gives the chief features of the anti-cyclonic weather immediately following a cold weather storm during which heavy general snow has fallen in the Afghan highlands and the Himalayas:

- (a.)—Pressure is excessive in Upper India and unusually clear bright fine weather prevails. Strong westerly winds set in over Upper India and extend rapidly eastwards. In Bengal these winds displace the light southerly or easterly winds which prevailed during the previous disturbed weather.
- (b.)—During the stormy weather both day and night temperatures are very low at the hill stations, but, with the melting of the snow, temperatures rapidly increase and the ordinary anti-cyclonic conditions of increased temperature are again exhibited at these stations. The important factor in determining this change of temperature conditions appears to be the melting of the snow from all the lower elevations.
- (c.)—During the disturbed weather the day temperature in Upper India is below the normal and the night temperature above it. In Bengal and Behar, in consequence of the prevalence of light southerly and easterly winds, both day and night temperatures are considerably above the normal and the weather sultry and oppressive. The disappearance of the disturbance is usually followed by a rapid reduction of both the day and night temperatures. This accompanies a complete shift of wind from some southerly to some northerly direction and the prevalence of unusually clear bright skies in which the solar radiation is even greater than usual. This passage of a wave of cold is hence evidently due to the intrusion of a body of cold air advancing from Upper India or the Himalayan mountain region into the Gangetic plain and Bengal.
- (d.)—The setting in of these winds produces a very rapid reduction in the humidity of the air and the amount of vapour. The reduction is far greater in Bengal than in the interior and is sometimes excessive.
- (e.)—In consequence of these large changes of humidity and temperature, the periods immediately following cold weather storms in Upper India are especially cool, pleasant, and bracing in Bengal and stand in marked contrast to the weather prevailing before and during the existence of the storms.

We proceed to give an explanation of these facts.

The chief feature of the cold weather in Upper India is great stillness of the air, the stillness being most marked at night.

The following table gives the amount of winds measured by the

1

|

|

II

|

2

i

|

.

clear weather. It is not necessary to give data for these statements, as a reference to the Tables I to IV will confirm them. We shall therefore assume these two figures, viz., 18° and 36° , as representing approximately the daily ranges of temperature of the air at the hill stations and adjacent plains in Upper India in ordinary fine clear anti-cyclonic weather in January. If there were absolutely no motion of the air, vertical or horizontal, an increase of temperature of 36° of the lowest strata of air over the plains would cause pressure, as measured by the barometer, to increase about two inches. No such increase actually occurs. The only large barometric movement in such weather is the diurnal oscillation (slightly exceeding in amount a tenth of an inch), which goes on with great regularity. Again, as no such large increase of pressure occurs, it is evident that it is counterbalanced by the subsequent change of pressure due to air motion of expansion, contraction, and also to horizontal movement. The cooling of the air takes place very rapidly for some hours after sunset when the air-movements are apparently least. The adjustment of pressure to the changing temperature conditions during night is frequently not accompanied by any perceptible or measurable air movement (see data of Table, p. 41). A slightest observation of the way in which the smoke of domestic fires in an Indian town in Upper India lies over it notwithstanding clearly that the only important air movement which occurs is the sinking during the rapid cooling of the air, can only be one of compression due to descent of the air above the lowest stratum, and that this is so extremely slow a process as to be imperceptible even by its action on mist and smoke. Considering the first 1000 feet thickness of the atmosphere to be homogeneous, the upper surface would have to descend about 60 feet in order to produce the compression required to maintain pressure at the same amount. This motion may appear to be considerable, but if it occurs as an accompaniment to the cooling it will take several hours to be completed. A total downward movement of the air at a height of 1000 feet through sixty or seventy hours spread over several hours is exceedingly small and cannot be detected by any of the ordinary methods of measuring air motion. The explanation of this slow motion of compression is hence in accordance with facts and competent to explain them. The cooling by night here takes place in a nearly quiescent atmosphere, and if there be any convection currents, they are so feeble, more especially when compared with those which accompany heating during the day, as to be of no importance and negligible. Hence the motion of the air at night in Upper India during fine clear weather in January may be assumed to be a very small gradual downward movement producing the

amount of compression necessary to counterbalance almost exactly the effect of diminishing temperature on the pressure. In the open Ganga-tic plain, more especially near the hills, it may be accompanied by slight horizontal movements, but they are generally too small to be measured by an anemometer. Hence the adjustment of pressure takes place in the cold weather during the day time chiefly by convection currents and partly by expansional movement of the lower strata and partly by horizontal motion from west to east or from the area of later to earlier solar action during the day; and during the night, almost solely by vertical movement accompanying or producing compression.

Through such a nearly motionless atmosphere the heat radiated from the earth's surface will pass readily. The chief proportion of the small absorption which occurs will be in the lowest strata. Hence the upper strata which receive little heat and give out little by radiation will have their temperature very slightly affected by this cause. Also the compression of the lower strata effected by the expansion of the upper strata, these strata will be slightly cooled, whilst the compression of the lower strata will cause a slight increase of temperature, but these changes can be shown to be so small as not to affect the temperature at the most more than 1° or 2° . The most important action, however, occurs in the lowest strata. The earth is cooled rapidly by radiation from its surface into space, and in the vast level plains of Northern India, the air remains quiescent or stagnant over it and hence cools down rapidly. (The cooling of the lowest strata probably takes place chiefly by conduction and to some extent by convection currents extending to a comparatively small height, determined partly by height of vegetation, trees, houses, &c.) The chief fact, however, remains that the cooling occurs in a stagnant or quiescent stratum near the earth's surface, and hence goes on continuously during the night, and produces a very large accumulated decrease of temperature.

This action is, however, chiefly confined to the lowest strata and above these the fall of temperature will be almost solely due to conduction (a slow process in air) and hence be small in amount. Also, as the lower strata are compressed and the upper strata expand, there will be some level at which at each instant there is neither compression nor expansion. Whether this will alter much in position during the night can only be conjectured, but it appears on the whole most probable that it will not. The total fall of temperature during the night will hence increase rapidly in amount with elevation and at some elevation become practically constant where it will be due almost entirely to slight cooling by radiation and by expansion and to a very slight extent by conduction and probably not exceed 2° or 3° in amount.

In the preceding discussion it has been shown that the temperature conditions and changes at the hill stations are usually different from those of the plain stations. For example, ordinary anti-cyclonic weather gives increased day and night temperature at the hill stations, and hence increases the mean temperature and only affects the diurnal range very slightly, whilst in the plains it gives increased day and decreased night temperature, and hence increases very largely the diurnal range of temperature, whilst it only slightly affects the mean daily temperature. Again stormy weather in the mountain districts of Northern India gives decreased day and night temperature and hence a much lower mean temperature than usual with little change in the diurnal range of temperature. The same weather in the plains gives decreased day and increased night temperature, and hence the diurnal range of temperature is largely diminished, whilst the mean temperature is very slightly affected. Hence the important conclusions,

- 1st.—That the chief weather changes and conditions in Northern India during the cold weather affect the temperature in entirely different ways in the plains and hills. In the former they modify the diurnal range of temperature chiefly, and in the latter the daily mean temperature.
- 2nd.—That the monthly means of temperature or of daily range of temperature are in consequence not comparable for the hills and plain stations, and that similar variations from the normal imply different conditions and actions in the two cases.
- 3rd.—Hence the nature and causes of these changes and variations of the vertical temperature relations cannot be properly estimated and investigated by comparing monthly means but by comparison of the actual temperature conditions prevailing in each particular state or type of weather.

Hence typical cases have been selected in the previous portion of the paper and the same principle is adopted throughout.

We are now in a position to give a simple explanation of the high night temperatures at the hill stations observed during fine clear weather in December and January.

In ordinary anti-cyclonic weather in January in the Punjab plains the temperature ranges from an average maximum of 72° to an average minimum of 36° , giving thus a mean diurnal range at such periods of 36° . The hill stations in Upper India are at an elevation of about 7000 feet above the sea or 6000 feet higher than the neighbouring plain stations. The rapid increase of temperature in the plains during the morning gives rise almost entirely to convection currents. As the air is very dry, it may be assumed that in rising and expanding it will cool

and diminish in temperature at a rate not much less than that of a rapidly ascending current of dry air, which is very approximately 1° for every 193 feet. Assuming the rate of decrease of temperature in these ascending currents to be 1° for every 200 feet, the motion of the atmosphere would tend to give a temperature of ($72^{\circ}-30^{\circ}$ or) 42° at the elevation of 6000 feet above the plains of the Panjab. Little or no change would occur at night, when there are practically no convection currents, and hence at that elevation above the plains of Northern India the temperature in such periods would remain permanently at about 42° and hence be about 6° higher than the average night or minimum temperature at the level of the plains below.

The day temperature at the hill stations would be considerably higher than 42° in consequence of the heating of the air by contact with the land surface, and average about 69° in such weather. About sunset temperature would fall quickly and a short period of rapid decrease of temperature would occur until the temperature reached that of the same level above the plains, viz., 42° . The continuous decrease of temperature in the hills and plains for some time after sunset would evidently give rise to a compressive movement over the hills and plains and also to a very slow downward movement of air from the hills towards the plains and to a nearly horizontal upper movement from above the plains towards the hills. Hence the air which cools by contact with the mountain sides and moves down towards the plains is replaced from a large source (that of the whole mass above the plains at the higher levels), and hence arrives at a nearly constant temperature corresponding to that level. Thus air brought in from the level of 6000 feet would arrive during the night at that level in the hills at a nearly constant temperature at 42° , and hence when the temperature at the hill stations has fallen to a little below 42° it would remain fairly steady during the night at about that temperature.* As the tempera-

* In order to verify this statement I had two series of temperature observations taken in a suitable open position on the top of a ridge at Simla on the nights of the 1st and 11th of December last, when ordinary anticyclonic weather prevailed in Northern India. They are given in the following table and it will be seen fully to confirm the conclusion given in the text.

Date.	Temperature of the air.														Min. temp. during night.
	1st	1630	17	1730	18	1830	19	1930	20	2030	21	2130	22		
	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.		
December 1st	58.9	52.4	49.2	47.7	45.4	46.6	46.9	46.8	45.2	44.9	43.2	43.6	43.9	41.0	
11th	59.7	48.6	43.9	43.8	42.6	42.2	42.7	43.4	42.6	43.9	43.6	44.8	45.2	47.4	

ture at the level of the plains would probably fall to about 35° ; on such clear nights, the minimum temperature in the plains would hence be slightly below that at the hill stations 6000 feet above.

The previous supposition gives an average case, and shows that in ordinary anti-cyclonic weather in December and January the minimum temperature at the hill stations tends to be higher than at the plains stations.

The following are specific examples taken from the observations of the inversion of the vertical temperature relations was most marked:—

On the 2nd the maximum temperature at Rawalpindi was 75° . The corresponding temperature of convection at the level of Murree 4800 feet higher would be $(75.5 - 24^{\circ})$ or 49.5° . The minimum temperature on the night of the 2nd was 49.3° or slightly greater. On the 3rd the maximum at Rawalpindi was 68.9° and the convective temperature at the level of Murree 44.9° , which was practically identical with the actual minimum at Murree 44.6° . The minimum temperatures on these two nights at Rawalpindi were 57.4° and 36.3° or 11.9° and 7.7° less than at Murree. Again at Ludhiana on the 3rd the maximum was 74° and at the level of Simla 6200 feet high the corresponding convective temperature would be $(77.7 - 31^{\circ})$ or 46.7° . The minimum at Simla on the night of the 3rd was 48.4° and 2.8° higher than at Ludhiana. At Roorkee on the same day the maximum was 72.3° and the corresponding convective temperature at the level of Mussoorie (6000 feet higher) was 42.3° . The minimum at Mussoorie was actually 42.0° and 5.7° higher than at Roorkee. It is not necessary to multiply examples, as these show roughly that the minimum temperatures at the hill stations and therefore the temperature during the greater part of the evening and night is practically that of dry air at the level of the hill station rising rapidly with the maximum day temperature at the level of the plains or what may be termed the convective temperatures corresponding to the maximum temperature conditions of the lowest stratum.

Hence the explanation and facts appear to establish the following:—

- (a)—In ordinary anti-cyclonic weather when the horizontal air motion by day or night is very small, the temperature

With these figures may be compared the following temperature observations recorded at Lahore on the same days:—

Date.	Temperatures of the air at					Maximum temperature during day	Minimum temperature during night
	4 hrs.	8 hrs.	10 hrs.	10 hrs.	22 hrs.		
December 9th	40.4	47.5	66.0	70.1	86.0	72.2	53.5
11th	41.0	46.0	66.0	72.5	88.6	75.2	55.0

considerable elevations above the plains is nearly constant, and is determined by the temperature at that elevation of the rapid upward convective currents at the hottest period of the day.

(b)—There is at such periods a slow steady descent of air during the night from the hills towards the plains and a horizontal inflow from higher levels of air at nearly constant temperature to the hills.

(c)—Temperature decreases very rapidly at the hill stations shortly before and for some little time after sunset until the temperature falls to or slightly below that of the same level in the open atmosphere over the plains of Northern India, after which it remains nearly constant throughout the night. The short chilly period immediately after sunset is a very characteristic feature of the hill stations in ordinary fine weather during November, December, and January.

(d)—The temperature of the earth's surface in the plains of Northern India falls rapidly and steadily during the whole night and until very shortly before sunrise. Hence also the temperature of the quiescent mass of air immediately above it falls rapidly, and by amounts ranging from 30° to 40° in ordinary clear weather in January. The fall of temperature is greatest at a considerable distance from the foot of the hills, where the observations show that the maximum temperatures are higher, the daily range of temperature greater, and the minimum frequently lower than immediately under the hills. The following gives examples for the 2nd and 3rd January, 1869. The stations which were to be compared are grouped by means of brackets.

Station	2nd			3rd		
	Max.	Min.	Range	Max.	Min.	Range
Delhi	69.7	61.0	38.7	72.2	45.6	26.6
Almora	72.0	36.2	35.8	73.0	37.2	35.8
Dehra	70.8	38.9	31.9	70.8	35.6	35.2
Muzaffarnagar	72.7	42.1	30.6	74.2	39.0	35.2
Meerut	73.1	41.1	32.0	75.1	40.1	35.0
Shahjahanpur	73.7	41.3	32.4	71.2	38.8	32.4
Benares	75.6	44.6	31.0	78.6	43.6	35.0
Allahabad	68.9	45.4	23.5	71.8	37.9	33.9
Mathura	76.2	49.0	27.2	71.1	41.1	30.0
Jaipur	71.4	48.7	22.7	77.0	42.7	34.3

As there is little or no difference, so far as can be judged, in the radiating power of the earth's surface at Ludhiana, Rohtak, Bareilly and Gorakhpur as compared with Lahore, Delhi, Agra, and Allahabad in January to account for the greater cooling of the earth's surface and the superincumbent air, it is almost certain that the mass of air descending from the hills is warmed by the action of compression in descending and that this is only if not the chief, factor in giving a smaller fall of temperature and slightly increased night temperature at the stations near to the hills when compared with the more distant ones. Hence it is clear that the descending air does not contribute towards the cooling of the plains of Northern India during the night but actually tends to diminish it.

The efficient factors in the rapid cooling of the air in the plains of Northern India at such periods are:—

- 1st.—Absence of cloud and other conditions favouring rapid radiation from the earth's surface.
- 2nd.—Absence of air motion, and more especially of downward convection currents, so that the same mass of air remains in contact with the earth's surface.

The first ensures the rapid cooling of the earth's surface and the second of the air immediately above the earth's surface.

A brief explanation will serve for the temperature conditions of Upper India during and after stormy weather. The most important factor appears to be snow fall in the hills and rain in the plain districts. The condensation takes place largely, if not almost entirely, in the upper return current of the north-east monsoon circulation and hence at a great elevation. The falling rain and snow carry down with them the temperature of their place of origin and hence tend to cool considerably the whole mass of air through which they fall. The amount of the cooling will evidently depend greatly upon the amount and period of the rain and snowfall. In the hill districts, the temperature falls steadily throughout a long snow storm, and the lowest temperatures are usually recorded just before the weather begins to clear. In the plains, the day temperature falls in consequence of cloud and rainfall and the action of rainfall referred to above. But the cloud canopy causes terrestrial radiation to proceed very slowly at night. The effect of the cloud in diminishing radiation is so large that the night temperatures are hence at such periods considerably higher than usual. Hence stormy weather in January and February depresses temperature largely throughout the whole day at the hill stations, as in fact tends to give them a temperature nearly equal to the permanent temperatures of a stratum considerably above their level (i. e. of the stratum in which condensation occurs). Whereas in the plains the clouds

effect is to diminish the daily range of temperature by decreasing the day and increasing the night temperature.

Finally, when the stormy weather passes away, unusually dry clear weather sets in. In the hills the snow probably extends down to a level of 4,000 or 5,000 feet. The temperature of the air at and above that level is mainly determined by that of the snow surface with which it is in contact, and hence, even in the middle of the day, differs little from 32° . Hence a period of low and nearly constant temperature conditions sets in until the snow is melted and the snow line retreats. The snow melts very rapidly, at a rate of six to nine inches per diem in clear weather in exposed positions, and a snow fall of 3 or 4 feet will melt away and disappear in five or six days in favourable weather except in sheltered positions. Consequently, temperature in the hills at such periods is at first low, but rapidly rises with the melting of the snow, and after a few days of fine clear weather the conditions merge into those of normal ordinary anticyclonic weather, which have been already stated.

In the plains the conditions and actions are different. Solar radiation during such periods is more active than usual in consequence of the great clearness of the atmosphere, the absence of dust, &c. Hence not only is the upward convective motion over the plains during the day greater than usual, but in consequence of the low temperature over the snow-covered surface of the hills there is a rapid flow of air from the hills towards the plains, which in consequence of the first action is probably greater by day than by night. This mass of air starting from, say, a level of 4,000 feet above the plains at a temperature of 32° will by rapid descent be heated about 20° and hence will arrive at the level of the plains at a temperature of about $32^{\circ} + 20^{\circ} = 52^{\circ}$, or 20° lower than the maximum temperature prevailing in the plains in ordinary anticyclonic weather. Hence there will be a steady flow of cool air towards the plains from the hills, the temperature of which, when it arrives at the level of the plains, will be very low when compared with the ordinary day temperature at the period. As the snow melts and the snow line ascends, the temperature of the descending current at the level of the plains will increase. Hence in the plains immediately after a severe storm in the hills there will be,

- 1st. A strong and steady current from the hills towards the plains and hence a strong easterly current from the north north-west and west down the Gangetic Plain.
- 2nd. This current will be fed from a source of nearly constant temperature above the elevation of the snowline, and hence the temperature of the descending current at the base of the hills will be least immediately after the clearing up

of the weather, and will increase slowly with the melting of the snow in the hills. Hence one of the most striking features is the low maximum temperatures recorded at such periods in Upper or Northern India, although the air is unusually clear, and the solar radiation at the earth's surface more intense than usual.

3rd. One of the chief features of a descending current is great dryness, hence the descending currents from the hills at such times will tend to give abnormally low humidity to the whole area over which their influence extends. The change of humidity due to this will evidently be greatest in the area over which damp sea winds previously prevailed, that is, usually in Bengal.

It will thus be seen that the features of the very cool and dry periods after stormy weather in Northern India during January and February are explicable on the assumption of unusually large and massive currents from the hills at a time when the snow surface is greatly extended downwards.

It is hardly necessary to point out that these cool periods are occasional occurrence in Bengal, and are the most characteristic and pleasant feature of the cold weather. These cool periods in Northern India hence show most strikingly the rapid and large influence which snowfall over a large mountain area exerts. Mr. Blanford and myself have shown the probably large influence it occasionally exerts on the distribution of the south-west monsoon rainfall. This has been questioned by some writers as the effect appears to them to be disproportionate to the cause. The large changes in air motion, temperature, air humidity over the whole of Northern India which follow general winds in the hills, and which continue for longer or shorter periods according to the intensity and extent of the storm, are a frequent strong argument in its favour.

HI

1

rk.

「

l

is formed. The maternal attachment of each placental cord is separate and distinct.

At the fetal end, the cord, having pierced the ventral wall between the pectoral fins of the fetus, divides into two branches. The lower of these, which is the artery, can be traced into the mesentery, where at the level of the proximal end of the large intestine, it is found to be furnished with a pouch-like gland; its connexion with the dorsal aorta could not be made out. The upper branch (venous) subdivides into two branches, which ascend in the median fissure of the liver to the portal vein.

A transverse section of the placental cord shows one artery and one vein.

A transverse section through the wall of the uterus shows an outer thin, compact layer of muscular and connective tissue; but the greater part of the section consists of an indefinite spongy network (vascular?) with numerous large thick-walled arteries.

The red blood cells of the fetus are $\frac{1}{10}$ of an inch long, and $\frac{1}{16}$ of an inch broad.

b. *ZIPHAX BLOCHII*. On the same occasion, a female of this species, nearly five feet long, was taken. The general appearance is smaller to the appearance in *Carcharias melanopterus*; but each uterus contained five fetuses; and the placental cords, which were much more delicate, were uniformly covered, except at the extreme fetal end, with flattened, leaf-like, bilobed or trilobed appendicula, from one-eighth to one-quarter of an inch long, each lobe being about one-eighth of an inch broad.

A transverse section of a placental cord, which includes vertical sections of the peripheral appendicula, shows, in the cord, a single artery, a large vein, and four large irregular channels; and, in each of the appendicula, a central longitudinal vessel apparently opening into one of the channels of the cord.

A single intact appendiculum, examined under a moderate power, is seen to have a thick external epithelial investment, while internally the central vessel is seen to break up into a fine ramifying and anastomosing capillary-like plexus.

A transverse section of an appendiculum, under a high power, resolves the epithelium-like investment into a gland-like aggregation of round large-nucleated cells, about ten strata deep, beneath which is the loose-meshed connective tissue of the appendiculum which supports the ramifying branches of the contained vessel.

The structure of the placenta, and the ultimate distribution of the vessels of the cord, are the same as in *Carcharias melanopterus*, but the

no gland-like body in connexion with the artery. The red blood-cells of the foetus are $\frac{1}{2}$ of an inch in the major, and $\frac{1}{3}$ of an inch in the transverse diameter.

The length of the foetuses was about fifteen inches.

The nature of the appendicula is difficult to understand, seeing that the foetus is connected with the mother by a large and well-developed placenta; but their richly cellular investment is evidence of some active function, either in the elaboration or purification of the blood proceeding to the foetus. If the channels of the cord are regarded as lymphatics, the appendicula might be looked upon as forming a diffused and primitive lymphatic gland-system, their thick investment of lymphoid cells being analogous to the medulla of a mammalian lymphatic gland.

CARHARIAS DUSSUMIERI. A female, seven feet and a half long, was hooked at sea, off the west coast of Middle Andaman Island, on the 14th of April, 1889.

Immediately after death, lively movements commenced in the abdomen, which was much distended; and the abdominal cavity, on being opened, was found almost completely filled by the dilated, congested, angry-walled uteri, as in the case of *Carharids melanopterus* and *Zygus*. Each uterus contained five living foetuses, each two feet long, and head forwards in separate compartments, each with its own placenta, exactly in the manner already described. The placental cords had the usual appearance.

The young ones when removed to a tub of sea-water swam about normally for nearly an hour, but died eventually from hemorrhage, due to rupture of the placental cord.

The structure of the placenta, and the distribution of the vessels in the cord, were exactly similar to those of *C. melanopterus*; but no gland-like organ was found on the artery.

Unfortunately, the selected specimens, though placed in strong alcohol, were spoiled.

The specimens of *Carharids melanopterus* and *Zygus bleekeri*, though packed in salt, became so rotten that they fell to pieces.

§ 2. Observations on the Gestation of *Trygon bleekeri*, and on the habits of *Myliobatis nishiohi*.

T. BLEEKERI. A female, with a disk of very large dimensions, was taken in the seine, by Mr. W. H. W. Searle, in False Point Harbour (Orissa coast), on the 15th December, 1888.

The distal end of the right oviduct was enormously dilated, and contained in its cavity a fully-developed male foetus with a disk 11 inches long and 10½ inches broad. *

The striking feature was, that there was no connexion of any kind between the foetus and the mother; and no evidence of any such previous connexion.

The mucous membrane of the uterus, however, was covered with an abundant glairy albuminous fluid, the secretion apparently of a layer of thick-set papillae which formed its inner coat; and the inference seems irresistible that this fluid constituted the nutriment of the foetus and was, in short, a true pterine milk. Unfortunately, the examination of the stomach of the foetus was delayed for twenty-four hours, when the viscera had undergone such changes that the verification of the theory was hardly possible.

On removal of the fluid, which was then found to form a nearly solid coagulum on the application of heat, the papillary layer of the mucous membrane of the uterus was found to be of a vivid scarlet.

The papillae themselves average about half an inch in length, and are filiform in shape, and very delicate. They are so thick-set as to be in contact when not soaked out in water.

Beneath them is a thick mucous layer rich in blood-vessels. Outside this is (1) an inner circular and outer longitudinal layer of muscle, and (2) a connective-tissue coat; the whole aggregated thickness one-eighth of an inch.

The thickness and compactness of the muscular coat is in stark contrast with the loose spongy nature of the uterine walls in *Oarichthys* and *Zygota*, and appears to indicate much greater parturient effort in *Trygon*.

b. *MYLIOLETHA KIRCHOFFII*. A female, with a disk seventeen inches long and twenty-eight broad, was taken in the spine, by Mr. W. H. Searle, off Cocanada, on the 31st March, 1880.

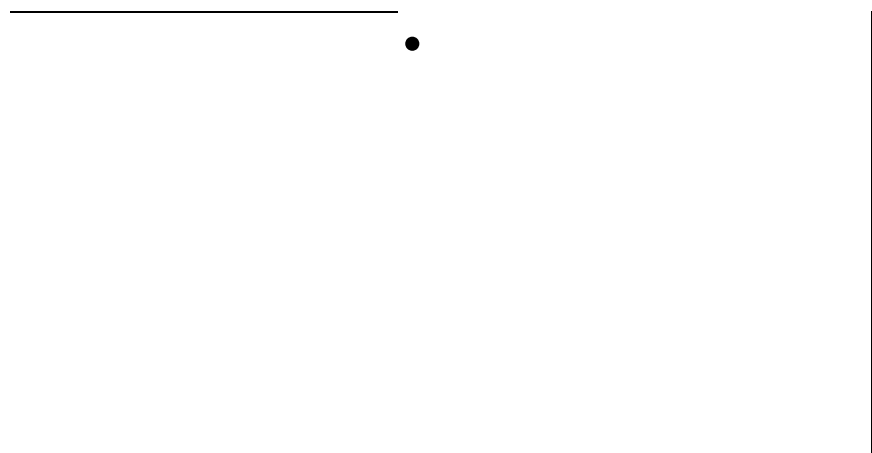
The left ovary was full of large ova, and the distal end of the oviduct formed a large globular swelling, with thick, firm, muscular walls, and a uniform internal lining of broad flattened papillae, some half an inch long.

On the posterior surface of this uterus, and closely adherent to it, was an indistinctly lobulated gland-like organ, which, on section, was found to consist of an aggregation of tubules with blood-vessels and characteristic glomeruli, and a small amount of intertubular stroma. The tubules were lined with large-nucleated, cubical, epithelium. Unfortunately, the other relations of this kidney were missed.

A section through the uterus shows, from without inwards, (1) a compact connective-tissue investment about one-eighth of an inch thick, with numerous large blood-vessels; (2) a layer of anastomosing muscular tissue in transverse bundles; (3) a layer of similar muscle

1
 w

1



EXPLANATION OF PLATE I.

Fig. 1. A piece of the potential cord of *Zygodon blackii*, natural size.

Fig. 2. Transverse section through the same, showing artery and vein, lymphatic (F) spaces, and three appendiculi in oblique section with parts of two more in vertical section. $\times 16$.

Fig. 3. A portion of one of the appendiculi of the same, showing the ramified vessel. $\times 21$.

Fig. 4. Transverse section through part of one of the appendiculi of the same near its base. $\times 110$.

Fig. 5. Transverse section through uterine wall of *Mytilobates wislizeni*, showing cilia and muscular coats, and parous membrane, with the bases of three papillae. $\times 21$.

Fig. 6. Obliquely transverse section through part of one of the uterine papillae of the same, showing some of the simple follicles of the mucous membrane in oblique section, and one of the transverse follicles. $\times 110$.

III.—On Gleitsch's Transformation of the Hydrokinetic Equations.

By ANURUP MUKHOPADHYAY, M. A., F. R. A. S., F. R. S. E.

[Received February 27th;—Read March 24th, 1903.]

A first integral of the hydrokinetic equations of Euler may be obtained by known methods in three cases: (1) Irrotational motion; (2) Steady rotational motion; (3) General rotational motion. It is the object of this note to show how the method* of applying Gleitsch's transformation to the third case can be materially simplified, and incidentally the relation between the three solutions is pointed out.*

Starting, then, with the hydrokinetic equations, we remark that they may be at once reduced to the form

$$\frac{du}{dt} - 2\omega\xi + 2\omega\eta + \frac{dR}{ds} = 0 \quad \dots\dots\dots (1)$$

$$\frac{dv}{dt} - 2\omega\xi + 2\omega\xi + \frac{dH}{d\eta} = 0 \quad \dots\dots\dots (2)$$

$$\frac{dw}{dt} - 2\omega\eta + 2\omega\xi + \frac{dR}{dz} = 0 \quad \dots\dots\dots (3)$$

where

$$R = \int \frac{dg}{\rho} + V + \frac{1}{2} q^2$$

$$q^2 = u^2 + v^2 + w^2$$

* For the ordinary method, see Boussinesq's *Hydrodynamique*, vol. i, p. 28.

s

,0

' 1i~

<

.

ier.

b for n mon

$$+ A$$

fur

$$+ r_t$$

<»£ which givv m

$$\pounds ''$$

Substituting in v

•

1

.

1

i

round

$$d\wedge d_x$$

ions D£ the clos *a* the coor
•*i* the coordinate pla
jnce tlie ordinary formula for the jnaati
integral

$$d\wedge d_x$$

£

$$\dot{\mathbf{D}}\mathbf{y}$$

∴

$$di$$

But, a= an im'

$$-\mathbf{X}^{-a}+$$

$$\frac{dv}{t?a} \quad \text{Ji/} \quad \text{' \rf^{\wedge} dy}$$

//
-

|

ss

■: 1 LI

■+■ rf

$$3\& - '!\>f - 18 (ac - b^*) - 8^*$$

$$8 \quad -$$

$$8 \quad ';$$

$$b = - (an + b)$$

$J_{nx} i^{\wedge r}$ of the curvo we have

ewlore, Btil ing for*;

.writing «. $+ ($ p a, /2, we Boi ocirv*

another plane cubic of *the* same class is

$$^1 = — ha$$

$$B = — i-6$$

$$0 = k) \quad ac —$$

$$D \ll - /.J + (I$$

fj therefore,

the invariants of the given cubic> and W, i
itios for the aberrancy cubic, t

$H' = AC - B^{\wedge} Q' - AW - 3ABO$ we
have by direct calculation

IF « 0 .
. for bu

$$x = - \textit{b}$$

1

' Li:

d
wit

$\therefore 1.$

7 ID' is alii

•2.

ins oft



3, H. Rp., Pl. I
uteness o

comparative shortness of the limbs, and appears to most nearly resemble *A. australis*, Hurwell, from which, however, it differs in the comparative length of the joints of the thoracic appendages.

My specimen was 11 mm. long; of a pale brown colour liberally marked with patches of a deep brown.

The *head* is small and oval, the two pairs of simple eyes being placed respectively opposite the origins of the antennules and antennæ.

The *thorax* forms more than half the body length, the four anterior joints increase progressively in length, but the three hinder are equal and longer than any of the other segments, thoracic or abdominal. The first four coxal plates are deeper than their corresponding segments, the fourth being the deepest, and also exceptionally so. The fifth coxal plate has an anterior lobe of moderate depth, and the hinder border of the posterior lobe subdivided by a notch into two lobules, of which the upper is the smaller.

The *abdomen* forms rather more than one-third of the entire body length, its first three segments are subequal in length, and each is as long as the remaining three together. Their depth is moderate, not exceeding that of the thoracic segments with their attached coxæ.

The *telson* is small, squamiform, and deeply cleft.

The *antennule* is very minute, being barely as long as the head and first thoracic segment; the first joint of the peduncle is moderately stout, but the remaining two joints can barely be distinguished from the articuli of the flagellum, especially the third, which but little exceeds them in length. The peduncle forms about one-third of the entire length of the organ.

The *antenna* is more than twice as long as the antennule. Its first two joints are short and moderately stout, while the distal three are very long and slender, the third being the longest and the fifth the shortest; the flagellum is composed of a number of long slender setæ, but was broken off, so that the entire length could not be ascertained.

The *gnathopods* are completely hidden beneath the opaque first coxal plate.

The second and third *thoracic appendages* (gnathopoda) are small, and have the propodite merely dilated without forming a true subchela. The third is somewhat the larger. The fourth and fifth are of similar size, but the fifth is a little the larger, the fourth being as long as the head and first four thoracic segments. In both, the metopodites are peculiarly long, and the carpopodites very short. The last three are remarkable in having their dactylopodites curved backwards, instead of forwards, as is usually the case. The sixth and seventh have the

tfhich is the longer, is

iliar in

having

ly below t

moro- and csirpopodit

, and

nui

are oi

amous ai'

E ibe

i.e low' lation of

the. :iree (

r a

,

and c

o! & lui'ge numbi

;imeu oil y na

very Bmall, not a

nearly twice a

tt is

stouter, and is pj

Lite boincr minn

th and

ory leg

id subeqnal to each other, and cqnal to the 3rd i

jaroly as long as the 1st gnathopod, and

i

lodite, which is of nearly (r outline aud very deeply serrate on

. Tho 7th. i

'as the

P0<»

ndency to the same form

ther broader than long, but its borders are

quite

i of tin

idftge3

short, stont

Tho 4th ia

, while tho

»rt,

I for til

Ling abdominal flpptiida

>ms off the

as *Pit*

ts.

In

hy wi

ud it

es about 5 ram.

in

pper part

'ng tho

ubcgoal in length, bui

domen

sorat

T

ur

ll ((it, d tho last

two very

and double.

■rt, the i le, wh

first joiu

, of a sr." :iber 0
r. ;.locos.

the J i forma a *h*
li.
The ■ are **small** and
it a simple
id the ii

■lite is a
amail esh

podite.
me exa

tes.
its o

ftuy •

!i otheL- iu £orui

-entir

e **It**

p v -urs, **n.**

east coast of Greenland. Our species was dredged in 30 fathoms, Manner's Straits, Andaman Islands. Found crawling upon a *Pennatula*, the pink and white colours of which are almost exactly imitated by the amphipod.

The distribution of the colouring varies in different specimens. In one, the head and body as far as the fourth thoracic segment and the first abdomen were pink, while the remaining middle zone of the body was of an opaque glistening white. In another, the distribution was just reversed, the pink forming a broad band in the middle of the body. In a third it was almost confined to the hinder part of the body. In all, however, the tints were the same, the pink parts having a uniform transparent character diversified by minute opaque spots of a darker tint, while the white was remarkable for its dead opacity.

The largest specimen measured about 7 mm., the smallest little more than 2 mm.

The head is rather long and cylindrical, its anterior half being almost completely covered by the eyes, which are of a pink colour, deeper than any other part of the body.

The remainder of the length of the body is almost exactly divided between thorax and abdomen, the latter, however, being much the deeper. The segments of the thorax are of nearly equal length throughout, but the more posterior are much the deeper. In the abdomen the first segment is considerably the longest, while the second exceeds the first in depth, as well as all, save the third, in length.

The fourth abdominal segment is nearly as long as the first, but very narrow, while the last two are very small in all dimensions.

The telson is simple and squamiform, equalling in length the pereopodite of the sixth abdominal appendage. It is armed with a few setae.

The first four coxal plates are very deep and broad, the fourth being the largest, the last three comparatively small. Spence Bate (*Ann. Nat. Hist. Ser. 3, Vol. 1, p. 303, 1858*), in his definition of the genus, states that the "Corn of the second pair of pereopoda" (fourth coxal plate) is "very deeply excavated upon the upper part of the posterior margin to receive the corae of the third pair of pereopoda." This is, however, more apparent than real, at any rate in the present species; the appearance being the optical expression of the fact that the 4th coxal plate overlaps the fourth as well as the sixth, the upper part of the former not being remarkably excavated, but narrowing uniformly to its articulation with the pleuron of its segment.

The antennule has a three-jointed peduncle not exceeding the head and first thoracic appendage in length. The first joint is somewhat

longer than the second, while the third is very short. The flagella of both antennae vary somewhat in length in various specimens, the number of articles, however, remaining about the same, the increase being gained by an elongation of all the pieces. In the specimen figured the flagellum but slightly exceeds the peduncle in length, but in others it was considerably longer. There is no appendage to the flagellum.

The first three joints of the peduncle of the antennae are very short and, except the end of the third, hidden beneath the excavated cephalon. The last two joints equal in length the first two of the antennae. The flagellum also varies in length, but is always about a third shorter than that of the antennule.

The gnathopods were not dissected out, but a mandibular appendage was distinguished, and it could be seen that the maxillipeds are not but pediform.

The two pairs of gnathopods closely resemble each other alike in size and form. Both are feebly subchelate, with the palm oblique, the propodite forming about one-third of the entire length exclusive of the dactylopodite. Their carpo-mero- and basispodites are shorter than their breadth, while the basipodites form nearly a half of the length of the appendage exclusive of the dactylopodite.

The 4th and 5th thoracic appendages are of the usual ambulatory type, are subequal to each other, and, in length, to the branching, each being as long as the head and first five thoracic segments. They are very slender and closely resemble each other in all particulars. The 6th, 7th, and 8th closely resemble each other in all points in size, each being stoutly built and having the basipodite provided with a strong buttress-like plate along the posterior border. The 6th and 8th are subequal, being as long as the thorax and the first two antennal segments, but the seventh is about one-sixth shorter.

The first three abdominal appendages are small, but quite of the usual type. The last three are biramous, with equal rami; the fourth being the longest and the sixth the shortest of the three. The fourth and fifth have their rami armed with stout spines, while the sixth has only fine hairs.

Cirropoda *amblybranchia*, new sp., Pl. II, Fig. 7.

Found in a net at Port Mout, Andaman Islands. One specimen was found and this was swimming free, nor could any other be found and got destroyed by the waves of the tide.

The animal is small, about 1 mm. long, and of a dirty white color. It is sparsely sprinkled with fine white spots.

its au i shortnes
detail H of the a

ileopodt

on the hir

The I rate, rather deeper tlian lo 'igth form-
only one-* he entire body leugtu.
Tho small d on a prominence oppo; nfgtn of
uatenna.

tlor

, forming tin -

ender, tiuu ante]
iaii i, and ! ;nt exu ;iUy

The borax, tts first
.are rathev average thorai 9, The
narrow, is v than the. others, while the fifth
■ill.

1 laminar, aud is armed with a few short,

ef as tl . ar thors
fents. arc formed bj the |
lo ; the first joint o^wlmh, thoui y stout, rter than-
0 tho second in cot bly the longe
ulary appendage, consisting of four short
long as the firat joint of the pedancl
' four joints tl of which f ;iite half
L*e of' timed with

,ts ; it i Lominnl
tr climbiag. The fi
ther as loi%

, wli; two distal joi e subequal, aii<t form two-thirda
. couHiats of two stoat

'jgjuuui ■j; hooked spines. The
ihcd with long stiff hairs, like
ro

1 is armed v
pairs
id by a ho

could

uaai.
not be closely examined, hut it

awed, and that tho

ly lai ' pediforra.

The first of the *gnathopods* is small, being no longer than the two joints of the peduncle of the superior antenna; nearly half its length is made up by the basipodite. The articulation between the ischiodactyl and propodite is very oblique, and the appendage appears to consist of but five pieces, owing probably to the dactylopodite being fused with the propodite, the subchela being formed between these and the dilated carpopodite. The second is very much larger than the first, being nearly as long as the head and entire thorax; it, however, resembles the first closely in general form, and like it is composed of but five pieces.

The fourth and fifth *thoracic appendages* are subequal and exactly similar, and have the distal extremities of their articuli dilated so as to admit of very free flexion, but are otherwise of the usual ambulatory type. In length they nearly equal the first six thoracic segments. The sixth, seventh, and eighth much resemble the fourth and fifth, but are of stouter build, and, while the sixth is only subequal to them, the seventh is as long as the antennule, and the eighth as long as the antennae, except the last joint of the flagellum.

The first three *abdominal appendages*, though of the usual type, are exceptionally small. The fourth is as long as the last joint of the peduncle of the antennae, its propodite forming half its length. The rami are unequal, the outer being hardly more than half the length of the inner, both rami and peduncle being armed with stout spines. The fifth is only two-thirds the length of the fourth, but is stoutly built like the fifth, its rami are unequal and spinose. The sixth is reduced to a rudimentary tubercle, armed with one or two spines.

EXPLANATION OF PLATE II.

Fig. 1. *Melita costei*, $\times 20$; 1a, 3rd and 3rd right thoracic appendages, $\times 20$.

Fig. 2. *Phoxus uncinatulus*, $\times 15$; 2a, mandible and appendage, $\times 20$; 2b, the maxilla, $\times 120$; 2c, the 6th abdominal appendage, $\times 30$.

Fig. 3. *Ampelices daley*, $\times 7$.

Fig. 4. *Lychnus wood-masoni*, $\times 10$.

Fig. 5. *Ampelisca indica*, $\times 12.5$; 5a, distal joints of 3rd thoracic appendage, $\times 20$.

Fig. 6. *Parapandora picta*, $\times 15$.

Fig. 7. *Cyrtophium endamanense*, $\times 35$; 7a, flagellum of inferior antenna, $\times 30$; 7b, last three abdominal segments with appendages, $\times 30$.

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Part LI—N. SCIENCE.

No. II.—1890.

A Descriptive List of the Uredineae occurring in the Neighbourhood of Sylhet (Western Himalayas). Pt. III.—By A. BASCLAY, M. B., Bengal Medical Service.

[Received January 27th 1890. February 5th, 1890.]

(With Plates III.—VI.)

In this third instalment of a descriptive list of the Uredineae of Sylhet (in continuation of the second part in this Journal, Vol. LVIII, II, 1889), I complete a description of all the species known to me to the present time. The present part includes descriptions of 6 species of *Uromyces*, 4 of *Phragmidium*, 3 of *Melampsora*, 3 of *Colletotrichum*, 1 of *Gymnosporangium*, 2 of *Chrysomya*, 2 of *Coenia*, and 6 of other Uredineae forms. I have also added descriptions of four *Ascidia* species, which should have been included in Part I of this List, and seven species of *Puccinia*, which should have found a place in Part II.

I must here express my obligations to Dr. George Watt, C. I. E., for his kind and ever ready help in determining the species of many

UROMYCES, Link.

There are remarkably few of these in this region, only six species as far as I am at present aware, and all but one on the higher plants.

ulao bears a- **ml**
is, I

nEMnrRoiKrc cfi3,
1 -p.

Aut
1

b.

erent, and remain in a quiescent state until the following year, when they germinate and reproduce ascidia on the newly developed leaves. Experimental evidence, which will be found detailed in the above-mentioned paper, fully confirmed the antecocious nature of the fungus.

The ascidiospores are round or oval pale yellow bodies, and measure on an average 16μ in diam. They are tuberculated on the outer surface. Their mode of germination is quite peculiar. A germ tube is emitted, about 25μ in length, which then divides into two by a transverse septum, and each part forms a long narrow sterigma, which, however, forms no sporidium, but directly penetrates the host to form their mycelium, bearing ascidiospores at first (but no spermatogonia) and later.

The peridium is formed of a single layer of cells about $36 \times 12\mu$ in size. The paraphyses accompany the first crop of ascidia: they are not branched, and measure about 145μ in depth and width. They have a few protruding paraphyses.

The ascospores are brown single-celled bodies, thickened at the end, firmly adherent to their beds, becoming detached with a portion still adhering. They measure $36 \times 20\mu$ on an average. They germinate after a winter's rest in the usual way, each promycelium forming a sporidium as a rule, but sometimes four.

The sporidium is oval, and measures $12 \times 8\mu$ to $14 \times 10\mu$. Secondary sporidia are abundantly formed, often before the primary one has become detached.

3. *GEOMYCES VALKEIANUS*, Schum.

On *Faleriana Walpersii*, D. C.

For a description of this species see the Journal of this Society, LXI, Part II, No. 3, 1887, page 352.

Dr. P. Dietel (Leipzig) to whom I sent specimens of this fungus asks it is a new species.

4. *LEPTUROMYCES*, Schröter.

4. *GEOMYCES SORDIDUS*, Nival.

On *Solidago Virginica*, L.

The host may be found in some localities largely attacked in mid September. Attention is drawn to the fungus by the circular discoloured patches produced, mostly on the radical leaves, but also on higher leaves. An attacked plant, however, does not form a flowering stalk. These discoloured patches (pale yellow)

' Aii old pa
cm. A single leaf uiuy bear from 30 p
minute brown suri, with
. If these spores bo examined they
pores. A earefi
upper and lower surfaces of i discloser crmog'

■od in water i These
spores goriniaat.' tho
usual way, pri

throwing
tory of ■ ■'« the |
me pbei ' Those detaclued

M-TOBUROAiZTCI'

-

ves oi

!d not, foi it to their teds Li
aro idore or less elongated

ra l>y Medico! office

a n<

I

PHSAGMIDIITM

\ *m*

usual

▪

tin

>xura

■res.

attention to the resting property of the teliospores, which is in contrast with the immediate germinability of the aurt spores.

3. HEMIPHLAGMIDIUM, Schröter.

2. *Phragmidium* Rost. Pers.?

On *Balan lanigerum*, Smith.

A *Phragmidium* on this host is fairly common. On the 21st February I collected some leaves bearing both yellow uredo-like pustules & black teliospore pustules on separate green leaves. Both kinds of pustules are hypophyllous, in scattered circular pustules, indicated over by a brownish red discoloration of the leaf, especially marked in cases of teliospore formation. I put some spores from each kind of pustule into growing cells on the following day; but whilst none of the teliospores from the black pustules germinated, several of those obtained in the yellow pustules did so freely, forming ordinary perithecia, dividing into four parts, each bearing a sporidium at the end of a pointed sterigma (fig. 5, Pl. I). The sporidia are round orange yellow bodies, 8 to 10 μ in diameter, the diameter of the promycelial cell being 8 μ . These latter teliospores were among numerous uredospores, and were orange red in colour as contrasted with the deep brown of the former teliospores, which would not at the time germinate. The orange yellow teliospores were evidently just formed, and, indeed, not for their ready germinability, would be described as immature spores, the more so as they contain fewer cells than the brown spores, namely 3 to 5 cells against 5 to 7 in the brown spores. Curiously enough the uredospores, which were in the majority in such pustules, do not germinate in the cultivations in which the young teliospores do.

The uredospores are round pale orange yellow bodies, with numerous club-shaped paraphyses among them. They are tuberculated on the surface, and measure about 21 μ in diameter. I never succeeded in observing their germination (fig. 6, Pl. I).

Later in the year, from July to December, fresh crops of black teliospore pustules are produced, without any uredospores. Some of these later teliospores, which are dark brown and many-celled (on an average six-celled), I put into water on the 10th September, and now they germinated very freely, producing immense numbers of sporidia (four to each promycelium), round or pyriform in shape, orange yellow in colour, and 10 to 12 μ in diameter. These brown teliospores measure on an average 10 $\cdot$ 8 $\times$ 8 $\cdot$ 7 μ ; but of course they vary considerably.

Tbts
PL i).
ed aon.

rW ofc Wil:
puuuiform

ie steni

oiargius of tl e pustules uro wnouudd

germ p* I ^w^_

it esco^

:

LBO«

OH

1'

'l appe." G
format;
iue. !.
■permo

D TVUil 1U :

MELAMPSORA,

a.

it
the

fchoagrl I D
■· Lies ' ■ ■

Ln this !
,v shoo^l formed

j

fi of wi

l

onnl.

road. TIHJ

ij. They aj...

l

ill.

2. l'i ^otu LKPTOIM:

OL.

T

e yelk

aOft. I di

•' in wutor on L

uaae -io

11 the nai pr
very li 3ply orange r&

1 i J. I

Hppan

MEI

(Purs). ?

On *S'dix*, ap.

April T found this host attacked by a tired
no means largely. Young sEoota were at¹ and in sui¹!

I

uredo pustules were extremely nui,
b leaf, and on the lower surface mostly, with only a few on *
surface. These are round or oval and prominent -(hemispheric:
spores are pale yellowish orango, and very decidn each
[
contained club-shaped par;; s (fig. 8, PI. I). The spor
orm in size and r^und, measuring 20/i in diameter when
fresh. Ti . -pore is coarsely tubercnlated and tin.
l placed in water in a ■ttn.ich glass, but they did not

After this I fc of tho fungus ti
in the same locality ranch moj ■te parasite. Now tho
leaves were i cot as before only leaves on
particular shoots. 1

ches of discolouration, blackish brown in the centre v.,
ing zone of brownish rod, **and** lastly the whole siu-rcr lar
zone of pale yellow. On the lower surfaces of

■I. On th

pustl iri'ouiided by
outside the b'

The spore beds ever\

large club-shaped par ending the '

ong the spoi-es. A uredo bed may often be Been in tin
teleutospore beda. Tho un os are not given of!"

borne singly on stalks (fig. 8, PL I), These
birfirsoly with coarse sp The fresh sppres m

■rage. The heads of the parapbyses .are smooth.

Again in September I fou

fication. The leavo3 were now speckl

faces with orange red spots, mosi

shape from the

pustuV

■ may be seen, about 2 to

surface these invaded areas fire dark r

'cuoua 1 , ftre oiU:n veTy ex*il

central snore cushion containB uredospore3 with extreme

spores are very palo yeWw

L*uk

round, 29)* in diameter to 26 x %\p. Tho of the

I iifji in breadth by ! i length. The

mounted apeoi

th.alcolioi, IJO

5V iu length and 8/* iu breadth.

Remarks.—I have thought it best to name this fungus *H. Salicis* *apress*; but further research may show it to be different.

COLEGSPORim

Lévill.

HBMICOL1SOSPO HIU il

Schröter.

L I

LEOSPORIUM PLECTRANTHI, nov. sp.

On *Plectranthus Gerardianus*, Benth.

The plant begins to be attacked towards the end of July, and in great numbers at this stage. The pustules are entirely hypophyllous, and consist of little yellow heaps of the size of an ordinary pin's head. Sometimes they exhibit a circinate tendency. The position of pustules above is indicated on the upper leaf surface by yellow areas, regular in size and contour. Some leaves have very numerous areas of invasion, whilst others have but very few. The *uredospores* are very pale yellow, oval, closely tuberculated, measuring on an average when fresh in water $21 \times 17\mu$. The epispore is very thick; but I could not detect any germ pores. They are given off in fairly long chains.

Amongst the *uredo* pustules, early in August, some indistinct *teliospore* pustules of a brownish colour may be seen, the commencing *teliospore* pustules gradually acquire prominence. At the end of August *teliospore* beds are very numerous: they are strictly hypophyllous on the lower surface of invasion. The beds are bright orange-red waxy *teliospore* beds. A *uredo* pustule is often, though not always, the centre of a *teliospore* arrangement of *teliospore* beds. At the end of August I put some *uredospores* and some sections of leaf blade through a fine sieve in water. The former did not germinate, probably because they were dead; but the latter produced a few oval sporidia. It was extremely difficult to make out the exact morphological form of the *teliospores*, but as far as I could see it was of the nature of a *teliospore*. The *teliospore* beds are covered with a well marked *teliospore* layer, and the top of each spore often presents a globular mass of *teliospore* substance. The spore cells are usually single but sometimes divided into

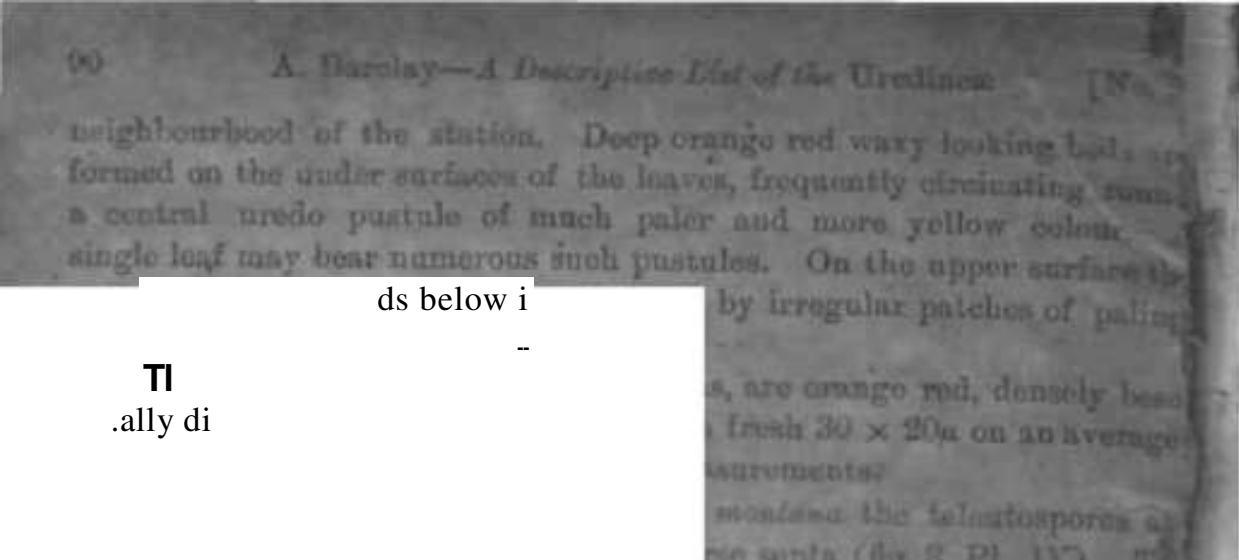
litr

DM ClI

On *Clematis montana*, Don.

Clematis Buchaniana, D. C.

Clematis montana is not infrequently found about August to October; it is not, however, common in the



ds below i

TI
ally di

*

MDB

red w

\ml



spores are thus attacked, the pustules breaking out from both surfaces of the leaf-blade. At this time I found that the uredospores germinated freely in water, throwing out a simple long tube (about 200μ in length, and 5μ in diameter), into which the coloured contents of the spore exuded, leaving the walls of the latter colourless. In March this stage is still common, but now the sori are more frequently erupted from the lower surface of the blade, a few pustules occurring on the upper surface, exactly opposite some below. Still only the lower leaves near the ground are attacked. The sori on the lower surface tend to coalesce now. Towards the end of March the uredospores do not germinate so readily in water. The fungus is then missed to general observation until early in July, when a new crop of uredo pustules attracts notice. These are numerous erupted from the upper leaf surface, and now from the upper leaves on the stalks. At the same time such attacked plants usually exhibit some generally pale lower leaves, on the lower surfaces of which waxy orange red elevations may be seen, which are teliospore beds. The same leaves usually bear a few uredo pustules as well. This stage continues throughout August, but the teliospore beds increase in numbers whilst the uredo pustules diminish and become very scarce, though never entirely absent. At the end of September a third crop of uredo pustules is produced, now all over the surface of the plant, ascending to, and involving even the green flower buds and young fruit capsules. Shortly after this the plant dries up. From July onwards the teliospore beds are met with.

The spores of all three crops are alike, both in measurement and appearance (fig. 10, Pl. IV). They are given off in a magenta red, thick walled, beset with tubercles; and measure $21 \times 17\mu$; but after lying in water for 12 to 24 hours each spore appears to have three germ pores.

The teliospores are covered by a well marked hyaline layer. The spores are magenta red and are divided by transverse septa into 3 to 5 cells (fig. 11, Pl. IV). The average length of each complete spore is 40μ and the average breadth 14μ .

Remarks.—I have named this species provisionally *C. Campanulæ*; but I have noted that both the uredo- and teliospores are smaller than those of *C. Campanulæ*; neither are the uredospores so variable in size and shape as to be in the European species.

GYMNOSPORANGIUM, Hedwig f.

1.

On C' , DCIL.

And. i tm.

For a Led description of this, the pccips
ion, I must refer the read per
oioirs *hj*- **Medical** Officere

India," Part V, I

<er th<

t'opean species. Si
t have no c^l med it as
abov^ T!

teleutOBpore beds arc **hemisplu lies**
during-dry weatliov, ai a woll as on t

During heavy rain I
Tli'

. tth a substance capable of swelling
ied. "VVheu the sp ooincs detached
characteristic tl i
appreciable n at tho sep
uniformly tl ith soraetimes

6)" ill
fo]
Oil stOTlt

co:

-o tel(

2. *CHRYSOBOTHRA PICEAE*, nov. sp.On *Picea Mariana*, Link.

I first found this parasite in June at Narkanda (40 miles from Simla) where it is fairly, though by no means very, abundant; but have since found it fairly common much nearer, namely, at Mashobra, a suburb of Simla. In Simla itself I have never met with it except comparatively few individuals of the host which are present. Mashobra I found numerous trees attacked with it in the middle of May, and some very extensively. The upper sides of the needles bear brilliant orange-red convex beds, round or oval to oblong. Each usually bears several such beds; but varying from 2 or 3 to 10, and in a single row. Sometimes, however, there was an intermediate row on the other side of the upper needle surface. I observed that most trees almost all the beds were on one particular side of the needle so that they could be much better seen from one side of the tree than from the other. This was probably due to some light effect?

Thus the usual site of eruption is the upper half of the needle surface; but sometimes beds are extruded from the lower side also. In the immediate vicinity of the beds the needles were very slightly green or yellowed, but very inconspicuously. These fruit bodies occur most on the older needles, and by far the most frequently on two-year-old needles, and were never present on the youngest just-evolved needles. I never found any on the axis. The beds varied from about 1 mm. in diameter to 2.5 or 3 mm. in length by 0.6 mm. in breadth. In depth (i. e. from the free end to the base on the subhypodermis) they usually measured 0.44 mm.).

The mycelium ramifies among the chlorophyll-containing cells between the hypodermis and the endothelial sheath, but appears never to penetrate within the latter. The hyphae are on the whole sparsely distributed, except at the bases of fruit bodies where they are very abundant. They are easily seen in fresh sections as they contain orange-red oil globules, and measure $\frac{1}{2}$ μ in diameter. The resin canals also contain hyphae; but these are sometimes branched, and may contain stomata.

The fruit body consists mainly of radiating septate cells, formed by much septated filaments forming a network. The long cells measure from 0.100 to 0.182 μ in length. They may frequently be seen to contain a central nucleus, staining deeply with carmine. There are also small cells (Fig. 1, PL. IV.) There are a few scattered cells, larger than the long cells, on the surface of the fruit body, but they do not contain

portions of a promycelium. Unfortunately I have never been able to see a special formation. I have kept needles bearing the fructification in a moist atmosphere, but without seeing any germination. My description of this parasite is therefore very imperfect.

Remarks.—In comparing this fungus with Rees's description of *Chrysomyxa Abietis*, Ung., there appear to be considerable differences, and especially in the large cells forming the main elements of the fruit body. I have examined numerous sections, but have never seen these cells septated, nor locked. It would therefore almost seem that the parasite is more nearly related to *Colosporium* than to *Chrysomyxa*. The want of observation of the nature of germination unfortunately precludes any decision on this point, and I have included it among *Chrysomyxa* on general rather than on particular analogy. Should future research show that it is in fact a *Chrysomyxa* it would be an interesting example of the very close morphological relationship between the genus and *Colosporium*.

Among other points of difference may be noticed the larger size of the teliospore beds in the European species, the smaller number of spores on each needle (one to two), their eruption from the wider surface of the needle, the conspicuous yellow bands of discoloration produced by the needles, the smaller number of teliospore cells on each fruit body (about 12 against 20 in Smolensk), and the presence of haustoria.

CAEOMA, Link.

1. CAEOMA SMILACIS, Barclay.

On *Smilax aspera*, L.

For a detailed description of this parasite I must refer the reader to a paper on its life history in the "Scientific Memoirs by Medical Officers of the Army of India," Part IV. It is apparently a complete seasonal species, but the experimental evidence for this is not complete.*

The *ascidial* stage is found in July on the newly evolved leaves and petioles. Proliferous patches are formed on the leaves, more or less extensive in size, and varying in size from a small point to a large blotch. These patches are considerably thickened. When fully developed patches bear blunt, brownish papillae on both surfaces, and are perforated by a pore, through which the spores are emitted. The patches also bear spermatia mostly in the form of small, dark, oval cells.

In the autumn, when the *ascidial* stage is disappearing, the same patches are covered by a distinct mycelium.

*The experiments I have completed the evidence.

A. i

lightly paled circular areas on each of which
L, conta brown ured
are &ot in the least ted- When a leaf is not exc<
the uredo pustules frequently exhibit a marked circinatu
air:

1 a central pustule.
Tin > in the gradual pr.
uredo
beds.are well dark brown c<
a leaf bearing fceleutospore I
ht brown
is due to th of a gelatinous sheath en

The **edo-** ;.
red oil globi form i
to any **hypertrophy of fch<**
lobnlef
hy of the host's I **form 1**
Ibe **11 or pj**
nally with very pro:

measure on **an ave** **7/t.** T
germinate readily
sequently not observed I
The *tehutos* ■ yellow, with lo;
a n-elatinous sheath. The free end is fchicl
from 7-JJ'O to 5Q-8ju : the upper cell
varies''f)
and thy lower from 36 x 3 X 15/a.
stri
firmly adlieront. ri
iu he thin c<
The spores gi Eormin

mtly
r etached cells **measure from 14 x S to 18**
x
U germinating. At the time I wrote
tl
iove^I hud ne ■ **any vi**
time .all my cultural

in a co **phere. Re**
leu

;OLATED UREDO FORMS.

1 [It

normally !•

1

.

• • • • •

• ut.

>ntiimcm&ly fot: soim

L.

m (
i !

■me i,
; in

tin

J J —

press and I have
been m

hfJ« M

ADDENDA

In the first

uriing

■.: . bal ime in-
.. in atlu o 1 iiavo

I Aecidia.

publication of the second part of

■unmi oi fl Ik) Sofiety of B

: |¹¹

38 of /

El S*¹

indeed, it is rat' ad the
on it on the stem (vai
the variety on t¹

id ni

n a)} •

it.,

Tl emptied o
 red aacidiospores is white. It ruptui ripe
 to allow the exceedingly numerous
 sists mainly of two layers of cells (in some parts oi
 firmly adherent to one another, by tl
 which cover them externally. The walla of the
 are 4ft and the ceils themselves measure when
 28 x 30 to 44 x 29/Avor on an average 38 x 41/t.
 The *awidiaspnres* are foi-med in very long rows, those to
 from one another by cleai
 lamelli! bey are oval, orajage red bodies, with fchici
 promineni iid in t
 The dry n au a
 when moistened
 4 x 1 on an av>
 lese spores to gi
 Ink¹

e of the usual struct and
 deeply set.

ist, I think, *h*
 Willd;
 list the BS I have desc
 to 1 cm. in length and 2*5 to 35 m.m.
 lindrical and 2
 æ« >res of the latter arc 30 to 34 x 20 t<
 ■Bpt -20 — 24 x 19 —17/*

2. A sp.
 On *Pi* Wall.
 This is au aln mdant
 i the above, t; Lia being¹ much
 a distinct
 fche markedly later in
 . The aacidla begin to
 nui to Juno. The needles of this host are
 though •■> great many are shed annually, and
 thos<
 ire apparently always so shed, aa after July i
 idia remains. New ne< agin to emerge fn
 lie end of April, and are fnll grown in Jul
 new needles are never found attack«
 Tho *aacidia* arc like those of the abt
 eh smaller (fig, J, PI. III),

and i:

.aed as in i

ml ahenth, and does not , **ate within thi**

Lwo In

dhuj'tUt

il *cells iii-o* uiu-■

.. . ■ LII).

I

iro, II.

< 1G 3

OBO twp -
I

:K3.

-In a paper describing a *Ghryscmyxa* (*C. Hhitafe'*
i Simla on *JSldodendron* a
to ft jsihlo uonnectioa between tho
P. etnxU * and have ^iveu reasons
ie uoi- ooe
when I wrote th< t- they eh T d:

-la or

! ore is some don*
^ion; n
tho niime

4. AECILHI

I liave described on tl:
No, 2,1386, T now propose **naaniu**

5.

6, A ni, n

An inconspicuous and rai **uly**, and
tton shortly e-fterwarda on a
iality. T^{lie} neci^{al}

usually
■rmogojiia could bu
i. Theiaa»©shi

j^,, Metlieul (itliwrs «f the

tnberc

I have only '»

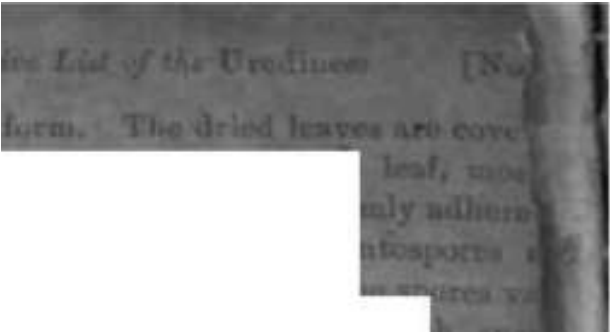
dry, of
a e spam
fjoj i:

scon tl

(1'

,

Sr^t time at the end oj
■tullj for them in



> ID t<

tlai* septum. The

ic] retjuite. a winte

2. Pi

In the .i

. U. PL I). '!

tbi

OB'

jjj, yres ar<> plut
Oeornocon.s mall coi
fchout iliis (fi^- 11> PI- I). Fi
q portion of I
Act.

1

ing 23 x 1

usual way { PL I). I have o
at the end of the germ tube, as shown in the
separated off by a septum.

The *i* s are very deciduous, g off with on
ment of stal¹ ling. They are dark brown and very
size and sh; what constricted at the septum, v

seen in < cell (fig., 9, PL. I). The fresh spoi
by 11 to 13ju

thickness. *i* do noi

5, PUCCIKIA Gs

On (.

I

(near E
Yfit)

u leaves bor<

found 1 ist of teleutosporea with a few uri
are n i¹ beds, coming

Uy adhering.

8 are oval, pale brown bodies, 2-4
hours in water.

re plump and rounded fit 1 if

at all cons

p both cell

exhibit iiucleolar spa
i

spore d from 38 to 40//. it

uniform in size. **They do not germi**

ionally a single collod I —This is

most probably P :rs of both urcdo and
teleutos]

any The locality, however, in which I
not familiar to me : I have only once visited it in wi

KICBOPtTCCIIflA, Sehi

scription sec above UTKI

7. Ptjccrau WATTIANA, nov. sp.

On 01

f-^{aud} T.

This fungus was collected by Dr.

' Suttlej vail

Suni, 2,500 ft., i October I

•re or less circular patches, on the under Bi
nv. . own pustules, with a marked
circii

. were found also on the upper
led areas oi »l oration measured 3—4m.ni. va
From 5 to 30.

vered i .d ultimate stem

The spores are readily detached, coming off with a coi

,lk adhering. They are deep chest not brown, smooth

1 at both ends, with little constriction at the septum,
>s iiammilhi at i

- 37 X 21 — 20 ft.

n preservi

ed iu ,n the, 4th Stay 1890, and on
tin

> heve germinated freely. fi

y quite short, thoat;¹ Limes long, mid are colour!

i t whii upper promyceliutn isaaea from
fho
aal, th<

al and colourless.

7_{UT}

r" -

were t

• v Curtis, and

.1 with eith. Tlr

Dr. G.

I

spores, us i .

to pr<

INDEX.

- I = Vol. LVJ, Pt. II, No. 3, 1887.
 II = " LVIII, Pt. II, No. 2, 1889.
 III = " LIX, Pt. II, No. 2, 1890.
- Acetabularia* brevius, III, p. 102.
 " *Cedri*, n. s., III, 104.
 " *Complanatum*, n. s., III, 100.
 " *Compositarum* Martius, I, 373.
 " *infrequens*, n. s., III, 105.
 " *Jasmi*, n. s., I, 303.
 " *leucospermum*, D. C., I, 361.
 " *Pieris*, n. s., III, 104.
 " *Plectranthi*, n. s., III, 104.
 " *Saniculae*, n. s., I, 352.
 " *Strobilanthia*, n. s., I, 369.
 " *Thalictri* Davi, D. C., I, 362.
 " *Thomsoni*, Berk., III, 104.
 " *Urticae*, Schum. v. Hima., I, 308.
- Cassia* Mori, n. s., III, 97.
 " *Sollersii*, n. s., III, 95.
- Chrysomela* Himalensis, n. s., III, 93.
 " *Piceae*, n. s., III, 94.
- Clematis* *Compositae*, Pers., III, 80.
 " *Clematidis*, n. s., III, 80.
 " *Plectranthi*, n. s., III, 80.
- Cynodactylon* *Clavariacearum*, Jacq., I, 370.
 " *Cunninghamianum*, A. s., III, 92.
- Dactylis* *Lepidodermis*, n. s., III, 86.
 " *Sacchi-Johannis*, n. s., III, 84.
 " *Sallas* *Carpaeae*, Pers., III, 88.
- Elaeagnus* *Andrachnoides*, n. s., I, 371.
 " *Euphorbiae*, n. s., I, 364.
- Eragrostis* *incompletum*, n. s., III, 83.
 " *quadrangulata*, n. s., III, 81.
 " *Rubi*, Pers., III, 81.
 " *salicoides*, Schrank, III, 79.
- Erica* *Arctostaphylos*, Schum., II, 240.
 " *Andropogon*, Schw., II, 246.
 " *Azaleastris*, n. s., III, 246.
 " *argentea*, n. s., III, 100.
 " *Arenifoliae*, n. s., II, 245.
 " *Cassia*, Schum., II, 244.
 " *Cassia* *Guineensis*, n. s., II, 250.
 " *Chrysopsis*, n. s., II, 247.
 " *Cinnamomi*, Pers., II, 238.
 " *Colletiae*, n. s., III, 110.

- Puccinia coronata* Corda, II, 248.
 " *Fagopyri*, n. s., III, 107.
 " *Rosculosorum*, Alb. et Schw., II, 238.
 " *Fragariae*, n. s., I, 359, II, 244.
 " *Galii*, Pers., II, 239.
 " **Goi** 15
 " *Gerani silvatici*, Karst., II, 236.
 " *Graminis*, Pers., I, 307, II, 240.
 " *helvetica*, Schri. (see *P. Collettiana*).
 " *Iridis*, D. C., III, 105.
 " *Leptodermis*, n. s., III, 100.
 " *Menthae*, Pers., II, 242.
 " *nitida*, n. s., III, 107.
 " *Pimpinellae*, Strauss, I, 356, II, 244.
 " *Pollinis*, n. s., I, 309, II, 243.
 " *Roseae*, n. s., II, 233.
 " *Rosaceae*, n. s., II, 237.
 " *Saxifragae ciliatae*, n. s., II, 234.
 " *Urticae*, n. s., II, 234.
 " *Violae*, Schum., I, 354, II, 244.
 " *Waltiana*, n. s., III, 109.
Uredo *Aplousae*, n. s., III, 99.
 " *Bupleuri*, n. s., III, 93.
 " *Crocantiformis*, n. s., III, 98.
 " *Dentulae*, n. s., III, 100.
 " *Eupatoriae*, D. C., III, 98.
 " *Gomphrenae*, n. s., III, 99.
Uromyces *Cunninghamianus*, n. s., III, 76.
 " *McIntoshii*, n. s., III, 79.
 " *Solidaginis*, Nüssl., III, 77.
 " *Strobilanthis*, n. s., III, 78.
 " *Waltiana*, Schum., I, 352, III, 77.
 " *Vomae*, n. s., III, 76.

i

of V

El

HI

1

in.

gale for a Fleet of the Malayan Peninsula. [N3]

ed into a cup, its mouth entire
irregularly toothed on expan-

large: stamens numerous, free 7. *Pangium*.

small: stamens united in a
5 anthers

8. *Ryparosa*.

1. *BCCA, Linn.*

pa

in,

slc

Ca

Im

gla

Fa

wh

ves

Yl

yl

Trees,

entire; sti

Sepals 4-6,

in bud. 2

Is -
k;

1

i

1

It is a v

3. *ENTHROSEUM*, Lamour.

Trees or shrubs. Leaves alternate, quite entire. Flowers racemose fasciated or panicled, 2-sexual. Sepals 4-5, imbricate in bud. Petals 4-6, usually small. Stamens 4-5; anthers lanceolate-serrate, connate dilated. Ovary 1-celled; style short, stigma entire or 3-4-ovules many, on 3-4 parietal placentas. Capsule coriaceous, 3-4-valved bearing the seeds on the middle. Seeds few, testa coriaceous fleshy; embryo incurved. Distrib. Species about 8, of which 6 Mascarene, one is from Ceylon, and the following Malayan.

E. SCORTECHINI, King n. sp. A small glabrous tree, the branches lenticellate. Leaves thickly membranous, broadly ob-lanceolate, abruptly shortly and bluntly acuminate, faintly crenate-serrate, the base broadly narrowed; nerves 5 to 6 pairs, thin, anastomosing, 25 in. in margin; length 4 to 6 in., breadth 2 to 2½ in.; petiole ½ in., caducous. Racemes two to four in a lax terminal panicle, 3 to 4 in. long in flower, and twice as long in fruit. Ovary glabrous, 12-20 ovules; stigma 3-lobed. Capsules on thin pedicels ½ in. globular, smooth, 35 in. in diam., crowned by the conical style 3-cleft stigma, 3-valved, 1-seeded. Seed sub-globular with red pulp.

Forak. Scortechini.

This species was collected only once by Father Scortechini; he found no flowers. He describes it as a tree 30 to 40 feet high. No species of the genus has hitherto been described from the Malayan province, Ceylon being the nearest country in which one is indigenous:

;;II

Leaves toothed or crenate. Flowers small, dioecious, rarely 2-sexual. Sepals 4-5, small, imbricate. Petals 0. Stamens many; anthers versatile. Ovary on a glandular stalk styles 2 or more, stigmas notched or 2-lobed; ovules usually in pairs on each placenta. Fruit indehiscent; endocarp hard, with as many seeds as cells. Seeds obovoid, testa coriaceous; cotyledons orbicular. Distrib. About 12 species, natives of the Old World, some being native in various tropical countries.

FLACOURTIA RUKAM, Zoll. et. Moritz Verz. 33. A tree; the young branches puberulous and ! / leaves ovate or ovate-lanceolate, membranous, shortly acuminate, slightly and remotely crenate-serrate, base narrowed, glabrous except the puberulous petiole and midrib; nerves 7 to 8 pairs; length 4 to 5½ in., breadth 2 to 2½ in., petiole ¾ in. Racemes three times as long as the petioles, axillary, pubescent, branched.

to 8-flowered. *Flowers* dioecious, pedicelled. *Sepals* 4, reniform, tomentose internally. *Male flower* with a circle of glands outside the numerous stamens; pistil none. *Female flower* with a sub-entire flattish perianth disc at the base of the globular glabrous ovary; *styles* 6 to 8, united to their bases, stout, spreading; *stigmas* discoid with a mesial lobe. *Fruit* subglobular, .5 to .75 in. long, its pericarp succulent, and dry 6-8 ridged: Hook. fil. Fl. Br. Ind. I, 192, Clos in Ann. Sc. Nat. Ser. IV, Vol. 8, p. 216, Miq. Fl. Ind. Bat. I, Pt. 2, 104. *P. cataphracta*, (not of Roxb.) Bijdr. 55, (probably).

Berak. Common at low elevations. *Malacca*: Griffith. *Distrib.* Malak, Sumatra and the Malayan Archipelago generally; Philippines. This species is badly represented in collections and is not well understood in published descriptions of it being very brief. Clos diagnoses it as having 5 sepals; but I do not find that this character holds as it approaches *P. incensis*, Roxb. very closely in foliage and fruit. According to Roxburgh, who originally described *P. incensis* from plants in the Moluccas cultivated at Calcutta, its flowers are hermaphrodite; in that respect they differ from those of the other species of the genus. Only authentic specimens of *P. incensis* which I have seen were collected in the Bot. Garden, Calcutta, and these are undoubtedly hermaphrodite. The styles are moreover very short and united, and the 5 stigmas form a radiating star on the apex of the ovary, each stigma being emarginate. The stigmas of *P. Rubra* are quite different; inasmuch as they are discoid and the styles are distinct to the very base. The Sumatra specimens No. 1206* appear to belong to *incensis*, as they are the only uncultivated ones which I have seen. The fruit of *incensis* as well as of *incensis* is eatable. I have not seen an authentic specimen of Blume's *P. cataphracta*; but I can readily believe it to be *P. Rubra*, which is a common Malayan species. The plants issued from the Bot. Gard. Cal. 6673 belong (as regards many of the sheets) in my opinion to this, and not to *P. incensis*, Roxb.

FLACOURTIA CATAPRACTA, Roxb. in Willd. Sp. Pl. iv. 620; Car. Pl. i. 222, Fl. Ind. iii. 834. A small tree, often thorny when young. *Leaves* glabrous, lenticellate. *Leaves* membranous, oblong or oblanceolate, bluntly acuminate (the older sometimes blunt) obscurely serrate, narrowed to the base; both surfaces glabrous, shining; 2-4 pairs of nerves thin, sub-erect; the reticulations minute; length 4 in., breadth 1-2.5 in., petiole 3 in. *Flowers* in axillary racemes or panicles, small, (.15 in. diam.); ovary flask-shaped; stamens 4-6, capitate. *Fruit* the size of an olive, purple. Hook. fil. Fl. Ind. I, 193, Clos in Ann. Sc. Nat. Ser. IV, Vol. 8, p. 216 (not of Blume, or Daisell). *P. Javanica*, Gmel. Syst., Miq. Fl. Ind.

nerve 5 to 8 pairs, spreading or sub-erect, thin but prominent beneath: length 2.5 to 5 in., breadth .75 to 2.5 in., petiole .25 to .5 in.: stipules persistent, linear-lanceolate, pubescent, about as long as petioles. Male inflorescence small, supra-axillary, 1 to 4-branched, monoparous, tomentose, bracteolate, cymes not much longer than the bracts: flowers .25 in. in diam.: Sepals 5, rotund, the 3 external slightly imbricate, pubescent: the 2 inner much imbricate, glabrescent. Petals smaller than the sepals, fleshy, with long white silky hairs externally, 1 each internally with a small oblong scale. Filaments short, thick, glabrous, the connective reniform: the anther cells small, remote from the other. Ovary 0. Female flowers solitary, supra-axillary, on glabrous pedicels .5 in. long. Sepals and petals as in the male: stamens without filaments: ovary ovoid, tomentose: stigmas 3, large, flat, bifid, reflexed, set on a pedicel .5 in. long, solitary, axillary, depressed-globular, entirely rugose, and velvety tomentose: about 1 in. in diam., persistent: pericarp dry, thin. Seeds 3 or 4, plano-convex, .5 in. long.

Penang, Curtis, 854: Perak: King's Collector, Soortechni, Wray.

This varies considerably as to size of leaf and fruit and in the amount of pubescence. In some specimens of the male plant the leaves towards the apices of the branches are much reduced in size. The form which has the more pubescent leaves may be separated as a variety, and acquaintance with it may prove that it is separable as a species.

Var. *pubescens*. Young parts, branchlets, and lower surfaces of all leaves pubescent.

Perak, at Gopong, King's Collector.

3. *Hymenocarpus Curtisii*.

Young branches slender, petioles and leaves on both surfaces, oblong-lanceol-

ate, gradually narrowed to the apex,

narrowed, rarely rounded; nerves

prominent on the upper surface

petiole less than .5 in., thick.

bracteolate, uniparous cymes

.5 in. in diam.: pedicels semi-

ovoid, ovate, blunt, imbricate,

5 petals. Petals 5, narrowly o-

val, glabrous; the gland no-

longer than the filaments, cordat-

shorter, grooved, pedicels; o-

stigmas 3, fleshy, bifid,

length .5 in. long, globose with

ridges, vertically ridged: the st-

in diam. Seeds few, plano-

Penang, Curtis, 809, 1534. . Penak; King's Collector, Soortechini.

No specimen that I have seen has female flowers showing anything besides the ovary. Complete female flowers are much wanted.

4. *HYPOCAERIS SOORTACHINI*, King n. sp. A tree, all parts except the sepals glabrous. Branchlets pale brown when dry, angular. Leaves sub-sessile, coriaceous, shining on both surfaces, slightly inequilateral, elliptic or elliptic-oblong, tapering to the acuminate apex, the edges slightly recurved when dry; the base rounded, slightly unequal; nerves pairs, thin, spreading; the reticulations minute and distinct on both surfaces: length 5 to 7 in., breadth 2.5 to 3.5 in., petiole about 2 in. long. *Oxysepals* small, monoecious, axillary or extra-axillary, on the young branches about three times as long as the petioles, densely bracteolate, 2-3 branched. *Male flowers* on pedicels 75 in. long. *Sepals* elliptic, longer than the apices incurved, pubescent. *Petals* smaller than the sepals but of the same shape; the gland nearly as long, linear. *Anthodes* narrow, elongate, filaments short, conical. *Ovary* none. *Female flowers* like the male but on short pedicels and the stamens barren; ovary ovoid below, upper half cylindrical, ridged, pale-coloured, glabrous; stigmas two, fleshy, reflexed, shortly bifid. *Fruit* (young) ovoid, minutely rugose, glabrous.

Dinding Islands; Soortechini, Curtis.

This species bears a general resemblance to *H. Carlislei*. But it differs from that species in having broader leaves on shorter petioles, in the male flowers being 2-3 branched, and a glabrous ovary. Ripe fruit of this

HYPOCAERIS, King, n. sp. A tree 60 to 80 feet high. Leaves with minute ferruginous mealy tomentum. Lower leaflets thinly coriaceous, slightly inequilateral, on one side, elliptic-oblong, tapering to a rather blunt acuminate apex, the edge very slightly wavy. Surfaces, but especially the lower, shining and minute reticulations very distinct: nerves pairs, thin; length 3.5 to 5 in., breadth 1.5 to 2.5 in.

Male flowers on pedicels 3 to 6 in. long, 3 to 6-branched. *Sepals* linear, longer than the apices, ciliate edges slightly wavy; the filaments short, conical. *Female flowers* like the male but the stamens barren. *Ovary* elongate, fleshy.

■* on p'

nenkee

nally.

ly BHOI

cuneate, plano-convex, ridged, the apex often irregularly toothed with 2 or 3 cylindric pits. *Stamens* 20 to 32, the anthers deeply cordate. *Female flowers* like the male, but the sepals often only 3, the petals 6, and the stamens 16 or 17; *ovary* elongate-ovoid, sulcate, div. above into 4 oblong, divergent, reflexed lobes, each bearing a stigma on its surface internally; 1-celled with 4 multi-ovulate parietal placentae. *Fruit* large, globose or ovoid, with hard fibrous or woody rind, several large seeds embedded in a scanty pulp. *Seeds* with thick testa, copious albumen, and straight central embryo; the cotyledons large, cordate, foliaceous, 3-nerved. Species probably about 8. Malayan.

Note.—This genus was founded by Hasskarl (*Botan. i.* 127) on a plant named *Hydnocarpus heterophyllus* by Blume (*Receptacul. iv.* 2, 178 B., fig. 1, and *Mus. Bot. i.* 16). Until now that plant has been the only known species. But the following have been discovered by Messrs. Kuostler and Wray in Perak. And from the similarity of the externals to *Hydnocarpus*, and from the imperfect nature of the *Herbarium* materials of the latter, it appears to me extremely probable that several things now referred to *Hydnocarpus* really belong to *Taxodendron*. In the Calcutta Herbarium, there are imperfect materials of 8 undescribed species which belong either to one or other of the genera.

1. *TAXODENDRON SCORTECHINI*, King, n. sp. A large globose fruit with 3-4 seeds.

2.

lies for

LEH, 3-1

[ndi

ooth, dark **browu'**when ri iVom 3 to 5 111,
tidpedi ir more
, about 1 3.
rak, u; .Mimen.
fished from **bo described** species of .t
te cucum!^ **Fhe** BC
1 **broad**er than is usual in Hydaocarpu
RPU8 \ King, n. sp. A small **sub-glabrou***
do brown, minutely lciitieelktte, puberutous bark.
is, oliplic, slid ;id abruptly acuni
i when dry ; the base rounded, sometimes **narrow-**
us on both surfaces **very** prominent ■ up; ,
minutely pustulate when dry; the **lower** oi
xcept the pubescent midrib and ira
ierves ; lr **to** 10 in., **breadth** 35 to
in 5 i ly 5 in. in diam., in very *m*

iael .1,1,

aaknowo, i
Q o 17b . ly **fall**

pulp, (;)luno-(

Uilltt

uly.
^v muol

h a

veins and reticulations; lateral nerves 3 to 4 pairs on the petiole and 4 to 7 pairs on the wider side, sub-erect, prominent; length 5 in., breadth 1.5 to 3 in.; petiole .3 to .5 in., pubescent. *Gynae* many flowered. *Male flowers* as in the last, the scales half as long as the petals, their apices erose, glabrous. *Stamens* 32; the filaments subulate, sericeous; anthers elongate, deeply cordate. *Pistils* like the males, but sepals 3, petals 6, and stamens 17 only. *Ovary* 1, glabrous, deeply sulcate, with 4 radiating reflexed oblong stigmas, 4-angled, with 4 multi-ovulate parietal placentae. *Fruit* solitary, globose, smooth, 2.5 in. in diam.; the pericarp thick, the outer layer fibrous, inner woody. *Seeds* embedded in scanty pulp, plano-convex, .75 in. in length.

Surak; in dense forest at low elevation; King's Collector, Nos. 5182 and 5183; Wray, 3389.

TAKAKOONOS TOMENTOSA, A. K. King, n. sp. A tree 60 to 80 feet high, the branches fulvous-tomentose. *Leaves* coriaceous, often inequilateral-oblong, abruptly and very shortly acuminate, the base rounded slightly unequal; the reticulations prominent on both surfaces, the upper surface smooth, shining; the lower fulvous-tomentose; lateral nerves 6 to 7 pairs, bold, sub-erect; length 5 to 7 in., breadth 2.5 to 3 in.; petiole .25 to .5 in., tomentose. *Gynae* woody, dense, short, round, smooth; when ripe 3 in. long; the pericarp nearly .5 in. thick, the outer layer fibrous, the inner thin and woody.

Surak, at an elevation of 500 feet; King's Collector, No. 7705.

Leaves of this are unknown. It is easily distinguished from the two species by its tomentose leaves, but in other respects it resembles them.

General description of the Burmese species referred to Hydronotus.

Hydronotus *Surak*, A. K. King. A tree 40 to 50 feet high. Youngest branches brownish-tawny-pubescent; otherwise glabrous; young pericarp finely lenticellate. *Leaves* sub-coriaceous, lanceolate, sometimes rarely elliptic, abruptly and very shortly and slightly acuminate, the base narrowed and equal-sided; both surfaces glabrous; the reticulations minute and distinct; main nerves 6 to 7 pairs, length 7 to 10 in., breadth 2 to 3.5 in., petiole .75 to 1 in. thick, the upper surface glabrous. *Gynae* axillary or extra-axillary, from the smaller branches on thick peduncles, nearly as long as the petioles, with many branches at their apices, many-flowered. *Male flowers* 3 in. long, the pedicels less than .5 in. long. *Sepals* 4, imbricate, ovate-oblong, concave, pubescent externally. *Petals* 8, broadly ovate, with ciliate edges, each with a flat fleshy pubescent gland with

*

7.

. 1

..

1

-

1

Him

|

as scale at its base. *Male flower*: filaments united in a column 5, ovate, 2-celled, extrorse anthers at apex. *Female flower*: sepals 5, alternate with the petals. *Ovary* 1-celled, with 1 to 3, late, parietal placentas. *Stigmas* 2 to 3, sessile, broad, emarginate, baccate with little pulp; the pericarp coriaceous, tomentose; 1 or 2, sub-globular, smooth.

Note.—This genus was first published by Blume in his *Bijdragen* (1800) as *Ryparosa*, and in that work he published only the single species *R. coccinea*. In a footnote to the preface of his *Flora Javae* (p. 1), the same author referred to the genus (apparently by inadvertence) as *Ryparia*, instead of *Ryparosa*; and the name *Ryparia* has been adopted by most subsequent authors. Blume regarded the genus *Euphorbiaceae*, in which view he was followed by Endlicher (*Gen.* 5), Hamkerl (*Pl. Jav. Bar.*, p. 267), and Baillon (*Hand. Euph.*, p. 10). Müll. Arg. (in *DC. Prod.* XV, 2, p. 1260) excluded the genus *Euphorbiaceae*; and, in their *Genera Plantarum*, the late Mr. Thunberg and Sir J. D. Hooker, (*G. P.* iii, 257), also exclude it; but, having seen no specimens either of it or of *Bergenia*, they make no mention as to the true position of *Ryparosa* or of the relation of *coccinea* to it. Kurz (*Journ. Bot.* for 1873, p. 233, and *Bot. Fl. B. M.* 75) was the first to refer *Ryparosa* to *Bursera*. But Kurz made the mistake of describing in the latter work, as "*Ryparia coccinea*," a plant which agrees neither with Blume's description nor with his name of *Ryparosa coccinea*. The name of Kurz's plant I have therefore altered to *R. Kurzii*. In 1848, Blume published, in *Rumphia* IV, 179 B, fig. 2, a new genus called *Bergenia* which, as Kurz also says (*Journ. of Bot.* for 1873, p. 233), is nothing more or less than *Ryparosa*. Only one species (*B. javanica*) was known to him. To this Miguel added (*Pl. Ind. Bat. Suppl.* 389) two species, *B. Sumatrana* and *B. ? acuminata*. I have seen neither of them, but the synonymy of *B. Sumatrana* leads me to believe that it must be a *Hydnocarpus*, while the second (*B. ? acuminata*) was added doubtfully to *Bergenia* by its author himself. The collections made within the past year or two, from Perak by the collectors of the Calcutta garden contain copious supplies of specimens of *Ryparosa*. On an examination of these, I have no doubt that *Ryparosa* belongs to *Bursera*, and that *Bergenia* must be reduced to it. Besides the species described below, there are in the Calcutta Herbarium several materials belonging to several additional species from Perak, from Penang, from Sumatra. Wall. Cat. No. 7847 B. (from Penang), and No. 702 (from Sumatra), are also clearly species of *Ryparosa*.

Ryparosa Kurz, King. A tree or shrub. Young shoots ad-

pressed ferruginous-pubescent. *Leaves* elliptic to elliptic-oblong, acute and bluntly acuminate, the base slightly narrowed; upper surface shining, glabrous except the puberulous midrib; lower, glabrous, reticulations distinct; nervex 7-8 pairs, spreading, prominent below; length 8 to 12 in., breadth 4 to 5½ in.; petiole 1½ in., thickened at its upper fourth, pubescent. *Male racemes* 5 to 10 in. long, leaves ones-tomentose, the petals reflexed; *female racemes* shorter and glabrous. *Fruit* globose, the size of a cherry, lenticellate, 2-seeded. *R. celsa*, Kurz P. Fl. Burm., i, 78, not of Bl.

Andamans; Kurz, King's Collector. Nicobars, Kurz.

2. *RYPAROA WHATEI*, King, n. sp. A tree 60 to 80 feet high, glabrous except the inflorescence. *Leaves* coriaceous, ovate-lanceolate to long-lanceolate or elliptic, the apex sub-acute; slightly narrowed to the base; upper surface shining; lower dull yellowish green when dry. Midrib and 4 pairs of sub-erect nerves prominent below as are the transverse veins; length 6 to 10 in., breadth 2½ to 4½ in.; petiole 1 to 1½ in., slightly winged at the apex. *Racemes* solitary or in pairs, axillary from below the leaves, 6 to 9 in. long, longer in fruit. *Male flowers* pedicelled. *Calyx* with 3 broad ovate teeth, pubescent externally. *Petal* 5, oblong-ovate, pubescent externally, each with a triangular coriaceous scale half as long as itself. *Staminal tube* pubescent; *anthers* 2, reflexed. *Female flower*: *sepals* and *petals* as in the male; *disc* as in the male with 5 conical staminoles. *Ovary* rugulose, pubescent, glabrous below. *Stigmas* 2, sub-bilobed, spreading. *Fruit* globular, crowned by 2 stigmas, rugose, pubescent, 5 to 7½ in., 1-seeded.

Perak: King's Collector, Wray; rather common.

3. *RYPAROA HULLATHI*, King, n. sp. A small nearly tree. *Leaves* membranous, obovate-elliptic, with a very short acuminate apex, the base narrowed; both surfaces shining, the midrib and 4 pairs of spreading nerves prominent on the lower, as are the transverse veins; length 5 to 7 in., breadth 3 in.; petiole 1½ in., thickened at its upper fourth. *Male racemes* a foot or more long, puberulous. *Female flowers*: *calyx* membranous, with 3 broadly ovate teeth. *Petal* 5, scale small, sericeous. *Staminal tube* glabrous; *anthers* 5, erect, the scales small. *Female flower* and fruit unknown.

Singapore: on Bukit Timah, R. H. Hallatt.

Distinguished from the other species by its thin obovate leaves.

4. *RYPAROA SCOTTECHUKI*, King, n. sp. A slender tree; the branches and inflorescence rusty, otherwise glabrous. *Leaves* large, thick, coriaceous, oblong-lanceolate or oblanceolate, shortly acuminate, gradually narrowed from the middle to the base; both surfaces shining, the upper shining, the lower dull, pale; the midrib and 4 pairs of

prominent; length 10 to 15 in., breadth 4 to 6 in.; petiole thickened and bent at the apex. Racemes in tufts from tubercles on the main and large branches, the male 8 to 12 in. long. Calyx split into 5 ovate segments, tomentose. Petals 4, oblong; the gland round, scarious. Female racemes shorter; sepals and petals as in the male; ovary tomentose, 4-angled; styles 2, discoid. Fruit angled when young; when ripe transversely oblong, 1.5 in., by 1 in., velvety tomentose with green or white dots; seeds two, plano-convex.

Perak: Seortechini, Kunth, Wray; common.

The male flowers have been found only by Seortechini from whose notes the above description of them has been taken.

5. *RYPAROA KUNTHIANA*, King, n. sp. A glabrous tree, the branches smooth. Leaves coriaceous, ovate-oblong, obovate-oblong to oblong, finely and abruptly acuminate, the base narrowed; upper surface shiny, lower dull, pale, much reticulate, the midrib and 5-7 pairs of nerves prominent; length 5 to 8 in., breadth 2.5 to 3.5 in.; petiole 1.25 to 1.75 in., swollen and bent towards the apex. Racemes axillary, solitary, rarely from an axil, the male 6 to 8 in. long, the female half as long; flowers white. Male fl. Calyx thin, pubescent outside, with 5 ovate broad segments. Petals 5, oblong-lanceolate, pubescent externally, each with a scarious gland at its base, the whole tube glabrous, the anthers oblong. Female flower. Sepals and petals as in the male; annular disc of ovary small; staminodes none. Ovary ovoid, angled, 4-lobed, 1-celled, with 4 parietal bi-ovulate placentas; stigmas ob-radiating. Fruit globular, yellowish, velvety, about 1.5 in. diam.; or 5, oblong, compressed, striate, about .75 in. long.

Perak, at elevations up to 800 feet; common. A tree 40 to 100 feet high with shorter and (in proportion) broader leaves than *R. fasciculata*; stigmas and more globular pedicellate fruit.

RYPAROA FASCICULATA, King, n. sp. A glabrous tree 30 to 60 feet high. Young branches lenticellate. Leaves thin, coriaceous, narrowly acuminate, the base narrowed, shining above, pale beneath, with 5 to 7 pairs of lateral nerves, and the bold sub-erect transverse and reticulations very distinct especially beneath; length 3 to 15 in., breadth 2.25 to 3.25 in.; petiole 1 to 1.5 in., grooved, thickened in its fourth. Racemes in fascicles of 4-7 from tubercles on the large branches and stem. Petals rotund, much imbricate and inflexed. Female flower with annular disc bearing 5 conical staminodes, the petals hairy scales at their bases; stigmas 3, large, reniform. Fruit sessile, tomentose, pyriform, the apex mammillate and crowned for some by the remains of the stigmas, about 6-seeded, 1.5 to 2 in. long.

Perak at elevations up to 800 feet; common.

7. *RYPARIA CÆREA*, Bl. Bijdr. 600; *Ryparia*, Fl. Javae (part), p. 103. A small tree, the branchlets and inflorescence ferruginous-silky. Leaves coriaceous, oblong, shortly acuminate, the base slightly cuneate, upper surface shining; lower pale, rather densely adpressed, benenervous 5 to 6 pairs, ascending; length 6 to 9 in.; breadth 2 to 3 in.; petiole 1-25 in., stout, thickened in its upper fourth. Racemes supra-axillary, the female longer than the leaves. Male flowers: sepals 4, tomentose, the latter with a small basal hairy scale. Stamens 5, short, glabrous; anthers 4, broadly ovate, reflexed. Fruit crowded by the 2 shortly-stalked fleshy radiating reniform emarginate stigmas, globose, ferruginous-tomentose, 5 to 7 in. diam. Hassk. Pl. Javae, Raz. 267; Baillon Euphorb. 439. Miq. Fl. Ind. Bat. : pt. 2, p. 38. DC. Prodr. XV, 2 p. 1260. Kurz in Journ. Bot. 1873, p. 233.

Java, Blume. Sumatra; Teysmann, Forbes, at an elevation of 3,000 feet.

Blume describes the lower surfaces of the leaves as "tomentosis"; but the hairs, although adpressed, are not stiff but silky. This is the only species in which the hairs on the lower surface of the leaves are at all conspicuous. The leaves of the Andaman plant referred to *R. cærea* by Kurz are nearly glabrous beneath.

ORDER X. PITTOSPORÆ.

Trees or shrubs. Leaves alternate or subverticillate, quite (very rarely toothed); exstipulate. Flowers usually hermaphrodite, terminal or axillary. Sepals 5, imbricate. Petals 5, hypogynous, imbricate. Torus small. Stamens 5, opposite the sepals; anthers 2-celled. Ovary 1-celled, with 2-5 parietal placentas, or 2-5-celled by junction of the placentas; style simple, stigma terminal 2-lobed. Ovules many, parietal or axile, anatropous. Fruit capsular or cent. Seeds usually many, albumen copious; embryo small, next the hilum.—Distrib. Genera 9; species about 20, chiefly Indian.

1. *PITTOSPORUM*, Banks.

P. nivei (P.) ... Sepals free or connate below. Petals 5. Stamens 5, erect; anthers 2-celled, sessile or shortly stalked, incomplete, each placenta. Capsule 1-celled, woody, 2-lobed, 5-angled, 5-ribbed. Seeds 5, 1-angled, 5-ribbed. Anthers 5.

inc.

inct'ol; **at, 3-!** i
fibrous, t

rnial

➤—6'

• Trees or erect shrubs.

Stamens 3, united; fruit of 3 samaroid

carpels 4. *Trigonostemon*

Stamens 8, distinct; fruit 1-celled, not

winged 5. *Xanthophyllum*1. *POLYDALA*, Linn.

Herbs or more rarely shrubs. Leaves alternate. Sepals persistent; 2 inner larger, usually petaloid. Petals 3, united at base with the staminal sheath, the inferior keel-shaped and crested. Stamens 8, filaments united for their lower half into sheath; anthers opening by pores. Ovary 2-celled, ovules 1 in each cell, pendulous. Capsule 2-celled, loculicidal, 2-seeded. Seed always strophiole and albuminous. Distrib. continuous with order, except Tasmania. About 250 species.

Sect. I. *CHAMÆXUXUS*, (Tournef. genus). Shrubs with large showy flowers. Calyx deciduous, the lower sepal large, concave-convex. Keel crested. Seeds with a large strophiole, exalbuminous.

1. *POLYDALA TENAXUS*, JACK in POIR. DICT. V. 493. A glabrous 4 to 10 feet high. Leaves membranous, lanceolate or oblanceolate-oblong-lanceolate, acuminate, entire, narrowed to the base, primary nerves 7 or 8 pairs, the secondary nerves nearly as far as the reticulations open, rather prominent; length 3 to 5 in., 1.5 to 2.5; petiole .2 in. Racemes axillary, pendulous, 1 to 2 long, often much elongated in fruit. Flowers more than 3 in. long. Capsule reniform, striate, more or less 4-winged, 4 in. in diam. DC. I, 331. Bl. Bijdr. 59. Miq. Fl. Ind. Bat. I, pt. 2, p. 126. Champ. revescens, Haack. Pl. Jav. Bat., 294. Pl. Jaugh., I, 126.

Var. *robusta*, Miq. l. c.; Haack. Pl. Jaugh. l. c. Leaves long elliptic-oblong to oblong.

In all the Provinces at low elevations. Distrib. Malayan archipelago.

A common shrub with handsome flowers; the inner sepals with pink veins; the petals white, spotted with pink and the keel pink.

Sect. II. Herbs. Flowers small. Calyx deciduous after the fruit. Keel not crested. Seeds albuminous.

2. *POLYDALA TRIPHYLLA*, Ham. in Don Pedr. 200; var. *glabra* HB. Fl. Br. Ind. I, 199. A glabrous, weak, erect or ascending herb. Leaves thinly membranous, lanceolate or ovate-lanceolate, entire, contracted into the petiole; main nerves about 7 pairs, thin; length 1 to 2 in., breadth .75 in., petiole .3 to .75 in. Racemes axillary, 2 to 3 long, (or more) slender. Flowers 1 in. long. Leaves opposite.

lj **boldly**

■ iarrov.

|

;

He:

Q

i, Ma

I

I. SA

1.

annunl ; stom **and bi-**
le n,,

minal, ctei

5

S,

Akad. d. Wias. tV, 2.

la

its

place*

Beet.

Alas.

|

-

i

-iTraf

■'■; Rei>

in dense Bamboo Forests. Distrib. Java, n, liov-, Tonkin.

3. SECURIDACA, Linn.

Shrub, almost always scandent. *Flowers* in terminal or axillary, compound, racemes. *Sepals* deciduous, 2 inner (brings) larger, obovate. *Petals* 3, lateral nearly or quite distinct from the galeate keel, superior petals 0. *Stamens* 8, filaments united: anthers 4, dehiscing by oblique pores. *Ovary* 1-celled, 1-ovuled. *Fruit* 3-lobed samara, 1-seeded; wing broad, coriaceous. *Seeds* exalbaminous, isolated. Distrib. Species about 25; COOSI numerous in tropical Asia, rarer in tropical Africa and Asia.

SECURIDACA BEAUTIFLORA, Benn. in Hook. Ill. Fl. Br. Ind. I, 208. A small climber; branches terete, puberulous. *Leaves* elliptic, shortly apically acuminate, the margins revolute when dry, base rounded slightly narrowed; upper surface shining, lower densely covered with pale pubescence; nerves 5-6 pairs. *Flowers* in racemes or panicles. *Bracts* ovate, acuminate, pubescent, deciduous. *Ostia sepals* small, ovate, very hairy, ciliate; wings large, rotund, distinct externally. *Lateral petals* truncate; keel with a recurved, prominent. *Ovary* orbicular; style curved. *Stigma* large. *Samara* with the nucleus smooth, sub-globular, 4 in. in diam.; the wing oblanceolate, membranous, with prominent transverse cartilaginous nerves; the upper edge thickened entire, the lower crenate. Distrib. Java, Malacca, Malagasy; Perak, Wray.

Having seen any specimen of this plant, I have copied the description of the sepals and

4. TRIGONIASERUM, Miquel.

Shrub or small tree. *Leaves* hoary beneath. *Flowers* in slender panicles. *Sepals* 5, nearly equal, the two outer larger. *Petals* 5, equal, the two lower partially united to form a keel; the largest, sacculate at the base and with a large hairy glandous cavity. *Stamens* 5 or 6, the filaments united into a group beneath the ovary and the keel. *Ovary* densely hairy, 3-locular; ovules 3, solitary in each cell. *Fruit* of 3 samaroid, ultimately almost 3-carpell. *Seeds* 1 in each carpel, not atrophied.

TRIGONIASERUM MALACCCUM, Miq. Fl. Ind. Bat. Suppl. I, 395. A tree, 30 to 60 feet high; young branches hoary-pubescent; the bark dark brown, lenticellate. *Leaves* elliptic-lanceolate, shortly apically acuminate, narrowed to the base; both surfaces shining; upper glabrous, the lower pale, very minutely scurfy-pubescent,

.SR

In Inn ty (t\ ■

8.

LI iii. „ ■

14 to lu p nil's 1L w

1»

o8

n

slender. *Sepals* rotund, pubescent, edges ciliolate. *Petals* glabrous, keel pubescent. *Filaments* flat and pubescent, otherwise glabrous. *Ovary* ovoid-elongate, glabrous, 4-ovuled, rather flat, pubescent; disc small, glabrous. *Fruit* globose, diam., smooth; pericarp thin, crustaceous.

Andaman Islands; Helfer, Kurz, King's Collector. Burmah

This is not unlike *X. Griffithii* in its leaves: but it differs in glabrous ovary.

2. *XANTHOPHYLLUM GRIFITHII*, Hook. Fl. Fl. Br. Ind. I. tree 40 to 50 feet high. Branches glabrous, except the inflorescence and fruit. Branchlets robust, dark brown, polished, terete. *Leaves* coriaceous, elliptic-lanceolate or lanceolate, acute or acuminate, teretely slightly revolute, the base acute; upper surface dark (when dry shining); the lower pale, sub-glaucous, the minute reticulations and pairs of main nerves distinct; length 3 to 5 in., breadth 1 to petiole thick, dark-coloured, 35 in. long. *Flowers* about 35 in. tomentose axillary racemes shorter than the leaves, or in terminal branched panicles: pedicels short, stout. *Sepals* broadly ovate, dark brown, tomentose externally. *Petals* oblong, blunt, glabrous except the pubescent keel. Lower half of *filaments* thickened, hairy sessile, tomentose, with 4 ovules from its base. *Style* cylindrical pilose. *Fruit* (young), globular, tawny-tomentose.

Malacca and Perak. Distrib. Burmah (at Mergui). But this is unknown.

3. *XANTHOPHYLLUM MAINGATI*, Hook. Fl. in Fl. Br. Ind. I. tree 20 to 40 feet high. Branches very slender with pale brown youngest puberulous. *Leaves* membranous, lanceolate or elliptic-lanceolate, cordate-acuminate, the base narrowed; both surfaces the lower more so, but not glaucous; nerves 4-5 pairs, the reticulations not prominent: length 2 to 3 in., breadth .65 in. to 1 in. slender, about .25 in. *Racemes* axillary and terminal, sometimes red, the rachis tawny-tomentose, 2 to 3 in. long; flowers white long. *Sepals* rhomboid, unequal, pubescent. *Petals* much longer than the sepals, spreading, glabrous except the pubescent keel. *Ovary* much curved, with a hairy thickening above the base. *Ovary* stipitate, ovoid, ridged, tawny-tomentose; ovules 4, perispermic globose, .5 in. in diam., minutely tomentose; pericarp moderate pucker when dry.

Penang, Malacca and Perak; at low elevations.

4. *XANTHOPHYLLUM GLAUCH*, Wall. Cat. 4129. A tree 2 feet high. Young branches terete, smooth, pale, the very young brown and slightly angled. *Leaves* sub-coriaceous, oblong-lance-

lanceolate, sub-acute, the base narrowed into the petiole; upper shining; lower dull, sub-glaucous; nerves 8 to 10 pairs, not proreticulations minute; length 3 to 4 in., ¹¹¹ rather thick, less than .25 in. Flowers .25 in. long, ^{ly wartcwi, find L} *Griffithii*. Fruit globose when quite ripe, ^{in. Miq. Ann.} diam. Hook. Bot. Fl. Br. Ind. I, 209; Hassk. Bat. I, 193.

King's Collector No. 14. ^{17.} Distrib. Chittagong, Burmah. This differs from *X. Griffithii* chiefly by ^{ore nerves} leaves.

XANTHOPHYLLUM PALEMBANICUM, Miq. ^{Ann. M-} Bat. I, 3. A glabrous tree 30 to 40 feet high; branchlets slender, pale, membranous, drying pale green, lanceolate, rarely elliptic, cundate, the base narrowed; acute or cuneate; upper surface shining, dull, pale but not glaucous, main nerves 4 to 5 pairs, slightly reticulations minute; length 5 to 4.5 in., breadth 1.1 to 1.3 in., whole .2 in., slender. Flowers .4 in. Racemes axillary, few-flowered, slender, shorter than the leaves. Sepals unequal, rhomboid, shining, but, puberulous externally. Petals spatulate, glabrous except the keel. Filaments thickened and pubescent in the lower half, shortly stipitate, villous; the annular disc surrounding the style sparsely villous. Ovary 4, from near base of ovary. Fruit .75 in. in diam., glabrous, boldly verrucosose and with several vertical grooves; pericarp .1 in. thick, crustaceous.

as. ra,

>m

is, rather common. It is not unlike *X. Ma* the deeply grooved fruit. *XANTHOPHYLLUM* *egua* glabrous tree 30 to 40 feet high, drying pale green, sub-lanceolate, to elliptic with reticulations smooth, the upper shining, the lower dull. Nerves 4 to 5 pairs, prominent beneath; length 5 to 4.5 in., breadth 1.1 to 1.3 in., whole .2 in. Flowers .4 in. long. Racemes axillary, few-flowered, slender, shorter than the leaves.

!U[. Alii:

or in terminal few-branched panicles. Sepals unequal, ovate-lanceolate, spreading, minutely tomentous externally. Petals spatulate, glabrous except the pubescent keel. Filaments slightly flattened, villous in the lower half. Ovary villous 4-ovuled. Style slightly flattened, villous. Fruit globose, .75 in. in diam., glabrous, rather verrucosose, not vertically ridged; pericarp crustaceous, brittle.

iri di»):

XANTHOXYLUM KUNZLERI, King, n. sp. A glabrous tree 50 to 60 feet high; the branchlets robust, dark brown, sub-glabrous. Leaves coriaceous (with a yellowish green tinge when dry) elliptic to oblong, the apex very shortly and rather suddenly acuminate, (when dry) undulate, the base rounded or slightly narrowed about petiole; both surfaces shining; nerves sub-horizontal, 8 to 10 prominent beneath as are the secondary nerves and reticulations; length 4.5 to 9 in., breadth 2.25 to 4.25 in., petiole .6 to .75 in. Flowers long, shortly pedicellate, in axillary racemes less than half as long as the terminal few-branched spreading panicles longer than, the sepals slightly unequal, ovate-rotund, fleshy, thickened along rib, minutely tomentose on both surfaces; the edges thin, ciliate. Petals oblong-obtuse, glabrous except the pubescent keel. Filaments with a pubescent ovoid swelling above the base. Ovary almost surrounded by a shallow wavy fleshy disc, ovoid, grooved, tomentose, 4-ovulate; style conical, slightly curved, pubescent. Fruit .65 in. in diam. (young) deciduously tomentose; pericarp thick, the calyx persistent.

Habitat: At low elevations, not common. King's Collector (Kunzler). Government Hill, Curtis, No. 1590.

XANTHOXYLUM HOOKERIANUM, King, n. sp. A glabrous large tree; young branches rather stout, sub-glabrous. Leaves coriaceous (drying yellowish) elliptic-oblong with a rather abrupt bluntish apex, 1 in. long, the edges slightly revolute when dry, the base slightly narrowed to the petiole; both surfaces smooth, the lower slightly paler; nerves 6 to 8 pairs, thin but rather prominent beneath as are the veins; length 9 to 11 in., breadth 3 to 4 in.; petiole .75 in. to 1 in. long, the pedicels about as long as the calyx. Sepals equal, broadly ovate, minutely tomentose on both surfaces, the margins ciliate. Petals oblong, obtuse, glabrous except the pubescent keel. Filaments flat, puberulous. Ovary sessile, ovoid, tomentose, 4-ovulate; style flat, grooved, pubescent, slightly curved. Fruit unknown.

Habitat: King's Collector; No. 5997.

XANTHOXYLUM VEXOSUM, King, n. sp. A glabrous long-leaved tree 30 feet high; young branches rather robust, with very dark bark. Leaves (drying pale yellowish-green), coriaceous, oblong, the edges recurved when dry, gradually but slightly narrowed towards the lower fourth to the rounded or minutely cordate base, both surfaces shining, the lower slightly paler; main nerves 14 to 16 pairs, sub-parallel near the base, sub-ascending towards the apex, prominent on lower surface and forming bold arches .2 in. from the margin.

secondary nerves and minute reticulations distinct; length 9 to broadth 2.5 to 3.25 in., petiole .75 to 1 in. Flowers 4 in. long, pedicels longer than the calyx. Pasples axillary, few-branched, 6 in. long. Sepals nearly equal, broadly ovate, fleshy with thin puberulous. Petals oblong, obtuse, glabrescent, the keel pubescent. Filaments flat, puberulous. Ovary surrounded by a shallow grooved disk, ovoid, minutely tomentose, grooved, 4-ovuled; style cent, slightly curved. Fruit globose with a conical apex, deeply verrucose; diam., .35 in. (young).

Perak, King's Collector; Nos. 10614 and 10804.

Ripe fruit of this is unknown. This species, in leaf char., approaches the Bornean *X. confusa*, Korth.; but the fruit of the latter is smooth; of this the fruit is deeply corrugated. It is also distinct from *X. lasiocarpa* and *X. curvicaulis*.

12. *XANTHOXYLLUM ERITATUM*, A. W. Benn. in Hook. Fl. B. I. 210. A tree with slender, smooth, brown branches. Leaves coriaceous, ovate or elliptic, shortly and obtusely cuneate, upper surface dull, the nerves obsolete; lower shining, the 3 to 5 of nerves indistinct; length 1.75 to 2.25 in., broadth .75 to 1 in., .15 in. Racemes slender, axillary, longer than the leaves, pubescent. Flowers 4 in. long, shorter than their slender pedicels. Sepals equal, oblong, obtuse, glabrescent. Petals twice as long as the sepals, apathulate, oblong. Filaments thickened and hairy in the middle. Ovary stipitate, cottony; style sparsely hairy; ovules 8 to 10. Malacca.

Hitherto known only by specimens from Malacca; fruit not known.

XANTHOXYLLUM SCORTECHINII, King, n. sp. A tall tree. Leaves thinly coriaceous, drying brown, ovate, obtusely at the base slightly cuneate, shining on both surfaces; nerves 3 pairs, erect, not prominent; length 2 to 2.25 in., broadth 1 in., petiole .75 in. Flowers handsome, 6 in. long, their pedicels .35 in. Racemes solitary, 2 in. long, few-flowered. Sepals fleshy, glabrous with edges; the three outer ovate blunt, the two inner rotund. Petals ovate, clawed, glabrescent, the keel pubescent. Filaments as the petals, flat, pubescent; anthers short, ovate. Ovary stalked, elongated-ovoid, ridged, glabrous, 6-ovuled; style little glabrous; stigma capitate; disc small, annular, glabrous.

Perak, Father Scortechini, No. 2079.

Of this distinct and handsome species fruit is as yet unknown.

14. *XANTHOXYLLUM ELLIPTICUM*, Korth. in Miq. Ann. Mus. Bat. I, 276. A glabrous tree 30 to 60 feet high, branchlets

h

i

w. ■
1 hire

hit

|

In leaf characters this comes near to the Sumatran *X. villosa* Blume; but the two differ in flower and fruit.

17. *XANTHOPHYLLUM AFFINE*, Korth. in Miq. Ann. Lagd. II. 271. A shrub or tree; young branches glabrous, pale brown, thinly coriaceous (drying of a more or less yellowish pale green, especially beneath), elliptic to oblong-lanceolate, shortly and bluntly acuminate, the base cuneate; upper surface smooth, shining, lower dull pale yellowish; main nerves 5 to 8 pairs, ascending, prominent beneath; length 4 to 7 in., breadth 1.8 to 2.5 in., petiole .3 to .5 in. *Flowers* .35 in. long, the pedicels nearly as long. *Panicles* axillary, terminal, few-branched, minutely tomentose, the axillary half as long, the terminal as long as the leaves. *Sepals* unequal, rounded to round, blunt, tomentose externally. *Petals* villous tomentose, pubescent near the base or wholly glabrous, the lower ways pubescent. *Filaments* flat, puberulous. *Ovary* shortly stipitate, glabrous, from 8 to 14-ovuled. *Style* short, flat, pubescent. *Stigma* annular, fleshy, glabrous, often wavy. *Fruit* globose, .8 to 1.2 in. diam., smooth; pericarp thin, crustaceous. Hook. fil. Fl. Br. Ind.

In all the provinces; common. Distrib. Malayan Archipelago generally. Tenasserim.

This occurs as a bush and also as a tree. It varies a little in colour and shape of leaves, and as to the pubescence on the petals, when its commonness is considered, its characters are really remarkably constant, that of the size of the individual alone excepted.

18. *XANTHOPHYLLUM BELLATUM*, King, n. sp. A shrub or small tree with large, sub-sessile leaves; young branches robust, pale, pubescent, lenticellate. *Leaves* coriaceous, drying a pale greenish-yellow, elliptic to oblong, sub-obovate, shortly and bluntly acuminate, the edge recurved; slightly narrowed to the cordate, sub-apiculate, the base unequal, bellate, especially in the lower half, shining and glabrous on both surfaces, the lower a little paler; main nerves 18 to 25, the lower surface and sometimes puberulous as in the young nuttallii; length 11 to 18 in.; breadth 4 to 6.5 in.; petiole .25 in., very stout, glabrous. *Flowers* .4 in. long, the pedicels twice as long as the calyx. *Panicles* axillary, many-branched, spreading, pubescent; bracts deciduous. *Sepals* unequal, rotund, fleshy, concave, tomentose, the edges villous, inner two thin and ciliate. *Petals* ovate-rotund, glabrous, not larger than the sepals. *Filaments* flat, fleshy, glabrous. *Ovary* globose, ovoid, 8-ovuled, surrounded by a glabrous fleshy annular wavy style glabrous; stigma conical, pubescent. *Fruit* globose, .75 in. in diam. (? ripe); pericarp thick, crustaceous.

m

:
genera

Of:

two

:

I

, Linn. An am

21.

¹

i

omghoui Iho Troi

onra:

1

d mo

CRATOXYLON FORMOSUM, Benth. and Hook. fil. Gen. Pl. I, 166. A tree 20 to 6 feet high, all parts quite glabrous, young branches greenish-membranous, broadly elliptic to elliptic-oblong, acute or obtuse, the base slightly narrowed; upper surface shining; lower dull-lanceouscent and with numerous minute black dots; main nerves 6 or 8, little more prominent than the secondary; length 3 to 4 in., breadth 1.75 to 2.25 in.; petiole .25 in., thin. *Cymes* axillary, or from the scars of fallen leaves, 2-3 flowered. *Flowers* .75 in. long, their pedicels .5 in. *Sepals* elliptic, pointed, faintly veined, .2 in. long, nearly imbricant. *Petals* thin, prominently veined, elliptic, with a small scale above the slender claw; *Hypogynous glands* small, oblong, acute, crimson. *Tubes of staminal bundles* long, slender, exserted-cylindric, acute, .6 in. long. *Seeds* .3 in. long, with an obtuse unilateral wing. Hook. fil. Fl. Br. Ind. I, 258; Kurz Fl. Burm. 84. *Tridesmia formosa*, Korth. Verh. Nat. Gesch. Bot. 179, t. 1, f. 1. *Fl.* [redacted], Spach Sait. Bull. Bot. I, 374.

in the Provinces. Distrib. Sum, [redacted] Malayan Archi-

CRATOXYLON MAINGAYI, Dyer in Hook. fil. Fl. Br. Ind. I, 258. A tree 20 to 6 feet high; all parts glabrous; young branches with pale brown, bark. *Leaves* coriaceous, elliptic, acuminate at apex and base; upper surface shining, the lower pale; main nerves obscure, about 6 or 8, length 2 to 3 in., breadth 1 to 1.5 in., petiole .25 in. *Cymes* axillary, or from above the scars of fallen leaves, few-flowered. *Flowers* .75 in. long, their pedicels .25 in. *Sepals* oblong, unequal. *Petals* 5-6, clawed, veined, the basal scale acute. *Capsule* .5 in. long, cylindric. *Seeds* .25 in. long, with oblong unilateral wing. Dyer; Maingay.

Apparently an uncommon tree, since only Maingay has as yet collected it.

ORDER XIV. GUTTIFERÆ.

Herbaceous plants or shrubs with yellow or greenish juice. *Leaves* opposite, entire or membranous, rarely whorled or stipulate. *Flowers* axillary or terminal, solitary, fascicled, subracemose or paniced, white, yellow, or greenish. *Directions*, polygamous or hermaphrodite. *Sepals* 2-6, or in decussate pairs. *Petals* 2-6 (rarely more, or 0), usually imbricated or contorted. *MALE FL.*: *Stamens* usually indefinite, free or variously connate, monadelphous or in as many bundles as there are petals; anthers various. *FEMALE FL.*: *Ovary* 1-6-celled; style slender, short or 0, stigmas 20

.

1

Sect. I.

ly.

. i . el

nular

t- l'-

...

cells

fru

A
L

.

|

(iatn., in

y, the outer p
all cf"
. m bud :

¹ B rre

n
^{*v*}
my Tt as a

***1 ii**

.

sides of 4 thick fleshy processes; cells 2, orbicular. At the apex of the thick connective, dehiscing along the conn. very large, discoid, smooth, depressed in the centre, stamens. *Hermaphrodite flowers* in 3-flowered, axillary, solitary bracteolate cymes; sepals as in the male; petals 4, orbicular, not covering the stigma, otherwise as in the male; anthers as in the male, 4-celled; stigma sub-sessile, covering the whole large, discoid, smooth, entire. *Fruit* solitary, or 2 or 3 from ovoid, sub-orbicular, 5 to 65 in. long and rather less in diam. crowned by the discoid sub-concave stigma. *Phaeo Fl. Forest* China, fasc. VI, p. v, tab. 91, B. *Discothyma rostratum*, Hassk. Bat. Boep. 213. Hook. fil. Journ. Linn. Soc. XIV, 486.

Malacca; Griffith, No. 855, Malacca 136. Perak: Scortech King's Collector Nos. 5485, 10762. Distrib. Java.

This is readily distinguished by its small flowers on slender and by its flattened buds: also by the sub-horizontal, clear distinct venation of the leaves.

4. *GARCINIA OCERIDATA*, King, n. sp. A tree 60 to 70 young branches terete, dark-coloured. *Leaves* elliptic sub-spathulate, cuspidate, the base narrowed; upper surface lower dull; nerves sub-horizontal, distinct beneath, apart, anastomosing with an intramarginal nerve; length 2.5 to breadth 1.1 to 1.5 in., petiole .3 in. *Male flowers* 15 in. in shortly pedunculate, axillary, 6 to 9-flowered, spreading cymes pyriform; pedicels slender, .3 to .6 long; sepals 4, equal, orbicular, thin, concave; petals 4, reflexed, covering the stigma in bud, thin, orbicular, concave, a little larger than the stamens numerous, on both sides of 4 fleshy processes, filaments short and thick; anthers with 4 globular cells, each dehiscing by vertical suture; style short, cylindric; stigma capitate, small, concealed by the staminal masses. *Female flowers* and fruit unknown.

Perak, at low elevations: King's Collector, No. 10852.

Collected only once by the late Mr. Knauth. The leaves somewhat resemble those of *G. rostrata*, Hassk.; but the nerves are more distinct, and the flowers have a different androecium, although externally they much resemble those of *G. rostrata*, Hassk.

5. *GARCINIA WRAYI*, King, n. sp. A small spreading tree; young branches very slender, terete, dirty yellow. *Leaves* thinly coriaceous, ovate or elliptic, the apex produced into a long sub-spathulate point, the base cuneate; upper surface shining, the lower dull, pale; nerves slender, sub-horizontal, .05 in. apart, invisible on the upper and faint on the lower surface even when dry; length 2 to 3.5 in., of which

is sometimes as much as 75 in., breadth 8 to 12 in.;

Male flowers 15 in. in diam., in axillary fascicles of 2 or 3, pedicels 15 in.; perianth reflexed, *sepals* 4, the outer as large as the inner pair, all orbicular, sub-coriaceous and petals 4, ovate-orbicular, blunt, with a thickened spot near covering the stamens in bud; *stamens* numerous, on both of 4 fleshy processes; anthers sessile, globular-oblong, the connective thick, 2-celled, dehiscence vertical; rud. style cylindric, smooth. *Female flowers* axillary, solitary, pedicels as in the male; *sepals* 4, orbicular, thin, concave, about the same size as the petals, the sepals nor petals quite covering the stigma in bud; petals 4, orbicular, concave, with a coloured thickened spot near the base; disk shallow, fleshy; staminodes none; ovary cylindric; stigma pericarpic, smooth, entire, enveloping the whole of the ovary, ultimately becoming discoid and slightly depressed in the middle.

Found on Ulu Batang Padang and on Gunung Batu Patch, at an altitude of 4,500 feet.

IB. "

No. 3235.

Not seen ripe.

is probably

s fr"

▷

Agave and *Yucca*.

Agave *sp.* King, 5. *sp.* A tree 40 to 60 feet high;

leaves rather thick, 4-angled, yellowish. Leaves lanceolate

to elliptic and shortly and bluntly cuspidate, the base

upper surface shining, the

prominent on the

spreading, the

length of the lanceolate form 3.5 to 4.5 in.

length of the elliptic form 2.5 to 4.25 in.

petiole 2 to 4 in. *Male flowers* 75 in. in diam.,

bracteolate, axillary cymes; buds globular-ovoid;

bracts 2 to 4 in.; bracteoles orbicular, fleshy; *sepals* 4,

concave, the outer pair small, united by their bases and

early denticulate, inner pair as large as the petals;

petals orbicular to orbicular, fleshy, concave; *stamens* very

numerous, occupying both sides of 4 fleshy processes; anthers sessile,

2- to 4-celled, the connective thick, bilobed, bearing at its upper part the two

sub-orbicular suturally-dehiscent cells; rud. pistil with cylindric style

thickened upwards; the stigma large, hemispheric, entire, and papillose.

Female flowers in cymes like the males but fewer-flowered and often

terminal; perianth as in the male; staminodes apparently none; ovary

depressed-globose, smooth; stigma sessile, discoid, entire, its surface

GIKCIN'U

a:ill lli

Kurz, *Pierria*. And it appears probable that, although its branches are *Hormala* and *Sylhet*, *G. speciosa* does occur on the Andamans. M. Pierre relies, as a diagnostic mark of his *G. Kurzii*, on its solitary male flowers, whereas those of *G. speciosa* are in cymes. In the Herbarium specimens of the same set which M. Pierre refers to his *G. Kurzii*, the flowers are sometimes solitary, sometimes clustered. Another mark which M. Pierre relies on is that the peduncles of the flowers of *G. speciosa* are described by Wallich as two or three times as long as the leaf petioles, whereas in *G. Kurzii* the peduncles are shorter than the petioles. The female flower of *G. speciosa* is described in the *Flora of British India* as unknown. M. Pierre says the same of the female flower of his *G. Kurzii*. Some specimens of *G. affinis* from Sylhet have advanced female flowers and it is from these that I have described the female flower (by Pierre, tab. 79, fig. G.); for *affinis* appears to me in no way to differ from *speciosa*. Wallich was no doubt misled by the size of the very stigma in the male flowers of *speciosa* into considering it a hermaphrodite, and it is probable that he never saw true female flowers. This view is supported by the fact that he does not describe the fruit. Pierre (l. c. t. 79, figs. H and I) gives drawings of flowers to be the male and female flowers of *G. speciosa*. In text (l. c. VI, p. xiv), he states that the flowers thus shown in the specimen from which he took them, unattached to the twig and were mixed with flowers of other species. They are altogether doubtful even for M. Pierre.

GARCINIA KURZII, Pierre, *Flor. Forest. Coch.-Chine*, fasc. VI, p. 73 B. A shrub with the branchlets and leaves of *G. speciosa*, leaves less serrulate and with longer petioles. Flowers as in *G. speciosa* but the stamens less numerous and the rudimentary stigma and flat. Ripe fruit unknown.

Andaman Islands; Kurz, King's Collector.

This differs from *G. speciosa* chiefly in being a shrub, and in its rudimentary stigma being flat and discoid, instead of convex. Both *G. Kurzii* and *G. speciosa* differ but little from *G. cornea*, Roxb., a species indigenous to Amboina.

19. *GARCINIA HOMMONIANA*, Pierre, *Fl. Forest. Coch.-Chine*, fasc. VI, p. xii, t. 79, figs. D, E, F, J. A tree, with rather stout, 4-angled branches, yellowish when dry. Leaves elliptic to oblong-elliptic, slightly or pinnately, sub-acute or very shortly and abruptly bluntly serrate; the base cuneate, slightly unequal; upper surface slightly glossy, the lower rather dull; nerves numerous, ascending, not prominent on either surface; the midrib bold on both; length 3.5 to 5.5 in., breadth 2 to 2.75

be Malayan Peninsula and £

Bantoo, Ci

tred.

tte;
in.

..

186 G.
in., petio
of 3 to

!

1 in. in

i I in

;

sepals persistent at its base; pericarp thin, crustaceous. Seeds few, ovate. *G. cornea*, Wall. Cat. 1852 D.; Hook. fl. Pl. Br. Ind. I, 290 (in part). *G. fascicularis*, Wall. Cat. 1853, Pierre l. c., p. xvi.

Penang; Porter (Wallich's Collector), Curtis. Perak; King's Collector, Scortechini.

This plant, first distinguished as a species by M. Pierre, seems to be rather common in Penang and Perak. Ripe fruits are as yet unknown: those in Mr. Kunstler's specimens No. 3583 (noted by him as unripe) measure 1.25 in. in diam. A fruit on one of Scortechini's specimens measures half an inch more. Mr. Kunstler notes the tree as occurring at elevations of 300 up to 3,000 feet. The foregoing description of the flower does not quite agree with that of M. Pierre, which was drawn up from specimens without female flowers and with buds only of the male flowers.

14. *GARCINIA MALAGCENYLA*, Hook. fl. Pl. Br. Ind. I, 261. A tree, the branchlets rather stout, 4-angled. Leaves brown when dry, elliptic, shortly and abruptly acuminate, the base much narrowed, shining above, the lower surface rather dull; midrib bold, prominent on both surfaces; nerves numerous, faint, sub-horizontal, connected by oblique secondary nerves; length 4 to 5 in., breadth 1.5 to 2.5 in.; petiole .75 to 1 in., channelled. Male flowers 1 in. in diam., in terminal fascicles of 4 to 6; pedicels .35 to .55 in. long. Sepals orbicular, concave, fleshy. Petals twice as long as the sepals, dull red, broadly ovate, shortly clawed. Stamens very numerous, densely imbricated in a sub-cylindric or conical truncate mass formed of the fleshy confined filaments, anthers small, broadly ovoid, 2-celled, the connective broad; stigma large, convex. Ovary abortive. Female flowers 1.5 to 2 in. in diam., terminal, solitary, red. Staminodes few or 0. Ovary globose, 8-celled; stigma small, large, convex, enveloping half the ovary, much corrugated and deeply 8-lobed. Fruit unknown. Pierre Flore Forest. Coch.-Chine, fasc. VI, p. xi, t. 78, fig. D.

Malacca; Maingay (Kew Distrib. No. 149). Of this I have seen only Maingay's specimens. In its leaves, in the colour of its flowers, and in its 8-lobed stigma, this resembles *G. malagasyana*.

15. *GARCINIA MAINGAYI*, Hook. fl. Pl. Br. Ind. I, 267. A tree 40 to 60 feet high; young branches thick, 4-angled, and dark-coloured when dry. Leaves oblong-elliptic, obtuse with short blunt apicules, the base narrowed; both surfaces shining, the lower pale brown when dry; nerves 11 to 13 pairs, bold, spreading, prominent beneath as is the midrib; length 4.5 to 7 in., breadth 2.25 to 3.25 in.; petiole .75 in. Male flowers 1 to 1.25 in. in diam., waxy white, in terminal or axillary, 3 to 6-flowered, shortly peduncled umbels; pedicels .25 to .5 in. long. Sepals

nd tUo ab
r

i

i

¹ aina!

the rudimentary pi

■v, in BV

Lindric, with i

■ very slightly

25 in. **iu** dium. when **quite** ripe; <> id,
papillose, slightly 4-lob .ii.

>ist, J¹

110.

>te on tlii

but, in tho dried . they are d

on a thicl

; narrowly oblv

inate, the i

nerwas unmerou

csh, but v

as-

fpm the edge v, ine intra-ma]

L'25 to - petiole, 75 in.

tual clusters of few-flowered c

/. &'7

the **inner pi**

he dehiaoenci

J, solit. in

the malt, but

fleshy, red. Stamens from 25 to 40, in a square flat-topped mass; anthers nearly sessile, broadly oblong, the connective wide; the cells 2; lateral, slightly curved, their dehiscence longitudinal; rud. ovary 0. Female flowers in low-flowered axillary cymes; pedicels thick, 2 in. long. Sepals and petals as in the male stamens in 4 bundles of unequal length; ovary ribbed, 12-celled; style very short; stigma with many conical papillae, peltate, slightly depressed in the middle, its margin crenate. Fruit sub-globular, 2 to 3 in. in diam. when ripe, greenish yellow, crowned by the concave papillate stigma, very glutinous. *Planch. Flor. Coch.-Chine*, fasc. VI, p. xvi, tab. 80, fig. B.

Malacca; Griffith 861, Maingay 153 (Kew Distrib). Perak, common. Pangkore, Curtis 1609. Distrib. Sumatra; Forbes, No. 2934.

21. *GARCINIA FORBESII*, King, n. sp. A small tree, young branches subtetragonous, yellowish. Leaves thinly coriaceous, oblanceolate to ovate-lanceolate, shortly acuminate, the base cuneate; both surfaces slightly dull when dry, the lower slightly pale; nerves spreading, anastomosing with an intra-marginal nerve, 15 in. apart, the intermediate rather bold, all distinct below when dry; length 3.5 to 5 in., breadth 1.5 to 2.5 in., petiole 3 to 4 in. Male flowers 2.5 in. diam. in 3 or 4-flowered clusters from small axillary tubercles, buds sub-globose, pedicels 2 to 4 in. Sepals 4, equal, rather thin, pale-coloured, orbicular, concave. Petals 4, fleshy, orbicular, dark-coloured, concave. Stamens numerous, in a single convex mass, the connective small; anthers sessile, sub-ovate, 2-celled with longitudinal dehiscence; rud. ovary 0. Female flowers axillary, solitary, sessile; sepals 4, broadly ovate, blunt, fleshy, concave. Petals 4, orbicular, fleshy, concave, red to orange; stigma sessile, small, completely covering the ovary, entire, its surface with prominent glandular papillae. Fruit (young) ovoid, crowned by the stigma.

Perak; Wray 3396. Sumatra; Forbes Nos. 2936 and 3152.

22. *GARCINIA BANCANA*, Miq. Fl. Ind. Bat. Suppl. 494. A tree 60 to 80 feet high; young branches stout, angular, not angled, black and shining when dry. Leaves coriaceous, large, broadly short-lanceolate; the apex rounded, often slightly and bluntly uncrenate; middle narrowed in the lower third into the stout winged petiole; upper surface shining, the numerous and very oblique nerves distinct; lower surface dull, opaque, pale brown, the nerves obsolete; midrib prominent below. Length 5 to 7 in., breadth 2 to 3 in., petiole .75 to 1.25 in. Male flowers 1.5 in. in diam., in crowded fascicles of 6 to 12, from short densely bracteate tubercles in the axils of leaves or of fallen leaves; pedicels unequal, 2.5 to 5 in. long; bracteoles ovate, coloured, 1 in. or less. Sepals 4, orbicular, concave, fleshy, the outer pair larger than the inner. Petals 4, ovate, blunt, fleshy, concave. Stamens numerous, in

short, the c
 anthers bent like a horse E
 of the CO] nd <^.:>
 Be male, sir
 lantheinn
 hidden by the large b
 lia. *Fruit* (immature) ov>
 -ase and the apex cr<
 . Pierro Vloro Forest. Coch.-Chiuc. VI, V- xxxiii,
 KurK.
 [emsle . in Herb. Kew. A b
 mng branches p ied. I nlycoi¹
 1fCCS1: 'lull, t'
 18 pairs, very distinct on the lower sui
 in to 14 in., breadth 3*5 to 6 in.; petiole 1 to 1*5 n
 L to 1*25 in. in diam., in shortly led, !
 d, tinal cymes ; pedicels '25 to "5 in, aal,
 orbicnlai
 an the , palo yellow with a
 its short, thick, n
 , cun^ ith fhr
 longitudinal d*
 e, discoid ilitary, terminal,
 as in the male : stain: aboi
 HI I grooves; si largo, discoid,
 uding- to those of the
 In diam. by 2 ii. , with many
 zfi: loured to crimson.
 k ; on Gnnong Bubo at elevations of 2500 to 3000 feof. King's
 y.
 A remarkably 6b i, at once known by its large
 deeply
 ait.
 , T, Anders, in Hook. PI. Ind. I, 266.
 aab-tei
 to ovate-elliptic lightly nai
 ower paler; midrib stoit;
 ., breadth 4
 - in. in diam., in deisse 3 to 10-flWered
 nines
 es or of fallen 1. in.
 Tbicnlar, fleshy, concave. *

Fl. Buna. I, ■

This is very near *G. Kydiana* but differs in the points noted under that species.

24. *GARCINIA KYDIANA*, Roxb. Fl. Ind. II, 622. A dioecious tree to 40 feet high; the branchlets dark-coloured when dry, not angled. Leaves thinly coriaceous, lanceolate, acuminate, the base acute, both surfaces shining; nerves thin but distinct when dry, rather few for this genus; length 3 to 5 in., breadth .75 to 1.5 in., petiole .35 to .5 in. Male flowers .75 in. in diam., in small axillary or terminal pedunculate umbels of 3 to 5, or solitary; pedicels .25 in. long; peduncles of the umbels 6 in. Sepals 4, equal, ovate, obtuse, fleshy, yellow. Petals numerous, large as the sepals, broadly ovate, blunt, pale yellow. Anthers numerous, inserted into the slightly 4-lobed fleshy mass of compressed stamens, square, 4-celled (a cell at each angle) pistil 0. Female flowers axillary and terminal, solitary, sessile. Sepals and petals as in the males, nodes 4, small, 3 or 4-lobed. Ovary globular, sessile, 6 to 8-lobed, 1.5 in. diam., smooth, yellow, globular, depressed, with 6 to 8 vertical grooves near the apex, and with a nipple-like protuberance from the depressed apex on which is inserted the persistent stigma. Seed 6 to 8, oblong, .85 in. long; the arillus soft, acid, juicy. Kura For. Fl. Burma I, 90, in part; Pierre Fl. Forest. Coch. China, fasc. VI, p. xxix. Lessing'son Mem. Garcin. 39, in part; *G. Roxburghii*, Wight Ind. II, 313. *G. Coca* Roxb. Hook. fil. Fl. B. Ind. I, in part.

Andaman Islands.

Of the true Roxburghian *G. Kydiana*, the only specimens that I have seen are from the Andamans. The Burmese specimens referred to this species by Pierre and others belong mostly to *G. Coca* as Roxburgh described and figured it. But the two species are very closely allied. The chief points that separate *Kydiana* from *Coca* are its larger size, the arrangement of the males in distinct pedunculate umbels, the females always solitary and sessile; and, in the fruit, the curious nipple rising from the depressed apex, and the restriction of the vertical grooves to the neighbourhood of the apex. In the Flora of Br. India the two are united under *G. Coca*. Griffith's Nos. 863 and 867, referred to *Kydiana* by Pierre, belong in my opinion to *G. nigro-lineata*, Planch.

25. *GARCINIA NIGRO-LINEATA*, Planch. MSS. A tree 20 to 30 feet high; young branches not angled, their bark rather dark. Leaves thinly coriaceous, lanceolate and acuminate, or ovate-lanceolate and shortly caudate-acuminate, the base acute; both surfaces shining; the lower ferruginous in some stages; midrib rather stout; main nerves rather distinct when dry, about .1 to .15 in. apart, the intermediate nerves almost as prominent; length 3 to 4.5 in., breadth 1 to 1.5 in., petioles

Ft

.

wrn

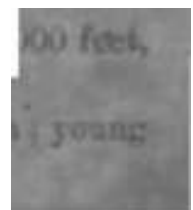
■

■ \ seat I

■ *it* about 1

1000

y si



branches 4-angled, yellow. Leaves thinly coriaceous, ovate-lanceolate to oblong-lanceolate, shortly caudate-acuminate, the base acute; both surfaces shining, the lower pale, opaque; nerves 7 to 9 pairs, bold and prominent beneath as are some of the secondary nerves; length 4·5 to 5·5 in., breadth 1·5 to 2 in., petiole .25 in. Male flowers about .2 in. in diam. in dense 6 to 10-flowered fascicles from small minutely bracteolate axillary tubercles; buds turbinate; pedicels slender, .1 in. or less in diam.; sepals 4, membranous, orbicular, concave; the outer pair much larger and thicker, keeled; petals 4, smaller than the sepals, fleshy, concave; stamens from a small receptacle; filaments short, broadly reniform, the connective expanded transversely, the anthers sometimes confluent, bent round it, and dehiscing along the connective; stigma 9. Female flowers on axillary tubercles like the male but fewer-flowered; sepals as in the male but subequal; petals as in the male; staminodes about 10, distinct, the filaments broad, the anthers 2-lobed, ovate; stigma convex with 8 radiating ridges, 8-angled; ovary thick, cylindric, nearly as wide as the stigma (see Kunth) ovoid, pointed.

Perak; at low elevations, Wray No. 2102, King's No. 2531.

Subgenus I. *XANTHOCHYME*, Roxb. (Gen.). Sepals 5, very rarely 4. Filaments connate in 5, rarely in 4, are called spathulate bodies, antheriferous at the top, from the base short, incurved; anthers small, didymous.

31. *GARCINIA XANTHOCHYME*, Hook. Fl. Br. Ind. A dioecious tree; the branches glabrous, angled. Leaves glabrous, narrowly oblong or oblong-lanceolate, acute, the base cuneate, numerous, not prominent; length 8 to 15 in., breadth 1 to 1·5 in., petiole about .75 in. Male flowers .5 to .75 in. in diam., in 4-10-flowered fascicles, axillary or from the axils of fallen leaves, greenish-white; pedicels stout, .5 to 1 in. long. Sepals .25 in. in diam., orbicular, unequal, fleshy, concave. Petals .35 in., orbicular, spreading, thin. Stamens in 5 broad bundles of 3 to 5, alternating with 5 fleshy glands; anthers 2-celled. Hermaph. flower like the male, the pedicels 2 or 3 times as long. Ovary ovoid, pointed, usually 5-celled; stigma with 5, spreading, oblong blue lobes. Ripe fruit globose, pointed, 2·5 in. in diam., dark yellow. Seed 1 to 4, oblong. Kurz For. Flora Burma I, 93; Pierre Flore Forest. Cochinchine, fasc. VI, p. iii, t. 21 A. *Xanthochymos pictorius*, Roxb. Corom. Pl. II, 51, t. 196; Fl. Ind. II, 633. *X. thactoring*, DC. Prodr. I, 562; Choisy Guttif. Ind. 32; Planch. and Triana Mem. Guttif. 49; W. and A. Prodr. 102; Wall. Cat. 4337, except C.

Andamans, Penang. Distrib. Barmah and Chittagong, base of Himalaya and Assam, S. India up to 1500 feet.

A

'ft.

toim;

•

fnrth«

1

laryei

.rated .

Bin

■ i ids; J

V

A

«

HOT

21)

2 n & I

i

tmli

ala Dyi

ike ft(>■
tpeu i. coll' fioobara l>
1 Calcutta ^floi hariiru^ Tl be
i

t ary or in pai in
axillary *fti-iillary* rac

loi

...

' Got

obi

o.

11.

kly

15.

•

.

1

lower

;to Tier.

as, ell?

rt« aosfc of tlit: loaf-ax i

i-a, 1 rous(*style* not

lonjL

Wai' in
pro]

ax lie in,

107; Kurz Fl. Berm. i, 94; *O. tetrapetalum*, Roxb. Fl. Ind. ii, 608; *O. Moonii*, Wight Ill. i, 129, In. i, 111; Thw. Enum. 52; Beddome Flor. Sylvat. Gen. xxi; *O. cymosum*, Miquel Fl. Ind. Bat. Suppl. i, 497; *O. Diapenhorstii*, Miq. l. c. 497; *O. hirtellum*, Miq. Pl. Jungh. i, 291; Fl. Ind. Bat. i, Pl. 2, 511; *Apoterium Sulatri*, Bl. Bijdr. 218.

Penang, Singapore, Andamans, Nicobars. Distrib. Malayan Archipelago, Cochin-China, Fiji, Society Islands.

7. *CALOPHYLLUM AMORNUM*, Wall. Cat. 4849. A tree 20 to 40 feet high; the apices of the youngest branches, the buds, the leaf-petioles, and the rachides of the racemes minutely ferruginous or griseous-pubescent. *Leaves* thinly coriaceous, lanceolate or oblong-lanceolate, rarely ovate-lanceolate or obovate-elliptic, acute or very shortly and obtusely acuminate, the base cuneate; nerves very close, about equally prominent on both surfaces; length 2.5 to 3.5 in., breadth 1 to 1.5 in., petiole .4 in. *Racemes* stout, sub-erect, shorter than the leaves, few-flowered. *Flowers* .25 in. in diam., pedicels .2 in. *Sepals* relaxed, the outer pair oblong, ferruginous-tomentose externally; the inner pair longer, sub-glabrous. *Fruit* globose or sub-ovoid, .3 in. long, the pericarp pulpy. *Choloy Gattif. de l'Inde*, 41; *Planch. and Triana Mem. Guttif.* 235; Kurz Fl. Berm. i, 95.

Andamans; King's Collector. *Tenasserim, Haller, No. 881, Amherst Wallieb, No. 4849.*

None of the Andaman specimens which I have seen are in fruit, and none of the Burmese are in flower. But in leaf and other characters the specimens are alike. The species seems to me a good one and to be distinct from *C. citrurum*, Wall., with which it has however been united in Fl. Br. Ind., and this is also the opinion of Planchon and Triana.

8. *CALOPHYLLUM RETUSUM*, Wall. Cat. 4846. A much-branched, very leafy shrub; the young branches 4-angled, softly ferruginous-pubescent as are the petioles and inflorescence. *Leaves* coriaceous, ovate to ovate-elliptic, obtuse, the base rounded or slightly narrowed; nerves rather blunt for the genus, more visible on the upper than on the lower surface; length 1.75 to 2.25 in., breadth .75 to 1 in.; petiole .2 in. *Flowers* .25 in. in diam., pedicels .2 in. *Sepals* 5, clawed; the inner ovate-oblong. *Fruit* pisiform. *Planch. and Triana Mem. Guttif.* 235; Kurz Fl. Berm. i, 95; *O. piniferum*, Planch. and Triana Mem. Guttif. 235; *O. piniferum*, Hook. fil. Fl. Br. Ind. i, 272, (excl. syn. *C. amernum*).

Malacca; Griffiths (No. 150). Singapore; Griffiths (No. 150).

9. *CALOPHYLLUM* King, n. sp. A tree; the young branches

- 111., til
r. ldr •

* .
rouudod,
r. i.

i

Unlace- iffay- PerafcjE Collector No
Distrib. Got , Bn

,Plr.n>

GALOP;; . Lim
Bet lit;-1 y
obo

-. stigma (
Jiam. o

.

, i

tie mi

▪

are thicker, smaller, and invariably obovate and retuse. The flowers are smaller than those of *G. laophyllum*; the fruit also differs in being smaller, ovoid and not pulpy. This species also resembles the British Indian *G. Wrightianum*, Wall. The existence of petals is certain, but the condition of the flowers on the only specimens hitherto collected is such that their number cannot be made out with certainty.

14. *Calophyllum WALLICHIANUM*, Planch. and Triana Mem. Gult. 249. A tree; the branchlets pale yellowish, the youngest 4-angled and, with the buds under surface of young leaves and inflorescence, minutely ferruginous-tomentose. *Leaves* thinly coriaceous, narrowly elliptic-oblong, the apex shortly and obtusely acuminate, the base acute; upper surface shining, the midrib narrow; lower surface dull, the midrib prominent, at first minutely ferruginous-tomentose, when adult glabrous; length 4.5 to 6 in., breadth 1.5 in.; petiole .75 in., rusty. *Racemes* axillary and terminal, less than half as long as the leaves, ferruginous-tomentose, erecto-patent. *Flowers* .5 in. in diam., pedicels .2 in. *Sepals* 4, orbicular, ferruginous-tomentose on both surfaces. *Petals* 4, cuneate-oblong, glabrous internally. Fruit (see G. B. Ind.) globose, the size of a cherry. Wall. Cat. No. 4843, in part. Hook. fil. Fl. Be. Ind. I. 273.

Malacca; Mangay.

This species was found by Planchon and Triana on a specimen mixed with Wall. Cat. No. 4843, (the bulk of which is *C. spectabile*, Willd.) This does not appear to be a common species, and its fruit I have not seen. It may be readily distinguished by its yellow branches, the pale ferruginous, almost cinnamonaceous, colour of its leaves when dry, and its darkly rusty racemes.

15. *Calophyllum GRIFFITHII*, T. Anders. in Hook. Fl. Be. Ind. I. 273. A glabrous tree, the youngest shoots 4-angled. *Leaves* thinly coriaceous, oblong or elliptic-oblong, acute or obtuse, the base shortly cuneate, shining on both surfaces, the rather distant nerves equally distinct on both, the midrib more distinct and pale-coloured on the lower; the edges with a pale thickening; length 4 to 6 in., breadth 1.75 to 2 in., petiole .4 to .6 in. *Racemes* solitary, axillary, from 1.5 to 2.5 in. long, few-flowered. *Flowers* .35 in. in diam., glabrous; pedicels unequal, .2 to .5 in. long, slender, each with a small deciduous bract at its base. *Sepals* 4, outer pair orbicular, inner pair longer but narrower. *Petals* 4, oblong, obtuse. Fruit (young) ovoid, smooth.

Malacca; Griffith. Distrib. Sumatra, Forbes, No. 322a.

16. *Calophyllum MACROCARPUM*, Hook. fil. Fl. Be. Ind. I. 273. A glabrous tree; branchlets polished, sharply 4-angled. *Leaves* coriaceous, narrowly oblong or elliptic-lanceolate, shortly and obtusely acuminate,

6-10 • niinuti
Uoffla 1 to L'25 in,
•iner ; s

; Maingoy (K> b. 174)
• and

jtnb

KiT' 1l

HP **largo** R; .
is, iiliimeti- ■ connti

rlo! BctiBoe vertical,

I -1-seeded.

vrew in racor-

i
Ritocrttea !
i llia n I ii >
arillaa
■" leave diet in.

Fruit turbinate, quite enveloped by
the outer sepals when ripe ... 3. *K. grandis*.

Fruit ovoid, pointed, only partly
covered by sepals.

Leaves tapering to the mo-
derately long petiole ... 4. *K. Kunthii*.

Leaves rounded or cordate at
base, sub-sessile ... 5. *K. nervosa*.

Fruit ovoid with a much elongate
hooked apex, leaves caudate-
acuminate ... 6. *K. caudata*.

Nervation of leaves indistinct.

Young branches slender, smooth,
flowers axillary ... 7. *K. elegans*.

1. *KAYEA WHARF*, King n. sp. A small glabrous tree; the young branches pale, polished, terete, often whorled. Leaves very thickly coriaceous, broadly elliptic, acute or acuminate, the edges much recurved when dry, the base rounded; nerves about 14 pairs, unequal, only slightly prominent on the lower and less so on the upper surface; both surfaces smooth, the upper shining, the lower dull; length 3 to 4.5 in., breadth 1.75 to 2.25 in.; petiole 4 in. thick. Racemes axillary or terminal, 2 to 3 in. long, suberect, stout, with minute subulate bracts at the base, 3 to 4-flowered. Pedicels 1 to 1.25 in. in diam., pedicels 5 to 1.25 in. long. Sepals orbicular, nearly equal, glabrous, the outer pair coriaceous, the inner thinner. Petals much larger than the sepals, broadly-obovate or orbicular, clawed. Stamens much shorter than the petals. Fruit unknown.

Pakong, on Gunung Brannan, elevation 7000 feet, L. Wray, junior.

A remarkable species quite unlike any hitherto described.

2. *KAYEA SACROSA*, Planch. and Triana Mem. Guttif. 269. A glabrous tree, 40 to 60 feet high. Leaves sub-coriaceous, elliptic-oblong, with a very short blunt acumens, slightly narrowed to the petiole; upper surface rather dull, the lower paler and shining; main nerves 18 to 25 pairs, bold, spreading; length 6 to 9 in., breadth 1.5 to 2.5 in.; petiole 75 in. long. Racemes less than 1 in. long, few-flowered, bracteolate, crowded at the apices, or in the axils near the apices, of the rather long naked often whorled branchlets; pedicels stout, 15 in. long. Flowers 3 in. in diam. Sepals rotund, thickly coriaceous. Petals longer than the sepals, thin. Stamens numerous, in one series, monodelphous at the base, Wall. Cat. without number or locality; Hook. & Th. Br. Ind. i, 276, (excl. syn. *Macha Singaporensis*, Wall. Cat. 4336.)

Malacca; Muirguy (Kew Distrib. 177). Perak; Soortechini, 97.

The foregoing description has been drawn up from Maingay's Malacca specimens above quoted, which have been accepted by Sir Joseph Hooker as of the species described by Planchon and Triana as *K. macraea*. These authors founded the species on a Wallichian specimen in M. de Candolle's Herbarium, without number or indication of locality, which had been separated from some other Wallichian number, and which bears the following note by Choisy "*Mesua speciosa? specimen imperfectum sine utula in herb. Wallichiano repertum.*" This specimen I have not seen. Of Wall. Cat. No. 4836, (*Mesua Singaperiana*.) there is a specimen in Herb. Gale.; and it is certainly different from Maingay's 177, being more like a *Mesua* than a *Kaya*.

3. *KAYEA GRANDIS*, King, n. sp. A glabrous tree, 40 to 80 ft. high. Leaves large, coriaceous, oblong to elliptic-oblong, sub-acule, the edges revolute (when dry), slightly narrowed towards the rounded or sub-acute base; both surfaces rather dull (when dry), the 20 to 25 pairs of main nerves sub-horizontal, prominent, the secondary nerves also prominent. Length 9 to 18 in., breadth 3 to 4.5 in.; petiole 4 to 7.5 in., smooth. Flowers sub-globose in bud, pedicelled, in short few-flowered axillary cymes crowded in the axils of the leaves, rarely solitary, about 1.25 in. in diam. when expanded; pedicels 5 in. Sepals rotund, the outer obscurely very coriaceous; the inner thin, not larger than the outer. Petals elliptic-oblong, acute, larger than the sepals (5 in. long or more). Ripe fruit turbinate, 2 to 2.5 in. in diam. and 1.25 in. thick, bony, completely enveloped by the persistent, thickened, outer sepals.

Malacca, Maingay (Kew Distrib. 178), Cantley No. 2351, Peak, King's Collector.

A very fine species; at once distinguished by its large leaves and depressed turbinate fruit. The fruit, and probably the whole plant, abounds in yellow juice. According to M. Cantley the wood sinks in water.

4. *KAYEA KUNSTERI*, King, n. sp. A glabrous tree, 30 to 50 feet high; the branchlets brownish, sub-striate, not tuberculate. Leaves linear-coriaceous, elliptic-lanceolate, acuminate, sub-undulate, the line much narrowed to petiole; both surfaces rather dull (when dry) with a few scattered opaque black dots; the lower pale, sub-glaucous (when dry); length 4 to 6 in., breadth 1 to 2.25 in.; petiole .25 in. to 4 in., rugose; nerves 20 to 24 pairs, unequal, prominent; the lower horizontal, the upper slightly curving upwards. Flowers solitary, axillary or terminal, 1.5 to 2 in. diam., on a very short smooth pedicel, bracts at its base linear-subulate; bud globose, smooth. Sepals unequal as in *acrostachya*. Petals oblong-acuminate, 1 in. long. Ripe fruit ovoid, gradually narrowing into a short subulate apical beak.

Perak: King's Collector, Nos. 3301, 6850; Penang, Curtis, No. 1419; Malacca, Mainway, No. 175.

This is allied to *K. verrucosa*, T. Anders.; but it is readily distinguished from that by its smooth branchlets, by the leaves much and gradually narrowed to both base and apex, and by the oblong-acuminate petals. A shrubby form of this occurs in Penang (Curtis, Nos. 805, 1418,) and in Perak (King's Collector, No. 345) in which all the parts are smaller and the leaves are less acuminate at the apex, and rounded instead of much attenuated at the base.

5. *KATEA NERVOSA*, T. Anders. in Hook. fil. Fl. lit- Ind. i, 277. A glabrous tree; the branchlets minutely tubercled, 4-angled. Leaves subsessile, membranous, elliptic-oblong, shortly and bluntly acuminate, the base rounded or emarginate; both surfaces (when dry) dull coppery brown, the lower paler; nerves 16 to 20, unequal, rather prominent beneath; length 3 to 5 in.; breadth 1.25 in. to 2 in.; petiole .15 in. long, rugose as is the base of the midrib. Flowers axillary, usually solitary (sometimes 2 or 3 from an axil), or terminal, 1.75 in. in diam.; pedicels .75 in. or less, tubercled, each with several linear lanceolate bracts at its base. Sepals unequal, the outer very coriaceous, sub-orbicular; the inner nearly twice as large but thinner. Petals obovate; filaments about as long as the slender petals. Ripe fruit sub-globular, beaked, leathery, .75 in. in diam. or more, the calyx marcescent. Kurz Flora Borm. i, 96; *Mesua verrucosa*, T., and Triana Mem. Guttif. 279.

Malacca, Perak. Distrib. Burmah.

6. *KATEA CAUDATA*, King, n. sp. A slender glabrous tree, 20 to 30 feet high, with drooping habit; the branchlets slender, pale brown, striate. Leaves membranous, obovate-elliptic, caudate-acuminate, mucronulate, edges undulate, slightly narrowed to the rounded base; both surfaces dull, the lower pale; nerves 12 to 14 pairs, prominent, sub-horizontal; length 3 to 5.5 in. of which the acumen forms .7 in.; breadth 1 to 1.5 in., petiole .15 in. Flowers unknown. Fruit solitary, terminal, shortly pedicellate, narrowly ovoid-cylindric, tapering very much to the apex and often curved, less narrowed to the base, 2 to 2.5 in. long, and 1 to 1.25 in. in diam. at the middle; bracts at base of pedicel subulate, 1-nerved. Sepals persistent, the outer pair orbicular, the inner oblong; pedicel about 2 in. long, rather shorter than the subulate bracts.

Perak; King's Collector, No. 7937.

Only once collected and only in fruit. Easily recognisable by its caudate-acuminate leaves and fruit.

7. *KATEA URBANA*, King, n. sp. A glabrous tree 40 to 60 feet high, with slender drooping branches; branchlets very thin, pale gray. Leaves thinly but rigidly coriaceous, lanceolate, acuminate, the base acute, the

edges undulate (when dry); both surfaces rather dull, the nerves numerous but indistinct, the midrib slightly prominent; length 2.25 to 3 in., breadth .5 to .75 in., petiole .25 to .35 in. *Flowers* solitary, axillary or terminal, .4 in. in diam.; pedicel .1 in. long with several ovate-acute bracts at its base. *Sepals* nearly equal, the outer coriaceous. *Petals* oblong, acute, smaller than the sepals. *Ovary* narrowly ovoid, attenuate above, and passing into the long filiform curving exerted style. *Fruit* unknown.

Perak; on Gunung BuTiu, elevation from 1500 to 2000 ft. King's Collector.

A very distinct and elegant species, distinguished by its thin rigid lanceolate leaves and very slender branches.

4. *MESUA*, Linn.

Trees. *Leaves* opposite, rigidly coriaceous, often pellucid-dotted; veins very numerous, very slender, at right angles to the midrib. *Flowers* polygamous or hermaphrodite, large, axillary or terminal, solitary. *Sepals* and *petals* 4 each, imbricate. *Stamens* very numerous, filaments filiform, free or connate at the base; anthers erect, oblong, 2-celled, dehiscence vertical. *Ovary* 2 celled; style long, stigma sessile; ovules 2 in each cell, erect. *Fruit* between fleshy and woody, 1 celled by the absorption of the septum, at length 4-valved, 1-4-seeded. *Seeds* without an aril, testa fragile. *Distrib.* Tropical Asia; 3 species.

1. *MESUA FERREA*, Linn. sp. 734. A medium sized tree with spreading head; branches faintly 4-angled, glaucous. *Leaves* coriaceous, linear-lanceolate to oblong-lanceolate, acute or acuminate, the base acute or rounded; above shining; below pruinose, glaucous or glaucescent; nerves numerous, close, inconspicuous; length 3 to 6 in., breadth .75 to 1.25 in., petiole .25 to .35 in. *Flowers* .75 to 3 in. in diam., in pairs or solitary, usually terminal. *Sepals* orbicular, fleshy, the margins thin. *Petals* 4, obovate, white; anthers large, elongate. *Fruit* ovoid-conic to sub-globose, from 1 to 2 in. long, the sepals persistent. *Choisy* in DC. Prod. i, 562; *Choisy Guttif. Ind.* 49; *Planch. and Triana Mem. Guttif.* 271; *Roxb. Fl. Ind. ii*, 635; *W. and A. Prod.* 102; *Wall. Cat.* 4834; *Wight Ill.* 127; *Lo. t.* 118; *Beddome Flor. Sylvat. Gen.* xxiii; *Hook. Ill. Pl. Ind.* 277; *Bl. Bijdr.* 216; *Miq. Fl. Ind. Bat. i*, Pt. 1, 509; *Karst. For. Fl. Borm.* i, 97; *M. speciosa*, Choisy, in DC. l. c.; *Guttif. Ind.* 49; *Wight l. c.* 118 and 261; *Wall. Cat.* 4835; *Pl. and Triana l. c.* 375; *Beddome l. c.* 261. *M. pedunculata*, Wight Ill. 127; *Lo. t.* 119. *M. corymbosa* *Beddome*, Wight Ill. 129; *Lo. t.* 117; *Pl. and Triana l. c.* 378; *Beddome Flor. Sylvat. l.* 64. *M. Roxburghii*, Wight Ill. 127; *Beddome l. c.* xxiii. *M. salicifolia*, *M. Walkeriana* and *M. pulchella*, *Planch. and Triana l. c.* 373.

374, and 512. *M. acrophylla*, Thwaites Enum. 407; Beddome l. c., xiii. *M. Nagana*, Gard. in Calc. Jouru. Nat. Hist. vi. 4.

In all the Provinces. Distrib. Eastern and Southern provinces of British India; Ceylon: often cultivated.

A variable species to which many names have been given. — A form with narrow leaves (5 in. broad) and small flowers is found in Ceylon, and was distinguished by Thwaites as var. *angustifolia* (*M. micro*, Pl. and Tri.). In other forms from Ceylon and the South of India, the leaves have very little of the characteristic white waxy powder on their under surfaces; and these formed the bases of Planchon and Triana's species *M. pulchella*, and of Wight's *M. Ceramandiana*.

2. *Mesua sarsura*, T. Anders. in Hook. fil. Fl. Br. Ind. I, 288. A slender glabrous tree, 60 to 80 feet high; the branches pale brown, the youngest minutely ragose when dry. Leaves coriaceous, shining, narrowly elliptic or oblong-lanceolate, the apex shortly acuminate, the base acute; lower surface pale, nerves indistinguishable but the midrib prominent on both surfaces; length 2 to 3 in., breadth .75 to 1.2 in., petiole .15 in. Flowers unknown. Fruit solitary, terminal, pedicellate, broadly ovoid or depressed-globose when young, slightly pointed when mature, apiculate, 1 in. or more in diam., subtended at the base by the 4 ligulated sub-rotund spreading sepals: pericarp thick, woody, rugulose, dehiscent vertically by 2 (rarely 3) pointed valves. Seeds two, plano-convex, or one depressed-globose; the testa brown, brittle; pedicels 1 to 1.5 in. long, thickened upwards, and with several minute subulate deciduous bracts at their bases.

No. 183¹, King's Collector, Nos. 4551 and 5881.

It is suggested in Fl. Br. Ind. (I, [redacted] that (type of [redacted] No. 845, although now put with *Mesua*, is probably the type of [redacted] new genus [redacted] and [redacted]

spicy
appears
rather
thin

mu full-

lit

tUer bolonifs to [redacted]

ORDER XV. TERNSTROMIACEÆ.

Shrubs rarely climbing, or trees. Leaves alternate, simple (in Indian species) entire or often serrate, usually coriaceous, cristipulate. Flowers handsome, seldom small, usually subtended by 2 sepal-like bracts, rarely distinct, axillary, 1 or more together, rarely in lateral or terminal racemes or panicles. Sepals 5, rarely 4-7, free or slightly con-

nate, the innermost often larger. *Petals* 5, rarely 4-6, free or connate below, imbricate or contorted. *Stamens* numerous (definite in *Steleonia* and *Stoebgeria*) free or connate, usually adnate to the base of the deciduous corolla; anthers basifixed or versatile, dehiscing by slit or rarely by terminal pores. *Ovary* free ($\frac{1}{2}$ -inferior in *Asmusia*), sessile, 3-5-celled, (many-celled in *delinidia*); styles as many, free or connate, stigmas usually small; ovules 2-8 in each cell, rarely solitary, never orthotropous. *Fruit* baccate or capsular. *Seeds* few or numerous, placentas axile; albumen scanty or 0, rarely copious; embryo straight or hippocrepiform, cotyledons various. *Distrib.* Rare in temperate, abundant in tropical Asia and America, almost wanting in Africa and entirely in Australasia; species about 270.

Tribe I. TERNSTRAMIÆ. *Peduncles* 1-flowered. *Petals* imbricate. *Stamens* adherent to the base of the corolla; anthers basifixed. *Fruit* (in Indian genera) indehiscent. *Seeds* usually few; albumen fleshy, usually scanty. *Embryo* curved; cotyledons shorter than the radicle and about as broad.

* Fruit inferior.

1. *Anacardium*.

** Fruit superior.

Flowers hermaphrodite.

Anthers usually pilose, stamens and seeds numerous, ovary 3-5-celled.

2. *Alseodendron*.

Flowers dioecious.

Flowers large, on long pedicels ...

3. *Ternstroemia*.

Flowers small, sessile or sub-sessile ...

4. *Eurya*.

Tribe II. SAURAUJÆ. *Peduncles* many-flowered. *Petals* imbricate. *Anthers* versatile. *Fruit* usually pulpy, rarely sub-dehiscent. *Seeds* numerous, minute, albumen abundant. *Radicle* straight or slightly curved and longer than the cotyledons.

Climbers, dioecious ...

5. *Actinidia*.

Trees or shrubs, usually hermaphrodite ...

6. *Saurauja*.

Tribe III. GOSBORNIÆ. *Peduncles* 1-flowered, often very short. *Petals* imbricate. *Anthers* versatile. *Fruit* indehiscent or loculicidal. *Albumen* scanty or 0. *Cotyledons* various; radicle short, straight or curved.

* Fruit indehiscent.

7. *Pyrenaria*.

** Fruit dehiscent.

8. *Schinus*.

9. *Gosbornia*.

-OTIS

•

11 tUe provin

the

ttile ; i

I. A Mi.

glabrous trees or shrubs. 3!

b to ti iceous rowiii' tlio

mnate I ted on the torus; anthers
narrow, clon^af

apiculus anecti g 1 i^l
led; stylo oylindrio

sepals.
and flt

unsuki : species 2.

3, Hook, i] m. Ternst. 41, A bush
or

in ceo w.ng branches stout, the bari
le or oblanceoLa brupt blunt a
! at th* ■ves 6 the midrib prominent
in both ,

.l

Her than

njflk *Fruit* . T5 in.^ong
, rough ; stylo per

■iffitU ic.—Perak ; on QB (U
"i.

re, minutely an -tly
usly \

n of 0, i fē
: with ha:

Jack.

5, connate at tho **ba**
the inner smaller; anther cells la
„ hairy.

iiitii **or.ahortly 3-5-f:** ;-5-

short, coarsely pilose as are the narrow elongate apiculate anthers. Ovary 5-celled, depressed, ribbed, pubescent; style filiform, pilose; stigma small, conical. Fruit 5 to 75 in. in diam., baccate, dry, with coriaceous, pubescent, but ultimately glabrous, pericarp, 2-celled, many seeded. Seeds oval, flat, furrowed on both sides. Hook. fil. Fl. Br. Ind. I, 282. Mig. Fl. Ind. Bat. I, Pt. 2, p. 478. *Gordonia anomala*, Wall. Cat. 3664. *Ternstroemia? coriacea*, Wall. Cat. 1453. *Camellia axillaris*, Wall. Cat. 1453, p. 148 (not of Roxb. ex Bot. Reg. 349, see Journ. Linn. Soc. xiii, 339). *Polypora axillaris*, Choisy. Mem. Ternstr. 21 (not of Don).

In all the provinces, from 1000 feet to (in Perak) 4000 feet: common. Distrib. Sumatra.

In Journ. Linn. Soc. xiii, 330, there is a note by Mr. W. T. Thinsdon Dyer (who elaborated this family of Ternstroemiaceae in the Flora of Brit. India), on the plant issued by Wallich as *Ternstroemia coriacea*, and identified by him (in an appendix to his Catalogue,) with *Camellia axillaris*, Roxb. Mr. Dyer shows that, under the name *C. axillaris*, Roxb., a totally different plant (= *Gordonia anomala*, Spreng.) was figured in the Bot. Register (t. 349), and that Wallich's *T. coriacea* was neither Roxburgh's plant nor that figured in the Bot. Register, but really *A. andersonia*, Korth.

3. *ADIXANDRA MACULOSA*, T. Anders. Hook. fil. Fl. Br. Ind. I, 282. A tree 40 to 60 feet high; young branches dark-coloured, pubescent near the apex, not silky. Leaves coriaceous, elliptic to sub-rotund, shortly, bluntly and abruptly acuminate, entire, the base acute; upper surface smooth, shining; the lower pale brown, dull, opaque, minutely rugulose when dry; main nerves 8 to 10 pairs, spreading, very indistinct; midrib distinct; length 3.5 to 5.5 in., breadth 1.5 to 2.25 in.; petiole .25 to .4 in., glabrous. Flowers 75 in. in diam.; peduncles little longer than the petioles, pubescent; bracteoles sub-rotund, opposite, close to the calyx. Sepals unequal, the two inner smaller, round to broadly ovate, very fleshy, puberulous externally, the edges thin and glabrous as in the whole internal surface. Petals membranous, ovate, acute, glabrous, connivent. Stamens about 30; filaments attached to the petals, short, glabrous. Anthers narrow, the cells elongate, lateral; the connective coriaceous with short glabrous apicules. Ovary depressed-hemispheric, 5-ribbed, 5-celled. Style cylindric, glabrous; stigma small, conical. Fruit 5 in. in diam., globular, baccate, 4-celled, the leathery pericarp at first pubescent but finally glabrous; seeds numerous, black, shining, horse-shoe-shaped, small. *Ternstroemia integerrima*, Wall. Cat. 1452 in part.

Penang, Wallich, Curtis. Perak, Scottichini, Wray, King's Collector; at elevations of from 1800 to 4000 feet.

4. *ADIKINTUS INTERMEDIA*, T. Anders. Hook. Fl. Br. Ind. 1, 202. A small tree: young branches with dark-colored bark, the petioles fulvous-pubescent, the leaf-buds sericeous. Leaves sub-coriaceous, ovate to ovate-oblong, shortly acuminate, the base acute or rounded, the margin minutely glandular-dentate; upper surface glaucous, shining, greenish when dry; the lower pale brown, sparsely pubescent and with many minute black glands; main nerves 10 to 14 pairs, thin, interarching 2 in. from the margin, slightly prominent on both surfaces (when dry) as are the reticulations; length 3.5 to 5 in., breadth 1.4 to 2.25 in.; petiole 2 to 2.5 in., pubescent. Flowers 6 in. in diam.; peduncles not much longer than the petioles, strigose; bracteoles ovate, acute, appressed, close to the calyx. Sepals spreading, broadly ovate, acute; the two outer longer, very thick, the edges thin, serrulate-denticulate; externally adpressed-sericeous, internally smooth and shining. Petals smaller than the sepals, coherent by their bases, connivent, ovate, acute, membranous, glaucous except an adpressed sericeous patch on the back, among pubescence about 30, adnate to the base of the petals; filaments short, glabrous; anthers elongate, fusiform, the cells lateral; connective sericeous with a long glaucous apiculus. Ovary depressed-hemispheric, adpressed-sericeous, 3-celled, multi-ovulate; style cylindrical, expanded below, sericeous; stigma small, subcapitate. Fruit (Ad. Dyer) lanceate, adpressed-pubescent, 7 in. in diam. Seed small, shining. Type in Hook. Fl. Br. Ind. 1, 202. Pierre Fl. Forest Coch.-Chin., 1: 428, (excl. syn. *A. villosa*, Choisy). *Ternstroemia dipetala*, Choisy (excl. Korth.). *Ternstroemia intermedia*, Wall. Cat. 1492 (in part) and 2246. *Gordonia reticulata*, Wall. Cat. 2663 and 7070.

Penang; Wallak, Perak, Siam, Siam: at low elevations.

The specific name is unfortunate, as in all the specimens I have seen the leaves are as described above and not entire.

5. *ADIKINTUS VILLOSA*, Choisy Mem. Ternstr. 24. A pubescent tree, 40 to 50 feet high: young branches pilose, pale brown, leaf-buds sericeous. Leaves coriaceous, oblong-lanceolate, shortly acuminate, entire or faintly glandular-dentate; the base rounded, rarely acute; upper surface shining, glaucous except the pubescent midrib; under surface yellowish, sparsely pubescent; nerves 7 to 9 pairs, ascending, interarching from the margin, not prominent; midrib bold; reticulations rather distinct; length 4 to 5.5 in., breadth 1.5 to 1.75 in.; petiole 2 in., pilose. Flower 7.5 in. in diam., from 4 to nearly 1 in. long, pilose; bracteoles ovate, from the middle of the peduncle, imbricate. Sepals spreading, pale equal, rotund, fleshy, pilose externally, smooth internally. Petals ovate, blunt, membranous, adpressed-sericeous externally, the edges glaucous. Stamens about 30, attached to the base of the petals, connivent, the

persistent everywhere, the apiculus of the connective with a terminal tuft, filaments short. Ovary depressed-beneliphenic, 3-4-celled, somewhat as is the cylindric style; stigma small, conical. Fruit 75 in. in diam., imperfectly 3 to 4-celled, pericarp smooth. Seeds few, large, brown, horse-shoe-shaped, punctate, shining.

Perak; from 500 to 1500 feet, King's Collector, Scott's Hill. Damp Sumatra.

The Perak specimens agree perfectly with Teyemann's types collected in Sumatra.

S. AMARANTHINUS MURRAY, King. A medium sized tree; young branches stout, the bark white and polished. Leaves thickly membranous, oblanceolate, apex with a short blunt abrupt point, gradually narrowed in the lower half to the petiole, entire; midrib prominent; nerves 4 to 5 pairs, ascending, anastomosing 2 in. from the margin, invisible to the flesh, inconspicuous in the dry state; length 4 to 6 in., breadth 1.5 to 2.25 in.; petiole 9 to 75 in., stout. Flowers about 75 in. in diam., scattered below the apices of the branches; axillary and extra-axillary; polygamous; peduncles spreading, solitary, compressed, pale, 75 to 1 in. long; bractules just below the flower, small, ligulate. Sepals fleshy, 2-lobed, the 2 outer much smaller. Petals larger than the sepals, rotund, flattened, fleshy. Stamens numerous, slender from the base, prominent, the connective with a long unispinous filament short. Ovary 2-3-celled, 2-celled, narrowed above into the short cylindric style; stigma small, bifid, the lobes narrow acute spreading. Fruit unknown. *Tournefortia laevis*, Miq. Fl. Ind. Bat. Suppl. 477.

Perak; Curtis, No. 1612. Distrib. Bangha.

The stigma shows that this does not belong to the genus *Tournefortia* into which Miquel put it. It is evidently a new plant in Penang, as Curtis's specimen (which agrees perfectly with Miquel's type specimens from Bangha) is the only one which I have seen from that island.

3. *TEURNEFORTIA*, LAM.

Evergreen glabrous tree or shrub. Leaves entire or base serrate, entire or crenate-serrate. Peduncles axillary, solitary or sub-fascicled, recurved, 2-bracteolate, flowers usually numerous. Sepals 5, entire. Petals 5, imbricate, connate by their base. Stamens many, mostly adherent to the base of the corolla, anthers glabrous. Ovary 2 to 4-celled, style simple or almost. Stigma usually 2 to 3-lobed, or subdivided; lobes usually 2 in each cell, pendulous. Fruit indurated, indehiscent. Seeds rather large, the albumen copious & scanty. Distrib. Tropical Asia and America; species about 20.

bracteoles about 2 in. below the calyx, minute, fugacious. Sepals subequal, fleshy with thin edges, rotund. Petals much larger than the sepals, orbicular to reniform, blawed. Stamens in the male very numerous; anthers sub-sessile, the connective broad, bearing the 2 cells on its edges and produced above them into a broad short truncate process; rudimentary ovary flattish, without stigma. Female flowers like the males but with fewer stamens; ovary hemispheric, imperfectly 3-celled; stigma 2, sub-sessile, flat, foliaceous, each divided into 3 or 4 lobes with thick corrugated edges. Fruit a dry ovoid berry with coriaceous dark coloured epicarp, $\frac{7}{8}$ in. long, and 2 in. in diam., subtended by the leathery calyx. Sepals 2, large, broad, horse-shoe-shaped, bluish, $\frac{5}{8}$ in. long.

Perak, at low elevations; Scottichief, King's Collector.

A very distinct species with leaves curiously like those of *Ulex* or *Cassia*, and with smaller flowers than the other species.

3. *Tournefortia coccinea*, Seheff. Ois. Phyt. ii, p. 16, (not of Wall.). A tree 30 to 70 feet high: young branches light brown, smooth. Leaves coriaceous, usually oblong-oblancculate with an abrupt short blunt apiculus, sometimes oblong-lanceolate and acute; attenuate in the lower third to the stout petiole: midrib bold; main nerves 5 to 8 pairs spreading, anastomosing 2 in. from the entire margin, rather less prominent when dry: length 4 to 6 in., broadish $1\frac{1}{2}$ to $2\frac{1}{2}$ in., petiole $\frac{7}{8}$ to 1 in. Flowers 1-2 to 1-5 in. in diam., diurnal, solitary, axillary or from the axils of fallen leaves: peduncles flattened, deep brown, 1-2 to 2 in. long, slender; bracteoles alternate, minute, about 25 in. below the calyx. Sepals fleshy with thin edges, rotund, the 2 outer rather smaller than the inner 3. Petals larger than the sepals, much imbricately rotund, fleshy, not blawed. Stamens in the male numerous, from the base, the connective with a broad rounded apical appendage; quite absent in the female flower. Ovary globular, 3-celled; stigma 2, sub-sessile, each deeply divided into 6 to 8 sub-spathulate lobes. Fruit hirsute, globular-ovoid, $\frac{7}{8}$ in. in diam. and nearly 1 in. long, dry, with a coriaceous rind, subtended by the slightly enlarged hardened calyx and covered by the remains of the stigma. Seeds about 4, oblong, the testis rugulose.

Malacca; Griffith (Kew Distrib.) 183. Penang; Curtis, No. 1025. Perak; King's Collector. Distrib. Bangka.

Distinguished from the preceding by its anthers, by the venation of its leaves, and by its young branches. Tournefort's specimens from Bangka in no way differ from those from Perak, Malacca and Penang. Wallich's fragmentary specimens, (Cat. No. 7426,) probably fall here. The plant named by Wallich as *Tournefortia coccinea* (Cat. No. 1477) is, as

described by the late Dr. Anderson and Mr. Dyer. *Flora Ind. Soc.* vol. 11, 12, *Illustr. Accurata*, Kunth.

5. *Karya*, Thunb.

Stem. Leaves narrow, usually serrate-serrate. Flowers small, subsessile, sessile or shortly pedicelled, in axillary fascicles, rarely solitary, with persistent bracteoles. Sepals 5. Petals 5, united at the base. Stamens 15 or less, rarely 5; anthers glabrous. Ovary 3 (rarely 2)-celled; styles 3 (rarely 2-4); free or united, styles many in the upper angle of each cell. Fruit baccate. Allodes fleshy. Distrib. N. E. Asia, Indian Archipelago and Pacific Islands; described species more than 20, probably including 10.

1. *Karya accurata*, DC. *Mém. Ternat.* 29. A tree 20 to 40 feet high; young branches slender, pubescent to minutely punctate. Leaves thick, coriaceous, narrowly oblong-lanceolate or oblanceolate, acuminate, serrulate, the base acute; upper surface glabrous, shining; the lower pale, pubescent especially on the midrib, or sub-glabrous; length 2.5 to 3.5 in., breadth 5 to 7.5 in., petiole 1 in. or more. Flowers 2.5 in. in diam., in 2 to 6-flowered clusters; pedicels short, pubescent, bracteolate. Buds glabrous. Sepals unequal, the outer smaller, round with a thickened wrinkled patch near the base, pubescent externally. Petals longer and thinner than the sepals; oblong, blunt, curved, glabrous. Style 4-angled; stamens about 15, glabrous; filaments slender, anthers oblong, blunt; rudimentary ovary borne without styles, or absent. Petals fewer as in the male, but the sepals and petals smaller and shorter; stamens 0; ovary double-ovule, smooth, 3 or (by abortion) 2-celled, multi-ovulate; styles 3, united or free in the lower two-thirds, cylindrical, about as long as the ovary. Stigmas on the inner surface of the upper part of the styles. Fruit globose, 1.5 in. in diam., smooth, reticulated by the persistent calyx and crowned by the styles. Seeds small, egg-shaped, pitted, shining, brown. *Diagnos. serrata*, Ham. in Don *Prod. Fl. Nep.* 143.

In all the provinces at low elevations, common. Districts Kalyand, Hundya, Assam, Calcuttagong and Burmese Ranges, Malay Archipelago, Pin Islands.

In a plant with such a wide distribution, variations in form are only to be expected. Many of these have been treated as species which, in Sir J. H. B. H. *Flora of British India*, Mr. Thielson Dyer has reduced to varieties as follows:

Var. 1 *repens*, Kunth. *Verh. Nat. Gesch. Bot.* 113 (sp.).
Style distinct. Gill. *Id.* 24, 1, 3. *K. malayana*, DC. 1, 2, 20. *K. repens*, *Flora Fl. Jav. prod. vol. P. repensifolia*, Wall. *Cat.* 186.

E. acuminata, Boyle III. 127, t. 25. *E. salicifolia*, Blume Mus. Bot. II. 113. *E. chloraula*, Hook. f. and Thunb. Herb. Ind. Or. (not of Brown).

Var. 2. *Wallikiana*, Steud. in Blume Mus. Bot. II. 118 (ag.), styles united. *E. laevis*, Wall. Cat. 1402. *E. foveolata*, Harms in Wall. Cat. 1403. *E. acuminata*, Wall. Cat. 1404. *E. ligaria*, Wall. Cat. 3731 f. *E. quadrata*, Gardn. in Calif. Journ. Sci. Hist. vii. 144. *E. japonica*, *flavescens*, Thw. Enum. Pl. Cey. 41.

2. *Euta* Wray, King, n. sp. A small tree; young branches slender, purplish-brown, hairy pubescent towards the apex. Leaves drying greenish-yellow, thinly coriaceous, oblong-lanceolate, bluntly acuminate, minutely serrulate, the base cordate; upper surface glabrous, shining; lower paler, dull, sparsely pubescent; length 2 to 2.5 in., breadth 1 to 1.5 in., petiole 1 in. Flowers narrowly ovate, pointed, scarcely expanding, 1 in. in diam. and 2 in. long, axillary, solitary or in 2 to 5-angled umbels, quite glabrous; pedicels slender, glabrous, 1 to 1.5 in. long bi-bracteolate. Sepals unequal, erect, fleshy, ovate, acute, weak imbricate. Petals sub-equal, erect, membranous, ovate, acute, cordate in the lower third. Stamens 16, glabrous; anthers narrow, elongate, densely apiculate; filaments short. Ovary ovoid, gradually narrowing into the thick style, imperfectly 3-angled, sigmoid after. Fruit unknown.

Penak; at Tapa, Wray.

Distinguished by its narrowly ovate pointed flower-buds and flowers, and by the rounded base of its leaves.

4. *Acrostia*, Lindl.

Glabrous, strigose, or tomentose shrubs; usually climbers. Leaves entire or serrate, usually membranous, feather-veined. Flowers polygamous or dioecious, in axillary cymes, rarely solitary. Sepals 5, slightly imbricate, sub-ovate at the base. Petals 5, somewhat undulate-lanceolate. Stamens many; anthers dehiscing by slit. Ovary many-celled, the styles as numerous, divergent and elongated after flowering. Fruit baccate. Distrib. Himalaya, China and Japan; species about 8.

1. *Acrostia* Macraei, King, n. sp. Slender, scandent, 3 to 10 ft. long; young branches cylindrical, striate, glabrous, dark coloured. Leaves membranous, ovate-acuminate to sub-rotund, serrulate, minutely glandular-denticulate, the base rounded or slightly cordate; upper surface glabrous, rigid, the nerves and midrib minutely pubescent; lower surface pale brown when dry, minutely but densely tomentose; nerves about 5 pairs, the lower spreading; the upper sub-erect, parallel to each other and the midrib and transverse veins; length 2 to 3 in., breadth

2.5 to 3.5 in.; pedicels 1.25 to 1.5 in., slender. Cymes axillary, dichotomous, spreading, rusty-tomentose, on slender steriate peduncles 1.5 in. long which lengthen to 3 in. in fruit. Flowers numerous, dioecious, 5 in. in diam.; pedicels 3 to 4 in. long. Sepals thick, ovate, blunt, densely rusty-tomentose externally. Petals larger than the sepals, membranous, oblong-ovate, blunt. Stamens in males very numerous, glabrous; the anthers broadly oblong, blunt, deeply cordate at the base, filaments slender. Ovary in the males abortive or rudimentary, densely pilose, and with several rudimentary styles. Female flowers unknown. Fruit oval, 1.5 to 2 in. long, and .5 in. in diam., baccate, smooth, pulpy, subtended by the persistent calyx and crowned by the remains of 15 to 20 filiform styles. Seeds numerous, shining, brown, less than 1 in. long, oval, sub-compressed, pitted and with several longitudinal grooves. *Kadura pubescens*, Miq. Fl. Ind. Bat. Suppl. 620.

Perak; on trees, at elevations of 3500 to 4000 feet, King's Collector, Nos. 5437 and 8762. Distrib. Eastern Sumatra.

I have*carefully examined a type specimen of Miquel's *Kadura pubescens* from Sumatra named by the author's own hand, and there is no *doubt* whatever that it is an *Actinidia* and not a *Kadura*; nor is there any that it is identical with the above quoted numbers of the Calcutta collection or from Perak. Miquel is quite wrong in describing his plant as having 3 sepals and 5 petals; there being 5 in each a ~~5~~.

6. RACIUM, Willd.

Trees or shrubs. Branches usually brown with whitish tubercular dots, both branches and leaves more or less strigose-pilose or scaly when young. Lenticles approximate at the ends of the branches, usually serrate, with parallel veins diverging from the midrib. Inflorescence lateral, often from the axils of fallen leaves, cymose, subpaniculate, rarely few-flowered. Bracts usually small, remote from the calyx. Flowers usually hemispherical. Sepals 5, strongly imbricate. Petals 5, usually connate at the base. Stamens many; anthers dehiscing by pores. Ovary 3-5-celled; styles as many, distinct or connate, rarely dry and sub-dehiscant. Distrib. Tropical and sub-tropical Asia and America. Species about 60.

1. *SHRUBA RACIUM*, DC. Méém. Ternate 51, t. 7. A shrub or tree 5 to 7 feet high; young branches with grey, finely striate bark, deciduously scurfy and striate towards the apices. Lenticles membranous, oblong-oval, abruptly and shortly acuminate, minutely and remotely serrulate or sub-serrate, the base acute; both surfaces glabrous, except the midrib and main nerves which have a few scale-like hairs, the lower pale brown when dry; nerves 10 to 12 pairs, strongly-petent, rather prominent be-

bearing many, sub-globular seeds, and in its often bearing 6 styles. There may be two species covered by the foregoing descriptions, but I cannot find a constant character to separate them. I believe this to be Blume's *S. Fove-Mina* and Dr. Oakes's *S. conferta*; but, not having been able to consult any authentic specimens of the former and only moderately good ones of the latter, I am not quite satisfied of the identity with these of this common Peak tree. The genus *Saurauia* is a very puzzling one. The species come very close together, and Miq.'s descriptions of the *Andaman* species which he named are so incomplete that it is almost impossible to recognize them with any certainty.

1. *Saurauia ciliatoloba*, HB. *Rijds. 12a*, var. *calycosa*, King. A tree; young branches and petioles densely covered with long pale-brown yellowish hairs. Leaves elliptic-oblong, shortly and sharply acuminate, the edges faintly serrate-serrate, the base acute; upper surface glabrous; lower pale brown when dry, strigose on the midrib nerves and veins, main nerves 12 to 14 pairs, spreading, prominent beneath; length 4 to 5 in., breadth 2.25 to 2.75 in., petiole about 1 in. Flowers 1/4 in. in diam., on long pedicels, crowded in large fascicles from flat tubercles on the larger branches and stem; pedicels from 75 to 1 1/2 in. long, tomentose-squamulose, rufous. Sepals rotund, the outer densely tomentose-squamulose, the inner almost glabrous, veined. Petals oblong-obovate, united in their lower third, membranous, beveled, scarcely so large as the sepals. Stamens about 25, adherent to the corolla, elongate-ovate, obtuse, dehiscing by two large apical pores. Ovary axile, 3-celled, multiovular. Style 2, united by their bases only. Fruit enveloped by the slightly scarious calyx, sub-glabrous, 3-celled. Seeds small, orbiculate, compressed, lenticulate, pale brown. DC. *Mém. Soc. Genève* 1, 125; Kerl. Verh. Nat. Gesch. Bot. 125; Baerb. *Pl. Jav. Ind.* 273; HB. *Pl. Ind. Bat.* 1, Pl. II, p. 486. *Ann. Mus. Indig. Bat.* IV, 106.

Peak: Rajahmundry. Schlegel, No. 1614.

This differs in no respect from the plant described by Blume, of which I have seen good specimens, except in its larger sepals which are densely tomentose-squamulose externally.

7. *Praxanthia*, Blume.

Shrub or tree. Leaves serrate, large and submembranous. Flowers white, tubular, tubular, erect or nodding. Sepals usually 5, unequal, graduating from the bracts to the petals. Petals connate at the base. Stamens very numerous, mostly connate, adnate to the base of the petals. Ovary 3-celled, style 3, free, or partially united; ovules 2 in each cell, attached laterally. Fruit dehiscent, indehiscent. Seeds oblong, erect, with a thick woody testa, wingless; albumen 0; cotyledons large, trans-

pled or conduplicate; calicle inferior, inflated. Distrib. Malay Peninsula and Indian Archipelago. Species about 7.

1. *PIRENEA ACUMINATA*, Planch. ex Choisy Mém. Ternst. 84. A shrubby tree, 15 to 30 feet high: young branches densely tomentose or pubescent-tomentose. Leaves elongate-oblongate, sometimes oblong-elliptic, acuminate, minutely serrulate, the base attenuate; upper surface glabrous, shining, the midrib and nerves pubescent, greenish when dry; the lower softly pubescent, minutely papillose; the midrib stout, sometimes main nerves about 10 pairs, sometimes forking and always interarching about 25 in. from the margin; length 6 to 12 in., breadth 2 to 3½ in.; petiole ¼ in., tomentose. Flowers 1½ in. in diam., shortly pedicellate, solitary; crowded towards the ends of the branches in the axils of leaves or of abortive leaves; pedicels recurved, tomentose; bracteoles imbricate, close to the calyx, tomentose externally as are sepals and petals. Sepals and petals graduated in size from the bracts inwards, broadly ovate, acuminate, glabrous and brownish internally; anthers ovate, sessile, only about one-fourth the length of the slender filaments. Ovary ovoid, sericeous; styles united in the lower half, few above; stigmas small. Fruit depressed-globose, 1½ in. in diam., and 1 in. long; the pericarp sericeous, becoming glabrous, hairy, subsucculent. Seeds few, large, sub-triangular, compound. Mss. Fl. Ind. Bat. I, Pt. II, p. 491; Dyer in Hook. Fl. Pl. Ind. 3, 200. *Tournefortia* f. *malayensis*, Wall. Cat. 3663. *Goodenia* (*Goodenia*?) *perakensis*, Wall. Cat. 3664.

Singapore, Malacca, Penang and Perak; at low elevations.

2. *PIRENEA KESTLEII*, King, n. sp. A tree 15 to 20 feet high, all parts glabrous except the very apex of the branchlets, the youngest leaf-buds, and the flowers. Leaves elliptic-oblong to oblong-oblongate, acuminate, faintly serrate in the upper three-fourths; the base obtuse, acute; both surfaces, but especially the lower, much pustulate when dry; the lower brown, the upper greenish; midrib and 6 to 8 pairs of erecto-patent main nerves rather prominent below, the latter interarching 3 to 4 in. from the edge; secondary nerves prominent; length 5½ to 7 in., breadth 1½ to 2½ in., petiole 3 to 4 in. Flowers 7½ in. in diam., corolla-tube 1 in. long; bracteoles 2, opposite, broad, close to the calyx. Sepals round, coriaceous, pubescent externally. Petals 1½ in. long, sepals, inward, glabrous, fleshy with thin edges, white. Stamens numerous; anthers broadly ovate, sessile, 4 or 5 lines in length on the slightly flattened filaments. Ovary ovoid-ovate, ridged, stippled and pubescent, 5-celled. Style short, conic, glabrous, terdigid. Stigmae ovate, sessile, connate. Fruit 1½ in. long, and 9 in. in diam., oval, slightly bridged, pubescent. Seeds few, small, sub-succulent, thin-fleshed.

Perak; at elevations of 100 to 2000 feet. King's Collection.

3. *PHENACIA* W. & A. King, n. sp. A bush; the young branches pale, minutely adpressed-pubescent towards the apices as are the leaf-backs. Leaves thinly coriaceous, oblong-oblancoolate, shortly acuminate, obscurely crenate-serrate to sub-entire; the base attenuate, entire; both surfaces glabrous, the lower yellowish-green, pubescent when dry, the upper greenish; midrib prominent especially beneath; main nerves 10 to 12 pairs, interarching 25 in. from the margin, rather prominent beneath; length 6 to 8 in., breadth 1.75 to 2.25 in.; petiole 3 or 4 in., stout. Flowers 5 in. in diam., buds globose; peduncle very short, glabrous; bracteoles 3, broadly ovate, connate just below the calyx. Sepals 5, increasing in size inwards, rotund, minutely pubescent externally. Petals 5, rotund, concave, thinner than the sepals, pubescent externally with broad glabrous edges. Stamens numerous; anthers broadly ovate, about one-fourth as long as the filaments. Ovary shortly ovate-conic, with many lines of white hair, 5 or 6-celled. Styles 3, united for half their length, stigmas vertically flattened. Ovules 2 in each cell. Fruit sub-globose, bluntly 5-ridged, deciduously pubescent, 1 in. in diam. Seed oval, sub-compressed, smooth, 5 in. long, the hilum very large.

Perak; at low elevations, Wray, Seputehini.

Closely allied to *P. Kusatheri*; but the leaves have many more nerves, the flowers are 5-merous with only 3 styles, and the fruit is more globular than in that species.

8. *SCINNA*, Reinw.

Trees with evergreen leaves. Peduncles usually erect, axillary or solitary, or the uppermost shortly exserted. Flowers handsome, 2-limbed. Sepals 5, subequal, united below. Petals 5, much larger, connate at the base, the outermost concave and sub-cuspidate. Stamens many, adnate to the base of the petals. Ovary 5 (rarely 4-6) celled; styles united, or partially free at the apex with broad spreading stigmas; ovules 2-6 in each cell, attached laterally, sub-pendulous. Capsule woody, depressed-globose, hemispherical, with a persistent axis. Seed flat, kidney-shaped, dorsally ridged, hilum central, albumen woody; cotyledons foliaceous, flat or crumpled, acumbent; radicle inferior, curved upwards. Distrib. Tropical Asia. Species about 3.

SCINNA *BOHARAN*, Reinw. in Ill. Rumph. 120. A tree 50 to 80 feet high; young branches with pale brown bark, deciduously pubescent, hirticillate. Leaves sub-coriaceous, narrowly elliptic to elliptic-lanceolate, acuminate, faintly crenate-serrate, often sub-entire, the base narrowed or rounded; both surfaces glabrous, the lower pale, dull; main nerves 9 or 10 pairs, spreading, slender, rather distinct below when dry, the minute nerves obsolete; length 4.5 to 6 in., breadth 1.4 to 2.5 in., petiole

55 to 125 in., flat, more or less winged. Flowers 1.25 to 2.5 in. in diam., axillary, crowded at the apices of the branches and forming lax terminal pseudo-corymbes; peduncles 1 to 1.5 in. long, slender, thickened towards the apex, glabrous or pubescent, bracteoles minute. Sepals rounded, or sub-acute, glabrous or glabrescent, the margins minutely ciliate, about 1.5 in. long. Petals thin, veined, obovate, clawed, their bases pubescent and their edges ciliate in the lower half, white or pale pink. Stamens 5-dalpheous; anthers sub-rotund, small, the filaments 4 or 5 times as long. Ovary depressed-hemispherical, pubescent, 5-celled. Style thick; stigma discoid, with 5 lobes. Fruit 75 in. in diam., adpressed-pubescent when young, glabrous or sub-glabrous when old; upper part of exocarpsia expanded, 5-angled. Korth. Verh. Nat. Gesch. Bot. 143, t. 2, figs. 21 to 27. Choisy Map. Ternat. 24; Map. Fl. Ind. Bat. 1, Pl. i, p. 402 v. Ann. Mus. Lapid. Bot. IV, 112; Kuhn For. Fl. Burma. i, 107. *S. crassa*, Korth. l. c. t. 20, figs. 1 to 20; Map. Flora l. c. 491; Ann. l. c. 112; Kuhn l. c. 107; Hook. fil. Fl. Be. Ind. t. 429. *Pinnis* Fl. Pinnis Ceylon. l. 121. *Groffoid* *Jackwoodii* Wail. Cat. 1456; Griff. Nov. 17, 1833. *G. obliata*, Hook. Fl. Ind. fil. 572.

In all the provinces except the Andaman and Nicobar. Districts, The Malayan Archipelago, Borneo, at elevations of 1000 to 2000 feet.

This rather widely distributed species varies considerably in the size, in spite, however, of this, Korthol. varied out of it his species *S. crassa*, which he states to have the same calyx, corolla, stamens, ovary, style and stigma as Reinwardt's *Nesothoe*, but to differ in the leaves and capsule. His own descriptions and figures of leaves and capsule, however, of both species are practically identical. The only other really distinct species of the genus appear to me to be *S. Khasiana*, Dyer, *S. laevis*, Miq. and perhaps *S. Wallachi*, Clancy.

3. *GARDUJA*, Ellis.

Trees with evergreen entire or serrate leaves. Flowers axillary large, often subsessile, solitary in the axils of the leaves or collected at the ends of the branches, 2-4 bracteolate. Sepals usually 5, unequal, graduating from the bracts to the petals. Petals free or united at the base, imbricate, the inner larger. Stamens 5-dalpheous, 5-angulate, adnate to the petals; anthers versatile. Ovary 5-angulate, style single; the stigma flat, rotund, rather thick, sometimes deeply oval or pedicellate, 4 to 5 in each cell. Capsule obovoid, woody, 5-angled, with a persistent column. Seed flat or compressed, the apex often winged, albumen none; embryo usually straight, the cotyledons linear, flat or plicate. Districts, Tropics, Asia, N. America. Specimens about 15.

Perak, at elevations of 3000 to 4000 feet, King's Collection.

3. *Gustonia Marsdeni*, Dyer in Hook. fil. Fl. Br. Ind. I, 791. A tree 30 to 40 feet high; young branches slender, with glabrous pale roughish bark, pubescent towards the apices. Leaves coriaceous, broadly oblanceolate, shortly and bluntly acuminate, obscurely serrulate in the upper two-thirds, the lower third gradually attenuate, entire; both surfaces glabrous, the upper greenish, the lower brownish when dry, the midrib bold and sparsely pubescent beneath; lateral nerves 6 pairs, indistinct; length 2.5 to 3 in., breadth 1 to 1.4 in., petiole .25 in. Flowers subsessile, .8 to 1 in. in diam., buds sub-globular; bracts, sepals and petals forming a cone, all adpressed-sericeous externally except the glabrous edges; pedicels about .15 in. long. Sepals and petals orbicular, blunt or reflex. Stamens numerous; anthers elongate-ovate; filaments much longer, slender. Ovary oval-cone, vertically ridged, adpressed-sericeous, 4 or 5-celled. Style single, angled. Stigmas 4 or 5, acute, convergent. Capsules 4 to 5-angled, woody, 1 to 1.25 in. long, 5 to 6 in diam., 4 or 5-celled, backs of valves flat. Seeds 2 in. long of which three-fourths are wing.

Malacca; Malacca, No. 192. Perak, Seribekini, Wey; at about 1000 feet.

4. *Gustonia Scortechini*, King, n. sp. A tree; young branches slender, dark brown, glabrous, the apices and leaf-buds minutely pubescent. Leaves coriaceous, narrowly elliptic, blunt, or sub-emarginate, slightly narrowed to the sub-acute or rounded base; both surfaces glabrous, the lower dull, pale; the upper shining, green when dry; midrib bold; nerves about 8 pairs, faint on the upper, invisible on the lower surface; length 2 to 3 in., breadth .8 to 1.4 in., petiole .25 in. Flowers .6 in. in diam., solitary, axillary, only towards the apices of the branches, on very short curved pubescent peduncles. Buds oval. Sepals orbicular, fleshy, unequal, pubescent externally. Petals twice as large as the sepals, membranous, pubescent externally. Stamens few, (only about 30); anthers broadly ovate, about a fourth as long as the flattened filaments. Ovary narrowly oval, pubescent, 3-celled. Styles 2, thick, shorter than the ovary, pubescent; stigmas on the inner surface only, slightly spreading. Fruit unknown.

Perak; Seribekini, No. 362b.

This has a superficial resemblance to *G. Mangrovei*, to which the late Father Scortechini referred it. But it has smaller flowers with fewer stamens, and very different ovary and styles; the leaves moreover are thicker than those of *G. Mangrovei*, and are not oblanceolate.

5. *Gustonia uracanthi*, King, n. sp. A tree? Young branches rather stout, glabrous, dark purplish-brown when dry. Leaves cori-

1. *GORDONIA KIEBLEA*, Bl. Bijdr. 130. A tree 30 to 40 feet high: young branches slender, smooth, pale brown, pubescent towards the apex. Leaves thinly coriaceous, glabrous, elliptic-lanceolate, acuminate, the edge slightly recurved, sub-serrulate, base acute; midrib bold, puberulous near the base beneath: main nerves 5 to 7 pairs, indistinct, bifurcating 3 in. from the edge and forming wide intra-marginal areolae; length 2.5 to 5 in., breadth 1 to 1.5 in.; petiole 3 in., slender. Flowers 1.5 in. in diam., subsessile, solitary, in the upper axils only: pedicel about 1 in.; bracteoles lanceolate, small, ligulate. Sepals spreading, free, orbicular, pubescent externally, fleshy. Petals white, much larger than the sepals, orbicular, minutely pubescent externally, fleshy with broad membranous glabrous margins. Anthers ovoid, only a quarter of the length of the flattened filaments. Ovary hemispheric-conic, vertically ridged, densely sericeous, 5-celled. Styles single, slender, 5-angled; stigma small, with 5 blunt radiating lobes. Capsule 1.5 in. long, .75 in. in diam., deciduously adpressed-pubescent. Seeds 1 in. or more long, three-fourths being wing. Dyer in Hook. fil. Fl. Br. Ind. i, 291. Miq. Fl. Ind. Bat. I, Pt. II, p. 482. *G. singaperiana*, Wall. Cat. 1457 (in part). *Anthecrinchium aculea*, Korth. Verh. Nat. Gesch. Bot. 138, t. 27. *Dipterocarpus*, sp. Griff. Notul. iv, 564.

Malacca. Penang; Curtis No. 834, King's Collector. Perak; King's Collector, Wray; at elevations of 1200 to 2500 feet. Distrib. Outer ranges of Eastern Himalaya.

Allied to *G. Maingoyi*, but with much larger flowers and fruit and differently shaped leaves.

2. *GORDONIA ORAWATIS*, King, n. sp. A tree 80 to 120 feet high; all parts except the flowers glabrous; young branches as thick as a goose-quill, dark purplish-brown when dry. Leaves coriaceous, oblong-oblancculate, shortly acuminate, faintly serrate-crenate in the upper two-thirds, entire in the lower third and prolonged along the petiole; upper surface greenish when dry, shining; the lower dull, brown; nerves 10 to 12 pairs, indistinct, interarching 15 in. from the margin; length 4.5 to 6 in., breadth 1.1 to 1.5 in., petiole proper 15 in. Flowers 1.5 to 2 in. in diam., solitary, axillary, about 3 in. long, puberulous; buds globose; bracteoles few, small, ligulate. Sepals and petals greenish, rotund, minutely adpressed-sericeous externally, coriaceous, the edges thin and glabrous; the petals much the larger, spreading. Stamens very numerous; anthers narrowly oblong, about a fifth of the length of the slender slightly flattened filaments. Ovary narrowly ovoid, vertically ridged, minutely adpressed-sericeous. Style longer than the ovary, vertically ridged and sericeous like the ovary. Stigma with 5 small roundish lobes. Fruit unknown.

leaves, oval-oblong, sometimes slightly oblanceolate, the apex obtuse, very slightly emarginate, the edges thickened and slightly recurved, quite entire or very faintly sub-serrulate; the base slightly narrowed, roundish; both surfaces shining, the upper greenish, the lower dull, tinged with brown when dry, midrib bold; nerves about 12 pairs, thick but inconspicuous; length 1.75 to 2.25 in., breadth .9 to 1.1 in.; petiole .15 in., thick. Flowers about 1 in. in diam., axillary, solitary, sub-axile, only in the upper axils; the buds elongate-obovoid; the bracts numerous, closely imbricate, passing into the sepals, all orbicular, and pubescent externally with broad scarious glabrous ridges. Petals much larger than the sepals, orbicular, deeply and minutely pubescent externally, fleshy with thin glabrous edges. Stamens numerous; anthers ovate, about one-fourth of the length of the slender cylindrical filaments. Ovary oval-conic, ridged, adpressed-pubescent, 5-celled. Style single, boldly 5-angled, somewhat distinct, small. Fruit slightly under 1 in. long, .4 in. in diam., 5-angled, adpressed-pubescent, subtended by the elongate imbricate cup formed by the sepals and bracts. Seed .75 in. in length, of which one half is wing.

Perak, Scortechini, No. 402b.

Father Scortechini's scanty specimens are accompanied by no notes; but, from the species of *Hymenophyllum* growing on the branches of some of them, I conclude that they were collected probably at elevations of 4000 or 5000 feet. The remarkable imbricate buds at once distinguish this species.

6. *Gegonia scortechinii*, King, n. sp. A tree 40 to 60 feet high; young branches smooth, greenish, sub-compressed, all parts glabrous except the flowers. Leaves thinly coriaceous, obovate, apex rounded or emarginate, faintly crenate-serrate or subentire, attenuate below the middle and passing into the short petiole; upper surface greenish when dry, the lower brown, midrib bold; main nerves 12 to 18 pairs, spreading, rather faint, interveining 2 ls. from the edge, length 5.5 to 8 in., breadth 2.5 to 3.25 in.; petiole 2 to 2.5 in., stout. Flowers 1.25 in. in diam., on stout curved peduncles .5 to .6 in. long; bracts small, few, fugacious. Sepals rotund, fleshy, spreading, adpressed-sericeous externally, the edges glabrous. Petals like the sepals but larger and thinner, spreading. Anthers short, broadly ovate, only a quarter of the length of the slender slightly flattened filaments. Ovary oval-conic, adpressed-sericeous, 5-celled. Style single, thick, sub-glabrous. Stigma discoid, with 5 blunt lobes. Fruit unknown.

Perak, Scortechini, No. 1198.

The style and stigma are quite those of a *Gardnia*. The leaves, however, are more those of a *Pyrenaria* and are very like those of the *Banana* *E. albertina*, Bern.

10. ANCHYRA, Martius.

Glabrous shrubs or trees with semiamplexicaul leaves. Flowers on a lateral, compressed, 1 to 4-flowered, peduncle. Bracts large, leaf-like. Sepals and petals nine 5. Stamens numerous, 5-adelphous; anthers versatile. Ovary 3-celled; styles distinct, or wholly united; ovules numerous, in many imbricating rows. Capsule acuminate, length 1/2 to 1 in. below, with a persistent axis. Seeds linear-oblong, bent, albumen scanty. Plateau, Trop. Amer. and Indian Archipelago. Species 3.

1. *ANCHYRA VAMBI*, Choisy Mem. Tournef. 73. A glabrous shrub (sometimes epiphytic) or small tree the young branches, pale smooth. Leaves thinly coriaceous, sessile, narrowly oblanceolate, entire, slightly narrowed to the truncate or slightly amplexicaul base; nerves about 15 pairs, straight, erect, interveining with an intra-marginal nerve; length 2 to 4.5 in., breadth 5 to 7.5 in. Flowers 1 to 1.75 in. in diam.; peduncles crowded towards the end of the branches, coloured; bracts close to the flowers, oblong, sub-serrulate, 5 to 7.5 in. long. Sepals ovate-retund, coriaceous. Petals obcordate, much larger than the sepals, membranous, seined, pink. Fruit 7.5 in. long, narrow, is ovoid, acuminate, crowned by the persistent style. Hook. Fl. Bor. Ind. I. 294. Pierre Fl. For. Coch. Chine, t. 129. *Planchon oblonga*, Kerth. Verh. Nat. Gesell. Bot. 185, s. 23. Miq. Fl. Ind. Bat. I. Pl. 3, 491. *Hippocris oblongifolia*, Vahl. Synth. II. s. 42; DC. Prodr. I. 445; Wall. Cat. 496.

In all the provinces except the Andaman and Nicobar Islands. Distrib. The Malayan Archipelago.

** Note on the fruit of *Xanthophyllum Sumbalense*, King.

Since the pages describing the genus *Xanthophyllum* were printed off, I have received from Mr. Carris, of the Forest Department, Penang, complete specimens of this species; and I am therefore now able to add to the account of it given on p. 160 the following description of the young fruit.

Fruit globular or ovoid-globular, 7.5 to 1 in. in diam., shortly stipitate, smooth, shining; the pericarp very thick.

Ripe fruit is still a desideratum.

IX.—Description of a new Genus of Bamboo.—By J. S. Gamble, M. D.

(Received January 25th;—read February 1st, 1890.)

(With Plate VII.)

MICROCALANES, nov. genus.

Spikes many-flowered, spicately arranged in a leafy panicle, sheaths jointed under the flowers. Flowers many hermaphrodite, the uppermost male or empty; empty glumes 2, pubescent, smooth. Flowering glume bilobed, many-nerved. Palea 2-beaked, falcate, beak ciliate. Lodicules 3. Stamens 6, filaments free. Fruit with a fleshy pericarp, adhering to the seed; style shortly 3-lobed, stigmas plumose. A climbing wiry grass with leaf branches in whorls. Leaves short, articulate with their sheaths, without transverse veinlets. Flower spikes on leafy branches; spikelets distant as are the flowers.

M. Prostrata, nov. spec. A small wiry climbing bamboo. Stems thin, smooth, green, one quarter inch in diameter, nearly solid and reaching 20 feet in length, swollen at the nodes into a well-marked ring; internodes 5 to 9 inches long. Stem sheaths thin, somewhat scabrous, 4 to 4½ inches long, gradually tapering to a point and crowned with a short (1 to 2 inch) needle-like apical leaf. Leaf branches short, numerous, in close whorls on the stem and branchlets. Leaves small, 2 to 3 inches long by 3 to 4 inches broad, much acuminate with a hair-like tip, the point as well as one edge of the leaf scabrous; main veins 2 to 4 pairs, transverse veinlets none; petiole short, distinct; leaf-sheaths smooth, striate, ending in a curved apex under the petiole; ligule blunt. Spikelets in terminal and axillary leafy panicles; peduncles very thin, wiry. Spikelets in the axils of a sheath-like bract, 1 to 1½ inches long. Glumes 5 to 6, spicately in alternate excavations of a thin glabrous sheath; terminal ones empty or male. Empty glumes two, glabrous, scale, the upper often long acuminate, 5-nerved; the lower 3-nerved. Flowering glume triangular-falcate, acute, glabrous, 5-11 nerved, ciliate-mucronate. Palea 2-beaked, ciliate on the beak, 7 to 9 nerved, falcate. Lodicules 6, straight, with a blunt tip, filaments distinct. Ovary with fleshy walls; style bulbous, papillous at the base; stigmas 3, plumose. Lodicules 3; two obovate, slightly striate at tip, the third acute and 3-toothed, all 3-nerved.

Found by Dr. Peain, in April 1890 on the edge of a precipice on Palmetades, 7,870 feet, Naga Hills, Assam, and by Mr. Hall on the

Jaman road about 5½ miles from Jorai, Jaintia Hills, 3,500 feet in April 1909. The Khasi name "Dangai."

EXPLANATION OF PLATE VII.

Microcalamus Prainii, Glanville

Fig. 1. Spine.

Fig. 2. Semi-branch.

X.—*Novius Indicus*. II. An additional species of *Ellipanthus*.

By D. PRAIN.

(Received and read May 23, 1909.)

(With Plate VIII.)

The Commaracum genus *Ellipanthus* Hook. f., contained in L. f. (*Genera Plantarum* i, 434), included two Indian species when the account of it in the *Flora of British India* (vol. iii, pp. 53, 55) was published in 1876. Specimens of a sixth species occur in a collection made in Diamond Island by the writer in 1905. Diamond Island is situated off the south coast of Arakan at the mouth of the Haveli river. The genus is rather Malayan than Indian, though one of the species is confined to Ceylon and one occurs in Pegu; the present is the first specimen on which the genus has been reported from Arakan.

In order to admit the Diamond Island plant the generic description requires very slight modification; unlike the other Indian species this has a glaucous capsule marked externally by a net-work of ridges while its short staminal tube is devoid of hairs. We are thus able, by employing these characters as divisional, to add the species to the *Flora of British India* without altering the excellent arrangement of the Indian species there adopted. Only one word requires to be inserted into the text as it now stands. The following synopsis of Indian *Ellipanthus* in which the new species is included, exhibits all the alterations necessary. A diagnosis and a description of the species are appended.

ELLIPANTHUS Hook. f.

[Generic description (*P. B. I.*, i, 53) line 6; delete "velvety".]

† Capsule velvety, surface even; staminal tube hirsute within.

* Leaves glaucous beneath or scurfy on. (*P. B. I.*)

1. *E. TENARITAN* Hook. f.—Ceylon.

2. *E. HILLIANI* Hook. f.—Tenasserim or Andaman Islands.

Fig. 3. Sepal, from inside.

Fig. 4. Staminal tube laid open.

Fig. 5. Capsule in section, showing seed in situ.

Fig. 6. Arilhus.

Fig. 7. Seed.

Fig. 8. Seed, in section, showing embryo in situ.

Fig. 9. Single ovule from inside and also edge view.

Figs. 2, 4 and 8 are enlarged, the others are of natural size. The petals and anthers of the species are at present unknown.

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Part II.—NATURAL SCIENCE.

No. III.—1890.

XL.—Description de Curculionides et de Brentidies inédits faisant partie
des collections de M. de Meule I. de la Calcutta, par M. T. DESMOULANS
DES L. de la Calcutta. Communicated by the SUPERINTENDENT OF THE INDIAN
MUSEUM.

[Received July 24th.—Read 6th August 1890.]

(1re partie.)

I. CURCULIONIDÆ.

1. *HEMITELEPHES VITIGRANULATA*. Long. ♂, 9 mill.; ♀, 12 mill.;
lat. ♂, 3.5 mill.; ♀, 5 mill. Ollong-oval, ciliis-squamis, elatere
scabrum. Caput breve, post oculos transversum subimpressum; oculi
parvi, prominuli. Rostrum sublaevigatum, strigulosum, inter antennis
funiculares. Antennae piceae, piceae, articulo 2o funiculi 3o longior,
intersequebuntur. Prothorax a latere medio rotundatus, basi emarginatus,
dorsum sublaevigatum; aliter sublaevigatus, basi breviter emarginatus, postice abrupte
graves 2-actuale-striatus, latitudinaliter sublaevigatus, ad hanc partem fovea
transversa oblonga fuliginosa prodita. Tibia antica, intra serrata.

Ovale-oblong, brun, recouvert d'une épaisse couche de cendre,
noir. Tête transversale, faiblement impressionnée transversalement
derrière les yeux, à trois suture longitudinales sur le front, confluentes
sur la nuque; yeux médiocrement convexes. Rostre en arc un peu plus
long que large, bidentaire entre les antennes. Antennes assez courtes, égales

3. *REYCHERTS FLAVICORNIS*. Long. 33 mill.; larg. 15 mill.
Ollivier, *opra. vicat-curculionidellus*, parce pubescens, infra nigro-
viridescens. Rostrum, maxillæ pedunculæ totæ luteo-pallide. Caput sub-
globosum, cili punctulatum, oculi magni. Antennæ 3-
articulæ de intermediis brevioribus. Rostrum apicis breviter apicem
curvum ampliatum, maxilla punctulatum. Prothorax subtransversum sub-
triangulatum. Elytra elongata, infra punctulata impressa regulariter striata.
Tibia à pariete curvata.

Corps, vert métallique en dessus, noir bleuâtre ou verdâtre en
dessous; par conséquent pubescent de gris; rouille, saignée et passée
suffisamment d'un blanc pâle. Tête brillante, rétrécie en arrière, arron-
diée transversalement à la base qui est arrondie, légèrement ap-
platie derrière les yeux qui sont grands et saillants. Rostrum plus court
que la tête, élargi en avant, marqué d'impressions au devant des anten-
nes, avec quelques points épars. Antennes insérées vers le milieu du
rostrum, pubescentes, à 2 anneaux intermédiaires pour la longueur aux
articles 1 et 3, tous allongés. Prothorax subtransversal, rétréci en
avant, à côtés presque parallèles en arrière, à angles postérieurs presque
droites; éparsément punctué, marqué d'une faible impression basale.
Ecuillon subtriangulaire, noir. Elytres du double plus longues que
larges, subparallelèles dans leurs trois quarts antérieurs, faiblement
divergentes après la base à stries régulières, formées de points rappro-
chés; intervalles subobtusés, au bout à la base, à points peu rappro-
chés. Pattes à poils dressés; tibia antérieure droite, les autres arquées.
Dessous faiblement punctué.

Indes Angliques. Musée Indien de Calcutta, collection de l'auteur.

4. *ANDREA FLAVICORNIS*. Long. 8 mill. (sans rostre); lat. 4.5 mill.
Subglobosus, pubes. Prothorax postérieur nigra, elytra cyanea, reticula
punctulata. Caput subglobosum, elongatum, basi angustius restrictum,
fere unguiculatum, fronte foveolata, nullo interoculari foveolato. Rostrum
breve, basi dilatatum, apice piceo. Antennæ breves, articulo 2 fere mediis inter-
mediis brevioribus. Prothorax curvatus, basi angustatus, ante humerum latius
apice angustius restrictus, vix plicatus. Scutellum vix inter-
medium. Elytra subquadrata, humeris distinctis, infra punctulata impressa
regulariter punctulata striata, intervallo 2 et 4 humeris distinctis. Tibia sub-
recta, vix curvata apice gradata.

De forme presque carrée, glabre, prothorax et poitrine noirs, élytres
d'un bien foncé, tout le reste d'un blanc pâle. Tête très bombée, faibles-
sant rétrécie derrière les yeux en s'arrondissant, à cul assez court,
marqué d'une foveole entre les yeux, d'une impression oblique entre
eux-ci et d'une faible ligne longitudinale en arrière; saillie sur anten-
naire à l'apex, son sublancoforme, yeux arrondis, saillants. Rostrum

subcylindrique, élargi vers le sommet; bords noirs. Antennes à scape atteignant le milieu des yeux, à deuxième article du funicule plus petit que les intermédiaires, 5-8 très-courts coniques; massue oblongue formée de trois articles peu détachés. Prothorax en forme de cloche, étranglé brièvement en avant, largement impressionné transversalement avant la base, quelques rides à celle-ci; une autre impression vers le milieu et une plus petite, longitudinale, en avant, de chaque côté de sillon médian qui est presque entier. Ecusson légèrement convexe, aléutres quatre plus longues que larges, à angles subangulaires terminés d'une petite dent, fortement impressionnés au dessous de la base, largement arrondies séparément au sommet, chargées d'une seule sinuose interrompue vers le tiers de la longueur; antère droite ainsi que le pontoise de l'écusson; stries formées de deux points, affaiblies vers l'extrémité. Les intervalles externes un peu convexes, peu distinctement ponctués. Dessous à ponctuation peu profonde avec quelques séries de points; premier segment abdominal noir dans son milieu. Tilleul crénelé en dedans, vers le sommet.

Sikkim. Musée Indien, collection de l'auteur.

5. *CELEUS HYPERBOLICA*. Long. 4.5 mill.; lat. 2 mill. Obovale sub-oblongue, subconvexe, glabre, subopaque, couleur ferrugineuse, fasciées infusantes. Caput postice depressum impunctatum, fovea sub-plana, infra oculos cristulata. Rostrum brevius, crassum. Antennae breviores, minutae, articuli funiculari transverse, massae oblongae, perispermatae. Prothorax oblongatus, antice subglobosus, postice cristulatus, lineae punctulatae. Scutellum nullum. Elytra foveolata, basi contracta, callis humerali prominente, subordinatione punctulata. Tilleul inter paleas, non spinosus.

Oblong, peu allongé, glabre, noir bruni opaque, subopaque, et postice ferrugineux, celle-ci à zones rembrunies. Tête élargie en arrière, déprimée transversalement derrière les yeux, une petite fossette en dedans de ceux-ci, avec une autre très-obscure au milieu; front plus saillant. Yeux non saillants, assez rapprochés en dedans. Rostrum un peu plus étroit que la tête, plus long que large, presque plat, pointillé, avec une impression oblique au devant des yeux. Antennes courtes et épaisses, pubescentes de gris, à scape seul plus long que large, avec les articles du funicule brièvement transverses; massue oblongue, peu séparée de l'antenne. Prothorax plus long que large, subglobuleux en avant, brièvement rétréci dans son premier tiers postérieur, à pointillé très-fin, espacé. Ecusson indistinct. Elytres bombées, deux fois, de même, aussi longues que larges, subtransverses vers la base, avec les épaules marquées à plus saillant, à très-fine ponctuation affaiblie à la base, un peu en séries latéralement. Callosités nulles, incuses; tiller très-déjà

très légèrement pubescente en dedans; tarses allongés, ongles soudés à la base.

Sembler se rapprocher du *C. leucella*, dont je ne connais que la description, par la ponctuation des parties antérieures, la brièveté relative du rostre; mais cette partie offre, à peine, les traces d'une carinaule très obsolette, les 5 derniers articles du funicule seulement, sont transverses, les élytres sont beaucoup plus longues que le prothorax, elles ne sont pas striées-punctées, mais subtilement punctillées presque sans ordre; enfin les pattes sont ferrugineuses, ainsi les cuisses.

Indes méridionales. Musée de Calcutta, collection de l'auteur.*

6. *ARTOY SIMILARUM*. Long. 2.5 mill. (sans rostre), lat. 1.5 mill. Ovale-oblong, noir-roux pub. prise in illarum lateribus confusis, in elytris lineis fasciisque punctis formantibus; antennis totis, pedibusque latis, fatis. Caput transversum, vix punctatum, oculis saepe. Elytra elongata, arcuata, subcylindrica, in medio vix reflexa. Antennae breviter, graciles, ante medium laeviter, vix punctis 2-3 punctis in crementis, clava robusta. Prothorax antice contractus, angustius pedibus subarctis, basi uni-striatus, latus punctatus. Elytra humeris angustis, interstitiis planis, regularis. Pedes aut elongati, angustius simplicibus.

Ovale oblong, noir à reflet bruni; antennes entièrement pattes, rostre les hanches, les genoux et les tarses qui sont rembrunis, d'un jaune clair; une pubescence grise paraissant condensée de chaque côté du prothorax, formant, sur les élytres, une bande longitudinale recouverte de chaque côté de l'écusson et une autre subarctique vers le dernier tiers, entre une autre partie obsolette sur la quatrième interstiale. Tête transversale, obsolement striée entre les yeux, avec quelques points, ligne au vertex; yeux grands, saillants. Rostre assez long quo la tête et le prothorax rétrécis, modérément arqué, subcylindrique, légèrement épais à l'extrémité des antennes, pointillé, brillant au bout. Antennes minces insérées vers les deux tiers du rostre dans des creux sans sautoir, à peu près de la longueur du rostre, à 2 articles du funicule plus long que large, 3-5. moniliformes; creux ovalo-allongé. Prothorax subtransverse, légèrement arqué latéralement avant les angles posté-

* Le *C. simularum* Deh. indiqué par Latr., doit être, à mon avis, réuni au *C. subarctum* Latr. Antenn. Je ne trouve aucun caractère pour les séparer. Quant au *C. subarctum* Latr. et Latr., on doit être simplement au *C. subarctum*. La forme diagonale de son rostre n'a aucun valeur, puis, elle ne s'applique qu'à des individus viciés ou à des individus de genre type et à la figure, elle s'applique aussi bien au *C. subarctum*. Faut-il en dire de même de l'espèce de Yesso, sur la description appartenant à Olivier qui décrit, à son tour, le même rostre, que je prends en donnant une bien minime figure; mais, chez les variétés typiques, l'antenne est rouge presque au entier, avec les élytres brunes, ce qui le fait ressembler à première vue, au *C. subarctum*.

plus forte en avant qu'en arrière des antennes; grossièrement punctué, terminé par une pointe lamiforme; squamules éparses, punctées dans les cavités, mais en dessous d'une trousse de poils jaunes; ne dépassant pas latéralement les nœuds. Antennes raccourcies, à poils squamiformes, courts; scape égal en longueur au reste de l'antenne; 1^{er} article du labiale subcylindrique, plus court que le 2^e qui est allongé, 3-5 subégaux, mouli-formes; maxilla allongée, subelliptique, au moins de la longueur des 4 articles précédents, squameuse de gris, avec quelques poils fins dressés. Prothorax aussi long que large, peu arrondi latéralement, subtriangulaire tout à fait au sommet, rebordé étroitement, sensiblement comprimé à la base, avec les angles postérieurs semblant aigus, par suite d'une sinuosité inférieure; cristé de scutelles égales, confluentes, squamigères, sans trace de sillons ni carènes. Ecuver triangulaire, squameux. Elytres à poils plus larges que le prothorax, un peu plus longues que deux fois sa longueur, un tant soit peu atténuées en arrière; à séries de points peu rapprochées sur la base; intervalles plans, à poils pointillés, avec des squamules serrées par places; crées d'une bande sans squamules longitudinales, par fois interrompues, sur le 2^e intervalle; d'une autre plusieurs fois interrompue sur le 7^e et de quelques taches allongées, les premières situées entre les deux précédentes, l'autre vers l'épaule. Pattes antérieures à cuisses courtes à la base, peu punctuées, à tibias courtes en dedans dans leur dernière moitié et munies d'une large frange de poils rous, sur laquelle on distingue sept ou huit fortes dents aigües; antérieures et intermédiaires allongées en dessous; larges à article prothorax un peu plus long que large, triangulaire, rugueux de la longueur de deux précédents. Dorsons punctués sur le dos fortement, moins densément sur le milieu de l'abdomen, sans poils dressés, mais, seuls, sur le bord antérieur du prothorax d'une frange de poils rous; des points squamigères sans écailles sur la poitrine qui est brillante; métathorax marqué d'un faible sillon ovalaire sur le premier segment abdominal, sans impression.

♀. Diffère du ♂ par la forme un peu plus large et les élytres plus abondamment arrondies au sommet; par le ventre plus court, peu rugueux au milieu, presque sans tubercules, avec une dépression infra-ventrale et une série de lamelles transversales de chaque côté, sans poils en dessous; par les villosités antérieures n'ayant, en dessous, qu'une série de poils rous.

Des Andamans. Musée Indien, collection de l'auteur.

II. BRENTHIDÆ.

10. *Metopides quadricinctus*. Long. 20-23 mill. (musée indien); lat. 4-5 mill. *Elongatus, subcylindricus, subopacus, velox et validus*.

Quatre faiblement renflées, avec une traînée de denticules dorés en dessous, ainsi que les filices, les antérieures armées d'une ligne denticulée, les autres d'apex denté court. — Denticules à faible pectination, éparses sur le prolongement de et de segments latéraux et, côtés externes du 3^e et 4^e boris réfléchis correspondants d'un très court denticule.

9. — Antre aussi long que la tête et le pronotum réunis, à antennes plus courtes, à front nul, à dent externe du sommet des élytres plus obtuse, chaises antérieures armées, comme celles des autres parties, d'une courte dent.

Iles Andaman. Musée Indien, collection de l'auteur.

PELOPONNESE, N. 6

Caput breve, basi ante collum subnulliformiter caput fronte latissimo, infra, fuscis excavatis, et lateris utriusque convexis dentatis; oculis sub-Japoneis, thoracis breviter truncatis, postice angulatis, vix emarginatis, apice profunde emarginatis, capite angulatis. Mandibulae raris, brevis, intra curvata, apice subulata. Antennae breves, laevis, sub-Japoneis, vix parvis approximates, insertae. Pronotum elongatum, medio subulatum, angulatum, vix attenuatis et a lateribus profunde emarginatis. Denticulae, nullae. Elytra subulata, apice clausura, apice acuminata.

* Tarsus simpliciter; femuribus parvis vix non magis excavatis, et vix apice non angulatis; tibiae triangulariter ampliatas, vix apice non angulatis curvatis armatis; tarsi gracilibus articulis elongatis.

Pronotum medio utriusque angulatum, procoxa longitudinaliter emarginata, a lateribus marginata. Abdomen basi truncatum, segmentis parvis subulatis.

Ce nouveau genre appartient à la tribu 1 et au groupe 1 du système de Lacordaire, Genres p. 405-407. Les divers genres compris dans ce groupe par ce savant se distinguent du nôtre par les principales caractéristiques suivantes: Calathus, par la longueur excessive du 1^{er} article des tarses. Zenobius, par les tarses courts, à 4^e article très gros aux pattes postérieures. Solanus, par les antennes très rapprochées sur le front pour l'insertion des antennes. Cyphodonta, par le rostre au moins aussi long que la tête.

Ces quatre genres ont les culottes prolongées au delà de l'abdomen. Anagrus, distinct, par la tête très allongée et par la forme des mandibules du 3^e. Taphrodonta, par le rostre très allongé, par le 1^{er} article des tarses des quatre pattes postérieures au moins aussi long que la jambe et par les élytres lisses avec un sillon unique juxta-coséral.*

* Quant au genre Anagrus Guérin, il a été décrit antérieurement, sous le nom de genre des Guérin. Guérin lui-même avait reconnu son erreur, car j'ai trouvé le type de ce genre dans la collection que Lacordaire de lui avait léguée, dans

les vitta suturales et la utroque macula 3-cupris. Caput subquadratum, basi truncatum, anticeque inclivum. Rostrum rectum, cylindricum, laciniaum; basi vixde incrassatum, apice foveolatum. Antennae 11-articulatae, articulo primo solo elongato. Prosthorax elongatus, a latera posteriora subparallelis. Vitta antennarum, crassissime rugosa punctulata, canali longitudinali integra. Scutellum indistinctum. Elytra hexagonis rectangulari ante apicem compressa, sulco punctata, interstitia angustiora. Femora clavata, incurva.

♀. Subcylindrique, d'un brun clair, avec les pattes rouge-ferrugineuses, ainsi que les élytres; sur celles-ci, une bande suturale basale et sur chacune une tache basale allongée et deux bandes partant du bord externe, s'atténuant vers la suture, l'une submédiane, l'autre après le deuxième tiers, noires. Tête en carré transversal, tronquée en arrière, échancrée au milieu du bord, avec les angles latéraux saillants. Yeux peu saillants. Rostrum droit, cylindrique, lisse, sa partie dilatée occupant, environ, le tiers du segment et marquée d'une foveole allongée. Antennes à articles 2-7 en carré transversal, 8-9, en carré aussi long que large, presque du double plus longues que large. Prosthorax plus long que large, à peine arqué latéralement, peu rétréci à la base, devenant conique en avant. Epaules nulles. Élytres légèrement convexes, subparallelèles, comprimées avant le sommet d'où les inflexures comme brisées à cet endroit, terminées par une sorte de rebord formé par la réunion de la suture suturale au 7^e intervalle; sillonnées-punctuées. Pattes courtes; tibiae antérieures munies d'un fort éperon en dehors; tarses très courts.

C. 1876. M. des Longes, collection de l'auteur.

Ma collection renferme deux autres espèces du même genre, de la Nouvelle-Guinée et provenant de la collection de Bernierina de Guérin Meneville qui fait actuellement partie de la mienne. L'une portait une étiquette de sa main ainsi conçue: "*Brech. nova guineensis* Guér. Voy. de Duperrey var. gen. (à oreilles)". L'autre m'a été désignée, par M. Pouter, sous le nom de *carvata* Dej. La première (♂), a la tête étroite, en carré long; le prosthorax, la tête et le rostre sillonnés, celui-ci de un tiers plus long que la tête et un peu dilaté au sommet, le prosthorax dilaté subangulairement dans son milieu latéral; les élytres sont ornées d'une bande noire étroite, le long du 2^e intervalle; les tarses sont courts et égaux. La deuxième, ♀ également, a la tête presque carrée sillonnée sur le rostre et le prosthorax, mais non d'un bout à l'autre avec la portion du rostre en avant de la dilatation aussi longue que la portion basale; le prosthorax un peu dilaté; les élytres sont ornées d'une bande noire longitudinale au milieu, les tarses sont dilués; tous les articles de dessous, à l'exception des derniers segments abdominaux, sont ornés d'une bande formée par un épais duvet squameux-argente.

Ces caractères suffisent pour distinguer ces deux espèces de la série indépendamment de la taille.

XII.—On some new and little known Hot Springs in South Bihar.—By
L. A. WALLIS, M. B., Indian Medical Service.

In the southern portion of Bihar, amongst the hills—a climatic prolongation of the great Vindhya range—forming the natural boundary between Bihar and Deltaic Bengal, are numerous hot springs, several of which have already been described in more or less detail. Others again, situated in wild and almost inaccessible localities, have merely been mentioned by name, on casual hearsay reports, the exact sites and other particulars remaining undetermined, while some have altogether escaped notice. The present paper deals mainly with those falling under the last two categories.

Of the hot springs here described none do not appear at all in Mr. Odham's descriptive List of Indian Hot Springs, published in 1893,* which is now the *locus classicus* on this subject; but Mr. Odham had omitted from his list one of these hot springs which had long ago been recorded by Dr. Buchanan in his Survey of Bihar.†

For brevity as well as contrast, I present the observations in the far as possible in tabular form. The springs belong to two natural series, viz., (a) those (Nos. 1 to 8) situated along the southern flank of the hill-range of the Santal Parganas, and (b) those (Nos. 9 to 15) situated in the Muzir (Monghyr) district among the so-called Kharay hills. I may state that the elevations were ascertained by hypsometrical observations, while the latitude and longitude were obtained by carefully fixing the position of the spring with reference to the surrounding villages on the large scaled (4 miles to the inch) Survey of India map.‡ The temperatures are recorded in degrees of the Fahrenheit scale. The thermometer used for the temperature of the spring-water had recently been compared with a standard thermometer. The names of the springs and adjoining villages have been spelt according to their local pronunciation.

* *Descriptive System of India*, by the late F. Odham, LL. B., F. R. S., &c. Edited by H. D. Odham. *Memorandum Survey of India*, Vol. XII, pt. 2, Calcutta, 1893.

† *Eastern India*, II, 182. Most of the details respecting the Bihar hot springs quoted by Dr. Odham in *loc. cit.* are from Captain Sheridani's Report (L. A. S. B. XXII, 1881) already been recorded by Dr. Buchanan.

‡ The correction of $-1'21''$ for longitude noted on the map was not taken into account.

TABLE VI

Name of Spring	Geological Features				Height in feet above sea	Temperature of spring	Temperature of Air	Temp. of subjacent rock in situ	Precipitation, or not	Whipped or not	Date of Observation	Previously recorded in any way
	Stream channel	Thick bedded limestone	Thin bedded limestone	Thin bedded limestone								
1. Lakeview	Spring	Malpais lava	United States Nat.	24 22 27 41	60	122°	70°	70°	slightly	Yes	2-12-89	Not
2. Pedermon	Hot	"	"	24 28 27 42	33	97°	61°	62°	Not	"	4-12-89	Not
3. Huerfano point	Overhead	Dark	"	24 27 27 41	67	95°	60°	70°	Not	"	5-12-89	No shown, given a different temp.
4. Tule	Pool	"	"	24 22 27 40	64	145°	50°	68°	slightly	"	9-12-89	No shown, given
5. Nambé	Overhead	"	"	24 05 27 13	127	119°	52°	52°	do	"	11-12-89	Not visible
6. Tule point	Overhead	"	"	24 12 27 19	125	102°	52°	61°	do	"	11-12-89	do
7. Huerfano Kamela	"	"	"	24 09 27 41	122	87°	61°	61°	do	"	12-12-89	Not

Table I.—Continued.

Name of species.	Gammarrus-like form.				Height in feet.	Temperature of spring.	Temperature of air.	Time of exposure.	Exposure on soil.	Hatched on soil.	Date of hatching.	Previously recorded or not.
	Number of eggs.	Time of hatching.	Time of hatching.	Time of hatching.								
10. <i>Gammarrus</i> .	Individual.	Young.	25.04	25.25	112	61°	61°	12	Yes	Yes	18.12.00	Yes
11. <i>Gammarrus</i> (small form).	Single.	Young.	25.05	25.18	105	61°	61°	12	Yes	Yes	4.1.00	Yes
12. <i>Gammarrus</i> .	Single.	Young.	25.06	25.23	105	61°	61°	12	Yes	Yes	4.1.00	Yes
13. <i>Gammarrus</i> .	Single.	Young.	25.06	25.28	105	61°	61°	12	Yes	Yes	7.1.00	Yes
14. <i>Gammarrus</i> .	Single.	Young.	25.06	25.30	105	61°	61°	12	Yes	Yes	11.1.00	Yes
15. <i>Gammarrus</i> .	Single.	Young.	25.06	25.30	105	61°	61°	12	Yes	Yes	11.1.00	Yes
16. <i>Gammarrus</i> .	Single.	Young.	25.06	25.30	105	61°	61°	12	Yes	Yes	11.1.00	Yes
17. <i>Gammarrus</i> .	Single.	Young.	25.06	25.30	105	61°	61°	12	Yes	Yes	11.1.00	Yes
18. <i>Gammarrus</i> .	Single.	Young.	25.06	25.30	105	61°	61°	12	Yes	Yes	11.1.00	Yes
19. <i>Gammarrus</i> .	Single.	Young.	25.06	25.30	105	61°	61°	12	Yes	Yes	11.1.00	Yes
20. <i>Gammarrus</i> .	Single.	Young.	25.06	25.30	105	61°	61°	12	Yes	Yes	11.1.00	Yes
21. <i>Gammarrus</i> .	Single.	Young.	25.06	25.30	105	61°	61°	12	Yes	Yes	11.1.00	Yes
22. <i>Gammarrus</i> .	Single.	Young.	25.06	25.30	105	61°	61°	12	Yes	Yes	11.1.00	Yes
23. <i>Gammarrus</i> .	Single.	Young.	25.06	25.30	105	61°	61°	12	Yes	Yes	11.1.00	Yes
24. <i>Gammarrus</i> .	Single.	Young.	25.06	25.30	105	61°	61°	12	Yes	Yes	11.1.00	Yes
25. <i>Gammarrus</i> .	Single.	Young.	25.06	25.30	105	61°	61°	12	Yes	Yes	11.1.00	Yes

sample in silver of the Sec. sample of the water the temperature rose in 15 minutes to 112.5°F . A considerable quantity of slightly sulphuretted gas occurred. A silver coin on immersion for five minutes was very slightly discoloured. The rock in the neighbourhood is sandstone and quartzite gneiss intersected by trap.

Two more hot springs are reported to occur about half a mile further down the course of this river (then called Nua-hill *ganga*) but the temperature is reported to be not more than that of the springs in the hill which I found to be 46.5°F .

The direction of the Nua-hill spring given by Sherrill from native information, and for which he gives latitude and longitude, is most inaccurate and misleading. Dr. Buchanan on the other hand chooses its true position approximately.* It lies $9\frac{1}{2}$ m. south-west of Kaurahat, near the village of Kaudghata.

Tapti-pat, a colloquialism for *tapta yoni* or 'hot water,' is the name of a small sulphuretted spring on the left bank of the Mor river near the village of Hoshidra, about 1½ miles north of Kaurahat. It issues from a sandy pool below a lateritic stratum and near an outcrop of coarse conglomerate. The outflow is only about two gallons per minute. Sulphuretted fumes are given off, and the pool and its outflowing channel contain a considerable quantity of yellowish flaky deposit, evidently sulphur. The temperature of the spring is 102°F , while that of the Mor river, about 15 yards off, is 62°F .

Sanku-pat means 'cold water' in the vernacular. This spring is situated about 3 miles S. E. of the last noted spring and close to the village of Bhumra, on the opposite bank of the Mor river, in a small marsh, which is in line with another outcrop of coarse conglomerate dipping to the N. W. The temperature of the spring is only 84°F , but it is said to have been formerly much hotter. The temperature of a small stream 15 yards off is 62°F . No sulphurous odour is perceptible, and the outflow of water is sparse.

Bhumra, apparently the same name as 'Bhumra' applied by the Saktas to the first noted spring and apparently related to the Hindi *bhoomi* earth, is situated in a small marsh on the right bank of the Mor river a quarter of a mile from Rimbihal village. It seems an instance of a hot spring which has regressed. It has the reputation of having been hot till quite recently—the village headman of Rimbihal who led me to the spot seemed surprised that the spring was not decidedly hot. Its deity, called 'Bhumra devi' is still worshipped at the place by the Mal Paharias from the hill three miles off, who call the spring 'Ganga Nua-hill'.

* See vol. p. 280.

Jhariga is a small form of the colloquial Hindi *Jhara* (Bengali *Jhar*) a spring or cascade. This spring is situated at the eastern end of a marsh fed by it. It is recorded under the name of 'Jharvadi' in Mr. Oldham's list, with a temperature of 87° F. I found by wading into the marsh, the temperature to be 93°, while a streamlet about 100 yards off was 76°. The outflow is copious.

Tāi-lāi, also called *Tāi-sāi*, is a Bengali corruption of *Taptā nālā* or the hot rivulet.* This spring is well named, as its outflow is so very copious that it produces at once a large stream. It emerges about 50 yards from the left bank of the Bhārbhārī river near the village of Pāket, from numerous chinks, in the rocky-gneissic bed of a small streamlet. These chinks, giving vent to the spring, extend over an area of about 20 x 2½ yards. In the cool winter morning the position of the spring is indicated by the dense clouds of vapour hanging over it and also along the issuing stream for several hundred yards. The water has a decidedly sulphuretted odour, but it did not perceptibly blacken a silver coin on two minutes immersion. A good deal of fishy deposit is found in the bed of the stream, and conifers grow even at the hottest parts of the spring where the temperature is 145·6° F. Two yards above the spring the temperature of the streamlet is 98° F. and the aerial temperature is 69°. The highest temperature recorded in July 1882 by Mr. Oldham was 145°† while Dr. Buchanan found the temperature to be 145° F. on the 28th October circa 1860.]

Nas-tāi or the 'saline marsh' is a small marsh containing several hot springs of a sulphurous nature, and the sulphurous deposit accumulating in the marsh appears to have given rise to this name. The chief spring is found where an adjoining rivulet has cut away the soil near a border of the marsh. At the time of my visit this spring was not visible in the sandy bed of the stream; but an old resident indicated a spot where on digging to a depth of about two feet a spring freely welling up was reached. Another hole was dug about a yard above this one, and reached a more copious spring with hotter water. This point is in the river bed 17 yards distant in a direct line, 3° east of North (magnetic), from the large *ail* tree on the river bank nearest to the gully of the spring. At first the temperature only rose to 111° F., but on cutting a

* In colloquial Bengali the sun's heat (*depta*) is ordinarily spoken of as *hāt*, and hot rice is called *hāt* *khā*. The word *hāt* in Bengali is uniformly pronounced *hāt* or *hāt*, the *h* and *t* being always interchangeable, and the *h* is anything in Bengali as *hāt* or *hāt*; moreover the *h* is occasionally dropped from the word, e.g. in *hāt* and *hāt*, the names of rivers in the adjoining districts of Barisal and Rajshahi.

† *Op. cit.*, p. 42.

‡ *Ibid.*, p. 124.

to distinguish it from 'the great' Nushki already described. The outflow is scanty and there are no visible sulphuretted fumes.

Steph. Hika *tsai-pai*, or the 'hot water (at the shrine) of Hika shrine,' is a copious hot spring in a gorge among the Hingonai hills. It issues in 6 or 7 places down below a high cliff of quartzite and at once forms a considerable stream which lower down is called *tsai-tsun* and by the Kopa hillmen. No sulphuretted smell is perceptible. The water is drunk. A temple to Mahadevi and a house for bathing have been erected at this highly picturesque site—which is a famous place of pilgrimage, especially on the *Sib-rari* festival in February.

Pi-chi-shie, or the 'five checks or shafts,' is a spring which emerges in two streamlets amidst masses of quartzite rock, from a small hill about 2 miles east of the hillside village of Kachel. The water is found flowing for some distance underneath the decomposed quartzite. On coming to the surface it has a temperature of only 84.5° F.

The *Tsai-pai*, or 'hot water' spring of Hingonai, is well characterized by Dr. Buchanan* as "by far the finest in the district." The highest temperature recorded by Dr. Buchanan there in 1854 was 150° F.; Sherrill in 1884 found it 147°. In January of this year the highest temperature found by me was 146.2° F. The water can be found flowing under the masses of quartzite debris, so that the temperature a few feet further in would be doubtless higher. A very faint sulphuretted smell is perceptible and in the stream-bed is a white deposit of light yellowish silky material—this formed such a fine covering over the stones and covered growth, that I could not obtain a pure sample of it. Dr. Buchanan calls it 'siliceous trash'—he found it did not effervesce with nitric acid. It appeared to me to be sulphurous. No blackening of a silver coin occurred after immersion for 5 minutes.

Sita-kud, or 'Sita's well' or pond, where according to the legend Sita bathed after passing through the fiery ordeal, and so imparted to the water the heat she had absorbed from the fire, is a hot mineral spring for hot springs in India. This particular one near Manjira is well-known, and only figures in this list in order to exhibit my observations on its temperature, &c.

The *para-pai*, or 'hot water,' of Barde village is practically a branch of the above-named *Sita-kud* hot spring. It is found on the bank of a pond in the Moslem village of Barde, about 200 yards N. W. from *Sita-kud*. In January it had exactly the same temperature as *Sita-kud*, viz., 137° F. Owing to its shallow situation it is not well-shielded and is only visible as a surface spring in autumn and winter, in

* Loc. cit., p. 228.

March when I revisited the spot no spring was visible, and on digging down two feet the temperature of the water found only registered 103°F .

Bhains polder hot spring is also to be regarded as an offshoot from Sita-kund, from which it is distant about one-third of a mile in a south-westerly direction. These three last springs lie almost in a straight line and are found to be in the middle. This spring emerges from a source in quartzite rock at the base of the small hill of Bhains which also consists of similar rock. At my visit in March it was a stegryish spring in a paddie polluted both by men and cattle. No sulphuretted smell was perceptible. The water is only drunk by cattle.

Bhadaria blue, or the 'cleft of Bhadaria' hill, is a hot spring which is locally believed to be a branch of Rishi-kund hot spring about two miles farther E. H. E. on the other side of the range of hills. The spring, which is much cooler than Rishi-kund, emerges at the foot of Bhadaria hill from amongst masses of quartzite rock accompanied by a free discharge of gaseous bubbles, devoid of amrt and taste. The water is drunk by men and cattle. Much coniferoid growth is present. This seems to be the spring described by Buchanan* as "about five or six miles from Sita-kunda, at the western foot of the ridge running south from Bhadaria and at a place called Bharia." The spring, however, is not very far from Rishi-kund, and its temperature at my visit was 103°F , somewhat different from the temperature of 112° given by Buchanan.

The names of these hot springs it will be seen, are all trivial, usually descriptive of the water.

The chemical composition of the water and of the gaseous contents of the springs could not be very fully ascertained, owing to the great difficulty of properly collecting and carrying off from such remote places a sufficient quantity of material for analysis. In only four instances was I able to collect and safely transport suitable samples of the water, which Dr. Warden, the Chemical Examiner, has very kindly analysed with the results shown in the accompanying table:—

* Enc. Ind. p. 197.

TABLE II.

Bottle No.	Name of Spring	RESULTS OF ANALYSIS OF SAMPLES FOR IODINE										Total
		Total iodine matter.	Chlorine.	Free Ammonia.	Alumina and Ammonia.	Sulphuric acid and Sulphur.	Hydrogen in Gas.		Sulphur.	Nitrogen.	Other gases of volatile type or liquid.	Total
							Total.	Temperature.				
1	Yakoutley Marsh.	2.75	2.3	.005	.004	.001	1.0	—	1.0	Trace	Nil	Trace
2	Yakoutley Marsh.	2.04	1.8	.002	.0015	.001	2.14	22.5	8.5	Trace	Nil	Trace
3	Yakoutley Marsh.	2.40	2.0	.002	.001	.001	2.4	22.5	8.5	Trace	Nil	Trace
4	Yakoutley Marsh.	2.70	2.3	.005	.004	.001	2.7	22.5	8.5	Trace	Nil	Trace

Of the mineral matter of No. 1 sample a considerable proportion seems likely to be chloride of sodium, owing to the large proportion of chlorine and the very slight hardness of this water. In No. 2 sample, the extreme degree of hardness is accounted for by its containing a large formation—it seems to contain a mixture of sulphate and chloride of sodium. The water from the other springs appears to contain chloride of sodium and perhaps sodium. The absence of blackening of the solid residue on ignition indicated the absence of organic matter from all of the samples. All contained sulphur in the form of sulphates.

The gas evolved at the springs has when examined otherwise been noted in column 13 of Table I—very slight traces of sulphuretted hydrogen are detectable by smell. Nitrogen is a gas which is evolved from hot springs in much greater quantity and more frequently than sulphuretted hydrogen,* but samples of the gas evolved could not be collected for analysis; one characteristic of nitrogen is that it does not support combustion; and in every case the bottles of gas from the springs extinguished a light, but the burning of the bottle on the surface would of itself tend to blow out the light. Carbonic acid is occasionally evolved from hot springs—in the last two samples it could not be present in any quantity, judging from the absence of pungency in the taste of these waters; no direct test for free carbonic acid was attempted in any of the waters, but the results are as follows.

* Dumas on Potash, p. 510.

gives a sensation of decided heat; which contrast becomes less marked during the day when the sun has heated up the earth and air, causing these to approach the temperature of the spring.

The temperature of some of the springs, however, does seem occasionally to undergo actual fluctuation according to season and other conditions not yet well ascertained. This indeed might to a certain extent be expected, seeing that hot springs derive their heat more or less directly from volcanic action—which is essentially subject to alternate periods of activity and relative rest. A notable instance of this fluctuation is cited by Dr. Buchanan in his report on the Sita-kund "spring. He writes: "I visited this spring first on the 7th April, a little after sunrise. The thermometer in the open air stood at 65° F. "and in the hottest part of the reservoir where many air-bubbles rose, "it stood at 136°. The priests said, that about eight days before it had "become cooler, and that the heat would gradually diminish till the "commencement of the rainy season. I visited the spring again on the "20th of April at sunset, the air having been hot all day and parching; "the thermometer in the air stood at 84°, in the well it rose to 122°. "On the 28th April I visited it again a little after sunset, the wind "blowing strong from the east, but not parching. The temperature in "the air was at 90°; in the well it only rose to 92°. The water still "continued clear; but soon after, owing to the reflection of the heat, "and the natives being in consequence able to bathe in the well, the "water became so dirty as to be no longer drinkable by an European. "Indisposition for some time prevented me from being able to revisit "the place; but in the beginning of July, on the commencement of the "rainy season the water, in consequence of the return of the heat, "became again limpid; and on the 25th of that month a native sent "with the thermometer found at sunset that it stood in the air at "90°, and in the water at 132°. In the evening of the 21st September, "the thermometer stood in the air at 88°, in the cistern at 138°, and the "number of air bubbles had very evidently increased."* That record was made about eighty years ago. I find on enquiry from the priests at Sita-kund that the water still becomes slightly cooler in early summer, but since forty years ago it has never become so cool as to permit of bathing, and they endeavour to make a miracle of this by saying that the annual cooling of the pool ceased immediately after the visit of a certain Maharatta rájá. In January of this year I found the highest temperature to be 137° F., and two months later at the same place the temperature registered 136°. When Sir Joseph Hooker visited the place on April

* See *ibid.*, p. 197.

the introductions. As I directed my full attention to horticultural plants, I hope that I have noted nearly all the plants growing at my "visit to the cleared lands."

During a brief visit to the Andamans, in November 1892, the writer made as complete a collection as the time at his disposal would permit of the naturalized species in the settlement at Port Blair, in order to ascertain the number and nature of the species introduced between 1860 and 1892. And Dr. King, who paid a short visit to the settlement in April 1890, very kindly collected such weeds as were flowering then, but had not been seen in the previous November. The results of the visits are given below, the plants collected first by Dr. King being indicated by a (K); the following method has been adopted in presenting them—

1. Cultivated species and weeds—enumerated together by Mr. Kerr—are here dealt with separately.

2. Species (of both kinds) present in 1860 are taken from the *Enumeration* by Mr. Kerr referred to above; for convenience of reference the numbering of the *Report* has been made to conform with the nomenclature in the *Flora of British India*.*

3. Additional species (of both kinds) are those first met with by the writer in 1892, or by Dr. King in 1890.

It ought to be noted that the list of cultivated species for 1860, as the remarks of Mr. Kerr show, is not exhaustive. This is equally true of the corresponding list for 1892. It has been felt that an exhaustive list of exotic species would serve no useful purpose; it is sufficient if attention be directed to such plants, introduced since 1860, as may be reasonably supposed to be capable of becoming in the course of time spontaneous or subspontaneous, and to such plants as possess a direct economic interest. The remarks attributed to Mr. Kerr are in every case taken as taken from his report; where necessary the condition of the species in 1892 is commented on; when no remark occurs the condition of the species is to be understood as having remained apparently unchanged during the period between 1860 and 1892.

* This has been done to do with accuracy since the original specimens are in the collection of the British Museum, and the specimens in the Indian Museum are not always in the same condition as the original.

A. SPECIES UNDER CULTIVATION, OUTDOOR PLANTED OR INTERNATIONALLY INTRODUCED.

I. Species under cultivation or obviously planted in 1860.

NAME OF SPECIES.	REMARKS.	
	Condition in 1860 (Fors.).	Condition in 1862-63.
<i>Melastoma Champan</i> Linn.	'Cultivated in gardens at Port Blair.'	
<i>Cassia alata</i> H. & T.	'Cultivated only in the gardens.'	
<i>Aspidochloa Linn.</i>	'Cultivated only in gardens.'	
* <i>Breynia alata</i> Linn.	'Many varieties of this plant are cultivated, but do not grow well owing to the great moisture of the atmosphere.'	
6 * <i>D. campestris</i> Linn.	'As the former.'	
* <i>Persea indica</i> Linn.	'Cultivated only.'	
<i>Bixa orellana</i> Linn.	'Cultivated only.'	Cultivated and appearing spontaneously in waste places.
<i>Hibiscus rosa-sinensis</i> Linn.	'Cultivated only.'	
<i>Goussypium barbadense</i> Linn. var. <i>acuminatum</i> .	'Cultivated only.'	Cultivated and (as Mr. Harris) appearing spontaneously in waste places.
10 * <i>Impatiens Balsamina</i> Linn.	'Cultivated in gardens, and sometimes spontaneously.'	
<i>Citrus medica</i> Linn.	'Cultivated in the gardens of Europeans.'	
<i>C. decumana</i> Linn.	'Cultivated in the gardens of Europeans.'	
<i>Mangifera indica</i> Linn.	'Cultivated.'	Not very successfully.
<i>Moringa pterygosperma</i> Gaertn.	'A couple of trees observed on Viper Island evidently planted.'	Very common everywhere throughout the Antigua and.
15 * <i>Lupinus</i> , sp.	'Cultivated in gardens.'	Not seen in 1860 or 1863.
<i>Sesbania grandiflora</i> Fors.	'Cultivated at Hopetown, Rose Island, etc.'	
* <i>Cyperus</i> , sp.	'Cultivated only.'	
* <i>Phaseolus vulgaris</i> Linn.	'Cultivated only.'	
* <i>Cilicaria</i> <i>Ternstroemii</i> Linn.	'Cultivated and sometimes as wild.'	
20 * <i>Cassia grandiflora</i> DC.	'Cultivated only.'	Mr. Knibb writes to the Antigua distinguished as <i>C. grandiflora</i> by R. G. G. G. G. The wild form of the plant is indigenous.

Names of Species.	Flowers.	
	Condition in 1895 (Kew)	Condition in 1903 (G.)
* <i>Salvia veronica</i> Linn. and other species.	*Cultivated in gardens of Europeans.	
55 * <i>Plantago major</i> Linn.	*Cultivated in native gardens.	Now common in 1903.
* <i>Mirabilis jalapa</i> Linn.	*Only cultivated in gardens.	Now also introduced spontaneously.
<i>Colours cristata</i> Linn.	*Cultivated in gardens.	
<i>Amaranthus</i> , several spec.	*Cultivated in native gardens.	<i>A. caudatus</i> and <i>A. crinitus</i> .
<i>Gomphrena globosa</i> Linn.	*Cultivated and sometimes as wild.	
100 <i>Piper Betle</i> Linn.	*Cultivated by natives.	
* <i>Euphorbia pulcherrima</i> Willd.	*In gardens, cultivated.	
<i>Jatropha multifida</i> Linn.	*Cultivated only.	
<i>Jatropha gossypifolia</i> Linn.	*Cultivated only.	
<i>Nicotiana glauca</i> Linn.	*Cultivated only.	Cultivated but also spontaneous in all cultivated lands and in many waste places and by cultivation.
105 <i>Cassia sativa</i> Linn.	*Cultivated only.	
<i>Artocarpus integrifolia</i> Linn.	*Cultivated only.	
<i>Cassia equisetifolia</i> Forst.	*At Ross Island, cultivated.	Also now extensively planted on the islands and many seedlings appearing. This species is, however, indigenous in the Andamans, viz. Chidi V. G., and other islands, and is plentiful at Cochin Bay on the west side of N. Andaman.
<i>Cassia</i> , several species.	*Cultivated.	
<i>Canna indica</i> Linn.	*Cultivated in gardens and sometimes wild in jungle, where it has been sown.	
110 <i>Musa sapientum</i> Linn.	*Cultivated everywhere.	
<i>Ananas sativa</i> Adans.	*Now everywhere cultivated and producing fruit of good quality.	
* <i>Belamcanda sinensis</i> Adans.	*In gardens, cultivated.	
* <i>Zephyranthes</i> , species.	*Cultivated in gardens.	
* <i>Hippocrepis</i> , species.	*Cultivated in gardens.	

NAME OF SPECIES.	REMARKS.	
	Condition in 1881 (Rare)	Condition in 1893-94
111. *Allium sativum Linn. *A. Cepa Linn. *Allium sativum Linn. *Cultivated in gardens. *Cultivated in gardens. *Cultivated, especially at Aberdeen. *Only on the Great Islands Indigenous. Now every- where cultivated and grown along the shores.		Extensively cultivated. Very extensively planted throughout the British Isles, many thousands of acres of excellent quality having been planted in the general islands. The quality of the com- mon product by the time on Great Orons Island is considerably poor. The question of distribution of this species is hoped to be discussed in a future note.
112. *Allium sativum Linn. *A. Cepa Linn. *Allium sativum Linn. *Cultivated in gardens. *Cultivated in gardens. *Cultivated in gardens.		Now in ditch as it wild at Aberdeen and Hadding- ton. Cultivated largely, but not seen anywhere as a spe- cialty.
113. *Allium sativum Linn. *A. Cepa Linn. *Allium sativum Linn. *Cultivated in gardens and open places as wild. *Only in small quantities, cultivated.		Now a staple crop along with watercress and cress. Also raised in small quantities, espe- cially in the islands, on account of its being used also very largely culti- vated in the cultivated man- grove-ways, there producing heavy crops of excellent quality.
114. *Allium sativum Linn. *A. Cepa Linn. *Allium sativum Linn. *Cultivated in gardens. *Cultivated in gardens. *Cultivated in gardens.		Very common everywhere, and still the favorite cress.

II. Species cultivated or planted, or obviously introduced, here in 1893 and 1899 not present in 1913.

NAMES OF SPECIES.	REMARKS.
<i>Artocarpus reticulata</i> Linn.	Cultivated.
125 <i>Garcinia Mangostana</i> Linn.	Cultivated and doing well.
<i>Canellia theifera</i> Griseb.	Systematically cultivated as one of the inferior trees of the forest; the tea produced is of excellent quality.
<i>Hibiscus rosuleatus</i> Linn.	Cultivated in garden.
H. Sabdariffa Linn.	Cultivated by natives.
<i>Durio Zittichiana</i> DC.	Cultivated.
126 <i>Swietenia Mahagoni</i> Linn.	Planted.
<i>S. macrophylla</i> Ait.	Planted and thriving well, does much better than the true mahogany.
* <i>Nephelium Lilloi</i> Camb.	Cultivated but with poor results.
<i>Phanacis triflora</i> Ait.	Cultivated by natives, but also very common in waste places as a weed.
<i>Banksia acuminata</i> , Linn.	Cultivated, but also appearing spontaneously. (K.)
127 <i>Pithecellobium dulce</i> R. & P.	Planted.
Brownia, several varieties	Planted.
<i>Anacardium occidentale</i> Wall.	Planted and thrives very well.
<i>Tamarindus indica</i> Linn.	Planted.
<i>Bumelia indica</i> Linn.	Planted.
128 <i>Pithecellobium dulce</i> R. & P.	Planted as a shade-tree and also increased as a hedge; many seedlings appearing spontaneously.
<i>P. Surian</i> Smith.	Planted very generally; does well on sandstone and on ground too indifferently cleared—where few native species will.*

* *Pithecellobium dulce*, the Hala-tree, a native of the West Indies, Central America, Venezuela and Guinea, though yielding a timber useless except as firewood is nevertheless a valuable tree. It is a fast-growing and easily raised species and, if planted along with more valuable kinds, forms an efficient screen for them during the earlier years of their growth. It also yields a valuable crop of sweet pulpy pods, greedily eaten by cattle. It is said, moreover, to improve the quality of land exhausted with soil indifference. The following girth measurements of 12 trees in the Botanic Garden, Calcutta, will give some idea of the extent which the species grows. The measurements in every case are taken at 60 inches from the surface of the soil—the trees measured were not selected (except No. 12 which was the largest in the whole line) but were contiguous trees in the row known as the College avenue. The trees all date from 1874; the measurements were made in January 1893.

No.	ft.	in.	No.	ft.	in.
1.	5	65	8.	5	1
2.	6	4	9.	5	4
3.	6	4	10.	4	2
4.	5	7	11.	7	9
5.	7	5	12.	5	12½
6.	7	6	13.	8	2
7.	6	10½			
			average girth	6	14

346 D. Peiris—The non-indigenous species of the Andaman Islands. (No. 2.)
 that affect a drier climate than that of the Andamans; such species have been distinguished by an (*):—

2. Such as might be expected to find their way in the struggle for existence should the Settlement happen to be abandoned—a class the precise limits of which cannot be laid down with certainty; this is the class not marked (*), and at the same time not noted as occurring spontaneously; it is merely from this that the next class is recruited.

3. Such as are mentioned in the Andaman news—the species for which there was evidence either in 1850 or 1856 that spontaneous appearance had actually commenced.

The two former classes do not require further consideration; taken in detail we find that of the last class 14 species were naturalised prior to 1856. These were:—

<i>Impatiens Holanthes</i>	<i>Lepturus ramosa</i>
<i>Clitoria Ternstroemii</i>	<i>Strobilanthus indica</i>
<i>Coffea indica</i>	<i>Ocimum sanctum</i>
<i>Carica Papaya</i>	<i>Gomphrena glabra</i>
<i>Vicia rostrata</i>	<i>Cassia tubosa</i>
<i>Ipomoea Quamoclit</i>	<i>Cassia swartzii</i>
<i>Solanum Malabaricum</i>	<i>Cynodon Dactylon</i>

Before 1856 14 other species, that had been introduced prior to 1850 but had not at that date become naturalised, had begun to appear spontaneously. These were:—

<i>Bixa Orellana</i>	<i>Capparis rotundifolia</i>
<i>Goussipium barbatum</i>	<i>Datura fastuosa</i>
<i>Moringa pterygosperma</i>	<i>Vicia trifolia</i>
<i>Trichostema coccineum</i>	<i>Micrabilla Lalaya</i>
<i>Luffa cylindrica</i>	<i>Ricinus communis</i>
<i>Euphorbia corollata</i>	<i>Cassia spectabilis</i>
<i>Tecoma sp.</i>	<i>Celastrus speciosus</i>

At the same time 9 other species not present in the Andamans all in 1856 were nevertheless appearing spontaneously in 1859. These were:—

<i>Phanodora trilobata</i>	<i>Ipomoea pes-caprae</i>
<i>Banksia acuminata</i>	<i>Tournefortia sp.</i>
<i>Pithecolobium dulce</i>	<i>Tournefortia glabra</i>
<i>P. saman</i>	<i>Tournefortia speciosa</i>

Colocasia antiquorum

So that in 1859 there were in the Andamans no fewer than 33 species occurring spontaneously that had originally been introduced, as against 14 species of this kind in 1850.

It is necessary to note further that one species, *Zea Mays*, v.

Mr. Kura found occurring spontaneously in 1860, was only seen cultivated in 1880 and 1890.

B. WEEDS OR UNINTENTIONALLY INTRODUCED SPECIES.

III. Species accidentally introduced prior to 1860.

NAME OF SPECIES.	REMARKS.	
	Condition in 1860 (Kura).	Condition in 1880-90.
<i>Clusia vitacea</i> Linn.	"Cultivated lands, Kure Island, introduced and rare."	Still rare.
<i>Euphorbia</i> <i>varicosa</i> Linn.	"Cultivated lands near Aberdeen, introduced and rare."	Not seen in 1880 or 1890.
<i>Portulaca</i> <i>dissecta</i> Linn.	"Cleared lands around Aberdeen, Haddley, on Kure Island, etc., introduced."	Observed at Hahione, which is almost the extreme limit of the Settlement.
<i>Portulaca</i> <i>quadrifida</i> Linn.	"Cleared lands around Port Hilo, introduced."	Much more common than the preceding.
4. <i>Sisymbrium</i> <i>officinale</i> Linn.	"Cleared lands, Aberdeen, Kure Island, etc., introduced."	Very common all over the Settlement.
<i>Datura</i> <i>meteliana</i> Linn.	"Cultivated lands around Port Hilo, introduced and rare."	Still exceedingly uncommon; not seen on Kure Island.
<i>Cardiophorum</i> <i>hillebrandii</i> Linn.	"Cleared lands in and around Aberdeen, common but introduced."	
<i>Desmodium</i> <i>triflorum</i> DC.	"Common in cleared lands around Port Hilo, introduced."	Very common on the dry primary slopes all over the Settlement.
<i>Cassia</i> <i>alata</i> Linn.	"Hedges, etc., on Kure, but evidently introduced."	Very common near Hahione, not seen elsewhere.
10. <i>Eleusine</i> <i>gallica</i> Linn.	"Cleared lands around Aberdeen, and Phoenix Bay, rare, introduced."	Very common throughout the whole extent of the Settlement.
<i>Erythronium</i> , <i>viridulum</i> Linn.	"On Kure Island, in cultivated lands, rare, and evidently introduced."	Not seen in 1880 or 1890.
<i>Lupinus</i> <i>pusillus</i> Linn.	"From Aberdeen to Hilo on two places, appears to be introduced with rice. The <i>L. pusillus</i> of Mr. Kura's list but sp. are not common but Mr. Kura only gathered this one."	Common in the rice fields cultivated from Hahione onwards all over the Settlement.
<i>Melilotus</i> <i>albus</i> Linn.	"Aberdeen, cultivated lands, rare, introduced."	Not common about the Settlement.
<i>Lotus</i> <i>coronatus</i> Pers.	"Cultivated lands on Kure Island around Aberdeen, etc., introduced."	

NAME OF SPECIES. •	REMARKS.	
	Condition in 1860 (Kear.)	Condition in 1869, etc.
15 <i>Oblivandia myrsinifolia</i> Linn.	"Cultivated lands" around Port Blair, introduced."	A very common species.
<i>Veronica ciliata</i> Linn.	"Common all over the cleared lands but only introduced."	
<i>Elyonurus ruber</i> Linn.	"Rough island in cultivated lands, rare, introduced."	Not seen in 1869 or 1880.
<i>Ageratum myrsinoides</i> Linn.	"Common on cleared ground, rapidly penetrating into the jungle whenever a little cleared, introduced."	
<i>Blumea amplifolia</i> DC.	"Phoenix Bay, cleared lands, introduced."	Common everywhere, but possibly indigenous.
20 <i>Eclipta alba</i> Hassk.	"Common on cultivated or cleared lands around Port Blair, introduced."	
<i>Synedrella nodiflora</i> Gaertn.	"Common on cleared lands around Hapetown and Aberdeen, introduced." (<i>Eleusine indica</i> Kear. and DC.): "cultivated lands, Ross Island, rare, introduced." (<i>Eleusine ciliata</i> Kear. and Linn.)	Extremely common everywhere and in two strikingly distinct conditions; one, the grass-like plant, and another, larger in habit and ranker in growth, but resembling the one in its strikingly like the <i>Eleusine indica</i> leaves at first sight.
<i>Centipeda cylindrica</i> Linn.	"Uncultivated lands on Ross Island, around Aberdeen, etc., introduced."	
<i>Heteranthera diffusa</i> Linn.	"Cultivated lands around Aberdeen, rare and introduced."	Not very common.
<i>Cynoglossum micranthum</i> Desf.	"Between Aberdeen and Phoenix Bay. I suspect introduced only, as I saw it nowhere else."	Not seen in November, 1869. Found in April, 1880.
25 <i>Solanum nigrum</i> Linn.	"Cultivated lands around Aberdeen, rare, introduced."	Very common.
<i>Solanum torreyi</i> Benth.	"Around Aberdeen, etc., introduced."	Very common.
<i>Solanum elaeagnifolium</i> Aublet	"Cleared lands around Phoenix Bay and Aberdeen; introduced."	Not at all common.
<i>Angelica salicifolia</i> H. B. & K.	"Common in cultivated lands on Ross Island; introduced."	Not common.
<i>Morus nigra</i> Linn.	"Cultivated lands around Aberdeen; introduced."	
30 <i>Vandellia crustacea</i> Benth.	"In cultivated lands around Port Blair; introduced."	
<i>Bauhinia variegata</i> Linn.	"Cultivated lands around Aberdeen; introduced."	

NAME OF SPECIES.	REMARKS.	
	Condition in 1868 (Kerr).	Condition in 1890-91.
<i>Scorpaenia dolens</i> Linn.	"Common all over the cleared lands around Port Blair and penetrating into the jungle; introduced."	
<i>Mussaenda parviflora</i> Roxb. <i>M. tomentosa</i> Clarke	"Abundant."	On Ross Island, not evidently introduced, not common.
<i>Lippia nodiflora</i> Willd.	"Cleared lands all around Port Blair, and becoming very bushy along the sea shore; introduced."	
21. <i>Leucaena</i> <i>Bauhinia</i> <i>Sperry</i>	"Cultivated lands, on Chatham Island; introduced and still rare."	Not yet on the mainland or on Ross Island apparently.
<i>Calamagrostis</i> <i>Linn.</i>	"Cleared lands around Port Blair; introduced and rare."	Still rare.
<i>Amorpha</i> <i>sp.</i> <i>Linn.</i>	"Cultivated lands around Port Blair; introduced and rare."	Still rare.
<i>A. viridis</i> Linn.	"Rather common in cleared lands at Alcock's, Ross Island, Raddo, etc.; introduced."	Very common.
<i>Albizia</i> <i>sp.</i> <i>Linn.</i>	"Common in cleared lands along roads, etc., at Port Blair; introduced."	Common.
40. <i>Polygonum barbatum</i> Linn.	"Common in the cleared lands around Alcock's; evidently introduced."	Common in the ditches about Aberdeen.
<i>Euphorbia pulchra</i> Linn.	"Cultivated lands around Port Blair; common; introduced."	
<i>E. thymifolia</i> Pers.	"Along roads, in cultivated lands, etc., around Port Blair; introduced."	
<i>Dyssonia</i> <i>sp.</i> <i>Linn.</i>	"Cultivated lands between Alcock's and Navy House; introduced."	
<i>C. indica</i> Linn. fl.	"Ross Island and other stations in former grounds; introduced."	
45. <i>C. acrotricha</i> Linn.	"Cultivated lands here and those around Port Blair; introduced."	
<i>C. lutea</i> Linn.	"Rather rare, in wet places on Ross Island, etc.; introduced."	Not now very rare.
<i>Egletes</i> <i>sp.</i> <i>sp.</i>	"Cleared lands around Port Blair; introduced."	Common; both types and var. <i>subrepens</i> K. & L. var. of Kerr's list is only this latter variety.

24 D. Paine—The non-indigenous species of the Hawaiian Flora [No. 5.]

NAME OF SPECIES.	REMARKS.	
	Condition in 1899 (Kure.)	Condition in 1899-00.
<i>Piptocarpha diphylla</i> Vahl.	Common all over the cleared lands around Port Blair; introduced? The <i>P. milium</i> of Kunz' list is only another state of this species and is not <i>P. milium</i> of Vahl.	Perhaps indigenous.
<i>Panicum lineatum</i> Nees.	*On Rose Island; introduced.	Common.
50 <i>P. arrabidaei</i> Less.	*Cultivated lands around Port Blair; introduced.	
<i>Eriochloa arrabidaei</i> Nees.	*On Rose Island; introduced.	Also about Aburatsubo.
<i>Panicum Colours</i> Less.	*South Point, Aburatsubo, etc., in cultivated lands; introduced.	
<i>P. ciliare</i> Retz.	*Common in cultivated lands around Port Blair; introduced.	
<i>P. sanguinalis</i> Less.	*Cultivated lands around Port Blair; introduced.	
51 <i>Andropogon pseudo-lanceolatus</i> Nees.	*Cultivated lands and gardens at Rose Island; introduced.	
<i>A. tortuosus</i> Less.	*Only in garden land on Rose Island; introduced.	
<i>Chrysopogon aculeatus</i> Pers.	*Common on Ohashima Island; introduced.	Common throughout the Settlement.
<i>Syntherisma juncea</i> Pers.	*Common on Ohashima Island; introduced.	Very common throughout the Settlement.
<i>Eleusine indica</i> Gaertn.	*Cultivated lands everywhere around Port Blair; introduced.	
52 <i>E. aegyptiaca</i> Pers.	*Cultivated lands on Rose Island; introduced.	Common everywhere around Port Blair.
53 <i>Lernaeola glomerata</i> L. f.	*Along the path from Phoenix Bay to Aburatsubo; introduced.	

IV. Species unintentionally introduced between 1899 and 1903.

NAME OF SPECIES.	REMARKS.
<i>Sida rhombifolia</i> Less.	Everywhere throughout the Settlement and also as common as <i>S. purpurea</i> in Ohashima.
<i>Melastoma franchetii</i> Less.	On Rose Island, and also at Aburatsubo, but not very common.
54 <i>Crotalaria retusa</i> Less.	Not infrequent about Aburatsubo, especially in cultivation.

Name of plant.	Remarks.
<i>Scilla maritima</i> Lam. <i>Dianthus pinnatifidus</i> DC.	Common on dry grassy slopes at Alabach. Common at North Bay and on the elevated hillsides above. Not met with by Mr. Kerr, but, perhaps, it may be indigenous for it also occurs on Great Cook Island and Harris Island.
<i>Desmodium</i> (Benth.)	Common along with <i>Desmodium</i> and with <i>Desmodium</i> <i>prostratum</i> . It is rather an interesting addition to the flora, for though it may well be that this plant has hitherto only been collected in Vancouver, Michigan and Arizona.
<i>Stachys virginica</i> DC.	Common on grassy slopes (K.)
75 <i>Centaurea uniflora</i> Lam. C. Y. in Lam.	Common (K.)
<i>Stachys virginica</i> Lam.	Very common everywhere.
<i>Desmodium</i> (Benth.)	In wet places, but not common.
<i>Desmodium</i> (Benth.)	In wet places, along with the two <i>Desmodium</i> and much more plentiful than either.
<i>Desmodium</i> (Benth.)	Common in fields, but not quite as frequent as <i>Desmodium</i> .
76 <i>Hyssopus officinalis</i> Lam.	Common on some walls and railroads at Alabach, but not yet present on the islands or on the other islands.
<i>Oenothera diffusa</i> Lam.	Aberdeen etc., not very common.
<i>O. coccinea</i> Lam.	This commonest <i>Oenothera</i> on Alabach Island.
<i>O. coccinea</i> Lam.	The commonest <i>Oenothera</i> at Aberdeen and on the islands (K.) very common.
<i>O. coccinea</i> Lam.	Common on Alabach Island and elsewhere both by the writer in 1893 and by Dr. King in 1895.
<i>Stachys virginica</i> Lam.	Only met with in one place on a rubbish heap at Alabach.
77 <i>Wibbena glauca</i> DC. & <i>Wibbena glauca</i> Lam.	Common on Alabach Island, etc. (K.)
<i>Wibbena glauca</i> Lam.	Alabach only (K.)
<i>Wibbena glauca</i> Lam.	Very common on hill sides and other places. That the writer has secured had never been given as a garden plant. It forms large patches where it occurs, the individual plants being 4 to 10 feet in height.
<i>Wibbena glauca</i> Lam.	Common on Alabach, but not common on the islands.
<i>Wibbena glauca</i> Lam.	Aberdeen (K.)
78 <i>Wibbena glauca</i> Lam.	Common in gravel pits on Mt. Hareton.
<i>Wibbena glauca</i> Lam.	Aberdeen, Alabach and at Aberdeen (K.)
<i>Wibbena glauca</i> Lam.	Is present at Alabach—the seeds of <i>Wibbena</i> of this species is quite greenish. It may have been introduced by Alabach, but it very possibly may have been introduced as a weed.
79 <i>Wibbena glauca</i> Lam.	Very common all over and abundant on other hill sides along with <i>Wibbena</i> .
<i>Wibbena glauca</i> Lam.	Quite as common as the preceding. (K. Alabach and at Alabach, though, certainly before 1893, but for an amount of frequent.)
80 <i>Wibbena glauca</i> Lam.	Not at all common.
<i>Wibbena glauca</i> Lam.	Common on dry hill sides at Alabach, particularly in introduced grasses.
<i>Wibbena glauca</i> DC.	Frequent (K.)

NAME OF SPECIES	REMARKS
<i>Phyllanthus purpureus</i> Willd. <i>Hypochaeris glabra</i> Desv.	Rare, on Hills only (K.). Common in wet places along with <i>Jussiaea</i> and <i>Indigofera</i> .
95 <i>Lippia venusta</i> H. B. K. <i>Hypochaeris glabra</i> Desv. <i>Barbarea pruriens</i> Linn.	At Nodda (K.), rare. Common (K.). Not mentioned and not met with by Mr. Kurz; it may, however, be indigenous; it certainly seems to be so on Great Coco Island.
<i>Sesuvium portulacastrum</i> L. <i>Achyrocline satureioides</i> Lam.	Not very common. Very common in every part of the settlement and penetrating into the forests.
100 <i>Phyllanthus arvensis</i> Linn.	Common on Hills and on Mr. Harrier's; not so plentiful at Abodeem.
<i>Monochoria virginica</i> Presl.	In ponds at Abodeem; perhaps introduced by the natives of Walling-Hills.
<i>Portulaca distachya</i> Linn. <i>P. pulchellus</i> Desv. <i>Portulaca wendlandiana</i> Benth.	Common on Hills and at Hypocheris. Common on Hills, and some elsewhere. Abodeem, common.
105 <i>P. sanguinalis</i> Presl. <i>Portulaca</i> W. & A. <i>P. sanguinalis</i> H. B. <i>Impatiens glandulifera</i> Wendl. <i>Radialis exaltata</i> Linn.	By edge of pond at Abodeem. On Mr. Harrier's. Very common. Common everywhere. Common in marshy ground about Abodeem and Hadda.

* There is another species that had, however, been introduced from some other source. Dr. King in 1860 saw the writer in 1860 and said it was the same remark applies. The species is *Radialis exaltata*. The Andaman is not given as a locality for this species in King's *Flora of the Andaman Islands*, p. 74. The Andaman specimens were obtained by one of Dr. King's garden and located in 1864 in a ditch among rice-fields near Hadda. It may be said with some thing like certainty that the species was not there in 1858; at all events there was no record of it and no other trace. And it is almost as certain that it was not present in 1855, for Mr. Kurz, as his report shows, gave particular attention to the vegetation, yet he did not meet with it. Probably the place where Dr. King's collector found *Radialis*, like the place where the writer found *Radialis* and *Chrysanthemum*, did not exist at all in 1855. Another circumstance that tends to confirm the idea of the introduction being recent is that it had not been introduced to any of the districts or ponds mentioned by the writer in 1855, and Dr. King, to whom this fact was particularly mentioned, and who looked for *Radialis* with especial care in 1860, was equally unsuccessful in his search. It may, therefore, be safely assumed to be still quite local. For the specimens of *Radialis* at the base of Mount Mithragany, as once suggested by Mr. Harrier, are not, however, regarded as other than local. All along the coast of Andaman to be a great abundance of *Radialis* there will remain an interesting fact—the species that *Radialis* is of course, it is not *Radialis* only, but *Radialis* from the opposite shore of the Andaman Sea. And that fact without the addition from other sources is its introduction; for it is the *Radialis*, and particularly the *Radialis* *exaltata*, that seems to predominate in the indigenous Andaman flora.

TABLE I. *Intrusion of non-indigenous Andaman plants.*

Non-indigenous species —					
Introduced intentionally —			Introduced accidentally —		
Prior to 1856 —		During 1856-60 —	Prior to 1856 —		During 1856-67
Source lost to 1856 —	Root in 1856 —	Notified in 1859 —	Seen in 1856 —	Seen in 1859 —	Seen in 1859 —
15	(15-1)+14	2	61	(51-3)	20
Total for 1856		15+21			= 36
Total for period 1856-60		14+ 9+51			= 74
Total for 1860		25+ 9+38+20			= 92

During his stay in the Andamans in 1856 Mr. Kurz observed 320 indigenous species. But he has pointed out (*Report*, p. 19) that this "is only an approximation to the actual number existing on the islands." Since 1856 the number of indigenous species has been raised to about 630. Mr. Kurz has recorded the number of species found growing on 100 square yards in a suitable locality in the interior on the eastern side of the island and not far from Aberdeen. He shows (*Report*, p. 21) that an estimate based on this record and extended to the rest of the islands of the Andaman group gives extremely near about 600 or 700 species for the whole. At the same time, he thinks that an estimate of the same kind deduced from the conditions that prevail on the western side of the island would give quite other results, and taking everything into consideration, he concludes that "the number of really indigenous phanerogamic plants may range between 1500 and 1600 species." In all probability the second estimate is too high and perhaps a number nearer 1000 will be ultimately found to express the actual total of indigenous phanerogams. But the question need not be discussed here, and if in the meantime abundant records of the appearance of non-indigenous species be supplied, the proper proportion of introduced to indigenous species at various periods in the history of the islands can easily be ascertained when their flora shall have been completely investigated.

t. a. s. a. total	NAMES OF SPECIES.	REMARKS.
L. t.	<i>Ischaemum rugosum</i> Nees. <i>I. ciliare</i> Retz. <i>Anthiduria verticillata</i> Rees. <i>Chloris barilata</i> Des. <i>Eragrostis amabilis</i> Nees.	Aberdeen. Aberdeen, rather common. Aberdeen, very common. Rene Island and Aberdeen. Very common on Rene Island, not seen at Aberdeen.
C. g.	<i>Sclaginella pruriens</i> Bak. <i>Chloranthus tenuifolius</i> Des. <i>Centropogon thalictroides</i> Des.	Very plentiful everywhere on Rene, but not present either at Aberdeen, Hepstoun or Viper. On gravelly meadows at Aberdeen. In ponds at Aberdeen: possibly introduced by water-birds; (see note on <i>Monacharia vagans</i> etc.)

Comparing the state of affairs in 1866 with that prevailing in 1890 we find that at the former date there were present in the Andamans 61 weeds of cultivation of which 58 were again met with, either in November 1889 or in April 1890. But too great weight should not be placed on the absence of any plant, since it is quite possible that in visits of such short duration as those of the writer and Dr. King species that are not very common might easily be overlooked.

In November 1889 and in April 1890, on the other hand, we find that not only were 58, or 95%, of the weeds of 1866, present, but that 56 others had found their way into the settlement during the interval between 1866 and 1890.

Briefly reviewed the results indicated by these four lists are:—

1. That in 1866 15 intentionally introduced plants and 61 weeds of cultivation had apparently or actually become so established in the Andamans that, though not indigenous plants, they had become an integral portion of the Andaman flora.

2. That by 1890 14 more of the plants intentionally introduced prior to, but only seen under cultivation in, 1866 had become similarly naturalised; that along with these 9 species, intentionally introduced during the interval between 1866 and 1890, had begun to appear spontaneously; also, that during the same interval 56 more weeds had been introduced.

3. That, on the other hand, a species appearing spontaneously in 1866 was only seen cultivated in 1890, and that three of the 1866 weeds were not met with in 1889 or 1890.

The subjoined table exhibits the intrusion of the non-indigenous elements present existing in the flora of the Andamans.

as a relative proportion is only 1:23 rather than an absolute one, and if we take 1876 as a convenient approximation to the total we may compare the state of affairs in 1876 with that in 1890. In this case we must consider ourselves to introduce plants and exclude the three cryptogams that have been introduced in the interval between 1876 and 1890. The following are the results:

$$\text{Proportion of introduced to indigenous species} = \frac{76}{1000} \text{ or, } 1:13.$$

$$\text{Percentage of introduced species} = \frac{76}{1076} \text{ or, } 7.05\%$$

$$\text{Proportion of introduced to herbaceous species} = \frac{146}{1000} \text{ or, } 1:7.$$

$$\text{Percentage of introduced species} = \frac{146}{1146} \text{ or, } 12.74\%$$

The greater number of these introduced plants are herbaceous; but the proportion of woody species is slowly increasing, as the following shows:—

$$\text{Proportion of woody to herbaceous species} = \frac{2}{11} \text{ or, } 1:5.5.$$

$$\text{Percentage of woody species} = \frac{2}{13} \text{ or, } 15.38\%$$

$$\text{Proportion of woody to herbaceous species} = \frac{7}{133} \text{ or, } 1:20.$$

$$\text{Percentage of woody species} = \frac{7}{140} \text{ or, } 5.00\%$$

Human agency is responsible for the introduction of the whole of the non-indigenous element in the Flora of the Andamans. That it is directly responsible for the introduction of such species as have been intentionally introduced that have subsequently become spontaneous is evident; that it is equally directly responsible for the unintentionally introduced weeds is hardly less plain. They are with very few exceptions the companions of Indian rice-lands and rice-field weeds. These weeds would readily be found mixed with imported grain or the belongings of carried immigrants or of the police sepoy's equipment. This mode of introduction explains not only the weeds of the woods of dry ground but of the majority of the marsh species as *Hypoxis*, *Jussiaea*, *Lobelia*, as well. And species such as *Ipomoea* for which this explanation is not altogether satisfactory—plants like *Mimosa*, *Crotalaria*, or *Lycium* species—must owe their introduction indirectly to human agency.

since but for the existence of the Settlement and the ditches, and which they occur would not exist. The agency of winds, supposed to be highly effective, suggests itself for very few species, the most probable being the *Sesuvias* and the *Chenopodium*, almost the only possible one among phanerogams being the *Portulaca*. But if these be wind-introduced species then, as regards the questions at issue arise:—why were they not to be found and, why are they only to be found within the limits of the Settlement now? And as regards *Sesuvias* a closer enquiry makes of wind highly improbable, for it is as yet only to be found on Ross Island, although there, as it happens, it is exceedingly common. Ross Island is the part of the Settlement that is in contact with Burma and India, and unless it has been imported as one can hardly explain its absence from the rest of the Settlement where the conditions are quite as favourable for its existence as on Ross. As regards *Calotropis* too there is a striking fact. It happens to be the chief food-plant of a particular species of butterfly—*Danaus genialis*—which is dispersed throughout India and Ceylon. This butterfly was long supposed to be absent from the Andaman within the past few years it has been sparingly reported. It thus seems as if till the establishment of its food-plant in the Settlement this butterfly was not known from the Andaman. This agency the introduction of *Danaus genialis* itself is due it is hardly the purpose of this paper to enquire, but it is a suggestive fact that the food-plant had become established the butterfly appeared. And absence of the butterfly while there was no evidence of the presence of the plant seems presumptive evidence that the plant was not present till very recently, and that, therefore, human agency is not directly responsible for its introduction, by providing conditions favourable for the survival of wind-conveyed seeds, but is directly responsible for the unintentional conveyance of its seeds along with grain or in some other way. For it is long since that such conditions have come into existence, and wind-agency, if a factor at all, is in these days a fairly constant one.

Human agency being so completely responsible, one might expect that the channels of introduction of particular species, when they coincide with the routes of traffic between the Settlement and the adjacent mainland, could be easily ascertained. But this appears not to be the case. These traffic routes are—

* This information was obtained by Mr. L. de Kerville in the course of a conversation that followed the reading of this paper at the meeting of the Society of Bengal in April 1892.

1. Calcutta to Port Blair, implying introduction from Northern India and especially the Gangetic plain.

2. Port Blair to Rangoon, implying introduction from Lower Burma.

3. Port Blair to Madras, implying introduction from Southern India.

4. Madras to Port Blair, implying introduction from Tenasserim—a route used by native craft.

5. Port Blair to the Nicobar Islands, implying introduction from these—the Nicobars are a dependency of the Settlement at Port Blair.

The distribution of the majority of these introduced species is so wide that (with the exception of 4 species whose introduction has almost certainly been confined to the Haldighat or the Musalmah route and other 4 almost certainly restricted to the Madras or the Calcutta route) very few of them may have equally well reached the Settlement by any or all of these routes. This is best shown by a tabular view of the species thus introduced.

TABLE II. *Distributional features of the Non-indigenous element in the Flora of the Andamans.*

Conspicuous in the Tropics		62
Indigenous in the Old World		62
In other Southern Indian Asia		55
Confined to Asia		19
In	Thence to South Eastern Asia	21
	Confined to India or only extending westward from India	4
	Confined to Burma and Malaya or only extending eastward thence	4
Indigenous in the New World, but now cosmopolitan or nearly so		19

It may therefore be concluded that there is a practical indifference displayed as regards route, here, as everywhere else, when there is demand in cultivation for evidently indigenous needs, as there is elsewhere a wholesale propagation of the species introduced by him for commerce or for profitable marine crops and become spontaneous.

It has been already said that the present Settlement occupies the site of an earlier one. This earlier settlement was founded under the

252 D. Prash—The non-indigenous species of the Australian Flora [Vol. 3]

bania of Port Cornwallis by Lieut. Blair* in 1762, in addition to orders issued in September of that year. In November 1792 orders were issued for the removal of the Settlement to another and more spacious harbor in North Australia; to this new settlement the original name Port Cornwallis was again applied. It is nowhere distinctly stated, though considering the transfer of name from the old settlement to the new, it is highly probable, that old Port Cornwallis was entirely abandoned in 1792. We know, however, that in 1793 orders were issued for the removal of the whole establishment to Penang. The doubtful point, so far as our present enquiry is concerned, is the length of time prior to the establishment of the present Settlement that its site was exposed to influences favorable for the active introduction of non-indigenous species. But we know that altogether these influences only existed for six seasons and could only have been active during three seasons, probably they only existed at all during these three seasons. The present Settlement was commenced in March 1858; Mr. Kurz visited it during April-July 1866; to the eight seasons (1858-66) that had passed between the foundation of the Settlement and the date of that visit we must therefore add three more seasons (1793-95) in order to make up the whole period during which the non-indigenous species recorded by Mr. Kurz were being introduced. Even if the original site was not wholly abandoned in 1792 the subsequent seasons (1792-96) may be neglected without producing any appreciable error. Assuming, therefore, that a period of eleven seasons has been responsible for the naturalization and introduction of the species in the two lists for 1866 we are able to calculate the rates of these processes and to compare them with the rates between 1866 and 1890. These are shown in the following table:—

TABLE III.—Rate of Introduction of Non-indigenous Species

Non-indigenous species introduced.	PERIOD PERIOD I. Prior to 1866 (1762-95) = 11 seasons.		PERIOD PERIOD II. 1866-90 = 24 seasons (including 1866)	
	No. of species.	Rate per annum.	No. of species.	Rate
Cultivated plants introduced during Period I.	15	1.36	14	0.58
Cultivated plants introduced during Period II.	2		8	0.33
Weeds of cultivation.	53	5.54	15	0.62
Totals.	70	6.90	37	2.15

* The name of the 1762 Settlement having been transferred to the new founded in 1762, the present Settlement, which occupies the site of the 1762 one and which since Dec. 1858, has been named after Blair in honor of the original founder. The name Port Cornwallis is still used to designate the site of the Settlement in North Australia that existed from 1792 to 1795.

The rate per annum for the second period requires similar correction by the deduction from it of the rate per annum of disappearance of naturalized species. We have seen that one introduced plant occurring spontaneously in 1866 was only under cultivation in 1859 and 1890 and that three of the 1866 weeds were not met with in 1859 or 1890. These 4 species, therefore, give a disappearance rate of $\frac{4}{21} = .19$, or 0.19 species per annum, and the corrected rate for Period II is thus $3.28 - 0.19$, or 3.12 species per annum.

When we find on comparing the two periods that the rate of introduction in the second is only 3.12 species, as compared with 6.90 in the first, we naturally endeavour to find some explanation of the discrepancy. But, unfortunately, no very satisfactory explanation offers itself. So far as cultivated species are concerned, we are not in a position to compare the 18 naturalized species of 1866 with the 23 similar species of 1890, but only with those 9 species that had been both introduced and naturalized subsequent to 1866. The proportions indicated by these two classes being 1.36 : 0.57 evidences a rate of naturalization per annum 2½ times as great for the earlier as for the later period. But when the circumstances of the case are considered we are not surprised that the difference should be so great; we are, rather, astonished at its being so small. Going to the abandonment of the 1780 Settlement the species that had been introduced while it existed were left to their fate, and it is not to be wondered at that when the new Settlement was founded in 1858, and when Mr. Kerr visited it in 1866, the majority of the common tropical cultivated species had already become fully naturalized. So far, however, was this from being the case that we find there were in 1866 only 15 such species naturalized, and we are compelled to conclude either, that the original settlement was very ill provided for, or that the species which on a priori grounds we might consider likely to hold their own in the struggle for existence in an abandoned settlement are really far from being able to do so. Now not only is there no ground for supposing that the Settlement was ill provided for, but there is ample proof, from the evidence that exists of a direct and extensive reciprocal correspondence between its founders and the first Superintendent of the recently established Honolulu Co. Henry's Botanic Garden at Calcutta, that the number of species introduced at Fort Oahu was, for a Settlement so young, unusually high. We are compelled, therefore, to accept the other explanation and to conclude that cultivated species are not as a rule able to exist when they have to struggle on equal terms with a native jungle. Without mentioning other instances, we may refer to the lists of *Cucurbitaceae* and *Lepidaceae* present in 1866 as cultivated plants only, yet in 1890 beginning to become

spontaneously and appearing likely as time goes on to increase perceptibly the numbers of the non-indigenous flora. The greater number of these must have certainly been introduced in the 1792-93 period, and many of them are such as at first sight suggest for themselves the possibility of survival.

Perhaps, however, it ought not to surprise us greatly that species which readily appear spontaneously elsewhere and which are appearing spontaneously in the Andamans now, should, if they were previously introduced, have perished between 1792 and 1838. Most of them are plants that, when they do escape from cultivation and appear spontaneously, affect such situations as waste places, rubbish heaps, roadsides, hedgerows and margins of clearings,—situations that have at least this in common, that they afford their destined abundance of air and light. Many of them too are herbaceous or at most biennial, and the native jungle as it invades the abandoned clearings overwhelms them and either chokes them completely, or by merely preventing them from flowering, makes their fate only a matter of time. Even trees that were quite naturalised in clearings sometimes succumb to the weight of creepers that rapidly overlead them in a forest.

If, however, the survival of even a small proportion of the cultivated species abandoned in 1792 will suffice to explain the higher rate of naturalisation during Period I, deducible from the figures in Table III (Cereus, Ficus and Cassia amongst others are excellent examples of such survival), there is no similar explanation possible for the higher rate of weed-introduction during the same period. A considerable number must have been already introduced by 1792, and, though many doubtless yielded to the influences adverse for naturalised cultivated species, weeds are often proverbially tenacious of life and a good few, as the notes against them show, in place of avoiding the jungle are actually penetrating into it. Taken altogether we find that the rate of introduction during the first period was 2½ times as high as it has been during the second, and the most probable explanation of this higher early rate of weed-introduction appears to be that in the dirty grain of an Indian house seeds of most of the commoner Indian weeds are certain to be present. This being the case so many weeds became introduced with the very earliest cargoes of any grain that the subsequent rapid introduction of species can be but small. And it is highly probable that for the same reason the rate of weed-introduction becomes year by year diminished. Unfortunately it has not occurred to any one to make observations on these weeds during the interval 1833-66 or 1866-90. And without repeated observations after short intervals of time, especially towards the commencement of a settlement, it is impossible to test the adequacy of this explanation.

XIV.—On some Indian Psychids.—By F. Moore, F. Z. S.

(Received 20th October, read 24th November, 1893.)

Genus *Basila* (Moore).—Wings short, broad, sparsely covered with short very slender brown hair-like scales. Forewing triangular, costal margin slightly arched from the base to near its end, the apex rounded, exterior margin oblique; cell broad, extending to beyond half the length of the wing; costal vein at its base some distance from the costal margin; sub-costal vein angled near end of the cell, five-branched, the first and second branches parallel, the first arising at some distance and the second at an angle before end of the cell, third branch trifurcate at one-fourth beyond end of the cell; discocellular veinlets bent inward at the middle, the radial vein extending from their angle; within the cell are two discoidal veinlets starting from the upper and lower end of the second discocellular, these enclosing near middle of the cell area and extending to its base; median vein four-branched, angled at its lowest branch, the two upper branches continuous and starting together from end of the cell, the two lower branches wide apart; sub-median vein convexly-angled upward at its middle, and with a short outwardly-oblique lower spur starting from one-fourth of its base. Hindwing oval, broad; subcostal vein two-branched, the first branch arising before end of the cell; the cell broad; upper discocellular vein bent angled outward, the radial extending from the angle; two discoidal veinlets within the cell starting from the upper and lower end of the second discocellular veinlet and enclosing at the middle of the cell area; median vein angled at end of the cell, four-branched, the two upper branches starting from angles at end of the cell; a sub-median and two internal veins. Body slender; abdomen short, slightly pilose; palpi small, pilose; antennae short, bipectinate, the pectinations delicately plumose and long at base of the shaft; legs slender, nearly naked, middle and hind tibiae with a long appendage.

Basila georgi (Moore).—Upper and underside uniformly pale ashy-brown. Wings sparsely covered with short very slender hair-like scales; cilia long, dense. Expanse of wings $\frac{1}{16}$ th of an inch.

HABITAT. Calcutta. (Type in Coll. F. Moore).—The type specimen was reared from larva, found by the late Arthur Grote, near Calcutta, feeding upon the Babul (*Acacia arabica*). The larva forms a white, coated, narrow, cylindrical case about three-fourths of an inch long, and uniformly covered with minute granular particles of bark.

The following are descriptions of two allied genera and species of

Psychids—one of which is found in the Calcutta District, the other in the N. W. Himalayas. These two forms are as follow:—

Genus RALINOTA (Moore).—Wings sparsely clothed with short whitish hair-like scales. *Forewing* short, narrow, triangular; costal margin arched before the end, apex somewhat acute, exterior margin oblique, posterior margin short; costal vein short; subcostal vein three-branched, second and third starting from end of the cell; the cell narrowed at its upper end; discocellular veinlets oblique, angled outward; radial vein from their angle; a discoidal veinlet emitted within the cell from the 2^d lower discocellular; median vein four-branched, the two upper branches on a foot-stalk from end of the cell; submedian vein with a lower branch from its middle towards the base. *Hindwing* short, apex convex; subcostal vein two-branched; radial vein from below end of the cell; discoidal veinlet within the cell from end of lower discocellular; four median branches; a submedian and an intercal vein. *Body* moderately robust, abdomen extending beyond the hindwings; antennae bipectinated, plumose.

RALINOTA ALBIVENTRIS (Moore).—Fulgiginous-white, wings and body sparsely clothed with short whitish hair-like scales; antennae and anal segments fulvous-yellow. *Expanse* $\frac{1}{2}$ the of an inch.

HABITAT. Calcutta District (*Arthur Groll*).

This species forms a long, narrow, somewhat naked fusiform cotten

Genus ALIOTIS (Moore).—*Forewing* long, rather narrow, apex somewhat acute, anterior margin oblique, posterior margin short; costal vein short, distinct at the base from the costa and extending two-thirds from the base; subcostal vein slender, scarcely apart from the costal, four-branched, the fourth or lower branch extending to a little below the apex, the first branch emitted before end of the cell, second branch from end of the cell, third branch at half-way between the cell and the apex and terminating on the costa above the apical angle; discoidal cell long, reaching two-thirds of the wing, very narrow at the base and widening up to the end; discoidal veinlet within the cell, slender, corresponding with the median vein near its base; upper and lower discocellular veinlets of equal length, bent inward at their juncture; two radial veins, one from the upper end of the discocellular, the other from the angle of their junction; median vein stout, four-branched; the two lower branches extending to near the posterior angle, the two upper in middle of the exterior margin and anastomosing at their base; submedian vein long, extending to the angle, recurved, with a wide interspace between it and the median vein, and emitting a short, straight lower branch at half its length. *Hindwing* short, trian-

gular; costal margin convex, apex acute; exterior margin convex; costal vein slender, subcostal reaching to the apex; cell broadly diamond-shaped veinlet slender, straight, emitted within the cell from lower angle of the upper discocellular veinlet and extending to base of the cell; a radial veinlet emitted from upper angle of the discocellular and terminating below the apex, lower discocellular oblique, straight; median vein long, three-branched, the branches at equal distances; submedian vein and lateral veins long, extending to the margin. Antennae broadly bipediformed, the branches plumose to the tip; thorax thick, round, plumose; head and palpi inconspicuous, hidden in dense plumose hairs; abdomen very long, extensible and mobile, densely covered with long plumose hairs, and ending in a naked point which is either concealed by the long hairs extending like a tail beyond the abdomen, or exposed, the plumose hairs parting and curling outwards and upwards; legs nearly naked; forelegs very long, tibia with a long spur; first joint of tarsus as long as all the rest; middle legs shorter; hindlegs shorter and more slender.

MONTANA FULMINANS (Muese).—Wings hyaline, fuliginous, very sparsely covered with minute hair-like scales, not sufficiently numerous to detract from the perfectly vitreous appearance of the wings; costal margins and the veins fuliginous-black; veins distinct and black. Antennae black, bipediformed, the branches plumose to the tip; thorax and head covered with dense black plumose hairs; abdomen of a reddish yellow when naked, but appearing densely black from the long black plumose-hairs which cover it; anal point naked or concealed by long plumose-hairs like a tail, the hairs parting and curling outward and upward; legs black. Expanded 1 inch.

HABITAT: Upper Kumbhar, N. W. Himalaya. (In Coll. Col. A. M. Lang and F. Muese).—"Larval case fusiform, about 1½ inch in length, formed of tough silk covered with short sticks of dry guano. The larva feeds with the three anterior segments protruded from the portable case. The pupa before emergence of imago inverts its position within the case, and the imago emerges from the upper pointed end, the lower, blunter end is closed by a film of silk firmly attached to some rock. The imago is observed hatching on rocks, and flies off, when disturbed, with very rapid and dextrous flight, more like a wasp or bee than a moth. It is seen flying from morning till 4 p. m., chiefly on cliffs, from end of October and November." (Lang's MS. notes.)

XV.—A new Species of Diptera in the Collections of the Indian Museum—
Diochus Graecus, N. Sp.—By J. M. F. Bouce.

[Received 31st October; read 1st November, 1900.]

Length. ♂ = 2 millim. ♀ = 2½ millim.

♂. *Ocellus nigro micatus, halteres nigres; alis albidis, stigmata parva, nigra.*

Enlèvement d'un noir luisant; balanciers noirs; ailes blanchâtres; stigmata petits, noirs.

♀. *Palpi, Cephalo, antennis, palpi, mandibula, nucha thoracis, scutellum, costella, dorsi separata, abdominalis tibiae, tarsi, femuribus* *et tibiae nigres; alis pallidioribus fuscis tinctis, stigmata nigra, magna.*

D'un fauve rougissant; la tête, les antennes, les palpes, la pipette, les épines du prothorax et du tergum, les balanciers, quelques anneaux sur les flancs au dessous des ailes, les tibiae, les tarsi, l'extrémité des femurs postérieurs, le tout, d'un beau noir; les ailes, presque hyalines et légèrement teintées d'un roussâtre tout pâle, stigmata grand et noir.

In copula 1 ♂ 1 ♀.

Dharmam, India, Major Sage.

XVI.—*Preliminary List of the Butterflies of Madras*—By LIEUT. E. Y. WALTON. (Communicated by E. TURNER, Esq.)

[Received July 1st.—Read 5th November 1900.]

The following list of Madras Butterflies is compiled from a collection made between March and the middle of August, 1899. The total number of species obtained is only 74; but there is no doubt that, if the observations had been extended throughout the entire year, this number would be increased by at least twenty additional ones. For the first three months of this period there was little or no rain; but from the 1st June till the middle of August the rain, though never very heavy, was more or less continuous, comparatively few days passing without at least a slight shower. It will be noticed that only the typical wet-season forms of *Mycalesis ephesus*, *Mycalesis leda*, and *Junonia* species were met with. Presumably the corresponding dry-season forms would be met with from November till February.

Family NYMPHALIDÆ.

Sub-family EUPATHE.

1. *Danaë linaria*, Cramer. March to August; very common.
2. " *septentrionalis*, Butler. June, July; occurs occasionally with the preceding.
3. " *chrysippus*, Linn. March to August; very common.
4. " *penetia*, Cramer. March to August; very common.
5. *Euplexis cora*, Cramer. March to July; very common.
6. " *coronides*, Moore. June and July; a few specimens only.

Sub-family SATYRÆ.

7. *Mycalesis mineus*, Linn. April and June, 10th August noted form only.
8. *Melanitis leda*, Linn. August; not common. Form *seclusa* not met with.

Sub-family ACESIE.

9. *Teuchocis violæ*, Fabr. March to August; very common.

Sub-family NYMPHALINÆ.

10. *Erydania arctius*, Linn. July, August; not common.
11. *Idalia phalaena*, Drury. April to August; very common.
12. *Pieris iphita*, Cramer. May to August; very common.
13. *Junonia almana*, Linn. The crested form, *J. almana*, occurs commonly from March to August.
14. " *lemonias*, Linn. March to September; very common.
15. " *hierta*, Fabricius. March, June, and August; fairly common.
16. " *erithya*, Linn. March, May and August; fairly common.
17. *Neptis parnassus*, Moore. April to August; not uncommon.
18. *Hypolimena bolus*, Linn. March to August; very common.
19. " *virgippus*, Linn. March, April, July and August; not so common as *H. bolus*.
20. *Cyanus audax*, Linn. One specimen obtained in October, 1888.
21. *Charaxes fabius*, Fabricius. One specimen obtained in April.

Family LYCENIDÆ.

22. *Cardia thelis*, Drury. June and July; not common.
23. *Chilodactylus*, Cramer. April to August; very common.

50. *Ternstroemia eucharis*, Fabricius. Common from April to August. The specimens obtained from June to August are referable to *T. pseudomathis*, Butler.
51. " *deca*, Fabricius. May to August; very common.
52. " *amata*, Fabricius. April to July; very common.
53. *Catoplys leucopara*, Moore. July and August. The specimens obtained were referable to this species. The females differ greatly in the depth of the yellow coloration of the underside.
54. *Appias libythea*, Fabricius. May to August; not uncommon.
55. *Haydonia phryx*, Fabricius. April to August; very common.
56. *Belonch nardina*, Cramer. March to August; very common.
57. *D. eucharis*, Drury. July and August.

Sub-family PARNASSIÆ.

58. *Popilio distinctus*, Linn. Two specimens in May.
59. " *præpex*, Linn. A single specimen in May. Approaches *P. franchetii*.
60. " *leuco*, Linn. June to September; very common.
61. " *aristochloë*, Fabricius. March to June; not very common.
62. " *erithonius*, Cramer. March to August; very common.
63. " *phryx*, Linn. March to August; common. All three forms of female occur.
64. " *polygona*, Cramer. Three specimens in June.
65. " *apammon*, Linn. March to August. The commonest Madras *Popilio*.

Family HESPERIDÆ.

66. *Redania acclamationis*, Fabricius. June to August; common.
67. *Perata chryseus*, Cramer. June to August; common.
68. *Chama mathia*, Fabricius. April and May; probably common, but only a few specimens obtained.
69. *Parnassia guttata*, Reuter. Two specimens of the female obtained in July.
70. *Swarcia graminea*, Fabricius. June to August; common.
71. *Talbotia hirsuta*, Moore. April to August; common.
72. *Amphipia nana*, Fabricius. A single female in July.
73. *Tancredus nardina*, Fabricius. A single specimen in September.
74. *Antiopterus salasta*, Moore. A few specimens of the form *strepser* in June and July.

In addition to the species recorded in the above list the Madras Museum collection contains the following species captured within the

limits of the city of Madras:—*Certhia phoenicea*, *Halcyon*; *Heteropoda glaucopis*, Linn.; *Nephrolepis frontalis*, Moore (form *cylindrica*); *G. calia allagata*, Moore; *Uroloncha fides*, Cramer, and *Harporhynchus*, Fabricius.

XVII.—A new Trap-door Spider from Orissa.—By SEPTEMBER J. H. T. WALSH, I. M. S.

(Received Oct. 27th.—Read 6th November, 1892.)

MYGALIDÆ.

APLOSYCHIA, n. g.

Adelonychia nigrofasciata. ♀, n. sp.—At present the following description will be that of the genus also. The spider, which I think is new to mygen, measures 19 mm. The palps are reddish-brown in colour with long fangs which set vertically. Pedipalpi of medium length, the terminal joint furnished with a black pad of strong hairs. Eyes: anterior and central pairs large and of a blackish-brown colour, the hind-centrals and hind-externals small and pearly white. Cephalothorax reddish-brown above, whitish yellow below; fangs transverse with eight dark, shallow grooves radiating from it. The cephalothorax is markedly convex in front between the two anterior dark markings and slightly convex over the remaining part. Abdomen oval, truncated in front and convex on the upper than on the under surface. The ground colour above: greenish-grey with a central black stripe and several well marked black lateral stripes directed downwards and slightly backwards from the central line. The entire upper surface of the abdomen is covered with fine light-coloured hairs. Under surface of abdomen dull grey, the four lung sacs visible as small whitish spots; two pairs of whitish spinners. Legs: relative length 4, 1, 2, 2, pale reddish yellow above, almost white below. Tarsi without hooks (?) but terminating in brush-like black pads. Palps, pedipalpi and legs thickly covered with strong blackish-brown bristle-like hairs.

On the 19th January of this year I was out looking for ants in the forest near Kharla and while digging round the roots of a Banyan tree I turned up a tube with a lid which I at once recognised as the home of a trap-door spider of the "cork nest" class. I had unfortunately cut obliquely through the tube, but the lid and hinge were intact. Having found one tube I began to dig carefully round the tree, and was successful in finding an almost perfect specimen with the spider inside. The thread cut through the extreme lower end of the tube and disclosed the spider who made no attempt to escape downwards but clung tenaciously to the under surface of the lid. In order to enclose the spider and complete the tube, I went down to a neighbouring tank and

covered the cut and with mud. Although I continued to dig for some time in the neighbourhood I did not find any more specimens, and shortly afterwards was obliged to leave Khurda and return to my headquarters, taking with me the two nests and the captive spider. The situation of these nests is worthy of notice. They were in a cool sheltered spot which, as the tree would be a favourite resort for insects, no doubt formed an excellent hunting-ground for the spiders. The ground in which the tubes were found was sloping and bare. The spider found in the second nest was kept alive until the 8th of February and fed on flies, small beetles etc., but although I watched very carefully I never saw her come out of her nest and failed even to surprise her at night. All these spiders are shy and nocturnal in their habits, and there is no doubt that she did come out, as the bodies of flies placed close to the door of the nest at night were always found to be picked dry in the morning. On one occasion I lifted the door and propped it half open with the body of a spider; during the night the body was recovered and the lid closed down. Once or twice when I endeavoured to raise the lid of the nest the spider strenuously opposed me by clinging to the undersurface; at other times I was able to raise the lid and then the spider retreated to the bottom of her tube and never made any attempt to escape. When I wanted to remove the spider to put her into spirit I was obliged to stir her up with a straw before she would budge. She rushed out and ran down on to the floor, but almost immediately crouching close down to the matting and was evidently much distressed by the bright sunlight.

The larger tube measured 30 mm. by 16 mm. at the opening and 29 mm. at the widest part near the lower extremity. The whole inner surface was lined with a tough whitish brown fibrous membrane. The hinge was of the same material and covered about one-third of the edge of the lid. The diameter of the lid on the upper surface was about 20 mm., and this surface was covered with earth of exactly the same colour as the surrounding ground, making discovery almost impossible except by accident. The under surface of the lid was convex and covered with tough web similar to that lining the tube. The greatest thickness of the lid was in the centre, gradually decreasing towards the margin which was thin and fitted tightly over the aperture of the tube.

The tube in which the living spider was found was much smaller than the one just described, and as I wished to preserve the specimen intact, I did not make any measurements. These cast, I think, no doubt that both tubes belonged to the same species, and Macgregor distinctly states (*Trap-door Spiders*, pp. 122, 127, Ed. 1873) that as the spiders increase in size they enlarge their dwellings accordingly.

JOURNAL

OF THE
ASIAN SOCIETY OF BENGAL

Part II.—NATURAL SCIENCE.

No. IV.—1890.

XVIII.—*Natural History Notes from H. M.'s I. M. Survey Steamer
"Investigator,"* Commander R. F. HORTON, R. N., Commanding—
No. 17. *A List of Diamond Island Plants.*—By D. PRINCE.

(Received and read—7th May 1891.)

§ INTRODUCTION.

Diamond Island is a small tongue-shaped islet off the African coast. It is situated at the mouth of the Beasché River, in Long. 24° 18' E. and Lat. 15° 51' N., about 5 miles from Pagoda Point, 8 from Cape Negrin, and 9 or 10 from the lighthouse on Algodra reef. Its length is somewhat under a mile and a half, and it is about three quarters of a mile wide. The N. E. and S. W. corners which terminate the known axis rise rather abruptly from the sea. Except, however, at the extreme western end its shores all round is rather bluff and rises rapidly. It is rather a central small plateau than a ridge, the general level of this central portion being about sixty feet above the sea. There are three small breaks, however, in the sea face; a little water channel, dry in November, opens to the north; another, with a very little water in November, opens to the south; a third, somewhat larger and quite new to the last, but at one time found its way to the sea through the small patch of low land on the east, but a tidal having been thrown across its passage, about 100 yards from the sea, its channel has been converted into a tank about 150 yards long and 50 wide.

through the sand and mud, extending to the water of the sea at high tide, at the east and the west at low tide, from 6 inches to a foot of a structure as thick as the little finger and of the consistency of solid pine. The jungle along the south and east sides of the island commences at the edge of the sandy beach, the roots of the trees being reached by the waves at very high tides; the trees that grow at this line are *Tournefortia*, *Pongamia glabra*, *Erythrina*, *Terminalia*, *Calappa*, *Staple-gia discolorata*, and *Pinus* *terrestris*. East of the cleared part in front of the telegraph office and round as far as the graveyard, are a number of large *Tamarind* trees; it is not impossible that these have been planted. One specimen of *Terminalia* *Calappa* grows close beside the boat house, different from all the others in being in flower. There is no doubt that this particular tree is *T. Calappa*, and there is hardly a doubt that it is an introduced tree. But that the others (and it is a plentiful species in Diamond Island) which were all, like those on the coast and Port Blair in the Andamans, and five there were a week later on Table Island and the Great Coco, is almost ripe fruit in November and December, are quite wild and indigenous in the island scarcely admits of a doubt.* Underneath these trees along the south side occur *Hibiscus* *indicus*, not plentifully, however, and, especially towards the south-west angle of the island, *Dioscorea* *umbellata*. On the west side of the island, which is the most fertile and also side, the trees are not so tall and there are fewer in number, though all these species except *Pongamia*. But close to the beach on the west side is a dense hedge of *Terminalia* *umbellata*, *Tournefortia* *terrestris*, and *Clusia* *indica*, with here and there some *Pinus* *terrestris*. All these species occur on the north side of the island also, and at the extreme north-east corner there is a considerable patch of *Castanea* *spicata*. All round the island *Cassia* *uniformis* is plentifully it is associated on the western sea-face with *Pongamia* *plumifera*, *Ipomoea* *granulata* and *Ipomoea* *discolorata*; the last is an species of common that in the interior. On the south-west corner of the island, the most plentiful of the interior climbers, comes to the very water mark, it is a jungle all along; it is here and there accompanied by *Calappa* *umbellata*. There are several patches of *Ipomoea* *liloides* on the beach, but the species is not so common as it usually is in such situations; and *Ipomoea* *discolorata*, which has not been generally believed to occur so far north, is many times more plentiful. Near the mouth of all three streams, and also at the almost low tide-water, a corner of the island, there are considerable patches of *Opuntia* *sp.* The cleared space near the telegraph office is mainly covered by a short turf

* As regards other trees found on the point is impossible.

The island is said never to have been occupied by the Burmese, and has evidently been originally densely wooded.

The greater part of it is indeed densely wooded still, but a corner has been completely cleared between the watercourse that has been converted into a tank and the watercourse that passes south. On the cleared high ground between these two streams stands a telegraph office with a house for the telegraph-master attached; a little way off are servants' quarters. The clearing has been extended across this latter stream for a short distance, so as to provide a site for a shelter-butt for Bassin pilots while they await vessels bound for that port. Between the tank-bund and the sea, but nearer to the tank and close to its overflow, stand two Burmese huts occupied by collectors of *urlics*; <sup>between these huts and the beach is situated a small European grave-
yard.</sup> At the outlet of the other streamlet and opposite the safest landing place is a boat shed; from this point eastward for about 400 yards—along the sea-view of the telegraph-office, in fact—the jungle has been cleared away down to the beach. Everywhere else the jungle along the sea-face of the island remains intact. A plantain garden and a paddock of considerable size have been cleared on the central plateau behind the telegraph-office; elsewhere the jungle remains untouched; altogether between two-thirds and three-fourths of the surface of the island has not been interfered with. The beach itself consists of deep soft sand in which the streamlets disappear before they reach the sea; at low tide, however, long reefs, extending south and west of the island proper for half a mile or more, are laid bare. On the east side, where the telegraph cable lands, no reefs appear; at the north-west corner they do, but only extend seaward for 50 or 60 yards. The reefs consist of the same sandstone that forms the Arracan Yomah and that appears again first in the Andaman and afterwards in the Nicobar group of islands; they are altogether without coral.

The reefs and pools between them are remarkably destitute of marine vegetation, *Padina pavonia* and *Gouleya densifera* being the principal species, and both being in very small quantity. Not only are there very few growing Algae, but very few are washed ashore; these consist chiefly of a small green *Sargassum*. The absence of the submarine meadows of marine *Hydrocharide*, so characteristic of the otherwise similar pools among the coral-encrusted reefs of the Great Cocos, is very striking. There is no mangrove belt on any part of the shore, unless it be considered as represented by some small patches of *Avicennia officinalis* on the reefs about 20 paces from the beach; the individual plants send their roots along the seams between the layers of sandstone for considerable distances, and these give off rootlets that rise vertically

bearing well, there are the ordinary tropical vegetables; the only one that is noticeable from our present point of view is the bird's-eye chili (*Capsicum minimum*) which here, as in the Andamans and in Great Coco Island, has spread itself everywhere about the clearing and is even penetrating into the adjacent jungle. In front of the telegraph-office there are two rows of very weather-beaten Coco-nut trees of which only 14 are now left; probably if planted or sown along the edge of the bush they would have done much better; there is not at present, it may be remarked, a single Coco-nut tree in this situation anywhere round island.

The commonest tree throughout the island is *Bombax malabar* and next to it in point of numbers is *Albizia peters*; towards western end of the central table-land the latter is the more plant species, these trees at the extreme edge being stunted and weather-worn. Among the other trees and shrubs observed were *Chaetotia yuloni* (very abundant on the south side of the island,) *Conarus gill*, *Elipenthus duralaeifolia*, *Cordia ramiflora* (also very abundant on southern slope of the island,) *Lagerstrœmia Flac-Baginas* (a common tree on the Eastern part of the island,) *Isora rogersii*, *Persea* (a *Psychotria* *adenophylla*, *Ehretia laevis*, *Heterophyllum adenophyllum* *sucomense*), *Ipilolia tomentosa* and *Eleocharis microcarpa* (both frequent), *Portulaca* (not frequent,) *Mouroupa Tawara* (the only *Mouroupa* present and common on the south side of the island.) A common very striking undershrub is *Isora parviflora* in the open grown, the weather weather-beaten side *Opuntia* *chinensis*, *Persea* *sucomensis*, *Adiantum* *oculata* are common. *Burkea*; along the water course leading the north side of the island *Adiantum* *luculentum* occurs, not frequent however, and it does not appear to be anywhere else on the island, the only other fern met with here the water-fern *Ceratopteris* and a climbing species, *Lycopodium* *foeniculaceum*. Quite as striking as the absence of ferns is the absence of any species of *Belaginitia*; still more striking perhaps, considering the proximity of the island to Burma, is the absence of *Bauhinia*.

In the interior the ellianum met with were *Cycas peltata* (frequent), *Albizia* *prostrata* (exceedingly common,) *Morinda* *sonnerati*, *Eugenia* *ambigua*, *Leuca* *myrsinacea* (only on the western side and, like the *Cycas*, not like *Ipomoea* *digitata*, spreading over the sea-face as well as occurring in the interior jungle.) *Wallaghtia* *elata* (only met with once,) *Leuca* *myrsinacea* and *Ipomoea* *digitata* (both common,) *Burkea* *ambigua* (spreading over adjacent species, but hardly a climber,) *Persea* *sucomensis* very common, as are *Dioscorea* *gibba* and *Ipomoea* *digitata*; a *Colocasia* (*C. tipica* Kurz f.) forms a great part of the

in which *Eleusine indica* is the only grass that appears in tufts; behind the boat house is a tangled patch of *Colubrina asiatica* and *Conocarpus Bonplandii*; on the road leading from the boat house to the telegraph office is a quantity of *Ipsomoea denticulata*, at the back of the office a large patch of *Adenostemma ricatum*, between the office and the servants' quarters a large patch of *Ocimum basilicum*, lower down and near the tank two or three extensive patches of *Cassia alata*. *Vernonia cinerea* is very common all over the older clearing, but *Ageratum conyzoides*, usually such a common weed, is quite rare as yet. *Urena lobata* is common towards the edge of the clearing nearest the jungle, but is less common than *Melastoma corchorifolia* is; the latter is also the commonest weed in the newer clearing in the centre of the island. *Sesuvium portulacastrum* is plentiful in both the old clearing and the new, but the common *Sida* are conspicuous by their absence. The wet soil near the edge of the tank is covered with broad patches of *Euphorbia thymifolia*; associated with it is *Vanillea crustacea* which is, however, less plentiful; over the tank still, or even growing in the shallow water at the eastern end, are *Sphaeralcea coccinea*, *Hydrilla azulica*, *Limonium confertum*, *Scirpus articulatus* and *Ceratopteris thalictroides*, all very profuse. In the tank itself grows *Nymphaea* * *lotus*, but not very commonly; the red form is not present*; *Nymphaea delata* too is absent; *Nelumbium speciosum*, however, is there. Perhaps the most interesting water plant present is *Limnolobos parviflorus*, only known previously from the transgangean peninsula through a gathering in Chittagong by Hooker and Thomson and one in Java by Wallich. The present gathering thus comes in midway between these two and perhaps indicates that the species only requires to be looked for in order to be found elsewhere in lower Burma. Besides the *Tamarindus* already referred to, there are near the houses of the Burmans some trees of *Moringa pterygosperma* that have evidently been introduced; in the same situation there are also a few *Cassia* trees and some *Platanus*. In the central clearing the telegraph master showed me what he imagined to be Mangrove trees belonging to him; the trees are, however, not trees of *Sonneratia* but of *Garcinia cornu*. He had, beside these, some trees of *Citrus medica* and *C. Aurantium* not doing very well; there were also by also some trees of each of the species *Myrsine glauca*, *Artocarpus Chalapaka* and *Antiaris toxicaria*, all either planted or preserved when the clearing was made; the present telegraph-master, who has been there many years, says they have been there since before his time. In his plantain garden, where he has some of the figal fruit-giving varieties and all

* In Great Coco Island it is only the red variety of *N. lotus* that occurs in its small lake.

interior jungle: *Schlotheimia officinalis* is very common everywhere in the interior and coast more alike and is the principal epiphyte. Not a single orchid was seen anywhere in the island. A few *Ficus* were found growing on dead wood; the season of the visit was apparently unsuitable for terrestrial species.

The visit of H. M.'s I. M. Survey Steamer "Investigator", in November 1892, to leave a survey-party is not the first scientific visit made has been paid to this island. Almost exactly one hundred years ago it was visited by Captain Kyd and Lieut. Colebrooke* who in 1793 determined its position, both absolutely and in relation to adjacent headland on the African coast. It is not probable that any natural collection engaged the attention of these officers; but during their visit by a scientific party (April 1866) in H. M.'s I. M. S. S. "Porpoise" Mr. Kurz, who was on board, landed and collected a few plants. Mr. Kurz makes a very interesting remark on this visit the 14th is worth repeating here:—"I had only a few minutes stay at the island, but I was struck, when afterwards 'reading' the *Arabian Nights*, by the similarity, nay rather identity, of the *Arabian Nights* 'Arabian Nights'."† The present collection is itself the result of only a few days' work, and is larger than it otherwise could have been, owing to the help given by Dr. Alcock, Surgeon-Naturalist of the "Investigator". During the time during which the state of the tide prevented the party from being on the rocks to assist the writer in obtaining specimens of the plants. The 16 species that it includes forms it is true only a part of what the island would yield to any one whose stay there could be prolonged; but it is hardly too much to assume that they are fairly representative of the flora of this island. And as its geographical position and geological structure both point to it as the first stepping stone in the series of islands connecting Africa with Sumatra (through the Andamans and Nicobars) the nature of the flora seems worthy of investigation.

The following is the method of presentation adopted:—

1. A list of the plants collected is given; any interesting feature regarding a particular species is noted where it seems necessary to do so, and in every case the dissemination of the species is adverted to.
2. A tabular view of the distribution of the species is presented.

* Asiatic Researches, Vol. IV, p. 217, the date of this visit was 14th December 1793.

† Report on the Expedition of the Indian Armada (1830) p. 12. Mr. Kurz was on board the "Porpoise" in an extended voyage which touched all Lower Indian Archipelago, to Africa, and to Faga proper; Mr. Kurz's remark here will be discussed further on.

the distribution within transgurgetic India being sub-divided as follows:—a. Aracan, Chittagong, Assam; b. Pegu, Tenasserim, Malay Peninsula; c. Andamans (including Coco Islands), Nicobars, Sumatra and Java. This is necessary for a proper understanding of the peculiar features of the flora of the island which forms (or at any rate is an excellent representative of) the area wherein these three lines of distribution meet and in which their species intermix.

B. An analysis in terms of the preceding sections is undertaken and the arithmetical values of the various relationships computed.

§ 5. LIST OF THE PLANTS COLLECTED IN DIAMOND ISLAND.

MENISPERMACEÆ.

1. *CYCLES PECTATA* Hook. f. and Thoms. Common.

NYMPHÆACEÆ.

2. *NYMPHÆA LOTUS* Linn. In the only tank, uncommon; the red form is not present.
3. *NELUMBIUM SPECIOSUM* Willd. In the tank.

CAPPARIDACEÆ.

4. *CAPPARIS ESTIARIA* Linn. var. *GRANDIFOLIA* Kunt (MSS. in Herb. Calcutta); forma ramis foliisque glabris, foliis floribus et fructu quam in forma varietatum aliarum multo majoribus. DISTRICT, Table Island and Great Coco Island, (Sp.); South Andamans, (Kunt) In Malacca Island and in Bali, (Teyssmann in Herb. Calcutta). In Timor and in Ceylon-China (as Mr. Hemslay informs me) occur forms that connect this very distinct looking form with the typical plants. Branches green; leaves regularly elliptic, retuse; petioles 0.5–0.7 cm. long; lamina 6–10 cm. long by 4–5 cm. broad, quite glabrous both above and below, or with a few scattered hairs, that soon disappear, on young leaves beneath; flowers 15 mm. in diam.; pedicels 15 mm. long; gynophore 8 mm. long; fruit 10 mm. in diam. (in Java specimens) to 14 mm. (in Diamond Island ones).

In the ordinary Indian plant, which also occurs without any considerable variation in Burma and in Perak, as well as in the S. Indian variety (*acutissima*) and in the Ceylon variety (*retusella*), the measurements are: petiole 0.2–0.4 cm., lamina 2–3 cm. long by 1.5–2 cm. broad; flowers 7–12 mm. in diam., pedicels 10 mm. long; gynophore 5–6 mm. long; fruit 7–9 mm. in diameter.

Except, however, in the greater size of all its parts—most notable as regards the anthers—which in var. *grandifolia* may be three times as

those in any of the other varieties—this plant differs in no essential character from *G. sepiaria*, Wall.; the ovary as in the type is glabrous, oval and pointed, the fruit is spherical and black. It is an extensive climber and in the interior jungle is one of the commonest species, it also extends into and covers the shrubby species of the coast zone.

GUTTIFERÆ

5. *GARCINIA CORNETA* Linn. In the telegraph house garden, cultivated.

MALVACEÆ

6. *URINA COCATA* Linn. Clearing behind telegraph-office.
 7. *HIBISCUS THIBETICUS* Linn. Coast plant, south side of Island.
 8. *THEPPEA POSUYLEA* Carr. Coast; very frequent all round the Island.
 9. *BOMEX MALARABITUS* DC. The commonest tree in the Island.

STERCULIACEÆ

10. *MISCHIA GONDIOPHYLLA* Linn. Very common in the central clearing.

RUTACEÆ

11. *CITRUS MEXICA* Linn. In the telegraph-house garden and elsewhere; planted.

CHAULLETIACEÆ

12. *CHAULETIA ELLOANESHA* Hook. f. Very abundant on the south side of the Island.

RHAMNACEÆ

13. *COLEBUTIA ASIATICA* Broug. One large bush beside the lighthouse, and here and there throughout the Island.

AMPELIDÆ

14. *LEEA PARALLISA* Wall. Very common throughout the Island.

MORINGACEÆ

15. *MORINGA PTERYGOCARPA* Quesn. Some trees near the Tale of Burmans, between the tank and the sea.

CONNARACEÆ

16. *CONNARUS CHINENSIS* Wall. In the interior jungle.
 17. *CONNARUS SAMBICUS* Griff. Very abundant, towards south side of Island.
 18. *ELLIPARINUS STREPTILAMINUS* Prain. Coast zone, south side.

LEGUMINOSÆ.

19. *Dioscorea cuneolata* DC. Shrub species? Frequent, especially on the west and north sides of the Island.

20. *Apocynum venetum* Linn. Very frequent everywhere in the Island.

21. *Erythrina indica* Lamk. A purely coastal species here, as it also is in the Andamans and in Great Coco Island. In the Great Coco it is, however, rather common; a striking contrast with the situation in Diamond Island where this tree forms an almost unbroken ring round the coast.

22. *Mimosa monosperma* DC. Very common in the interior jungle.

23. *Pueraria frutescens* Benth. Common on the western slope of the Island, climbing over bushes of *Tournefortia crista* and creeping in the grove at the late north-western corner of the Island.

24. *Canavalia ensiformis* DC. A climber all round the coast, especially common on west and north sides of the Island; not met with in the interior.

25. *Pueraria glabra* Vett. Frequent in the line of trees immediately behind the sandy beach.

26. *Canavalia Bonatiella* Ham. A thicket behind the beach.

27. *Cassia alata* Linn. Two or three large thickets between the telegraph office and the tank.

28. *Tournefortia coccinea* Linn. Several large trees behind the beach, between the telegraph office and the graveyard.

29. *Excoecaria agallocha* Benth. Common all over the island.

30. *Albizia leucacantha* Benth. A common tree, especially in the western half of the island; these trees exposed to the S. W. monsoon are gnarled and dwarfed and weather-beaten.

COMBRETACEÆ.

31. *Tournefortia Cavendishii* Linn. Frequent in the line of trees of grove. One tree overtopping the bushiness and probably an older specimen, was in flower in November; the others were all, as they were in South Andaman and in the Great Coco, in fruit.

MELASTOMACEÆ.

32. *Oreocoma cuneata* Linn.; *O. B. Clarke* in F. R. I. Frequent in the low grassy slope at the south-western corner of the Island. The form present in Diamond Island differs from typical *O. cuneata* somewhat in shape and form of leaves and calyx; in these specimens, leaves

7 cm.; 4 cm., ovate, acute, base subcordate; inflated ovary 6 mm.; 4 mm.; tubular neck of calyx 4 mm. long; 3 mm. diam. at junction of inflated and tubular portions and 5 mm. diam. at mouth. The specimens of this gathering precisely accord with specimens collected by Kunt in Arizona; they agree as to calyx with specimens collected by H. Scott in Peru; as to leaves they resemble specimens collected in Pinarbath and in Chetix Neger by T. Thomson, by Kunt, and by J. J. Wood.

LYTHRACEÆ

33. *LOOSESTICHIA FLO-ROSCA* Retz. A common tree in the eastern part of the island and to the north of the tank.

CUCURBITACEÆ

34. *URVA SPITTECK* Mill. Not infrequent on the western side of the island.

RUBIACEÆ

35. *STROMBILUS HYDROPHILA* Hook. f. Frequent in and immediately behind the coast zone.

36. *GUSTAFIA JAMAICA* Lam. Common on the north coast of the island; this appears to be the first occasion on which the species has been collected so far north as America.

37. *URVA SPITTECK* Wall. Frequent on the western part of the island; known from Peru and Tennessee; now, therefore, from America also.

38. *PISTIA LIMA* Linn. Common in the interior.

39. *PERUVIA MAMMILLA* WALT. Common in the interior.

COMPOSITÆ

40. *VERVINA CINREA* Less. Waste ground about telegraph-office; also on bare ground at the south-western corner of the island.

41. *ADENOTERIS VIGORIS* Fourn. var. *PARTICULARIS* Hook. f. Behind the tank-house.

42. *ANALITHA CANTABRICA* Linn. Only a few plants seen near the side of the tank.

GOODENOVIEÆ

43. *SCAVOLA KENTON*, Vahl. On the west and north shores; common.

CAMPANULACEÆ

44. *STROMBILIA EXULANS* Griseb. At the margin of the tank (western end); profuse.

APOCYNACE.

45. *Willdenowia bicolor* Hook. In the interior jungle, only one met with.

46. *Tournefortiana corymbosa* Hook. Very abundant on the west and somewhat less frequent on the north shore. A distinct northern extension to the distribution of this species which has been hitherto known from the Andamans and the Nicobars only. Foliolate 3-ranked, green, 2.75 cm. long, 1 cm. suboposterior, 0.75 cm. lateral diam., sessile or subsessile (leaf sheath reserved 6 mm. long) semicircular (ventrally concave, dorsum straight or very slightly concave), when opened flat 3.25 cm. across; anthers brilliant scarlet.

47. *Ipomoea pes-caprae* H. B. Extensive climber; frequent in the interior. Flowers sweet smelling; corolla here purp. white, but purple.

ASCLEPIADACE.

48. *Datura metel* L. In the interior jungle; frequent.

GESTIANACE.

49. *Isotriaena sarkavolia* Griseb. Plentiful near the west-end of the bank and the only species present. A species with, so far as is known, a somewhat detached distribution.* It is plentiful in the western Deccan and in Ceylon. This gathering is intermediate in its situation between that of Hooker and Thomson (Ceylon) and that of Wallach (Harvey)—the only two previous gatherings recorded from the Trans-gangetic Peninsula; perhaps it indicates that it would be otherwise found if particularly looked for.

HYDROPHYLLACE.

50. *Ruellia latifolia* Vahl. Swampy ground at west end of bank; plentiful.

BORAGINACE.

51. *Portulaca zoster* Hook. Common; all the specimens from this locality are apparently glabrous; there is no indication of any trace of glands, even on young branches, on young leaves, or on the youngest flower-buds.

* Another species with a somewhat detached distribution is *E. acuminata* D. C., a common species in the western Deccan and Ceylon (from Hooker's bank visits), but it is not reported to be recorded to this area. Excellent specimens have been seen from the island (collected 1890) by H. T. Peck, Esq., from Panayagunge near Dacca, and collected by Dr. G. King, F. R. S.

CONVOLVULACEÆ.

22. *HYPERICUM VERTICILLATA* Roeb. var. *verticillata*, Clarke. A small independent wild-growing tree; leaves glabrous opposite, serrate, at base, crude secondary nerves scarcely visible beneath with dense parallel white flaccid and rusty-tomentose sheath. The growth highly glandular intermediate between those noticed for the variety—*Chilodactylon* (Houllet) and *Medanense* (several collectors).

23. *IPOMÆA ANTHURIFORMIS* Lamk. Very common, climbing amongst the Coast species on the western and northern side of the Island, and also for a little way amongst the adjacent island species.

24. *I. PASTORIS* Linn. Common with the preceding on the western side of the Island.

25. *I. CONVULSIVA* Champ. By the side of the stream between the beach-house and the plant-house, beside the path leading to the telegraph office, along the closed slope between the telegraph office and the sea, and again at the north-east corner of the Island, all were plentiful. The distribution of this species, as far as we were known in 1873, was (F. B. I., v, 28) "Habit: Paumotu; from Mergu to the Cape. Cultiv.: none; was the one at Oahu. Synonym: its earlier cultivation being "Malaya, Australia, Polynesia, Seychelles." But it is also known to extend farther up the Bay. It occurs in the Archipelago. Is considerably abundant on the Great Coast, was collected by Kurz at Kolik on the shores of the Bay during his latest journey. Is very plentiful here in Diamond Island, and was collected by Kurz at Avela which is still farther north. In the Great Coast a massive hedge of this species and the next is their habitat. This species converts red of coral shingle beaches into purple macadam; on this shingle not a single plant of *I. biloba* is to be met with; but everywhere stretches of low sand at the heads of bays are completely covered with *I. biloba* and not a plant of *I. convulsiva* is to be seen. Whenever a little cleared patch of soil occurs near the sea the two species appear in it plentifully with *S. alba*.

26. *I. RUBRA* Forst. Sand-covered to north and west side of island, not plentiful. Also with the preceding species between the beach-house and the telegraph office.

SOLANACEÆ.

27. *CAPSAICA ANTHURIFORMIS* Roeb. In the telegraph-master's garden, cultivated, but also all over the western clearing, spontaneous.

SCROFULARIACEÆ.

28. *LYCOPHILA CURTANA* Roth., Hook. f. Is mostly grazed along with *H. biloba*.

59. *VALERIANA SCUTICARIA* Benth. On wet banks of the tank at west side.

60. *SONCHUS OLERACEUS* Linn. In cleared space behind telegraph-office.

BIGNONIACEÆ.

61. *HYDOPHILUM AUSTRO-INDICUM* Sonch. Frequent in the interior.

ACANTHACEÆ.

62. *THEMIDIA LINDLEYANA* Lindley. Common.

VERBENACEÆ.

63. *PERSEA INDIENSIS* R. Br. Local species; common.

64. *VITIS NERUVA* Linn. Leaves mostly 4-pinnate. On the west side of north side of island, but only in two places.

65. *CLIMEXINUS THUNBERGII* Gaertn. Very common on the coast here, and also throughout the whole of the Andaman group.

66. *AVICENNIA OFFICINALIS* Linn. On the sandstone rocks, but only in two or three places, to the south and west sides of the island.

LABIATÆ.

67. *ORCHOM. HAMILTONI* Linn. Waste ground behind servants' quarters of telegraph-office buildings. This is only Orleania that has been before me. In South Andaman the tree *Tala* (*O. sancta*) is the one that has become naturalized; in the Laccadive group it is the *R. indica* (*O. grandis*) which occurs as if wild.

68. *ANDROMEDA SPATA* R. Br. Here and there in open parts of the interior and plentiful on the bare part at the south-west corner of the island; and in the cleared space near the telegraph-office.

MYRISTICACEÆ.

69. *MYRISTICA ELATER* Blume. Only one (female) tree seen, near the *Quercus*.

EUPHORBACEÆ.

70. *EUPHORBIA TRIANGULARIS* Burm. On wet banks of the tank, plentiful; seeds red.

71. *BURSERA TORREYANA* Blume. Plentiful; absolutely glabrous in every part and in this respect quite like specimens collected by Kurz in Pegu.

72. *FAUCONIA SINGAPORENSIS* Thunb. A small tree; common in the interior.

73. *MACARANGA TANANTUS* Muell.-Arg. Plentiful on the south side of the island. This locality is a very distinct extension northwards for the distribution of this species which has been hitherto known only from South Andaman, Nicobars, Perak and Malacca. Dr. King has very kindly verified this determination for me.

URTICACEÆ

74. *ARTOCARPUS CHARTANUS* Roth. Only once seen, near the *Glavcinia* and *Hydnora*.

75. *ANTHURUS TOSTIVALIS* Lessch. Only once seen; the tree is close beside the preceding and is said by the Burmese (turtle-collector) to be the only one on the island; it may have been planted, but it is difficult to suppose by whom.

76. *Ficus RIVINII* Blume. Lateral; a very large tree, commonest on the south side, but plentiful all round the island.

77. *F. viciosa* Linn. f. In the interior, not very common.

SCITAMINEÆ

78. *Musa sapientum* Linn. Planted in the telegraph-master's garden.

DIOSCOREACEÆ

79. *Dioscorea OLIVERA* Roth. Common.

LILIACEÆ

80. *Smilax RICHMONDII* R. & H. With *Calamus* and *Pandanus* forms much of the interior jungle.

PALMEÆ

81. *CLAVUS THUNBERGII* Kunt? Very plentiful; not in fruit.

82. *Coccothrinax Linn.* Planted only; a double row containing 14 trees in front of the telegraph-office and a few others near the Burmese's huts.

AROIDÆ

83. *SCHOLASTIA REPIDIVALLIS* Schott. Epiphytic common on the coast side and the interior also.

CYPERACEÆ

84. *Cyperus REPENS* Linn. On all bare places, sand, the coast whether grassy or rocky; also in mud beside the back pools and on the banks of the water-course beside the boat-house.

66. *Sargassum articulatum* Lamour. In the shallow water at west end of tank.

GRAMINEÆ.

67. *Heteropogon contortus* (L.) Gaertn. Tufts of this grass occur along the path from the shore to the telegraph-station.

FILICES.

68. *Adiantum acrostichum* Bernh. Only along the water-course on the north side of the island.

69. *Ceratopteris thalictroides* Brongn. Common at the west end of the tank.

70. *Isodon flaccidus* Sw. Common in the interior.

FUNGI.*

71. *Hexagonia similis* Berk. On dead wood; interior.

72. *Hymenochaete polypora* Mont. On dead wood; interior.

73. *Strombosia cyathophora* Fries. On dead wood; interior.

74. *Polyporus occidentalis* Berk. On dead wood; interior.

ALGÆ.

75. *Enteromorpha flexilis* Grall. On sandstone rocks.

76. *Enteromorpha flexilis* Grall. On sandstone rocks.

SUMMARY OF THE SPECIES OBSERVED AT DIAMOND ISLAND.

A. GENERAL.					NAME OF SPECIES.	B. SPECIAL.				
						Fruit- ing-time.		Col. of specimens.		
America.	Alaska.	Europe.	Asia.	Africa.		Spring.	Summer.	Autumn.	Winter.	Color.
x	x	x	x	x	<i>Cyrtocarpus</i>	x	x	x	x	x
x	x	x	x	x	<i>Synchytrium</i>	x	x	x	x	x
x	x	x	x	x	<i>Sclerotinia</i>	x	x	x	x	x
x	x	x	x	x	<i>Uromyces</i>	x	x	x	x	x
x	x	x	x	x	<i>Uromyces</i>	x	x	x	x	x
x	x	x	x	x	<i>Uromyces</i>	x	x	x	x	x
x	x	x	x	x	<i>Uromyces</i>	x	x	x	x	x
x	x	x	x	x	<i>Uromyces</i>	x	x	x	x	x
x	x	x	x	x	<i>Uromyces</i>	x	x	x	x	x

* Mr. Hansen, through the good offices of Mr. Hensley, F. A. S., has very kindly supplied the names of these Fungi.

The proportion of forest species to the whole is 30 : 37, or 81 per cent, whereas in the case of the congeneric and almost cosmopolitan species the proportion of forest species to the whole is 10 : 30, or 33 1/3 per cent only.

To complete the account of the distribution of these species it is necessary to examine their special distribution throughout South-eastern Asia. From this it is possible to compute the relationships of the Diamond Island fauna to those of the three adjacent areas: Armenian, Indo-Malaya, Andamans-Nicobars respectively.

We find that 17 species are in distribution both Cis-gangetic (i. e., are present in India, or in Ceylon, or both) and Trans-gangetic (i. e., are present in some or all of the three areas whose influence meet in Diamond Island). The remaining 17 species are Trans-gangetic only, so that as regards the composition of the Diamond Island fauna the Indo-Chinese influence bears to the Indian a proportion of 95 : 77 (or say, nearly of 2 : 1); in other words the Indo-Chinese influence is 44, or just under 12 per cent, stronger than the Indian. The details of this distribution are more completely given in the subjoined table.

TABLE II. *Distribution of the Diamond Island species in S. E. Asia.*

Species both Trans- and Cis-gangetic	17
Abundant in all the three areas	20
Abundant in Cis-gangetic distribution	7
Abundant from Ceylon only	4
Abundant from India only (represented by <i>Centropus</i>)	1
Abundant from Yunnan only	10
Abundant from Andamans-Nicobars only	9
Abundant from Indo-Malaya only (from <i>Neophila</i>)	1
This species only represented in Armenia by the Diamond I. gathering only	
Abundant from both Andamans and Indo-Malaya only (from <i>Centropus</i>)	1
Abundant both from Cis-gangetic and Trans-gangetic distribution	4
(These are all about <i>Centropus</i> from the Andamans and Indo-Malaya)	
Trans-gangetic only	13
Common to the three Trans-gangetic distributions	10
Diamond Island only: Armenia, Japan, etc.	7
Represented in Armenia by the Diamond I. gathering only	4
Catched near	10

TABLE III. Relationship of Transitory Distribution to Habitat and Habitat

HABITAT	DISTRIBUTIONAL FEATURES	HABITAT					
		Lowland Forest	Highland Forest	Open Forest	Open Forest	Open Forest	Total
20 10 10 10 10	In all 3 districts and widely distributed in the Arakan-Arakan district	8	8	22	7	14	59
2 2 2	In all 3 districts but represented in Arakan by the Diamond I. gathering only	1	1	1	1	1	5
10 4 2 2 4	Almost from Andaman-Nicobar, but widely distributed in Arakan	1	1	10	3	1	16
2 1 1	Almost from Arakan-Nicobar and only represented in Arakan by the Diamond I. gathering	1	1	1	1	1	5
2 2 2	Almost from Pegu and at the same time only known from Arakan by the Diamond I. gathering	1	1	1	1	1	5
1 1 1	Almost from Pegu and Andaman; widely distributed in Arakan-Arakan	1	1	1	1	1	5
1 1 1	Only known from Arakan-Arakan	1	1	1	1	1	5
	Total	14	14	36	10	11	85

The first line of this table represents that element in the fauna of the island wherein the influence of the three adjacent districts may be assumed to act indifferently; the second line that wherein the influence of the Arakan district is to be eliminated and only Pegu-Malayan and Andaman-Nicobar influences (presumably equally) prevail; the third line that wherein Pegu-Malayan and Arakan-Arakan influences prevail, while Andaman-Nicobar influence does not act; the fourth contains the element representative of Pegu-Malayan influence alone; the fifth that representative of purely Andaman-Nicobar influence; the sixth that representing purely Arakan-Arakan influence; the last, like the first, includes a element wherein the influence of the three areas act indifferently but in the opposite way. As however this element (the smallest) is here only represented by one species, it is not necessary or useful to employ it in computation, and since Diamond Island is presumably inseparable from Arakan this species is treated as indicative of Arakan influence.

Reverting from particulars the Andaman influence is stronger than either the Pegu or the Arakan influence is, so far as positive evidence goes, the three are here almost exclusively Andamanian species as

compared with only two exclusively Archaean and one exclusively Pagan species. The negative evidence, however, points rather the other way, for there are no fewer than eight species* indicating the absence of Andaman influence, as against only *one*† indicating the absence of Archaean influence, and *two*‡ indicating the absence of Pagan influence. But it has to be kept in mind that the Andaman flora is by no means as well known as the flora of the other two districts are and this negative evidence may be expected to be decreased, while there is no reason why the positive evidence may not be increased. The significance of every case is small for special inferences being drawn from them.

The relative values of the influences of these three adjacent areas are more accurately determinable from general evidence. In applying this it is necessary to use in each case its own value, the figures yielded by each possible distribution—1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100. The following are the results—

I. Andaman-Niuean influence	$\frac{1}{2} + \frac{1}{2}$	$= 1$, or 2.7%
II. Pagan-Malayan influence	$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$	$= 2$, or 5.4%
III. Archaean-Archaean influence	$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$	$= 3$, or 7.7%
		$100 = 100\%$

This method of computation may be extended to each of the subdivisions under the general headings 'habitat' and 'habitat'. For some of these it is not, however, necessary, from either no particular information is to be derived. Under the heading of habitat, however, an analysis of the status of island and of coast plants is not without interest, especially when these are expressed as percentages, and compared with those affected by the general total. They are—

Island status—		
Andaman	$= \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$	$= 3$, or 7.7%
Pagan	$= \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$	$= 4$, or 10.5%
Archaean	$= \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$	$= 5$, or 13.9%
		$100 = 100\%$

* Obtained by adding together the totals of lines 3, 4, and 5.

† Obtained by adding together the totals of lines 3 and 4.

‡ Obtained by adding together the totals of lines 3, 4, and 5.

CHART NUMBER —

$$\text{Anderson,} \quad = \frac{V}{V} + \frac{1}{2} = \frac{34+12}{3} = \frac{V}{V} = 7\frac{1}{2} \text{ or } 352\frac{1}{2}\%$$

$$\text{Page,} \quad = \frac{V}{V} + \frac{1}{2} = \frac{34+3}{3} = \frac{V}{V} = 6\frac{1}{2} \text{ or } 305\frac{1}{2}\%$$

$$\text{Armen,} \quad = \frac{V}{V} + \frac{1}{2} = \frac{34+3}{3} = \frac{V}{V} = 6\frac{1}{2} \text{ or } 305\frac{1}{2}\%$$

 75% 100%

Comparing the results in these three series of figures we find the general influence differs from the special influence exhibited by the varieties of the island and the coast element of the flora as follows:

TABLE IV. Comparison of Results.

	Species in flora generally.	Island species.	Coast species.
Anderson influence responsible for in isolation of	20.27%	24.56%	25.84%
Page " " " " " "	26.44%	29.02%	27.52%
Armen " " " " " "	31.77%	30.41%	28.98%

It will at once occur to the reader that a falling understated this calculation so far as the Anderson influence is concerned, when he notes the low figure at which that influence as regards island species is given. This low figure, however, only affects minor portion of the part of the system, since it is strictly the island portion of the Anderson flora that is as yet inadequately known. The Anderson coast species are, however, nearly all well known as the Hawaiian or Malayan coast species, and it is interesting to find that for this element the equivalent numerical expression of the Anderson influence is decidedly higher than are the figures for Page or Armen. The only fallacy underlying the evidence from these figures is that which attends all calculations from numbers that are absolutely somewhat small. As a result they show low just was the passing observation made by Mr. Kura on his visit to Diamond Island in 1905.* The only point of

* Also given in the text (p. 224) and referred to in footnote 1.

which emphatically requires to be put in juxtaposition with the remark is that this striking "similarity, or rather identity of the above regulation" is due less, as Mr. Kinn appears to imply, to the general resemblance that subsists between the *Andaman* as a whole and the *Malaya* as a whole than to a special resemblance that subsists between *Diamond Island* as the first segment, and the *Andamans* as the continuation of a special geographical district wherein both are considered separate—a connection which is strikingly exhibited in those features wherein they together differ from *Burma* and *Malaya* as in the features wherein they alike agree with those two areas.

XIX.—*Serris Inlet*. III. *Some additional species of Leptura*.

By D. Prain.

(Received 21 November 1891, and read 2nd December 1891.)

THE account of the Indian *Leptura* in the *Flora of British India*, vol. vi, pp. 681–720 was published in January 1885, and since then a number of forms new to India, including a few new to science, have been reported from various portions of the Indian Empire. Having been directed by Dr. King to arrange the Indian material of the order preserved in the Calcutta herbarium, and having had at the same time the advantage of the use of the material of the order in the *Peninsular herbarium*, kindly lent for study by Mr. Dalman, as well as of that in the private herbarium of Dr. Wall, kindly placed at my disposal by Mr. Bower, I have taken the opportunity to provide diagnoses of all the forms new to India arranged according to the method of the *Flora* and now presented thus to the Society in the hope that they may prove of interest to entomologists who may be labouring in the field near the various Indian frontiers.

1. *OCIMUM* Linn.

O. Osmum Kinn. Coll. 2. *Head*.—Antennae stout slender, slightly beaded, basally petiolated decussately paired; rather thick, slightly hairy beneath. Sclerites above, narrowly plate-like lamellate, coarsely punctate beneath. Soft palpi, basally, lateral setae about 7 pairs oblique. *Mentum*.—Spiracle long bar, bristles small subventral spinous, setae 4–5 per seta, setae short, edge bristles numerous, 2 long dark subterminal very long, subulate spinous, bristles elongated dry, rigid conspicuously paired upper lobes subulate slightly curved, setae the palpal bristles similar lower lip slightly convex upper 4 set, bristles short 2

erect upper pair slightly thickened at the base; nodule granular, pale, smooth.—*Orchidaceae* Coll. & Herbar., *Ann. Bot. Soc. Lond.* 112 (1890).

Buxia.—Meibomia, Coll. n. 877.

Apparently perennial, stems more than 30 cm. high; leaves 2.5–3.5 cm. long, 0.75–1 cm. across, distinctly gland-dotted; sometimes terminating in a few sterile coloured bracts, bracts 2.5 mm. diam., pedicels 4–6 mm., calyx 3 mm. long 2 mm. across (fruiting 4 mm. long 4.5 mm. across, lower teeth strongly aristate), corolla tube 8.5 mm. long, externally pubescent as near the lip, lower lip 3.5 mm. long; stamens 10 mm. long; anthers 4 mm. diam.

A very interesting species unlike any Indian *Orchidaceae* and belonging to the *Orchidaceae* (*Himantia*), nearly related to the African *O. abundant* and *O. glaucescens*.

7. ORTHOSIPHON Benth.

* * * Calyx throat white, stamens few-staked.

8. *Orthosiphon* PARTHUR FLEMING: slender, glabrous, stem short or long; leaves decussately paired, pairs 3, lowest usually smallest even-veined, middle pair largest, all long petioled, ovate-acute gradually tapering from widest truncate or cuneate base, margin distinctly serrate on one side or entire, upper surface sparsely hairy under surface glabrous except the nerves, nerves very long, bracts narrowly ovate-acuminate slightly exceeding pedicels, calyx bilobate campanulate 2 lower teeth tubular, corolla blue, tube very slender 3½ times as long, lower lip narrow concave, upper 3-lobed, margins glabrous, filaments naked, lower as long as corolla, anthers broadly oblong, compressed, minutely reticulate irregular.

Buxia.—Pernambuco, Paraíba, São João do Rio, 2000 feet, Coll. D. P. Fleming, Proctor; Maymya, Dr. King's collection.

Herbaceous short tubular woody 1.5 cm. long 0.5 cm. thick, leafy stems 1–20 cm., internodes about 3 cm., petioles 2–5 cm. long, lamina of middle pair 7–13 cm. long 2–6 cm. across, of other pairs 3–7 cm. long 2.5–4 cm. across, nerves 6–11 cm. long, whole 6-lobed, about 2.5 cm. apart, bracts 3 mm. long, 1.5 mm. wide, margins acute bilobate, pedicels 2–3 mm. long, calyx 4 mm. long (as fruit 7.5 cm. long); corolla tube 8 mm. long, externally pubescent as near the lip, lower lip 6 mm. long, 2 mm. wide, upper 3-lobed, lobes 2 mm. long, 2 mm. across, filaments 1.5 mm. long, anthers 1.5 mm. long, margins ciliate sub-regularly, style 1.5 mm. long 1 mm. across.

Not yet in the collection of the British Museum.

It is a new species and should be added to localities of *Flora*.

It is a new species and should be added to localities of *Flora*.

altogether different habit. In habit this approaches *O. repens*. Doubtless from Nepal and Keweenaw, as does another plant from Mangrove (C. 7718) which has been collected without seedling or fruit; the only *O.* in Walt's plant is like that of *O. Perschkei*, but the bracts are rather longer (7 mm.) and the pedicels distinctly shorter (hardly 1 mm.) while the leaves are in 4 (not 3) pairs, are deeply cordate at the base, and have branches in the axils of the 3 lowest pairs.

8. PLEUANTHUS L'HERIT.

§ 1652c. (*P. B. L.* ix, 616).

*** *Pedding calyx indistinctly 2-lobed, shortly 2-toothed. 1½–2½ in. long, tube straight equal at the base.*

114. *PLEUANTHUS BERNARDI* Presl; stems simple or branched ascending leafy puberulous, leaves petioled lanceolate acute above, middle, puberulous beneath, subglabrous above, stamens proserted, corolla tube short broad, lips subequal; fruiting calyx red-punctate suberectum, 2 upper teeth acute, 2 lower broader triangular acute or sometimes obtuse; anthers narrowly oval.

Bernard; Fogg, Bander n. 813; Kew nm. 2475, 2476, 2477, 2478, 2479.

Stems slender single, culms 20–30 cm. long, branches spreading sometimes 20 cm. long, petioles 2–4 cm. long, leaves 5–12 cm. long, 1½–2½ cm. broad, membranous, pedicels 4, terminal branches all with flowers white speckled with red, stamens far exserted. Flowers in January.

Leaves and habit of *P. Walleri* and *P. Stracheyi* with influence of *P. striatus* and a speckled calyx like that of *P. striatus* to which this seems the relationship that *P. Stracheyi* bears to *P. striatus*. It is referred to in *P. B. L.* ix, 614 under *P. Stracheyi* by Sir Joseph Hooker as a plant very like but probably distinct from that species; the specimens available being neither in flower nor with fruit could not be then described.

**** *Pedding calyx longer than broad, 2-lobed or subequally 2-toothed. Corolla 4–5 in. tube declinate or sharply declinate (above straight in *P. repens* and *P. Kerrii*), base usually gibbous.*

164. *PLEUANTHUS KERRI* Presl; stem simple ascending, stems, leaves broadly elliptical obtuse, base cuneate entire narrowed gradually into the short petiole, above the middle few wide spotted, the terminal tooth always longest often very large and blunt, young leaves much shorter than the stem, middle tube nearly straight, the tube shorter wider spread at the base above, stamens included, the anthers small broadly oval.

Locality: Rabong in Yunnan, 2500-3000 feet, T. Anderson, Kew.

Stems 20-40 cm. rather bluish 4-angled above, leaves 4-6 cm. long and 1-2 cm. wide thinly coriaceous, narrowed gradually into a petiole 1-3 cm. long, serrations 3-7 on each side, central tooth 0.75-1.5 cm. wide, panicles solitary and terminal or low axillary, 6-10 cm. long, lax fl.

Most resembles *P. cuneata* Maxim. but is smaller in all its parts.

208. *PERITHOUS FRAXINUS* Prain; shrubby dwarf tomentose or pubescent, leaves small sessile or subsessile or petioled crenate, young in distinctly punctate rather dense few-fl. axillary racemes, corolla tube short wide, lips very large, fruiting calyx narrow sub-2-lipped subbipedal strongly curved, teeth acute, outside oblong.

Locality: Himalaya. Phari, Kew's collectors. District S. Tibet.

Small shrubby, stems woody and rounded below, 4-angled above, 15-30 dm. high, leaves 1-1.25 cm. long under 1 cm. broad, glabrous above tomentose at least on the nerves beneath, petioles 0.5-0.75 cm. long, calyx 4 mm. (in fruit 7 mm.) long, 2.5 mm. broad, 2 lower teeth 1/2 as long as the 4 upper, tube contracted above outside in fruit, petiole 0.5-1 mm., corolla 8 mm. long (tube 4 mm. long 2.5 mm. wide), lower lip 1.5 mm. long, calyx pale faintly reticulated outside, 2.5 mm. long 1.5 mm. broad.

A very distinct species, nearest to *P. velutina* and *P. repens* Indian which it stands intermediate.

10. HYPTIS Jacq.

11. *HYPTIS CURVATA* Jacq.; erect, stem glabrous, leaves opposite oblong linear serrate glabrous on both surfaces, peduncles 1/2 as long as the glabrous leaves, bracts ovate-lanceolate or linear, calyx 2-lipped with erect subulate shorter than tube. — *Hyptis capitata* Jacq., loc. cit. (114), Benth. DC. Prodr. iii, 101.

Locality: Baccata introduced; Kew, etc. District. Tropical America introduced into Futuwa, Philippines and India.

An erect often branching annual, leaves 2-10 cm. long 5-8 mm. broad, nerves beneath minutely pubescent; heads 25-35 mm. (1 in. or so) in diameter, enlarging in fruit, bracts oblong and often lobed, corolla longer than calyx.

12. POGOSTEMON Desf.

12. *POGOSTEMON* Desf.; add to locality of *P. ...* India India 1796-1801.

Locality: Kew's collectors, 2-4000 feet, T. Anderson, Kew.

44. *Diospyros cuneata* Coll. & Hemsl.; annual, puberulous, stems large, membranous, oblong, obtuse, narrowed at the base into a long winged petiole, margin widely serrate, sparsely hirsute with darkish white hairs on both surfaces, spikes 4–5½ in., calyx cylindrical, puberulous, equally 5-toothed, corolla tube not exceeding calyx.—*Diospylla cylindrica* Coll. & Hemsl., *For. Ind. Ser. xviii*, 114 (1890).

BURMA:—Shan hills at 4000 feet, very common.

Sparsely branching, branches 4-angled, internodes usually shorter than the leaves; leaves as much as 3½ in. long, paler beneath, the lateral nerves (about 4 pairs) prominent, flowers rose pink callositate and aggregated in dense spikes, corolla 1½–2 lines long, externally pilose; filaments shortly exerted, glabrous. Nectaries not seen.

"This approaches *D. auriculata* Blume, which is easily distinguished by the thicker substance of the leaves and by being densely "villosa all over" (Hemsl. l. c.).

There is no example of this plant at Calcutta. It differs from all other species of *Diospylla* in having naked filaments. The description is taken from the paper by General Collett and Mr. Hemsl. on plants from Upper Burma and the Shan hills collected by General Collett.

+ + Leaves in whorls of three or four (rarely more).

45. *Diospylla pentava* Prain: slender, erect, simple or branched, glabrous, adpressed puberulous, leaves 4 in a whorl sessile linear entire, spikes elongate, interrupted, tomentose, teeth of fruiting calyx erect.

Diospylla verticillata Hook. var. ? gracilis Benth., *DC. Prodr.*, xii, 155.

PRIN: Madagasc., B. Scott n. 354, Kew no. 2401, 2403, Moinsu-
G. f. l.

Stems 30–40 cm. high, slender, as thick as a crow-quill, branched, erect, leaves 2½–3 cm. long, 0.25 cm. wide not deflexed, spikes 3½–5 cm. l. g. 0.5 cm. wide, never interrupted, corolla tube very short, filaments 4, exserted, calyx densely hirsute externally, teeth in fruit erect, surface minutely erect, pale, shining.

Most like *D. verticillata* but very distinct owing to the elongated hairy stem, the calyx tube densely hirsute with teeth erect and not stalling patent in fruit, and the shining anthers which are paler in colour rather large and much narrower. One of the most distinct species of the genus.

15. ELSHOLTZIA Willd.

1. *Elsoltzia GUYANA* Hook. f. var. *typica* (add to localities of *typica* of British India, p. 644).

PRIN: B. Scott, Madag., 400, Kew's coll. 1890.

var. *typica* Prain: glabrous, leaves pointed or sessile, flowers, spikes

with long bracts dense, calyx in flower narrow, lobes trifurcate, subequal.

Upper Branch, Shan Hills at Tawang, 5000 feet, Chittagong, N. B. M. May 1900-1901, King's collector.

Stems 2-3 dm. round, rigid, dark brown, leaves 2-3 dm. long, lower petioled upper sessile, 0.75-1 cm. wide, coarsely serrate throughout, lower petioles 0.7-1 cm. long, spikes 3-6 cm. long, 1 dm. wide, bracts numerous not exceeding calyx, calyx pubescent, corolla tube 1 longer than calyx, lobes pubescent.

A very distinct variety. - Practised this art well and used by Shans as yellow offerings at pagodas.

21. Z. ZATANIA Hook.

Underbush with small elliptical leaves shortly petioled distinctly glandular punctulate, whole axillary axilla as in palmately compound and imbricate towards the ends of the branches, flowers very small. Calyx 5-nerved ovate equally 5-toothed, teeth erect, rough distinct. Corolla tube subincluded, limb 2-lipped upper entire lower 2-lobed. Stamens 4 included lower slightly longer, anthers very distinct parallel, at length divergent. Style shortly 2-lobed upper lobe slightly shorter. Noddy smooth - Species 2, Oriental.

1. Z. ZATANIA HOOKERIANA Hook. much branched, branches slender, white pubescent, leaves pubescent, whole dense, axillary axilla, lobes along equalling calyx, bractlets shorter than calyx, calyx tooth more shorter than tube, corolla upper lip equalling the lateral lobes of lower lip, many axillary - Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835.

2. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835.

3. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835.

4. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835.

5. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835.

6. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835. Z. ZATANIA HOOKERIANA Hook. Diapa. ser. 1, v. 18, 1835.

bracts 2-4 mm. long 2 mm. across, lobes 1-4-2 mm. long 1 mm. across, calyx 20 mm. long, (tube 10 mm. long upper lip 20 mm. wide, lobes of lower lip each 12 mm.), corolla 25 mm. (tube 20 mm. lips 2-5 mm.), anther sheath subglobous 4 mm. long.

A handsome species with a striking appearance on account of its large, delicate rose-pink calyx. The Panjab plant resembles *S. hydrogenae* with *S. Shalib Boia*.

§ § § § *Erucoid Heath*. (Root 2; F. H. I. iv, 654).

§ §. *Salvia stenocarpa* Boiss., tall, slender, hirsute, leaves petioled rugose densely hirsute above and beneath oblong obtuse base rounded margin subentire, floral submenstruous ovate long acuminate shorter than calyx, whorls 2-4 flowered distant, calyx long tubular, mouth slightly lacinate acute, corolla white 1½ times as long as calyx, tube 15 mm., upper lip suberect - *Salvia macrophylla* Boiss., *Diagn.*, ser. 4, no. 11 (1844); *Boiss.*, DC. *Prodr.*, iii, 282 (1845); *Boiss.*, *Flor. Orient.*, ii, 615 (1870) - *Salvia macrophylla* var. *calabica* Boiss., DC. *Prodr.*, iii, 282 (1845) - *Salvia macrophylla* var. *Kotschy* Boiss., *Flor. Orient.*, ii, 615 (1870) - *Salvia Kotschy* Boiss., *Diagn.*, ser. 4, no. 46 (1846).

Pakistan *Erucoid* sp. *Beluchistan*, assigned districts. *Pakistan*, *Beluchistan*, *Sindh*, *Southern*, *Assam*, *Dacca*, *Beluchistan*, *Afghanistan*, *Pakistan*.

Stem 40-50 cm., pubes 3-5 mm., leaves 4-6 cm. long 2-3 cm. wide, calyx 20-25 mm. long 7 mm. wide, corolla 25-30 mm., mouth tubular ovate suberect, pale green, shining and marked with dark punctations.

[*Salvia* sp. in Iran and *Salvia* *Salvia* Iran have been repeatedly collected just beyond the N.W. Frontier but not as yet within British territory.]

281. ZIZIPHORA Boiss.

Dwarf annual herbs or spreading perennial small shrubs with rigid stems, often hairy-tomentose, with small or large or slightly toothed leaves, floral like calyx or cluster and bracts, whorls few-flowered axillary often crowded towards the apex of the stem, flowers tubular or shortly pedicelled, bracts very small, calyx tubular elongated 13-nerved 2-lipped (upper 8-lower 2-toothed), throat villous, teeth (in fruit) sub-hirsute, corolla small tube hardly extended glabrous with somewhat dilated spreading upper lip erect entire, lower spreading 2-lobed, lobes very unequal, 2-lobed (obovate), spreading under apex by or suberect, anthers linear perfect or with the base with anthers, upper elongated small or 6, flag uniform, style 2-4 lobes like *Salvia*, ovary ovoid, smooth - Species about 12; *China*, *Asia*, *Oriental*, *Mediter-*

* Perennial.

1. *Zinnia ciliatissima* M. Bieb., shrubby, branching from the base, leaves glabrous or pubescent, ovate or lanceolate, basal similar smaller shorter than the flowers, whorls capitate, calyx narrowly cylindrical, teeth very short linear; lobesolate linear upper lobes longer, corolla tube shortly exerted, anthers coiled equal.—*Zinnia ciliatissima* M. Bieb., *Flor. Tur. Cass.*, 1, 17; *Benth.*, *Det. Prain*, xii, 211; *Horn.*, *Flor. Orient.*, iv, 583.

Herbaceous stout woody stems or branches usually numerous 6–16 cm. high, often decumbent, leaves 0.6–0.75 cm. long 0.35–0.55 cm. wide, capitate 1.5 cm. long 2 cm. across, calyx 8 mm. long 2 mm. wide, corolla 11 mm. long.

The typical form of this variable plant does not occur within Indian limits, the following varieties are reported:—

a. *Var. Benthiana*; calyx pilose with white spreading hairs.—*Zinnia ciliatissima* var. *canescens* Benth., *Flor. Orient.*, iv, 583 (1831) (= *Z. ciliatissima* var. *canescens* Benth., *Lab. Gen. et Sp.*, 341 et 3) and *Det. Prain*, xii, 305 (1913).—*Z. canescens* Benth., *Lab. Gen. et Sp.*, 621 (1833) and *Det. Prain*, xii, 305 (1913); *Hook. & Horn.*, *Flora Liban. Soc.*, ii, 11–96 (1878).

N. W. HIMALAYA; Gilgit, Wiles. DISTRIC. Boonagala, North Pers. Z. ciliatissima, Armenia.

After close examination it seems impossible to deal with this plant as Benth. then as M. Benth. has dealt with it. As regards floral structure it (var. *p.*) differs from typical *Z. ciliatissima*. M. Benth.'s varietal name is, however, preoccupied; it was supplanted by Mr. Hook. & Horn. previously to designate precisely the plant named by M. Benth., *loc. cit.*, *Z. ciliatissima* var. *serpyllacea*.

β. *Var. rigida*; calyx hirsute with appressed hairs or almost glabrous.—*Zinnia ciliatissima* var. *rigida* Benth., *Flor. Orient.*, iv, 586 (1831).

PERSIA; CAUCASUS; Belachistan; assigned districts. *Lab. Dist.*, Baluchistan, Afghanistan, Persia, Armenia. Leaves usually much smaller and stems more rigid than in the other varieties.

* * Annual.

2. *Zinnia serotina* Linn.; *Erigeron*, simple or branching from the base, leaves distinctly serrated subovate ciliate narrowly lanceolate acute, basal smaller longer than the flowers, whorls axillary along the stem to lower down along spikes, calyx narrowly cylindrical, teeth very short triangular or linear, corolla tube shortly exerted, lower lobes coiled equal upper.—*Zinnia serotina* Linn., *Sp. Pl.*, 21; Benth., *Lab. Gen. et Sp.*, 341 and *Det. Prain*, xii, 306; *Horn.*, *Flor. Orient.*, iv,

1872; *Arch. & Hortic. Trans. Penn. Soc.* n. s. vii, 36.—*E. purpurea* Benth.
Lab. Ess. 39 (side Russ.).—*Fabryana* var. *thunbergii* Thunb., *Bot. Ar-
 sep.* Petenik, vii, 21.

PANJAB PROVINCE; *Salween* range, Poda. District: Gilmohar.
 Afghanistan, Persia, Amu Minor, Turkistan, Samarcia.

Root slender, stems 10–15 cm. high, leaves 1.5–2.5 cm. long 0.25–
 0.5 cm. wide, whole often in spikes the whole length of the stem, 1.5–2
 cm. wide, calyx 5 mm. long 2 mm. wide, corolla 11 mm. long.

29. *NEPETA* Linn.

A. Whorls in simple terminal whorls or cylindrical spikes, which are
 rarely interrupted at the base. (F. R. I., iv, 657.)

* * Leaves entire or crenate serrate or ciliolate.

(1.) *Nepeta corymbosa* Benth., stem tall pubescent, glabrescent,
 somewhat elongated prostrate, leaves small sessile linear-lanceolate acute,
 base narrowed entire margin elsewhere crenate serrate, spikes narrow
 sometimes interrupted at the base, bracts linear-lanceolate mucronulate,
 calyx small, teeth very slender sparingly ciliate.—*Nepeta puberula* Benth.,
DC. Prodr. xii, 372; *Russ. Flor. Orient.* ix, 625.

WESTERN TIBETIAN HIMALAYA; Gilgit, at Gilgit, 13,000 feet, in
 irrigated soil, Gilg. District: Afghanistan (2–5000 ft.).

Stems 40–60 cm., erect 8–10 cm. slender, leaves 1–2 cm. long
 under 0.5 cm. wide, spikes 5–8 cm. long 1.5 cm. wide, leaves 2 mm. long
 calyx 2 mm. long, tube 4.5 mm., teeth 2.5 mm., corolla 12 mm. long.

Nearly related to *N. campylocha* Wurm. and *cruciatula* Benth. but well
 distinguished by its smaller leaves and narrower bracts. It bears in *N.*
cruciatula something of the relationship that *N. campylocha* bears to *N.*
cruciatula.

(2.) *Nepeta corymbosa* Moench, *Mot. Bot.* xi, 206 (1801); *F. R. I.*
& Hortic. Trans. Penn. Soc. xxi, 252 (1800).—*N. Thunbergii* Benth.,
Lab. Ess. 39 (side Russ.).—*DC. Prodr.* xii, 372 (1855).—*DC. Fl. Ind.* iv, 625 (1855).—*DC. Fl. Ind.* iv, 625 (1855).—*DC. Fl. Ind.* iv, 625 (1855).—*DC. Fl. Ind.* iv, 625 (1855).

B. Whorls in branched panicles some or all more or less pubescent.
 (F. R. I., iv, 651.)

* Corolla less than 1/2 in. long.

(3.) *Nepeta corymbosa* Benth., stem branched from a
 woody base, branches slender hairy sometimes simple or again branched,
 leaves small sessile, crenate, linear-lanceolate, ciliate, petioles below, sessile
 above, whole small five-fingered lower pubescent distinct upper sessile
 interrupted narrow spikes, bracts mucronate, on corolla with entire, equaling
 corolla beneath calyx with oblique mouth and (in corolla) teeth shorter
 than the tube, corolla 1/2 longer than calyx, corolla mostly tubular.

—*Nepeta glomerata* Boiss., *Diagn.*, ser. 1, v, 21; *Benth.*, *HC. Prodr.*, 2: 379; *Boiss.*, *Flor. Orient.*, iv, 651. —*N. juncata* Boiss., *Diagn.*, ser. 1, v, 21; *Benth.*, *HC. Prodr.*, 2: 379; *Boiss.*, *Flor. Orient.*, iv, 651. —*N. glomerata* Hook. *Ind. Bot.*, ser. 1, v, 21; *Benth.*, *HC. Prodr.*, 2: 379.

PANJAB PROVINCE: Suliman range *Stewart, Bohn.* Durrus, Baluchistan, Afghanistan, and Persia.

Stems 20–40 cm., petioles 0.5–1.5 cm., laminae 0.75–2 cm. long 0.5–1 cm. wide, lower petioles 4–7 mm., bracts 3.5–4.5 mm. long, 2 mm. wide, calyx 5 mm. long, corolla 7 mm. long, anthers 2 mm. long.

There are no very good characters whereby *Nepeta juncata* (the Panjab Frontier, Afghan and Baluch plant) can be separated from *Nepeta glomerata* proper (the Persian plant)—the secondary branches are more numerous, the leaves and bracts are rather smaller and the calyx teeth somewhat shorter in the more eastern form but the corollae and anthers of the two are quite indistinguishable.

21. *Nepeta saxatilis* Boiss., softy hirsute with spreading white hairs, much branched, branches slender, erect or prostrate, short or long, leaves sessile, chamo-petioled, ovate, obtuse, coarsely blunt-toothed, whole laminae softly hairy distant axillary subsessile or on petioles as long as the flowers, bracts subulate as long as the calyx, calyx teeth subulate almost as long as the tube, corolla hardly exerted. —*Nepeta saxatilis* Boiss., *Diagn.*, ser. 1, v, 21; *Benth.*, *HC. Prodr.*, 2: 379.

Waziristan: on Black Ridge, *Stewart, Saunders, Durrus.* Afghanistan (*Boiss.*, *Diagn.*, ser. 1, v, 21).

Branches 10–20 cm., leaves 1–1.5 cm. diam., petioles 0.5–0.75 cm., petioles 2–7 mm. long, calyx 5 mm. long, bracts 3–4 mm., corolla 7 mm.

Very related to the Persian *N. prostrata*.

22. *Nepeta saxatilis* Boiss., *Diagn.*, ser. 1, v, 21.

31. *Nepeta Hirsutissima* Boiss., ser. 1, v, 21; *Benth.*, *HC. Prodr.*, 2: 379. Branches 10–20 cm., leaves 1–1.5 cm. diam., petioles 0.5–0.75 cm., petioles 2–7 mm. long, calyx 5 mm. long, bracts 3–4 mm., corolla 7 mm.

Waziristan: S. H. Tiber beyond Peshawar, *Stewart, Saunders.*

Stems 10–20 cm., branches 5–10 cm., leaves 2–3 cm. long 0.5–0.75 cm. wide, lower petioles 4–7 mm., calyx 5 mm. long, bracts 3–4 mm., corolla 7 mm.

Distinctions of *Nepeta* (5 *Majorana*) — the stem with glaucous leaves, the calyx with 5 mm. long, the anthers with 2 mm. long, the anthers with 2 mm. long.

at length confluent lobular. This plant I had therefore at first thought might have to be generically separated from *Nepenthes*, but Professor Oliver who has very kindly examined specimens at Mr. Hance's request finds this is unnecessary; the character of prolonged filament occurs in other species of the genus.

II. *Dracaena* species; leaves crowded, cymes or whorls axillary, floral bracts as long as the calyx and corolla (Glaucaea L.).

32 A. *Nepenthes indica* Forst.; erect, subulate, leaves sessile subulate rugose serrate, cymes all axillary few-flowered shorter than the bracts, calyx softly tomentose sub-lobed upper lip longer and with broader less deeply divided, lower lip shorter with 5-6 lobes, corolla lobes included, upper pale sub-lobed, lower greenish yellow.

Common Tree: Forest. Hills all over between Poon and Lushai. Leaves Upper Epiphyllum p. 166.

Herbaceous creeping, stems 4-10 cm., leaves 12-20 cm. long, very close set, base truncate, ovate, sessile, lower minute, calyx 2 mm. long, corolla 16 mm., tube straight slightly dilated at throat, lobes 275 mm. long.

V. Annuals; calyx-mouth straight.

33. *Nepenthes sanguinea* Burtt.; dwarf, erect very slender herbaceous from the base, branches spreading suberect, leaves petioled oblong or rhomboid distant toothed apex acuminate ciliate, 2-nd leaves spreading and generally exceeding the dense spike, bracts numerous oblong or ovate longer than flowers, subulate acute, gradually narrowed with margins entire, whole enclosed by ovate bracts, calyx 1 mm. long straight subulate lobes half as long as tube, corolla lobes included, tube straight slightly smooth. — *Nepenthes sanguinea* Burtt., DC. *Prodr.* vii, 225; *Ann.*, *Flor. Orient.*, ix, 617. — *Nepenthes sanguinea* Burtt., DC. *Prodr.* vii, 183.

Herbaceous; suberect distichate at Shoblong, 6000 feet, Leaves 333. *Dracaena* Forst.

Stems 6-15 cm.; leaves 1-2 cm. long 1 cm. wide, lower leaves 1 cm. long, 0.5 cm. wide, leaves 8 cm. long, calyx 0.5 mm. long, corolla 6 mm. long, lobes 1.5 mm.

30. DRACOCETHALUM Less.

4. *DRACOCETHALUM KANTHARUM* Burtt.; 224 in *Catalogue of Trees of British India*, ix, 608.

Herbaceous Tree; Plant 11-14-20 feet, Dr. King's collection; Kanchi near Lushai, Dr. King's collection.

5. *DRACOCETHALUM KANTHARUM* Burtt., *Bot. Beech.* xi, 224 (1891). — Dr. Hooker (*Ch. B. Clarke*) in *Bull. J. Bot. Soc. Ind.* ix, 224 (1891).

11. *Scutellaria Bhamaya*, Phae. Inquest. Dr. King's collector, Math
common, *Lepa Ujja Gyalok*. District W. Kanan.

32. *SCUTELLARIA* L'V.

1. Flowers not axillary.

2. Flowers in short leafy terminal spikes that are brought in bud,
erect long.

2 a. *Scutellaria Bhamaya* Bham.: dwarf, acutely hirsute, woody at
base, much branched, old branches prostrate, young ascending, leaves
small elliptic-oblong, shortly petioled, apex acute base cuneate margin
entire, spikes few-flowered subsessile, corolla pubescent much longer
than calyx—S. *Blackell Bham.*, *Diagn.* ser. 2, 10, 23; *Flor. Orient.*, ix,
684.

PELAK MONTANA; assigned districts of Beluchistan: 94 Pil Hill near
Quetta, June 2, 1931. District Beluchistan (Chak & Tan, 1932).

Habit of S. prostrate and S. *Hoplet* but more compact and with
shorter branches and fewer-flowered heads. Leaves 1 cm. long 3 mm.
wide, bracts similar but smaller, heads few-fl. almost hidden by the
leaves, corolla 15 mm. long.

A very distinct species.

• • Flowers erect at less leafy branches.

2 b. *Scutellaria straminea* Bham.: much branched from a woody
base, branches erect virgate simple slender thinly pubescent, leaves
small linear-lanceolate and rhombic-lanceolate beneath, distinctly petioled,
apex acute, base cuneate or subtruncate, margin bluntly or deeply 5-
toothed, spikes few distinct appressed, heads small ovate entire barely
exceeding calyx, corolla pubescent much longer than calyx—*Scutellaria*
straminea Bham., *Diagn.* ser. 1, vii, 61; and *Flor. Orient.*, ix, 684
Diagn. ser. 2, 10, 23, 114—S. *repens* Linn., DC. *P. Ind.* 20, 44.

Quetta—Hindu Kush, Gilgit. District Afghanistan, Peshawar.
Beluchistan 21–25 cm. long, petioles 0.5 cm. long, lamina 1 cm. long
0.75 cm. wide, base 5–6 mm. long, calyx 3 mm. long, corolla 25 mm.
long, yellowish with purple patches.

1. Flowers opposite margins axillary.

• • • Flowers in very narrow racemes, heads shorter than the pedicels.

2 c. *Scutellaria aviantha* A. Prokr.: quite platymerous, stems erect
in a bushy clump with clustered nodules, erect, simple or branched,
rigid, leaves long petioled oblong-lanceolate, entire cuneate at
base, flowers opposite or in whorls of 3–5, the upper, well-labeled with centre of lip white, corolla pale brown
corolla Aviantha; Bengolung, in stream bed, 25 feet above
level, 1937.

Stems woody below and subterete, 4-angled above and ^{thought} pubescent, 20–25 cm. high, leaves few, petioles 3–4 cm. almost equalling laminae 4–4.5 cm. long and 1–1.5 cm. across, crenatures 7–8 on each side almost from base $\frac{1}{2}$ or $\frac{2}{3}$, venation 8–10 cm., bracts 3 mm. long equalling pedicels, calyx 3 mm., corolla 16 mm., anthers 1 mm.

Nearly allied to *S. flexilis* Colaba, of which it has all the characters of cordia and has also, near the top of the spike, the scattered flowers; it bears to that species the relationship that *S. oblonga* Benth. bears to *S. valant* Hayne. Flowers November to January. As to inflorescence it nearly approaches *S. oblonga*, with which species Mr. Hemsley, who has kindly examined it, suggests a union. That species however, besides differing in having all the flowers opposite, occurs at 5000 feet alt. and flowers in April.

* * * * * Flowers in long narrow racemes, bracts longer than the pedicels and calyx but hardly leafy.

7. *S. SUTCLIFFII* *erectata* Hems. & Low: glabrous, stems slender sulcat from thick woody rhizome, leaves petioled ovate acute, base truncate entire, sides each with 2–3 crenatures, anterior third entire, bracts ovate entire petioled only the lowest exceeding the calyx, pedicels short, corolla tube 5 times exceeding calyx, upper lip notched, anthers granulate.—*Sutcliffia petiolata* Hems. & Low, *Jour. Linn. Soc. Ind.*

RANICULACEAE; assigned districts, Mr. Duthie's collection. District S. Afghanistan at Ziarat. (Low 4000).

Rhizome 1 cm. thick, stems 13–25 cm. long round hardly as thick as crown quills, petioles 0.75–1 cm. long, laminae 2–3 cm. long 1.5–2 cm. across, crenatures shallow, both surfaces quite glabrous, bracts ovate long 3 mm. across, petioles 2 mm., calyx 4 mm. long 2 mm. wide, corolla tube 7.5 mm. long, lobes 5 mm. across upper lip 4 mm. long lower lip 3 mm. wide, anthers 2 mm. longer than petiole reddish brown.

10. *SUTCLIFFIA* *LAETIS* Duth. Prain, *Proc. Nepal. Acad.* 111 (1885); Benth., *Lab. Gen. et Sp.* 441 (1844); *Asiatic Researches* 2nd Ser. Bot. Vol. 2179 (1825); *Pl. As. Ind.* 8, 67 (1837); *Bull. Trade* xii, 436 (1840); *Hick. f. Fl. Brit. Ind.* iv, 602 (1855).—*S. coccinellina* A. Hume, *Manch. Schell.* 27 (1872).

* * * * * Flowers all solitary.

15. *SUTCLIFFIA* *KIMURA* Prain: stems pubescent densely branched several 6–8 m. creeping slender rootstock, leaves pubescent petioled ovate orbicular obtuse crenate except the rounded base, flowers solitary petioled few, pedicels short, calyx pubescent, corolla large

LOWER HIMALAYA.—Kangra, 60 miles north of Haridwar on the edge of the Poonahung Chy. D. Kimura coll.

short. Nails very minute, apices acute subcapitate, base smooth.
—Species 4: S. China; and Indo-China.

1. *Microstema cynna* Poole, minutely branched, leaves widely ovate-ovoid base subcordate margin serrate-dentate, cymes rather lax, calyx teeth triangular, palis throat half as long as lobes rather longer than tube, lateral lobes of lip sub-erect and three ascending central narrowly elliptic, anthers very minute.—*Microstema cynna*, Poole in *Fl. Ind. Arch. Sin.*, 1: 172.—*Microstema cynna* Fisher & Hemsley, *Jour. Linn. Soc.*, ser. 1, 1872.—*Microstema cynna* Poole in *Fl. Ind. Arch. Sin.*, 1872, p. 172.—*Microstema cynna* Poole in *Fl. Ind. Arch. Sin.*, 1872, p. 172.—*Microstema cynna* Poole in *Fl. Ind. Arch. Sin.*, 1872, p. 172.—*Microstema cynna* Poole in *Fl. Ind. Arch. Sin.*, 1872, p. 172.

ARIZONA: Santa Rita, Graham; Maricopa, Chandler; Kilauea, 1880, coll. Chandler; Shilling 1890, coll. Hensley. BUREAU OF AGRICULTURE: Santa Rita, 1880, coll. Chandler; Shilling 1890, coll. Hensley. BUREAU OF AGRICULTURE: Santa Rita, 1880, coll. Chandler; Shilling 1890, coll. Hensley.

Stems 40–100 cm., lower branches 15–25 cm., petioles 2–3 cm. long, laminae 4–7 cm. long 3–5 cm. wide, hairy on both surfaces, cymes sometimes loosely paniculate irregularly branched, calyx 2.5 mm. (tube 2 mm.), corolla 14 mm. (tube infundibuliform 8 mm., upper lip 8 mm.), palis greenish minute oral anthers, anthers 1.5 mm.—The cultivated plant smells very strongly of Patchouli, much more so than does the Patchouli plant of commerce, but it is only grown as a curiosity. The natives of the hills of Arizona do not grow this plant or the true Patchouli plant, nor do they know or use the proposed species: the Green Hill plant is devoid of smell.

2. *Microstema Gaudichaudii* Poole, glabrescent, leaves widely ovate-ovoid, base cuneate margin doubly serrate, cymes rather dense, calyx teeth distinct acuminate, palis throat entire half as long as lobes, lateral lobes of lip rounded half ascending central lobes, anthers small.

ARIZONA: "Eastern Hopewell" (probably Mohave Valley, Arizona, n. 1880 Kay district; Dismal Marsh, Navajo, 1872.

Stems 40–100 cm., lower branches 15–25 cm., petioles 2–3 cm. long, laminae 7–9 cm. long 4–7 cm. wide, glabrous finely serrate, cymes throat, calyx 6 mm. (tube 4 mm. corolla 15 mm. (tube infundibuliform above 11 mm., palis 5 mm.), palis greenish spherulic rugulose, anthers 3 mm.

23. STACHYS Linn.

* * *Herba, stem 4-angled. Whole fragrant, leaves opposite.*

24. *Stachys monarda* Poole, ascending, stems sparsely branched with long spreading white hairs, leaves long petiolate, ovate elliptic acute, deeply serrate, anthers, head on both surfaces with long white hairs, floral small shorter than the calyx, anthers subulate, whole 4-8

Reversed, distant, calyx glandular-pubescent teeth triangular acute, corolla tube exserted.

Upper Burma: Mawmye on the Yunnan frontier, J. Anderson. District S. W. Yunnan, at Momein, Anderson.

Rootstock slender creeping, stem 25–30 cm. simple or branching at the base, radical leaves very small (1 cm. long 0.75 cm. wide, petioles 0.5 cm. long), cauline 2.5 cm. long 2 cm. across, petioles 1.5–2 cm., hirsute with spreading hairs, calyx widely campanulate, slightly oblique, 5 mm. long (tube 3.5 mm., teeth 1.5 mm.), corolla 12 mm. long (tube 7 mm.), pale pink.

A very distinct species.

424. MOLUCELLA Linn.

Annual or perennial glabrous herbs, leaves opposite petioled or sessile, lanceolate crenate or entire. Whorls many-fld., all axillary, sometimes subulate pungent. Calyx obliquely campanulate below, strictly 5-lobed, dilated above into a broad reticulated limb elongated behind with marginally 5-dentate or 5–10-spined. Corolla tube included, oblique, annular within, slightly enlarged upward, limb 2-lipped, upper lip connate entire or emarginate, lower 3-fld., lateral lobes oblong suberect, midlobes spreading subcordate. Stamens 4, ascending didynamous, lower longer, anthers conniving 2-locular. Style 2-lobed, lobes subequal subulate. Nectary triquetrous truncate sessile.—Species 3, Malabar, Java, and Orient.

♂ ♂ *Curassava*; calyx-limb 2-lipped, prolonged behind as an erect spinous tooth and in front as a spreading 3-parted lip with smaller radiating marginal lateral spines.

L. *Molucella ovata* Peain; glabrous, leaves sessile lanceolate, teeth quite entire serrulate, bracts 2-partite subulate pungent.

S. W. Sumatra; Palembang mts., in the Zulu delta leading to Wamotan, 1500 feet, Steudel.

Stems, branches slender 4-angled, green, leaves 4 cm. long narrow, obl. Ups sharp but hardly pungent, whorls distant, bracts all axillary, calyx 5-lobed, glabrous rigidly coriaceous, tube 5 mm. exserting bracts three-fld., upper tooth 5 mm., lower 3 mm. long 4 mm. across, corolla 7 mm., tube short, upper lip entire villous, stamens exserted.

Habit of *Ocotea Andersiana* with calyx like that of *Molucella* but much smaller, excluded from *Impatiens* by its pubescent anthers.

425. LAGOCHEILIS Benth.

Herb with rigid herbs or subshrub with imbricated leaves often with prominent nerved lobes, bracts foliate decreasing upwards. Whorls

cellary for 51. bracteoles acuminate often apiculate. Calyx lobes 5-merous 4-nerved, mouth equal or oblique, teeth 2-subopposite equal or with the upper prolonged. Corolla tube often shortly crenate, anther-palms within slightly enlarged upwards, limb 2-lipped, upper lip erect, oblong, 2-lobed subacute, lower 2-lobed, lateral lobes short acute erect, central spreading wide emarginate. Stamens 4 didynamous, lower longer spreading, filaments adnate, anthers 2-locular, lobes parallel or divergent, margins ciliate. Style 2-lobed, lobes subequal subulate. Nectary 2-quantous apex truncate. — Species about 15, Oriental.

* Lower axis armed with sterile spinous bracts.

1. *Lamourea cuneata* Panch., stems pubescent, white or glabrous, white, leaves palmately 3-lobed, lobes oblong entire or 1-lobed obtuse or acute mucronate or not, edges hispid hirsute or glabrous, teeth along subulate acute mucronate longer than the lobes, corolla tube short, upper lip villous. — *Lamourea subulosa* Benth., DC. Prodr. xii, 515; *Begon. Flor. Orient. ix, 267*.

Grass: Gilan. District Afghanistan, Turkistan.

Stems 12–25 cm. high 4-angled smooth, leaves 2 cm. long 1.5 cm. broad, petioles 1 cm., lobes 2 mm. broad, only those of the uppermost leaves and bracts usually spinousulate, bracts sparse 8–10 mm. long glabrous, with a pair of subulate lateral suberect spinules on upper edge, some long, floral spike 22–25 mm. long, hispid setose or of length glabrous with the lateral spinules 10 mm. long, anthers and styles long 1.5 mm. style 5 mm., lobes 9 mm. long, 4.5 mm. across margins of lobes hispid-haired, tips acuminate mucronate.

41. OTOSTEHA DAVID.

1. *Otosteha ovata* Benth. in *Flor. Orient. ix, 779* (1879); Benth. *man. in Flor. Berl. Ind. iv, 689* (1854).

2. *Otosteha AUCHERII* Benth.; glabrous, leaves subovate elliptic-lanceolate acute with spinous tips, quite entire, nervious bracts subulate spinous. — *O. Aucheri* Benth., *Days. bot. v, 40*; Benth. in *DC. Prodr. xii, 523*; *Jach. et Spach. Ind. Fl. tur. ix, 128, t. 262*; Benth. *Flor. Orient. ix, 778*.

Habitat BELUCHISTAN, Nal, Dale; Quetta, Lam. 366 (in Herb. Wall.) Districts Throughout Beluchistan and S. Persia.

An erect spiny bush branching below, young branches slender 4-angled green, spines 6–12 mm., leaves 2.5 cm. long narrowed, 2-lobed 3-lobulate below, smooth above, tips pungent, whole distich, leaves all spiny rounded straight pungent, calyx sparsely hairy, throat white, flowering 6 mm., tubulate with broad membranous 3-lobed 5-lobed, upper teeth acute acuminate, lateral smaller, lower very large rounded spinous

tippled, corolla 13 mm., tube short, upper lip short, ciliate villous, stamens exserted, anthers smooth truncate flattened, 3 mm. long.

Very closely related to *Chrostogon limbata* Benth. (Flor. Orient. iv, 778) from which it differs by its glabrous habit, spinescent-tipped leaves, blunt-spines all rounded, broader lower calyx lobes and shorter corolla upper lip.

45. LEUCAS R. Br.

1. *OPTHOLEPTON*.

* * Perennial rooted. Branches 4-angled, hairs on them erect or spreading (not deflexed). Calyx teeth not $\frac{1}{2}$ the length of the tube.

51. *LEUCAS COLETTII* Prain: everywhere densely silky silky with long spreading hairs, stems simple their hairs spreading and angles obtuse, leaves all sessile very small thick ovate acute, blunt truncate or subcordate entire their margin elsewhere coarsely serrate, whorls many flowered, bracts linear short, calyx truncate teeth minute erect, corolla tube exsertulate.

Uttara Banga, Popah hill, 5000, Collett n. 29. Derrum. S. China.

Rootstock woody, stems short 8-15 cm. rather stout bluntly angled at distinctively grooved, leaves 1.5 cm. long 1.25 cm. wide above set off by silky below and above, calyx 5 mm. long, corolla 7 mm. long, tube not exserted.

Very like a densely silky form of *Leucas lancea* from the dry hills of the Dacca (L. *villosa* Dalm.) but easily distinguished on analysis by the calyx, within densely villous at the mouth only and not (as in all forms of *L. lancea*) sparsely hispid throughout the upper third, and by the much shorter corolla without any trace of an exsertion.

46. NOTOCHLITE Benth.

1. *NOTOCHLITE NIGRA* Benth.: add to localities of *Flora of Siam*, vol. iv, 304.

Assam: Naga Hills, 9000-9500 feet, Clarke, Prain.

47. ERMOSTACHYS Benth.

1. *ERMOSTACHYS RUTABROMA* Benth.: root-leaves obtusely incised notched curved into a long petiole, floral sessile oblong dentate, lower as long as flower, whorls in leaf 5-7 flowered cymes forming lax racemes, the terminal lower of each cyme sessile, the others pedicelled along the axis of the cyme branches, bracts 2, linear-subulate silky hairy erect as long as the calyx, calyx 5-very long-tubose infundibuliform, teeth long subulate from a weak base shorter than the corolla.—*Ermostachys*

chrysantha Hook., DC. *Prodr.* xii, 248; *Palaeo. Fl. Obov.* vi, 257; *Humb. Lab. Foss.* 79; *Boyd, Acta Hort. Pein.* vi, 381 and xi, 507, (*Humb. Bracteol.* 41), t. 9, f. 4, 5.

WESTERN PARSAN; Sulaiman hills, Dabir; Assigned districts, Hamill; Lax. Duran. Afghanistan (Griffith, Bollen); Helmandistan (Stückl).

Rootstock woody, stem short rather thick simple leafless hairy pubescent or glabrous 20–30 cm. high, radical petioles 3–6 cm. long, laminae 5–8 cm. long 3–4 cm. wide, basal leaves 4 cm. long 1.5 cm. wide, ovate 3–5 cm. long, bracts 20–30 mm. long 2–3 mm. wide, pedicels 1–3 mm. long, calyx tube 17–25 mm. long 8 mm. wide, teeth 5 mm. long, corolla tube 20 mm. long, lip 9 mm. long, ovary densely pilose.

51. COMPHOSTEMMA WALL.

11. *COMPHOSTEMMA WALLICHII* Prain; stem densely tomentose almost erect, leaves rugose, petioled truncate or subovate at the base, margin serrate, apex acute, densely tomentose beneath, spikes erect interrupted, bracts truncate cordate at the base decreasing upwards, corolla tube bracteate within more than twice as long as calyx.—*G. strebilanthum* var. *chama* Hook. in Wall. Cat. n. 2151/2 and Pl. As. Res. ii, 112.—*G. strebilanthum* Hook. Lab. 547 and DC. *Prodr.* xii, 248; Walp. *Mag.* iii, 892; *M. J., Flor. Ind. Res.* ii, 309 (all in part and var. *G. strebilanthum* Wall. Cat. n. 2151/1.—*G. strebilanthum* var. *typus* H. & A. f. *Fl. Ind. Ind.* iv, 386 (in part).—“*G. elatius*” Wall. nom.

ASIAN; Nagas Hills, Kohima, 4500 feet, Phomans, 5000 feet, Pines, Uman Huma; Tumpching Mts, Wallach; Kaim hills, O'Donogh; Bham hills, at Puching, O'Donogh; Maymyo, 4000 feet, King's collector. Distant Western Yunnan.

Stems 200–250 cm. high, petioles 1–2 cm., laminae 11–14 cm. long, 7–8 cm. wide, calyx 11 mm. long, corolla 20 mm. long, petals white or white, rarely pink, bracts quite ovate cordate at the base lower 40 x 20 mm., upper 12 x 8 mm.

The species resembles *G. Hymenanthum* (*G. strebilanthum* var. *Hymenanthum* Hook. f.) which is, however, distinct and is recognized at once by its small purplish corolla hardly longer than the calyx. Its nearest ally is *G. nutans* which has the same calyx and corolla, but differs in having slender stems, small leaves and short drooping interrupted spikes. It is much less like *G. strebilanthum* (type), with which Mr. Bonchani associated it; that species has larger leaves tapering towards the base, calyx softly tomentose with long hairs, corolla somewhat shorter and bracts much smaller, truncate at the base and subequal along the ribs.

24. *Gonolobosoma Cuneum* Prain; stems scabrid, leaves long-petioled ovate, or elliptic-ovate, denticulate, pubescent above tomentose beneath, whorls in large thyrsoid, cymes along the old wood below the leaves, bracts squalling the calyx, entire laminate with filiform points, calyx lobes narrowly lanceolate, with filiform points, longer than the tube.—*G. Cuneum* Prain in *Ann. Bot. Bot. Gard., Utrecht*, 18, 1890.

Malay Peninsula, Perak, Wray n. 1231, Serendah n. 924, Penang, Curtis n. 1310.

Stems flexuous 50–120 cm. long not rooting below, leaves distant, petioles 3–12 cm., laminae 8–12 cm. long, 5–7 cm. wide; cymes 5–9 cm. long, bracts 10–15 mm. long, calyx 14 mm. long, anther 25 mm. long, anthers usually all matured, oblong, squatted above triquetrous below, glabrous, punctulate.

Nearest to *G. puberulatum* from which it is distinguished by its narrower entire bracts and longer narrower style such as well as its smaller leaves with longer petioles. As in *G. puberulatum* the bracts and calyxes are red-brown; the anther, however, is in this species white.

25. *Gonolobosoma Scottianum* Prain; stems, leaves beneath and whorls sparsely brown-tomentose, leaves short-petioled elliptic acute or obtusely acuminate entire or subciliate, or lower glabrous beneath mucronate above, nodes many-flowered pedicellate, flowers pedicelled bracts small ciliate, calyx 12 mm. long, lobes long, calyx lobes pubescent large.—*G. Scottianum* Prain in *Ann. Bot. Bot. Gard., Utrecht*, 18, 1890.

Malay Peninsula, Perak, Gunung Ipek, Serendah n. 1221.

Stems 50–100 cm., petioles 0.5–1 cm. long, laminae 10–20 cm. long, 12–16 cm. wide, narrowed or not towards the base, bracts 4 mm. long, pedicels very short, pedicels 8–10 mm., calyx 22 mm. (tooth 18 mm.), anther 40 mm., upper lip emarginate, style bearded near top, anther 8 mm., ovate oblong, sparsely hairy at top.

Near *G. oblongum* and *G. lucidum*; differs from both in having petioled whorls and pedicelled flowers, and is larger than either in all the parts.

26. *Gonolobosoma Hemsleyanum* Prain; stems and leaves beneath brown-tomentose, leaves petioled rugose elliptic-ovate acute narrowed to the base, serrate, hirsute above, whorls small many-flowered, bracts imbricate or bracts shorter than the calyx, calyx tooth longer than tube, anther not crossing calyx, tube hirsute within.—*G. Hemsleyanum* Prain in *Arch. Bot. Jard. Bot. Univ. Liège*, 2, 1890, 116; *Ann. Bot. Bot. Gard., Utrecht*, 18, 1890.

Upper Brachy, Malacca, Curtis n. 17, 1897.

Stems erect, over 60 cm. high, petioles 1–2 cm. long, laminae 12–18

62. *Torenia* *Warreni* Prain, stem stout diffusely branched culms, villous, leaves long-petioled oblong-ovate acute, base cuneate entire margin elsewhere sharply irregularly toothed, racemes panicle-like linear-lanceolate hardly exceeding pedicels, calyx campanulate deciduous, upper tooth rounded, 2 lower lanceolate, corolla tube subequaling calyx, terminal lobe ovate the four upper rounded obtuse.

— *Maxima*. — *Knessia* *canon*, *Walt.*, n. 3, 27.

A straggling herb, stems 80–120 cm. long almost terete below, densely toment-villous with long spreading hairs, leaves 13–15 cm. long, 5–7 cm. across, membranous, nervously bilobate, petioles densely villous 5–7 mm. long, racemes inflorescences, bracts 6–7 mm. long, pedicels 6 mm. long, calyx 7 mm. (tube 4 mm.) upper lobes ovate acute, twice as broad as rounded obtuse, lateral and as long as lower pair translucent lanceolate acute, tooth within and calyx throat entire, corolla tube 6 mm. long, lip 7 mm., filaments sparingly hairy.

Nearest to *T. guineensis* from which it differs by the pedicels being 3 times as long, the leaves cuneate not cordate at base, and membranous not rugose, and by the bracts which are linear-lanceolate instead of large ovate. The calyx in both is very similar but the corolla-tube in *T. Walp.* longer and the upper pair of lobes are rounded like the lateral, not, as in *T. guineensis*, acute.

§ § § *Reveria*. — (*J. H. J.*, 16, 762)

9. *Torenia* *salween* Hook. f. perennial sparingly hairy or glabrous, stems leafy, leaves small lanceolate-terete base cuneate apex acute, bracts lanceolate longer than flowers, branches long slender paniculate, nodes 2–4-fid, rather remote, pedicels $\frac{1}{2}$ exceeding calyx, calyx tooth triangular subequal shorter than campanulate gibbous tube, corolla $\frac{1}{2}$ exceeding calyx, filaments suberect sparsely hirsute, ovules small sublong. — *Torenia* *serotina* Hook. f. *Proc. Linn. Soc. Bot. Flac.* 1844, n. 213.

N.W. Himalayas, Gilgit, China, Druce, Afghanistan.

Stems 25–40 cm. high, reddish glabrous, leaves 25–45 mm. by 8–15 mm. decreasing upwards instead of uniform, and acute at the apex instead of obtuse, also by having distinctly longer pedicels and a slightly smaller corolla.

Next *P. Smithii* Lam. which it follows and from which it differs by having leaves decreasing upwards instead of uniform, and acute at the apex instead of obtuse, also by having distinctly longer pedicels and a slightly smaller corolla.

§ § § *Prain*. — Herb cordate to ovate or globose terminal bracts. Calyx tubular campanulate tooth subequal.

10. *Torenia* *serotina* Hook. f. dwarf shrubby densely hairy

pubescent, branching from the base with rigid tilted stemlets again densely bristling; leaves small elliptic subentire, heads few-fl. dense small, flowers small sessile, calyx permanently hairy, teeth short ovate obtuse, corolla yellow; exceeding calyx, anthers exserted.—*Tournefortia Stockmansii* Boiss., *Diagn. ser.* 2, iv, 38 and *Flor. Orient.* iv, 821.—*T. leucostachya* Herb. Ind. Or. II, f. 7 *T.*, var. Boiss.

WARRAN PAKISTAN.—Peshawar district, Shomali; Derz Ghazi Khan district, Alach; Derz Lomal Khan district, Willehwal; Quetta, Lark. Durran, Behashistan, S. Afghanistan.

Rostetost short woody, stems 10–12 cm., branches 3–5 cm., leaves 15 mm. by 4 mm. apical third oblong mucronate, crenations shallow basal two-thirds crenate entire, buds 6 mm. by 3 mm. entire or slightly crenate at apex, calyx 6.5 mm. (tube 6 mm.), corolla 8 mm. Dr. Alcock has described this species in the field, his notes say inter alia "herb greyish green, odor lightly aromatic, taste very bitter, flowers yellow; 'not met with below 5000 feet on the Suliman hills.' It is most nearly allied to *T. leucostachya* from Arabia and *T. leucostachya* from Syria.

[In concluding the Weber has to acknowledge his great indebtedness to Mr. W. B. Hemsley, F. R. S., who has kindly compared specimens of the majority of the species here described with specimens at Kew. As it happens the case there are a few points where Hemsley's data and his view of the facts that Mr. Hemsley's experience and skill are much the greater, the writer feels it only just to mention the chief of these, when they affect the systematic value of the plants here treated.]

Mr. Hemsley thinks that *Platanus* (p. 289) might really be united to *P. brevifolia* and that *Strobilanthus* (p. 297) may be only a form of *S. strobilanthus*; he believes too, that the two forms of *Strobilanthus* (p. 297) are not specifically distinct but that the two forms included under *Nepenthes* (p. 300) are in the two last cases. Mr. Hemsley is almost certain to be right; he also thinks it is possible that the writer has told his great stress on the fact that both plants varied at elevations and flowers at seasons of the year different from those belonging to the species which they respectively resemble. These characteristics may be only due to local color and geographical space; but they are not to be taken as evidence and *Platanus* (p. 289) may be taken as an approximation of *S. strobilanthus* and *P. brevifolia* respectively. Still the corolla of *S. strobilanthus* is somewhat different from that of *S. strobilanthus*, and the calyx of *P. brevifolia* from that of *S. strobilanthus*. The prominent ruby red glands characteristic of the outer surface of the calyx and under surface of the leaves of *P. brevifolia* are absent from *P. strobilanthus*, which has leaves exactly like those of *S. strobilanthus* and nearly the same of *P. brevifolia*.

On the other hand the writer believes *Diospyros* (p. 307) to be only a form (hardly distinguishable as a variety) of *D. acuminata*.

< \t

nc

i

a

T.

it>i

n

III. Metasternum prolonged behind in a triangular process, the anterior piece entirely wanting; habits aquatic.

Antenae slender, filiform or setaceous, abdomen with six segments; eyes two: *Dytiscidae*.

Antennae irregular, very short; abdomen with seven segments of which the first two are closely united; eyes four: *Gyrinidae*.

The *Carabidae* are divided into three sub-families:—

Middle coxal cavities not entirely enclosed by the sterna, the epimeron of the mesosternum attaining the coxae: *Carabinae*.

Middle coxal cavities entirely enclosed by the sterna, the epimeron of the mesosternum not attaining the coxae.

Head without antennal grooves beneath and with distinct super-orbital setae; ambulatorial setae of abdomen usually well developed: *Harpalinae*.

Head with distinct, usually long, antennal grooves beneath, and without distinct super-orbital setae; ambulatorial setae of the abdomen feeble or wanting: *Pseudomorphinae*.

The *Harpalinae* are further subdivided into two sections, the first in which the head has two super-orbital setigerous punctures, the second in which there is but one. The groups included in the subfamilies are as follows:—

Cerathus	11. <i>Proconus</i>	22. <i>Leptis</i>	33. <i>Crematichia</i>
1. <i>Campylodonta</i>	12. <i>Enicodonta</i>	23. <i>Platysoma</i>	34. <i>Orthoporus</i>
2. <i>Trachypachia</i>	13. <i>Scarites</i>	24. <i>Achillobuthus</i>	35. <i>Harpalus</i> II
3. <i>Cyrtus</i>	<i>Harpalus</i> I	25. <i>Crematichia</i>	36. <i>Neoharpalus</i>
4. <i>Carabus</i>	14. <i>Proconus</i>	26. <i>Odontobuthus</i>	37. <i>Aptesis</i>
5. <i>Proconus</i>	15. <i>Harpalus</i>	27. <i>Dryptus</i>	38. <i>Brachinus</i>
6. <i>Pachysoma</i>	16. <i>Phaenocarpa</i>	28. <i>Mormolyca</i>	39. <i>Scarites</i>
7. <i>Harpalus</i>	17. <i>Nematus</i>	29. <i>Agabus</i>	40. <i>Polymerus</i>
8. <i>Amara</i>	18. <i>Polymerus</i>	30. <i>Agabus</i>	41. <i>Chlorus</i>
9. <i>Phaenocarpa</i>	19. <i>Nematus</i>	31. <i>Lebia</i>	42. <i>Lebia</i>
10. <i>Hypodactylus</i>	20. <i>Conochilus</i>	32. <i>Hellgramm</i>	43. <i>Harpalus</i>
11. <i>Scarites</i>	21. <i>Polymerus</i>	33. <i>Strophodonta</i>	44. <i>Pseudomorphus</i>
12. <i>Nyctelia</i>	22. <i>Phaenocarpa</i>	34. <i>Lebia</i>	

Several of these groups are further subdivided, but these details need not be noticed here.

"M. Dejean writes of this arrangement:—'Remarque des genres' présente une des places bien difficile à celles où nous sommes arrivés, de les voir; d'après, dans cette partie des travaux, nous avons pu voir que des affinités nous ont par un usage pour ainsi dire général, sans que nous les voyions, et je dois dire avec justice, car, dans tout ce qui est relatif à la nature de l'œuvre, il n'y avait dans notre classification que très peu de traces de notre vue, nous avons vu que l'on peut l'appeler l'œuvre."

,i

nut lffMH t •

i
M

and contenting ourselves with the simple method of numbering the tribes or groups, instead of naming them." As pointed out by Mr. Sharp, the number of tribes, or groups of genera, in each sub-family is greater than those given by Dr. Horn, whose investigations refer mainly to the species of North America. Mr. Sharp also remarks that, in the case of many of the tribes adopted by Dr. Horn, that a tribe makes use of the same names for tribes as have been used by his predecessors, although giving to these names a widely different extension or meaning. Though this is the usual plan, it gives to classifications a false appearance of sound and permanence, and also, by giving to the names the sanction of long use, tends to make them appear in the eyes of many of more importance than they are in fact. With these remarks I thoroughly concur, and any one who has had to study the literature of the Carabidae, will, I am sure, endorse them. In preparing this paper, I have found that it would be possible almost to count as a group* each genus, and I consider the best course is to arrange the genera as near as possible in the groups that have been established with some authority, and then to give fairly full references, which those who have the knowledge and material can hereafter work out for themselves. I possess neither the time nor the material necessary for this purpose, and my object is merely to help others by giving a list of the recorded species from the Oriental Region.

Notes II.—

On the group *Perichlaena*.—Ent. Mon. Mag., vi. 1868, p. 68.

Leuchaphanta.—Lx. viii. 1871, p. 76.

Biologia Centrali-Americ., Col. i (3), 1881.

Smith, E. J. —

"Observations entomologiques," in *Mémoires de l'Académie Impériale des Sciences, Littérature et Beaux-arts, classe de Physique et de Mathématiques*, pour les années, 1869-70. Paris, 1869, p. 21; *ibid.*, 1872 p. 413. [My copy does not contain the last page, quoted by authors.]

Stål, A. —

Die Coleopteren der Indische, par M. M. André et Br. Stål. *Leipzig*, [Verl. F. Vieweg, 1894.

*Let us now compare the index to the Zoological Record for a series of years, and we will at once appreciate the extent of the existing confusion, which the *Zoogeographischer Atlas* will put over by giving the genera in alphabetical order.

† A list follows of the principal papers of Chapuis, Fawcett, Fawcett, and others on classification.

‡ A few subgenital species, marked by an asterisk, are given from the collection made by the Varied Minister of which the types are in the Indian Museum. The species identified to the Indian Museum have the prime locality as regular locality.

Chaudet, H. le Baron de. —

Bulletin de la Société Impériale des Naturalistes. Moscou.

1. — Genre nouveau et espèces nouvelles des Carabiques, ib. — x (3), 1817, p. 1; (7) p. 8.
2. — Tableau d'une nouvelle subdivision du genre *Fervens*, ib., xi (1), 1818, p. 4.
3. — Genre nouveau ib. — xi, 1818, p. 323; xvi 1818, p. 283, 471.
4. — Texte Mémoire sur la famille des Carabiques ib., xvi, 1818, p. 412.
5. — Note sur le groupe des *Stenolus* : ib., xix (7), 1820, p. 211.
6. — Mémoire sur la famille des Carabiques, L, ib., xxi (3), 1820, p. 1. — *Oleus* (p. 20), *Perichorus* (111), II, ib., xxi (7), 1820, p. 1. — *Dryops* (p. 33), *Anisus* (11), *Callis* (31), *Catantopus* (349), *Cryptus* (354), *Proctopus* (379), *Dinamocerus* (387), *Callistus* (394), *Laelinus* (402), *Oxytelus* (424), III, ib., xxi (7), 1820, p. 1. — *Tetragonus* (p. 71), IV, ib., xxi (7), 1820, p. 112, 179. — *Cicadellus* (p. 272), V, ib., xxvii (3), 1826, p. 1. — *Succinea* (p. 5), VI, ib., xxix (3), 1826, p. 187. — *Chalcidius*, xxi (3), 1827, p. 1.
7. — Matériaux pour servir à l'étude des *Chalcidites* et des Carabiques, ib., xxviii (4), 1826, p. 309 (*Chalcidites*) : xxix (1), 1826, p. 495. — *Cyclonotus* (p. 402), *Carabidus* (507), *Helorus* (504), *Oxytelus* (505), *Hilarius* (506), *Din* (*Stenellus*) (545), *Dryops* (546), *Galerita* (551), *Anisus* (552) : ib. (7), p. 1842. — Revision de l'ancien genre *Stenopus* : — *Stenopus* (p. 345), *Stenopus* (354), *Stenopus* (354), ib., xxi (7), 1820, p. 215. — *Urosoma* (p. 273), *Urosoma* (300), *Hilarius* (302), *Pogonochorus* (303), *Pogonochorus* (304), *Euphorus* (310).
8. — Essai monographique sur le genre *Alausus*, xlii (3), 1828, p. 305.
9. — Monographie des *Graciliteroides*, ib., xlii (7), 1828, p. 293.
10. — Monographie des *Léridés*, ib., xlii (2), 1828, p. 111. — *Dasyus* (p. 127), *Nomophorus* (145), *Lobis* (152) : ib., xlv (7), 1829, p. 1. — *Stenopus* (p. 50).
11. — Observations sur quelques genres des Carabiques, ib., xlv (7), 1829, p. 204. — *Callistomus* (p. 302), *Gemma* (391).
12. — Matériaux pour servir à l'étude des *Fervens* : — xlv (3), 1829, p. 221. — xlvii (1), 1829, p. 1. — *Leptus* (p. 30).
13. — Essai monographique des *Mesochorus*, et des *Tetragonitoides*, inconnus, 1829, p. 1. — *Cyphus* (p. 5), *Mesochorus* (11), *Cyphomus* (17), *Tetragonitoides* (23), *Mesochorus* (29), *Tilus* (71).
14. — Monographie des *Stenopus*, ib., 1 (7), 1829, p. 61. — *Stenopus* (p. 61), *Stenopus* (119).
15. — Genre nouveau et espèces indigènes des Carabiques : — ib., III, 1829, p. 1. — *Stenopus* (p. 7), *Tetragonitoides* (9), *Alausus* (17), *Tetragonitoides* (17).
16. — Essai monographique sur les *Mesochorus*, ib., iv (7), 1829, p. 317. — *Mesochorus*, *Mesochorus*.

Annales de la Société Entomologique de France.

1. — Genre et espèces des Carabiques nouveaux : — iv, 1827, p. 429.
2. — Monographie du genre *Cylindrus*, Nation, — (3 a) vi, 1828, p. 237.
3. — Revision des genres *Dicranocera* and *Cylindrus*, (3 a) vii, 1828, p. 275.
4. — Monographie des *Cylindrus* : — (3 a) vi, 1828, p. 317, 399.

Finlay, G. —

Entomographia imperii Russici, III, Moscow, 1923-24.

Harvet, J. P. W. —

Kritische Verzeichnisse meiner Insecten-Sammlung (C.A.), in *Archives de l'histoire des sciences* par L. Félizy, 1794; in French by Wiedersheim, 1794.

Kirby, W. —

Fauna boreali-Americana, Zool., 16. Norwich, 1837.

Lacordaire, J. T. — *Genre des Coléoptères*, I, Paris, 1854.

Fauna entomologique des cavernes de Paris — Paris, 1855.

Latreille, P. A. —

Histoire naturelle générale et particulière des Crustacés et des Insectes, Paris, 1801-1807.

Genre Crustacéens et Insectes, vertébrés ordinaires naturels de familles *Suppl.*, 10, Paris, I, II, 1805-7.

Matshushiki, Y. —

A list of the genera and species furnished by this author 1894-1937 and is found in the Supplement to vol. IV of the *Hornes Entomische Entomologische Rundschau*, St. Petersburg, 1938.

Examen des noms des espèces des Coléoptères rapportés de nos voyages 16, *Bull. Mus. Hist. Nat.*, 1934, p. 171, 207, et, 1935 (II), 1935, p. 222.

Essai d'une Catalogue des Insectes de l'Asie Occidentale, *Bull. Mus.*, 1935 (II), 1935, p. 22.

Mayet, A. G. —

Entomologie des Fleuves naturels des Insectes, Paris, 1799-1800.

Payson, G. W. F. —

Fauna Insectorum Germaniae septentrionalis, Nürnberg, 1807-1820.

Pilawa, J. —

1.—*Monographie des Cladus et des genres voisins* — *Mém. de la Soc. Roy. Belg.*, II, 1842.

2.—*Postscriptum ad Cladus et des genres voisins*, *L. A.*, 1844, 1847.

3.—*Révision générale des Cladus*, *Ann. Soc. Ent. Belg.*, 1, 1844-47, p. 1-273.

4.—*Supplément à la Révision générale des Cladus*, *ibid.*, 1847-48, p. 1-22.

5.—*Deuxième supplément à la révision*, *ibid.*, 1848, p. 90.

6.—*Monographie des Cladus*, *L. A.*, 1848, p. 13.

7.—*Brachyptera, Cladus et des genres voisins* — *Ann. Soc. Ent. Belg.*, 1848.

8.—*Les Brachyptera, Cladus et des genres voisins*, *ibid.*, 1848, p. 204 — *Brachyptera*, p. 204.

9.—*Étude sur les Amis de la Cladus et des genres voisins* — *ibid.*, 1848.

10.—*Monographie des Amis*, *L. A.*, 1848, p. 194.

11.—*Étude sur les Amis de la Cladus et des genres voisins* — *ibid.*, 1848.

Rehn, J. E. —

Illustrations of British Hymenoptera, or a Synopsis of indigenous species — *Naturalists' Club*, I-VI, London, 1928-33.

A Manual of British Coleoptera — London, 1928.

A Provincial catalogue of British Hymenoptera — London, 1928.

Wiedersheim, G. R. W. —

Entomologische Magazine, Vol. I (5), 1819; II (1), 1821.

Wiedersheim's Magazine der Entomologie, IV, 1821, p. 161.

OMOPHRENI.

Lacordaire, Gen. Cat., I, 1844, p. 41. Horn, Gen. Cat., p. 179. Leconte and Horn, Class. Cat., 1833, p. 6.

Genus OMOPHREON.

Latreille, Hist. Nat. Ins., III, 1807, p. 79. Lacord., Gen. Cat., I, p. 41. Muls. Cat., p. 42. Chaudoir, Rev. Mag. Ent., 1868, p. 34. Jelinek, Hist. Consp. Amer. Cat., 6, p. 14.

Epistoma, Schenck (1791), Zool. Berge, Berlin, Ent. Zeit., 1794, p. 229.

Homophron, Latr. Hist., 1807, p. 172.

Andryan, pp. Feltz, Ent. Myth., 4, 1795, p. 189.

Homophron, Jelinek, Amer. Ent., I, 1890, p. 29.

Hab. India.

maculosa, Chaudoir, Bull. Mus., xxxv (7), 1870, p. 424.

Hab. N. India.

picta (Audouin), Wiedemann, Ent. Mag., 8 (1), 1823, p. 69.

Hab. in Ind. Bengal.

vittata (Audouin), Wiedemann, l. c., p. 69.

Hab. India, Bengal.

CYCHRENI.

Ald., Gen. Cat., 1891, p. 197. Jelinek & Horn, Class. Cat., 1890, p. 7.

[M. Jelinek (Class. Cat., 1890) places the Cychreni with the Carabini and he describes as comprising these genera, designated sub-order by

"Cychreni, Cychreni and Carabini, each with numerous sub-divisions."

M. Jelinek writes: "Pour les groupes qui se trouvent d'habitude sous le nom de tribus cychreni, on doit les regarder comme appartenant aux Carabini."

Chaudoir et Cychreni. On doit le regarder comme appartenant aux Carabini."

Chaudoir et Cychreni. On doit le regarder comme appartenant aux Carabini."

Chaudoir et Cychreni. On doit le regarder comme appartenant aux Carabini."

Chaudoir et Cychreni. On doit le regarder comme appartenant aux Carabini."

Chaudoir et Cychreni. On doit le regarder comme appartenant aux Carabini."

Genus CYCHREUS.

Faldermann, Pacific Nat. Soc., II (3), 1854, p. 64-71. Chaudoir, Ent. Mag., 8, p. 116.

l. c. Latr., Hist. Consp., III, p. 79. Lacord., Gen. Cat., I, p. 42. Chaudoir, Bull. Mus., xxxv (7), 1870, p. 424. Muls. Cat., p. 42. Chaudoir, Bull. Mus., xxxv (7), 1870, p. 424.

Muls., xxxv (7), 1870, p. 424. Muls. Cat., p. 42. Chaudoir, Bull. Mus., xxxv (7), 1870, p. 424.

Duvoy, Hist. Nat. Mus., xxxv (7), 1870, p. 424. Chaudoir, Bull. Mus., xxxv (7), 1870, p. 424.

Jelinek, Hist. Nat. Mus., xxxv (7), 1870, p. 424. Chaudoir, Bull. Mus., xxxv (7), 1870, p. 424.

Faldermann, Pacific Nat. Soc., II (3), 1854, p. 64-71. Chaudoir, Ent. Mag., 8, p. 116.

l. c. Latr., Hist. Consp., III, p. 79. Lacord., Gen. Cat., I, p. 42. Chaudoir, Bull. Mus., xxxv (7), 1870, p. 424. Muls. Cat., p. 42. Chaudoir, Bull. Mus., xxxv (7), 1870, p. 424.

Muls., xxxv (7), 1870, p. 424. Muls. Cat., p. 42. Chaudoir, Bull. Mus., xxxv (7), 1870, p. 424.

Chaudoir et Cychreni. On doit le regarder comme appartenant aux Carabini."

- Dasygasterus*, Gebie, 1874, Cat. p. 2318, 24.
Friller, Fischer, Bull. Mus., v. p. 182-183; Thoms, Op. Ent., 1875, p. 477.
 Gebie, Cat. p. 8. Gough, Entom. Soc. Brit., 1884, p. 258.
 Solter, Wien Ent. Zeits., 1897, p. 186.
- Altrichia* (*Morphosaurus*), Mulsant, Bull. Acad. St. Petersb., v. 1862, p. 237.
 Bates, Trans. Ent. Soc. Lond., 1872, p. 223. Gebie, Cat., p. 17.
Leucostictus, G. Thomson, Op. Ent., 1875, p. 228 (as *J. Thomson*).
 var. *sericeus*, Mulsant, Bull. Mus., xxxviii (4), 1867, p. 232.
 Fowler, Bates, Trans. Ent. Soc. Lond., 1898, p. 223.
Morphosaurus, Bates, L. c., 1872, p. 223. id., 1898, p. 223.
Mulsantia, Mulsant, Bull. Mus., xxxviii (4), 1867, p. 232.
Christina, Guenée, L. c., 1867, p. 232.
 Hal. China.
- Maculicollis* (*Maculicollis*), Kollar, in Hüfnér's Katalog, iv (St. 1844), p. 177, 1, 23.
 Hal. Gebie, Cat., p. 10.
 var. *indistinctus*, Tabor, Arch. Mag. N. H., xii, 1897, p. 74.
 Hal. Hukabya, Kollar (Ind. Mus. Natur.).
- Maculicollis* (*Maculicollis*), Choulou, Rev. Mag. Ent., (2 s.) 49, 1898, p. 714.
 Gebie, Cat., p. 10.
 Hal. China.
- Davilla* (*Morphosaurus*), Deyrolle and Fairm., Ann. Soc. Ent. Fr., (3 s.) 12, 1875,
 p. 27, 1, 2, 1, 1. Gebie, Cat., p. 11.
 Hal. Middle China.
- Davilla*, Fairm., Le Nat., viii, 1885, p. 222; Ann. Fr., L., 1885, p. 222.
 Hal. Yunnan.
- Fairm.*, Ann. Mus. Civ. Gen., (2 s.) vi, 1885, p. 104.
 Hal. Burma, Hama, Kollar, Kollar.
- Scutellaria* (*Morphosaurus*), J. Thomson, Ann. Soc. Ent. Fr., (3 s.) 12, 1875, p. 228.
 L. c. 1, 2. Gebie, Cat., p. 10.
 Hal. China (Ind. Mus. China).
- Scutellaria* (*Scutellaria*), J. Thomson, Arch. Ent., 4, 1897, p. 186. Gebie, Cat.,
 p. 10.
 Hal. China (Ind. Mus. China).
- Scutellaria*, Fairm., Ann. Soc. Ent. Fr., (3 s.) 12, 1875, p. 228.
 Hal. Siam (Ind. Mus. Dupl.).
- Scutellaria* (*Morphosaurus*), Choulou, Rev. Mag. Ent., (2 s.) 49, 1898, p. 714.
 Bates, Trans. Ent. Soc. Lond., 1872, p. 223; id., 1876, p. 223. Gebie, Cat., p. 17.
 Kollar, G. Thomson, Op. Ent., 1875, p. 227.
 Hal. Japan, Canton (Pam.).
- Scutellaria* (*Morphosaurus*), Fairm., Soc. Asia Prop. Ent. Soc. Fr., 1875, p. 227; L. c., 1876, 1. (*Apotomoptera*) High. Ch. Mus., 1876, 1877, p. 16.
 Hal. China (Ind. Mus. China).
- Scutellaria* (*Morphosaurus*), Bates, Trans. Ent. Soc. Lond., 1872, p. 223. Gebie,
 Cat., p. 17, 17.
 Hal. India, Hama (Ind. Mus., 1876).

- sticticus* (*Morphosticticus*), *Carabid.*, *Bull. Mus. Nat. (F. & S.)* xxi, 1886, p. 28.
(= sticticus, M. Thomson.)
 Hab. China.
Thomson (*Morphosticticus*), *J. Thomson*, *Arch. Ent.*, x, 1887, p. 147; *Géol.*, *Col.*,
 p. 16.
 Hab. China.
vicinidorsatus, *Fairmaire*, *Ann. Mus. Nat. Belg.*, xxi, 1887, p. 74.
 Hab. Tibet, Mongolia.
Walleri (*Sphaerostictus*), *Fairmaire*, *Ann. Soc. Ent. Fr. (S. 4.)* ii, 1892, p. 63.
Géol., *Col.*, p. 28.
 Hab. W. India.
Walleri (*Oncomeris*), *Hoppe*, *Verh. d. Ent. Mus.*, 1871, p. 31; *Géol.*, *Col.*, p. 44.
Boyd., *Yalco.*, *Ann. Mus. N. H.*, viii, 1883, p. 31.
 Hab. Nepal.
Yunnan, *Fairmaire*, *Le Nat.*, viii, 1886, p. 223; *Ann. Soc. Ent. Fr. (S. 4.)* i, 1890, p. 109.
 Hab. Yunnan.

Genus **COPTOLA** •BWS

- Kollar*, *Trupel und Rader's Stud. Ent.*, i, 1848, p. 28; *Mon. Col.*, vii, *Géol.*,
Col., p. xxi, 38.
Macrotis, pl., O. Thomson, *Opusc. Ent.*, 1875, p. 101.
Elysi, J. Thomson, *Ann. Soc. Ent. Fr. (S. 4.)* ix, 1892, p. 207, t. 2, f. 2.
Géol., *Col.*, p. 35.
 Hab. E. China.
gambialis, *Fairmaire*, *Bull. Soc. Ent. Fr. (S. 4.)* vii, 1887, p. 276; *Ann. Soc. Ent.*,
Belg., xxi, 1887, p. 61.
 Hab. Yunnan.
laticollis, *Fairmaire*, *Ann. Soc. Ent. Fr.*, 1887, p. 108, t. 2, f. 7; *Géol.*, *Col.*, p. 35.
(= vancouverensis, Thomson, Ann. Soc. Ent. Fr. (S. 4.) vi, 1889, p. 75, t. 1, f. 3—*Kollar*,
Diagnos. Ent. Trupel, 1848, plate, f. 8, 7.)
 Hab. N. China, Shanghai, Canton (*Fairmaire*), (Ind. *Thom.*, *Géol.*).
collaris, (*Thomson*), *Thomson*, *Bull. Soc. Ent. Fr. (S. 4.)* ix, 1892, p. 217, t. 2, f. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.
 Hab. N. Tibet, Mongolia.
laticollis, *Fairmaire*, *Le Nat.*, viii, 1886, p. 223; *Ann. Soc. Ent. Fr. (S. 4.)* i, 1890, p. 109.
 Hab. Yunnan.

Genus **DAMASTER**

- Kollar*, *Ann. Soc. Mus.*, i, 1848, p. 22; *Laurel*, *Mon. Col.*, i, p. 61; *Mon. Col.*,
 p. 71; *Trupel*, *Ent. Mus.*, xvi, 1880, p. 125; *Géol.*, *Col.*, *Géol.*, p. 85;
Boyd., *Géol.*, p. 104.
laticollis, *Kollar*, *Ann. Mus. Wien*, i, 1848, p. 77, t. 1, f. 1; *Laurel*, *Mon. Col.*,
 Allen, t. 2, f. 2; *Levi*, *Bull. Mus. Nat.*, xvi, 1880, p. 125; *Géol.*, *Col.*, *Géol.*,
 p. 85, t. 1, f. 1; *Walleri*, *Mon. Ann. Soc. Ent.*, 1886, p. 13.

apocrita, Lewis, Trans. Ent. Soc. Lond., 1862, p. 324.

Fortunei, G. Thomson, Opusc. Ent., 1872, p. 217.

viridipennis, Lewis, Ent. Mus. Mag., xvii, 1862, p. 152.

Formosa, Adams, Ann. Mag. N. H., (3) 43 vol. 1861, p. 32; Bates

Trans. Ent. Soc. Lond., 1872, p. 230; Lewis, ib., 1862, p. 324.

maculata, Schiner, Arch. Soc. Ent. Fr., 14 et 15, 1862, p. 30, t. 1, f. 7.

Leveillei, Lys. Ent. Mus. Mag., 1872, p. 131.

pendula, Bates, Trans. Ent. Soc. Lond., 1872, p. 22; 44, 1874, p.

231; Kollar, Ent. Nachr., xii, 1867, p. 247.

Hab. Japan, Formosa (Ind. Arch.) etc.

Genus CALOSOMA.

Waller, Obs. Ent., 4, 1861, p. 20; Latr., Hist. Nat. Cynip. Ind., ii, 1807, p. 31; Latr.,

Gen. Col., 4, p. 33; Muls. Col., p. 79; Gahan, Cat. Cynip., 1880, p. xvii, 25.

Asiaticum, Gahan, Col., p. xxiv, 47.

Blattaria, Gahan, 1876; Col., p. xxvii, 65.

Guineensis, Mulsch., Bull. Mus., xxviii (2), 1865, p. 207; Gahan, Col., p. 23.

Callipterus, Mulsch., l. c., p. 209; Gahan, Col., p. 27.

Callipterina, Mulsch., ib., Ent. Rev., 1870, p. 227; Gahan, Col., p. 28.

Callipterus, Fitch, Latr. & Fitch, 1825, p. 10; Gahan, Col., p. xxv, 63.

Callipterus, Mulsch., Bull. Mus., l. c. supra, p. 209; Gahan, Col., p. 28.

Callipterus, Mulsch., l. c., p. 207; Gahan, Col., p. xxv, 28.

Callipterus, Mulsch., l. c. supra, p. 209; Gahan, Col., p. xxvii, 65.

Callipterus, Mulsch., l. c., p. 210; Gahan, Col., p. 28.

Callipterus, Henry, Le Nat., 1866, p. 204; Gahan, Col., p. xxvii, 67.

Canadensis, Mulsch., l. c. supra, p. 214; Gahan, Col., p. xxx, 65.

Canadensis, Mulsch., l. c., p. 208; Gahan, Col., p. xxx, 59.

Canadensis, Mulsch., l. c., p. 208; Gahan, Col., p. xxvii, 62.

Canadensis, Gahan, 1875; Col., p. xxvii, 63.

Callipterus, G. Thomson, Opusc. Ent., 1871, p. 425; Gahan, Col., p. xxvii, 70.

Canadensis, Mulsch., Bull. Mus., l. c. supra, p. 207; Gahan, Col., p. 28.

Chernovi, Mulsch., l. c., p. 201; Gahan, Col., p. xxvii, 61.

Chrysostoma, Kirby, Facs. Ent. Assoc., 1822, p. 15; Gahan, Col., p. xxvii, 57.

Canadensis, Mulsch., Bull. Mus., l. c. supra, p. 203; Gahan, Col., p. 28.

Canadensis, Mulsch., l. c., p. 206; Gahan, Col., p. xxvii, 55.

Callipterichus, Gahan, 1876; Col., p. 70.

Callipterichus, Gahan, Bull. Soc. Ent. Fr., 1862, p. xxxvii; Col., p. xxvii, 66.

Callipterus (*Chrysostoma*), Kirby, Trans. Linn. Soc. Lond., vii, 1816, p. 279; Gahan, Col., p. 28.

Callipterus, Mulsch., Bull. Mus., xxvii (2), 1865, p. 431.

Hab. China, Canton, Japan, India, Ceylon (Ind. Arch.), California, California.

Callipterus, B. Gahan, Ann. Mus. Civ. Gen., vii, 1875, p. 211; Gahan, Col., p. 27.

Hab. N. W. Hindustan, Ladak.

- indicus* (*Chamaea*) Hope, Orig. & Desc. Insect., 1831, p. 71 (Gotha, Cat., p. 61).
Holt. Mag., 41.
- survestigator* Hope, Kilar. Trans., i, 1788, p. 142. Schwarz, Salzburg, Lat., i, 180, p. 114. (*Chamaea*) Motsch., Bull. Mosc., xxxviii (4), 1865, p. 301. Gyllén, Cat., p. 61.
- sericans*, Sturm, Ins. Deutschl., iii, 1813, p. 180, t. 66, f. 2. Dejourn, Hymen., ii, p. 255. Lat., v, t. 71, f. 2.
- capensis*, Fischer, Ent. Imp. Russ., iii, 1826, p. 226, t. 8, f. 5, 6.
- auratus*, Motsch., Ins. Sib., 1844, p. 112, t. 4, f. 9. Bull. Mosc., xxxviii (4), p. 304.
- apicatus*, Fischer, Ent. Imp. Russ., iii, 1826, p. 228, t. 8, f. 1.
- nitens*, Motsch., Ins. Sib., 1844, p. 111.
- capensis*, Motsch., Ins. Sib., 1844, note 2.
- sericans*, Fischer, Ent. Imp. Russ., iii, 1826, p. 226, t. 8, f. 1.
- nitens*, Motsch., Ins. Sib., 1844, p. 111. Bull. Mosc., xx (9), 1847, p. 224.
- laevigatus*, Gyllén, Insul. Holm., iii, 1835, p. 58 (see *Fahr*).
Holt. Trans. v. Russia, Siberia [*Ind. Mus., Kashmir, Srinagar*].
- negus* (*Chamaea*), Chaudoir, Ann. Soc. Ent. Fr., (4a) ix, 1862, p. 372. Gyllén, Cat., p. 61.
- var. flavus*, Gyllén, Cat. Carab., 1862, p. 61.
Holt. Trans. v. Russia, Siberia.
- negus* (*Chamaea*), Furr., Trans. Ent. Soc. Lond., iv, 1843, p. 85. Gyllén, Cat., p. 61.
- var. subcapensis*, Chaudoir, Ann. Soc. Ent. Fr., (4a) ix, 1862, p. 371.
Holt. Trans. v. India.
- orientalis* (*Chamaea*), Hope, Trans. Ent. Soc. Lond., i, 1833, p. 97. Chaudoir, Ann. Soc. Ent. Fr., (4a) ix, 1862, p. 368. Gyllén, Cat., p. 61.
Holt. India, Persia [*Ind. Mus., Sind Valley, Soggyat*].
- parvulus* (*Campestris*), Motsch., Ins. Sib., 1844, p. 123, t. 4, f. 1. Gyllén, Cat., p. 62.
Holt. Kirgizia, India [*Ind. Mus., Kashmir, Srinagar*].
- agrostoides* (*Chamaea*), Chaudoir, Ann. Soc. Ent. Fr., (4a) ix, 1862, p. 369. Gyllén, Cat., p. 61.
Holt. Bengal, Cochin-China (Malacca).
- caelestis* Fennel, Ann. Soc. Ent. Belg., xxxi, 1867, p. 92.
Holt. Mongolia, N. Tibet.
- QULETTI** —
Lacordaire, Gen. Cat., i, 1854, p. 61. Chaudoir, Bull. Mosc., xxxviii (4), 1865, p. 306. Horn, Gen. Carab., p. 318.

Genus HILETUS.

- Schultz, Krieger's Tijds., (7a) ii, 1847, p. 348. Lacord., Gen. Cat., i, p. 48. Horn, Cat., p. 48.
- chamaecephala*, Fennel, Mag. Nederl., 1848, p. 1, t. 1, 165-1; Ent. Mag. Nederl., (7a) i, 1849, p. 485.

sumatrensis (Ghesbille, *Notes Lepid. Mus.*, v, 1822, p. 225.

Hab. S., Sumatra, Serdang.

ELAPHRINI :—

laevi, Chevrol., *Ann. Col.*, i, 1824, p. 23 : *Chaud.*, *Bull. Mus.*, xxvii (7), 1861, p. 222.

Horn, *Gen. Carab.*, p. 210 : *Laporte & Herr.*, *Class. Col.*, p. 19.

Genus ELAPHRUS.

fulvipes, Spill. *Ent.*, 1778, p. 227 : *Syll.*, *Eleuth.*, i, 1807, p. 223 : *Latre.*, *Hist. Nat.*

Ins., iii, 1802, p. 32 : *Laporte*, *Gen. Col.*, i, p. 43 : *Mun.*, *Col.*, p. 24.

barthol., *Fauna Ind. Néer.*, *Ann. Soc. Ent. Belg.*, xxv, 1887, p. 25.

Hab. Yunnan.

MEGALINI :—

chevrol., *Bull. Mus.*, xxvii (7), 1861, p. 204 : *Horn*, *Gen. Carab.*, p. 212 : *Laporte*

& Herr., *Class. Col.*, p. 12.

Oat, OPIETHIUS.

elys., *Faun. Bor. Amer.*, iv, 1857, p. 67 : *Laporte*, *Gen. Col.*, i, p. 45 : *Chaud.*,

Bull. Mus., xxvii (7), 1861, p. 202 : *Mun.*, *Col.*, p. 47.

indica Chevrol., *Ann. Mus. Ent.*, Fr. (3 + 4), 1862, p. 222.

Hab. N. India.

Genus NOTIOPHILUS.

laevi, Chevrol., *Bull. Mus.*, 1861, p. 124 : *Laporte*, *Gen. Col.*, i, p. 43 : *Mun.*, *Col.*, p. 19.

halles, *Bull. Carab. Amer. Col.*, i (3), p. 18.

acuticollis, *Fauna Ind. Néer.*, 1887, p. 25.

Hab. S. China, & Shanghai.

orientalis, *Chaud.*, *Bull. Mus.*, xxvii (7), 1861, p. 222.

Hab. India, Siam.

Genus LEISTUS.

fulvipes, *Naturf.*, xviii, 1778, p. 27 : *Chaud.*, *Bull. Mus.*, ii, 1807, p. 145 : *Latre.*,

Gen. Col., i, p. 22 : *Mun.*, *Col.*, p. 24.

hypoleuca, *Latreille*, *Hist. Nat. Ins.*, iii, 1802, p. 22, *Ann. Carab.*, i, p. 22.

argentea, *Fauna Ind. Néer.*, 1887, p. 22, *Ann. Soc. Ent. Fr.*, (3 + 4), 1862, p. 207.

Hab. Yunnan.

Genus TERRIA.

laevi, *Horn*, *Gen. Carab.*, iii, 1862, p. 22 : *Chaud.*, *Bull. Mus.*, ii, 1807, p. 145 : *Latre.*, *Gen. Col.*, i, p. 22 : *Mun.*, *Col.*, p. 24.

alpinus, *Smith*, *Mem. Acad. York*, 1809, p. 64.

halles, *Chaud.*, *Bull. Mus.*, ii, 1807, p. 147.

chud., *Fauna Ind. Néer.*, 1887, p. 22 : *Ann. Soc. Ent. Fr.*, (3 + 4), 1862, p. 207.

Hab. China, Korea.

sinensis, Bates, Ent. Mon. Mag., ix, 1872, p. 82; Trans. Ent. Soc. Lond., 1872, p. 319; Fauna. Ann. Fr., l. c. supra, p. 305.

Hab. Yangtze Valley in China, Japan.

sinensis, Oberthur, Nov. Col., i, 1892, p. 47.

Hab. Darjeeling.

sinensis, Fairmaire, Le Nat., viii, 1885, p. 227; Ann. Fr. l. c. supra, p. 305.

Hab. China, Kiangsi.

sinensis, Bates, Trans. Ent. Soc. Lond., 1872, p. 319; Fairmaire, Ann. Soc. Ent. Belg., xxi, 1877, p. 93.

Hab. Yangtze Valley, Japan, Kiangsi.

sinensis, Oberthur, Bull. Mus., xiii (4), 1890, p. 423.

Hab. India, Simla.

INDELADENTUS

Horn, Gen. Cat., p. 113.

Genus LUPERCA

Lap. de Casteln., Hist. Nat. Ind. Col., i, 1840, p. 42; Lacord., Gen. Col., i, p. 102; Mon. Col., p. 102.

sinensis, Oberthur, Bull. Mus., xiii (4), 1890, p. 423; id., 50 (4), 1890, p. 42.

sinensis, (Gyllenhal & Palm, Spet. Ind., i, 1781, p. 404; Ent. Syst., i, p. 213; Syst. Mus., i, p. 124; Gyll., Ent., vi, p. 7, t. 2, p. 18; Herbst, Naturges. Fr., Koen., p. 210, t. 179, l. 8; Lacord., Ann. Col., l. c. supra, t. 8, l. 1.

sinensis, Oberthur, Spet., v, p. 474; Oberthur, Bull. Mus., 50 (4), 1890, p. 42; id., 50 (4), 1890, p. 42.

sinensis, Lap. de Casteln., El. Nat., i, 1841, p. 181.

Hab. India, Bengal (Fed. Mus., Calcutta.)

DEFINITION

sinensis, Monograph, Ann. Soc. Ent. Belg., xxi, 1877, p. 224; id., 1878, p. 224; Horn, Gen. Cat., p. 113; Lacord. & Horn, Class. Col., p. 10.

The genus divides the tribe, as far as is known with it, into two sections with the names *Synanthus* (*Phaenanthus* and *Phaenanthus*), and *Chlorus* (*Phaenanthus*, *Chlorus*, *Indistinctus*). Others make four sections, of which the genus occurring in the Oriental Region are:—

Synanthus — *Synanthus*.

Chlorus — *Oxytelus*, *Haplophaster*, *Synanthus*, *Cephalotes*, *Distichus*, *Scaphisoma*.

Indistinctus — *Scaphisoma*, *Phaenanthus*, *Synanthus*, *Oxytelus*, *Distichus*, *Scaphisoma*.

Phaenanthus — *Synanthus*, *Chlorus*, *Coryus*, *Anax*, *Andistoma*, *Phaenanthus*, *Distichus*, *Scaphisoma*.

Ann. Soc. Ent. Belg., x, 1876, p. 1.

Genus MOUHOTIA

Lap. de Casteln., Rev. Mag. Ent., xiv, 1842, p. 215; Mon. Col., p. 102.

sinensis, Lewis, Ent. Mon. Mag., xiv, 1842, p. 215; Waterhouse, Ald., i, 179, t. 1.

Hab. Laos.

Chaudhri, *Monograph*, Ann. Soc. Ent. Belg., 1927, p. 109.

Immatura. Feltgen, *Chaudhri, Mém.*, 1927, p. 154.

Hab. Malabar.

ovata. Chaudhri, *Mém.*, 1927, p. 154.

Hab. S. India.

Genus **SCARITODERUS**.

fulvipes, Ball, Soc. Ent. Fr., (4 s.) 19, 1901, p. 72, n. sp.

laevigatus, Chaudhri, Ann. Soc. Ent. Belg., 1927, p. 110 (nom. nov.).

laevigatus, Feltgen, Rev. d'Ent., 1, 1927, p. 223 (nom. nov.).

leptus, Feltgen, *Id.*, *supra*, p. 22.

Hab. India, Sumatra.

Genus **COPTOLOBUS**

- Chambor*, Bull. Mus., xxx (3), 1887, p. 56; *id.*, Monograph, Ann. Soc. Ent. Belg., xiii, 1879, p. 125; Mem. Cal., p. 182.
Agassiz, Chambor, *Ann.*, l. c., p. 160.
 Hab. Ceylon.
subcostatus Chambor, Bull. Mus., xxx (3), 1887, p. 60; *Ann.*, l. c., p. 182; Mem. Cal., p. 182.
fulvipes (Chambor) Walker, Ann. Mag. N. H., (7), ii, 1868, p. 303.
fulvipes (Chambor), Walker, l. c., p. 303.
 Hab. Ceylon, Western Gyr, Horton Plains (Noted), Ceylon (Peters).
ovatus Chambor, *Mem.*, l. c., p. 161.
 Hab. Ceylon, Colombo (Noted).
capitatus Chambor, *Mem.*, l. c., p. 161.
 Hab. Ceylon, Colombo (Noted).

Genus **DISTICHUS**

- Mitschke*, Zs. Ent., 1857, p. 94; *Chambor*, Monograph, Ann. Soc. Ent. Belg., xiii, 1879, p. 14; Hab. Dist. Centr. Amer., Cal., l. c., p. 50.
scutiger, p. 1, Rondel, Dejean and
fulvipes, p. 1, Chambor, *Ann.*
distans Chambor, *Mem.*, Ann. Soc. Ent. Belg., xxii, 1880, p. 32.
 Hab. Ceylon.
distans Chambor, *Mem.*, l. c., p. 32.
 Hab. Ceylon, Colombo, Kandy.
distans Chambor, *Mem.*, l. c., p. 32.
 Hab. India.
distans (Chambor), Dejean, Spec. r. 1831, p. 493; Chambor, *Mem.*, l. c., p. 32.
distans, Rondel, Wagner, Ann., 1857, p. 271.
distans, Rondel, Wagner, Ann. Al. Mus. Hung., xxx, 1856, p. 279; Ann. Mag. N. H., xxviii, 1857, p. 244.
 Hab. Ceylon, Chambor, Dejean, W. Africa, Zanzibar.
distans (Chambor), Rondel, Hb. Acad. Paris, 1817, p. 179; Dejean, Spec. r. p. 203; l. c., in Cal. Mus., l. c., p. 51; 2. Klap. Synch. Vesp., Dec. 18, t. 24, f. 8; Chambor, *Ann.*, l. c., p. 32.
distans (Chambor) Klap. Fauna Boles Mamm., v, 1863, p. 138.
distans (Chambor), Rondel, Hb. Mus. Boles, p. 279.
distans (Chambor), Rondel, Cal. Mus., l. c., 1852, p. 142.
distans, Rondel, Dejean, Spec. r. 1831, p. 194.
 Hab. Mediterranean and Caspian regions, N. India.
distans Chambor, Bull. Mus., xxi (2), 1881, p. 47; *Ann.*, l. c., p. 32.
 Hab. N. India.
distans Chambor, *Mem.*, l. c., p. 32.
 Hab. India.

Genus SCARITES.

- palustris*, Edl. Syst. 1, 1772, p. 91; Syst. Eleuth., 1, p. 123 (*Cholestus*, DeGree, new Lib.); Lamey, Gen. Cat., 1, p. 154; Schmidt Guelst, Faun. Cat. Bern., p. 93; Brn. Cat., p. 124; Chaudoir, Bull. Mus., xviii (3), 1894, p. 5; id., Monograph, Ann. Soc. Ent. Belg., xliii, 1899, p. 43; Motschulsky, St. Ent., 1837, p. 81.
Descommerphus, Motsch., St. Ent., 1837, p. 94; Chaud., Mon., p. 44.
Glyptomerphus, Motsch., l. c., p. 82.
Harporhynchus, l. c., p. 80; Chaud., Mon., p. 47.
Pseudomerphus, Motsch., l. c., p. 94; Ent. Russ., 1839, 1, v; Chaud., Mon., p. 45.
Paramerphus, Motsch., St. Ent., 1837, p. 96; Chaud., Mon., p. 46.
Scaphomerphus, Motsch., l. c., p. 83; Chaud., Mon., p. 47.
Stenomerphus, Motsch., l. c., p. 81.
Tenebrioides, sp., Chaudoir, Mon. Mus. Cat., p. 161.
scutellus, Chaudoir, Bull. Mus., xviii (3), 1894, p. 29; id., Mon., p. 42.
 Hab. Eastern China, China.
barbarus, Dejans, Spec., 1, 1833, p. 385; Chaud., Mon., p. 41.
 Hab. India, Dekhan.
bragadensis, Dejans, Spec., 1, 1833, p. 385; Chaud., Bull. Mus., xviii (3), 1894, p. 79; id., Mon., p. 43.
 Hab. N. India, Bengal.
brasil, Chaudoir, Bull. Mus., xviii (3), 1894, p. 57; Mon., p. 43.
 Hab. N. India.
castus, Chaudoir, Bull. Mus., xviii (3), 1894, p. 60; id., Mon., p. 43.
 ? *cf. Solana*, Schmidt Guelst, Faun. Cat. Bern., 1845, p. 44 (*solana*, Lamey).
 Hab. Burma, Rangoon, N. India.
cylindricus, Chaudoir, Mon., p. 44.
 Hab. Ceylon, Galle, Colombo (Hates).
cyrtosternus, Chaudoir, Mon., p. 112.
 Hab. India.
dentipalpus, Chaudoir, Mon., p. 74.
 Hab. Ceylon, Galle.
dyschirius, Chaudoir, Bull. Mus., xviii (3), 1894, p. 77; id., Mon., p. 42.
 Hab. N. India.
edricatus, Fairmaire, Ann. Soc. Ent. Belg., 1887, p. 33.
 Hab. China, Fokien.
eryon, Hope, Geny's Ent. Mus., 1831, p. 21; ? MacLeay, Trans. Ent. Soc. N. S. Wales, 1, 1863, p. 66 (Australia).
 Hab. Nepal.
hammersoni, Chaudoir, Bull. Mus., l. c., supra, p. 82; Mon., p. 47.
 Hab. N. India [Zad. Mus., Zinac Valley].
indus, Guérin, Ent., 16, 28, 1775, p. 83, 1, 1, 2 & 3; Dejans, Spec., 1, p. 385; MacLeay, Austral. Fauna, p. 66; Chaud., Mon., p. 108.
 Hab. India, Ceylon, Colombo [Zad. Mus., Bengal, Tripulit, (El. Spec.)].
inspurus, Chaudoir, Mon., p. 47.
 Hab. N. India.

longiusculus, Chaudoir, *Mém.*, p. 86.

Hab. Philippines.

marginatus, Bonelli, *Mon. Acad. Torino*, 1812, p. 473; Dejourn., *Spéc.*, 1, p. 194; Chaudoir, *Mém.*, p. 172.

Hab. India, Java, Philippines.

opacus, Chaudoir, *Bull. Mus.*, xviii (3), 1835, p. 86; *id.*, *Mém.*, p. 102.

? - parvus, Wiedemann, *Zool. Mag.*, 8 (6), 1822, p. 37.

Hab. N. India, Bengal.

orthomus, Chaudoir, *Bull. Mus.*, xviii (3), 1835, p. 86; *id.*, *Mém.*, p. 83.

Hab. Himalaya.

partitus, Bates, *Trans. Ent. Soc. Lond.*, 1873, p. 298; Chaudoir, *Mém.*, p. 101.

Hab. Formosa, Japan.

parallelus, Dejourn., *Spéc.*, 1, 1825, p. 283; Chaudoir, *Mém.*, p. 86.

Hab. Java.

praedator, Chaudoir, *Mém.*, p. 97.

Hab. Burma, Bangoon.

pusillus, Wiedemann, *Zool. Mag.*, 8 (6), 1822, p. 36; Chaudoir, *Mém.*, p. 101.

Hab. Bengal.

semistriolatus, MacLeay, *Annul. Javan.*, 1835, p. 24; Chaudoir, *Mém.*, p. 107.

? - pusillus, Wiedemann, *q. v.*

Hab. Java.

semitrugens, Chaudoir, *Bull. Mus.*, xviii (3), 1835, p. 90; *Mém.*, p. 87.

repens, Chaudoir, *Bull. Mus.*, *ix*, p. 22.

Hab. Bengal, Java, Philippines.

serilis, Chaudoir, *Mém.*, p. 63.

Hab. I. E. Asia.

schelloni, Chaudoir, *Bull. Mus.*, xviii (3), 1835, p. 87; *Mém.*, p. 103.

Hab. N. India.

semitrugens, Chaudoir, *Mém.*, p. 90.

Hab. Java, Bangoon.

sublatus, Olf., *Kon. St.*, 36, 1795, p. 7, s. 1, t. 11; Dejourn., *Spéc.*, 1, p. 215; Chaudoir, *Mém.*, p. 80.

subvirens, Erichson, *Nov. Acta Leop. Carol. Nat.*, xvi, Suppl. 1, 1812, p. 221.

Hab. India, Minor, Formosa [*Zool. Mém.*, Sikkim, Assam?].

Genus SCAPTERUS.

Dejourn., *Spéc.*, 11, 1826, p. 451; Lacord., *Gen. Col.*, 1, p. 137; *Mém. Col.*, p. 184.

Palang, Bérillon-Chiribbes, *Ann. Soc. Ent. Belg.*, 1, 1855, p. 7.

typoides, H. Gahan, *Ann. Mus. Civ. Gen.*, xviii, 1892, p. 701, 86.

Hab. Burma.

usertali, Dejourn., *Spéc.*, 11, 1826, p. 452; *Icon. Col. Ent.*, 1, s. 25, f. 3; Gahan, *Proc. U.S. Nat. Mus.*, 1, s. 1, f. 1.

Ugala, *Ann. Soc. Ent. Belg.*, 1, 1855, p. 7; Gray, *Griffiths Anim. Kingdom*, 1892, s. 6, f. 1.

Hab. India.

tiparica R. Gestro, Ann. Mus. Civ. Gen., xliii, 1888, p. 179/82.

Hab. Burma, Mienla.

ulicatus Puterbaugh, Mém. Soc. Entom. France, 1913, p. 17; ? Chauchat, Rev. Mag. Zool. (2 s.), xv, 1902, p. 117.

Hab. N. E. India (Ind. Mus., Siliguri, Assam).

Genus **THLIBOPS**

Puterbaugh, Ann. Soc. Ent. Belg., x, 1905, p. 9; Mus. Cat., p. 193.

striata, Chauchat, Rev. Mag. Zool. (2 s.), xv, 1902, p. 118.

Hab. Cooch's China.

Puterbaugh, Chauchat, l. c., p. 118.

Hab. Java.

punctifrons R. Gestro, Ann. Mus. Civ. Gen., xliii, 1888, p. 182.

Hab. Burma.

Genus **XYONATHUS**

Dejean, Syn., ii, 1835, p. 473; Icon. Car. Eur., i, 1, 20 f. 37; Latr., Gen. Cat., i, p. 195; Mus. Cat., p. 199.

elongatus (Rugosus), Wiedemann, Rev. Mag., ii (3), 1833, p. 13; Dejean, Syn., ii, p. 475.

Hab. India.

Genus **DACCA**

Puterbaugh, Mém. Soc. Entom. France, 1913, p. 48; Mus. Cat., p. 181.

striatipes, Puterbaugh, l. c., p. 48, 1, 1, 1, 1.

Hab. India.

Genus **SFAITTES**

Puterbaugh, Dissert., Ann. Soc. Ent. Belg., x, 1905, p. 12; Mus. Cat., p. 183.

brevis, Puterbaugh, l. c., p. 27.

Hab. N. China, Canton.

striatipes, Puterbaugh, l. c., p. 29.

Hab. India, Bihar.

Genus **DYSCIRIUS**

Bonelli, Mém. Acad. Turin, i, 1811, p. 432; Latr., Gen. Cat., i, p. 202; Mus. Cat., p. 193; Puterbaugh, Mém. Soc. Entom. France, ii, 1914, p. 4; 43, *Elaphogaster*.

Ann. Soc. Ent. Belg., x, 1905, p. 32; Synops., ii, 1908, p. 7; 474, 1913, p. 13.

Asphodes, Latr., Ann. Soc. Ent. Belg., New York, v, 1861, p. 124.

Phaeogaster, Schmidt-Göbel, Faun. Cat. Hym., 1910, i, 2, 1, 4.

Rochei, Sauboy, Ann. Soc. Ent. Belg., (4 s.), 1902, p. 205; Puterbaugh, l. c., p. 33; Mus. Cat., p. 193.

Spilanthus, Muls., Wien. Ent. Monats., vii, 1853, p. 73.

striatipes, Puterbaugh, Ann. Soc. Ent. Belg., xxi, 1916, p. 434.

Hab. Columbia.

- calceolatus*, Bates, Trans. Ent. Soc. Lond., 1873, p. 241.
Hab. Yangtze Valley, Japan, Nagasaki.
- celatus*, Schmidt-Gobel, Vienn. Ent. Biern., 1845, t. 3, f. 5. Putzeys, Rev. Ann. Soc. Ent. Belg., x, 1867, p. 97; id., G. B. Ent. Belg., 1878, p. clxxix.
calceolatus, Putzeys, Rev. 1^a, p. 97.
celatus (*Pterocryptus*), Schmidt-Gobel: Putzeys, Rev., p. 97. (non Dejans).
Hab. Burma, N. India.
- celatus*, Putzeys, Ann. Soc. Ent. Belg., xvi, 1873, p. 14.
Hab. Burma, Mandalay.
- celatus*, Putzeys, G. B. Ent. Belg., xxi, 1878, p. clxxii.
Hab. Calcutta.
- celatus*, Putzeys, Rev., 1^a, p. 98.
Hab. Siam.
- celatus*, Putzeys, Ann. Soc. Ent. Belg., xi, 1866, p. 14.
celatus, Schmidt-Gobel, p. 5.
Hab. Siam, Bangkok.
- celatus*, Putzeys, Rev., 1^a, p. 91.
Hab. N. India.
- celatus*, Putzeys, G. B. Ent. Belg., xxi, 1878, p. clxxii.
Hab. Calcutta.
- celatus*, Bates, Trans. Ent. Soc. Lond., 1873, p. 241.
Hab. Japan, Ceylon, Korea.
- celatus*, Putzeys, Rev., p. 97. Bates, Trans. Ent. Soc. Lond., 1873, p. 241.
Hab. Yangtze, Japan.
- celatus*, Putzeys, Ann. Soc. Ent. Belg., 1873, p. 14.
Hab. Bangkok.
- celatus*, Putzeys, G. B. Ent. Belg., xi, 1877, p. 21.
Hab. Burma.
- celatus*, Putzeys, 1^a, G. B., 1878, p. clxxii.
Hab. Calcutta.
- celatus*, Putzeys, 1^a, 1877, p. 21.
Hab. Calcutta.
- celatus*, Putzeys, Ann. Soc. Ent. Belg., xvi, 1873, p. 12.
Hab. Bangkok.
- celatus*, Putzeys, G. B., 1878, p. clxxii.
Hab. Calcutta.

Genus OLIVINA.

- olivina*, Geoff., 1815, p. 104; Latr., Gen. Col., 1, p. 254. Monograph.
Putzeys, Mon. Japan, 1846; *Hedraea pinnata*, id., Ann. Soc. Ent. Belg., x,
1866, p. 127. Mus. Col., p. 128. Hora, Gen. Carab., p. 121. Bates, Hist. Gen. Carab.
Am. Col., 186, p. 92.
Boulenger, Month., Bull. Mus., xxiv (3), 1881, p. 101.

crucians, Putney, C. N. Soc. Ent. Belg., xv, 1877, p. 21.
Hab. Canada.

halicti, Putney, *Revue*, 1888, p. 126.
Hab. India.

hirsutella, Putney, *Mem. Ligea, Fribourg*, 1902, p. 32; *id.*, *Revue*, p. 123.
Hab. Straits.

humilis, Muesebeck, *Bull. Koller-Gesellschaft Insektenk.*, 1943, p. 23; *Bull. Trans. Ent. Soc. Lond.*, 1947, p. 224.

indigena, Putney, *Proc. Ent. Soc. Lond.*, 1904, p. 2.
Hab. China, Hongkong, Yangtze Valley, Japan.

kytrepia, Putney, *Revue*, 1888, p. 123.
Hab. S. India (Ind. Mus.—?)

lutea, Putney, *Mem.*, 1888, p. 623, sup. p. 63; *id.*, *Entomograph*, p. 26; *Bull. Trans. Ent. Soc. Lond.*, 1891, p. 72.

oxygaster, Muesebeck, *Journ. As. Soc. Ben.*, xiv, 1914, p. 190; *Ann. Mag. Nat. Hist.*, (Ser. 6), xiv, 1917, p. 245.

Hab. Ceylon, Ceylon, S. India, Malacca.

severinae, Putney, *Journ.*, 1888, p. 123, sup. p. 74; *id.*, *Revue*, p. 124.
Hab. Java.

stata, Putney, *Revue*, 1888, p. 121; *Bull. Trans. Ent. Soc. Lond.*, 1891, p. 7.
Hab. India.

tehuatlana, Muesebeck, *Mem. Acad. Yucat.*, 1913, p. 491; *Depress.*, *Spec.*, 1, p. 414; Putney, *Ann. N. Y. Ent. Soc.*, p. 31; *id.*, *Revue*, p. 123.
Hab. Mexico.

thymicola, Putney, *Journ.*, 1888, p. 123.
Hab. India.

trichocoma, *Depress.*, *Spec.*, 1, 1913, p. 494; Putney, *Mem.*, sup. p. 79; *id.*, *Revue*, p. 123.
Hab. Java.

umbra, Putney, *Ann. Soc. Ent. Belg.*, vii, 1878, p. 78.
Hab. Madagascar.

varia, Putney, *Mem. Ligea, Fribourg*, 1902, p. 37; *Revue*, p. 123.
Hab. India.

viridula, *Bull. Trans. Ent. Soc. Lond.*, 1878, p. 239.
Hab. Yangtze Valley, Japan.

viridis, Putney, *Mem. Ligea, Fribourg*, 1902, p. 39; *id.*, *Revue*, p. 123; *Bull. Trans. Ent. Soc. Lond.*, 1878, p. 239; *id.*, 1878, p. 2; *J. Ann. Mus. Civ. Gen.*, (2), 1, 1880, p. 120.

viridula, Schmidt (Schulz), *Fall. Coll. Ent.*, 1914, A. B., C. A.

Hab. China, Hongkong, Yangtze, Japan, Taiwan, Ceylon, Ceylon, Yangtze Valley, Japan.

viridulata, Putney, C. N. Soc. Ent. Belg., xv, 1877, p. 21.
Hab. California.

Genus **ARDISTOMIR**.

- Polyph. Mex. Lep.*, 8, 1812, p. 338, sep., p. 115; *ibid.*, Ann. Soc. Ent. Belg.,
2, p. 250; *Linn.*, Gen. Col., 1, p. 298; *Nat. Col.*, p. 354.
variegata, *Polyph. Ann. Soc. Ent. Belg.*, xi, 1815, p. 21.
Hab. Mex., Bangkok.

Genus **PSILUS**.

- Polyph. C. R. Soc. Ent. Belg.*, xi, 1815, p. 214.
undulata, *Polyph. C. R.*, p. 214.
Hab. Columbia.
variegata, *Polyph. C. R.*, p. 214; *Linn.*, Gen. Col., 1, p. 298; *Nat. Col.*, p. 354.
variegata, *Polyph. Ann. Soc. Ent. Belg.*, xi, 1815, p. 21; *ibid.*, Ann. Soc. Ent. Belg.,
xi, 1815, p. 21; *Linn.*, Gen. Col., 1, p. 298; *Nat. Col.*, p. 354.

Genus **RACHYONYCHUS**.

- Chasmodon*, *Mex. Lep.*, 8, 1812, p. 338, sep., p. 115; *ibid.*, Ann. Soc. Ent. Belg.,
xi, 1815, p. 21.
undulata, *Polyph. C. R.*, p. 214.
Hab. Mexico, Colombia.
variegata, *Polyph. Ann. Soc. Ent. Belg.*, xi, 1815, p. 21; *ibid.*, Ann. Soc. Ent. Belg.,
xi, 1815, p. 21; *Linn.*, Gen. Col., 1, p. 298; *Nat. Col.*, p. 354.
variegata, *Polyph. Ann. Soc. Ent. Belg.*, xi, 1815, p. 21; *ibid.*, Ann. Soc. Ent. Belg.,
xi, 1815, p. 21; *Linn.*, Gen. Col., 1, p. 298; *Nat. Col.*, p. 354.
variegata, *Polyph. Ann. Soc. Ent. Belg.*, xi, 1815, p. 21; *ibid.*, Ann. Soc. Ent. Belg.,
xi, 1815, p. 21; *Linn.*, Gen. Col., 1, p. 298; *Nat. Col.*, p. 354.
variegata, *Polyph. Ann. Soc. Ent. Belg.*, xi, 1815, p. 21; *ibid.*, Ann. Soc. Ent. Belg.,
xi, 1815, p. 21; *Linn.*, Gen. Col., 1, p. 298; *Nat. Col.*, p. 354.

Genus **EPICOSMUS**.

- Chasmodon*, *Mex. Lep.*, 8, 1812, p. 338, sep., p. 115; *ibid.*, Ann. Soc. Ent. Belg.,
xi, 1815, p. 21.
undulata, *Polyph. C. R.*, p. 214.
Hab. Mexico, Colombia.
variegata, *Polyph. Ann. Soc. Ent. Belg.*, xi, 1815, p. 21; *ibid.*, Ann. Soc. Ent. Belg.,
xi, 1815, p. 21; *Linn.*, Gen. Col., 1, p. 298; *Nat. Col.*, p. 354.
variegata, *Polyph. Ann. Soc. Ent. Belg.*, xi, 1815, p. 21; *ibid.*, Ann. Soc. Ent. Belg.,
xi, 1815, p. 21; *Linn.*, Gen. Col., 1, p. 298; *Nat. Col.*, p. 354.
variegata, *Polyph. Ann. Soc. Ent. Belg.*, xi, 1815, p. 21; *ibid.*, Ann. Soc. Ent. Belg.,
xi, 1815, p. 21; *Linn.*, Gen. Col., 1, p. 298; *Nat. Col.*, p. 354.
variegata, *Polyph. Ann. Soc. Ent. Belg.*, xi, 1815, p. 21; *ibid.*, Ann. Soc. Ent. Belg.,
xi, 1815, p. 21; *Linn.*, Gen. Col., 1, p. 298; *Nat. Col.*, p. 354.

- Camelinus* Chaudoir, Ann. Soc. Ent. Belg., xvi, 1878, p. 112.
Heterostoma, Lap. de Casteln., Et. Ent., 1834, p. 115 (see Fabr.); Chaudoir,
 Bull. Mus., xxiix (3), 1867, p. 226.
 Hab. India, Malacca, Ceylon, Ceylon, Ceylon (Hav.).
- Fera* Guérin, Ann. Mus. Civ. Gen., (2s.) vii, 1859, p. 101.
 Hab. Burma, Siam, Yunnan, Formosa.
- Paragaster* Chaudoir, Bull. Mus., xciv (5), 1891, p. 225, 58, 400; Ann. Ent. Belg., xxi, 1878, p. 114.
 Hab. India [Ind. Mus.—?]
- Milare* Laferté, Ann. Soc. Ent. Fr., (2s.) ix, 1851, p. 221, 3; Chaudoir, Bull. Mus., xxiix (2), 1867, p. 247; 58, Ann. Soc. Ent. Belg., xxi, p. 116.
Paragaster (Paragaster), Westw., Ent. Mag., 2 (18), 1822, p. 66; Chaudoir,
 Ann. Belg., loc. supra, p. 112.
Paragaster, Laferté, loc. supra, p. 221, 7.
 Hab. India, N. Borealis.
- Paragaster* Chaudoir, Rev. Mag. Ent., (2s.) xxi, 1878, p. 114; Ann. Soc. Ent. Belg., xxi, p. 112.
 Hab. Cambodia, Laos.
- Paragaster* (Paragaster), Schaller, Ann. Soc. Ent. Fr., (2s.) 1833, p. 436; Chaudoir,
 Ann. Soc. Ent. Belg., xxi, p. 112; N. Guérin, Ann. Mus. Civ. Gen., xvi, 1858,
 p. 114.
 Hab. Hongkong, Burma.
- Paragaster* Chaudoir, Rev. Mag. Ent., (2s.) xxi, 1878, p. 92; Ann. Belg., loc. supra,
 xxi, p. 112.
 Hab. Cambodia, Laos.
- Paragaster*, Fabr., Syst. Eleuth., 4, 1801, p. 207; Schaller, Ann. Soc. Ent. Fr., (2s.) 1833, p. 436; Chaudoir,
 Ann. Belg., loc. supra, p. 112.
Paragaster, Dejourn., Syn. N. 1833, p. 250; Laferté, loc. supra, p. 221;
 Schaller, Ann. Soc. Ent. Fr., (2s.) 1833, p. 436.
 Hab. Bengal, Dekkan [Ind. Mus.]
- Paragaster* Chaudoir, Bull. Mus., xxiix (3), 1867, p. 247; Ann. Belg., loc. supra,
 p. 112.
 Hab. India.
- Paragaster* Chaudoir, Rev. Mag. Ent., (2s.) xxi, 1878, p. 114; Ann. Belg., loc. supra,
 p. 112.
Paragaster Chaudoir, p. 1.
 Hab. Cambodia.

Genus EUDEMA.

- Lap. de Casteln., 94, Hist. Nat. Gub., 1, 1838, p. 137; Chaudoir, *Monograph*, Ann. Soc. Ent. Belg., xxi, 1878, p. 143.
Paragaster & Carabus, Fabricius, *Historiae*, pt. Laferté; *Paragaster*, Dejourn.,
 1833.
- Paragaster*, Fabr., Syn. Eleuth., 4, 1801, p. 207; Mant. Eleuth., 4, p. 137; Ent. Syst., 4,
 p. 143 (see Syst. Eleuth., 4, p. 207); Chaudoir, ed. Syn. Eleuth., p. 187.

Obolus, Esq., 46, 47, p. 24, t. 7, f. 76; 47, Esq. *Mod.* Carab., No. 47.
Schizanthus, Agn. Ins., t. p. 160. *Chaudoy*, Bull. Mus., xxxiv (7), 1861,
 p. 227; *Schizanthus*, Ann. Soc. Ent. Fr., (2) 1, 1862, p. 421.
Carabidus (*Pseudus*), Esq., 47, Ins., t. p. 218; *Mod.* Ins., t. p. 209;
 Esq. 47, t. p. 218. *Schizanthus*, Esq. Ins., t. p. 160; 1. *Chaudoy*, Bull.
 Mus., xxxiv (7), 1861, p. 227; 42, *Mod.* t. c. *supra*, p. 227.
Carabidus (*Pseudus*), Vigors, Esq. Ins., t. 1862, p. 227, t. 23, f. 1.
Diplos, Esq., v, p. 224; *Schizanthus*, Ann. Soc. Ent. Fr., (2) 1, 1862, p. 421.
Hab. India, Nilgiris, Coimbatore, Pundicherry (*Ind. Mus.*, Unpublished,
 Calcutta, China).

Carabidus, *Chaudoy*, Bull. Mus., xxxiv (7), 1861, p. 227.

Hab. E. Indies, *Penang*.

Carabidus (*Schizanthus*), *Mitch.*, Bull. Mus., xxxiv (7), 1861, p. 227.

Hab. India.

Genus LOROBTEMMA.

Melichovsky, Bull. Mus., xxxiv (7), 1861, p. 227; *Mod.* Carab., p. 212.

Lorobtemma, *Mitch.*, t. c. *supra*.

Mod., *Mitch.*, t. c. *supra*, p. 212.

Hab. India, *Tranquebar*.

Genus MICROCOSMUS.

Chaudoy, *Monograph*, Ann. Soc. Ent. Belg., xxi, 1875, p. 128.

Carabidus, *pt. Murray*, *Schizanthus*.

Indica, *pt. Tufani*.

Carabidus, *pt. Dejean* & *mod.*

Carabidus, *Chaudoy*, Bull. Mus., xxxiv (7), 1861, p. 227; *Ann. Belg.*, t. c. *supra*,

p. 128; *Esq.*, *Trans.*, Esq. & *London*, 1875, p. 212.

Hab. Brazil, *Parana*, *Japan*.

Genus DISCHISSUS.

Esq., *Trans.*, Esq. & *London*, 1875, p. 212; *Chaudoy*, *Ann. Soc. Ent. Belg.*, xxi, 1875,
 p. 128; *Esq.*, *Ind.*, (7) 1, p. 20.

Carabidus, *Mod.*, *Esq.*, *Esq.* & *Chaudoy* *Carabidus*, *pt. Murray*.

Schizanthus *Indica*, *pt. Tufani*, *Schizanthus*.

Carabidus, *Esq.*, *Esq.*, *Esq.*, t. 1, 1875, p. 212.

Hab. Japan.

Carabidus (*Pseudus*), *Mod.*, *Esq.*, *Esq.*, t. 1, 1875, p. 212; *Chaudoy*, *Ann. Soc.*

Ent. Belg., xxi, 1875, p. 128; *Esq.*, *Esq.*, *Esq.*, t. 1, 1875, p. 128.

Carabidus, *Esq.*, *Esq.*, *Esq.*, t. 1, 1875, p. 128.

Hab. Japan.

Carabidus, *Schizanthus*, *Ann. Soc. Ent. Belg.*, (2) 1, 1862, p. 421; *Chaudoy*, *Ann. Soc.*

Ent. Belg., xxi, 1875, p. 128.

Hab. Japan.

immaculata (Champion), Schumm, Berlin Ent. Zeits., 1883, p. 36 (Chandl., Ann. Soc. Ent. Belg., p. 188).

Hab. Nigra, Hongkong, N. China.

quadrinotata (Peronowicz), Motschulsky, Bull. Mus., xxxv (3), 1869, p. 223 (Chandl., Ann. Soc. Ent. Belg., xxi, p. 182; Bates, Trans. Ent. S. Lond., 1873, p. 244).

Hab. India, Japan.

Genus **MUSCHLOMERUS**.

Chandl., Bull. Mus., xxix (3), 1865, p. 417; *Lacord.*, Gen. Cat., i, p. 117; *Ann. Soc. Ent. Belg.*, xxi, 1876, p. 187; *Mus. Cal.*, p. 211.

conspicua, *Chandl.*, Ber. Mus. Berl. (3), xii, 1868, p. 118; *id.*, *Ann. Soc. Ent. Belg.*, xxi, p. 187.

Lecontevillei, Kollar, p. 8.

Hab. Malacca.

acuta, *Chandl.*, Ber. Mus., i, 2, p. 118; *id.*, *Ann. Belg. Ent. Soc.*, p. 183.

Hab. India.

indica, *Kollar*, Ann. Wien Mus., i, 1874, p. 274, t. 24, f. 2 a, b.

Hab. India.

castellana, *Harris*, Verzeich. Ent. Zeit., vi, 1863, p. 201.

Hab. India.

Genus **PERONOMERUS**.

Schumm, Ann. Soc. Ent. Fr., (3), i, 1866, p. 446; *Chandl.*, Ann. Soc. Ent. Belg., xxi, 1876, p. 187; *Mus. Cal.*, p. 211.

laticornis, *Schumm*, Ann. Soc. Ent. Fr., (3), i, 1866, p. 446; *Chandl.*, Ann. Soc. Ent. Belg., xxi, p. 187; *Bates*, Trans. Ent. S. Lond., 1873, p. 244; *id.*, 1883, p. 251.

serafus, *Chandl.*, Bull. Mus., xxix (3), 1865, p. 414.

signatus, *Bates*, Trans. Ent. S. Lond., 1873, p. 244; *Chandl.*, Ann. Soc. Ent. Belg., xxi, 1876, p. 187.

Hab. India, Burma, Hong Kong, Japan (Ed. Mus. Hong K.).

Genus **TRICHISIA**.

Motschulsky, Bull. Mus., xxxv (3), 1869, p. 221; *Chandl.*, L. c., 1865, p. 417; *id.*, *Ann. Soc. Ent. Belg.*, xxi, 1876, p. 188; *Mus. Cal.*, p. 211.

Trichocoma, p., *Chandl.*, *id.* = *Trichocoma*, p., *Lep. de Candolle*.

Zetterstedt, p., *Zetterstedt*, *Schumm*.

cyanea (*Zetterstedt*), *Schumm*, Ann. Soc. Ent. Fr., (3), i, 1866, p. 446; *Chandl.*, Ann. Soc. Ent. Belg., xxi, p. 188.

cyanocephala, *Motschulsky*, Bull. Mus., xxxv (3), 1869, p. 222.

Hab. India, Hong Kong.

aurata (*Zetterstedt*), *Lacord.*, Ann. Soc. Ent. Fr., (3), ii, 1867, p. 221, p. 1 a, b; *Chandl.*, Ann. Soc. Ent. Belg., xxi, 1876, p. 188.

Hab. Europe, India.

ambigua Chandler, *Mem.*, p. 44.

Hab. Malacca, Bangkok, Cambodia.

CHACHINI.—Lounsbury, *Gen. Cat.*, 4, p. 185; *Stenomacrus* Chandler, *Ann. Ent. Soc. Belg.*, 44, 1907-08, p. 44; *Horn, Gen. Cat.*, p. 428; *Lounsbury & Mason, Chalcid. Cat.*, p. 28.

Genus **PSEUDOS**

typus de Casteln. *Et. Ent.*, 1, 1894, p. 45; *Mem. Cat.*, p. 135.

Hoplonychia Chandler, *Bull. Mus.*, 229, 1915, p. 191.

Chusov, Klap. Deutsch. Ent. Lager. 20 Caracal, 1901, p. 11.

Purpur Chandler, *Bull. Mus.*, 229, 1915, p. 191; *Chusov, Klap. Deutsch. Ent. Lager. 20* Caracal, 1901, p. 11.

obscura (Fernal) Chandler, *Ann. Ent. Soc. Belg.*, 44, 1907-08, p. 44.

Hab. Burma.

obscura (Fernal) Chandler, *L. Ent.*, p. 45.

Hab. India.

orientalis (Fernal) *Chusov, Klap. Deutsch. Ent. Lager. 20* Caracal, 1901, p. 11; *Chusov, Klap. Deutsch. Ent. Lager. 20* Caracal, 1901, p. 11; *Chusov, Klap. Deutsch. Ent. Lager. 20* Caracal, 1901, p. 11.

Rem., 221 (3), 1908, p. 191; *id.*, 221 (7), 1914, p. 191; *id.*, 221 (8), 1914, p. 191; *id.*, 221 (9), 1914, p. 191.

Ent., 41, p. 45.

neglecta, (Fernal) *Chusov, Klap. Deutsch. Ent. Lager. 20* Caracal, 1901, p. 11; *Chusov, Klap. Deutsch. Ent. Lager. 20* Caracal, 1901, p. 11; *Chusov, Klap. Deutsch. Ent. Lager. 20* Caracal, 1901, p. 11.

Hab. Java, Burma, Malacca.

Genus **ITANUS**

obscura Gahan, *Fern. Cat. Mem.*, 1905, p. 45; *Lounsbury, Gen. Cat.*, 4, p. 185.

Mem. Cat., p. 135; *Chandler, Ann. Ent. Soc. Belg.*, 44, 1907-08, p. 44.

obscura, Gahan, *Fern. Cat. Mem.*, 1905, p. 45; *Chandler, Ann. Ent. Soc. Belg.*, 44, 1907-08, p. 44.

Hab. Burma.

Genus **EUSTRA**

obscura Gahan, *Fern. Cat. Mem.*, 1905, p. 45; *Lounsbury, Gen. Cat.*, 4, p. 185.

Mem. Cat., p. 135; *Chandler, Bull. Mus.*, 229, 1915, p. 191; *Chusov, Klap. Deutsch. Ent. Lager. 20* Caracal, 1901, p. 11.

Ann. Ent. Soc. Belg., 44, 1907-08, p. 44.

obscura, Gahan, *Fern. Cat. Mem.*, 1905, p. 45; *Lounsbury, Gen. Cat.*, 4, p. 185.

Mem., 221 (7), 1914, p. 191; *id.*, 221 (8), 1914, p. 191; *id.*, 221 (9), 1914, p. 191.

Trava. Ent. Soc. Lond., 1875, p. 207.

Hab. Burma, Malacca, Japan.

NOBILIS.—Horn, *Gen. Cat.*, 1895, p. 137; *Lounsbury & Mason, Chalcid. Cat.*, p. 28.

Chusov, Klap. Deutsch. Ent. Lager. 20 Caracal, 1901, p. 11.

Genus **COSCINIA**

obscura, Gahan, *Fern. Cat. Mem.*, 1905, p. 45; *Lounsbury, Gen. Cat.*, 4, p. 185.

Chandler, Bull. Mus., 191, 1915, p. 191.

Cynalutrota, *Bull. Berlin Ent. Mus.*, 1914, p. 111.

SIAGONINI Lacordaire, Gen. Col. I, 1854, p. 169; Chandler, Bull. Mus. Hist. Nat., 1876, p. 63. Horn, Gen. Catal., p. 127.

Genus SIAGONA

Latrodia Horn, Catheg. A. Ind. I, 1866, p. 160; Latrod., Gen. Col. I, p. 163; Mulsant, p. 191; Chandler, Bull. Mus., xiii (2), 1893, p. 429; *Met. graph.* 3, 190, 1876, p. 76.

strata Dejans, Spec., I, 1826, p. 300; Chandler, *Mus.*, p. 63.
Hab. India, Dacca, Burma.

basalis Chandler, *Mus.*, p. 63.
Hab. S. India, Burma.

stratella Chandler, *Mus.*, p. 63.
Hab. Burma, Rangoon.

depressa (*Galerita*), Fabr., Ent. Syst. Suppl., 1792, p. 34; id., Syst. Eleuth., I, p. 215; Chandler, *Mus.*, p. 63; Debel, Ann. Soc. Ent. Fr., (6 s.) vii, 1857, p. 176; *sculpta*, Dejans, Spec., II, 1826, p. 455; *Ps. Col. Eur.*, I, 20th p. 3; Chandler, *Mus.*, p. 61; Gray, Grinn. An. Kingd. Ind., I, 1831, t. 8, f. 1; *Obs. Trans.*, Dejans, Spec., v, 1833, p. 477; *Id.*, I, t. 20, f. 3; *Peyron.* Ann. Soc. Ent. Fr., (7 s.) 1858, p. 239.
Hab. Malabar, & Cochin regions, Bengal, Nodda, Burma, India [*Ind. Malay.* (Horn, Rangoon)].

sericea (*Galerita*), Fabr., Syst. Eleuth., I, 1801, p. 215; Dejans, Spec., I, 1826, p. 300; Chandler, *Mus.*, p. 64.
sericea, Dejans, Spec., v, 1833, p. 477.
Hab. India, Bengal.

sericea Chandler, *Mus.*, p. 64.
Hab. Cochin, Malabar, Rangoon, India.

indica Chandler, *Mus.*, p. 64.
Hab. India, Dacca.

chrysipha Chandler, *Mus.*, p. 64.
Hab. Burma, Rangoon.

stratella Chandler, *Mus.*, p. 63.
Hab. India, Dacca.

sericea Bouché, Mém. Acad. Turin 1813, p. 428; Debel, Ann. Soc. Ent. Fr., (6 s.) vii, 1857, p. 176.
depressa, Dejans, Spec., I, 1826, p. 300 (new Fabr.); Chandler, *Mus.*, p. 63.
Hab. India, Dacca, Cochin.

subsericea Chandler, Bull. Mus., xiii (2), 1893, p. 429; *Mus.*, p. 63.
var. dilutipes, Chandler, Bull. Mus., I, p. 440.
Hab. N. India (Horn, *Mus.*, Rangoon), Rangoon.

punctatissima Chandler, *Mus.*, p. 106.
Hab. S. India, Burma.

punctulata Chandler, *Mus.*, p. 76.
Hab. India, Dacca.

Granger, *Michiganist*, Bull. Mus., xviii (7), 1931, p. 127.

Typ. Nova, Klap. Germ. Fl. p. 1872.

1872 Chandler, Bull. Mus., xiv (3), 1927, p. 22; *id.*, *ibid.*, 1927, p. 131.

Hab. N. Java.

1872 Chandler, Bull. Mus., xviii (7), 1931, p. 441; *id.*, *ibid.*, 1931, p. 122.

Hab. Burma, Malacca, Java.

1873 (1871) - *Leconte*, *Proc. Ent. Soc. U. S.* 1871 - Chandler, Bull. Mus., ix (3), 1922, p.

217; *H. W. Coe*, *Canad. p.* 182; *Leconte & How*, *Trans. Ent. Soc. Ind.*, p. 22; *H. W.*

Proc. Ent. Soc. Ind., *ibid.*, p. 22.

Genus MORIO.

1871 Chandler, *Proc. Ent. Soc. U. S.*, 1871, vol. xviii, *Ent. Soc. Ind.*, p. 122; *H. W. Coe*, p.

172; *Philips*, *Ann. Ent. Soc. Ind.*, 1871, p. 122; Chandler, *Monograph*, Bull.

Ent., ix (3), 1922, p. 122.

Typ. Nova, p. 1872; *Leconte*, p. 182; *H. W. Coe*, p. 182.

1872 Chandler, Bull. Mus., ix (3), 1922, p. 122.

Hab. Philippines.

1873 (1871) - *Leconte*, *Proc. Ent. Soc. U. S.*, 1871, p. 122; *id.*, *ibid.*, p. 122; Chandler, *Monograph*, Bull.

Ent., ix (3), 1922, p. 122.

Hab. Burma, Malacca.

1873 (1871) - *Leconte*, *Proc. Ent. Soc. U. S.*, 1871, p. 122; *id.*, *ibid.*, p. 122; Chandler, *Monograph*, Bull.

Ent., ix (3), 1922, p. 122; *H. W. Coe*, p. 182; *Leconte & How*, *Trans. Ent. Soc. Ind.*, p. 22; *H. W.*

Proc. Ent. Soc. Ind., *ibid.*, p. 22.

1873 (1871) - *Leconte*, *Proc. Ent. Soc. U. S.*, 1871, p. 122; *id.*, *ibid.*, p. 122; Chandler, *Monograph*, Bull.

Ent., ix (3), 1922, p. 122; *H. W. Coe*, p. 182; *Leconte & How*, *Trans. Ent. Soc. Ind.*, p. 22; *H. W.*

Proc. Ent. Soc. Ind., *ibid.*, p. 22.

1873 (1871) - *Leconte*, *Proc. Ent. Soc. U. S.*, 1871, p. 122; *id.*, *ibid.*, p. 122; Chandler, *Monograph*, Bull.

Ent., ix (3), 1922, p. 122.

Hab. Burma, Malacca.

1873 (1871) - *Leconte*, *Proc. Ent. Soc. U. S.*, 1871, p. 122; *id.*, *ibid.*, p. 122; Chandler, *Monograph*, Bull.

Ent., ix (3), 1922, p. 122; *H. W. Coe*, p. 182; *Leconte & How*, *Trans. Ent. Soc. Ind.*, p. 22; *H. W.*

Proc. Ent. Soc. Ind., *ibid.*, p. 22.

1873 (1871) - *Leconte*, *Proc. Ent. Soc. U. S.*, 1871, p. 122; *id.*, *ibid.*, p. 122; Chandler, *Monograph*, Bull.

Ent., ix (3), 1922, p. 122; *H. W. Coe*, p. 182; *Leconte & How*, *Trans. Ent. Soc. Ind.*, p. 22; *H. W.*

Proc. Ent. Soc. Ind., *ibid.*, p. 22.

1873 (1871) - *Leconte*, *Proc. Ent. Soc. U. S.*, 1871, p. 122; *id.*, *ibid.*, p. 122; Chandler, *Monograph*, Bull.

Ent., ix (3), 1922, p. 122; *H. W. Coe*, p. 182; *Leconte & How*, *Trans. Ent. Soc. Ind.*, p. 22; *H. W.*

Proc. Ent. Soc. Ind., *ibid.*, p. 22.

1873 (1871) - *Leconte*, *Proc. Ent. Soc. U. S.*, 1871, p. 122; *id.*, *ibid.*, p. 122; Chandler, *Monograph*, Bull.

Ent., ix (3), 1922, p. 122.

1873 (1871) - *Leconte*, *Proc. Ent. Soc. U. S.*, 1871, p. 122; *id.*, *ibid.*, p. 122; Chandler, *Monograph*, Bull.

Ent., ix (3), 1922, p. 122; *H. W. Coe*, p. 182; *Leconte & How*, *Trans. Ent. Soc. Ind.*, p. 22; *H. W.*

Proc. Ent. Soc. Ind., *ibid.*, p. 22.

1873 (1871) - *Leconte*, *Proc. Ent. Soc. U. S.*, 1871, p. 122; *id.*, *ibid.*, p. 122; Chandler, *Monograph*, Bull.

Ent., ix (3), 1922, p. 122; *H. W. Coe*, p. 182; *Leconte & How*, *Trans. Ent. Soc. Ind.*, p. 22; *H. W.*

Proc. Ent. Soc. Ind., *ibid.*, p. 22.

•

armatus, Fabricius, *I. c.*, p. 714.

Hab. Ceylon.

atimatus Villalobos, *Col. Hispani.*, 1908, p. 28; Bates, *Ann. Mag. N. H.*, (5 s.) xix, p. 132.

microscopus, Bates, *Trans. Ent. Soc. Lond.*, 1912, p. 299.

† *tracilla* (*Polydora*), Mulsant, *Et. Nat.*, 1862, p. 23.

Hab. Cape Verde Islands, Ceylon (Sagawatalawa).

violatus Putzys, *Ann. Mus. Civ. Gen.*, vii, 1874, p. 742; Bates, *I. c.*, (5 s.) xix, 1908, p. 132.

Hab. Ceylon; Borneo, Hawaii, Taiwan, Transcaucasia.

vestitus (*Stenotarsus*), Stålner, *Ann. Mag. N. H.*, (5 s.) ix, 1874, p. 423.

Hab. Ceylon.

xylophilus Mulsant, *Bull. Mus.*, xxiix (4), 1891, p. 24.

Hab. Ceylon, Colombia.

xylophilus Putzys, *Ann. Mus. Civ. Gen.*, vii, 1874, p. 742.

Hab. Borneo, Sarawak.

xylophilus Mulsant, *Bull. Mus.*, xxiix (4), 1891, p. 24.

Hab. India.

xylophilus (*Stenotarsus*), Stålner, *Ann. Mag. N. H.*, (5 s.) ix, 1874, p. 423.

Putzys, *Ann. Mus. Civ. Gen.*, vii, 1874, p. 742; Bates, *Ann. Mag. N. H.*, (5 s.) xix, 1908, p. 132.

xylophilus, Bates, *Trans. Ent. Soc. Lond.*, 1912, p. 299 (see *Stenotarsus*).

Hab. Ceylon, Colombia (Potosi), Fuchan, Lower Yangtze Valley.

xylophilus, Bates, *Ann. Mag. N. H.*, (5 s.) xix, 1908, p. 132.

Hab. Ceylon, Indrag.

xylophilus (*Stenotarsus*), Walker, *Ann. Mag. N. H.*, (5 s.) ix, 1874, p. 504.

Hab. Ceylon.

xylophilus Mulsant, *Et. Nat.*, 1862, p. 23.

Hab. Ceylon.

xylophilus Mulsant, *Bull. Mus.*, xxiix (4), 1891, p. 24.

Hab. India.

xylophilus Mulsant, *Bull. Mus.*, xxiix (4), 1891, p. 24.

Putzys, *Ann. Mus. Civ. Gen.*, vii, 1874, p. 742.

Hab. Hongkong.

xylophilus (*Polydora*), Mulsant, *Et. Nat.*, 1862, p. 23.

Hab. India.

xylophilus, Bates, *Trans. Ent. Soc. Lond.*, 1912, p. 299.

Hab. Fuchan, China.

xylophilus Mulsant, *Et. Nat.*, 1862, p. 23; Putzys, *Ann. Mus. Civ. Gen.*, vii, 1874, p. 742.

Hab. Ceylon, Colombia.

xylophilus Mulsant, *Bull. Mus.*, xxiix (4), 1891, p. 24.

Hab. India.

indica (*Lysandrus*), Motsch., Bull. Mosc., xiv (4), 1851, p. 107; *Lysandrus*,
Ex. Ent., 1852, p. 27.

Hab. India.

indica, Bates, Ann. Mag. N. H., (5s.) xvi, 1885, p. 154.

Hab. Ceylon, Kandy.

kingii (*Bombidus*), Nixon, Ann. Mag. N. H., (5s.) ii, 1884, p. 423.

Hab. Ceylon.

lathropis (*Exochus*), Motschulsky, Bull. Mosc., xiv (4), 1851, p. 108-11, Ex.
Ent., 1852, i, 1, 2, 3.

Hab. India.

leucostictus (*Pachys*), Schumm, Berlinscher Zentr., vii, 1871, p. 14.

Hab. Ceylon.

longirostris Bates, Ann. Mag. N. H., (5s.) xvi, 1885, p. 154.

Hab. Ceylon, Kandy.

orientalis (*Bombidus*), Nixon, Ann. Mag. N. H., (5s.) ii, 1884, p. 423.

Hab. Ceylon.

ovatus (*Bombidus*), Nixon, l. c., p. 424; Putney, Ann. Mus. Civ. Gen., vi,
p. 141.

Hab. Ceylon, Kandy (Bates).

ovatus (*Exochus*), Motschulsky, Bull. Mosc., xiv (4), 1851, p. 109.

ovatus, Schumm, Berlin. Ent. Zeits., ix, 1866, p. 103.

Hab. Hongkong.

paralithus Motschulsky, Bull. Mosc., xiv (4), 1851, p. 107.

Hab. India.

periphrastica, Bates, Ann. Mag. N. H., (5s.) xvi, 1885, p. 151.

Hab. Ceylon, Kandy.

postleptus Bates, Trans. Ent. S. Lond., 1872, p. 327.

Hab. Peking, China.

posticus, Motsch., Bull. Mosc., xiv (4), 1851, p. 109; Putney, Ann. Mus. Civ. Gen.,
vi, p. 141.

posticus (*Bombidus*), Nixon, Ann. Mag. N. H., (5s.) ii, 1884, p. 423.

Hab. Ceylon.

pubescens (*Lysandrus*), Motschulsky, Ex. Ent., 1852, p. 21.

Hab. India.

pygmaeus (*Bombidus*), Nixon, Ann. Mag. N. H., (5s.) ii, 1884, p. 423.

Hab. Ceylon, Colombo (Bates); Yangon Valley (Lewis).

sericans, Motschulsky, Bull. Mosc., xiv (4), 1851, p. 107.

Hab. India.

subcostatus (Fairley), Motsch., Bull. Mus., xiv (4), 1851, p. 509; Fairley, Ann. Mus. Civ. Gen., vii, 1873, p. 749.

Hab. India.

subulatus, Fairley, Ann. Mus. Civ. Gen., vii, 1873, p. 749.

Hab. Hongkong.

subulatus (Fairley), Motsch., Bull. Mus., xiv (4), 1851, p. 509; Fairley, *l. c.*, supra, p. 749.

Hab. India.

subulatus, Motsch., Et. Ent., 1862, p. 27.

Hab. India.

subulatus (Fairley), Nicolson, Journ. As. Soc. Bengal, 1857, p. 72; Ann. Mag. N. H., (Ser.) II, 1858, p. 421; Schaum, Berlin. Ent. Zeits., 1863, p. 72; Bates, Trans. Ent. Soc. Lond., 1871, p. 218.

subulatus, W. MacLeay, Trans. Ent. Soc. N. S. Wales, 1872, p. 175.

Hab. Yuzg, Yuzg (Athena), Japan, Yangtze Valley, Ceylon, Colombo, Dikruys (Nepal), Oolaba, Melbourne, Queensland.

subulatus (Fairley), Nicolson, Ann. Mag. N. H., (Ser.) II, 1858, p. 421.

Hab. Ceylon, Dikruys (Nepal).

subulatus (Fairley), Nicolson, *l. c.*, p. 421.

Hab. Ceylon.

subulatus, Motsch., Bull. Mus., xiv (4), 1851, p. 507; *l. c.*, xiv, 1852, p. 52; (Fairley), Et. Ent., *l. c.*, p. 27.

subulatus (Fairley), Walker, Ann. Mag. N. H., (Ser.) II, 1858, p. 204.

Hab. India, Ceylon, Dikruys (Nepal), Yuzg in Yangtze Valley.

subulatus, Bates, Trans. Ent. Soc. Lond., 1871, p. 211.

Hab. Yangtze Valley.

subulatus (Fairley), Nicolson, Gen. Cat., I, 1854, p. 264; Chandler, Essai, Ann. Soc. Ent. Belg., xiv, 1871, p. 31; Horn, Gen. Carab., p. 172.

Genus **POGONUS**

Pogonus, Bates, *l. c.*, 1854, p. 2; Leconte, Gen. Cat., I, p. 267; Horn, Cat., p. 264; Chandler, Essai, Ann. Soc. Ent. Belg., xiv, 1871, p. 31.

Pogonus, Motsch., Bull. Mus., xxxv (3), 1864, p. 197; Chandler, *l. c.*, p. 31; (Gen. Cat.).

Hab. India, Timor.

Pogonus, Chandler, Ann. Soc. Ent. Belg., xiv, 1871, p. 31.

Pogonus, Gyllenhal, Bull. Mus., xvi (5), 1867, p. 312.

Pogonus, Chandler, *l. c.*, xiv, 1871, p. 31.

Hab. India, S. Korea, Java, I. Karim.

Genus **PATROBUS**

Patrobus, Bates, *l. c.*, 1854, p. 2; Leconte, Gen. Cat., I, p. 267; Horn, Cat., p. 264; Chandler, Essai, Ann. Soc. Ent. Belg., xiv, 1871, p. 40; Schaum, Naturg. Deutschl., I, p. 518.

Patrobus, Paykull, Pflanzsch., Fauna, Hagen. *Haepatus*, Gyllenhal, Entom. Hb. *Patrobus*, Sturm.

Genus **TRIGONOGNATHA**

Metachelys, *Bull. Ent.*, 1842, p. 25.

Trigonos, *Bull. Ent. Soc. Lond.*, 1855, p. 245.

Hab. China, Kwantung.

Genus **TRIGONOTOMA**

Trigon. *Proc. Ent. Soc. Lond.*, 1855, p. 245. *Trigon.* *Gen. Catalogue*, p. 219. *Mon. Cat.*, p. 249.

Trigonotoma, *Bull. Ent. Soc. Lond.*, 1855, p. 245. *Trigonotoma*, *Mon. Cat.*, p. 249.

Trigon. *Bull. Ent. Soc. Lond.*, 1855, p. 245.

Trigonotoma, *Bull. Ent. Soc. Lond.*, 1855, p. 245.

Hab. Hongkong.

Trigonotoma, *Bull. Ent. Soc. Lond.*, 1855, p. 245.

Hab. Japan.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249. *Trigonotoma*, *Mon. Cat.*, p. 249.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Hab. Japan.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Hab. India.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Hab. Java.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Hab. Hongkong.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Hab. Japan, I. Izu.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Hab. Japan, I. Izu.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Hab. Japan, I. Izu.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Hab. Manchuria, Japan, China, Korea, Japan.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Hab. Philippines, Japan, Manila.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Hab. Ceylon, India.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Hab. Java.

Trigonotoma, *Trigon.* *Mon. Cat.*, p. 249.

Hab. India.



RHATHYMTT3

- pubescens* (Gastropodist, *Metach.*, 11, xxxiii (1), 1888, p. 307.
Hab. India, Burma.
- subquadrata* Bates, Ann. Mus. Nat. Hist., (18) 16, 1887, p. 125.
Hab. Borneo, Sumatra, Siam.
- variosifrons* Bates, Ann. Mag. N. H., (14) 230, 1888, p. 144.
Hab. Ceylon, Columbia.
- chalcidensis* Chandler, Min., p. 281.
Hab. N. India.
- auriculata* Chandler, Min., p. 215.
Hab. India, Transjordan, Ceylon, Malacca.
- exanthematica* Chandler, Min., p. 272.
Hab. N. India.
- degenet* (Argente), Walker, Ann. Mag. N. H., (14) 19, 1888, p. 264.
Hab. Ceylon.
- duranti* (Gastropodist, *Metach.*, 11, p. 319; Chandler, Min., p. 295.
argentea (Gastropodist, *Metach.*, Bull. Mus., xxxviii (1), 1888, p. 224.
Hab. India, Ceylon.
- acutipes* Chandler, Min., p. 214.
Hab. Siam.
- marilla* (Argente), *Metach.*, Bull. Mus., xxxvii (1), 1888, p. 229; Chandler, Min., p. 297.
argentea (Gastropodist, *Metach.*, 11, p. 319.
Hab. India, Transjordan, Malacca.
- subquadrata* (Gastropodist, *Metach.*, *Ann. Mus. Nat. Hist.*, 1887, p. 125; *Argente*, *Ann. Mag. N. H.*, 1888, p. 144.
Hab. Java.
- lunulata* (Gastropodist, *Metach.*, Bull. Mus., xxxvii (1), 1888, p. 224; Chandler, Min., p. 297.
Hab. India, Transjordan.
- exanthematica* Chandler, Min., p. 274.
Hab. India.
- subquadrata* Chandler, Bull. Mus., 11 (1), 1878, p. 28.
Hab. Siam, Bangkok.
- auriculata* Chandler, Min., p. 271.
Hab. Siam, Bangkok.
- argentea* (Gastropodist, *Metach.*, 11, 1888, p. 319; *Argente*, *Ann. Mag. N. H.*, 1888, p. 144; Chandler, Min., p. 297.
Hab. India, Malacca.
- lunulata* Bates, Trans. Ent. Soc. Lond., 1873, p. 263.
Hab. Java, the Valley, Nagasaki.
- lunulata* Bates, Ann. Mag. N. H., (14) 230, 1888, p. 144.
Hab. Ceylon, Columbia.

signatus Motsch., Bull. Mosc. soc. nat. 1855 (2), 1855, p. 371: Chaudoir, Mem., p. 442.

Hab. India, British Territory, Burma, Malacca.

hypoleucus Chaudoir, Ann., p. 471.

Hab. Burma, Bangkok.

eximius Chaudoir, Mem., p. 473.

Hab. Bengal.

harmonicus (*Dischydus*) Motsch., Bull. Mosc. soc. nat. 1855 (2), 1855, p. 334: Chaudoir,

Mem., p. 434.

Hab. Burma.

quadringularis Chaudoir, Mem., p. 465.

Hab. Dekkan.

Genus **HOLCONOTUS**.

caninus, Rev. Mag. Zool., (2s.) iv, 1870, p. 333.

furcator (*Aharator*), Chaudoir, Bull. Mosc., xii (3), 1859, p. 330; Schmidt-Gobel,

Faun. Col. Form., 4, 2, f. 4.

Hab. Burma, Nam.

Genus **AULACOCOELIUS**.

chaudoiri, Bull. Mosc., xii (3), 1859, p. 403.

lucicola Chaudoir, f. a., p. 405.

Hab. N. Australia, 7 Philippines, Luzon.

Genus **POECILUS**.

Boisdu, Che. Ent., 1852, tab. xix: Latreille, Gen. Cat., 1, p. 102; Muls. Cat., p. 101; Chaudoir, Latreille, etc., 1875, p. 134.

arabicus, n. sp., Chaudoir, Latreille, etc., 1875, p. 41.

flavipes, Motschulsky, Bull. Mosc., xxviii (2), 1855, p. 371.

dischydus n. sp., Chaudoir, Bull. Mosc., xi, 1858, p. 35.

coenostylus, Chaudoir, f. a., p. 8.

chamaeleus, Chaudoir, Bull. Mosc., xxxvii (7), 1864, p. 110.

cyrenus, Chaudoir, Bull. Mosc., xi, 1858, p. 8.

zoeus, Motschulsky, Kilar Band., 1855, p. 41; ed., Bull. Mosc., xxxvii, (2), 1865, p. 235.

solius, (*Lucicola*) Stephens, Ill. Brit. Ent., 1858: Chaudoir, Bull. Mosc., xi, p. 8.

pyrenoides Chaudoir, Bull. Mosc., xi, 1858, p. 6: Motsch., f. a., xxxvii (4), 1865, p. 122.

signatus, Linnaeus, Faun. Suec., 1760, No. 301; Degeer, Spex. Ri., p. 297: for syn. vide Muls. Cat., p. 101.

Hab. Europe, N. Africa, Asia Minor, Persia, Japan, Canton (*Poecylus*).

indicus (*Sepidus*) Motschulsky, Bull. Mosc., xxxvii (4), 1865, p. 257.

Hab. N. India.

Genus **TROPIDOCERUS**.

Chaudoh, Bull. Mus., (1818) 1819, p. 5.

Indica, Chaudoh, *Id.*, p. 15.

Hab. N. India.

Genus **MOLOPS**

Burton, Obs. Ent., 1, 1802, tab. 99a. Mus. Cat., p. 222; Kröyer, Detached Ent. Zool., 1845, p. 908.

Indica, Burton, *Proc. Zool. N. Lond.*, 1817, p. 119.

Hab. India, Burton [*Ind. Mus.*, 1790].

Genus **AUFSERA**

Chaudoh, Bull. Mus., 1818 (2), 1814, p. 25.

Indica, Chaudoh, *Id.*, p. 26.

Hab. Burma.

Genus **AMARA**

Bosc, Obs. Ent., 1802, tab. 99a. *Lacord.*, *Gen. Cat.*, 1, p. 222; Mus. Cat., p. 24.

Pontory, *Monograph.*, L'Abbeille, 1871, p. 180.

Arctodes, Zimmermann, *Obst. & Fauna*, 1, 1821, p. 67; Mus. Cat., p. 245.

Amara, Hübner, *Ich.*, 87, Ent., 1801, p. 1.

Amara, Zimmermann, *Id. supra*, p. 25; Mus. Cat., p. 245.

Bradytes, Stephens, *Ill. Brit. Ent.*, 1, 1826, p. 151; Mus. Cat., p. 228.

Colas, Zimmermann, *Id. supra*, p. 19; Mus. Cat., p. 244.

Cyrtocera (*Cyrtocera*), Stephens, *Id. supra*, p. 155; Mus. Cat., p. 227.

Bosc, *Ent. Contr. Amer.*, *Id.*, 1875, p. 10.

Amara, Hübner, *Ich.*, 87, Ent., 1801, p. 1.

Amara (*Amara*), Zimmermann, *Id. supra*, p. 25; Mus. Cat., p. 245.

Leira, Hübner, *Id. supra*, p. 17 (= *Cyrtocera*).

Perona, Zimmermann, *Id. supra*, p. 18; Mus. Cat., p. 227.

Trilene, Latreille, *Ann. Linn. N. York*, 2, 1815, p. 252.

Amara, Burton, *Proc. Zool. N. Lond.*, 1817, p. 119.

Hab. S. W. Hindia, Burton [*Ind. Mus.*, 1790].

Amara (*Amara*), Burton, *Id.*, p. 119.

Hab. north of Hindia [*Ind. Mus.*, 1790].

Amara, Burton, *Id.*, p. 119.

Hab. south of Hindia [*Ind. Mus.*, 1790].

Amara, Burton, *Id.*, p. 119.

Hab. south [*Ind. Mus.*, 1790].

Amara (*Amara*), Burton, *Proc. Zool. N. Lond.*, 1817, p. 119.

Hab. India, Burton [*Ind. Mus.*, 1790].

Amara, Burton, *Proc. Zool. N. Lond.*, 1817, p. 119.

Hab. Burmah.

Amara (*Amara*), Burton, *Proc. Zool. N. Lond.*, 1817, p. 119.

Hab. + Yarkand, or S. slopes of Hindia [*Ind. Mus.*, 1790].

Amara (*Amara*), Burton, *Id. supra*, p. 119.

Hab. India, Burton [*Ind. Mus.*, 1790].

- shoshunae* Bates, Trans. Ent. S. Lond., 1873, p. 218.
Hab. Yangtze Valley, Japan.
- supremum* (Crotch), Fabr., Ent. Spid. Suppl., 1833, p. 87; Syst. Eleuth., 4, p. 189.
Dejean, Spid., 8, p. 333.
Hab. India.
- taikooi*, Dejean, Spid. v, 1837, p. 478.
Hab. India.
- typicus* Chaudoir, Bull. Mus., xiv (3), 1887, p. 97.
Hab. Japan China, S. India, Java.
- validus* (Crotch), Fabr., Ent. System. Hist., p. 793; Syst. Eleuth., 4, p. 189; Dejean, Spid., 8, p. 333; Lap. de Carabid., Hist. Nat. Ind., 6, p. 400.
Hab. India, [Ind. Mus., Bengal, Calcutta].
- venustus* Bates, Ann. Mag. N. H. (3 s.), ii (1868), p. 186.
Hab. Ceylon.
- vestimentum* Hoshino, Repts. Nippon. Mus., 1907, p. 30, & 1, p. 34; Bates, Zool. Ent. S. Lond., 1873, p. 218.
Hab. Formosa, Yangtze Valley, Japan, New Zealand.

Genus BADISTER

- Chervillei* Bad. Hist., 4, 1905, p. 89; Brit. Mus. Nat. Hist., Cat., 1, 1929, p. 408.
Lacord. Gen. Cat., 4, p. 236; Mon. Cat., p. 237; Lafont, Ann. Mus. Hist. Nat., 1873, p. 253; Lacord. Trans. Amer. Ent. S., vol. 1, p. 109; Bd., Proc. Transil. Ent. S., v, 1867, p. 7.
Amblypus, Gyllenhal, Faa. Svec., ii, 1809, p. 14.
Basilis, Haggen, Nat. Hist., vi, 1899, p. 2.
Tricorpha, Hoshino, Cat. Ent. Soc., 1928, p. 418.
rubellus Wiedemann, Zool. Mag., N. O., 1813, p. 26.
Hab. Borneo.
- clavicornis* Wiedemann, l. c., p. 27.
Hab. India.

Genus ECCOPTOGENIUS

- Chaudoir*, Bull. Mus., xiv (3), 1887, p. 77; Lacord. Gen. Cat., 4, p. 236; Mon. Cat., p. 237.
- novus* Chaudoir, l. c., supra, p. 74; Bates, Ann. Mag. N. H. (3 s.) 1906, p. 172.
typicus Walker, Ann. Mag. N. H. (3 s.) 1906, 1909, p. 41.
Hab. S. India, Ceylon.

Genus DIROTUS

- Harlowi*, Ann. Journ., 1925, p. 79; Lacord. Gen. Cat., 4, p. 232; Mon. Cat., p. 234; Lap. de Carabid., Hist. Nat. Ind., 6, p. 400.
- extremus* Harlow, Ann. Journ., 1925, p. 16; Bagn. Zool. Mus., N. O., 2, 1, 1, 4-6.
Hab. Java.

- FLATENINI.—Horn, Gen. Carab., p. 141; Leconte & Horn, Conn. Coll., p. 42.
 (*Andalocinus*) Bates, Ill. Contr. Amer. Coll., p. 91.
 Horn forms three sub-divisions—*Platys* (*Calathus*, *Proctos*, *And.*), *Microps*, and
Prognus.

Genus SPHODRUS.

- Chlorobius, Ent. Belg., ii, 1854, p. 98; Brullé, Hist. Nat. Ins. Col., i, 1854, p. 319.
 Lacord., Gen. Col., i, p. 340; Muls. Cat., p. 330; Motsch., Bull. Mosc., xxxvi,
 1861, p. 318 (ab. sp.).
S. venenosus, Horn, Gray's Zool. Misc., 1861, p. 31.
 Hab. Nepal.
sericeus, Motschulsky, Bull. Mosc., xxxvii (7), 1864, p. 315.
 Hab. Circassia, Georgia, India [Ind. Mus., 7 var. *Murton*].
indus, Chaudoir, Bull. Mosc., xxv (6), 1852, p. 67.
 Hab. N. W. Himalaya [Ind. Mus. *Murton*].

Genus EULEPTUS.

- Klug, Bericht über Malagasc. Ins., 1853, p. 2; Lacordaire, Gen. Col., i, 1854, p. 314.
codrus, Chaudoir, Bull. Mosc., xxiii (3), 1850, p. 363.
 Hab. Himalaya.

Genus FEANUS.

- Bates, Ann. Mus. Civ. Gen., (2 s.) vol. 1862, p. 107.
pinetorum, Bates, l. c., p. 103.
 Hab. Burma, Bhamo, Tonkin.

Genus GNYCHOLABIS.

- Bates, Trans. Ent. Soc. Lond., 1873, p. 379.
obscurus, Bates, l. c., p. 378.
 Hab. Yangtze Valley.

Genus CALATHUS.

- Brullé, Ois. Ent., tab. xvi, 1859; Dejourn. Spéc., vi, p. 67; Brullé, Hist. Nat.
 Ins. Col., i, 1854, p. 303; Lacord., Gen. Col., i, p. 342; Guérin, MT. Schw. Ent.
 Ver., ii, 1857, p. 236; Putony, Monograph. Ann. Soc. Ent. Belg., vii, 1872, p. 19.
 Muls. Cat., p. 335; Lacord., Proc. Acad. Phil., vii, 1856, p. 25; id., 1860, p. 327.
Monticola, Stephens, Cat. Brit. Ins., 1829, p. 28; id., Man. Brit. Col., p. 28.
Proctostyla, Dejourn. Spéc., vi, 1859, p. 67; Lacord., Gen. Col., i, p. 343.
Priscus, Motschulsky, Bull. Mosc., xxxvii (3), 1864, p. 313; Muls. Cat.,
 p. 337.
annulipes, Fairmaire, Ann. St. Ent. Yr., (4 s.) vi, 1866, p. 314.
 Hab. Yunnan.
calathus (*Proctostyla*), Bates, Trans. Ent. Soc. Lond., 1873, p. 382.
 Hab. Formosa.

epidaurus (*Prostodactylus*) Bouché, l. c. p. 272.

Hab. Fushima, Japan.

ornatus, Fulsche, Ann. Soc. Ent. Belg., vii, 1872, p. 32.

Hab. N. India.

detoxatus, Fulsche, l. c. xxi, 1897, p. 75.

Hab. Yunnan.

fulvipes, Fulsche, Ann. Soc. Ent. Fr. (N.S.), 1899, p. 303.

Hab. Yunnan.

kalidasa, Fulsche, Ann. Soc. Ent. Fr., xii, 1877, p. 22.

angustatus, Fulsche, Hesper's Fauna, Belg., 1844, p. 200 (N. S. p. 200).

Hab. India.

labialis, Fulsche, Ann. Soc. Ent. Fr. (N.S.), vi, 1895, p. 314.

Hab. Yunnan.

postulator, Fulsche, Ann. Soc. Ent. Belg., vii, 1871, p. 34.

Hab. N. India.

pusio (*Prostodactylus*), Motschulsky, Bull. Mus., xxi, 1856, p. 312; Fulsche, Ann.

Soc. Ent. Belg., vii, 1872, p. 31.

Hab. India.

Genus **RISTONYCHUS**

Dejean, Spéc. El., 1828, p. 215; Chaudoir, Bull. Mus., xxi, 1856, p. 310; Fulsche,

Gen. Cat., l. p. 341; Muls. Cat., p. 355; *subulatus*, Monograph, El. Nat. Hist.

Belg., 1842, p. 120; Chaudoir, Bull. Mus., xxi, 1856, p. 342.

Cryptoriscus, Fulsche, Monograph, 1892, p. 315; Muls. Cat., p. 356.

Cryptoriscus, Motsch., Bull. Mus., xxi, 1856, p. 314.

Chrysos, Fulsche, Hesper's Fauna, Belg., (2 ed.) iv, 1849, p. 220.

Leontiscus, Fulsche, Ann. Soc. Ent. Fr., 1867, vii, 1871, p. 336.

Leontiscus, Fulsche, Mus. An. Paris, 1869, (2 ed.) p. 315; Muls. Cat., p. 355.

Platynotus, Fulsche, Fests. Ent. Trans., i, 1875, p. 45; Muls. Cat., p. 354.

maculatus, Fulsche, Ann. Soc. Ent. Belg., xxi, 1897, p. 31.

Hab. Yunnan.

spurius, Schaerf, N. B. Ent. Ges., lxxv, 1892, p. 68; D. Mus., 1892, p. 176.

Hab. Hindia.

Genus **PLATYNUS**

Dejean, Spéc. Ent., i, 1828, (2 ed.) p. 345; Motsch., Bull. Mus., xxi, 1856, p. 346.

Muls. Cat., p. 355; *leontiscus*, Fests. Acad. Phil., vii, 1814, p. 30; Fulsche, Fests. Ent. N.

Land., 1812, p. 374; id., Ent. Gault. Amer. Cat., i, 1817, p. 31; *leontiscus*, Bull. Mus.,

Ent. N. B., 1879, p. 45.

apertus, Motsch., Bull. Mus., xxi, 1856, p. 345.

apertus, Motsch., l. c., p. 345.

apertus, Fulsche, Mus. An. Paris, 1869, (2 ed.) p. 345.

apertus, Motsch., Bull. Mus., xxi, 1856, p. 345.

apertus, Fulsche, Mus. An. Paris, 1869, (2 ed.) p. 345; *leontiscus*, Bull.

Cat., l. p. 345.

gemma (Lachnower), Faunae, Ann. Mus. Nat. Belg. 1903, 1907, p. 94.
Hab. Yunnan.

orbicula (Agnew), Metch., Bull. Mus., xxxv (3), 1904, p. 228.
Hab. Hongkong.

stactulus (Agnew), Walker, Ann. Mus. N. H., (Ser. 2), 1908, p. 254.
Hab. Ceylon.

polystictus, Bates, Proc. Acad. S. Lond., 1878, p. 219.
Hab. India, Mysore (Panjoli) (Fed. Mus., 1899).

gemma (Agnew), Metch., Faun. ESP., June, 1907, p. 423 (Part. Trans.
Ent. S. Lond., 1878, p. 219).
Hab. China, Japan.

orbicula, Uchida, Frog. Roy. Soc. Col., 1908, p. 16.
Hab. Hongkong.

gemma (Agnew), Faunae, Ann. Mus. Belg. 1907, p. 94.
Hab. Yunnan.

Genus DICRANONCUS

Chaudoi, Bull. Mus., xiii (1), 1900, p. 207; Lacord., Gen. Col., 5, p. 208; Metch.
Col., p. 191; Chaudoi, Ann. Mus. Nat. Fr., (Ser. 2), 1908, p. 277.
Leucopyga, Metch., Bull. Mus., xiv, 1904, p. 223 (see Metch.)
Metch., Bull. Mus., xxxv (4), 1904, p. 228.

sinensis, Chaudoi, Ann. Mus. Nat. Fr., (Ser. 2), 1908, p. 278 (see Metch.)
1908, p. 277.
refuge (Leucopyga), Metch. (see Metch.), Ann. Mus. Nat. Col. S., 1908,
p. 228, 1908, 2.
Hab. N. India, Java.

castipennis, Chaudoi, Ann. Mus. Nat. Fr., (Ser. 2), 1908, p. 278.
Hab. Ceylon, Hongkong.

sinensis, Chaudoi, Bull. Mus., xiii (1), 1900, p. 207-66; Ann. Fr., 1908,
p. 277; Lacord., Trans. Ent. S. Lond., 1878, p. 219.
castipennis (Leucopyga), Metch., Bull. Mus., xxxv (1), 1904, p. 214.
Hab. Bengal, Sunda, Borneo, Japan (Lacord.).

Genus MENERA

Metch., El. Ent., 1904, p. 22.

castipennis, Metch., El. Ent., p. 22.
Hab. Java.

Genus COLPODES

Harvey, Journ. Japan, 1905, p. 17; Lacord., Gen. Col., 5, p. 207; Metch., Col.,
p. 191; Chaudoi, Ann. Mus. Nat. Fr., (Ser. 2), 1908, p. 277; 1908, p. 278; Metch.,
El. Ent., 1904, p. 278; Bates, Proc. Acad. Amer. Ent., 1908, p. 100.

Agnew, Metch., Bull. Mus., xxxv (3), 1904, p. 228 (see Metch.).
Synthesa, Dejourn. Spem., 1, 1911, p. 427; Chaudoi, Bull. Mus., xiii (1),
1900, p. 207; Lacord., Gen. Col., 5, p. 206.

liriodactylus Chaudoir, *Mém.*, 189.

Hab. N. India.

lucicola Chaudoir, *Mém.*, p. 14.

1. *Barlensis*, *Suppl. papae*, vol.

Hab. India.

lucicola Bates, *Ann. Mag. N. H.* (Ser.) vol. 17, p. 143.

Hab. Ceylon, Ceylon, Ceylon.

lucicola (Dasyneles) Muls., *Et. Ent.*, 1850, p. 17. *Lucicola*, *Publ. Acad. Sci.*

Philipp., 1851, p. 10. *Lucicola*, *Trans. Ent. Soc. Lond.*, 1852, p. 275.

Hab. N. India, Ceylon.

lucicola Bates, *Ann. Mag. N. H.* (Ser.) vol. 17, p. 143.

Hab. Ceylon, Ceylon, Ceylon.

lucicola Chaudoir, *Mém.*, 189.

Hab. Philippines.

lucicola (Lucicola) M. Muls., *Publ. Acad. Sci.*, 1851, p. 10.

Hab. India.

lucicola Chaudoir, *Mém.*, p. 14.

Hab. India, Ceylon, Ceylon.

lucicola Chaudoir, *Mém.*, p. 14.

Hab. Ceylon, Ceylon.

lucicola Bates, *Ann. Mag. N. H.* (Ser.) vol. 17, p. 143.

Hab. Ceylon.

lucicola Bates, *Ann. Mag. N. H.* (Ser.) vol. 17, p. 143.

Hab. India, Ceylon (1851, 1852).

lucicola Chaudoir, *Ann. Ent. Soc. Fr.* (Ser.) vol. 17, p. 143.

Hab. Ceylon.

lucicola Chaudoir, *Mém.*, p. 14.

Hab. India.

lucicola Bates, *Ann. Mag. N. H.* (Ser.) vol. 17, p. 143.

Hab. Ceylon, Ceylon, Ceylon.

lucicola Bates, *Ann. Mag. N. H.* (Ser.) vol. 17, p. 143.

Hab. Ceylon, Ceylon.

lucicola Chaudoir, *Mém.*, p. 14.

Hab. Ceylon, Ceylon.

lucicola (Lucicola) Muls., *Publ. Acad. Sci.*, 1851, p. 10. *Lucicola*, *Publ. Acad. Sci.*

Philipp., 1851, p. 10. *Lucicola*, *Trans. Ent. Soc. Lond.*, 1852, p. 275.

1. *Barlensis*, *Suppl. papae*, vol. 1, p. 10. *Lucicola*, *Publ. Acad. Sci.*

Philipp., 1851, p. 10. *Lucicola*, *Trans. Ent. Soc. Lond.*, 1852, p. 275.

2. *Barlensis*, *Suppl. papae*, vol. 1, p. 10. *Lucicola*, *Publ. Acad. Sci.*

Philipp., 1851, p. 10. *Lucicola*, *Trans. Ent. Soc. Lond.*, 1852, p. 275.

3. *Barlensis*, *Suppl. papae*, vol. 1, p. 10. *Lucicola*, *Publ. Acad. Sci.*

Philipp., 1851, p. 10. *Lucicola*, *Trans. Ent. Soc. Lond.*, 1852, p. 275.

4. *Barlensis*, *Suppl. papae*, vol. 1, p. 10. *Lucicola*, *Publ. Acad. Sci.*

Philipp., 1851, p. 10. *Lucicola*, *Trans. Ent. Soc. Lond.*, 1852, p. 275.

5. *Barlensis*, *Suppl. papae*, vol. 1, p. 10. *Lucicola*, *Publ. Acad. Sci.*

Philipp., 1851, p. 10. *Lucicola*, *Trans. Ent. Soc. Lond.*, 1852, p. 275.

6. *Barlensis*, *Suppl. papae*, vol. 1, p. 10. *Lucicola*, *Publ. Acad. Sci.*

Philipp., 1851, p. 10. *Lucicola*, *Trans. Ent. Soc. Lond.*, 1852, p. 275.

7. *Barlensis*, *Suppl. papae*, vol. 1, p. 10. *Lucicola*, *Publ. Acad. Sci.*

Philipp., 1851, p. 10. *Lucicola*, *Trans. Ent. Soc. Lond.*, 1852, p. 275.

8. *Barlensis*, *Suppl. papae*, vol. 1, p. 10. *Lucicola*, *Publ. Acad. Sci.*

Philipp., 1851, p. 10. *Lucicola*, *Trans. Ent. Soc. Lond.*, 1852, p. 275.

caudatus, Chaudoir, *Mém.*, p. 342.

Hab. Poang, Tonkin.

caudatus, Chaudoir, *Mém.*, p. 344.

Hab. India.

caudatus, Fairmaire, *Ann. Soc. Ent. Fr.*, (3 s.) vi, 1886, p. 713.

Hab. Yunnan.

caudatus, Chaudoir, *Mém.*, p. 345.

Hab. N. India.

caudatus, Chaudoir, *Ann. Soc. Ent. Fr.*, (3 s.) xii, 1873, p. 307.

Hab. Sumatra, Mt. Singalang.

caudatus, Fairmaire, *Ann. Soc. Ent. Fr.*, (3 s.) vi, 1886, p. 316.

Hab. Yunnan.

caudatus, Fairmaire, *l. c.*, p. 318.

Hab. Yunnan.

caudatus, Fairmaire, *l. c.*, p. 318.

Hab. Yunnan.

caudatus, Bates, *Ann. Mag. N. H.*, (3 s.) xvii, 1886, p. 166.

Hab. Ceylon, Bogawantalaya.

Genus PIRANTILLUS

pirantillus, Ann. Mus. Civ. Gen., (2 s.) vi, 1812, p. 108.

pirantillus, l. c., p. 112.

Hab. Burton, Gougham, Mexico.

pirantillus, Schmidt, *Ann. Soc. Ent. Fr.*, 1886, p. 31. *Linn. Gen. Cat.*, i, p. 309. *Schmidt, Berlin Ent. Zeits.*, vi, 1883, p. 70. *Mém. Cat.*, p. 112.

pirantillus, Schmidt, *Ann. Soc. Ent. Fr.*, p. 31, t. 2, f. 8. *Chaudoir, Bull. Mus.*, (3 s.) xii, 1873, p. 307.

Hab. Burma.

Genus ANAULACUS

anaulacus, *Ann. Soc. Ent. Fr.*, 1886, p. 31. *Linn. Gen. Cat.*, i, p. 309.

anaulacus, *Ann. Soc. Ent. Fr.*, 1886, p. 31. *Linn. Gen. Cat.*, i, p. 309. *Chaudoir, Bull. Mus.*, (3 s.) xii, 1873, p. 307.

anaulacus, *Ann. Soc. Ent. Fr.*, 1886, p. 31. *Linn. Gen. Cat.*, i, p. 309.

anaulacus, *Ann. Soc. Ent. Fr.*, 1886, p. 31. *Linn. Gen. Cat.*, i, p. 309.

anaulacus, *Ann. Soc. Ent. Fr.*, 1886, p. 31. *Linn. Gen. Cat.*, i, p. 309.

anaulacus, *Ann. Soc. Ent. Fr.*, 1886, p. 31. *Linn. Gen. Cat.*, i, p. 309.

- Alaira*, Mulsch., Bull. Mus., xix (4), 1901, p. 505; *Ex. Ent.*, 1909, p. 32.
Man. Col., p. 294.
- Alipha*, Castelnau, Trans. R. S. Victoria, vii (1), 1900, p. 127.
- Alphaca*, Mulsch., Ann. Mag. N. H. (2 s.), vi, 1905, p. 498; *Man. Col.*, p. 294.
- Alphaca*, Leonard, Trans. Amer. Phil. Soc., 1903, p. 285; *Leonard, Gen. Col.*, i, p. 292.
- Alphaca*, Pilsbry, Ann. Mus. Civ. Gen., vi, 1903, p. 772.
- Alphaca*, Bates, Ann. Mag. N. H. (2 s.), xvii, 1906, p. 144.
Hab. Burma, Sarawak, Ceylon.
- Alphaca*, Pilsbry, Ann. Mus. Civ. Gen., vi, 1903, p. 772.
Hab. Japan, Malayan Peninsula.
- Alphaca*, Wollaston, *Isa. Males.*, 1844, p. 61; *Ann. Mag. N. H.*, (1 s.), vii, 1842, p. 213; *Col. Hesperid.*, p. 27; *Bates Ann. Mag. N. H.*, (2 s.), xvii, 1906, p. 144.
Alphaca, Wollaston, *Ann. Mag. N. H.*, (2 s.), vi, 1905, p. 19.
Hab. Cape Verde Islands, Ceylon, Colombo.
- Alphaca*, Pilsbry, Ann. Mus. Civ. Gen., vi, 1903, p. 772.
Hab. I. Cocos Island.
- Alphaca*, Pilsbry, *I. C.*, vi, 1903, p. 106.
Hab. Philippines, Manila.
- Alphaca*, Pilsbry, *I. C.*, p. 114.
Hab. Burma, Sarawak.
- Alphaca* (*Alphaca*), Mulsch., Ann. Mag. N. H. (2 s.), vi, 1905, p. 498.
Hab. Ceylon, Wollaston, supra cit.
Hab. Ceylon.
- Alphaca* (*Alphaca*), Mulsch., Bull. Mus., xix (4), 1901, p. 505; *Pilsbry, Ann. Mus. Civ. Gen.*, vi, p. 772.
Hab. Burma, Sarawak, Ceylon.
- Alphaca* (*Alphaca*), Mulsch., *Ex. Ent.*, 1909, p. 32, & 1. 1. 1; *Pilsbry, I. C.*, vi, p. 106.
Hab. Ceylon, Galle (Pilsbry), Singapore, Batavia (Bates).
- Alphaca* (*Alphaca*), Mulsch., Bull. Mus., xix (4), 1901, p. 505; *Pilsbry, Ann. Mus. Civ. Gen.*, vi, p. 772; *Bates, I. C.*, (2 s.), vi, 1906, p. 144.
Hab. Ceylon, Galle (Pilsbry), Burma, Sarawak (Pilsbry), Burma (Bates).
- Alphaca*, Bates, Ann. Mag. N. H. (2 s.), xvii, 1906, p. 144.
Hab. Ceylon.
- ALPHACINUS*, Leonard, *Gen. Col.*, i, 1904, p. 273; *Bates, Ex. Ent. Mag.*, vii, 1901, p. 39; *Bates, Col. Ceph.*, p. 144; *Leonard & Hays, Class. Col.*, 1906, p. 273.

GENUS LASIOCERA

- Daguer*, *Spec.*, v, 1861, p. 241; *Leonard, Hist. Nat. Isa. Col.*, i, p. 242; *Chester, Bull. Mus.*, xviii (7), 1899, p. 402; *Leonard, Gen. Col.*, i, p. 274; *Man. Col.*, p. 297.

- adiposus* (*Leptodermus*), MacLeay, *Annul. Japan*, 1925, p. 23, f. 1, 1, 1. F. Schmidt Guelb, *Famm. Col. Bonn*, p. 84; *Lap. de Casteln.*, *Hist. Nat. Ind.*, 1, p. 123; *Bolton, Trans. Ent. S. Lond.*, 1912, p. 257; *Chandler, Mex.*, p. 15; *Baker, Ann. Mus. Civ. Gen.* (2 s.) vii, 1909, p. 119.
arabicus, Zimmerman, *Mex.*, 1932, p. 179; *Metzsch.*, *Bull. Mus.*, xxvi (3), 1894, p. 144; *Chandler, Mex.*, p. 17.
 Hab. Java, Borneo, Dekhan, Burma, Elanor, Cochlea China, Japan, W. Australia.
- auratus* (*Leptodermus*), Schmidt Guelb, *Famm. Col. Bonn*, 1915, p. 89; *Chandler, Mex.*, p. 15.
 var. *basalis* *Flabius*, *Ann. Soc. Ent. Fr.*, 43, 1907, p. 25, 57, f. 1, 1, 1.
 Hab. Burma; Annam, Ind.
- brunneus* (*Leptodermus*), Schmidt Guelb, *l. c.*, p. 89; *Chandler, Mex.*, p. 15.
Baker, Ann. Mus. Civ. Gen. (2 s.) vii, 1909, p. 119.
 Hab. Burma, Bhamo, Shwaby, Tenasserim.
- caeruleus* (*Macromus*), Zimmerman, *Mex. Carab.*, 1932, p. 115; *Chandler, Mex.*, p. 15.
 Hab. India, Ceylon.
- caeruleus* (*Macromus*), *Bepan, Spet.*, iii, 1928, p. 132; *Chandler, Mex.*, p. 15.
gracilis, Zimmerman, *Mex. Carab.*, 1932, p. 111.
Schmidt, Chaudoy Bull. Mus., xii (34), 1935, p. 319.
 Hab. India, Egypt, Abyssinia.
- caeruleus* (*Macromus*), Zimmerman, *Mex.*, 1932, p. 119; *Chandler, Mex.*, p. 15.
 Hab. India, Malabar, Calcutta, Ceylon.
- caeruleus* (*Leptodermus*), Schmidt Guelb, *Famm. Col. Bonn*, 1915, p. 89; *Chandler, Mex.*, p. 15.
 Hab. Burma.
- caeruleus* (*Macromus*), Schmidt Guelb, *l. c.*, p. 87; *Chandler, Mex.*, p. 15 (not
dup. var. Huchthaus).
 Hab. Burma.
- caeruleus* (*Macromus*), MacLeay, *Annul. Japan*, 1925, p. 22, f. 1, 1, 1, 1; *Lap. de Casteln.*, *Hist. Nat. Ind.*, 1, p. 123; *Chandler, Mex.*, p. 15.
 Hab. Java.
- caeruleus* (*Macromus*), *Chandler, Mex.*, p. 15.
 Hab. Bangkok.
- caeruleus* (*Leptodermus*), Schmidt Guelb, *Famm. Col. Bonn*, 1915, p. 89; *Chandler, Mex.*, p. 15; *Baker, Ann. Mus. Civ. Gen.* (2 s.) vii, 1909, p. 119.
 Hab. Borneo, Malabar; Burma, Bhamo, Mandalay.

Genus PERIGONA.

- Lap. de Casteln.*, *St. Ent.*, 1938, p. 18; *Chandler, Bull. Mus.*, xii (35), 1935, p. 251; *Peterson, Ann. Mus. Civ. Gen.*, iv, 1913, p. 218; *Baker, Hist. Nat. Amer. Col.*, i (2), p. 113.
Macromus, p. *Lacordaire, Gen. Col.*, 1, p. 114.

longisternax (Zetter), Wiedemann, *Kon. Mag.* 6 (6), 1823, p. 73; Schumm, *Berlin Ent. Zeits.*, vii, 1862, p. 483.

Hab. India.

intusata, Kirby, *Trans. Linn. S. Lond.*, xix, 1823, p. 524 (var. *Impati*); Brauer, *Hist. Nat. Ind. Col.*, i, p. 227; Lap. de Casteln., *Hist. Nat. An. Ind.*, i, p. 24.

Hab. India.

ODACANTHINI (*Chalcidanthini*) Col. Hoffer, vi, p. 114; Lounsbury, *Gen. Col.*, i, p. 11; Horn, *Gen. Cynip.*, p. 147; Lounsbury & Horn, *Class. Col.*, 1893, p. 37.

Genus *CASNONIA*

laevigata, Jn. Col. Ent., i, 1822, p. 77; Lounsb., *Gen. Col.*, i, p. 77; Chandler, *Bull. Mus.*, xii (1), 1850, p. 24; *Id.*, xli, xxxv (1), 1862, p. 279; xlv (1), 1872, p. 297; *Mus. Col.*, p. 24; Lounsb., *Bull. Brackl. Ent. W.*, ii, 1880, p. 25; Bates, *Bull. Centr. Amer. Col.*, i (1), p. 160.

Apodera, Chandler, *Bull. Mus.*, xii (1), 1850, p. 25; Lounsb., *Gen. Col.*, i, p. 72.

Leptanthrenus, Motschulsky, *Et. Ent.*, 1852, p. 18.

Ophion, n. Kling, *Ent. Brackl. Spec. priv.*, p. 298 (non *Reichb.*).

laevigata, Chandler, *Bull. Mus.*, xii (1), 1850, p. 24; Lounsb., *Gen. Col.*, i, p. 72.

laevigata (*Odontaspis*), Chandler, *Bull. Mus.*, xli (1), 1862, p. 498.

Hab. Japan, Borneo.

laevigata (*Leptanthrenus*), Motsch., *Et. Ent.*, 1852, p. 18.

laevigata, Chandler, *Bull. Mus.*, xli (1), 1862, p. 291.

Hab. India, Transganga, Siam.

laevigata, Kollar, *Diesel-Kaschutt.*, ii (2), 1813, p. 225, t. 23, f. 2; Chandler, *Bull. Mus.*, xli (1), 1862, p. 291.

Hab. Kashmir, China, Java, Sumatra.

laevigata, B. Gahan, *Ann. Mus. Civ. Gen.*, i, 1913, p. 254.

Hab. Siam, Bangkok.

laevigata (*Ophion*), Hübner, *Prog. Ent. Soc. Col.*, 1822, p. 2.

Hab. Hongkong (Zetter).

laevigata, Chandler, *Bull. Mus.*, xli (1), 1862, p. 24; xlv (1), 1872, p. 291.

laevigata, Schmidt Ouellet, *Ann. Col. Bern.*, 1844, p. 18 (var. *Kollar*).

Hab. Berna.

laevigata, Bates, *Trans. Ent. S. Lond.*, 1872, p. 212.

Hab. China, Fuzhou, Japan.

laevigata (*Odontaspis*), Chandler, *Bull. Mus.*, xlv (1), 1872, p. 497; Bates, *Trans. Ent. S. Lond.*, 1872, p. 212.

Hab. Hongkong, Celebes.

laevigata, Chandler, *Bull. Mus.*, xli (1), 1850, p. 24; *Id.*, xli (1), 1862, p. 291; *Id.*, xli (1), 1872, p. 291.

laevigata, Ann. Mus. Civ. Gen., i, 1913, p. 254.

Hab. India, Siam, Transganga, Siam, Malacca, Tonkin, Madagascar, China, Japan.

- maculicincta* Mulsch., Bull. Mus., xix (2), 1872, p. 219; Chalcid. C. A. xiv (1), 1872, p. 474; id. (2), 1872, p. 268.
Hah. India, Ceylon, Colombo (Bates), Java, Celebes, S. China.
- malincha* Chandler, Bull. Mus., xiv (1), 1872, p. 424.
Hah. India.
- maria* (Mason & Schmidt) Gahan, Trans. Cal. Acad. Sci., 1885, p. 22; Chandler, Bull. Mus., xiv (1), 1872, p. 425; id. (2), 1872, p. 268.
Hah. Burma, Java, Japan.
- metallina* Feltgen, Ann. Soc. Ent. Fr., (4) xiv, 1882, p. 224.
Hah. Tonkin.
- monticola* R. Gahan, Ann. Mus. Nat. Hist. Cal., 1885, p. 187.
Hah. Burma, Bhamo.
- pilifera*, Krombe, Ann. Mag. N. H., (3) xiv, 1884, p. 179.
Hah. Ceylon.
- punctata* Viereck, l. c., supra, p. 178.
Hah. Ceylon.
- schizocincta* Gahan, Nederl. Leyden Mus., v, 1883, p. 114.
Hah. S. Sumatra, Bantam.
- tetracincta* Schmidt Gahan, Trans. Cal. Acad. Sci., 1885, p. 18.
Hah. Burma.
- virgata* Chandler, Bull. Mus., xiv (2), 1872, p. 424; Gahan, Ann. Mus. Nat. Hist. Cal., v, p. 181.
Hah. Siam, Bangkok.

Genus OPHIONEA

- fulvipes*, Zool. Atlas, ix, 1879, p. 1; Chandler, Bull. Mus., xiv (1), 1872, p. 47.
Lacord., Gen. Cal., i, p. 72; West. Cal., p. 98.
Gahan, Lay de Camille, Et., Ent., v, 1881, p. 287; G. Ann. Mus. Nat. Hist. Cal., i, p. 18.
- maculipes*, Feltgen, Ann. Soc. Ent. Fr. (4) xiv, 1882, p. 224.
Hah. Tonkin.
- maculicincta* (Chandler), Feltgen, Ent. Syn. Repert., 1884, p. 49; (Chandler) Dejans, Spun., i, p. 172; Lacord., Gen. Cal. Atlas, i, p. 127; Schmidt Gahan, Trans. Cal. Acad. Sci., p. 18.
Hah. India, Ceylon, Colombo (Bates), Ceylon, Japan, Hongkong (Feltgen), Mys., Calcutta, S. India.
- intercincta* Schmidt Gahan, Trans. Cal. Acad. Sci., 1885, p. 18.
Hah. Burma, Java, Bantam, Balamang, Celebes.
- signatipes*, Schmidt Gahan, l. c., p. 18.
Hah. Burma, Ceylon, Colombo (Bates).

Genus DICRASPEDA

- chalcid*, Bull. Mus., xxxv (1), 1892, p. 143.
maria, Chandler, l. c., p. 200.
Hah. Siam.

PRYPTINI - Horn, *Icon. Coel.*, p. 145; *Icones et Hyst. Class. Coel.*, 1838, p. 185.
Lucanidae (Gyllenhall), *Icon. Coel.*, 4, p. 23.

Genus DRYPTA.

Palmerus, *Proc. Entom. Soc.*, 1837, p. 159; *Hyll.*, *Hist. Nat. Ins. Coel.*, (v.), 185.
Lucanidae, *Icon. Coel.*, 4, p. 23; *Mon. Coel.*, p. 25.

ANDRIMONIA, *Horn, Icon. W. Coel. Coel.*, (1837) vol. 1838, p. 185.
Hab. Burma, Bhamo.

ANDRIMONIA, *Chaudoir, Bull. Mus.*, ser. 3, 1845, p. 247 (in *Handb. Mus.*);
Hab. India, Rangoon.

ANDRIMONIA, *Chaudoir, F. A. Mus.*, 63, 1861, p. 185.
Hab. N. India.

similis, *Palmer, Notes Leyden Mus.*, II, 1830, p. 191; *Mus. Gussone, F. A. S.*, 7,
 1. 2.
Hab. Sumatra.

caripes, *Wiedemann, Zool. Mag.*, 1813, 1822, p. 28; *Dejean, Syn.*, 1, p. 442; *Lap-
 de Cadelle, Hist. Nat. An. Art. Ins.*, 4, p. 34.
palipes, *Chaudoir, Bull. Mus.*, ser. 3, 1845, p. 23; 45, 1846, p. 248.
Hab. N. India, Koda.

PERMORSA, *Palmer, Trans. Ent. Soc. Lond.*, 1833, p. 232; *Chaudoir, Bull. Mus.*, ser. 3,
 1847, p. 257.
Hab. Formosa.

INDICA, *Lejeune, Syn.*, 1, 1828, p. 144; *MacLeay, Austral. Fauna*, p. 71; *Lap-
 de Cadelle, Hist. Nat. An. Art. Ins.*, 4, p. 33; *Chaudoir, Bull. Mus.*, ser. 3,
 1847, p. 257.

var. philippinensis, *Chaudoir, Bull. Mus.*, ser. 3, 1847, p. 257.
Hab. India, China, Hongkong, Philippines (Ind. Mus. Malacca).

INDICA, *Schmidt Oshichi, Faun. Col. Form.*, 1848, p. 28.
Hab. Burma.

maculata, *Lap. de Cadelle, Hist. Nat.*, 1834, p. 43.
Hab. India, Burma.

maculata, *Chaudoir, Rev. Mag. Zool.*, (2), 1846, 1872, p. 172.
Hab. Java.

maculata, *Schmidt Oshichi, Faun. Col. Form.*, 1848, p. 28.
Hab. Burma.

maculata, *Schmidt Oshichi, Faun. Col. Form.*, 1848, p. 28.
Hab. Burma.

maculata, *Schmidt Oshichi, Faun. Col. Form.*, 1848, p. 28.
Hab. Burma.

maculata, *Schmidt Oshichi, Faun. Col. Form.*, 1848, p. 28.
Hab. Burma.

Genus DENDROCELLUS.

maculata, *Faun. Col. Form.*, 1848, p. 28; *Chaudoir, Bull. Mus.*, ser. 3, 1847, p. 257.
maculata, *Schmidt Oshichi, Faun. Col. Form.*, 1848, p. 28.

maculata, *Schmidt Oshichi, Faun. Col. Form.*, 1848, p. 28.
maculata, *Schmidt Oshichi, Faun. Col. Form.*, 1848, p. 28.

canaliculatus (Dryden), Windemann, *Ind. Mag.*, 1805, p. 60.
Hab. India.

circulatus, Schmidt G. et al., *Faun. Col. Burm.*, 1846, p. 22.
Hab. Burma, Mandalay (Fa. Mus., Utharadi Valley, Assam).

eximius (Muls.) King, *Jahrb. Insect.*, 1, 1824, p. 12; Schmidt G. et al., *op. cit.*, p. 22.
Hab. India, Assam, Burma, Malacca, Java, Japan.

per., 1, 1825, p. 185.

per *Ind. Mag.*, 1805, p. 71.

Ind. Mag., 1805, p. 24; *Ind. Mag.*

Ind. Mag., 1805, p. 145.
Burma.

Ind. Mag., 1805, p. 101.

Ind. Mag., 1805, p. 25.

Ind. Mag., 1805, p. 51.

ITA.

Ind. Mag., 1805, p. 101; *Ind. Mag.*,
Ind. Mag., 1, p. 83; *Ind. Mag.*, p. 82,
Zaner, *Ind. Mag.*, 1805, p. 115.

Ind. Mag., 1805, p. 101; *Ind. Mag.*,
Ind. Mag., 1805, p. 101, 102, 103.

Ind. Mag., 1805, p. 101.
Hab. N. India.

signatus Chaudoir, *l. c.*, p. 527.
Hab. Achhar.

eximius Schmidt G. et al., *Faun. Col. Burm.*, 1846, p. 22; *Ind. Mag.*,
Ind. Mag., 1805, p. 101.
Hab. Burma, Bhamo.

pergrinus Indre, *Ind. Mag.*, 1805, p. 101.
Hab. Hongkong.

rubens Chaudoir, *Ind. Mag.*, 1805, p. 101; *Ind. Mag.*,
Ind. Mag., 1805, p. 101.
Hab. N. India, Burma, Bhamo.

Genus ZUPHIUM.

laevellii, Gen. Crust. & Ins., 1, 1834, p. 198; Lap. de Casteln., Monograph., 612a.
lucii, l. p. 221; Lacord., Gen. Col., 1, p. 83; Brullé, Hist. Nat. Ins. Col., 1, p. 374.
 Mon. Col., p. 36; Chaudoir, Bull. Mus., xxv (4), 1862, p. 310; Lacord., Bull.
 Sociét. Ent. Franc., 1879, p. 41; Bates, Biol. Centr. Amer. Col., 1 (3), p. 166.

Syllabus, Schmidt-Göbel, Faun. Col. Brit., 1845, p. 27.

semicinctum, Schmidt-Göbel, Faun. Col. Brit., 1845, p. 28; Chaudoir, Rev. Mus.
 Zool., 1872, p. 102.

obsoletum, Schmidt-Göbel, Faun. Col. Brit., 1845, p. 28.

Hab. Burma, Martaban (Ind. Néer., China).

erythrophthalmum, Chaudoir, Bull. Mus., xxv (3), 1862, p. 311.

Hab. India, Malabar.

lanceolatum, Schmidt-Göbel, Faun. Col. Brit., 1845, p. 30.

Hab. Burma.

modestum, Schmidt, Göbel, l. c., p. 28.

Hab. N. India, Burma.

stans (Carab.), Fabr., Hist. Spéc., 1, 1792, p. 189; id. (Göbel), Spéc. Elém.,
 1, p. 215; Olivier, Enc., 13, 28, p. 91, t. 12, f. 126; (Laphium) Dejourn., Spéc., 1,
 p. 197; G. la. Col. Eur. 1, t. 10, f. 3; Brullé, Hist. Nat. Ins. Col., 1, p. 173, t. 4,
 f. 1; Lap. de Casteln., Mon., p. 237; Schmidt-Göbel, Faun. Col. Brit., p. 28;
 Deval, Gen. Carab., t. II, f. 105; Chaudoir, Bull. Mus., xxv (3), 1862, p. 311.

Lophoceros, Chaudoir, Bull. Mus., xv (3), 1842, p. 304; id., xxv (3), 1862,
 p. 312.

cyphus, Chaudoir, l. c., 10, 1862, p. 311.

Hab. Europe, N. Africa, Asia Minor, Madagascar, Siam.

pitum, Schmidt-Göbel, Faun. Col. Brit., 1845, p. 29.

Hab. Burma.

gambiana, Kuhn, Ann. Mag. N. H., (3a) II, 1868, p. 192.

Hab. Ceylon.

arvensis, Chaudoir, Rev. Mus. Zool., (3a), xiii, 1872, p. 104.

Hab. France.

Genus AGASTUS.

Schmidt-Göbel, Faun. Col. Brit., 1845, p. 30; Lacord., Gen. Col., 1, p. 87; Mon.
 Col., p. 36.

agastus, Schmidt-Göbel, l. c., p. 31.

Hab. Burma.

nitidus, B. Götze, Ann. Mus. Civ. Gen., - (1873), p. 67a.

Hab. Japan.

hornboulvini H. von Sch. Carab., p. 147.

Genus KOIMOBROI

Hagenbach, Rev. Gen. Col., 1836; Lacord., Hist. Nat. Ins. Col., 1, p. 115; Lacord.,
 Mon. Col., p. 144; Mon. Col., p. 185; Götze, Ann. Mus. Civ. Gen., - (1873),
 p. 67b.

Castelnaudia Deyrolle, Ann. Soc. Ent. Fr., (2nd ser.), 1897, p. 311, t. 11, f. 2.
Hab. Malacca.

Hagenbachii Westwood, Ann. Mag. N. H., (3rd ser.), 1832, p. 95; *Deyrolle*, l. c. supra, p. 313, t. 11, f. 2.

Stettinica Thomson, Mon. Hymenopt., 1861, p. 2.
Hab. Sumatra.

phyllodes Hagenbach, Nov. Gen. Col., 1822, pp. 2-3; *Gray*, Griffith's Acrony Kingd., 1st ed., 1823, t. 25, f. 17; *Westwood*, Hist. Nat. Ins., Col. 4, p. 213, t. 13, f. 2; *Lap. de Casteln.*, Hist. Nat. Ins., t. 1, p. 139, t. 7, f. 2; *Deyrolle*, l. c. supra, t. 11, f. 1; *Vachell*, Ann. Soc. Ent. Fr., 1847, p. 314, t. 7, f. 1-4; *Chen*, J. Natur. Hist. N. Pays-Bas, 1, 1857, p. 41.

var. *indistincta* Guérin, Ann. Mus. Civ. Gen., vi, 1873, p. 851, 85.

Hab. Java, Borneo, New Guinea [*Ind. Mus., Singapore*].

LEHNI—Horn, Trans. Amer. Ent. Soc., 8, 1892, p. 125; *Gen. Carab.*, p. 123; *Leconte & Horn*, Conn. Col., p. 42.

Lehtinen p. 4, *Lehtinen*, Gen. Col., l. p. 132.

Pustulidus Lehtinen, l. c., p. 132.

lucicola *Tetragonoderus*, Chaudoir, Bull. Mus., (3rd ser.), 1876, p. 32.

Genus CYCLOSOMUS

Lehtinen, Edgus Ann., 11, 1897, p. 294; *Dupont*, Spec., 19, p. 31; *Lehtinen*, Gen. Col., 1, p. 124; *Mun. Col.*, p. 124; *Chaudoir*, Bull. Mus., (3rd ser.), 1876, p. 32.

Cyclosomus (*Cyclosomus*) *Nikolai*, H. An. Soc. Ent., xxvii, 1897, p. 132; *Ann. Mag. N. H.*, (3rd ser.), 1897, p. 275; *Chaudoir*, Bull. Mus., (3rd ser.), 1876, p. 32.

Hab. Ceylon, Ceylon.

Schmitti *Fabricius*, Syst. Ent., 1775, p. 245; *Spec. Ins.*, 3, p. 131; *Westwood*, l. c. supra, p. 213; *Horn*, Syst., t. 1, p. 130; *Lehtinen*, Gen. Col., 1, p. 124; *Lap. de Casteln.*, Hist. Nat. Ins., t. 1, p. 90; *Lehtinen*, Gen. Col., 1, p. 124; *Gray*, Griffith's Acrony Kingd., 1st ed., 1823, t. 25, f. 17; *Westwood*, Hist. Nat. Ins., Col. 4, p. 213; *Chen*, J. Natur. Hist. N. Pays-Bas, 1, 1857, p. 41.

sinensis (*Schmitti*) *Wiedemann*, Zool. Mag., (1st ser.), 1817, p. 162.

Hab. Bengal, Hongkong.

MARGINATA *Monsulsky*, Bull. Mus., xxvii (7), 1897, p. 320; *Chaudoir*, Bull. Mus., (3rd ser.), 1876, p. 32.

Hab. India.

Genus TETRAGONODERUS

Dupont, Spec., 19, 1878, p. 435; *Schmitti* *Guérin*, Trans. Ent. Soc., p. 85; *Lehtinen*, Gen. Col., 1, p. 122; *Mun. Col.*, p. 122; *Chaudoir*, Monograph, Bull. Mus., (3rd ser.), 1876, p. 32; *Syst. Amer.*, 4, *Horn*, Trans. Amer. Ent. Soc., 10, 1879, p. 436; *Horn*, Hist. Contr. Amer. Col., 1, 1879, p. 171.

Carabus, Felt. et coll. 1861; *Pseudocarus*, Wied., Germar; *Pseudocarus*, *Carabus*, *Carabus*, *Carabus*.

Carabus, *Carabus*, *Carabus*, *Carabus*, *Carabus*.

Carabus, *Carabus*, *Carabus*, *Carabus*, *Carabus*.

Hab. India, Egypt, Senegal.

variegatus. Bates, Ann. Mag. N. H., (3s.) xvi, 1891, p. 291.

Hab. Ceylon, Kandy.

ovatus (*Hemichnus*). Windemann, Zool. Mag., ii (3), 1823, p. 61; Chaudoir, *Mém.*, p. 41.

Hab. India, Bengal.

campanulatus. Chaudoir, Bull. Mus., xliii (3), 1896, p. 456; *id.*, *Mém.*, p. 47.

Hab. N. India, Simla.

lunulatus. Bates, Ann. Mag. N. H., (3s.) xvii, 1892, p. 292.

Hab. Ceylon, Kandy.

notaphidius. Mulsch., Bull. Mus., xxiiv (3), 1861, p. 92; Bates, *l. c.* *supra*, p. 291; Chaudoir, *Mém.*, p. 44.

Hab. Ceylon, Colombo, Kandy.

prunatus (*Hemichnus*). Windemann, Zool. Mag., ii (3), 1823, p. 61; Dejans, *Spéc.*, iv, p. 505; Schmidt (Gmel), Faun. Col. Hir., p. 93; Chaudoir, *Mém.*, p. 45.

Hab. India, Bengal, Dekhan.

quadricollatus (*Carabus*). Fabric., Ent. Syst. Suppl., 1798, p. 55; *id.*, *Syst. Eleuth.*, i, p. 185; Dejans, *Spéc.*, iv, p. 491; Lap. de Casteln., Hist. Nat. Ins., i, p. 67; Chaudoir, *Mém.*, p. 41.

Hab. India, Ceylon (*Ind. Mus.*).

quadricollatus. Guenée, Schilberr., Syn. Ins., i, 1858, p. 318 *note*; Dejans, *Spéc.*, iv, p. 491; Chaudoir, *Mém.*, p. 41.

Hab. India, Hongkong (*Ind. Mus.*, *Natural.*).

campanulatus. Schmidt (Gmel), Faun. Col. Hir., 1816, p. 93; Chaudoir, *Mém.*, p. 45.

Hab. Burma, Martaban.

affinis. Chaudoir, Bull. Mus., xliii (3), 1896, p. 456; *id.*, *Mém.*, p. 45.

Hab. N. India.

Genus **HHUPHORUS**

Chaudoir, Bull. Mus., xliii, 1896, p. 45; *id.*, Bull. Mus., ii (1), 1876, p. 62.

amphiporus. Chaudoir, *l. c.*, p. 62.

Hab. N. India, Simla.

Genus **TILIUS**

Chaudoir, Bull. Mus., ii (3), 1876, p. 71.

laevigatus. Chaudoir, *l. c.* (see Windemann).

laevigatus. Chaudoir, Bull. Mus., xliii (3), 1896, p. 45; *id.*, ii (3), 1876, p. 71.

Hab. N. Bengal.

Genus **DICTYA**

Chaudoir, Bull. Mus., xliii, (3), 1896, p. 416, 429.

subtruncatus. Karsenia, Bull. de l'Ent., x, 1903, p. 240; Chaudoir, *l. c.* *supra*, p. 423.

Hab. E. Siberia, E. China, Corea (*Pecheux*).

Genus **NEMATOPUS**

Chandolr, Bull. Mosc., xliii (2), 1870, p. 145.

paucis, Chandolr, *l. c.* supra, p. 150.

Hab. N. India.

basalis (*Lebia*), Chandolr, *l. c.*, xxv (3), 1852, p. 43; *id.*, *ib.*, xliii (2), 1870, p. 149.

Hab. N. India.

decora, *id.*, p. 15P.

Hab. N. India.

Genus **LEBIA**

Latreille, Hist. Nat. Ins., viii, 1804, p. 247; *Laeser*, Gen. Col., i, p. 127; *Man*
Cat., p. 138; *Motsch.*, Bull. Mosc., xxvii (3), 1864, p. 220, *sub. syn.*;
Chandolr, *l. c.*, xliii (2), 1870, p. 111, 162; *Baues*, Biol. Centr. Amer., Col., i (1),
p. 222.

Stimmer, Leach, Radiab. Encycl., 1818.

Horn, *op.*, Motschulsky, Kaiser Russl., 1845, p. 42.

X *impria*, Bonell, Obs. Ent., 1809, *tab. syn.*

Lebia, Motschulsky, Ent. Ent., 1861, p. 51; *id.*, Bull. Mosc., xxvii (3),
1864, p. 223.

Lebia, *Motschulsky*, Bull. Mosc., *l. c.*, p. 227; *Chand.*, *l. c.*, lii (2), 1877,
p. 213.

Lionel, Chandolr, Bull. Mosc., xliii (2), 1870, p. 120.

Onatomorpha, Motschulsky, Ins. Sib., 1862, p. 42.

*oftflChw** p. 70; xliii (2), 1870, p. 223.

Hab. N. India, Simla.

*Cftlytepfaor**, Schmidt Cieobel, Faun. Col. BJ: m., 1846, p. 14.

Hab. Burma.

chinensis, Bohem., *Free, Bug.* *Bess.*, Col., 1858, p. 8; *Chand.*, Bull. Mosc., xliii (2),
1870, p. 163.

Hab. Hongkong

circumdata, Schmidt, *Ge* i

xliii (2), 1870, p. 224

Hab. Burma.

*eler*U*

. Wat Bfit.,
Mote,, xxvii 01 ISM,
,

Fnirni.ilir.:, AE,

urv-pc, Bartaa.

id., Bull. Mosc.,

id., *l. c.*, 204;

id., Faun. Col., *

: *Drullé*, Sib.

grossus, Chaudoir, l.c., p. 222.

Hab. N. India.

infuscula, Motschulsky, Bull. Mosc., xxxvii (3), 1864, p. 227.

Hab. India.

scutata, Schmidt Goebel, Faun. Col. Birm., 1846, p. 43.

Hab. Burma.

luna, Schmidt Goebel, l.c., p. 45.

Hab. Burma.

Genus STEPHANA.

Chaudoir, Bull. Mosc., xlv (1), 1871, p. 53.

princeps (*Latic*), Chaudoir, l.c., xxv (1), 1852, p. 41; *id.*, xlv (1), 1871, p. 53.

Hab. N. India.

Genus PHYSODERA.

Erichscholtz, Zool. Atlas, ii, 1829, p. 8; Schmidt Goebel, Faun. Col. Birm., p. 46.

Lacord., Gen. Col., i, p. 130; Mun. Cat., p. 142.

Deville, Fairmaire, Ann. Soc. Ent. Belg., xxxi, 1887, p. 92.

Hab. China, Fuhkien.

Dejean, Erichscholtz, Zool. Atlas, ii, 1829, p. 8, t. 8, f. 6; Gray, Griffith's Anim.

Kingd. Ins., i, t. 12 f. 4; Lacord., Gen. Col., i, p. 130, Atlas, t. 4, f. 8.

Schmidt Goebel, Faun. Col. Birm., p. 46.

Hab. Burma; Philippinas, Manila [*Jed. Max.*, *Anlamans*].

Erichscholtz, Parry, Trans. Ent. S. Lond., v, 1849, p. 170, t. 18, f. 2.

Hab. Ceylon, Puzoseniya (*Bates*).

Genus EUPLYNES.

Schmidt Goebel, Faun. Col. Birm., 1846, p. 52; Lacord., Gen. Col., i, p. 131.

Mun. Cat., p. 390; Bates, Trans. Ent. S. Lond., 1882, p. 264; *id.*, Biol. Centr.

Amer. Col., 1 (1), p. 133.

insipida, Motschulsky, Et. Ent., 1859, p. 83.

Hab. Java.

grandipennis, Schmidt Goebel, Faun. Col. Birm., 1846, p. 52; Bates, Ann. Mag.

N. H., (3s.) xvii, p. 147.

Schmidt, Chaudoir, Ann. Soc. Ent. Fr., (3s.) vii, 1859, p. 360.

Hab. India, Burma.

Dejean, Nictus, Ann. Mag. N. H., (3s.) ii, 1858, p. 429; Bates, l. c., (3s.) xvii, 1884,

p. 157.

Hab. Ceylon.

Genus ALLOCOTA.

Motschulsky, Et. Ent., 1853, p. 23; Mun. Cat., p. 146; Chaudoir, Bull. Mosc., iii

(1), 1877, p. 226.

viridipes, *l.c.* Motsch., Et. Ent., 1859, p. 26, t. 8; Chaudoir, l.c. *supra*, p. 265.

Hab. Singapore, Malacca, Java.

O««w PAR?HA

Mitschinsky, *Ent. Zeit.*, 1869, p. 21: *Mon. Cat.*, p. 141: *Chaudr. Bull. Mus.*, 12, 1877, p. 241.

Monor, *Mitschinsky, Ent. Zeit.*, 1869, p. 21.
Hab. Java.

Genus LACHNODERMA

W. MacLeay, *Trans. Ent. & N. S. Wales, 2*, 1877, p. 241: *Chaudr. Bull. Mus.*, 12 (3), 1877, p. 212: *N. Gastero. Ann. Mus. Civ. Gen.*, 10, 1878, p. 202.

nitens (Stylop), *Palis, Trans. Ent. & Lond.*, 1877, p. 241; *ib.*, 1881, p. 247.
Hab. Hongkong.

Genus SCALIDION

Schmidt Guebel, *Fasc. Col. Birn.*, 1846, p. 53: *Lacord., Gen. Col.*, 1, p. 125: *Mon. Cat.*, p. 147.

libans, Schmidt Guebel, *Le. repens*, p. 44.
Hab. Burma.

Genus COPTODERA

Opus, *Spent.*, 1, 1828, p. 275: *Lacord., Gen. Col.*, 1, p. 140: *Mon. Cat.*, p. 149: *Muls., Chaudr. Ann. Mus. Civ. Gen.*, 10, 1878, p. 242.

apocrita, *Chaudr. Bull. Mus.*, 12, 1877, p. 247.

D. longicollis, *Chaudr. Bull. Mus.*, 12, 1877, p. 242: *Lacord., Gen. Col.*, 1, p. 142.

Elmendorf, *Montreuil, Ann. Mus. Civ. Gen.*, 1878, p. 57: *Mon. Cat.*, p. 143.

Muls., *Spent.*, *Trans. Ent. & Lond.*, 1877, p. 14: *Chaudr. Bull. Mus.*, 12, 1877, p. 247.
Hab. Canada, Hongkong.

apocrita, *Chaudr. Bull. Mus.*, 12, 1877, p. 242.
Hab. Japan, China.

apocrita, Schmidt Guebel, *Fasc. Col. Birn.*, 1846, p. 54: *Palis, Ann. Mus. Civ. Gen.*, 10, 1878, p. 211.
Hab. Burma, India, Japan, Taiwan.

libans, Schmidt Guebel, *Le. repens*, p. 45: *Chaudr. Bull. Mus.*, p. 247.
Hab. Burma, Singapore, Borneo.

apocrita, Schmidt Guebel, *Le. repens*, p. 45: *Chaudr. Bull. Mus.*, p. 247.
Hab. Burma, Borneo, Ceylon, Cebu (Palis).

apocrita, *Chaudr. Bull. Mus.*, p. 242.
Hab. N. India.

transversum, Schmidt Guebel, *Fasc. Col. Birn.*, 1846, p. 51: *Chaudr. Bull. Mus.*, p. 242.
Hab. Burma.

LJ

M0CHTHERU3

- longisterna*, Fuchs, Ann. Mag. N. H. (N.S.) 1875, 1876, p. 204.
Hab. Ceylon, Singapore.
- marginalis* (Devinck), Walker, Ann. Mag. N. H. (N.S.) 4, 1878, p. 204, pl. Engr.
Ex. supra, p. 110.
- particellus* Chaudoir, Mém. p. 249.
Hab. Burma.
- quadrifasciata*, Fuchs, Zool. Mon., vol. 7, 1875, p. 178, t. 4, f. 1, Chaudoir.
Mém. p. 249.
marginatus (Colpodes), Walker, Ann. Mag. N. H. (N.S.) 11, 1879, p. 51.
Hab. Ceylon, Annamopolis.
- reticulatus*, Schmidt Gravel, Fuchs, Cat. Burm., 1876, p. 27; Chaudoir, Mém. p. 249.
1881, Reim, Ann. Mus. Nat. Hist. (N.S.) 1882, p. 151.
Hab. Burma, Bhamo, Thabeik, Bhamo.
- sericea*, Schmidt Gravel, Fuchs, Cat. Burm., 1876, p. 28; Chaudoir, Mém. p. 249.
Hab. Burma, Tel. Ar, 1, Calcutta.
- serotinedata*, Chaudoir, Fuchs, Legation Bur., v. 1880, p. 218.
Hab. Bhamo, Bhamo.
- variegatus* Chaudoir, Mém. p. 249.
Hab. Burma, Bhamo (Cat. Mus. Berlin).
- viridellus*, Fuchs, Ann. Mag. N. H. (N.S.) 4, 1878, p. 204.
Hab. Ceylon, Singapore.

Genus BRACHYCTIS

- flavipes*, Ann. Mus. Nat. Hist. Belg., 1878, p. 212.
viridis, Chaudoir, L., p. 150.
Hab. Burma, Bhamo.

Genus PELIOCYPAS

- fulvipes*, Schmidt Gravel, Fuchs, Cat. Burm., 1876, p. 28; Chaudoir, Mém. Cat., p. 151. Mém.
Cat. p. 151.
- napaeus*, Schmidt Gravel, Fuchs, Cat. Burm., 1876, p. 28.
Hab. Burma.
- nitens*, Schmidt Gravel, L., p. 150.
Hab. Burma.
- nitens*, Schmidt Gravel, L., p. 150. Fuchs, Ann. Mag. N. H. (N.S.) 4, 1878, p. 204.
Hab. Burma.
- nitens*, Schmidt Gravel, L., p. 150.
Hab. Burma.
- nitens*, Fuchs, Ann. Mus. Nat. Hist. Belg., (N.S.) 1878, p. 212.
Hab. Burma.

Genus DROMIUS.

- Dromius*, Opa. Ent., 1, 1813, tab. 177, fig. 1. *Laurel*, *Trans. Cal.*, 1, p. 112. *Mon. Cal.*, p. 113. *Schmidt*, *Ann. Entomol.*, 1892, p. 322.
Crematogaster, *Chambers*, *Bull. Mus.*, xvi (3), 1889, p. 97.
Zabius, *Metach.*, 1881, *Mon.*, xliii (3), 1884, p. 282.
Micrometopon, *Schmidt*, *Ann. Entomol.*, 1892, p. 41.
Psyllidius, *Hagen*, *Cal. Mus.*, 1892, p. 42.
exilis (*Micrometopon*), *Schmidt*, *Ann. Entomol.*, 1892, p. 41.
Hab. Burma.
maculipes (*Micrometopon*), *Schmidt*, *Ann. Entomol.*, 1892, p. 41.
Hab. India.
orthognathus *Hagen*, *Ann. Mag. N. H.*, (54) xvi, 1892, p. 208.
Hab. Ceylon, Malaya.
steno, *Hagen*, *Id.*, p. 208.
Hab. Ceylon, New Guinea.

Genus BLECHRUS.

- Metchniksky*, *Bull. Mus.*, xii (3), 1911, p. 219; xiii (2), 1912, p. 245; *Id.*, *Ann.*, 1912, t. 2, p. 191.
Xanthopus, *Hagen*, *Ann. Mag. N. H.*, (54) xvi, 1892, p. 208.
Hab. Ceylon, Colombia.

Genus METABLETUS.

- Schmidt*, *Ann. Entomol.*, 1892, p. 39. *Chambers*, *Bull. Mus.*, xvi (3), 1889, p. 97. *Laurel*, *Trans. Cal.*, 1, p. 112. *Mon. Cal.*, p. 113.
Bracon, pt. *Laurel*, *Ann. Entomol.*, 1892, p. 277.
Laurel, *Trans. Cal.*, 1, p. 112.
Chambers, *Bull. Mus.*, xvi (3), 1889, p. 97.
Bracon, pt. *Schmidt*, *Ann. Entomol.*, 1892, p. 39.
areolaris (*Bracon*), *Schmidt*, *Ann. Entomol.*, 1892, p. 39.
Hab. Burma.
areolaris (*Bracon*), *Schmidt*, *Ann. Entomol.*, 1892, p. 39.
Hab. Burma.
quadripunctatus, *Schmidt*, *Ann. Entomol.*, 1892, p. 39. *Hagen*, *Trans. Ent. Soc. Lond.*, 1892, p. 208.
Hab. Borneo, Japan.
variegatus *Hagen*, *Proc. Zool. & Acad.*, 1892, p. 119.
Hab. Borneo, Yang-Ming, and Suifu, (*Ind. Mus.*, 1892).

Genus APRISTUS.

- Chambers*, *Bull. Mus.*, xvi (3), 1889, p. 97. *Id.*, *Bull. Mus.*, xvi (3), 1889, p. 97.
Laurel, *Trans. Cal.*, 1, p. 112. *Mon. Cal.*, p. 113.
areolaris (*Chambers*), *Schmidt*, *Ann. Entomol.*, 1892, p. 39. *Hagen*, *Trans. Ent. Soc. Lond.*, 1892, p. 208.
Hab. Burma, Yunnan.

B T

s, Chnudoir, Hull. Mcsc xxJ
II ak N\ ImUa, Site'
.btraaspaxons. Motseh., Ball. Mosc. XEtir (i), IBttl.
(5s.) 3S7ii, 1830, p. 305,
ilab. Ceylon, Xuw&ra Elfya, Hndlsy, Ditoya (Batea).

w APPvISTOJffOEPHUS.

Bull. M v CDi 18
Motsob
EU

Geaus LIONYCH0S*

ifiifi, p.
be!, Faun. Col, Birm., p. 3(
xvii, I8S6, j
Batttt^ Am;
Hfcb. Ceyloi

./). Burma.

.-nun TETRAGONICA.

; iluii. Ctitt_J p. 13li ; Batte Ann, Wag.

catenata, Bates H» 168^> p. 208,

.

Batei, Anr "3.)xtii_t16

Hal). Coylou, Colombo.
ens, , Ann. W

a BRACHICHILA.

.lUmeirit, Ann i), 123.

Chan AL', (p.

'»i» TANTILLUS.

iir*, Ann. So

1890.]

E. T. Atkinson—*Catalogue of the Carabidae.*

77

Genus **SLNURUS-**

Chandlor, *Mémoire*, Ann. Soc. Ent. Belg., xii, 1868, p. 129.

opacus, Chandlor, *Mémoire*, p. 136.

Hab. Borneo, Sarawak.

> **SERRIMABGO**

■'« **PXRIPRISTUS.**

⁵«S, p.

Chandlor, *Mémoire*, Ann.

Thysanoptera, pt.

guttator, Schaum, Berlin.

p. 125.

Hab. Borneo, Sarawak; Malacca.

variegator, Chandlor, *Revue*, p. 171.

Hab. Malacca.

!, p. US: Bates. Axui Mw. C'

fl, p. 171 ; Mem., p.

den. CoJ u.

Col. Bino., isiO, p. 6

MISCELT
S

.»

rudiventris, Walker, Ann. Mag. N. H., (3a.) II, 1853, p. 292.

ceylanica, Chaudoir, Berlin Ent. Zeits., v, 1861, p. 125.

Hab. Ceylon, Colombo (Bates).

unicolor, Fatsy, Mem. Soc. Indge, II, 1846, p. 375; *id.*, Ann. Mus. Civ. Gen., xii, 1875, p. 123.

Hab. Java.

HOLCODERTJS.

L., Bn

Hab. Penang.

Holcodertia, Chaudoir, Lc., p. 199.

Hab. Penang.

praemorsus, Chaudoir, Ann. Soc. Ent. Belg., xii, 1863, p. 153.

Hab. Ceylon, Dikoya, Bogawantalawa (Bates).

'JATASCOPTrS

Kirby, Trans. Linn. S. Lond.

p. 89: Linn., Gen. Col.

Ent. S. Lond., (3a.) I, 1853

id., Berlin Ent. Zeits., v,

Cyphosoma, Hope,

aeolipennis, Chaudoir, Berl.

Hab. Dekken.

aeolus, Chaudoir, Trans. H.

Hab. Borneo, Sarawak.

aegistus, Dej., Spec., v, 1831, p. 432.

Hab. Philippines, Manila.

andamanensis, Chaudoir, Bull. Mus., III

Hab. Andaman Islands.

angulatus, Chaudoir, Berlin Ent. Zeits.,

dejeani, MacLeay, Annul. Javan.

facialis, Dej., Spec., v, 1831,

var. *glabris*, Mannerheim, Bull. Mus.

aeolipennis, Chaudoir, Berlin Ent.

xxiii, 1872, p. 244: Samml., Trans.

Hab. Malacca, Java, Borneo, Am.

brachypterus, Chaudoir, Berlin Ent. Ze.

Lond., 1863, p. 463.

Hab. Borneo, Sarawak, Singapore.

cingalensis, Bates, Ann. Mag. N. H., (6a.) xvii, 189

Hab. Ceylon, Kandy, Balangoda.

cupreocollis, Waterhouse, Trans. Ent. S. Lond., 187

Hab. Andaman Islands.

reductus, Walker, Ann. Mag. N. H., (2s.) II, 1858, p. 208 : nec Chaudoir, Berlin Ent. Zeits., v, 1861, p. 117; Rev. Mag. Zool., (2s.) xxiii, 1872, p. 245; Bates, Ann. Mag. N. H., (5s.) xv, 1886, p. 210.

Hab. India, Ceylon, Malacca.

regalis, Schmidt Goebel, Faun. Col. Birm., 1846, p. 84.

Hab. Burma.

fratellus, Gory. Ann. Soc. Ent. Fr., 1833, p. 234; Chaudoir, Rev. Mag. Zool., (2s.) xxiii, 1872, p. 229.

Selysianus, Motschulsky, Bull. Mosc., xxvii (3), 1864, p. 392.

Hab. India (near Bengal).

Schaumii, Saunders, Trans. Ent. S. Lond., 1863, p. 457, t. 1, f. 3 a-b.

Hab. Borneo, Sarawak.

simplex, Chaudoir, Rev. Mag. Zool., (2s.) xxiii, 1872, p. 245.

Hab. Philippines, Mindanao.

amaraginus, Dejourn., Spec., I, 1825, p. 331; Lap. de Casteln., Hist. Nat. Ins., I, p. 54; Chaudoir, Berlin Ent. Zeits., v, 1861, p. 112.

pauper, Schmidt Goebel, Faun. Col. Birm., 1846, p. 84.

Hab. Java, Burma [*Ind. Mus.*, Andaman Islands].

splendidus, Saunders, Trans. Ent. S. Lond., 1863, p. 452, t. 17, f. 1 a-b.

notulatus, Chaudoir, Rev. Mag. Zool., 1865, p. 482; 66, 1872, p. 249.

Hab. Borneo, Sarawak.

versicolor, Saunders, l. c. *supra*, p. 463, t. 18, f. 1 a-b.

Hab. Sumatra.

violaceus, Schmidt Goebel, Faun. Col. Birm., 1846, p. 82.

Hab. Burma, 1

rears, Cliaffoir, B. Mag. Zool., (2s.) xxiii, 1872, p. 245.

Hab. India.

Vollenhovensii, Chaudoir, l. c., p. 248.

Hab. Sumatra.

WMtiuUll, i. c. *supra*, Col. Man., II, 1838, p. 164, t. 3, f. 2.

Hab. India [*Ind. Mus.*, Sikkim, Assam, Calcutta, Burma].

Genus PEHICALUS-

Hab. L.

Loc.

1848

1868

vi, 18

. 156 : -■

p. 69.

clatnd

Castell.

Hab.

irm., p. 85.

er., xxi (5).

a. Belg., cit.

l. Mon. Belg.,

1851's Apies

230 : Lap. de

E. T. Atkinson—*Catalogue of the Caralm:*

Zeim¹B (/

Berlin-

Aidi. Ent. i, 1867, p. 2S2 : Cbaudodr,

aeo, Sarawak.

cyanellu3, c r, Ball. Mo3C, xxi (i p. 113.

¹ p- /

s, CM

ii (i)>

b. N. India.

a i, 1301, p. 184 :

1861, p. 120 : Lap. .i

Wlin Eat, Zeifcs., r, 1861, p. 128: i:

xx

16B.

, 1S42. p. 426.

I'aun. Ool. Birm. p. 83, ?«c Wei
137, p. 233.

Hab Java, Smnat Ainbirta, Aru.
ilia, **Capo** Vork, New (!uir

levatus Ool. Birm., 1816, p. 81.
:fvban.

, Zool. BIflg., i (3), 1819, p. 165 : D >

Cbamtoir, Bull

Berlin Knt. Zeit 161, pi 116 : Saul

12.

. Kirby, Trai

iri, p, 9

t. 1.

, "eratn [I ■u]

iff. Zool., (2s.) xxiii, 1872, p. **247**

(4). 1864, p. 303 (ad.)

lab. Penally

doe,, . & Har., Mum. Cat., 18G8,

pennis, Skundei

5. Loud

111*

.LEIBA.

- ovoidula* (Carson), Fabr., Syst. Eleuth., i, 1801, p. 184; Dajon (*Callista*), Faun. Col. Birm., p. 311 : (*Zelia*) MacLoug, Annot. Javan., p. 34 : Schmidt Goebel, Faun. Col. Birm., p. 32 : Chand. Men., p. 113.
rubricata (*Callista*), Motsch., Bull. Mosc., xxxvii (2), 1894, p. 224.
 Hab. Bengal, Java, Hongkong, Shanghai.
seriata, Waterhouse, Trans. Ent. S. Lond., 1876, p. 11.
 Hab. Borneo, Sarawak.

Genus PLOCHIONUS.

- Dajon, Spec., i, 1825, p. 250 : Hope, Col. Man., ii, t. 7, f. 6 : Schmidt Goebel, Faun. Col. Birm., p. 42 : Loomé, Gen. Col., i, p. 125 : Men. Cat., p. 112 : Chandour, Monograph, Ann. Soc. Ent. Belg., xv, 1872, p. 168 : Bates, Biol. Centr. Amer., Col., i (1), p. 197.
brunneus (*Zelia*), Wiedemann, Zool. Mag., ii (1), 1829, p. 47 : *gen. nov.* : (*Zelia*)
 Hab. India, Bengal.
femestratus, Schmidt Goebel, Faun. Col. Birm., 1846, p. 43 : *gen. nov.*
 Hab. Burma.
pallens (*Charadrius*), Fabricius, Syst. Ent., 1773, p. 244 : Chandour, Men., p. 76 : Bates, Biol. Centr. Amer., Col., i (1), p. 198.
Reclusioides, Gory, Ann. Soc. Ent. Fr., 1837, p. 183.
Berglii, Dajon, Spec., i, p. 251 : Hope, Col. Man., ii, t. 7, f. 6 : Brulle, Hist. Nat. Ins. Col., i, p. 224, t. 7, f. 6 : Lap. de Casteln., Hist. Nat. Am.
 Hab. Java, Formosa, Omatia.

nC

Qouu* BOTHYNOPTERA,

8'1
6

.

xxv,

n.
Sot.

it

tisma

indica Schmidt Goshel, Faun. Col. Birm., 1866, p. 31 : Chaudoir, Bull. Mosc., x (5), 1873, p. 16.

Gedrejali, Chaudoir, Bull. Mosc., xliii (5), 1880, p. 49.

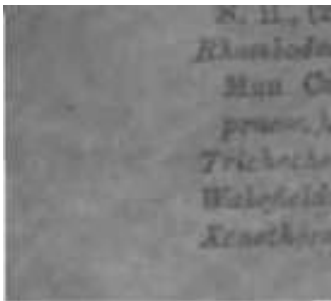
Hab. Burma. S. India, Nigela.

• Mannerheim Goshel, Bull. Ac. St. Petersburg, 4, 1842, p. 36 : Bull. Mosc., 1859, p. 3.
Hab. Siberia [Ind. Mos., Yarkand Minton, Baire].

(JELAtNEPHES

ii»'

■•« PENTAGONICA.



I Atkinson—*CataiogM*

MTxa[^] 1S1C, p.

Alose., sxxiv (i), 1861, |

, Berlin. Eat. 2

<y (*But*

∴, i_f p, 90 : Ho

torn, Claw. Col., ■, .

GEKAGEIS

. Ann. J

m.. Mag B
11

MACBOCHIUS-

.1555, p.
M : C

an, boides, Chaudoir, *U«v. M*g.* Zool., (2a.) xiii, 1873, p. 169.
Hab. Bengal.

asteriscus, White, Ann. M **ig. S. li** xiv, 1844, p. 422 : Chaudoir, Rev. Mag. Zool.,
1872, p. 172.

crucifer, Be ^{1 tr%in} Kftrⁿ **rtt** Zool. ii, Col., 1847, p. 1, t. 2, t. 3.
Hab. China, Hongkong [*Ind. Mus., Hongkong*].

Benson **L** Hope, Col. Man., ii, 1838, p. 166, t. 1, L. 5 : Chaudoir, Rev. Mag. Zool.,
p. 212.

quadrimaculatus, Guérin, Rev. Zool., 1840, p. 33 : Rev. Mag. Zool.,
t. **"7.**

Hab. N. India, Madras, Ceylon
Darjiling, B

(Hit.—

Wiedemann.

<torsAll4. King, Jnlrb.

Hat

impictus, Wiedemann, **r7** -»v ii (i*

tUb. Java.

scapularis

Aitn. S.

trispiculatus, Chaudoir

Hab. Dekhan

trispiculatus, Fair.

MacLeay, Annul. Juvs,
p. 95. IL-

, Scfeaum, Be: I
Hob, Malacca,

bimaculatus

p. 13

elegans.

(2a.)

immaculatus

• OMPHHA

f, Rev, Mag. :•■

p. 86.

a * *

it&g&patRtn, i, 1301,

p. 2-1

p

140.
|

[2,

* ANHTA.

i

1

i.e. 4

elliptica, (Pavlychevsky, Bull. Mosc., xxxvii (3), 1864, p. 216.

Hab. Transbaikalia.

indica, Chaudoir, Bull. Mosc., xxxiv (3), 1861, p. 563.

Hab. India [Ind. Mus., Visagapatam, W. Bengal].

orientalis, Hope, Col. Mar., ii, 1833, p. 163, t. 3, f. 4 : Chaudoir, Bull. Mosc., xxxiv (3), 1861, p. 563 ; Motsch., *l.c.*, xxxvii (3), 1864, p. 216.

Hab. Bombay [Ind. Mus., N. India].

serguttata, Fabr., Syst. Ent., 1775, p. 336 : Oliv., Ent. iii (36), p. 15, t. 1, f. 6 : Dejéan, Spéc., i, p. 341 : Brullé, Hist. Nat. Ins. Col., i, p. 179, t. 9, f. 21 : Laporte de Casteln., Hist. Nat. Ins., i, p. 69 : Chaudoir, Bull. Mosc., xxxiv (3), 1861, p. 562 : Motsch., *l.c.*, xxxvii (3), 1864, p. 216.

Hab. India, Pondicherry [Ind. Mus., Berhampur].

PHYSOCROTAPHINI:—Chaudoir, Bull. Mosc., xxxv (4), 1862, p. 301 : Horn, Gen. Carab., p. 162.

Genus HELLTJODES-

Westwood, Trans. Ent. S. Lond., iv, 1847, p. 279 : Lacord., Gen. Col., i, p. 92 : Mun. Cat., p. 92 : Chaudoir, Bull. Mosc., xxxv (4), 1862, p. 302.

saprobiana, Westwood, Trans. Ent. S. Lond., iv, 1847, p. 279, t. 21, f. 6 : ceylonicus, Lacordaine, Gen. Col., Atlas, t. 7, f. 1, (nec Parry).

Hab. Ceylon, Kitingalle (Rafes).

Westwoodii, Chaudoir, Rev. Mag. Zool., (2s.) xxi, 1863, p. 203.
Hab. Dekhan.

Genus PHYSOCROTAPHUS.

Parry, Trans. Ent. S. Lond., v, 1849, p. 180 : Lacord., Gen. Col., i, p. 181 : Chaudoir, Bull. Mosc., xxxv (4), 1862, p. 303 ; Man. Cat., p. 96.

ceylonicus, Parry, Trans. Ent. S. Lond., v, 1849, p. 180, t. 18, f. 4.

Hab. Ceylon, Dikny (Rafes).

Genus OGONOGLOSSUS.

Chaudoir, Bull. Mosc., xxxv (4), 1862, p. 304 : Gestro, Ann. Mus. Civ. Gen., vii, p. 362.

Chaudoirii, R. Gestro, Ann. Mus. Civ. Gen., vii, 1875, p. 363.

Hab. Cambodia.

sumatrensis, R. Gestro, *l.c.*, p. 362.

Hab. Sumatra.

validicornis, Chaudoir, Bull. Mosc., xxxv (4), 1862, p. 304 : R. Gestro, *l.c.*, supra, p. 362.

Hab. Java.

Hfli

Ituc BohmMt Qoebel, Faun. Col Elua., 18*6, p.
,1>. Burma.

md., Mm.,

.b. Java.

PcniiQg, Ktal^cr

]im.

7 DK

i. *lud.* .

typocrtu. >

va.

iBienueditiD. Ch »fo»,, p. 102.
b* Jura.

Hub. Pcnno»g.

ilBt Clianctair, *i*)/\'>\^ p. 109-

.. •

Hi

molanaclUB, Chn<<l,>lr, ,*t* p. I
Hab. Pctm

Bengal

atooertni:—Uorn, Gen Carab., p. 163.

Genus BRACHIDITXS

Cliadoir, Bull. MOM., xsvi (i), 18G2} P 78 ; *id.*, *Monograph*, 4

187\$.18: Lacon^Gcn. Mun. Cat.,

corpulbntus Chau^ipii', Aim. Soc. Eat. Butg.,*v, 1872, p. 20.

Hab, Penafllg-

oraMicornla. Cbandoir, Bull. 3J 0, 1852, p. 78; *id.*, *M«n.*, p. 19

Vt. Tim

rtbo^onlul, Chatirloir, *J?*iai Men.*, Ann. fioc. Enfc. Belg., xiv, 1871 Horn,
Gun. Uarab., p. 164.

Genus ORTHOGONIUS.

Itejean, Spec , i, 1825, p. 279 : Lacordaire, Gen. Col, i, p. 269 : Schmidt Goebel, Pann.

Uol. Birua , p. 56 : Man. Cat, p. 251: Chfttdoir, Bull, Mosc, xxi (i), 1848, p, 98 ; *id.*

Monograph, Aon. Soc. Ent. Belg-., xiv, 1871, p. 95, *Maraga*, Walker, Ann, Mag.

N. H., (3s.) ii, 1858, p, 204 : Wat«rhcrage, EQ

Mon. Mag., x, 1873, p. 17 : Chaudoir, *J/«t*, p. 121. Subg.

Appectra, Schmidt Goebel, Faun. Ool. Birm., 1846, p. 61. '

*Ilaplopitthiu**, Cbaudoir, Bull. Hose, xxiii (2)., 1850, p. *i'ii*.

acrogomia, Wiedemann, Zool, Mag., ;\3), L819, p. 167: Ilejean, Spec, r, p_,

LaTOtlairfi, Gen, Oil,, Atlas, 1.10 I - de CastelB., Hist. Au. Art,

. *fan.*, p. 104.

UacJjeay, Auiiai. Javau., 1B25, p. *:

Hal>, Java.

ingulas. Cbaudoir, Buil, Mosc., liii (2), 1878, p. 5. II

ab, Ceylon.

«lternatu {*I*loc7uontts*}, Wkdeinanu, Zool. Mag., ii (i), 1823, p. Z>2 : Drull6.

Tj.s , i, p. 225, t. 8f f. I : Cliadoir, *A/on.*, p, 102 : -. Mua,

Gen., (2s.) vii, 1889, p, 110,

flab. Jav;v.

angulatiu, Schmidt Goebel, Faun. Col> Birm , 1816, p. 58 : Chaudyir, Aloe, p. 110.

Hab. Burma, Tenasserim,

angusttcollls, firtimidt Goebel, I.A, p, 61 :

Hab. Barma.

ir, MOD., p.

122.

Ao\y, Mon.t p. 114, **Lake**

Ngami, *I* Malaya,

Baconil, Cbaudoir, *Ikon.*, p, 109.

Hab. Bengal.

sraaaiaorua, Chaudoir, *JUon.*, p, 106,

Hab, Java,

creuattcrus, Chaudoir, *Mon.t* p. V

Ha'», Cambodia

opacus Schmidt Goebel, Faun. Col. Birma, 1846, p. 69.

Hab. Burma.

parallelus, Chaudoir, *Mon.*, p. 100.

Hab. Ceylon.

parvus, Chaudoir, *Afres.*, p. 112.

Hab. Nilgiris.

? *philippensis* (*Amblepsastrus*), Chevrolat, *Rev. Zool.*, 1841, p. 221.

Hab. Philippines.

piens, Chaudoir, *Mon.*, p. 102.

Hab. Malacca.

picipennis, Chaudoir, *Mon.*, p. 100.

Hab. Cambodia.

plancher (*Maraga*), Walker, *Ann. Mag. N. H.*, (3s.) II, 1859, p. 204; Bates, *Loc.*

(5s.), xvii, 1856, p. 211; Chaud., *Ann. Soc. Ent. Belg.*, xiv, 1871, p. 121.

Hab. Ceylon.

placatus Schmidt Goebel, "Fium", *Mon.*, 1846, p. 59; Claud.,

Hab. Burma, Tenasserim.

pollinus, Chaudoir, *Mon.*, p. 102.

Hab. Malacca.

profundestrictus, Schmidt Goebel, Faun. Col. Birma, 1846, p. 61; Bates, *Loc.*, (5s.), xiv, 1856, p. 110; Chaud., *Ann. Soc. Ent. Belg.*, xiv, 1871, p. 121.

Hab. Burma, Tenasserim.

pusillus, Schmidt Goebel, Faun. Col. Birma, 1846, p. 67; Chaudoir, *Mon.*, p. 112.

Hab. Burma, Tenasserim; Bates, *Loc.*, (5s.), xiv, 1856, p. 110; Chaud., *Ann. Soc. Ent. Belg.*, xiv, 1871, p. 121.

rim.

punctus

schauinslandi

Schmidt Goebel, Cl

Goebel, Faun. Col. Birma, 1846, p. 61; Bates, *Loc.*, (5s.), xiv, 1856, p. 110; Chaud., *Ann. Soc. Ent. Belg.*, xiv, 1871, p. 121.

Wiedl.),

Hab. Burma.

salicivorus, Schmidt Goebel, Faun. Col. Birma, 1846, p. 59; Chaudoir, *Mon.*, p. 110.

Hab. Burma, Tenasserim.

senilis, Chaudoir, *Mon.*, p. 104.

Hab. Penang.

xanthomera, Redtenbacher, *Beih. Novara, Zool.*, 6. Col., 1867, p. 12; Chaud., *Mon.*, p. 124.

Hab. Hongkong.

Genus **EIFXACHAKUS**

Chaudoir, *Ann. Soc. Ent. Belg.*, xiv, 1871, p. 121.

IT, Bull.

i, p

na.

eralla, Ort&tn, V->y Delesaan, ii.
1871, p, 125.

Hab, Ooram&niJol; Penng.

ACTEWONOUS

ir, Ann. Soa Rnt, 8c!c-, itv ». d*
CastflID,j Et. Bar., 1334, p

Anu- 8

HABPALIHCE UNiaETOSC;

[a]—

. p, U

p.

Genus PHEROPSOPHUS

Hab. Java.
Sect.
BRACHYTHINI Lacordaire.

, F&br, Syat Bietrttu, E. 1801. |
Bftbu India, Tranquebor,

. Cli&ndotr,
Hnb.

Chaiidoir, *Mor*,.. p.
.b. Aasai

!T'!« r,;-n

iT7i

II ; ChK K.
India, Ceylon

; Lap.

∴ T .i8oii--

a. Cl

Cbaudoir, .*/«*.. p

. p. 306 : <

.SdbnritU
Goebi

:>. 3/.

M, Clmnloir, Bull. Mate., .xvi (a). I

o, Sumatra, Java, Ceylon, Kitngslk- {Bat

fllrionlerii. Bydoux ft Souleyetj HOT, Zoo!., 1S30, Daarnu:
i, 1811, p. 893,, t. 2 32.

flab 1 ai, Min :,>ti."v . I

/«., p. M.

Aflra., p.

, p. 310 : Schmidt Goabel,
Faun, i

53, p. 44 : Cliaaaair. M<

Season GO&IIDI, Faun. Col. Birm^]

ZlfiN. tnrlin, Bap

Uii, CL

B

lam«nalsf Chaodioir, Mo,
torn.

K. T Atkinson—*CttUdwus oj*
ike Olwodoir, Boll. M.-*c i

3B,
*L ---- ?

BRACHTNr

Hah. India, Simla.

I

s, ChaadcdR, ifa»,

bandnir, Jtf-r/i

. Ob

Sumatra* Bwilang.

. ObMtdoir, *Won.*, p

Hub. B lilotUB, Cliuua i:r,

JW.JK., p 53.

Umbellwi. amndcLr, J 70.

Hal>, l>ek,bfln.

^bandtrfr, *Afoa.*, p, 67,

Hnb. Betliftn,

UmglPftiPI*. Wieden.

. IS2l_r p. I

314 : C\w

n, Gfamcl ∴ . *'—.,

Us

Birm, U-

4 "

1870.]

E. T. Aitk

—C"

dictus (Aplous), H-ipo, Trans. Zool. 3, Lond. i, 1

Col. 1, 1884, p. 223 : 1.ap. ile

Art.

Chandol.

figuralis, Cl

Atidoir. Bull. Ho*:

Cl

Hah.

-I-

IHHHWT - bmili Goebel, Faun. Col BifnL, l»W,p..72 I ChWdoir, ■ -/- .«.,
;

scitulus, Schmidt Goebel, l. c.

Chandolr, Mon., p. 59.

Hab. Burma, 1 Tranque

p- T2 : ? C

— Redtenb., Reise Novara, Zool. II, C. 1, 1867, p. 5 : Chandolr, Mon., p. 51.

Hab. Hongkong, Shanghai.

tolutv ■ i ■ 1 lir, *Mu H*, p.
t .>. ■■.

maximiliani at«8. Deje

. : Lap.

p. SI T Ch

Hab. N. to S. India.

cutarellus, Chandolr, JUm^ j 69.

Hab. N. India.

IXACOIOn, <LiUJO17 Mon., p. 61.

Hab. Dekhan.

tetragrammus, Chandolr, Mon., p. 61.

Hab. Bengal.

vigilans, Chandolr, ir, if/m,, p.

Hab. N. 68. India,

vitticollis, Chandolr, Mon., p. 56.

Hab. Burma, Baggon.

Genus

STTPHLOMERUS.

Chandolr, Monograph, Ann. Soc. Eni. Belg-, xix, 1876, p. 87.

Styphlomerus, Chandolr, l. c. p. 88.

stebrous, Germ. & Har., Man. Cat., 1868, p. 105 : Chandolr, Mon., p. 92.

Bleeker, Bohem., Fing. Reg. Ross, Col., 1858, p. 8 (non Brulle) : see Balot,
Trans. Ent. S. Lond., 1873, p. 307.

Hab. Hongkong.

ruficeps (*Brachinus*), Schmidt Goebel, Faun. Col. Burma, 1845, p. 13 : Chandolr,
Mon., p. 91.

Hab. Burma.

ruficeps, Chandolr, Mon., p. 91.

Hab. India, Ceylon.

Genus CREPIDOGASTER.

Boheman, Ins. Caffr., l. 1845, p. 61 : Man. Cat., p. 105 : Chandolr, Monograph, Ann.

Soc. Ent. Belg., xix, 1876, p. 91.

Styph., pt. Dejean, Spec., l. 1835, p. 209.

EnL, IMS,

alia, Mklabar.

Genus MAST AX-

Pmm,0

LitC'ifi., Quo. Col., i, p. 1'J i : Set.-

Man. Cat., p. IDS : Chaadoir, JfrwprapA, Ann. Sue

is, Deje <

i, Schmidt Ooebel, Faua. Col. Uira
./lftn,, p. Hftb. Banna.

Wstrio, Fftbricias, Syet , p. 219 : chaudoir.
Uak ladin, Dekhaft.

raooatua, 8cliin- Lijrni., l*i*iA, p.
p. 1 Hab.
IJunna.

ornatu.i, Sclimidl Gocbel, I. if., p. 70 : Hub. if(VI., p. 100.
Burma.

PMMfta, Schai I

ib. l*u*iii-a,
CliiuiJ(jir

1POTOMIS*—Jacq. Duval, Gou., 1, p, !3 ; Horn., Gen. Camb., p. !

Genu* APOTOMOS^

Iliigex, Mag. Iue-, vt, 180?, p
3. MobtcbnUky, Bt, But, I n.
Hab- Ccjlwi.

RtaoTU, Mot.gchsilsky_t L c.v p. 2£,
Hub. India,
xwxtliot«l«. B«t,«*_t EnL 11 si, 1874_f p, 9S

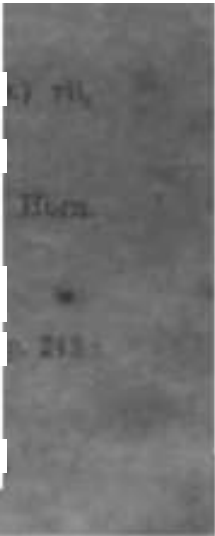
_t Burma, BU&m

BJ&O8CIK1.(Ow-mai Cat.
Oarub.

oDuvBaoscus.

Pun Bnt./fli

, BoucUi, Mem
pi:
4
^{^*0 f*>}
*tetU) Q'M'I**, \MK\X



p. *Si.*

YSPEDOHOTIJS. , 814

C firms CHLAEMTUS,

Laf

- obsoletus*, Chaudoir, Bull. Mosc., xix (3), 1856, p. 310; *Id.*, *Mosc.*, p. 62.
Lauf., Bates, Trans. Ent. S. Lond., 1873.
 Hab. N. India, Tranquebar, Borneo, Java, Hongkong.
- sinuatus*, Dejans, Spec. II, 1829, p. 301; Lacord., Gen. Col., i, p. 315, note:
 Chaud., *Mosc.*, p. 61.
C. variegatus, MacLay, Annul. Javan., 1825, p. 14; Chaud., *Mosc.*, p. 62.
 var. *crispus*, Schaef., Har. Ent. Bow., xii, 1867, p. 103.
 Hab. India, Java, [Ind. Mus., Bombay, N. Khasya Hills, Andaman Islands].
- sinuatus*, Dejans, Spec. II, 1829, p. 302; Chaud., *Mosc.*, p. 63.
staretyer, Casteln., Not. Austr. Col., 1867, p. 62.
punctatus, Chaudoir, Bull. Mosc., xix (3), 1856, p. 303.
punctipis, Germ. & Har., Mem. Ch., 1869, p. 271.
 var. *signatus*, Montrozier, Ann. Soc. Ent. Fr. (N.) i, 1860, p. 227.
 „ *guttatus*, Eschsch., Kool. Atlas, v, 1829, p. 26, t. 25, f. 8; Fairm., Rev. Zool.,
 1849, p. 282.
 Hab. Java, Sumatra, Philippines, Australia, New Guinea, New Caledonia.
- maculatus*, Chaudoir, Bull. Mosc., xix (3), 1856, p. 198; *Mosc.*, p. 50.
 Hab. India, Dekhan, Coromandel.
- hymanus*, Chaudoir, *Mosc.*, p. 93, 95.
 Hab. Burma, Rangoon.
- hymanus*, Chaudoir, *Mosc.*, p. 139.
 Hab. Coromandel.
- callidioris*, Bates, Trans. Ent. S. Lond., 1873, p. 23; Chaud., *Mosc.*, p. 194.
 Hab. Kinkiang on Yangtze, Japan.
- camillus* R. Gestro, Ann. Mus. Civ. Gen., (24) vi, 1888, p. 108.
 Hab. Burma, Tetaseo.
- celor*, Chaudoir, *Mosc.*, p. 201.
 Hab. N. India, Dekhan.
- chitadensis*, Chaudoir, *Mosc.*, p. 159.
 Hab. Siam, Bangkok.

Carabidae

cinctus (Cremat.)

J. 7. Dejans

p. 135; Bates

paleator,

N. H.

Hab. B.

1 Cha

circundatus, B.

Ann. Mag. S.

Mosc., p. 176.

]

Fid. Arch., iv, 1783, p. 125, t. 29

Bull. Javan., p. 13; Chaud., *Mosc.*,

p. 74.

v, 1856, p. 337; *Id.*, Ann. Mag.

[Ind. Mus. Sibadgar, Assam,

33; Chaud., *Mosc.*, p. 114; Bates,

E. T. Atkinson—*Catalogue of the*

i, p 120.
'ydaciylus, LaferttS, he. tupra_t \
'cms, Lafert.
Ham I.e., p. 2*K* : 1. Gea. Ci.
*Lis** • , Annul. Java:- !3 : Ldtord.,
i,p. 217 : Chanti.j *Won.*, p. ■ ,
Lafert

^
,

Chiuul., 2*J*.
oxanthas, Ciiaudioir
a,
a, (
llu

apicalt
., p. 89.

*, Ci. *Mon.*, p. 18
Hab, J
ungalensifl. Chau
er, Journ. A Lien,, xx

148.
. j. N. Xmlia^ Bengal u, Siatn,Tc'
Lor, Chauioir, *Men.*, p. i
Hob, Dekhan.
Japanj

- macromarginatus*, Motsch., Bull. Mosc., **c, autii ..;;. l¹-** 1861, p. 345.
Hab. India.
- purx*, Chaudoir, *Mon.*, p. 236.
Hab. N. India.
- serenus*, Chaudoir, *Mon.*, p. 199.
Hab. Laos.
- Gestrelli* Chaudoir, *Mon.*, p. 51.
Hab. Malacca, Macao.
- guttata*, Chaudoir, Bull. Mosc., xxix (3), 1856, p. 218; *Mon.*, p. 281.
Hab. Hongkong.
- hamatus*, Eschsch., Zool. Atlas, v, 1831, p. 26; Dej. Spec., v, **p** 633; Chaudoir, *Mon.*, p. 63.
Hab. Philippines.
- impressicollis*, Chaudoir, *Mon.*, p. 236.
Hab. N. India.
- isops*, Chaudoir, Bull. Mosc., xxix (3), 1856, p. 239; 4d., *Mon.*, p. 262.
areolaticollis, Motsch., Et. Ent., 1860, p. 7.
vestitus, Motsch., teste Chaudoir, *Mon.*, l.
Hab. Formosa, Yangtze Valley, Chosen, Japan, Korea, Manchuria.
- javanus*, Chaudoir, Bull. Mosc., xxix (3), 1856, p. 229; *Mon.*, p. 115.
Hab. Malaya, Java.
- Laferrie*, Guérin, Voy. Indes, 1843, p. 36; Chaudoir, *Mon.*, p. 66.
cyathocollis, Chaudoir, Bull. Mosc., xxix (3), 1856, p. 218.
diffilis, Laferrie, Ann. Soc. Ent. Fr., (2s.) ix, 1851, p. 21.
maculipennis, Motsch., Bull. Mosc., xxxv (3), 1864, p. 341.
Hab. India, Bengal, Pondicherry.
- laetiusculus*, Chaudoir, *Mon.*, p. 236.
Hab. N. India.
- laevipennis*, Chaudoir, *Mon.*, p. 1 **JO**.
Hab. Dekhan.
- leucops* (*Harpalus*), **HfcMMH** in, Zool. Mag., ii (1), 1823, p. 52; Chaudoir, *Mon.*, p. 71.
serripennis, Chaudoir, Bull. Mosc., xxix (3), 1856, p. 271.
Hab. N. India, Colombo, Philippines, Cochin-China, Ceram.
- limbicollis*, Chaudoir, *Mon.*, p. 51.
Hab. Dekhan, Formosa.
- luteicanda*, Chaudoir, *Mon.*, p. 201.
Hab. Dekhan.
- luridus*, Chaudoir, Bull. Mosc., xxix (3), 1856, p. 261; *Mon.*, p. 159.
Hab. Philippines (Luzon).
- lynx*, Chaudoir, Bull. Mosc., xxix (3), 1856, p. 19 **3:** *Mon.*, p. 50.
Hab. Hongkong.
- macropus*, Chaudoir, *Mon.*, p. 140.
Hab. Dekhan.

100 E. T -*Calalogw*

i^{*}, Nil.¹

-in, ilag

limb^{*}

Bengal, Kandj.

ictus, C p. 202,

Hab in.

convexus, Fairmaire, An

at. S. L

crebrepunctatae iir, Ball. M

oulminatus, Bates, Trai

Hab. *I W*

. Cbaudoir. *Man.*,

liab, bianri:

cyaneonitena, Fairraairc, A:

Hab. Yum:

dilatatus (*PoechoistJU*), id

i> Chaudoir, *AJOI*, p. 49.

Crana, Ent. S. T

JDorlae, Chaudoir, *Mon*, p. 137,

Hab. Siam, Druagk

ducalls, Chaodoir, *Moil.*, p. 155.

Ha!

vaucelH (*Ejromti*), Dejean, Spec, ■.

extremes, (

Hab. i

ftmoratua, Dcjeau, Spec.ii, 1[^]

<*tut*, Caatf

frater, t

Htib. India, Malabar

maculatus, Dejean, Spec., II, 1836, p. 309; Chant., *Mon.*, p. 22.

Hab. Dekhan, Siam.

marginifer, Chaudoir, *Mon.*, p. 118.

marginatus, Dejean, Spec., II, 1836, p. 305 (see Ross).

Hab. India.

medioguttatus (*Limenarchinus*), Chaudoir, *Mon.*, p. 23.

Hab. Dekhan, Burma.

Uaoptsroa,

ir., *Mon.*, p. 226.

Ceylon (*Pseudoniya*).

Ent. Syst., I, 1792, p. 137; *Syst. Eleuth.*, I, 1801, p. 191.

Leid., xix (3), 1856, p. 291, 294; *id.*, *Mon.*, p. 52.

Chant., *Bull. Mosc.*, xix (3), 1856, p. 309; *Mon.*, p. 62; Bates,

S. Lond., 1873, p. 247.

Zanzibar, [*Ind. Mus.*, Calcutta].

Ent. Japon., 1825, p. 14 (see *Flabr.*); Chant., *Mon.*, p. 52.

Mourn. St H.

naeviger,

Ind.

Mon.

neigther

p. 296; *id.*, *Mon.*

bilunatus,

biaculatus

formosus, C

malacatus,

xr, 1857,

Hab. Beng

nepalensis, Hope, Gray, *Zool. Misc.*,

concinus (*Barymerphus*),

Melli (*Diaphoroparphus*),

(3), 1856, p. 219; *id.*, (*id.*

planicornis (*Barymerphus*),

p. 236.

Swiakeel, Bates, *Proc. Zool. S. L.*

Hab. India, Bengal, Malaba

Calcutta].

nigricans, Windemann, *German. Mag. Ent.*, iv,

Spec., II, p. 371; Chant., *Mon.*, p. 126.

coloratus, Bates, *Trans. Ent. S. Lond.*,

p. 334; *id.*, *Beitr. Käferk.*,

S. Lond., 1873, p. 246; Chant.,

Chant., *Bull. Mosc.*, xix (3), 1856,

, 1861, p. 341.

1856 - 1857

Ann. Mag., (2c.)

ix, 1851, p. 236.

1850, p. 407; *id.*,

(2c) *ix*, 1857,

China,

Epomis Dejean,

ua« Boo. Ent Fr., (2s.) is,

An

in

i i

|

|

truncatus Chaudoir, *Mon.*, p. 210.

Hab. Shanghai, 7 Canton.

pretiosus Chaudoir, Bull. Mosc., xxix (3), 1856, p. 263 ; *id.*, *Mon.*, p. 178.

Hab. N. India.

procterus, Bates, Trans. Ent. S. Lond., 1875, p. 225 ; 1883, p. 235 : Chaudoir, *Mon.*, p. 259.

Hab. Kinkiang on Yangtze river, Japan.

proximus, Chaudoir, *Mon.*, p. 113.

Hab. Dekhan.

rudens? (*Cerambyx*), Fabr., Syst. Eleuth., i, 1801, p. 193 : Chaudoir, *Mon.*, p. 283.

malachinus (*Callistoides*), Metch., Bull. Mosc., xxxvii (3), 1864, p. 275.

Hab. Bengal.

rugosus, Cameron, Atti R. Acad. Sci. Turin., xiv, 1878, p. 146 : Genov. Ann. Mus. Civ. Gen., xviii, 1882, p. 306.

Hab. Burma, Mandalay.

punctatostriatus Chaudoir, Bull. Mosc., xxix (3), 1856, p. 244 ; *id.*, *Mon.*, p. 21.

Hab. N. India.

puncticollis, Dejean, Spec., ii, 1826, p. 315 : Chaudoir, *Mon.*, p. 196.

Hab. Bengal, N. India.

quadricolor (*Cerambyx*), Olivier, Ess. Meth., v, 1790, p. 344, *id.*, Ent., iii, 35, p. 72, t. 18, t. 111 : Fabr., Syst. Eleuth., i, p. 150 : Dejean, Spec., ii, p. 317 :

Schaum, Statia Ent. Zeit., 1847, p. 41 : Chaudoir, *Mon.*, p. 151.

calceoloides (*Amphyrinus*), Latr., Ann. Soc. Ent. Fr., (2s) ix, 1851, p.

)ton., p.

112:

>, laee, p..

1873, p. 324 ;

$$1, \dots, 1 \quad 1 \quad v^*$$

bar.

Bat«% Trftns, Ent. S.

tetr*gm t>4*n Lfl, «

i., p. 179,

11. Moic.t JLtix U), WW, p. 2(5 S : J

S7.

ir, J/J?'

tfftl



z&r.

PENTHIMUS

H

BLHOf. - 3

- **^TOMACHAHEITS.**

i,. tot. **CALLISTUS.**

ISMUU 1

i ANATRICHS.

Gftnua SYSTOLOCEAini
W, p. So

1

■
1

-UH CODES.

varta:

p. ary,

Genus SlMOtJS.

*tfiM<ff*rk, Ann. &

<»-

, p, 870, note 4 : ChaaH,, J/,

.

1

.to, CaTn^ci'

ilag, Zool^ (*2a.) xxi, p. 70 ; Xoiu, p. 81

WtMM fOoilf-9), Wicderaftan, Q

Mag,]

p. LH:

p, 375.

LACHNOCRHPIS

i: Mr.

i78.

K»

COLE0S.

•, 521.

bandoir, Bull. Moec, ^x (H), 1857, p. ft8 ; ^rfu Ifort.,

oo: Eat. Fi

a a,

1

Geuaa KTELAXODES.

■0.

Getma PATELLUS-

UoJVfjrapK Ana. Soc. E

CJs.Jii, 1*82

•i i 'r

crtwtaA

va, p &:

Genus ZABRTTB-

Chaetris, Ent. Helv., II, 1806, p. 80; Zimmermann, Monograph Carabiden, 1831;
Lacord., Gen. Col., I, p. 339; Schaum, Revision, Berlin. Ent. Zeits., 1861, p. 173;
Mon. Cat., p. 384; Horn, Gen. Carab., p. 174.

Peter, Bonelli, Mem. Acad. Turin, Obs. Ent., 1813, tab.

Polysenus, Motschulsky.

Polysenus, Zimmermann, Mon. Carab., 1831, p. 5.

oblongatus, Fairmaire, Ann. Soc. Ent. Fr., (2a.) vi, 1886, p. 313.

Hab. Yunnan.

HARPALINI, Horn, Gen. Carab., p. 174; Lacord. & Horn, Class. Col., p. 52.

Antidactylides, pt. Lacordaire, Gen. Col., I, p. 263.

Cratonotides, pt. Lacordaire, *Id.*, p. 257.

Ditomis, pt. Lacordaire, *Id.*, p. 165.

Harpalides, Lacordaire, *Id.*, p. 255.

Horn (*Id. supra*) divides this tribe into *Dapti*, *Glypti*, *Harpali*, and *Antidactyli*.

Gontia LIODAPrtTS.

Daptis, Ann. Man. Oi Gen., (2a.) vii, 1889, p. 102.

Daptis, *Id.*, 102.

Hab. Burma, Bhamo, Mandalay.

Genus BAEYSOKua

Dejean, Spec., iv, 1829, p. 59; Lap. de Casteln., Hist. Nat. Ins., I, p. 94; Lacord.
Gen. Col., I, p. 290; Mon. Cat., p. 341; Nietner, Jour. As. Soc. Ben., xvi, 1857, p. 147.

Genus, Nietner, Jour. As. Soc. Ben., xvi, 1857, p. 147; Ann. Mag.
N. H., (2a.) xx, 1857, p. 343.

Oxytelus, Dejean, Spec., iv, 1829, p. 59; Lap. de Casteln., Hist. Nat. Ins., I,
p. 95.

arenarius (*Oxytelus*), Nietner, Jour. As. Soc. Ben., xvi, 1857, p. 147;
Ann. Mag. N. H., (2a.) xx, 1857, p. 340.

Hab. India, Ceylon, Ceylon (Bates).

semirrtatus (*Carabus*), Fabr., Syst. Eleuth., I, 1801, p. 201; Dejean, Spec., iv, p.
60; Lap. de Casteln., *Id. supra*, p. 95.

Gerstaeckeri, Nietner, Jour. As. Soc. Ben., xvi, 1857, p. 147; Ann. Mag.
N. H., (2a.) xx, 1857, p. 340.

Hab. India, Ceylon.

subobscurus (*Amara*), MacLeay, Austral. Javan., 1925, p. 21.

Hab. J. .va.

subolivaceus (*Amara*), MacLeay, *Id.*, p. 21.

Hab. Java.

tricolor (*Amara*), MacLeay, *Id.*, p. 21.

Hab. Java.

Genus BRADYBAENUS.

Dejean, Spec., iv, 1829, p. 160; Lacord., Gen. Col., I, p. 292; Mon. Cat., p. 341.

Caledonius, Nietner, Ann. Mag. N. H., (2a.) vi, 1859, p. 134.

Gonna HYPHIJEPHUS.

'.cad., 1

Genoa PANGTTS.

Ma, PMIrvi., x, 18S3, }

Muu

HTTOLI1.**«» HAHPALTJS**

perforatus, Bates Proc. Zool.
Hab. India, Jhelum

Latreille, Hist. Nat. Ins., viii
p. 272 : Horn, Gen. Carab.

Asterophilus, Motschulsky

Xanthomyza, Motschulsky

Artibeus, Goeze, Mt.

Basileus, pl, Motschulsky

Conicus, Motschulsky

Erycinus, Motschulsky

Harpalidius, Kolbe

Harpalodes, Motschulsky

Holcus, Motschulsky

Ovatus, Motschulsky

Pteroporus, Motschulsky

Plates, Motschulsky, Cat. Carab. Ross., 1854

Paradothisus, pl, Motschulsky, Ins. Silu. 18

[This synonymy requires examination and revision].

E. »twon— C

ad-rolana Sic I ner, r, fi. is. Sec. Beng., XXT, 1886, p 2M id.,
±a%. M

fi.

, Hottehclak;, EL I

tete*, Tr*ai

Hopa, Trans, Eat.
Bab. China.

. p. 15.

b. China.

•ttft, Panzer, Faonn. Germ,, 3&.179" : D.

Tftr

irto, AbbUd. Q&W. But.

Kitfrjr, 4, 180S, p

PI

Bat

idUiWW, Eaten, Lt

tlaV

vu.

;· ! i;

Jura.

<4 Trans.

STENOLOPHUS.

1890.]

R. T. Atkinson—*Catalogue of the Carabidae.*

113

ruscillus (Pictet). Motschulsky, *Et. Nat.*, 1860, p. 3; Harold, *Abh. Nat. Ver. Bremen*, iv, 1875, p. 263; Bates, *Trans. Ent. S. Lond.*, 1863, p. 236.
japonicus, Morawitz, *Bull. Acad. St. Petersb.*, v, 1862, p. 227; *Beitr. z. Kenntn. Faun. Jap.*, i, 1863, p. 67; Bates, *Op. rarer*, 1873, p. 291.
 Hab. Formosa, Fuchan, Shanghai, Yangtze Valley, Japan [*Jed. Mus. Munro*].

sinicus, Hope, *Trans. Ent. S. Lond.*, iv, 1845, p. 14.
 Hab. China.

sinotulus, Bates, *Trans. Ent. S. Lond.*, 1873, p. 263.
 Hab. Canton, Yangtze Valley, Korea, Nagasaki.

transsilva, Hope, *Trans. Ent. S. Lond.*, iv, 1845, p. 15.
 Hab. China.

tridentis, Morawitz, *Beitr. z. Kenntn. Faun. Jap.*, i, 1863, p. 67; Bates, *Trans. Ent. S. Lond.*, 1863, p. 236.
 Hab. Canton, Japan.

pygmaeus, Bates, *Proc. Zool. S. Lond.*, 1878, p. 714.
 Hab. [near Yarkand] [*Jed. Mus.*, type].

Genus **UIBESSUS**

Bates, *Trans. Ent. S. Lond.*, 1863, p. 240.
reluctans, Bates, *Op.*, 1873, p. 264; 1883, p. 240.
 Hab. Fuchan, Nagasaki.

Genus **GNATHAPHANUS**

MacLeay, *Annul. Japan.*, 1885, p. 29; Lacord., *Gen. Col.*, i, p. 292; Chaudol., *Ann. Mus. Civ. Gen.*, iii, 1878, p. 56; *Mon. Cat.*, p. 264.
 1847, p. 105.

81: Lacord., *Gen. Col.*, i, p. 292.

82].

823, p. 29; Hope, *Col. Man.*, ii, t. 2, f. 2, 317.

■«CABICUS-

Acupalpus, Latr.
Col., i, p. 302.

Aphraon Motschulsky, Bull. Mosc., xxvii (4), 1864, p. 207. *Balcan. Schilke*.

Epidrema, Motschulsky, Et. Ent., 1837, p. 41; *id.*, *loc. cit.*, p. 201.

Melolontha, Motschulsky, Bull. Mosc., xxvii (4), 1864, p. 207.

Myrmecodorus, Motschulsky, Et. Ent., 1837, p. 36.

Philodes, Leconte, Class. Col., 1851, p. 33.

serialis (*Epidrema*), Motsch., Bull. Mosc., xxvii (4), 1864, p. 205.

Hab. India, Transjordan.

biplagiatus, Bohem., Fug. Eng. Herz. Col., 1838, p. 12.

Hab. China.

chalcus, Bates, Trans. Ent. S. Lond., 1873, p. 378.

Hab. Yangtze Valley, Japan.

confusus, Bates, *loc.*, p. 377.

Hab. Yangtze Valley, Japan.

yanellus, Bates, Ann. Mus. Civ. Gen., (2s.) vii, 1889, p. 103.

Hab. Burma, Bhamo, Mandalay, Bhamo.

derogatus (*Ampelopus*), Walker, Ann. Mag. N. H., (3s.) ii, 1853, p. 204; *id.*, Bates,

(2s.) xv, 1886, p. 80.

Hab. Ceylon, Nuwara Eliya (Bates).

zonitius, Bates, Ann. Mus. Civ. Gen., (2s.) vii, 1889, p. 104.

Hab. Burma, Bhamo, Telatso, Thagata (Tensacrim).

guttata (*Ampelopus*), Dejans, Spec., v, 1829, p. 368.

Hab. India.

incarnatus (*Ampelopus*), Bates, Trans. Ent. S. Lond., 1873, p. 208.

Hab. Yangtze Valley, Japan.

iridicollis, Redtenb., Reise Novara, Zool. II, Col., 1857, p. 10.

Hab. Hongkong.

laidus (*Stenolophus*), Dejans, Spec., iv, 1829, p. 415.

provinas, Valderm., Fauna Ent. Transilvaniae, III, 1838, p. 58.

Hab. India, Caucasus.

minimus (*Ampelopus*), Dejans, Spec., iv, 1829, p. 433.

Hab. India.

nilens (*Epidrema*), Motsch., Bull. Mosc., xxvii (4), 1864, p. 203.

Hab. Borneo.

opaculus, Bates, Ann. Mag. N. H., (5s.) xvii, 1886, p. 80.

Hab. Ceylon, Nuwara Eliya.

potygenus, Bates, *loc.*, p. 79.

Hab. Ceylon, Nuwara Eliya.

proximus (*Stenolophus*), Dejans, Spec., iv, 1829, p. 420; *id.*, *loc.*, t. 199, f. 4.

Hab. S. Russia, Japan, Shanghai.

quinquepartitus (*Enditer*), Wiedemann, Zool. Mag., h (3), 1823, p. 231.

(*Stenolophus*) Dejans, Spec., iv, p. 414; Bates, Trans. Ent. S. Lond., 1873, p.

270; Ann. Mag., N. H., (5s.) xvii, 1886, p. 79.

-

ANOPLOGEWIUS.

ioc- Ben 57, p, ■ 15)
.. 1640, oa w

, Trans.
.an.

78.

asn-, (2s,) p. 394 fUTm
a BRADYCEIXTTS-

Genus **OXYCENTRUS**.

Chandair, Bull. Mosc., xxvii (2), 1934, p. 345 : Man. Cat., p. 219.

angustus, Bates, Trans. Ent. S. Lond., 1876, p. 8, note, 3.

Hab. Burma, Bangoon.

bermesea, Bates, *Id.*, p. 8, note, 3.

Hab. Borneo.

parallatus, Chandair, Bull. Mosc., xxvii (2), 1934, p. 347.

Hab. N. India.

Genus **TACHYCELLUS**.

Merrilli, Bull. Acad. Petr., 7, 1863, p. 261 : Man. Cat., p. 264 : Horn, Gen. Carab., p. 182.

lampyris, Bates, Ann. Mag. N. H., (5a) xvi, 1885, p. 82.

Hab. Ceylon, Colombo.

Genus **DICHIROTRICHUS**.

Favre, Duval, Gen. Col. Carab., 1835, p. 35 : Man. Cat., p. 161.

* *atlicola*, Bates, Proc. Zool. S. Lond., 1878, p. 713.

Hab. Fawc [Fed. Mus., type].

aspidipennis, Bates, Trans. Ent. S. Lond., 1875, p. 526.

Hab. Shanghai.

Genus **CALATHOMIMUS**.

Bates, Ann. Mag. N. H., (5a) xvi, 1885, p. 77.

consors, Bates, *Id.*, p. 78.

Hab. Ceylon, Bogawantalawa.

maculatus, Bates, *Id.*, p. 77.

Hab. Ceylon, Bogawantalawa.

Genus **DIORYCHE**.

MacLachy, Annul. Javan., 1835, p. 21 : Lap. de Casteln., Hist. Nat. Ind., 1, p. 123.

Lacord., Gen. Col., 1, p. 309 : Man. Cat., p. 187.

Platymetopus, Dejean, Spex., iv, 1819, p. 68 : Lacord., Gen. Col., 1, p. 309.

Bates, Trans. Ent. S. Lond., 1873, p. 121.

amoena (*Platymetopus*), Dejean, Spex., iv, 1819, p. 12.

Hab. Java.

columbensis, Kistner, Jl. An. Soc. Belg., xvi, 1857, p. 131 : Ann. Mag. N. H., (5a)

xv, 1887, p. 373 : *Id.*, Bates, (5a) xvi, 1885, p. 78.

Hab. Ceylon, Colombo.

perrota, Bates, Trans. Ent. S. Lond., 1874, p. 279.

Hab. Yangtze Valley, Fuchow, Japan.

BO.' M.

<

***MELYSTOMUS.**

Lacord.

indicus (*Megaristernus*), Nietner, Ann. Mag. N. H., (3s.) ii, 1859, p. 423.

Hab. Ceylon, Kitagalle (*Bates*), Madras.

mandibularis (*Megaristernus*), Nietner, *l.c.*, p. 423.

Hab. Ceylon, Colombo.

pallipes, Motschulsky, Rt. Ent., 1859, p. 24; (*Hypodis*) *id.*, Bull. Mosc., xxxii (3), 1864, p. 233.

Hab. India.

quadrigruttatus, Motschulsky, *l.c.*, p. 24; (*Hypodis*) *id.*, Bull. Mosc., *l.c.*, p. 234.

Hab. India.

stenolophoides (*Megaristernus*), Nietner, *l.c. supra*, p. 423.

Hab. Ceylon, Colombo.

Genus SIOPELUS.

Murray, Ann. Mag. N. H., (3s.) iii, 1859, p. 27; Mun. Cat., p. 257.

ferrous, Bates, Ann. Mag. N. H., (3s.) xvii, 1886, p. 75, 211.

inconspicuus (*Curtonotus*), Walker, *l.c.*, (3s.) ii, 1858, p. 204.

Hab. Ceylon, Nawam Eliya.

Genus ANISODACTYLUS.

Dejean, Spec., iv, 1822, p. 132; Lacord., Gen. Col., i, p. 275; Mun. Cat., p. 251.

Horn, Gen. Carab., p. 184; Bates, Biol. Centr. Amer., Col., i (4), p. 52.

Amplasia, Newman, Ent. Mag., v, 1838, p. 267; Lacord., Gen. Col., i, p. 277; Mun. Cat., p. 254.

Anisodactylus, Chaudoir, Bull. Mosc., x, 1837, p. 41; Lacord., Gen. Col., i, p. 275; Mun. Cat., p. 257.

Aplousenus, Leconte, Good. Col. Un. St., 1846, p. 108.

Dileirus, Mannerheim, Bull. Mosc., xvi, 1843, p. 211.

Eurytelus, Leconte, Good. Col. Un. St., in Ann. Lys. Nat. Hist. N. York, iv, 1846, and separate, p. 115; Mun. Cat., p. 257.

Gyandromorphus, Dejean, Spec., iv, 1822, p. 155; Lacord., Gen. Col., i, p. 281; Mun. Cat., p. 258.

Gyandrotarsus, Laferté-Sénectère, Ann. Soc. Ent. Fr., (2s.) x, 1852, p. 202; Lacord., Gen. Col., i, p. 283.

Stenopis, Leconte, Good. Col. Un. St., *l.c. supra*, iv, 1846, p. 277; *id.*, p. 105; Mun. Cat., p. 258.

Triglectrus, Leconte, *l.c.*, p. 103.

Xestonotus, Leconte, Trans. Amer. Phil., x, 1833, p. 263; Mun. Cat., p. 759.

dispellens, Walker, Ann. Mag. N. H., (3s.) iii, 1837, p. 51; Bates, *l.c.*, (3s.) xvii, 1886, p. 75.

Hab. Siam, Ceylon, Kandy, Hongkong, Fuchau.

javanus, Dejean, Spec., iv, 1822, p. 146.

Hab. Philippines.

signatus, Illiger, Käfer Fauna, i, 1798, p. 174; Panzer, Faun. Germ., 38, 4; Dejean Spec., iv, p. 135; Schaum, Nat. Ins., i, p. 363.

rusticus, Dahl, Col. & Lep., 1827, p. 11.

Hab. Europe, Siberia, China, Canton (*Putzeys*).

OMOPHRON--P. 6.

arillaria, Chaudole.

cuttata, Chaudole.

interruptus, Chaudole.

levigatus, Gestr.

porcatus, Chaudole.

subgonensis, Chaudole.

striaticeps, Gestr.

P. 12--The following

Hab. Garjilip.

MOUHOTIA, p. 17.

Buteati, Lewis, Pat.

Genna LAMPROPHONTTSs. CiT. Gen., (2a.) vii, 188⁶J, p. 101.

lucens, i .3.

ib. Durrua.

Genus CHYDAEUS-

. xxvii (2), 1 : Mun. Cat., p. 251.

oftscuru

Ii-

Gcnua HYPHAKPAX-

n., 182-5. p. 22 : L; Col., i, p. 2S2 : Hun. Cat.

denUpes {Su

Ilab. I

b, 2, f. 3

Ins., i, p. 123,

p. 502.

Geuas HYPHAEREON

, Annul. Javiu; 5, p. 22 : Lacord., pen..Col., i, p. 2S4 : Mun. Cat.,

eatue,

in., ix, t. 2, f. G a-c.

ITtib- Jitva.

3M0KPI

i. Carab., p. 186 : Lcconte

Genus ADELOTOPTJS.

'>> P ^ 1, Bev.

1853, p.

t., p. U\

con*.

ums. Eat. a. Loud., 1877, p. 2.

Genus CRYPTOCEPHALOMORPHA.

mi, 1875, p. xcii,

ITBrei

ib_t, xxsii, p. Ixxx.

ise, Trans. Ent- S. Lond., 1877, p. 2.

Hab. Java, Batavia.

- 70—*Lidia pratensis*. Bates, *Le.*, 1889, p. 218. Ichang.
 „ *callitrema*. Bates, *Le.*, p. 219. Ichang.
 77—*Chlaenius anchomenoides*. Bates, *Le.*, p. 212. Goorah Valley.
 11—*Harpalus kashmirensis*. Bates, *Le.*, p. 213. Goorah Valley.
 „ *tilotus*. Bates, *Le.*, p. 212. Goorah Valley.
 „ *Pristodactyla laevifrons*. Bates, *Le.*, p. 214. Goorah Valley.
 „ „ *agonoides*. Bates, *Le.*, p. 218. Ichang.
 84—*Pristonychus kashmirensis*. Bates, *Le.*, p. 214. Goorah Valley.
 85—*Anchomennus mesostictus*. Bates, *Le.*, p. 215. Goorah Valley.
 10—*Cantrastel* Thoms. var. *nitens*. Bates, *Le.*, p. (17. Tch««p
 „ *clavicornis*. Bates, *Le.*, p. 217. Ichang.
 „ „ *protuber*. Bates, *Le.*, p. 217. Ichang.
 „ „ *klutiangensis*. Bates, *Le.*, 1888, p. 381. Klutiang.
 „ „ *dardielles*. Bates, *Le.*, 1889, p. 211. Goorah Valley, iv ashmir.
 var. *granulipartus*. Bates, *Le.*
 „ *darysonus*. Bates, *Le.*, p. 210. Goorah Valley.
 1—*Carabus (Oxytelus) angustus*. Bates, Proc. Zool. S. Loud., JS, p. 387.
 Klutiang, Yantse Valley.
 var. *ignimitella*. Bates, *Le.*
 „ „ *principalis*. Bates, *Le.*, 1889, p. 216. Ichang, Yantse Valley.
 „ „ *pustulifer*. Lucas, var., Bates, *Le.*, p. 217. Ichang.
 „ „ *longipennis*. Chaudoir, Bates, *Le.*, p. 217. Ichang.
 16—*Nethris himalayica*. Bates, *Le.*, p. 212. Goorah Valley.
 84—*Bombiclion brachymerum*. Bates, *Le.*, p. 212. Goorah Valley.
 „ *laevius*. Bates, *Le.*, p. 212. Goorah Valley.

CORRECTIONS.

- 26—for 'Nethierii,' read 'Nethierii.'
 28—line 5 from top, for 'Gestro,' read 'Bates.'
 30—line 19 from top, for 'mutabilis,' read 'metilicis.'
 34—for 'MORIONIDIUM,' read 'MORIONIDIUM.'
 42—for 'Cesotellii,' read 'Cesotellii.'
 55—for 'disidata,' read 'disidata.'
 line 22 from top, for 'Rhynchocelis,' read 'Rhynchocelis.'

▪

!! vD>Y'~...~...

i

J

Xfi

R

■5.
H

EDI < r t'i. H I ,

it.
2. 120.

(3.
Art a, *"« A

PTC
|^lter.fbLiahus_t 11, 120. 13.

ferthoconini

Uf.

LI.

«*, 11.

84.

■j

Rfiopafopa

45.
03, 84.

Sttð raemerutt 119.

W_F2''

•«. 20.

f jr. 11.
*Ptedaru**, 45.
'i*furw-wma, 5T.

98.

²¹
! 9, 20.

L7.
is, 18,

P

**Qgonoj>hvnts*, 16

igo, 77.

>ini. 31.

,

|

||

|

m 1



<■* thei 'I Rw Ko_

Odeopten, *Family Dyti*oki*«.-% K. T. Anxmov. B. A.

| Da. L .lonograph entitled < On aqaat

(SoientiEo Transactions, Uoyftl Dublin Soci
ders the preparitfi—* ^ of fche D3'
ir^ay Sharps rework ia prei.

aeraj of the family, its extent, and some

taxonomy j whilst another chapter is de\ i do

oriptton of the structure. In the prefatory chapter, Mr.

u-ka :—" Wo po-meaa already in fcho Mnuieh Catalogue oi

vhioh a large proportion gf synonyms are well recorded,

lideder the existence of this ■. uluublo pruduction sufficient

^g the Bynonyray ttlt^/ly" recorded llii'reiu, and have

Lilted with iu the alphabetical index of thisj work suuh

nan^et as are neceasftiy t hturmony between it ami the

cafcsv

in qiwwtion. For a similar reaaod it forma no part of my plan

t ho prev i

s belongin

■lunioli Litca in

which

ark, and for those described wucu 18t tt«d by

the i

him. Up to the year 1882, Dr. Shi

> Livli/gue may bo considered safe and snfik imtly.

In ilr. Sharp's w«Tk, there is

uttee in the record of species, which a
genua and Bpecific name of the original deacriber. wh

-^hioh they are placed have neither anther's named not

ia difficult therefore to ascertain wh= the getniR

of

• aa the genus of the original descrijler, or em

rencea to the genera

understood to be subject to tlm modi! : n

in hia diaguoaee. It would be imp

between tho varioiw phaaos which succt

.oust have given rise to in a aid

ace to attempt such a task. Uo tivo a.!

(p. 96t), aocori

if or u

; be followed he

of ott .Uies or;

foe these groups appears to be as sab-{ninili

v^nience the D may be

ivritea of Ui

noil plus & la famille f' . Bttrtout roseniVtlont compl
ienrB articles titnut gttloa, atlong^s ot chtxcun \
ixtrfcrnito.* Ho adds that Uio charactets givca aho

\viro makes the gfc^i •&1K

ito uii Bingtiliet l earn

'3;, Par Bea oi —

avue premiers, titiidisqnc j?*r us [■

j>roat<!ttiui. an un i-illon d' i

co

abides, ct l& sC u de ses sal,

. 'is." It thus dixfiluisLcB the diff

jstrml Cuinivora. laconic

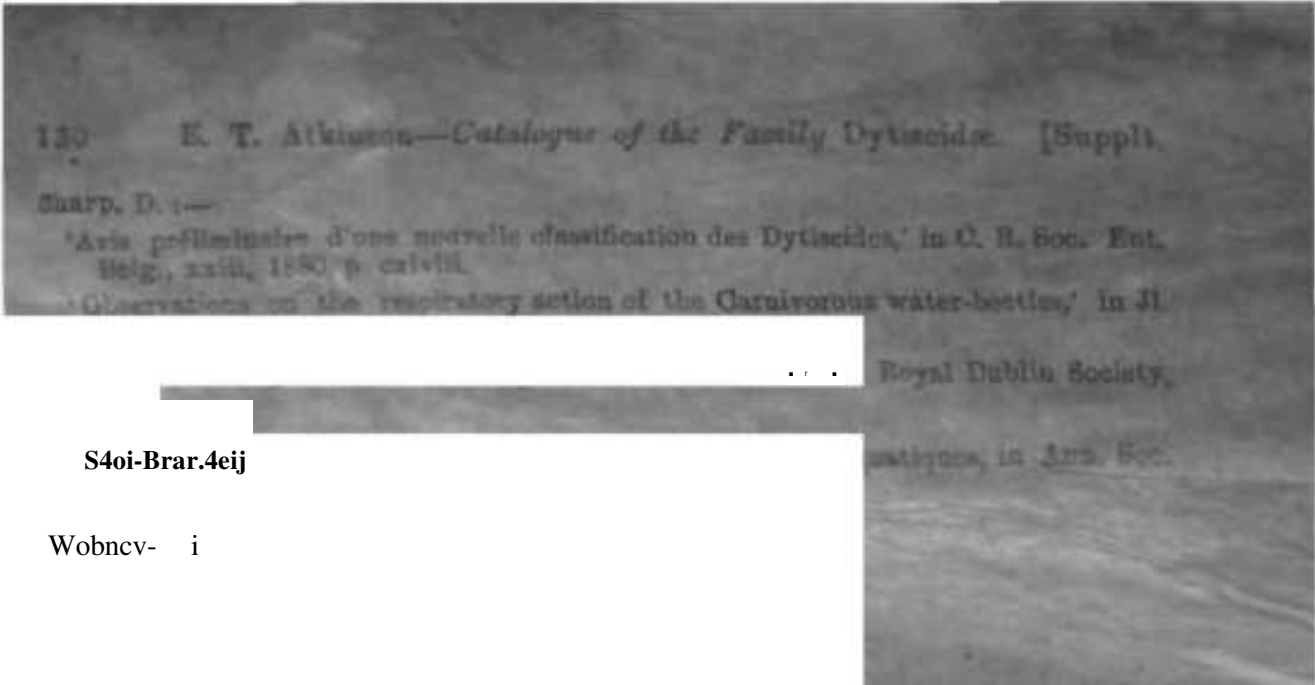
ihe

LaogrdaWa arrangement as Bt con
vri tings ou the

aaatha

and
Klea<r

ftKl.



S4oi-Brar.4eij

Wobnev- i

MX&
Eleta

that

behin

HALT PLUS.

.

ii.*

CMWldvtu*

ier., Qoi

W, Iliinilayaj.

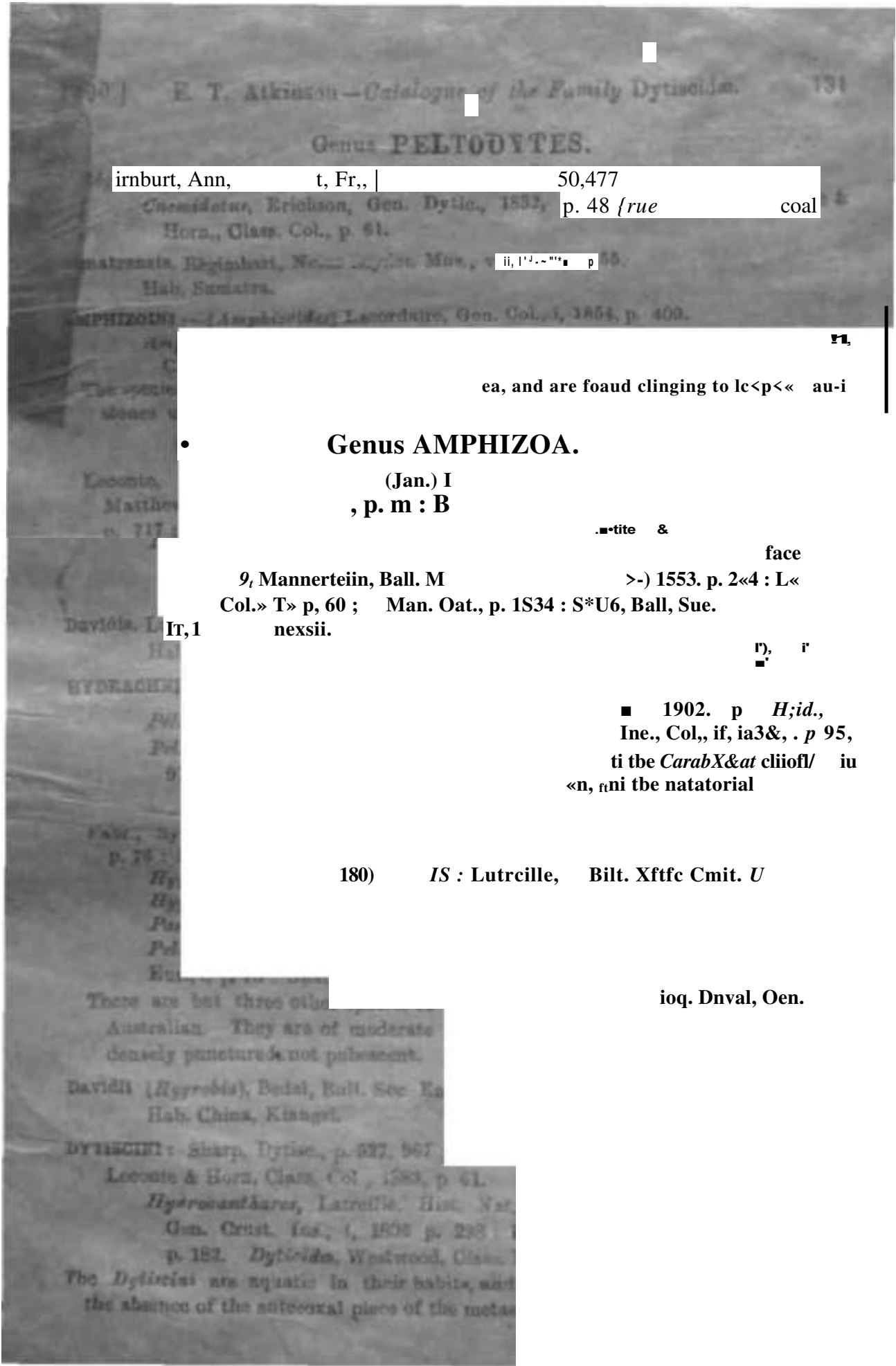
■awalsu : ,

pui0fa<Qtu

«jinm,

H*t

ratffttulii



Genus PELTODYTES.

irnburt, Ann, t, Fr., | 50,477
Enemidetur, Erichson, Gen. Dytic., 1832, p. 48 {rue coal
Horn., Class. Col., p. 61.
matransis, Bégouart, Nouv. Arch. Mus., v. ii, pl. 1, fig. 1, p. 65.
Hab. Sumatra.

AMPHIZOON (Amphizoon) Lacordaire, Gen. Col., i, 1854, p. 409.

ea, and are foaud clinging to lc<p<< au-i

Genus AMPHIZOA.

(Jan.) I
, p. m : B

.title &
face

9, Mannertein, Ball. M >-) 1553. p. 2«4 : L<
Col.» T» p, 60 ; Man. Oat., p. 1S34 : S*U6, Ball, Sue.
nexasii.

It,1

ry, r

■ 1902. p H;id.,
Ine., Col., if, ia3&, . p 95,
ti the CarabX&at cliiofl/ iu
<n, rni the natatorial

180) IS : Lutrcille, Bilt. Xftfc Cmit. U

ioq. Dnval, Oen.

' 1

•

Cicnus H.YDB.OCOPTUS ■
[tTydrn.

1

NOTERTTS.

STDROCAimi

angularis, Sharp, Dytisc., p. 277.

Hab. Singapore.

infasciatus, Régimbart, Ann. Soc. Ent. Fr., (3e) i ii. 1489. i' 148.

Hab. Cambodia.

insellus, Régimbart, Ann. Mus. Civ. Gen., (2e) vi, 1888, p. 610.

Hab. Burma, Rangoon.

maculatus, Sharp, Dytisc., p. 275 : Régimbart, Ann. Mus. Civ. Gen., (2e) vi, 1888, p. 610 ; cf. Ann. Soc. Ent. Fr., (3e) ix, 1889, p. 149.

Hab. Burma, Hmaw, Rangoon, Siam, Cochinchina, Celebes.

marinus (*Hydrocanthus*), Motschulsky, Ent. Ent., 1856, p. 83 : Sharp, Dytisc., p. 275 : Régimbart, Ann. Gen., *loc. supra*, p. 610 ; cf. Ann. Fr., *loc. supra*, p. 149.

Ricinus (*Hydrocanthus*), Régimbart, Notes Leyden Mus., II, 1880, p. 213 : Malacca Sumatra, iv, 6. 1. 1, 1. 7.

Hab. China, Formosa, Siam, Cochinchina, Burma, Rangoon, India.

montalis, Sharp, Dytisc., p. 276.

Hab. Arabia, Bombay.

fulvescens, Régimbart, Ann. Soc. Ent. Fr., (3e) ix, 1889, p. 149.

Hab. Assam, Cochinchina.

nasus (*Hydrocanthus*), Wehncke, Deutsche Ent. Zeits., xi, 1876, p. 222 : Sharp, Dytisc., p. 275.

Hab. Siam.

exilis, Wehncke, Deutsche Ent. Zeits., vii, 1863, p. 149.

Hab. Java.

lactatella (*Hydrocanthus*), Walker, Ann. Mag. N. H., (3e) ii, 1868, p. 205 : Sharp, Dytisc., p. 277.

orientalis (*Hydrocanthus*), Wehncke, Deutsche Ent. Zeits., xi, 1876, p. 222.

Hab. India, Madras, Tranquebar.

testaceus (*Hydrocanthus*), Aubé, Dejean Spéc., vi, 1885, p. 40 : Sharp, Dytisc., p. 276.

Hab. India.

meridionalis (*Hydrocanthus*), Wehncke, Deutsche Ent. Zeits., xi, 1876, p. 222 : Sharp, Dytisc., p. 276.

Hab. Cochinchina.

nitens, Sharp, Dytisc., p. 278 : Régimbart, Ann. Soc. Ent. Fr., (3e) ix, 1889, p. 147.

Hab. Formosa, N. China, Assam.

pollus (*Hydrocanthus*), Sharp, Trans. Ent. Soc. Lond., 187, p. 51 : Dytisc., p. 276.

Hab. Japan, China.

roximus, Sharp, Dytisc., p. 278.

Hab. Siam.

sempertis (*Hydrocanthus*), Wehncke, Deutsche Ent. Zeits., xi, 1876, p. 222 ; *id.*, 1883, p. 149 : Sharp, Dytisc., p. 275.

varius (*Hydrocanthus*), Régimbart, Bull. S. E. Fr., (5a) vii, 1877, p. 1xix;
ib., Ann., p. 359; Sharp, Dytisc., p. 783.

Hub. Philippines

sexpunctatus Kln\rp, Bytisc., 176.

Hub. India.

, BnhoniftTi, F<t?. En 1858, p. 19; Sharp.

Hydrocanthus p. 408.
Hab. China.

Walsol (*Hydrocanthus*), Wehrcke, Deutsche Ent. Zeits., vi, 1874, p. 272; Sharp,
Dytisc., p. 777; Régimbart, Ann. Soc. Ent. Fr., (6a) ix, 1882, p. 490.

HYDROCANTHUS-

Amor. Phil., ii, 18B5, p. 105 : Bmllrt,

b, \>

4V> 'A p. 7 : 1

, Deufci

^s.) vi, isflg, p.

6' ii, p. .'">!.

Bob. BatsiAf BAttgoen, Bhntno, Biiitti, Oochinci

VATELUH1 i-Bharp, Dytbt, p.28il, 9ZL

HUB DEROVATEI*LTJS-

vl.

B., p. 28ft, 925 .

Leach, Zool. Misc., iii, 1817, p. 49; Brullé, Hist. Nat. Ins. Col., H. p. 211; Lacord.,
Gen. Col., i, p. 420; Munn, Cat., p. 444, pt. i; Sharp, Dytisc., p. 287, 341, 441, 442;
Centr. Amer., Col., i (2), p. 9.

assimilis, Régimbart, Notes Leyden Mus., v, 1881, p. 276.

Hab. Java. . Rumi

Basril, Régimbart, lot. Fl.,

Sharp, Dytisc., p. 819.

Hab. Philippines, Manila.

basil t, Motsebniahy,

chinensis, Boheman, Frag. Mus. Hess., Col., 1858, p. 31; Sharp, Dytisc., p. 315.

Hab. China.

chlorotus, Régimbart, Notes Leyden Mus., ix, 1887, p. 267.

Hab. Andaman Islands.

Clarkii, Sharp, Dytisc., p. 313.

Hab. Australia, Philippines.

d*eoratus. Bobnra^, Ooh, 1658, p. 21 : Shwp,

Mr uu. p. 311.
mm, Bangkok.
. Lorn)., LS73, p. 53; E 1.

»Sh.-f p. 312-
Hab. Siara, Bangkok.

oticiiB. r Autt. Soo. Ent. Fjy, . 1S89, p, 15ft.
■>., Annam,

favesoen- ^.ky, Et, Eot., 1S59, p. 45 : Bluurp, Dytbc, p. 820.
H»b. Cey!

l, Anb&T Dej«&n Sppc. vi, 1838, p. 430.
^Oc. Bnt. Ft., {6a.) ix. 18S&, p. 151. ry.

ittOOides. Kfigimbiirt, Inn tit. Fr.f (5S.) Tli, 1877, ; id..
Ball.,

;

llegimbart, AUQ,

p. iao.
jFlah, Simn. Myt'oo.
■. 309.

-gimbait, A an, Soc. But. Pf., (6*) ii, 181

\nn(im, Saigon,
i, 163S,p. 429

Anbfe,

1 IDA.
wmttcu OR
•
H MTiMJ
pOBtiCUS A ■ 1838 D
42H

136 E. T. Atkinson—*Catalogue of the Family Dytiscidae* [d. 1891].
proetus. Séguinbart, Ann. Mus. Nat. Fr., (5e) vii, 1877, p. 264; Os. Bull., p. 121.
Sharp, Dytisc., p. 321.

1, 1, 1.
H. ab. Sumatra, Mesta Labra.
rufus, Séguinbart, Ann. Mus. Nat. Fr., (5e) vii, 1877, p. 611.
H. ab. Sumatra, Mesta Labra.
Sharp, Dytisc., p. 321.

Hab, UUina, Bnrrrm> Bhm

transvers
modulif
uni
by
HYDROPHINI
HYDROVATINI, Sharp, Dytisc., p. 321.
Genus I
Motschulsky, M. Ent., 1856, p. 52 : 8
429
& 44
P
acuminatus, Motschulsky, M. Ent., 1856, p. 43; Sharp,
Ann. Mus. Nat. Fr., (5e) vii, 1877, p. 611.
badina, Clark, Trans. Ent. S. Lond., (3e) i, 1863, p. 324.
malacca, Clark, Id., p. 325.
Hab. Bangoon, Malacca, Malaya, Sumatra, Celebes
Formosa, Philippines.

bnuni

Iwftri.n^ Sharp, **1888. p.**
roon, CcleUw,
.. 212

.....

Imam **int. viil, 1S50. p. 43 : Sharp, i**
'■. p

Gen. Vi, 1S83_t
,

" t p.

lift

CUMra

, Oluk, Tr

186?



«rl

y, K
Pitarp,

10 :

p*.
•

>ui. Knt S. i

1

a BIBES5UB

cr.iQ'.bin*

\\k

H&b,
ftuomulJitiu, Ssharp, iJyUm;,. p. i<
na, Kiultiaug.
ttavtcnliis fj> yhvtj_r ;ac_vxrau i-(i)_t 1S6I, p. 1

H*b,
(2*) *vi*, 1S8S.P. «U.

I

(IBICTW Ssharp
Gat y«ngt«e Vail
Ucf Oytiw., p.
ti • cobaricufi (' Beisc IToTwra, Co]

tttentalia,
Hah. 8iam.

IUTMIM, Sliarp, 1
Hab. Siam, F '>,
HWHYURINI :—\$t)«p, D]
THTDEUS

llab. Burma, Bban

- hydratus*, Swarth, Schöenherr's Syn. Int. II, 1895, p. 25, t. 4, f. 4, 5; Aube, Dejean Spéc., vi, p. 467; Sharp, Dytisc., p. 283; Régimbart, Ann. Mus. Civ. Gen., (2s) vi, 1898, p. 614; id., Ann. Soc. Ent. Nat. Fr., (6 s.) ix, 1903, p. 152.
basilatus, Clark, Trans. Ent. Soc. Lond., (2s.) i, 1903, p. 422; Malacca.
fulvipes, W. MacLeay, Trans. Ent. Soc. N. S. Wales, 8, 1871, p. 122.
 ♀. Gayndah.
 var. *suprematus*, Clark, *l. c. supra*, p. 421.
 Hab. Burma, Bhamo, Annam, Malacca, Penang, Formosa, New Guinea, Australia.
orientalis, Clark, Trans. Ent. Soc. Lond., (2s.) i, 1903, p. 419; Sharp, Dytisc., p. 282.
 var. *crinitus*, Clark, *l. c. supra*, p. 421.
 „ *pulchellus* Clark, *l. c. supra*, p. 420.
 Hab. China, Formosa, Amoy, Kinkiang.
rufus (*Hyphodrus*), Clark, *l. c. supra*, p. 423; (*Hyphodrus*) Sharp, Dytisc., p. 314.
 (*Hyphodrus*) Régimbart, Ann. Soc. Ent. Nat. Fr., (6 s.) ix, 1903, p. 152.
 Hab. China, Annam.

mmatrae,]

IB.

HIDROPORIKI:-

DUa HYPHOPORTJS.

»pc:

elegant

Régimbart, Ann. Mus. Civ. Gen., (2s) vi, 1898, p. 614; id., Ann. Soc. Ent. Nat. Fr., (6 s.) ix, 1903, p. 152.
 Hab. Burma, Bhamo, Annam, Malacca, Penang, Formosa, New Guinea, Australia.
elevatus, Sharp, Dytisc., p. 283; Régimbart, Ann. Mus. Civ. Gen., (2s) vi, 1898, p. 614; id., Ann. Soc. Ent. Nat. Fr., (6 s.) ix, 1903, p. 152.
 Hab. N. India.
interpulsus (*Hydrotus*), Sharp, Dytisc., p. 282.
 Hab. Ceylon.
solitarius (*Hydrotus*), Sharp, Dytisc., p. 282, t. 12, f. 14.
 Hab. Egypt.
Thomsoni, Sharp, Dytisc., p. 282, t. 12, f. 14.
 Hab. China.
discolor, Sharp, Dytisc., p. 282, t. 12, f. 14.
 Hab. China.

won— . / tint
I

Geaua DEB.ONECTES-

p. 418, 865 ;*A, Biul, Ceutr. Amer., C ore,
GUw«. OA., p. 64. grt«03un»tas (*Dyttitn**)_t Deee6i
ibo, **Dtjean Sp:**

la. N. 8. Phi
■, 1798, p
[[/.y^hidrJ-n), **EfldwchoItBj Mt''-<u. IfOSC, fi**
at, Pr,,

nices, W. Europe, Arotia A»t&> P
take Superior [/»ii. *Mut.*, Punkoii^ .
Sharp, Ityiiisc, p. 4
Hab. N. India.

Genus HYDROFOKUS.

i:ia-irville. BnL-.Halv.. i\ 1803, p. 132 : AuW, Dejeftn Spec., vl, p. 46B : Laco
Coi , p. 429, pt: **Sharp**, Oytisc., p. 435, 8«
An! , p, \$4.
in Vci . Bruno,

rans, ctea, Sharp ad
>mL, (Sa.) i, 1': :!3 : Sbi«
■.-. Java.

p. 1S7, (*ffeti. d*b.*).
' 150., p. 490 : 1. Class. Col., 18B3, p,
491,931.

Genus AGABTTS.

. p. 69, 72: LftCfl th O>],, i, p,
iun. Ca
r. *Amar.*_t Col., i (2), p. 32: Leoon^o At H
Thomson, Stand. Col., i, p,
ra, Brulle, Mi^L iflt. v. 193£.

w*, The

90, J25,

ntr-

;D., ii, 18S3,

*mthedyter, Sd&litz, la, p, **

■ttaiat

.Hi

mitidy

■-MH4, YTollfc-

w. *nifjri£olti'* Jluhkofl, Bull. Mi;

». Soc Ei ■

Irondtii i' T. Mlitcli. E

♦ dtctoom. Sharp, JL Ar ,mg,, iJvil (2), 187:.

a. Pamir Vadi Mv,ty*-

mm PLATYNECTES

Hub. Jkpaij, Chinri

U 6: ^l>Wp, 62.

(Colymhetn). MwLeay,
Aonnl. J

Ha,'

in. Mvis.
CW

i COPELATUS.
: Aub*.

.tf«#.f And»manB].

jATBOUfl, Rignu

Mufl. r, 1883, p. 330,

IVla

iTnatra, K*\ras

LACCOBBCTINI

G«nus LACCONNECTES.

in. Cut., p 446 : SbArt>

t

baaalls, Sharp,

inn. Mug. •

num. Carol-

ta, Temt«o_t Sbe&maga, i

rmve«o««»,

Drtisc., p, 598

,0, Mus.

Hab. t

Halt. Jr.

.-Sharp, D

Genus RHANTOS

ua (*i* - *i*, Fonrcroy,"En*

p, 343.

re, Ffton. fint. PB

11.

pvleenHK {C/>hjtJ>bvut'}*, Sloph

Stuna, Tns., viii, 1

ir Tew*\

G<mau PHODATICXJS.

p. 64S, !.

LLELVJ. K I w.

» **HYD ATICU8***

16'

— tf

Gey . Aiin. Soc. Agri
Iirk TslA'-
ftatcbian,

Pr., (3B.) Tiii, I860, p.

Erf., Knt. Sfst.,i, p. IS-.

10.

istraiift.

den Ma

i Middeo

S, p IT⁴.* : SImrp, Dy:

ShftT

Tmin.

«.i'*. Malaja, Sinn), Siu'troa,

Chin*, S. Lond., ia(tt, p. 231, t. H, f. \$:

fibarp, ^r

Aim. Mu* Civ. 0crt.,(2i

.

philippinensis Wehncke, Stettin Ent. Zeit., xxxvii, 1876, p. 191. Ind., Philippines, p. 732 : Régimbart, Ann. Sci. **«**, But. Fr., (i) vii, 1877, p. 355. *siampe*, Galapagos *duplex*, Sharp, Dytisc., p. 669.
Leveilles, Régimbart, Bull. Soc. Ent. Fr., (5a.) vii, 1877, p. 361, 1883, p. 67.
 Hab. Borneo, Philippines, Manila.

rectangulus, Sharp, Dytisc., 669.

Hab. Persia, N. Ind. **'**a. Kuln, Kanifrn f*** Mus., Biluchistan, 722 : Lacord., Ann., 1872,

phantoides, Sharp, Dytisc., p. 664.

Hab. Formosa, Japan, Manchuria, p. 47.

sesquivittatus, Fairmaire, Le Nat., ii, 1880, p. 164.

Hab. Middle China.

vittatus (*Dytiscus*), Fabr., Syst. Ent. App., 1775, p. 323 ; id., Spec. Mast. Ins., i, p. 190 ; Ent. Syst., i, p. 190 ; Syst. Eleuth., i, p. 2. Ent., iii (40), p. 30, t. 1, f. 5 ; Gmelin, ed. Syst. Nat., p. 1848 : A Spec., vi, p. 508 : Sharp, Dytisc., p. 670 : Régimbart, Ann. Mus. C vi, 1888, p. 613.

quadricittatus, Blanchard, Voy. Pole Sud, iv, 1833, p. 46, l.

var. *signatellus*, Wehncke, Stettin Ent. Zeit., xxxvii, 1876, p. 190.

Hab. Japan, Manchuria, China, Formosa, Philippines,

Malacca, India, Ceylon, Saigon, Borneo, Java, Sumatra, Celeb.

Mepado, Australia (Ind. Mus., Assam, Sikkim, Berhampore, Madras).

THERMONECTINI :—Sharp, Dytisc., p. 372, 490.

Genus SANDRACOTTUS.

Sharp, Dytisc., p. 655, 910.

Barthi (*Hydaticus*), Régimbart, Bull. Soc. Ent. Fr., (5a.) vii, 1877, p. 355. Ann., p. 355 : Sharp, Dytisc., p. 779.

Hab. Philippines, Manila.

Dejeanii (*Hydaticus*), Aubé, Dejean Spec., vi, 1833, p. 165 : Sharp, Dytisc., p. 656.

? *fasciatus*, Fabr., g. n.

Hab. India [Ind. Mus., Burma, Sikkim], Munchisabad.]

fasciatus (*Dytiscus*), Fabr., Syst. Ent. App., 1775, p. 323 ; Spec. Ins., i, p. 193 ;

Mant. Ins., i, p. 190 ; Ent. Syst., i, p. 189 ; Syst. Eleuth., i, p. 261 ; Olivier,

Ent., iii, 40, p. 18, t. 2, f. 19 ; Gmelin, ed. Syst., Nat., i (4) p. 1847 : Aubé,

Dejean Spec., vi, p. 151 : Régimbart, Ann. Mus. Civ., Gen., (2 a.) vi, 1875, p. 613.

Hunterii, Gratch, Col. Hettie, ix-x, 1872, p. 205 : Sharp, Dytisc., p. 653.

ovatus, Blanchard, Voy. Pole Sud, iv, 1833, p. 47, t. 4, f. 2, Timor.

var. *Carrélati*, Aubé, Dejean Spec., vi, 1833, p. 164 : Sharp, Dytisc., p. 656, t. 35, f. 214.

Hab. E. and S. Asia, India, Burma, Ceylon, Timor. [Ind. Mus., Sikkim]

festiva (*Dytiscus*), Illiger, Mag. Ins., i, 1802, p. 166 : Aubé, Dejean Spec., vi, p. 162.

Sharp, Dytisc., p. 656.

Hab. China, India, Ceylon. [Ind. Mus., Ceylon.]

marginis, Wehncke, Stettin Ent. Zeit., xxxvii, 1876, p. 191. Sharp, Dytisc., p. 657.

Hab. Philippines.

in Peuinlnla.

RHANTATICUS.

^ p. 6»I,911-
la r Lap. u AnW,
H-igimb., Ann.

: ¶. (je, On] Sent

Genus EB.ETES-

Kit)..

l** wt4»t, Ann. itn

20, t. 2, f,

1. India, aus. Et .
- I icbson, Wkgm. Arch., *IM7* (!), p, 73. Para.
ML fan n. 1845A v

1890.]

E. T. Atkinson—*Catalogue of the Family Dytiscidae.*

149

aculeator, Herbst, *Famly Arch.*, v, 1784, p. 113: Olivier, *Ent.*, iii (49),
p. 13, t. 3, f. 30: Gmelin, *ed. Syst. Nat.*, i (4), p. 1252.

var. *confusus*, Sharp, *Dytisc.*, p. 739. India, Ceylon, China.

cephalicus, Gronovius, *Mus.*, ii, 1778, p. 164, n. 552: Gmelin, *ed. Syst.*
Nat., i (4), p. 1254.

Hab. Manchuria, China, Formosa, Philippines, Burma, Sakhyea Hills,
Prome, Saigon, S. India, Ceylon [*Ind. Mus.*, S. India, Utakumudi,
Marshallabad, Ceylon].

marginatus, Wehncke, *Stettin Ent. Zeit.*, xxxvii, 1876, p. [redacted] (rp), *Dytisc.*, p. 717.

Hab. Burma.

pectoralis, Sharp, *Dytisc.*, p. 736.

vi, 1888 p. S7 : Sharj.,

fild. i/tr

id, Berkuuii} ;

prolixus, Sharp, *Dytisc.*, p. 736.

18.

Hab. Ceylon.

p. 74ft.

indicus, Aubé, *Dejean Spec.*, vi, 1889, p. 62: Régimbart, *Ann. Soc. Ent. Fr.*,
(6a) ix, 1889, p. 155.

Hab. India, Indo-China, Malay Archipelago.

rugulosus (*Trechalea*), Redtenbacher, *Hügel's Kachim.*, iv (3), 1844, p. 501: Sharp,
Dytisc., p. 725.

Hab. N. India.

siamensis, Sharp, *Dytisc.*, p. 737.

Hab. Siam, Andaman Islands.

il&tus.

717.

JSS3, p. 233.

i 14

i 8b

1871.

Soc. N. & Wales.

1846, p. 21

^—(*Jolalo*

Hab. Europe, A
.stern Arciiii [*Ind. Mu*_f*
MadraB, Berharap

CYBISTKINI i—Sharp, Uytisc, p. 700, 041 : Leconte * Horn, (

Genus CYBISTER.

)827, p. 151 V
len. Co)., i, p. 427 : Jacri. Duval, Gen. Col. Ear., i, p. '
p. 24 ; Sharp, Djtiac, p. 714, 9
Tr i , Isc, iii
sis, AuW, Dejeau Spec, vi, 1838, p. 6
Hub. India, China, Szechuen.
chlneusia, MotBchulAy, Et. Eat., 185 Sharp, Dytise.,p.
ib, China, Raigon [*2nd. Mvt._t* Saigon],
coguatua, Sharp. p.744.
HaV
ooavania. Sharp, Bytisc, p. 718.
Hfib. ludlu *Uut._j* Muaipur TT
B, Sharp, Dytisc, p. 743,
Hab. Ab.^jam, Silhat [*Tnd. Jf«**, Sikkim],
DeHaatiU, Aubd, Dejean Spec, vi, 1838, p. 101 : Sharp, Djt
.mbodia, Siam, Boroao.
lejeanll, AMbS, Dcjean Spec, . i, 1R88
Jj. India, Malab
ctenuans (*I'* \un, M (:ia.) ii,
1

Utjianii, Aube, *q. v.*

tumatUB, Sharp, Dytisc, p 731 : Ilcgimbarf, Aun.
p. i
Hab. Malacca, Slam, Saigon.
gracllia, Sharp, Pjtisc.i p. 742.
Hab. India.
Oueitull, Aubfe, Dcjean Spec., vi, 1833, p. 57 : Sharp, I
Hab. Manchuria, China, Siam, Laos, Saigon, J;w;
japouleus, Sh[^]Tp, Trans Ent, S Lood., 1873, .
Japau. China.

i, Sharp, TrauB. Ent. S. Loncl., \S*Ti*, p. 16 ; Dytisc., p.
Hai. , China, Assam.

Unrt>atts (*Dytitws*), Fabr. Syst. Erik, 1776, p. 230 \rant.
Ins., i. p. l&S ; Ent. 83 Nat!, i (4), p. 19⁴⁶ ■
Anbe, I f "24 : R&nburt, Ann. MUB CIV
Gen., (2a.)

son—f

Hoatfomti'

SnftJ''

Mto<

u

L-nw. PrTMir.t 1776, p.]
a, Etrosa, i, 1790, |

Vbfwilu, *Earn*

It.
- 5'), t, 8, ?

Germany.

*i*t;* *pr*neinlet** *r4 S^lirilu Sat.* Ocs-
r«, Noni

: tt.

CAd

Jorittutit, kuivlie, An;: n*b, Bnroiw,
N AfrICB_f I India (7*** ^fc
f«lmoW«amtt, Sharp, Dyiisc., p. .
Ii Indid,

Family

Catalogue of eAe if«j»<m No
Family GT*tt>?iDJt.—Z?jr E. T. ATi B. A,

Thfl speoiea of *thh* family are o(an o ;ttod
»t either end : of a blmsb black colour, shh;
^JH; their .movomentB on the surface of the vs we
tned thu common uatae of » wtitrilit;ige.' Xha armr: L proposed
mbart in Lia * *Monograph of Ike Gyrinida'* ia

1. Aitcin*on—

iii the present catalogue. He has divided ! *My* into three tri't
kt/drini) Gyrinini, and *OreeJUochilrni*, and describee the then
kno
jpecies. His prefi oliaptor notices tUe details of uctnre
re illastrat'.

■tniuiilos du b Hoc
<■ 121, 381,

itle&de Birmauie,' in Ann. Mus. Oiv. Gen., (2s.) vi, IS8R, p. 6l&.

Family GTRINID.3E.

diiib. Ency. Xat. ID
n. Col., i, >rd., Ocn. C 38: Lc:
f}8 : U^gimbart, M\
Vfprt., 1S82, p. 392.

Genua BINEUTES.

1-4 f.

0

nn. Kotm., i, ■ ■ .

Hab, "ska, PlilippiiicB, i, Jc....., ---
T
New \£, if Hi., Hong-
itou FOIMWK, ICov. AcU Cfpsal
[ab. Inch
ida«, Kcgimbart, Nt ten Mu;
a Sumatra, iv, 6, t. i, 1 8,
Btbi. Sus>' *ru, Al&liiltt Pftndj&Qga
Ki. i7S7, p.
3, Syfli. Ef< !,p, 275,
"yfi
/. Mi.

indus (*Gyrinus*), Fabricius, Ent. Syst. Suppl., 1798, p. 66 : Fuchs, No. viii, p. 302 : Régimb., *Mém.*, 1882, p. 404, t. II, f. 77, 77a.

proserpinus, Fabr., Syst. Eleuth., I, 1801, p. 275 : Aubé, *Dejean Spec.*, vi, p. 786 : Régimb., *Mém.*, 1882, p. 425, t. 12, f. 48, 48a.

Hab. India, Mauritius, Bourbon, Mascarene Islands, New

marginalis, Sharp, Trans. Ent. S. Lond., 1873, p. 56 : Régimb., *Mém.*, 1882, p. 425, t. 12, f. 47, 47a.

quadripennis, Fairmaire, Ann. Soc. Ent. Fr. (5a) viii, 1879, p. 187.

Hab. Japan, Manchuria, China, India, New Guinea.

Medet. Régimb., *Mém.*, 1882, p. 392.

Hab. China.

politus, MacLeay, *Ann. Mus. Javan.*, 1925, p. 30 : Aubé, *Dejean Spec.*, vi, p. 782.

Boitcau, Bolet. Novara, Oct., p. 24 : Régimb., *Mém.*, 1882, t. II, f. 24.

: Kollmann, *Pert. Obs. Col. Ind.*, 1831, p. xxxii.

Hab. Java, Timor, Australia [*Ind. Mus., Java.*].

sinuoides, p. de Casteln., *Hist. Nat. Ins. Col.*, I, 1840, p. 171.

Hab. Tibet.

spinosus (*Gyrinus*), Fabr., *Spec. Ins.*, 1758, p. 295 : *Mant. Ins.*, I, p. 194 : Ent.

Syst., I, p. 203 : *Syst. Eleuth.*, I, p. 203 : Olivier, *Ent.*, III, (I, p. 13, t. I, f. 7).

Casteln., ed. *Syst. Nat.*, p. 1612 : Aubé, *Dejean Spec.*, vi, p. 782 : Régimb., *Mém.*, 1882, p. 425, t. 12, f. 48, 48a; *id.*, *Ann. Mus. Civ. Gen.*, (2a) vi, 1834, p. 519.

Hab. India, *Orcomendal*, Burma, Siam, Yunnan, Kathu, Rangoon, *Siam*, Borneo [*Ind. Mus., Borneo, Madras*].

subspinosus (*Gyrinus*), King, *Symb. Phys.*, iv, 1829, t. 34, f. 9 : Aubé, *Dejean*

Spec., vi, p. 786 : Régimb., *Mém.*, 1882, p. 425, t. 12, f. 48.

? *dentipennis*, MacLeay, *Ann. Mus. Javan.*, 1925, p. 30.

tiyrin,

i \ *fad.* AffM

Gonua PORROITHYNCHUS

An Ct<beln.,

1834, p- 10 & : BmlK,

1- H

Genus **AOLONOGTRUS**(Motschulsky), Régimbart, *Mon.*, 1883, p. 124.*obliquus* (*Gyrinus*), Walker, *Proc. Linn. Soc. New South Wales*, vi, 1858, p. 208; Régimbart, *Mon.*, 1883, p. 127.

Hab. Ceylon, S. India, [Ind. Mus., S. India].

Genus **GYRINUS**Goudroy, *Ann. Paris*, i, 1762, p. 193; Fabr., *Syst. Ent.*, p. 234; *Syst. Eleuth.*, p. 271; Latr., *Hist. Nat. Crust.*, Ins., iii, p. 73; Brullé, *Hist. Nat. Ins. Col.*, ii, p. 225; Aubé, *Dejean Spec.*, vi, p. 655; Suffrian, *Stettin Ent. Zeit.*, 1845, p. 45; Leconte, *Gen. Col.*, ii, p. 428; Jacq. Duval, *Gen. Col. Eur.*, i, p. 79; *Mon. Col.*, p. 458; Régimbart, *Mon.*, 1883, p. 141; Sharp, *Bull. C. Tr. Amer. Col.*, i (2), p. 59; Leconte & Horn, *Class. Col.*, p. 69.*ceylonicus*, Régimbart, *Mon.*, 1883, p. 141.

Hab. Ceylon.

convexusculus, W. MacLeay, *Trans. Ent. Soc. N. S. Wales*, ii, 1871, p. 132; Régimbart, *Mon.*, 1883, p. 142, t. C. f. 38.*undulatus*, pt., Aubé, *Dejean Spec.*, vi, 1853, p. 100.

Hab. India, Madras, China, Siam, Tibet, New Caledonia, Australia, [Ind. Mus., Madras].

Dejean, *Bull. Exped. Vercé*, iii, 1827, p. 176, t. 31, f. 19; *Exp. de Casteln.*, *Hist. Nat. Ins. Col.*, t. 2, p. 250; Régimbart, *Mon.*, 1883, p. 142.*aratus*, Aubé, *Dejean Spec.*, vi, 1853, p. 690; *Id. Col.*, v, p. 338, t. 11, f. 4.Kirby, *Faun. Bor. Amer.*, p. 107.*nitens*, Suffrian, *Stettin Ent. Zeit.*, 1847, p. 251.

Hab. S. Europe, N. Africa, Caucasus, China, Kiangsi.

indicus, Aubé, *Dejean Spec.*, vi, 1853, p. 687; Régimbart, *Mon.*, 1883, p. 173.

Hab. India.

nitidulus, Régimbart, *Mon.*, 1883, p. 60; S.*t., *Eleatlt.*, i, p. 21; Dejean, *Spec.*, vi, 1853, p. 686, L 87.ETab. I -ndiclierty, Boi¹ uritius.*oceanicus*, Régimbart, *Mon.*, 1883, p. 151.

Hab. Philippines.

orientalis, Régimbart, *Mon.*, 1883, p. 167.

Hab. China.

sericeoclimbatus, Régimbart, *Mon.*, 1883, p. 155.

Hab. *>. JAVA, CoiebeSf Philippines,

nurtgdlnui, B[^]ii Régimbart.

Hab. Annam [Ind. Mus., N. Khasiya Hills].

semitriatus, Régimbart, *Mon.*, 1883, p. 14*.

Hab. Philippines.

:

0&fcr.

IECTOCHILTJS.

AnJ»:

j—1|

^ -

11

discolor (*Gyrinus*), Walker, Ann. Mag. N. H., (2a.) III, 1833, p. 31; (*Gyrinus*)
Redtsh., Reise Novara, Zool. II, Col., 1887, p. 24, t. 3, f. 11; Redtsh., *Mon.*,
1883, p. 416.

Hab. Ceylon, Malacca [*Ind. Mus.*; Kodaikanal, Madras].

discolor, Aubé, Dejean Spec., vi, 1838, p. 743; *Redtsh. Mon.*, 1883, p. 422.

Hab. Philippines.

palmarum, Redtsh., *Mon.*, 1883, p. 428, t. 12, f. 183.

Hab. Ceylon.

rossi, Redtsh., Ann. Mus. Civ. Gen., (2a.) vi, 1848, p. 421.

Hab. Burma, Tenasserim, Theerits.

interitus

R*1>. Gey

longicollis (*Gyrinus*), Wiedemann, *Reise Mus.*
Dejean Spec., vi, p. 740; *Redtsh. Mon.*, 1883,

Hab. India, Java [*Ind. Mus.*; *Mus. Marchand*].

costatus, Redtsh., Ann. Mus. Civ. Gen., xiii, 1849,
t. 12, f. 140.

Hab. Borneo, Sarawak.

indicus, Redtsh., *Mon.*, 1883, p. 425, ?.

Hab. India.

javanicus (*Costatus*), Aubé, Dejean Spec., vi, 1838, p. 741;
Lacord., Gen. Col. 34, p. 442; *Redtsh. Mon.*, 1883,

Hab. Java.

himatus, Redtsh., *Mon.*, 1883, p. 424, ?.

Hab. India.

indicus, Redtsh., Notes L.
t. 131, ?; *red.*, Ann. Mo.

Hab. Java, Burma.

marginipennis, Aubé, Dejean
t. 12, f. 133, a, b.

marginatus, Redtsh.

t. 6, f. 1, L. 10.

Hab. Java, Sumatra.

metallicus, Redtsh., *Mon.*,
Hab. India, Padong.

perthensis, Redtsh., *Mon.*,
Hab. Philippines.

oblongicollis, Redtsh.

Hab. Sikh.

proculus, Redtsh.

Hab. Cochin.

1889, p. Hab. *h*pttiMc^{ns},] II!

Bab. R

-raw»k.

pulohellus. R^{ginil}

13

IWgtm^{ftTt}, Aao. MUH, CIT, Gon., xviii.
18-S

Ana. Mua.

Hab, C

PAT

Calatcgue of

.« genus Pausstt* irtia eat»

7T5, aa.1

J. O.

1-830, " : enera,
BubBeqmentiy summarised bis work in the Kntotpolo:
descriptions and *ext* to 1845- In the Oxford
• *T *voaA* added many new speoies, ami fi West_oies
ise an figured up to 1S7*.
from the Oriental Region have been described, West
isequently form '< guid*¹
Hanson may also be mentioneJ os having brought to not;
trowi in the of the ' of
In 1886, M. fittffHv- *the A* ol
iramftriBe *«ed a number of u6v> the
chapters ou the Mid classification of the
morj nof «ynop test and a list of
species. M, .

> and -

ar ^OIL J buccal cavi
ie maxillary p*.
ry. The *Pauasid*



the •

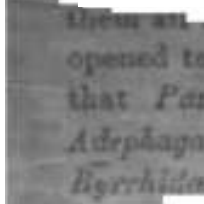
j tl^a *C^rabi/iae*,

■ m the *Adephaga*, but

Horn

¹These be excluded for many reasou», more
eacecially

fMt they fail to present the ventral structure which *may* safely be
taken



If we a 'icm there is no reason why
some and nfter

8 admitted, and the door would be
'•n series. It mtwt be admitted, however,
approach of the *Clavicorn* series to th(*

■ in auothev direction being through the
J owever, a very wide interval. * In
many

the *Pau\$sid*<*x* are placed after the *Caretbidec*, I place xii
here as more ouuveuient.

are small inBecta of a quadrate form with very remark,
so much so that Afzelius formed them into a
section of the Coleoptera from this character alone. They have
been found by Sensor,, Champion, Trim en and Gue»&ms in ants'
nest 8,
it is, perhaps, for this reason that they are BO seldom seen iu
colletf-

a, *« the ants appear to keep the *JPaussidce* :IB within the
for-

A few have been captured at the light at night,
but the more successful collectors here, as stated, found them by
examining the

nests, especially of the smaller species of ants. M. Roûray's list shows 4 species from Western Asia, 48 from the Oriental Region, 86 from Africa, 26 from Australia, 2 from Europe, and 8 common to several regions. The Indian Museum has only a very few specimens in its collection.

Afzelius, A. :—

Observations on the Genus *Pansus* and description of a new species. Trans. Linn. Soc. Lond., iv, 1793, p. 243-273, fig.

Benson, W. H. :—

'On Pansidae,' in Calcutta Journal Natural History, vi, 1840, p. 459.

Boyer, J. E. :—

Extract from note-book regarding Genus *Pansus*, in Journ. As. Soc. Ben., xii, 1845, p. 421, t. xxx., l. 1-8.

Burmester, H. C. G. :—

'Observations sur les affinités naturelles de la famille des Pansidae' in Mag. Zool., 1841, An. xi, no 76, p. 15, fig. ; *id.*, Bull. Soc. Ent. Fr., 1841, p. xxxi.

Demoulin, E. :—

'An epitome of the Natural History of the Insects of India and the Islands in the Indian seas.' London, 1800.

Rafray, A. :—

Mém. — Matériaux pour servir à l'étude des Coléoptères de la famille des Pansidae, in Nouvelles Archives du Muséum d'Histoire Naturelle, (10e.) viii, 1806, p. 307-350 ; *ib.*, ix, p. 1-52 ; Faunet, Rec. d'Ent., vi, 1807, p. 291.

Westwood, J. O. :—

Trans. Linn. Soc. Lond.—'On the Pansidae, a family of Coleopterous Insects,' in Transactions of the Linnean Society of London, xvi, 1830, p. 577-684, t. 39.

Synopsis of the Coleopterous Genus *Cerypterus*, in *ib.*, xviii, 1840, p. 604-606, t. 39 c.

Synopsis of the Coleopterous family Pansidae with descriptions of a new genus and some new species, in *ib.*, xix, 1841, p. 45.

Description of some new species of the Genus *Cerypterus* &c., in Proc. Linn. Soc. Lond., i, 1840, p. 75, 110, 115, 133 ; *id.*, Ann. Mag. N. H., vii, 1841, p. 532 ; *ib.*, p. 413 ; x, p. 409.

Trans. Ent. Soc. Lond.—'Descriptions of some new or but imperfectly known species belonging to the Coleopterous family Pansidae,' ii, 1835, p. 84-98, t. 7, 10.

Descriptions of new species of *Pansidae*, in *ib.*, v, 1835, p. 22 ; 1840, p. 69 ; 1847, p. 29 ; (n. s.) ii, 1857, p. 84, and Synopsis ; *ib.*, 1855, p. 81.

'On the Genus *Cerypterus* of Swedenus,' in Ent. Mag., v, 1838, p. 500-505.

Art. Ent. :—'Arcana Entomologica, or Illustrations of new, rare, and interesting Insects,' ii, p. 1, 37, 71, 161, t. 49, 50, 58, 63, 83-84, London 1843-45.

'On *Phrudidae*,' in 'Thesaurus entomologicus Chabrous,' 1874, p. 72-75, t.

Family PAtTSSIDAE

GERAPTERUs.

■i. South 1
4fr:

qu&drlinii .

PLEDSOPTERDS.

•

-

•

-SO, p. 249.

Loud.,

•
10, f. 4 ; *id.* : A re. " .
■§7.

Wesiwoo-ili, , in, p. 51 ; A:

PATTSSUS.

afflnis

ift.

{*Meritm. odervi*)}_t Westwood, Trans. Ent. 3. Lond., v, 1845, p. 23, t. 2. f.
 Cab. Orient. Ent._t p. 84, t. 41, f. 4; *id.*, Thea. Bnr. Oxon., 1874, p. 80,
 t. f. 1 : Benson, Calc. Jl. Nat. Hist., vi, 1816, p. 466, 470 : Raffray, *M* t
 25-27.

Hab. Bengal, ^r

folinr. .At- "...!, 1825, p. ?'
 Tran3. Ent. 8. Lond., ii, 1935, p. 90_t t. 10, f ? * W
 S. Lond.. xix, p, 51
 Ratray, *Mm., t.* 15, f. 6, t» Ifl, f. 22-24.

Bab. India.

Westwood, Trans. Ent. S. Lond., ii 1835, p.
 93 Cat., p. 702.

Oorii, Westwood, Trans. Eot. S. Loni.; ii, 1835. p. 94, t. 9, f. 8,
 ii, p. 39, t. 68, f. 3 : Eaflray, *Mon.*, t. 15,!. 7, 8 ; 28-S2.
 b. Tava.

Vnobufonll, Westw GS. Ent. Oxon., 1874, p. 80, t 17, f ».
 Hab. Java,

PLATYRHOPAXUS-

Westwood, Trans. Llau. 8. Lond., i n. 654 ; *id*[^] Arc. Ent., il, p 7S : L4001
 Gen. Col, ii_t p. 13 : Raffray, *Xon.*, viii, p. 34* : Hun. Cat., p. 703.

acuttaonB, Westwooo, Trans. Una. S. Lond., xTI, 1833, p. 661, t 33, f. 50 ;
 idx, p. 51: *ii.*, Arc. Ent. ii, p. 79. Hab. India.

anguatua, Westwood, T it, 8. Lond., ii. 1835, p. ^2, t. 10. *t* 6 ;
 ii, p. 78, t. 68, *i.* 3 : Eoyes, Jl. Aa. Soc. Bcn._f xii, 1843_t p. 421.

guturalis, Westwood, Arc, Eat., ii, 1845, p. 161, 1 ■■*.
 Boyes,

Jl. As. Soc Beog[^] xii, p. 427, t *ann.,, t.* 2.
 Hab. India, Nimech, Mbow.

[^] Westwood, Trans. Linn. 3 Lone!., ivi, 1833, p. 664, t. 33, Arc.
 Ent., ii, p, 163, t. 83, f. 3. Hab, Bengal.

Castelnandii. Westwood, Thes. Eat. Oxon., 1874, p. 96.
 Hab. Siam, Jnthia,

Comottli, E. Gcstroj Ann. Mus. Civ. Gen., xviii, 1382, p. 311, fij
 Hab. Burma.

Fairmaie, Le Nat., viii, 1866,. p. 224 ; *id.*, Ana. Soc
 Ko 1&86, p. 317.
 Hab, China, Kiangsi.

lewisii, Westwood, Proc. Linn. S. Lond., ii, 1819, p. 66; 45, Trans. Ent. Oxon., p. 39, t. 16, f. 9.

Hab. Hongkong.

royali, Westwood, Arc. Ent., ii, 1817, p. 177, t. 52, f. 2; t. 90, f. 6; Boys, *Psephenus*, no 5, Jl. As. Soc. Beng., xii, p. 429, t. annex, f. 6.

Hab. India.

signatus, Westwood, Trans. Linn. S. Lond., xii, 1817, p. 49; 48, Arc. Ent., ii, p. 159, t. 94, f. 3.

Hab. Bengal.

semituberosus, Westwood, Arc. Ent., ii, 1815, p. 179, t. 52, f. 1; t. 90, f. 17; 48, Trans. Ent. Oxon., 1817, p. 68, t. 16, f. 12; Boys, *Psephenus*, no 1, Jl. As. Soc. Beng., xii, 1818, p. 428, t. annex, f. 1.

Hab. India, Mhow.

lichtelli, Donovan, Ind. India, 1820, t. 5, f. *, *; Rees, *Encyclop. Ent.*, t. 8, f. 12; Westwood, Trans. Linn. S. Lond., xvi, p. 641, t. 33, f. 31-33; 48, Arc. Ent., ii, p. 181, t. 90, f. 5, 6, 9; Saunders, Trans. Ent. S. Lond., ii, 1835, p. 53, t. 9, f. 1; Boys, Jl. As. Soc. Beng., xii, p. 429, t. annex, f. 4, 5.

Hab. India.

fulvus, Westwood, Trans. Linn. S. Lond., xix, 1811, p. 47; 46, Arc. Ent., ii, p. 175, t. 90, f. 3.

Hab. India.

harshickii, Westwood, Trans. Linn. S. Lond., xvi, 1820, p. 649, t. 33, f. 32, 33; 48, Arc. Ent., ii, p. 189, t. 94, f. 5; Boys, Jl. As. Soc. Beng., xii, p. 424, t. annex, f. 3.

Hab. Nepal.

hearseyana, Westwood, Proc. Linn. S. Lond., 1842, p. 123; 48, Arc. Ent., ii, p. 189, t. 94, f. 4; Boys, Jl. As. Soc. Beng., xii, p. 427, t. annex, f. 3.

Hab. Saltanpur near Benares.

lytria, Westwood, Proc. Linn. S. Lond., ii, 1815, p. 59; 48, Trans. Ent. Oxon., p. 39, t. 16, f. 5.

Hab. Hongkong.

jordani, Westwood, Trans. Ent. S. Lond., 1846, p. 25, t. 2, f. 1; Cab. Orient. Ent., t. 41, f. 5; 48, Trans. Ent. Oxon., p. 68, t. 18, f. 1.

Hab. India.

jousseliini, Guérin, Rev. Zool., 1833, p. 31; Westwood, Trans. Ent. S. Lond., ii, p. 99; Arc. Ent., ii, p. 169; Ollivier, Ann. Soc. Ent. Fr., (6s.) iii, 1853, p. 195, t. 7, f. 1.

Hab. China, Hongkong, Pegu, Bangkok.

ludchinski, Vollenhoven, Statist. Ent. Zeit., xxxiii, 1872, p. 22; 48, 1874, t. 1, f. 6; Westwood, Trans. Ent. Oxon., p. 65.

Hab. Sumatra.

mauceras, Benson, Calc. Jl. Nat. Hist., vi, 1816, p. 461; Westwood, Trans. Ent. S. Lond., v, 1816, p. 25; 48, Trans. Ent. Oxon., p. 67, t. 16, f. 8.

Hab. India, Murworie, Candour.

B

,itn-ood, Trans.

Trims. T

Sauade;

-

1ft, *t*

a»nu«

.

i, p[^] 49 ; *iJ*,_{*t*} Arc. *I*:

;, EMCJCL, Hi t *id.*,
Ari

p.

t U, 1 Uerr,
Syo.

■. 17*i

W; ■

1
tiag.

HYDKOPHILIDiE.

ov*], i form, sometimes
ire Qom cmd sometimes h distinct
nro slender, aud
% to the length of these joint*, the I
-—77 *Bydr*
■ been doao to work ont
:id tbifl rtfore■ IJUHCH f
Dr. Sharp obsei-vea that though the Labite of
tin
be iwBOoiat

∴

HTDE

n«8

I?. Parii

Aiuer., CoV

India,

rloabtiui position.
(fceulxwto, *he. mtp*ra, p. H-i

. .L* TJ ml r.

Geoiis HTDROCHABIS-

r, Ann. Sac.

1. X.

-DC. Seng., IX T, *It* ;;8 \ *id.*, Ann. HI

vestrli. Kir?tnGr, J l.

;
Ian.

m&iooHto

Hub. i

hsGliOit?., KfUomognipliia, IS2.2-, pt **41**,

« STERNOLOPHUS.

Nafc. Jns. Coln

156 E. T. Atkinson—Catalogue of the Family Hydrophilidae. [Suppl.

ruipes (*Hydrophilus*). Fabricius, Ent. Syst. i, 1792, p. 163; Syst. Eleuth., i, p. 261; Herbst, Naturges. Ins., Kfler, viii, p. 367.

Hab. India, China, Malaya, Philippines.

HYDROBIKI (*Hydrobioides*) :— Lacordaire, Gen. Col., i, 1854, p. 452.

Genus HYDROBIKI.

Leach, Zool. Misc., iii, 1817, p. 91; Solier, Ann. Soc. Ent. Fr., iii, 1854, p. 313; Brullé, Hist. Nat. Ins. Col., ii, p. 280; Lacord., Gen. Col., i, p. 452; Jacq. Duval, Gen. Col. Eur., i, p. 57; Mun. Cat., p. 479; Sharp, Biol. Centr. Amer., Col., i (2), p. 64; Lacoute & Horn, Class. Col., p. 72.

Asacrus, Thomson, Scand. Col., i, p. 18, 1859; ii, p. 89, 1860; Gork, Boll. Soc. Ent. Fr. (64), i, p. cxxxv.

Brachypalpus, Lap. de Casteln., pt. Hist. Nat. Col., ii, 1840, p. 36.

Cryniphalus, Motschulsky, Bull. Mosc., xviii (5), 1845, p. 32.

Eucelus, Thomson, Scand. Col., i, p. 18, 1859; ii, p. 93, 1860.

Paracynus, Thomson, Scand. Col., ii, 1867, p. 120.

Sporophorus, Lacoute, List Col. N. Amer., i, 1863, p. 19, p. 377; Mun. Cat., p. 487.

Tribulus, Mulsant Ann. Soc. Agric. Lyon, vii, 1843, p. 377.

neglectus, Hope, Trans. Ent. Soc. Lond., iv, 1845, p. 16.

Hab. China.

semistriatus, Schaufuss, Hor. Ent. Ross., xxi, 1887, p. 109.

Hab. Singapore.

stigmatus, Walker, Ann. Mag. N. H. (3rd S.), 1858, p. 269.

Hab. Ceylon.

HYDROCASSIS.

Fabricius, Ent. Syst., i, 1792, p. 163; Brullé, Hist. Nat. Ins. Col., ii, 1840, p. 38.

pttlata,

Hab. Mid-

Genus PHILYDRUS.

Solier, Ann. Soc. Ent. Fr., iii, 1854, p. 315; Brullé, Hist. Nat. Ins. Col., ii, p. 276; Lacord., Gen. Col., i, p. 452; Jacq. Duval, Gen. Col. Eur., i, p. 56; Mun. Cat., p. 480; Sharp, Biol. Centr. Amer., Col., i (2), p. 66; Lacoute & Horn, Class. Col., p. 72.

Uper, Lap. de Casteln., pt. Hist. Nat. Col., ii, 1840, p. 480.

Philydrus, Mun. Cat., aut.

Pylephitus, Motschulsky, Bull. Mosc., xviii (5), 1845, p. 32; Ent. Ent., viii, 1859, p. 46.

esuriens, Walker, Ann. Mag. N. H. (3rd S.), 1858, p. 269.

Hab. Ceylon.

MKIivUE. MotochaUkJ, Bull. Mosc., xxxiv (5), 1861, p. 109.

Hab. Ceylon.

1890.] T. Atkinson—*Catalogue of the Family Hydrophilidae*. 167

nigriceps. Motschulsky, Et. Ent., xiii, 1856, p. 69.

Hab. India.

nigriceps. 1. Reichenbacher, Reise Novara, Zool. II, Col., 1867, p. 85.

Hab.

algeriensis.

M05C, xxxjv (i), 1861, i

Hab.

pallens (Eschscholtz), ydrv), MaeLi-ay, Annul. Javtt.,

Hab. Java.

Genus

BRACHYGASTER.

Mulsant, Ann. Soc. Ent., inn. Lj-on. 1833, i»- 380 : Man. Cat , p. 483.

Indon., Mulsant, &c. supra p. 384.

Hab. India.

Geuua BEEOSUS-

334, p.

. Duval.,

Hist. Nat. Ins. Col., II, p. 284 : Lacord., Gen. Col., I,
Eur., I, p. 89 : Man. Cat., p. 487 : Sharp, Biol. Cen.

r. AKCX., C<

Leconte & Horn, Class. Col., p. 11.

p. -7,

acuticollis

t., is. 3M.

t, IIIB.

, (

attenuatus d«cr»se»on«.

an. Hag,
p. 25S.

indicus

(J

.tschulsky, Dull . x«i^ (1), 1851, p,

nubescens

;,u.sc. Ent.,11, 3850, p. 61.

Hub. 1

S3

ttflr MarXeay, Anual. Javan., 1825, p. >.JAVA.

Genns GLOBARIA

Latrr

■ Anira,

icortK, Gen, CoL_t i, p, 4fi0.

.t. p. 485.

pe, Col. Man._r ii, 133S. p.

le Aniin., iv, 1 021; Hope., Col Man ₃ ii/ISSS, p.

Hab, h.

Sat Infç. I

rMw

Blslfonnlf Foirmnire, Bnll, \$or. Eu

H»b, Cambodln.

iaire, Gen, C

SPEBCHEtTS.

1

etiril IB,

1

R

PHOi.

us EPIMETOPUS.

i_f Lecoa ins. Am

. xi, p. S

illattt* CS*|

arp, Eht, Mon, Mag , 11, 1^

i

Uenus HYDROCHTIS'

;*, p. t»0

it., p.

Mots<:h«l«kv, Schroucfc BeU

laticornis, Fairmaire, Ann. Soc. Ent. Fr., (64.) viii, 1888, p. 237.

Hab. Yonkin.

opacus, Motschulsky, Schrenck Beitr., II, 1843, p. 193.

Hab. India.

violaceiventris, Motschulsky, *l. c.*, p. 193.

Hab. India.

SPHARRIDINI (*Spharridiini*)—Latreille, Faun. Nat., 1825, p. 265: (*Spharridiini*.)

Laondaire, Gen. Col., I, 1834, p. 470: Leconte & Horn, Class. Col., p. 73.

Genus CYCLONOTUM.

Eschsch., Käfer Mark Brand., I, 1837, p. 212: Latrech., Gen. Col., I, p. 471: Mun.

Cat., p. 495: Monograph, Mulsant, Ann. Soc. Agric. Lyon, 1844, p. 167: Jacq.

Daval, Gen. Col. Eur., I, p. 94: Sharp, Biol. Centr. Amer. Col., I (2), p. 103: Leconte

& Horn, Class. Col., p. 73.

Coelastoma, Brullé, Hist. Nat. Ins. Col., II, 1859, p. 293 (nom. praeoc., teste

Laond., *l. c.*)

expense, Mulsant, *Mem.*, p. 170: Brichson, Wings. Arch., (7), 1845, p. 105.

Hab. Africa, India.

hydrophiloides (*Spharridiini*), MacLeay, Austral. Journ., 1875, p. 26.

Hab. Java (Ind. Nee., Borneo, etc.)

nitidum, Lép. de Casteln., Hist. Nat. Ins. Col., II, 1859, p. 48.

Hab. J.

Genus DACTYLOSTERNUM.

Wollaston, Ins. Hader., 1854, p. 92: Mun. Cat., p. 495: Payval, Rev. d'Ent., II,

p. 257: Sharp, Biol. Centr. Amer., Col., I (2), p. 93: Leconte & Horn, Class. Col.,

p. 73.

insulare (*Coelastoma*), Lép. de Casteln., Hist. Nat. Ins. Col., II, 1859, p. 49.

albiventris, Wollaston, Col. St. Helena, 1877, p. 20.

Reussiae, Wollaston, Ins. Mader., 1854, p. 100, t. 3, f. 1.

Hab. S. Europe, Africa, St. Helena, Cape Verde Islands, Bourbon, Mauritius,

Madagascar, India, New Caledonia.

rubripes, Boheman, Freg. Hag. Res., Col., 1858, p. 24.

Hab. China, Philippines.

simplex, Sharp, Trans. Ent. S. Lond., 1874, p. 419.

Hab. Japan, China.

Genus CERCYON.

Leach, Zool. Misc., III, 1817, p. 96: Brullé, Hist. Nat. Ins. Col., II, p. 293: Latrech.,

Gen. Col., I, p. 473: Mun. Cat., p. 473: Monograph, Murray, Ann. Mag. N. H.,

III, 1853, p. 73: Sharp, Biol. Centr. Amer., Col., I (2), p. 103, 109.

Triclogoda, Brullé, Hist. Nat. Ins. Col., II, 1859, p. 291.

T.P

... *id*, ntieuou

five \
wrCO : flix \ .its*

without troohanth

l veu a « 10 family.

from I

i SILPHIBJE,

strict

s, Hal
Uaeoiatma (*f*>;

ifotestawus, Motsebulsky, Bull,
Mo--Hab. Ceylon,
ctaaalis, V

is SPHAERIDIUM.

Tabricins, Syst. Ent., 1775, p. 68 .
Brnlie, In*. C
DuvaJ, I, Eur., i, p, 95 ; ilun. Cat., p.
p. 73.
lidiatnm, Gory, Ic. Ecgne
Anm--Hiat. Nat., CoL, ii IInb.
Java.

QttnInquemaculatum, Fal
>

taioolor, Walker, At.
Hab. Cc

rtcinum, Lap. , Coi ii, 1851
, Java,

Genus PACHYSTEENUM.

Mot9cbtnl6ty, Ball. M

, PJ IXKvi (2), IS' L8
. ID

BLlgTOTltatajn, Motschulsky, I. c, p. 447," t. 9, I
b, Ccyl

Gwwa CKYPTOPLETTRUM

Mulsant, Col. Ft.
Sharp, Biol

W



Genus **NECROPHORUS**

Fabricius (*Necrophorus*), Syst. Ent., 1776, p. 71; Spec. Ina., i, p. 88; Mant. Ina., i, p. 88; Ent. Syst., i, p. 245; (*Necrophorus*) Syst. Eleuth., i, p. 333; Lap. de Casteln., Hist. Nat., Col., ii, p. 1; Lacord., Gen. Col., ii, p. 24; Jürg. Duvet & Felsch, Gen. Col. Eur., i, p. 101; 35, i, 161; Mus. Cat., p. 711; Kraatz, Deutsche Ent. Zeits., 1876, p. 452, 23; Tijdsch., i, with Nat., vi, p. 49; Kriemhoffer, 1876, p. 121; Heister, Wien Ent. Zeits., vi, p. 35; Schmitt, Faun. Nat., xiv, p. 39; Matthews, Biol. Centr. Amer. Col., 1891, p. 39; Lacoste & Horn, Clem. Col., p. 78.

Cyrtocaris, Hope, Col. Man., iii, 1843, p. 144.

japonicus, Harold, Deutsche Ent. Zeits., xxi, 1877, p. 345; Fairmaire, Ann. Soc. Ent. Fr., (6s.) viii, 1878, p. 82, i, 3, i, 5; Lewis, Ann. Mag. N. H., (7s.) ix, p. 339.

Hab. Middle China, Japan.

neglectus, Hope, Gray's Zool. Misc., 1871, p. 1; Kraatz, Deutsche Ent. Zeits., 1877, p. 101; Harold, l.c., p. 345; Dohrn, Stuttg. Ent. Zeits., xi, 1879, p. 459; Lewis, Ann. Mag. N. H., (7s.) ix, 1879, p. 339.

Hab. India, Nepal.

coellatus, Fairmaire, Ann. Soc. Ent. Fr., (6s.) viii, 1878, p. 80.

Hab. Middle China.

Genus **PTOMASCOPUS**

Kraatz, Deutsche Ent. Zeits., xxi, 1877, p. 102.

plagiatus (Ménétriér), Motschulsky, Et. Ent., iii, 1834, p. 27; Kraatz, Deutsche Ent. Zeits., 1877, p. 102; Bédet, Bull. Soc. Ent. Fr., (6s.) i, p. 211.

Davidis, Fairmaire, Ann. Soc. Ent. Fr., (6s.) viii, 1878, p. 81.

plagiatus, Lewis, Ann. Mag. N. H., (7s.) ix, 1879, p. 463.

quadrimaculatus, Kraatz, Deutsche Ent. Zeits., xxi, 1877, p. 104.

Hab. Kinkiang, Peking, Mongolia, Japan.

Genus **NECRODES**

Leach, Zool. Misc., ii, 1815, p. 87; Lacord., Gen. Col., ii, p. 29, note; Mus. Cat., p. 720.

Arctus, Vout, Cat. Col., 1808; *testis* Heister, Wien Ent. Zeits., vi, p. 85.

Bergroth, Berlin Ent. Zeits., xxviii, p. 229.

Diamerus, Hope, Col. Man., iii, 1843, p. 149.

oculatus, Vigors, Zool. Jour., i, 1825, p. 587, i, 20, i, 7; Lap. de Casteln., Hist. Nat., Col., ii, p. 3.

Hab. India, Deccan [*Ind. Mus. Silhet*].

Genus **SILPHA**

Linnaeus, Syst. Nat., 1758, p. 829; Fabr., Syst. Ent., p. 72; Spec. Ina., i, p. 85; Mant. Ina., i, p. 45; Ent. Syst., i, p. 248; Syst. Eleuth., i, p. 339; Gravelin, i (4), p. 169; Erichson, Käfer Mark Brazil ii, p. 226; Lap. de Casteln., Hist. Nat., Col.,

H. p. 4: Lacord., Gen. Col., ii, p. 900: Jacq. Duval, Gen. Col. Eur., i, p. 102, t. 33, f. 193: Mun. Cat., p. 720: Kraatz, Deutsche Ent. Zeits., 1876, p. 552: Kiesenwetter, Isis, 1872, p. 324: Karnsch, Ent. Nachr., x, 1884, p. 221: Reitter, Verh. Ver. Berlin., xliii, p. 85: Matthews, Biol. Centr. Amer. Col., ii (3), p. 74: Lacoste & Horn, Clav. Col., p. 79.

Silphidops, Reitter, Verh. Ver. Berlin., xliii, 1893, p. 92.

Desclaprea, Motschulsky, Et. Nat., 1855, p. 125.

Neurebra, Hope, Col. Man., iii, 1849, p. 149.

Nerephila, Kirby, Faun. Bor. Amer., 1837, p. 102.

Oleoptoma, Leach, Zool. Misc., iii, 1817, p. 74.

Perisilpha, Reitter, Verh. Ver. Berlin., xliii, 1893, p. 76.

Pelte, Geoffroy, Ins. Paris, i, 1764, p. 117: Reitter, Verh. Ver. Berlin., xliii, p. 75.

Phaeopaga, Leach, Zool. Misc., iii, 1817, p. 74.

Pseudopelte, Voet, Cat. Col., 1806: Reitter, l.c. supra, p. 83.

Pterostylis, Hope, Col. Man., iii, 1849, p. 149.

Thaustophilus, Leach, Zool. Misc., iii, 1817, p. 74.

Xylolirpa, Thomsen, • ■ ■ ■ ■ 1839, p. 50: Beitt^r, W. Ent. Zeit., vi, p. 107.

ey*B<l.ventilr y, Bull P, p. 348.

Hab. India.

cyaneocincta (*Oleoptoma*), Fairmaire, Ann. Soc. Ent. Fr. (5a) vii, 19:8, ■ 92.

Hab. India.

leptera, Redtenbacher, Hügel's Kach., iv (2), 1844, p. 517.

Hab. Kachmir [Ind. Mus. N. India].

melanura, Hope, Gray's Zool. Misc., 1861, p. 11.

Hab. India, Nepal.

minuta (*Thaustophilus*), Kraatz, Deutsche Ent. Zeits., xx, 1876, p. 574.

Hab. Tibet.

obscuriventris (*Oleoptoma*), Motschulsky, Bull. Mosc., xlii (1), 1864, p. 342.

Hab. India.

p. 400. '

mair, Ann. So

1838, p. 14.

•T»Ar

:x, 1876, p. 1-.

Philipi

Family **COSYXOPHIDJB.***Catalogue of the Insects of the Oriental Region, No. 9. Order Coleoptera,**Family CORVLOPHIDJE. -Ihi* E. T. ATKINSON, B. A.

Matthews places this family close to the Silphidae, but would separate *Aphanoccephalus* as a distinct family (*Pseudocorylophidae*) to be placed near the Carcinellidae. Leconte observes that 'the wings fringed with long hairs give this family a certain affinity with the Trichopterygidae, while the loose antennal club, and the comparatively small size of the fourth joint from the end, in several genera, show an unmistakable resemblance to *Anisotoma*, and other small Silphidae. The form of the mandibles and the structure of the feet, however, distinguish this family from all allies.' Jacquelin Duval forms two groups:—*Corylophini* in which the head is entirely hidden beneath the anterior margin of the pronotum, broadly rounded and dilated in front; more or less rounded before the eyes. *Orthoperini* in which the head is exposed in front of the anterior margin of the pronotum, more or less emarginate; abruptly contracted before the eyes. In the description of the species of the family that occur in Central America (Biol. Centr. Amer.,

i. .

i '11-C1'1', 'Ji'

j COKYLOPHIDJE

■ACTUM-

son—<

3 NODYNUS-

j, Trr.

ltld

: APATETICA-

»», II:

matr&j

Bora-ioides (!

itlduldee, v

. Ent.

t. 5. t n.

Hab. Java.

GenuB CHOLEVA.

an. 1796, p. II :

Murray, *Am*
Hab. India.

N. H, ■

Genus CATOPSIMOR.PHITS.

p. 176 : 3acq. Duval, Gen. Co]. p, 210.

Gozis, Recherche, 1386, p.

J7,

■*m>bra*, Go

p. 17.

Muu. Cat, p. 731.

flavlcorni

ky, Ball. Mosc., " xxtvi (2), IS63, p.

Halt. Ceylon.

Genus CLAMBUS-

ichP!

imp. Ru88.,i, 1S20, Ge-;

Col. Eat., i, p. 113,

, Col-, ii (i)^ p, 73 :

Stf

pumilua. M

ic., ru

Ceylon.

«« ARTHROLIPS-

▪

*

•i GLCTESOMA.

Wollaston u. Had

crtatai*

.;;<i{2j.

Uab. C

Geuos SEBICODERTJS.

8tn Mub. O*i f p. -tol'J :
L<

;- , Ball. ■

Hub. C<

GonuH PELTINTTS-

lalamt, Opasc

Cat/p

v- *U (5s) six

CORYLOPHODES-

.

TOPTYX*

;BHALUS

114.

Ia.

Godartii series to

tire name *Cyrtoncgdmus* Motadi, be m
not received auob at 09 as to warrant i
•iffitly ; r, ander stoa<
onmlly flj" ihe dugk. [^c>ata

«ely ai The Indian Museuoi dues no
ies« any BJ

|

I'

.laky. V :—

lc*

vit, 1S58, p.

a Zoolor

floliaoin, R 7—run* *u.* 'ily
SCYDMAENID^

■ ■ *h.* El

Gen. Ci p.

- Tr.

- liiiflk,

Genus CEPHENNIUM.

t Sohrift, Ges. 1

**p. 1SH: Jncq. Dttf»l,
Mo8C.(xlit tl), 18ftlt. C47
: Lsoonte & Horn.**

vumftdritro, RciLter, VctK
Gentitjtstf \$t.v\cy_t Ann. P
 ■.er, $U:3$

ist. Nat., Col., i, IB !00.
■ilsty, Ball. Mosar*^ ;35lf p>

Jie 1 at. Zflif*, xxxUi, 1889, p.

;v, 1856, p. 553 ; *id*
Schaufuss, *Ann.* Mus. Civ. Qen.t 12*) i_r
II

t. Ent._t 3, p. 33.

Deutsche Ent. SS9,

CEPHENWODES.

[^]3, p 420.

.fuss, Aim. MOT.

Civ.

-:i, Mon., 1S66. n. 2

p. 87, 1*59 ; 1.

Bull. MMC, xJii (1), 1869, p. 2i7:
E«itte>

xxT,]S56,p, 543 ;

'■'■ - '9.

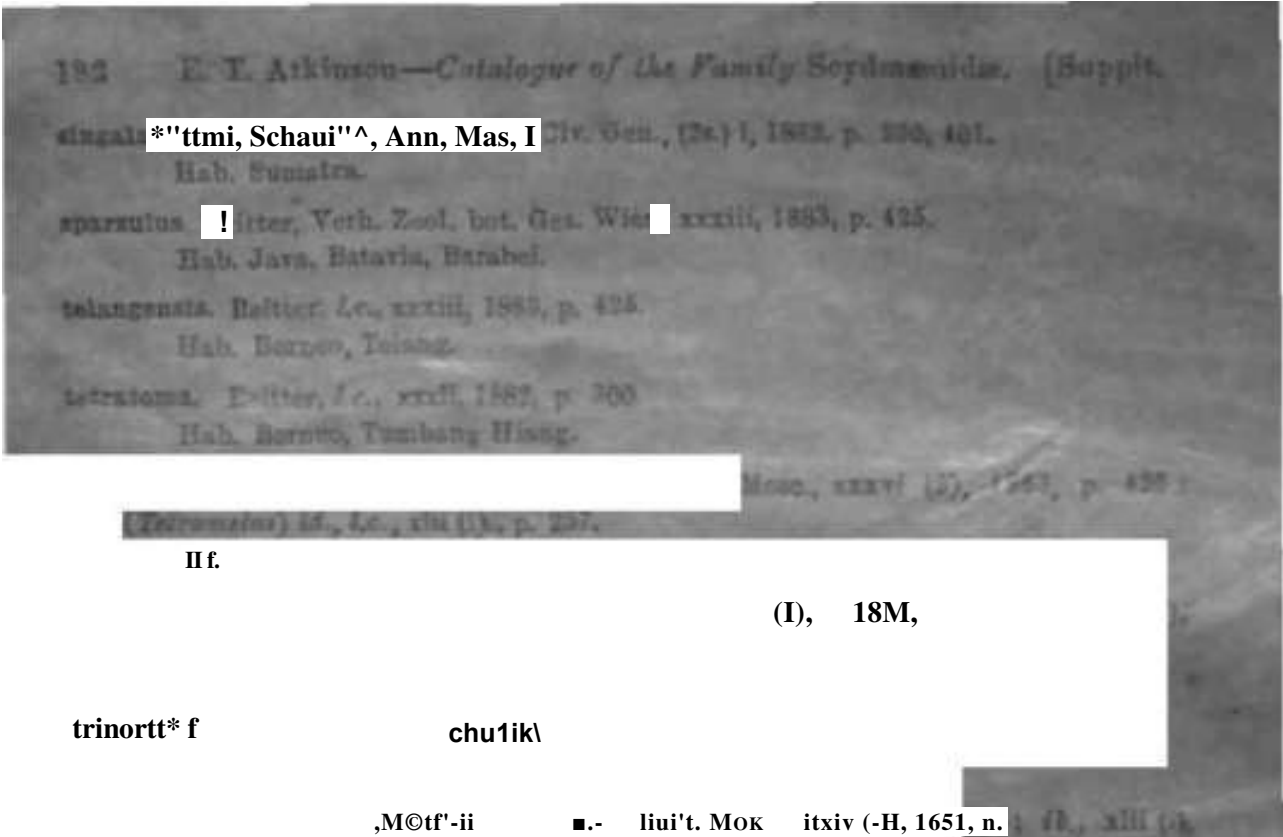
vixii, 1882,, p. 293.

Uas, Civ; . (2s.) it

Hai Sarawak,
Charon,

∴ .fl&3#p, '

1X
1



G*tms ELACATAPHOKA

IB% Ann, Uai. Civ

lava.

"ETJTVIICRTTS.

L«p. a« Cflsteln., Hist. Nut. Ins, C

■ifal, Goo. Col. Eur i, p.

257 : h ■., it, p.

Ool., p. 3

*f Ltpprta du Castf:

Q, s.xxi, p. t>81 j Wia J

grandls yi Bull, Mosc., xxiv (4), U

laevisalmus, Mgtschulsky, *l.c.*, p. 50L

Hal,

Ipllls / , Veih. ot. Gee. Winn, sxxii, 1882, p. 29

Ha

, Verh. *I.e.* xxiiii, 1853, p. 42a.

- . Mag. N. n. (3s.) iii, 1859, p. i2. *an*,

rlpalpls Ann. Mus. Civ. Gen., (29.) i, 1883, p. 339, 395.

0, Sara*

|0i«ritiUi< iol. tot. Ocs, Wien, xxxiii, 1883, p. 426.

JO, Tclang,

(*Segdmaettui*), Hotschnlaky, Bull. Moac, xxiv (4), 1851, p. 505 ; *ib.*,

Iiab. Tudia.

pnbasoens, , Jl. As. Soc^ Ben., xxv, 1856, p. 550 ; *id** Ann. Mag. N. H.,

i, 1857, p. I

Hab. Ceyl'-

uygmaeua,

QD., *I.e.*, \ Motschb., Bull.

Moac,

|

iv, p. loti ; Anu. ^us, a
(2)

; MJ., Ball, Moac,

Jii (i), ,
Sumatra, Cele

duinquelveolat

tlsky, Bu

■., xxxvi (2

p. 42

■lufescens {>

I .tschulsky, *i.e.*, xxiv (J^ 1851, p. 501; ifc., xlii (i), p. i

India,

eeminudus,

Civ. Gei

semisuloatus, Re

ftes- Wien, rrxiii, 1883, p,

Eab. Biiwvia,, Pen

simulator.

, /.<:, xixii, 1882, p, 302 : bauaufoba, Ann. Mm. *Cir. Qen*.,

Hub. Java, Bntav

■rtmtli

. t-olH!, ttt>J i dbm morft or iwa

Fl. A* 8oc. Beii£., KXV, 185\$, jp. 64fi ; Ann. Mag, N, H., (Jgj a,

Zooi. bot. Res. Wien, xxxfif, 1883, p. 127 :
Scl i., (2a.) i, 3883, p 303. o, Tnmeangleiang.

*us. '***3 ; Ann. Mag. N. H., (2s,) «,

p.] 'M, Mnnti. Ot., ill, p. 662.

m), Sbaafnfs, DeutRch' -xiii, 1889, p. 41,

, JLXIV (+i, i. '

I

capillsrls | S^hauf -., xxxiii, 18^9, |

. &«.Soc. Bftue Ann, Vlmy.,

• . . p. 5
Hab, Ceylon.
ana. Behfcalffl, Ann. Mus. Civ, GOIL, (2a.) i, 38R3, p. Si>2, 105.
Hub. Born

Hab. Sir>g»por» :r«ra». RchanfiiFfl, Ann, Mas- CIT. Q*n , (2A.)

i, I8SS, p, B9S, 416,

184. R. T. Atkinson—*Catalogue of the Family Scydmenidae*. [Suppl.
cyrtocera (*Scydmanus*), Motschulsky, Et. Ent., vii, 1838, p. 31; *Id.*, Bull. Mus., xiii,
 (1), p. 267.
 Hab. Ceylon.
declinatus Reitter, Verh. Zool. bot. Ges. Wien. xxxiii, 1883, p. 421; Schaefum.
 Ann. Mus. Civ. Gen., (2s.) i, 1883, p. 793.
 Hab. Borneo, Tameangliang.
diversipennis Schaefum, Deutsche Ent. Zeits., xxxiii, 1889, p. 42.
 Hab. Singapore.

ISBKJT3'.

nice

0jr,

fcM

Hab. Batavia.

Is (*Scydmanus*), Schaefum, Deutsche Ent. Zeits., xxxiii, 1889, p. 40.

Schaefum, *Id.*, p. 3.

ALL. Mag. N. H.

114

on 1

glandulifer (*Cyrtosydna*)

Hab. Singapore.

intermedia Nixon, J.

(2s.) xx, p. 163; Sch.

Hab. Ceylon.

laborator (*Cyrtosydna*),

Hab. Singapore.

lanuginosa Reitter, Verh.

Mus. Civ. Gen., (2s.) i,

Hab. Borneo, Tam.

longicornis, Motschulsky,

xli (1), p. 259.

Hab. India.

monticola

Hab.

obtusum

ocularis (*Cyrtosydna*), constant

Hab. Singapore.

1890.] E. T. Bakkenou—Catalogue of the Family Scydmanidae. 185

cyticidia, Schaafass, Ann. Mus. Civ. Gen., (2s.) 1, 1883, p. 393, 410

Hab. Singapore.

palipennis (Pseudomierus), Motach., Bull. Mosc. xxvi (2), 1831, p. 475; Reitter,
Wien Ent. Zeit., 1, 1883, p. 139.

Hab. Ceylon.

status, Motachulsky, Bull. Mosc. ., xiv (4\ 1831, p. 50* » (Pseudomierus) **, x] (1),
p. 259.

Hab. India, Bengal.

Reitter, Reitter, Verh. Zool. bot. Ges. Wien, xxxiii, 1884, p. 127.

Hab. Borneo

proter (Scydmanidae)

p. 260.

Hab. Ceylon

i; Odnmtfa ?

30 [id.. Bull, Motw., xl.i (1).

165\$, p. 647 ; {£., Aim. M*g. i?. E.,
>, 562.

1*1, DenUche Eirtv Zsi«, ix xUi, 18Sd, p. «.

p. 5.

;hsufus-?. Le<, p. 41.

agapur.

Reitter, Schaafass, l. c., p. 5.

Reitter, 1884.

Schaafass, Ann. Mus. Civ. Gen., (2s.) 1, 1883, p. 393, 407.

Java.

Motachulsky, Bull. Mosc., xxiv (4) * 1951, p. 60S;

, Dciitieh Eat. Zt

399, p. 39.

agapur.

rlu Zool, bot. GOB. Wien, xxxitl, 1S81, p, *27.

oraao, Telong.

■J53, Ann. MUH, Civ, Qea., (2s.) 1, 1883, p. 335, 415,

^eo., Sarawak,

4), Scbaafass, Dflatecba Eat. Zeita., xixiii, 1889, p. i.

. Mag. Oiv. Gen , . 18S3, p. 393, 410,

Hab, SumnLra,

5CU« Sat, Etttl, xxxiii, 1889, p*

H-H»b. B:ng*j

Z

M HORAEOMORPHUS-

SYNDfCUS

Genua GLANDULARIA-

UxWTrat

«CLIDICUS

.

It

■>=, Arm. U

ronu *t*,

he., p-

AGATHELOU

mily FSELAPHIP-E.

I. *Ota* optexa,

ity E. A.

Lec&nte describes the *Psclaphidw* as compriwng A uutabor of veiy small
iow 'oxo^ediag one-eighth of a! ;th*of & cheatntifc-brrtwu

•.icent : the }»ead auJ thdraj are niojt fi

tUa ely i. iUe abdoiaeu, the latter !b

from

Dr. I* \Y

■ lie an

ni, *Balrmni*,

i. Leaoute <fr Horn,¹ give two *aphtna*, the latter of
which *U* agaM stib-dWidetJ iato groups.

Anba, C. :—
Monographie des P&f
' Note sur la famille
H&risou de la famille

, iu Ann. Hoc. Enf. *t*

JL T.

EJB(f.

VWtu*«,

r,ir.

dei notables d* Ja

dot

rapports

t roy

Booittd

p. s

la this pnper aro an
imperfectly described, and whioh m
eatal Soma have tUo lefctera ' 51 P'
for ' Muumu ragne,' :• la state
subsequently dcaoribe the B^eoleu BO xnrkej, but T Im* to
trace any refewnce ta the pTOMisoil desciiptiooe. J bav«
ood nemo species naba^notitly ideutifie<Jlt uud
hftro fallowing though recorded in the Mtiuich catalogue;—

Amnorwhii ifottckucihfi. Bull. M . p,
orwi p. iS5.
Bong*)

J.t,
Indtfc. '.

"
"

Xndi

■ HWM tu.
In-
189.

fmi, 49S. Iodia.
481, Lttr*.
4P1.
nil,. P. WZ.
P* 491,
> P- 492.
India.

491.

i—Catalogue of the

Indrt.
Indu.
Bomb*:
todia.
India.

IN

Hit,

Eadl*.
Bombay.
-indU.

*it****

di,

lodin-

tomi en-'• i

tc,

Indu.

u

ladta.

fcocer* des

U, 15;

Uypt & '

art the

:ann<x mak€ use

sjnrtemn

irUnii, XT, 18-59.,

n Ucr Bu

" uni 8e

'ung der Clnvlgerinen and

irf., Ins. *Deals*

jen Coleop.

J882, p

nthnltetyl

ia

V,»Bf xxxt, 1SSJ, p.

fwoidoq Faona vou Java und Borrtec. ^ 3 j

xixiiL 1883, p. S87. itn audUcbeu Bntsiiieu gea&mmelte

Teelapbicten, ia Deatscuc Em

^38, p. 22S.

VmAUF TTSS, 0;-

CaUlogtiB ftyn{*uymicaB Faglapliidartta. in Tijda. T, S

xi, 1&B8.

SCHATT TDSg, L W. .-

Note* on cUutBtgcatton, in Nnnqaftni (Hiosas 1872, p.

Die PBiUphiden Bi*m*B» DreKlen, 18T7.

The PaefcpUtdn «nd Scj-dausnkl* from the Panda

ia tbe Lejden lfamuta,

in Notes I«/de» Mai, W# 13»2, p. 146 ; Tljdi. T, Kotr nr, 18S3, p- •».

SCHMIDT

.10.
WB6TWOOD,J 0 . B -
Osoii., 187*, p.

Family PSELAPHIDAE.

Genus AUTICEEUS.

Vot.-Aka, Hindi., 1B2r>, p. 3M : Ugp
t Atm.

> «n*#, Uaiflray, 1
Fmrti *iU* S. Pi

.....

V-
.alBky, J p, SOL.
cut td.

*u», ,ev, Mva&. <T Eat,,

ri, Gou.

CYATHIGER. *Cat*

Wales, *i*, 136?, ^ 37 ^
MIUL

GenM CTEWrSTES,

1

Ol

.,jnron.

Gmius ENOPTOSTOmS. **I**

;SG^, p. 5S3: *Bel*∧

Ifdff
■: % *Ct*

Hjjalpifl
MJQB.

uiji Beitr. t.

s. Soliaalma, Fcataofax, Sac. Eat. 1880. f. Otl!
p. D
Hab. India,
QJrtm Jkii*ufuss, F«st»cbr. I.e., (Scot^ ueuc PK
Ann, "M ;3^,

Oenua TKESIPHORUS-

itt, Boston Jonm. N. H^ v p. 7.^ : Lncofd., 9«a. CoL, U, p. 160 ; Mua.
,, p. 882 : Lecoiiite ft Horn, Clu- p 87.
1RA3 rt
&• s. Lona. LKOUIOJ Pr<«. Ac
"N. 8. Phliai, 1S73, p. 327. 7Vn«*; <pJW<>i&f,
Hotdebatskj, Kt. EnL, 1856, p. 56. *tU», fiAfljay, BUT.
C'EnL, i, 1382, p. JI.

.rx, 19SI,
p.

aiiit, Cat. PBCIAP'K., ISS8, p. S9, fwafrnwiM,
RaiEray, BeF.d'Eot., ii, 1883, p. 234, t. f f. a. Hab. Burma,
RCT, ti'Eat., i, l&S^, p. 10.

Genoa

Sir, Vefb, Vcr Br''afin, n, 1891, p. l&K
>dH»r«f,'Sharp {noo Lcvmta), Tcmtts. T!nt_F 8. Load., 1&7*
ttir, Deutaahc T t&, xjdx, 1635, >. S33, t. a, i. 20,

Genus ODOHXALGTJ&

f_R% Zoct, (to) T, 1877, p. 9
zaftus, Tijrts, 7. Elit., ttix, 1SS6, p. 343.

RYXABIS

^kPHROSTETHITS-

•nmt>W>i<tr -

few ENANTIUS.

ft

rungtirwiiiM.

p. ifio
-'.•

a, xx xi

CUta*tiUi Be

. Sism'i, 1677

dITVUJ, K-

'flit*. xxx ij 18B3

298.

Hal

fortlooriUM, Bohftuftt^, is

Pmxta, ScUmWt, Beitr. r. Hon.

Ball. Mute.

ana SUBDLIPALPUS.

TYRUS.

lark

tun.

PSELAPHOD

U-16.

vUIQSUB, W

I. Tran»

RNYLLIUM.



destinator, Reitter, *Ann. p.* 291, t. 20, f. 9; Schaefuss, Berlin Ent. Zeits., xxvi, 1887, p. 272.

Hab. Borneo.

Genus is BATRIS!

antid, *Mus. Psyllaph.*, Mag. Zool., 1883, p. 45; *Id.*, *Reitter*, Ann. Soc. Ent. Fr., (2a) ii, 1884, p. 80; *Lacord.*, Gen. Col. H., p. 171; *Jacq. Duv.*, Gen. Col. Eur., i, p. 159; *Man. Col.*, p. 581; *Reitter*, Deutsche Ent. Zeits., xvi, 1882, p. 123; *Id.*, xxiii, 1883, p. 246; *Verh. Zool. bot. Ges. Wien*, xxii, 1882, p. 451, 453; *Id.*, *Syn.*, xxiii, 1883, p. 293; *Leconte & Horn*, Class. Col., p. 88; *Sharp*, Biol. Centr. Amer., Col. 4 (9), p. 15.

Arctianus, *Leconte*, Boston J. Nat. Hist., i, 1843, p. 91; *Class. Col.*, p. 81.

Batrachodes, *Reitter*, Deutsche Ent. Zeits., xxiv, 1882, p. 131; *Deutschl. Ent.*, iii, p. 22.

Gracilaria, *Reitter*, Deutsche Ent. Zeits., xxiii, 1883, p. 245.

Sylvestris, *Reitter*, Deutsche Ent. Zeits., xxiv, 1882, p. 124.

abbreviatus (*Batrachodes*), *Reitter*, Verh. Zool. bot. Ges. Wien, xxiii, 1882, p. 235.

Hab. Borneo, Tamsang Hiang.

achilles, *Schaefuss*, Ann. Mus. Civ. Gen., xviii, 1882, p. 324.

Hab. Java, Talibodas.

angulipes, *Schaefuss*, *Id.*

Hab. Borneo, *trkk.*

angusticollis, *Raffray*, Rev. d'Ent., i, 1882, p. 74.

Hab. Java.

anthicus, *Motschulsky*, bull. Mosc. Soc. Ent., 1851, p. 187; *Schaef.*, Bull. Soc. Ent. Fr., (2a) ii, 1882, p. cxiii.

Hab. India, Burma.

architectus (*Batrachodes*), *Reitter*, Verh. Zool. bot. Ges. Wien, xxiii, 1882, p. 227, t. 20, f. 4.

Hab. Borneo, Tamsang Hiang.

basalis, *Schaefuss*, Ann. Mus. Civ. Gen., xviii, 1882, p. 324.

Hab. Sumatra, Ajer-Mantekor.

batauanus (*Batrachodes*), *Reitter*, Verh. Zool. bot. Ges. Wien, xxiii, 1882, p. 254.

Hab. Borneo.

brunneus, *Schaefuss*, Ann. Mus. Civ. Gen., xviii, 1882, p. 324.

Hab. Burma.

brevis, *Schaefuss*, *Id.*, p. 325.

Hab. Borneo, Sarawak.

capitatus, *Raffray*, Rev. d'Ent., i, 1882, p. 73.

Hab. Java.

cavir (Bateisades), Reitter, Verh. Zool. bot. Ges. Wien, xxviii, 1882, p. 284.
Hab. Borneo, Telang.

calabensis, Schaefuss, Ann. Mus. Civ. Gen., xviii, 1882, p. 378; (Bateisades) Reitter,
Syn., p. 393.

Borneo.

clavipes (Harpis-Jes), Reitter, Verh. Zool. bot. Ges. Wien, xxviii, 1882, p. 285.
Hab. Borneo, Telang.

causos, Schaefuss, Tijds. v. Ent., xxx, 1887, p. 138,
Hab. Borneo.

Dohrnii, Schaefuss, l.c., 1887, p. 137.
plicatus, Motschulsky, Bull. Mosc., xlii (2), 1851, p. 459; Schaefuss, Bull.
Soc. Ent. Fr. (6e) ii, 1882, p. cxvii.
Hab. In 'lift) Bu¹¹

exilis, Schaefuss, Pacht. pli. Siana'a p. 16; l.c., Ann. Mus. Civ. Gen., xviii,
p. 379.
Hab. Siam.

exigua, Uffray, Uev. iVent . i. 1882, p,

fundasbraccatus, S Schaefuss, Tijds. v. Ent., xxv , , V., Kot*a Leyden
Mus., iv, 1882, p. 151; Ann. Mus. Civ. Gen., xviii, p. 383; (Bateisades) Reitter,
Syn., p. 395; Verh. Zool. bot. Ges. Wien, xxviii, 1882, p. 285.
Hab. Batavia, Telang, Barabel.

Grosvalli, Schaefuss, Ann. Mus. Civ. Gen., xviii, 1882, p. 378; (Bateisades) Reitter,
Syn., p. 393.
Hab. Borneo.

grypochirus, Schaefuss, Ann. Mus. Civ. Gen., xviii, 1882, p. 379.
Hab. Borneo, Satwa at.

heterocerus, Motschulsky, Bull. Mosc., xlii (2), 1851, p. 454.

; -, Ana, Civ. Gen., xviii, 1882, p. 357.

Mua. mortal.

Hab. Borneo, Sarawak.

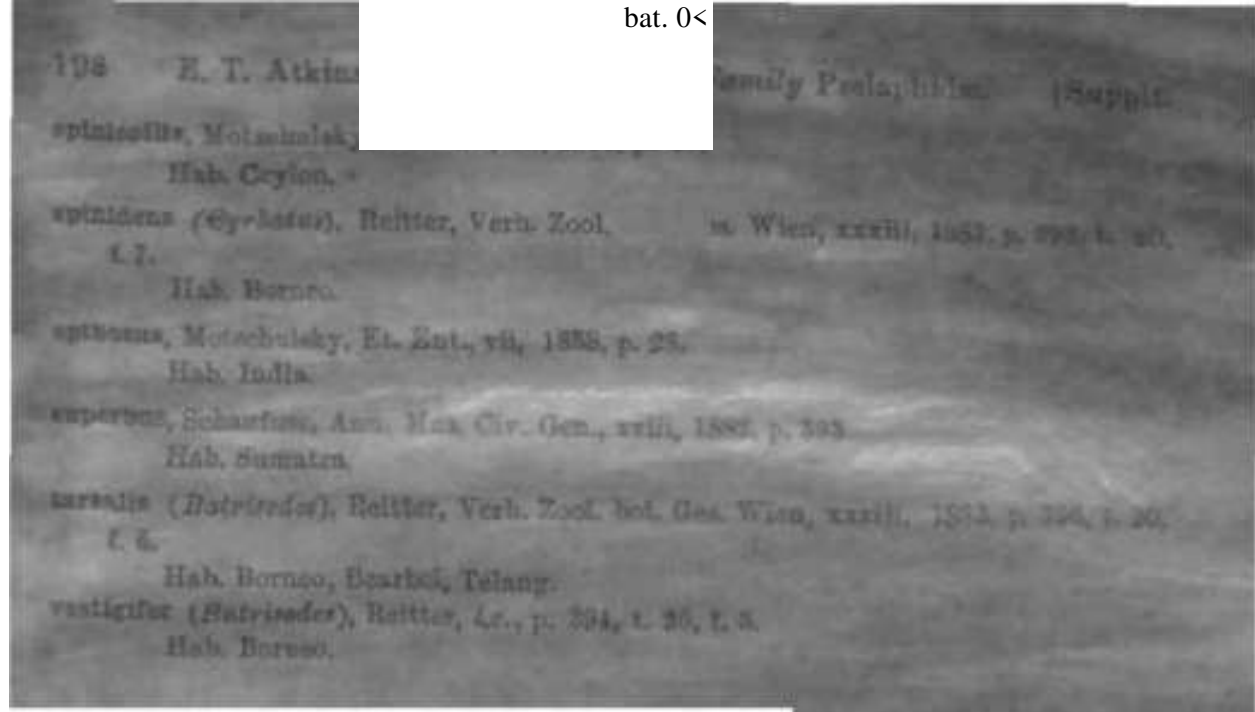
infus, Schaefuss, l.c., 75 : [Biitrisedot) K Reitter, Syn., p. 393.
Hab. Borneo , Sftrawuk.

javanus, Raffray, v. d'Hn' 'ft. 1882, p. 63.
Hab. Ja

la m , I. ib. /

t. 20, I.

lateridis UB. Reitler, i.
Hab. 1: Uorneo, TuTnfcanglt:: ang.



'«a DIOPTRTJS.

BERLARA

.«« BATEISOSCHEMA-

a.Iv

H.

is BORNE ANA-

BRYAXIS

. p r

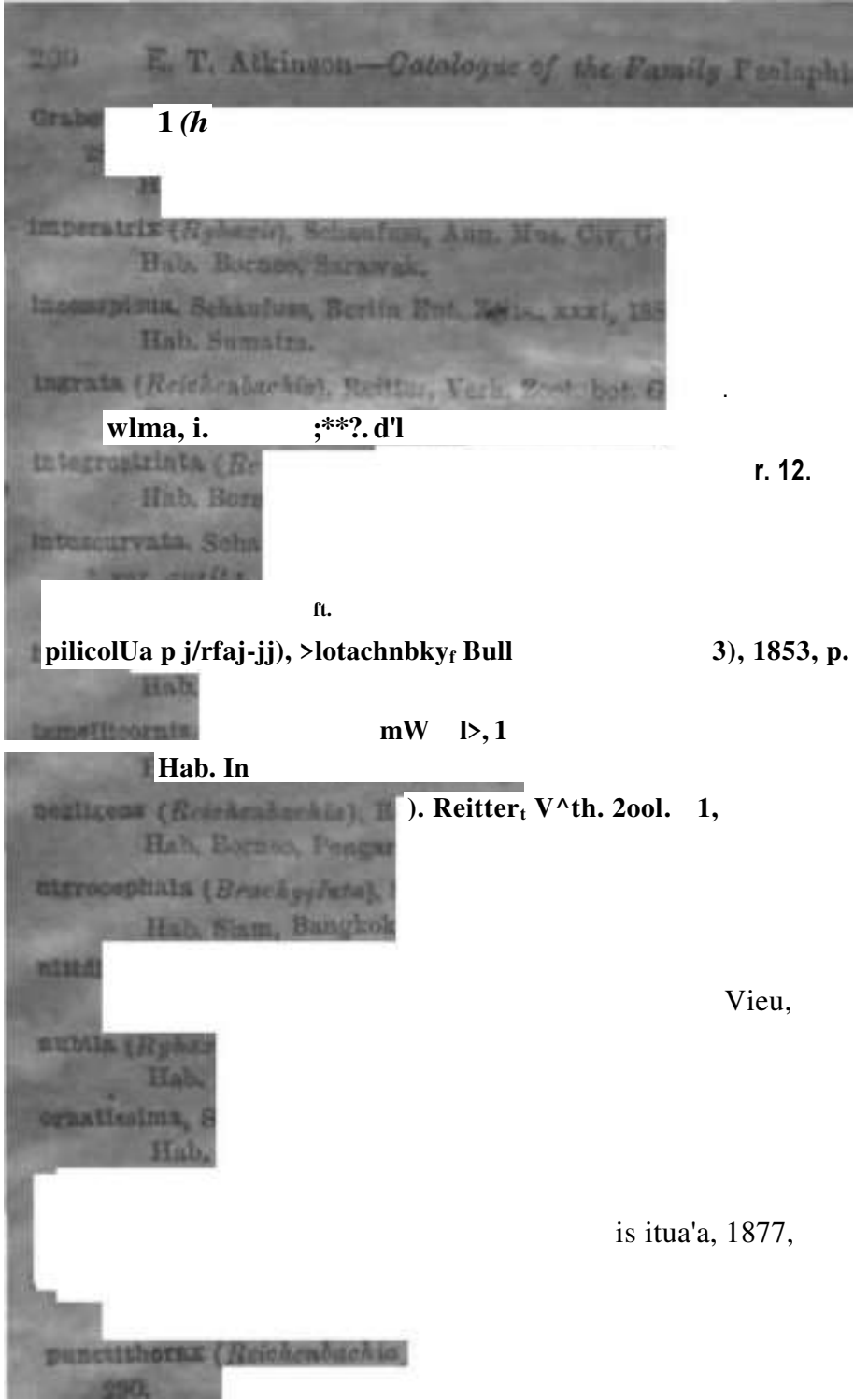


fl^{*y}, Kev. d'Knt, i, 1882. p. M ; Sobaufn*. Ann. Kus. Civ
 ..
 Hab. Java,
 marsarttirer , Ana. STuu. Civ. Gen., xviii, 1882, p. 377.
 mort ttB {Syrbat**}, Reitter, Verb. Zool. bot. Oes. Wi«n,x««i, 1832, p
 Batavia.
 n., X-Tiu,
 ii, 1*83, P- 369, t. 20_t f. 8.
 u. Burneo, Telai
 LUdus, Eaffray, i, 1S82, p. 74.
 Hab, Java,
 >nderes. Ann. Mua. Civ. Gen., sviii, 1882, p.
 prooortionls, Schanfuss, Ann. Mug. Civ. Gen., . p. S9S,
 Hub. Sumatra, Ajur Mantcior.
 pubeeoens, KaSray, Kcv. d'Eut., i, 1882, p. 62.
 Bab. Java,
 imblfsr [B« Oi fieitter, Verh. Zool. bot. Ges Wien, xx[^]iii, 1883, p, 397,
 Hub. Borneo, Telang,
 quaestus, S Eat, xxx, 1887, p. 139.
 t. Mos<\, xxiv (i), 1851, p.
 487-Burma.
 Ci[^] 32, p,
 ' <r, Haftray, liev. £85.
 Hab. Java.
 Ritseniaio, Scliaufuea, Tijda. v. Ent., «v, 1882, p. 70; *id.*, Kotee Leyden Jius.,
 i\ . b. Samatra, Bencoolon.
 '•S• . Oiv.CFer
 Hab. Borneo, Sarawak.
 ksliaufaas, Tijds. v. Eat., xty, 1882, p. 7] , ;d-t Notes Leydea Mqg .
 Hab. E. Java, Ardjocnn,
 Ucatus, Schanfuss, Anu, ling. Ch \ Java, viii, 1882, p, 391, (*nco* Hotacb.).
 'c. p. 376 : (*Batriaotsf*) Eeitter, Ayn., p.
 3[^]3. *wmmk*.
 Jtemfo- Iapb. Siam'a, 1877. p. 15.
 Ha
 t
 :mili8, Schaufns* Ann. Mus, Gir. Gen., iviii, 1882, p, 39J,
 Ilab, Sumatra.

*96.

gHrtydWH

.



I'orneo, Turn bang Hiaug.
1

ooo*'

H*r

Batftvi

.

barawakensis (*Syberis*), Schaufuss, Ann. Mus. Civ. Gen., xviii, 1882, p. 254.
Hab. Borneo, Sarawak.

Schaufussii (*Reichenowii*), Reitter, Verh. Zool. bot. Ges. Wien, xxviii, 1887, p. 139.
Hab. Java, Batavia, Barnes, Tambora Hlang.

ephaerina, Motschulsky, Bull. Mosc., xiv (4), 1851, p. 491; Reitter, Verh. Zool. bot. Ges. Wien, xxviii, 1887, p. 291; *id.*, Bull. Soc. Ent. Pr., (3a) iii, 1883, p. ix.
(*Epiphaerina*, Kinn).

ferus (*Epiphaerina*), Schaufuss, Fed. Siam's, 1877, p. 10; *id.*, Tijds. v. Ent., xiv, p. 68; Berlin Ent. Ztg., xxii, p. 200, *teste*, Reitter, Soc. Ent. Pr., (3a) iii, 1883, p. ix.

sumatrensis (*Epiphaerina*), Schaufuss, Fed. Siam's, 1877, p. 9; *id.*, Tijds. v. Ent., xiv, p. 69.
Hab. India, Siam.

subvillida (*Reichenowii*), Reitter, Verh. Zool. bot. Ges. Wien, xxviii, 1887, p. 104.
Hab. Borneo, Telang.

sumatrensis, Schaufuss, Tijds. v. Ent., xiv, 1887, p. 113.
Hab. Sumatra.

telangenensis (*Reichenowii*), Reitter, Verh. Zool. bot. Ges. Wien, xxviii, 1887, p. 103.
Hab. Borneo, Telang.

Genus BAT7UXI3.

Reitter, Verh. Zool. bot. Ges. Wien, xxvi, 1881, p. 451, 454.

Psittacops Raffray, Rev. d'Ent., i, 1882, p. 38; Reitter, Deutsche Ent. Ztg., xxi, 1881, p. 34.

corinthis (*Batrismorpha*), Schaufuss, Ann. Mus. Civ. Gen., xviii, 1882, p. 264.
Hab. Penang, Java, Sumatra.

batia (*Batrismorpha*), Schaufuss, *Id.*, 1882, p. 266.
Hab. Sumatra.

breviceollis (*Batrismorpha*), Raffray, Rev. d'Ent., i, 1882, p. 39.
Hab. Java.

ursula (*Batrismorpha*), Schaufuss, Ann. Mus. Civ. Gen., xviii, 1882, p. 267.
Hab. Java.

Genus COMATOPSELAPHUS.

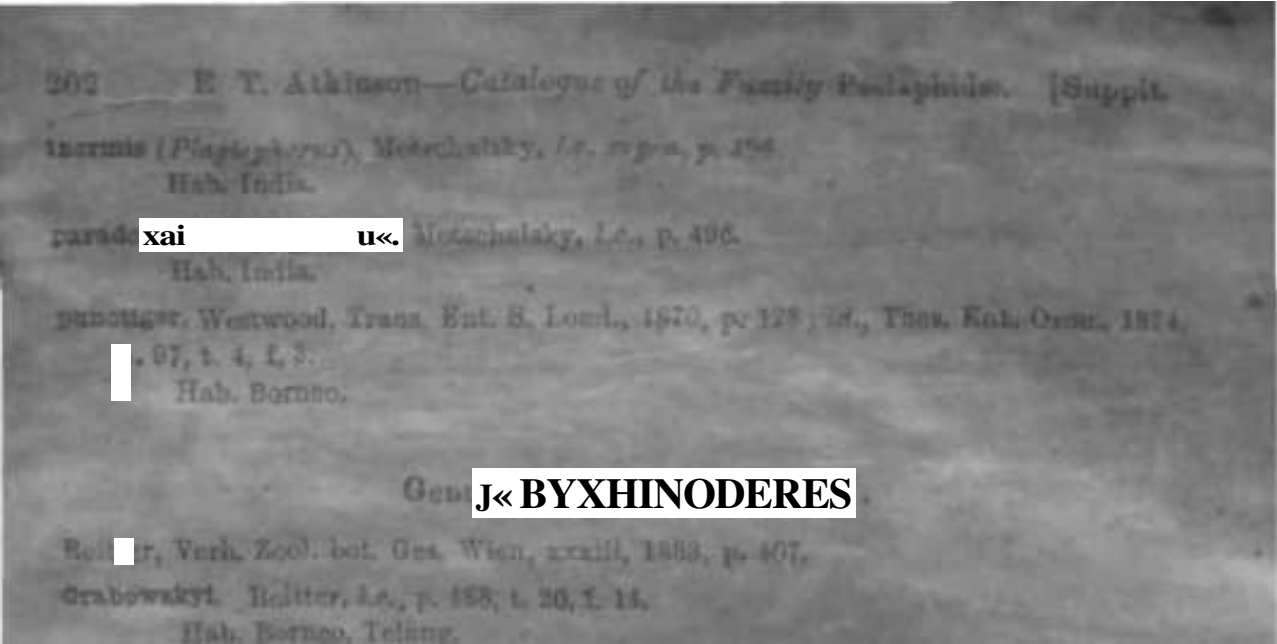
Schaufuss, Ann. Mus. Civ. Gen., xviii, 1882, p. 268.

opaciceollis, Schaufuss, *Id.*, p. 268.
Hab. Borneo, Sarawak.

Genus SATHYTES.

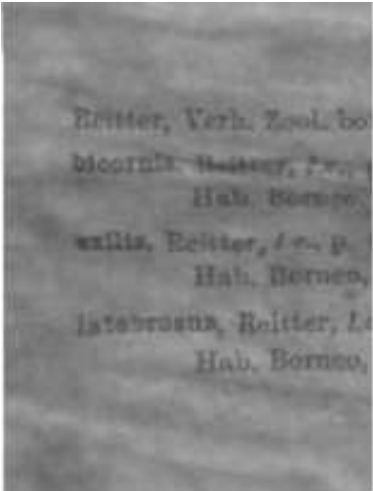
Westwood, Trans. Ent. S. Lond., 1870, p. 128; *id.*, Trans. Ent. Ozon., p. 97.

Psittacops, Motschulsky, Bull. Mosc., xiv (4), 1851, p. 491; Man. Cal., p. 643.



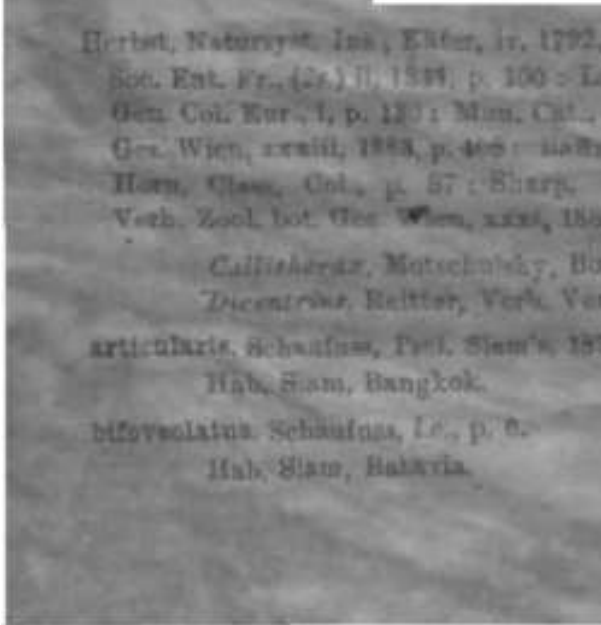
BYHTNOMOBPHA.

-



BYTHI

LAPHUS



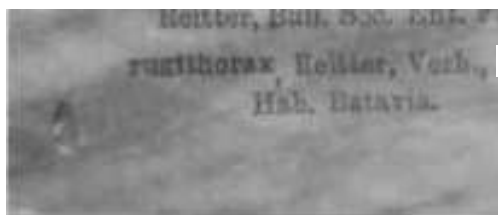


[tvmetatuf [-... ■ \ '": b;t. (*lax* W on, u,...; . ISS3. [>, HO.

TYRAPHTJS.

fiu.

CDECULIONELLUS.



1890.] E. T. Akluscu—Catalogue of the Family Psalaphidae.

Simons, Reitter, *l.c.*, xxii, 1882, p. 290.

Hab. Barrois.

squamiceps (*Psaphobates*). Schaufuss, *Notiz Leyden Mus.* iv, 1857, p. 116; *l.c.*

Typh. *z. Ent.* xiv, 1853, p. 60.

Hab. Java.

Genus **MESTOOASTI**; R.

Schmitt, *Beitr. z. Mon. Faun.*, 1838, p. 170; *l.c.*, *Mon. Ent. Zeit.* iv, p. 170; *l.c.*,
Mon. Soc. Ent. Fr., (6a.) ii, 1833, p. 27.

Metastoele, Schaufuss, *Psaph. Stam's*, 1877, p. 13; *l.c.*, *Nunq. Otios.* ii,
p. 483; *Ann. Soc. Ent. Fr.*, (6a.) ii, 1833, p. 309, 317; *l.c.*, *Bull.*
p. cxvii.

brachiformis (*Metastoele*). Schaufuss, *Psaph. Stam's*, 1877, p. 13.

Hab. Slam, Bangkok.

crassicornis, Schmitt, *Beitr. z. Mon. Faun.*, 1838, p. 9; *l.c.*, *f. 8.*

Hab. L. S.

EPHAI

Cat., p. 603; Schaufuss,
p. 103; Reitter, *York.*

l.c., p. 416.

. f. 17.

l.c., xiv (4), 1851, p. 483; Schauf., *Ann. Mus. Civ.*
supra, *l.c.* 416.

l.c.

l.c., xxiv (4), 1851, p. 483; Schauf., *l.c. supra*, p.

l.c.

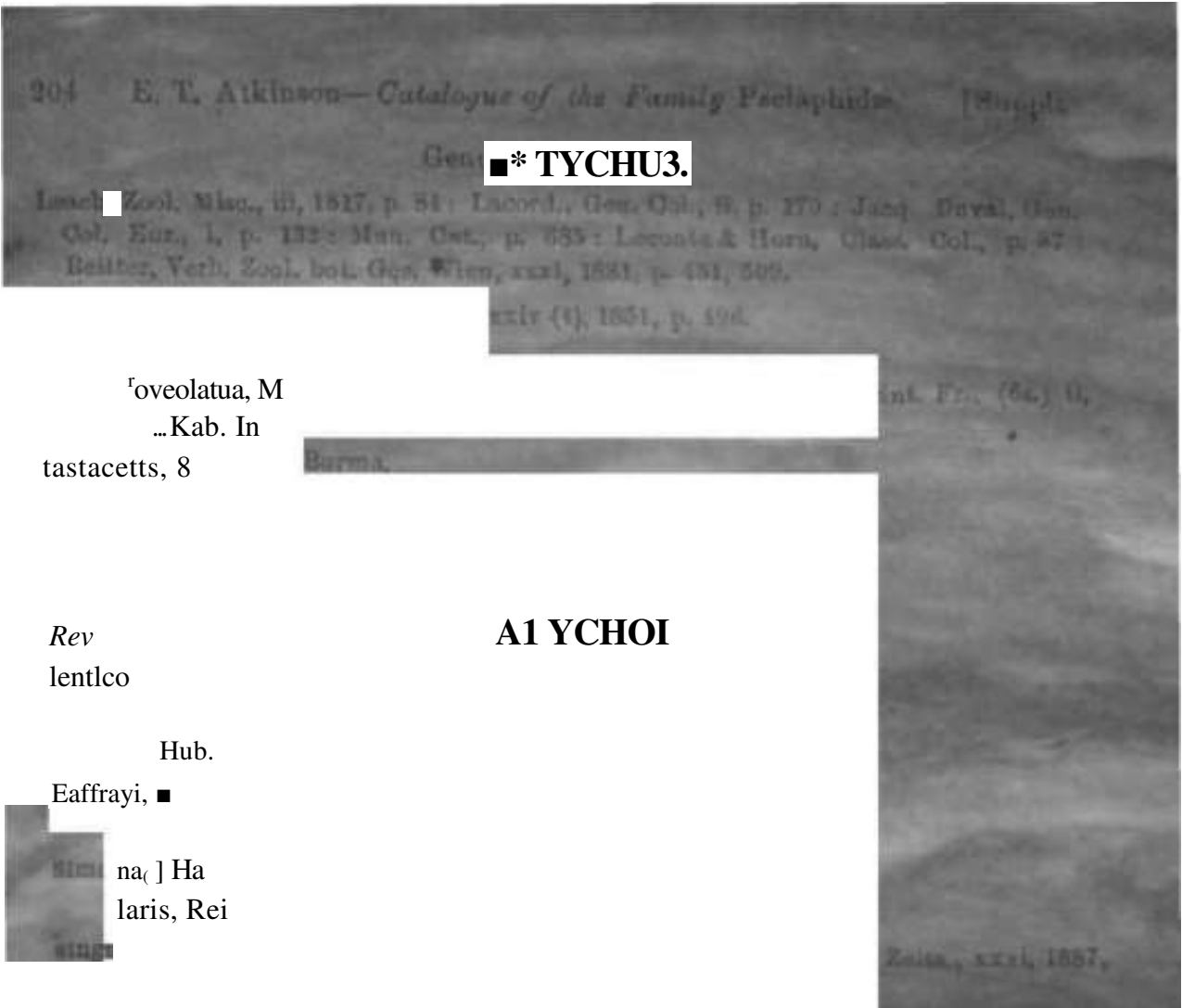
l.c., *Wien.* xxxiii, 1853, p. 417, t. 20, f. 18.

il«b I no a.

Genus **IMTEMPUS**.

l.c., *Ver. Braun*, xx, 1882, p. 105, 202.

as, Reitter, *Deutsche Ent. Zeits.*, xlix, 1895, p. 337, t. 3, f. 27.



204 E. T. Atkinson—Catalogue of the Family Pselaphidae [Bibliography]

Gen. ■* TYCHU3.

Leach, Zool. Mag., iii, 1817, p. 81; Lacord., Gen. Col., 9, p. 170; Jacq. Duval, Gen. Col., Eur., 1, p. 132; Man. Ost., p. 635; Lacoste & Horn, Glass. Col., p. 87; Reitter, Verb. Zool. bot. Ges. Wien, xxxi, 1881, p. 481, 509.

xxxiv (4), 1881, p. 494.

oveolata, M

...Kab. In

tastacetts, 8

Burma.

nt. Fr., (64), 11,

Rev

lentlco

A1 YCHOI

Hub.

Eaffrayi, ■

na,] Ha

laris, Rei

Zool., xxxi, 1887,

ua's, 1877,

Otiipivdntris, ScLaitfii^s, 1

Halt. S

carlnive-

j, I.e., p. 17.'

Hab. Siani.

*

conlcicoUls, Scl

Hal

APHARINA.

i,]

■

tiii^p. 414.

fuscipennls, Reitter, Verb. Zool. bori

Hal

;o, Ti;1»Qk.

Genus **MECHANICUS**.*chlamydophorus*, Sch.

Hab. Sumatra.

Genus **PTHARTOMICRUS**.*Schaufuss*, Tijds. v. Ent., xxx, 1887, p. 144.*externus*, *Schaufuss*, *Id.*, p. 153.

Hab. Sumatra.

Genus *** ZETHOPSUS**.*Reitter*, *Syn. Ich.*, Verb. Zool. bot. Ges. Wien, xxviii, 1883, p. 418; *Raffray*, *Rev. d'Ent.*, vi, p. 50.*Zethus*, *Schaufuss*, *Ann. Orléans*, II, 1872, p. 294; *Id.*, *Feet. Siam's*, 1877, p. 11 (non *proser*).*batavianus*, *Schaufuss*, *Tijds. v. Ent.*, xxv, 1882, p. 67; *Id.*, *Notes Leyden Mus.*, iv, p. 147; *Reitter*, *Syn.*, p. 419.

Hab. Batavia.

Dehrui, *Raffray*, *Rev. d'Ent.*, II, 1883, p. 248, t. 3, f. 24, 25.

Hab. Burma.

nitidulus, *Reitter*, *Verh. Zool. bot. Ges. Wien*, xxxii, 1882, p. 382; *Syn.*, p. 419.

Hab. Ceylon.

opacus, *Schaufuss*, *Feet. Siam's*, 1877, p. 12; *Reitter*, *Syn.*, p. 413.

Hab. Siam.

sculptifrons, *Reitter*, *Verh. Zool. bot. Ges. Wien*, xxxiii, 1883, p. 419.

Hab. Patavia.

strapillifrons, *Reitter*, *Id.*, p. 419.

Hab. Borneo.

Westwoodii, *Motschulsky*, *Bull. Mosc.*, xxiv (4), 1851, p. 500; *Schaufuss*, *Bull. Soc. Ent. Fr.*, (6s.) II, 1882, p. cxiii; *Reitter*, *Syn.*, p. 419.

Hab. India, Burma.

NEODEOTEEUS*Admirandus*, *Schaufuss*, *Id.*, p. 152.

Hab. Sumatra.

alter, *Schaufuss*, *Id.*, p. 152.

Hab. Sumatra.

PYXIDICEEUS.

is

n?57

, 697; *Schaufuss*,

fi APHIIIA-
Y«. BrUia, xx, 18&1, p. W

IMS

u OCTOMICF.US

w

, Sumai

una EDPLECTOMORPHUS

1>. 282.

teatU, i-

Genus EUPLECXDS-

DiiTal.

, I

go

, V

deoticon

iss;>

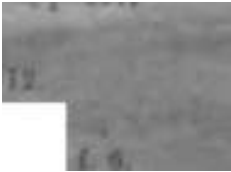
Is (

tafiuu

■

-

mx*



Gem* TRICHONTX-

bnW

1 r 3

Family STAPHYLINIDÆ.

Catalogue of the Insecta of the Oriental Region, No. 12. Under Coleoptera.

Family STAPHYLINIDÆ—By E. T. ATKINSON, L. L.

The *Staphylinidae* are very numerous in the Oriental Region, though little attention has been paid to them in India proper. They are usually of a small size, with short elytra, and an entirely corneous abdomen, for the most part exposed. They are divided into two sub-families, *Staphylininae* and *Micropeplinae*, of which the first is represented in our Fauna. Messrs. Lacaze & Hara, following Jacquelin Duval and Fauvel, distribute the sub-family *Staphylininae* into the following tribes:—

Antennae inserted upon the frons.	2
Antennae inserted at the anterior margin of the head.	3
Antennae inserted under the sides of the frons.	4
1. Prothoracic spiracles visible, front coxae large; antennae not abruptly clavate; fourth joint of maxillary palpi distinct.	I. <i>Microcharini</i> .
Prothoracic spiracles not visible, front coxae small; antennae slender, distinctly clavate, fourth joint of maxillary palpi obsolete.	III. <i>Stenini</i> .
2. Antennae filiform or gradually thickened, fourth joint of maxillary palpi distinct.	II. <i>Staphylinini</i> .
4. Front coxae conical, prominent;	5
Front coxae transverse	ix. <i>Protini</i> .
Front coxae globose	x. <i>Piedini</i> .
No scilli.	6.
Scilli two, situated at or behind the vertex.	viii. <i>Hemalini</i> .
6. Hind coxae transverse;	7.
Hind coxae conical.	ix. <i>Paderini</i> .
7. Seventh abdominal segment retractile	8.
Seventh abdominal segment exposed	vii. <i>Oxytelini</i> .
8. Prothoracic spiracles visible; epipleurae well-defined	v. <i>Thyphlorini</i> .
Prothoracic spiracles concealed; epipleurae ill-defined.	vi. <i>Philoscarini</i> .

Principal works noticed.

- Casey, T. L.:—Revision of the *Staphylinidae* of N. America, 1864.
- Duvivier, A.:—'Énumération des Staphylinides décrites depuis la publication du Catalogue de M. M. Guérin-Meneville et Harold' in *Annales de la Société Entomologique de Belgique*, xxvii, 1884, p. 91–215.
- Erichson, W. F.:—'Käf. Mark Brandenburg,' 'Die Käfer der Mark-Brandenburg,' Berlin, i, 1847; 'Gen. Staph.,' Genera et species Staphylinorum, Berlin, 1849.
- Fauvel, A.:—'Les Staphylinides de l'Australie et de la Polynésie,' in *Ann. Mus. Civ. Gen.*, x, 1877, p. 163; id., xv, 1878, p. 405; des Malgaches et de la Nouvelle Guinée, id., xii, 1875, p. 171; de l'Afrique boréale, *Bull. Soc. Norm.* (4e) ii, 1876, p. 83; de l'Amérique du Nord, id., p. 197; des nioe . Be. d'Ent., v, 1886, p. 143; Fauna Gallo-Rhémane, vol. iii.

210 E. T. Atkinson—*Catalogue of the Family Staphylinidae*. [Suppl.]

Gravenhorst, J. L. — *Mon. Hymen.*, 'Coleoptera Microptera Brachelytrinae,' Braunschweig, 1802. — *Mon. Col. Micr.*, 'Monographia Coleopterorum micropterygum,' Göttingen, 1806.

Horn, G. F. — *Synopsis of the Ptilinidae of N. America*, Trans. Amer. Ent. Soc., xi, 1864, p. 177.

Jacquelin Duval, G. — 'Genera des Coleopteres d'Europe,' ii, 1837, p. 1—93.

Kraatz, G. — 'Naturgeschichte d. Ins. Deutschl.,' vol. 3, 1855; 'Die Staphylinen-Fauna von Ostindien insbesondere der Insel Ceylon,' in Wiegmann's Archiv, xiv (1) 1839, p. 1.

Mannerheim von, C. G. — 'Beschd.,' 'Précis d'un nouvel arrangement de la famille des Brachélytres,' in Mém. présentés à l'Acad. St. Pétersb., i, 1880, p. 414.

Motschulsky, V. de — 'Extrait d'une lettre adressée à M. Koubkoff, Bull. Mus., x (5) 1837, p. 27; 'Énumération des nouvelles espèces des Coléoptères,' ib., xix (4), 1857, p. 490; xxxi (1), 1858, p. 631; ib., (2), p. 1204; Extrait d'une Catalogue des insectes de l'île Ceylon, ib., xxxiv (1), 1861, p. 93.

Mulsant & Rey — 'Tribe des Brachélytres,' Ann. Soc. Ent. Lyon, xix, 1872, p. 91; Mém. Acad. Lyon, xix, 1873, p. 75; ib., xx, 1874-5, p. 23, 285; Ann. Soc. Agric. Lyon, (1st) viii, 1875, p. 143.

Nordmann von, A. — *Symb. Mus. Staph.*, 'Symbole ad Monographiam Staphylinorum,' in Mém. Acad. St. Pétersb., iv, 1837, p. 1.

Sahlberg, J. — 'Enumeratio Coleopterorum Brachelytrorum Fenniae,' in Acta Soc. Scient. Fenn., 1816.

Sharp, D. — 'Staphylinidae of Japan,' in Trans. Ent. S. Lond., 1874, p. 7; *Trans. Ent. Soc. Lond.*, 1875, p. 11; (74) ii, iii, 1885-86; of the Amazon Valley, Trans. Ent. S. Lond., 1876, p. 77; of Central America, *Wool. Centr. Amer., Col.*, i (2), 1883, p. 145.

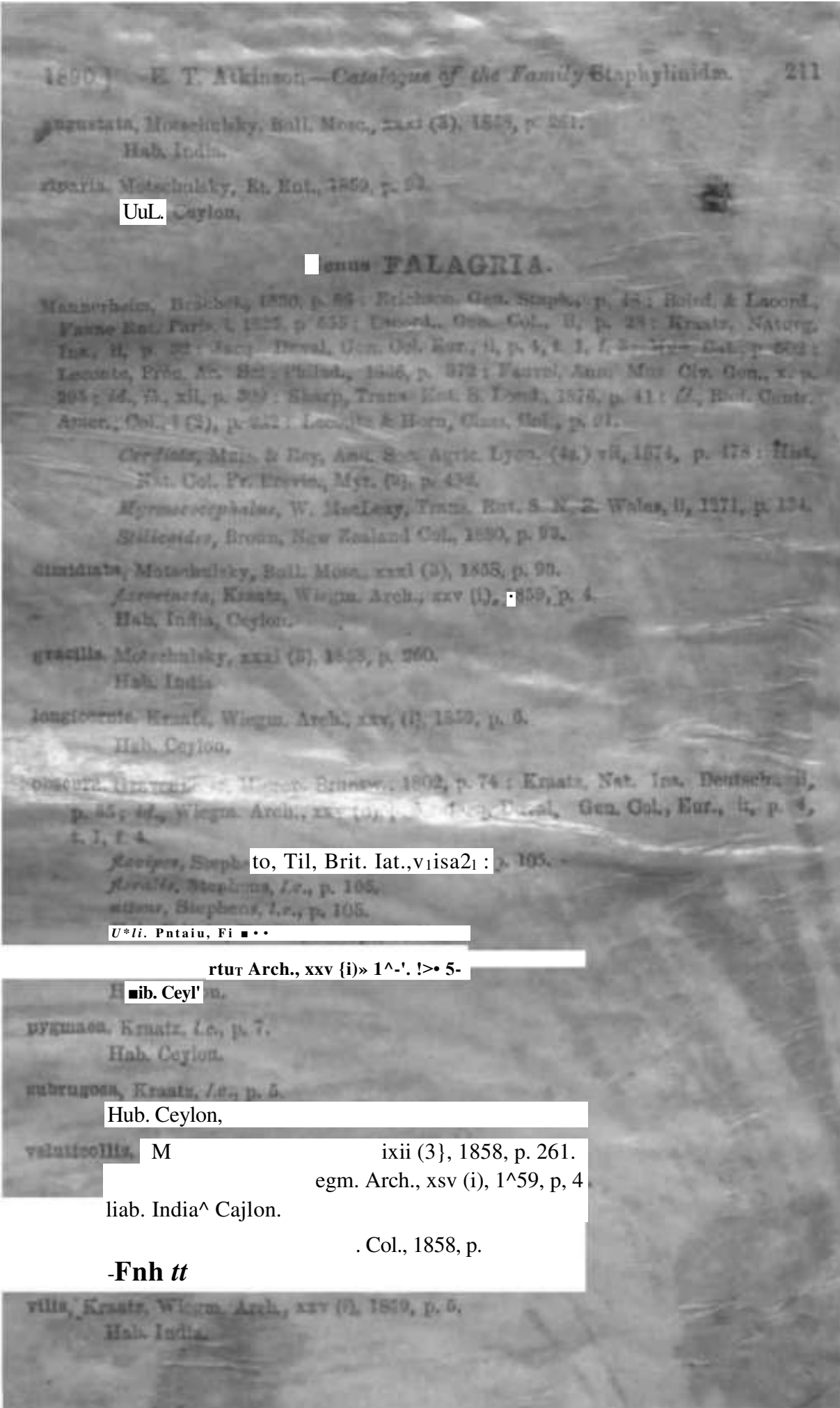
Hy STAPHYLIKID,E

Westwood, Med. Class. Ins., i, 1839, p. 161 5/6 (*Brachelytres*) Latrèlle, Règne Anim., i, p. 179; ii (*Brachelytres*) Faun. Nat., p. 211; (*Microptera*) Gravenhorst, Col. Micr. Hymen., 1802; (*Staphylini*) Erichson, Gen. Staph., 1840; Kraatz, Naturg. Ins. Deutschl., iii (*Staphylinidae*) Lacord., Gen. Col., ii, p. 17; (*Staphylinidae*) Jacqu. Duval, Gen. Col. Eur., ii, p. 1; Leconte & Horn, Class. Col., p. 88.

ALLOCHARINI: (*Allocharidae*), Lacord., Gen. Col., iii, 1854, p. 26; Jacqu. Duval, Gen. Col. Eur., ii, p. 2; Mon. Cat., p. 502; Muls. & Rey, Hist. Nat. Col. France, 1861, 1871; Fauvel, Ann. Mus. Civ. Gen., xii, p. 287; Leconte & Horn, Class. Col., p. 90; Sharp, Biol. Centr. Amer., Col., i (2), 1883, p. 145.

Genus AUTALIA

Mannerheim, Brachel., 1838, p. 87; Erichson, Gen. Staph., p. 46; Boisd. & Lacord., Faune Ent. Paris, i, 1834, p. 537; Lacord., Gen. Col., ii, p. 27; Kraatz, Naturg. Ins., ii, p. 29; Jacqu. Duval, Gen. Col., ii, p. 4, t. 1, f. 3; Mon. Cat., p. 502; Leconte & Horn, Class. Col., p. 92.



Genus **BOLITOCARA.**

Mannerheim, Brachid., 1830, p. 15 : Erichson, Gen. Staph., p. 27 : Lacord., Gen. Col., Supp., 30 : Mon. Cat., p. 501 : Kraatz, Naturg. Ins., II, p. 96 : Japq. Duvai, Gen. Col., II, p. 5, t. 1, f. 5 : Fawcett, Ann. Mus. Civ. Gen., III, p. 206 : Lacoste & Horn, Class. Col., p. 93.

amabilis, Motschulsky, Bull. Mosc., xxiv (1), 1851, p. 154.

Hab. Ceylon.

nitens, Kraatz, Wiegum. Arch.,, ffs I p. 7.

Hab. Ceylon.

Ge **JCOPTO** [A.

Kraatz, Wiegum. Arch., xxv (1), 1859, p. 8 : Mon. Cat., p. 505.

nitens, Kraatz, Loc., p. 9, t. 1, f. 1 & 2.

Hab. Ceylon.

Genus **HOPLANDRIA.**

Kraatz, Linn. Ent., xl, 1857, p. 4, t. 1, f. 6, t. 2, f. 14 : Mon. Cat., p. 505 : Lacoste & Horn, Class. Col., p. 91 : Sharp, Biol. Centr. Amer., Col., I (3), p. 219.

nitens, Kraatz, Wiegum. Arch., xxv (1), 1859, p. 9.

Hab. Ceylon.

Genus **PEHUSA-**

Erichson, Gen. Staph., 1810, p. 192 : Lacord., Gen. Col., II, p. 44 : Mon. Cat., p. 505.

nitens, Motschulsky, Bull. Mosc., xxiv (2), 1858, p. 225.

Hab. Ceylon.

o **SCHISTOGENTA**

Kraatz, Linn. Ent., a, L8j?, .i ■ ■

xxv (1), 1859, p. 10, t. 1.

L. 5 a-b.

Hab. Ceylon.

Genus **SILUSA-**

Erichson, Kaiser Mark Brand., I, 1837, p. 377 : id., Gen. Staph., p. 295 : Kraatz, Naturg. Ins. Deutschl., II, p. 44 : Lacord., Gen. Col., II, p. 45 : Kraatz, Naturg. Ins., II, p. 41 : Japq. Duvai, Gen. Col., II, p. 5, t. 4, f. 31 : Mon. Cat., p. 507 : Sharp, Biol. Centr. Amer., Col., I (2), p. 214 : Lacoste & Horn, Class. Col., p. 93.

Sennas, Kraatz, Naturg. Ins. Deutschl., II, 1856, p. 47 : Z. Berlin Ent.

Zeits., 1860, p. 329 : Mon. Cat., p. 507 : Lacoste & Horn, Class. Col., p.

93.

nitens, Linn. Ent., an. Ent. # ii, 13:T, p. 8! tf. Wic^io. Arch., xi (1), p.

10.

Hab. Ceylon.

1
i

All .italogut of the
OCALEA

1

fuM LEPTUSA*

I. Ool._r

aftvnl_tTOil

«B^{Λcm}



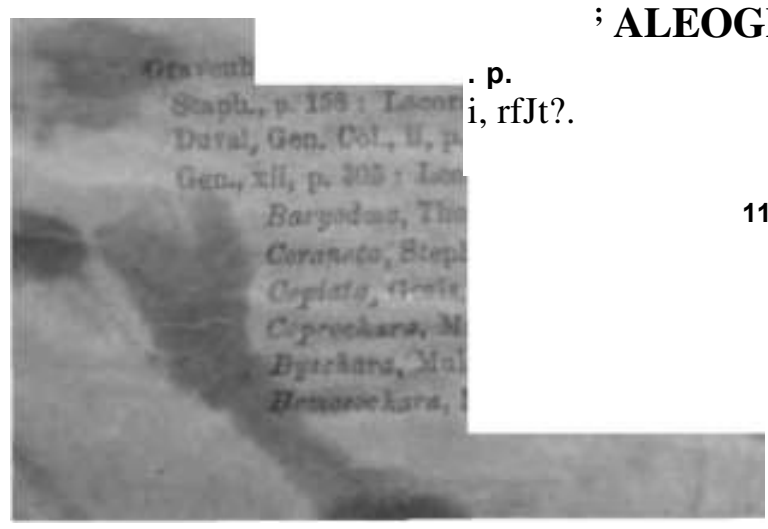
tons COENOWICA.
p, 510.



LINOGLOSSA

., p. 11.
- tia.

‘ **ALEOGHARA**



. p.
i, rfJt?.

ix, is;

H. p. sater, Schmidt-Göbel, Berlin Ent. Zeit., 1846, p. 245.
Mesochorus, Solier, Gay's Hist. Fis. Chili, 1851, p. 350.
Polysphara, Muls. & Rey, l. c. *supra*, p. 343.
Polysphara, Stephens, Mem. Brit. Ent., 1832, [1854 : Goss, Rech., 1860, p. 12.
Xanthochus, Muls. & Rey, l. c. *supra*, p. 344.

v. Gen.,

Japanica, Sharp, Trans. Ent. Soc. Lond., 1874, p. 8.
 Hab. India, Ceylon, Hongkong, Japan, Celebes, Am. Isles.
India, Motschulsky, Bull. Mosc., xxi (3), 1858, p. 237.
 Hab. India.

brunneiventris, Kraatz, Wiegum. Arch., xiv (5), 1859, p. 14.
 Hab. India.

castanea, Motschulsky, Bull. Mosc., xxi (3), 1858, p. 239.
 Hab. India.

croceipennis, Motschulsky, l. c., p. 238,
maculipennis, Kraatz, Wiegum. Arch., xiv (5), 1859, p. 17.
angustipennis, Herms., l. c., p. 17.
 Hab. India, Ceylon, Celebes, Australia.

denticulata, Motschulsky, l. c. *supra*, p. 238.
 Hab. India.

infumata, Kraatz, Wiegum. Arch., xiv (5), 1859, p. 16.
 Hab. Ceylon.

indistincta, Motschulsky, Bull. Mosc., xxi (3), 1858, p. 237.
 Hab. India.

insignitissima, Kraatz, Wiegum. Arch., xiv (5), 1859, p. 16.
 Hab. Ceylon.

mutata, Germ. & Har. Mun. Cat., 1863, p. 514.
tennicornis, Motschulsky, Bull. Mosc., xxi (3), 1858, p. 240 (nec Kraatz).
 Hab. India.

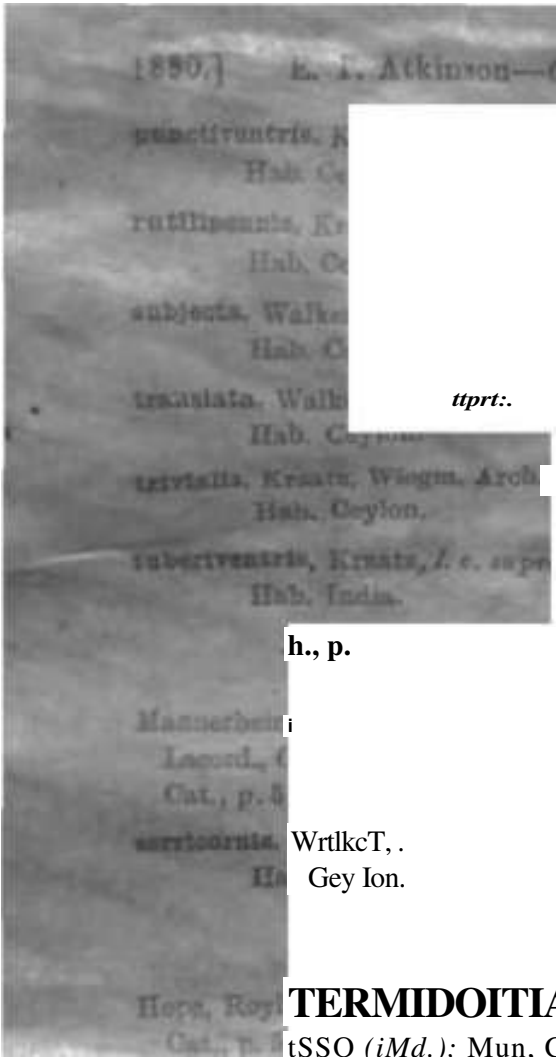
nigra, Kraatz, Wiegum. Arch., xiv (5), 1859, p. 13 (nec Stierlin).
 Hab. Ceylon.

postica, Walker, Ann. Mag. N. H., (2s.) ii, 1859, p. 295.
 Hab. Ceylon.

puberula, Klug, Ins. Mi., [1859] Gen. Staphyl., 1859, p. 155 : Wollaston Cat. Mad. Col., 1857, p. 180 : id., Canar. Col., 1864, p. 531 :
 Kraatz, Wiegum. Archiv., xiv (5), 1859, p. 16 : Rey, Brévip., 1874, p. 60 : Fauvel,
 Ann. Mus. Nat. Hist. Nat., (3s.) xii, 1895, p. 292.

Armitagei, Wollaston, Ins. Mader., Col., 1854, p. 559.
deceps, Aubé, Ann. Soc. Ent. Fr., (2s.) viii, 1859, p. 311.
duMa, Ktu. [1859] Gen. Staphyl., 1859, p. 172.

[1859] Gen. Staphyl., 1859, p. 172.
 son, Gou. Bta
 "V Atnci
 Java, Sumatra, New Caledonia, Australia.



xxr ft), l\$9p, T8.

Ij p. It). t. I,

tppt:.

1959, p, 53.

Genoa POUTJS.

h., p.

WrtlkT, .
Gey Ion.

TERMIDOITIA

tSSO (*iMd.*); Mun, Cat., p.
87.

Bab, C

Oenoa ACANTHOGLOSSA-

(aw. Krftata (:

Motsclmbky, Etad. Eat., riii, 1859, p. S'J.
Httb. Coylou-
iioteclitil&kyr I ?-, p. 1W.
Hah. Cej-ton.



MYRMEDONI

.

l.f. 8.

mm-

y, Bull* Mo

ll ri .

1

, «* CO* p.

.

,M
Hi

ffir
0.

punctatissima, Kraatz, *Linn. Ent.*, 1857, p. 52; *id.*, *Wiegman. Arch., l.c.*, p. 25.
Hab. Ceylon, Negambo.

pubripollis, Kraatz, *Linn. Ent.*, 1857, p. 51; *id.*, *Wiegman. Arch.*, xxv (II), p. 23.
—Hab. Ceylon, Negambo.

serraticornis, Kraatz, *Linn. Ent.*, 1857, p. 48; *Wiegman. Arch., riv (i)* 1859, p. 20.
Hab. Ceylon.

serripes, **KrwalB**, *Wiegman. Arch., l.c.*, p. 23.
Hab. Ceylon.

terniticola, **Westro**, *Ann. M no.*
Hab. Burma.

TETEAUSTICTA

Kraatz, *Linn. Ent.*, xi, 1857,
pollis, Kraatz, *l.c.*, p. 65; *Wiegman. Arch.*, 19, t. 1, l. 64-5.
Hab. Ceylon.

Genus PELIOPTEBA

Kraatz, *Linn. Ent.*, 1857, p. 49.
Ternitopora Motschulsky, *Ent. Ent.*, viii, 1859, p. 91; *Mun. Cat.*, p. 545.
adustipennis (*Ternitopora*), Motschulsky, *Ent. Ent.*, viii, 1859, p. 92, t. 1, l. 7.
—Hab. Ceylon.

minuta, Kraatz, *Linn. Ent.*, 1857, p. 46; *id.*, *Wiegman. Arch.*, xxv (II), 1859, p. 45.
t. 1, l. 64-5.
Hab. Ceylon.

epica, Kraatz, *l.c.*, p. 57; *id.*, *Wiegman. Arch., l.c.*, p. 12.
Hab. Ceylon.

Genus LXYPODA

». *Mannerheim*, *Brachyl.*, 1830, p. 60; *Erichson*, *Gen. Staphyl.*, p. 141; *Kraatz*,
Naturg. Ins., II, p. 408; *Faccol*, *Gen. Col.*, II, p. 85; *Jacq. Duval*, *Gen. Col.*, II,
p. 13, t. 3, f. 15; *Mun. Cat.*, p. 526; *Sharp*, *Trans. Ent. S. Lond.*, 1876, p. 63;
Leconte & Horn, *Class. Col.*, p. 92.

Acanthia, Thomson, *Skand. Col.*, I, 1859, p. 36; III, p. 11.

Besugera, Thomson, *l.c.*, I, p. 35; III, p. 12.

Buglens, Thomson, *l.c.*, IX, 1867, p. 245.

Cataraea, *pt.*, Thomson, *l.c.*, I, 1859, p. 33; II, p. 282.

Dasycoma, Thomson, *l.c.*, I, p. 37; III, p. 23.

Dicohara, Thomson, *l.c.*, I, p. 37; III, p. 30.

Mycetodrops, Thomson, *l.c.*, I, p. 37; III, p. 23.

Myrmecodora, **toti, Lie**, *Ent.*, xi, 1857, p. 46.

Podocys, *Muls. & Boy*, *Ann. Soc. Linn. Lyon*, (n. s.) xxi, 1874, p. 152.

Pycnarca, Thomson, **-SKQQ.** *Col.*, I, 1859, p. 37; III, p. 23.

Sphenoma, *Mannerheim*, *Brachyl.*, 1830, p. 63.

Tach **li n/i<f«**, **Muls. fit I** **-i. Soc**, *Linn. Lyon*, (n. s.) xix, 1872, p. 275.

Zilioboptera, *Tb jniaon*, *SUod. OoL.*, I, 1859, p. 37; III, p. 20.

E.T Atki:

.

Bftb,

niia HOMAIOTA

uoim, Bi

1

D'uRtrvtoi Bin-

uba, 1

148.

tf, I *H.*
Ami. Soo, Ai

66.

|

, *π*

Tra & Hey, f.cm 28, t. 1, £, 10.

MMtfMIUs, Kraau, Wieg̃m, 1

10.

.p^O

m **HI- Brit.** Elit., v, 1632, p. ain.



irtBin^i



D.

WJ
-a, K !. India.

QM. Mutfl.-lnilsky, Bnil. Mo
b. India.

Hab, Europe, 1 cr Hnrk Brand., i, , 185-
1 '0)>P-:
'.>piiM-, Ent., i

macrenata. Kraatz, Wieg. Arch., xiv (1), 1859, p. 22.

36.

Uoptera. Kraal p-30-

peregrins, i i.

; r,

glaiythetoides. MofcsohuUky. Bull. Mosc., xz 1S01, p. 152.

pyrena. Motschulsky, Lc., xxi (3), 1859, p. 251.
Hab. India.

putridula. Kraatz, Wieg. Arch., xiv (1), 1859, p. 25.
Hab. Ceylon.

rhyacoptera. Kraatz, Lc., p. 27.
Hab. India.

ruga Upnui
a.

scrobicollis. Kraatz, Lc., p. 21.
Hab. India.

spicidula. Kraatz, Lc., p. 28.
Hab. Ceylon.

suspiciosa. Motschulsky, Stud. Ent., 1859, p. 90.
Hab. Ceylon.

tenuicornis. Motschulsky, Bull. Mow., xxi (3), 158, p. 250.
Hab. India.

termitophila. Motschulsky, Stud. Ent., 1859, p.
Hab. Ceylon.

testaceipennis. MoUoIrolsk^ BttlI,|Mosc., x.Txi (8), p. 251.
Hab. 185-. Ir

tridentata, WJegm. Arch(1 acxr (ij, 1859, p. 31.
Hab. Ceylon* ^Ji

tropica. Motwholaky, Bull. MOM., xxi |, 1859, p. 259.
Hab. India.

tuberculata f K: AtcK, xiv (1), 1859, p. 32.
Hab. InOln.

tul«reullBolJls. Kraatz, he., p. 33.
Hab. Oeylou.



dlpb'

phna, I[^]ITCI, Ann, Soc Eot, Fr., (^)
«mmmAt», Kraut;, Wiegci. Arch., xxxy
■tt.
py»m*o«, Kiiuviz, f.c, p, 44.
•a.
?»)*.●**■ { .C, p, !

1

Hah. Oeyloa.

tmvm4sloollis, MotBobuhky, Ball. Mo^f
.. iadift.

indica, *KjmU* *u* **I**
Arch.. 18511 12
Hub. India.

Oeous **OLDJOTA**

*!•

: Mnn. Cftt. p. 6

a, Clus. -
r,i*oUor?Ga. 1851, p. ir»5 : Lucord,,
p. 155.
v Bej, >:
Mun

1

IS.

HYGBOPTERA-

XXIV (.

r., 1859, p. 87, I I

*Gem** GTROPHAENA.

*a,xxxi - Arch., IXv (i),
JS^y, p, 4S.

• c h . , xiv (i) I85J>, p, 18,

p. «(■.

MI II

May P. 6
1881. n

.30

iDimatura, Kraatx,

LS53, f. 47.

Uab. Ccjluu.

Qfto.)

Genus DrNOPSIS-

Oil

x , $V \setminus \text{-vra}$. $\text{Ar}^{\wedge} \text{li}$

n. At

enm LEUCOCRASPEDUM-

UK OTt

I XENEDUS-

HYPOCYPTUS-

Ha

fi&bCf, Kraau,

CIIFA.

221 E. T. Atkinson — *Catalogue of the Family Staphylinidae*.
[Suppl.]

livata, Motsch.
pygmaea, Kraatz, V Arch., xxv (i), 1859, p. 19.
Hab, India,
nigris, Stål
^ . (i), 1850, p.

ids*,
ky, Bull. Hist. Nat., xxi (3), 1858, p. 230.
<^tud. Ent., 1859, p.
84. on.
list of
Hulaant Be Rey, Ann, 3 . Linn. Lyoa, (a. 8.) xix, 1872, p. 54
; Ca
AMocli.. 2, t. 14-18: Fauvel, Facies. Gall. RIUM¹...
iii, p. (
WL Rat. S. Load., 1876, p. 15 j irf., Biol. CcnLr. Amer., Col., i (2), p. 2
Wplomatia), Kr<int?; ". 'i'^in. Atch., xxv(i), 1853,
p. Elab. Ceyl
Genus CAMACOPALPUS-Bky, Bull.
MOBC., xKii(3), 1858, p. 231, Maa, Cat., y. 549.
'c, p. 233, t. 1^f.
r.
Hab. Xadia.
flavicornis, y ^y, I.e., p. 233,
Hab. India.
alvus, Motschulsky to. t p. 234.
Hab, India.

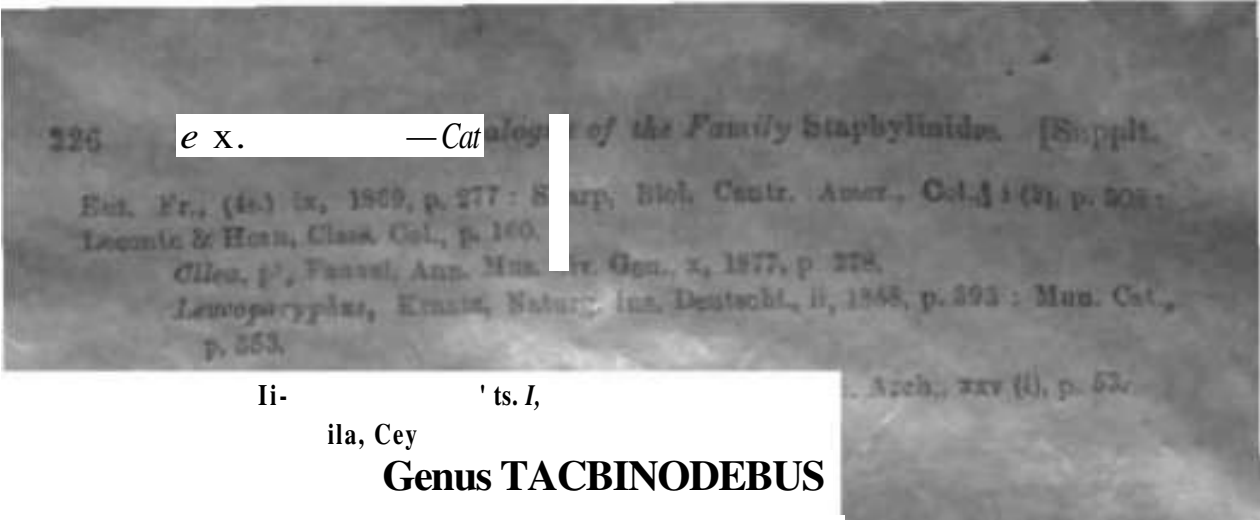
Germes PRONOMAEAE-

Schischou, KSfer Mark Brand., t, 1837, p. 252 : Laco^d., Gen. Col., ii, p. 45 : []
Naturg. Ins., ii, p. 364 : Jacq. Daval, Gen, Col^ ii, p. 20, t. 5, f. 24 ; MUH,
C p. 550.

Motschulsky, Ball. Mosc, xxxi (3), 1853, p. 22i.
Hab. India.
Motachulsky, I.C., xxxiv (;
Hab, Ceylon.

Genus MTLLENA.

UferM;vrli-Brand.,], 1337, p. 382 ; itl, Qen. fltaph., p. 209 i LacoT(3 L,
Col., ii, p. 48 ; Eraat*, Naturg. tna., ii, p. 387 : Jacq. Daval, Geti. Col., p.
2<\ t. S, f. 39: Mun. Oat., p. B50 : Fauvel, Aon. Mas. Civ. Gen., xii, p. 2B8 :
Sharp, Bioi. I titr. Amer., Col., i {2), p, 285 : Leconte & Horn, Class. Col, p, 9i,
Centroglypta, Mathews, Ent, Mag., v, 1838, p, 1&4.
Kraatz, Wieg. Ar<;h-, SIT (i), 1859, p. 5L
Halt). CeyloAi

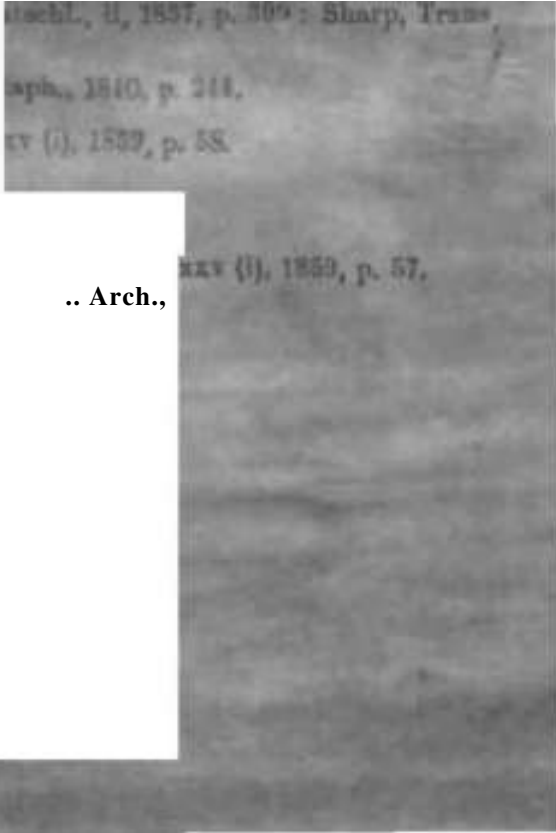


e x. —Cat

Genus TACBINODEBUS

3C.A xxi " : Mim.
Cat., p

ERCHOMCS.



oitfi!ma». U.

i (3). I65», p^{fi}

^proper

a»ta, Wi«

. SIT (i),

p. 281

1890.

T. Atkinson—Catalogue of the Family Staphylinidae.

237.

latus, Motschulsky, l. c., p. 219, t. 1, f. 9.

spectabilis (*Ceproporus*), Kraatz, Wiegman. Arch., xxv (i), 1859, p. 53.

Hab. India.

limbifer, Motschulsky, l. c., *supra*, p. 222.

tachyporeides (*Ceproporus*), Kraatz, Wiegman. Arch.,

Hab. India.

melanartus, Erichson, Gen. Staph., 1840, p. 252.

Hab. Bengal.

Wiegman. Arch., xxv (i), 1859, p. 60.

gm

«T {tl I8^f

Wiegman. Arch., xxv (i), 1859, p. 57.

Wiegman. Arch., xxv (i), 1859, p. 57 : Faarvel, Ann.

1859.

Wiegman. Arch., xxv (i), 1859, p. 81.

Wiegman. Arch., xxv (i), 1859, p. 921.

TACHYPORUS-

180G,

M

Sharp, L-

ol_u i (2). p. 311 : Lecom

ii. Helv., i, ISI[^]. p. 38tf-

;832_v p. 178.

pallens, Stephens, *l. c.*, p. 180.

pyralicrus, Stephens, *l. c.*, p. 180.

flaviventris, Stephens, *l. c.*, p. 180.

var. *albiventris*, Gravishurst, *Microp. Brunsv.*, 1892, p. 127.

„ *chloroticus*, Kolosetti, *M. Ent.*, 18, 1916, p. 13.

„ *stellatus*, Lacordaire, *Faun. Ent. Paris*, 1, 1855, p. 517.

„ *testaceus*, *Staph.*, *l. c.* supra, p. 177.

Hab. S. America, Europe, India.

Chrysomellinus, *Liban. Faun. Scut.*, 1746, no 555; *Id. Syst. Nat.*, ed. 12, II, p. 555.

Fahr., *Syst. Eleuth.*, II, p. 606; Olivier, *Ent.*, III (12), p. 36, t. 3, f. 23; Latreille,

Gen. Crust. Ins., x, p. 7, t. 79, f. 9; Kraatz, *Naturg. Ins. Deutschl.*, II, p. 471.

dupar, var. *n.*, Paykull, *Faun. Scut.*, III, 1800, p. 423, Sweden.

melanocryptus, Fahr., *Ent. Syst.*, 1 (2), 1792, p. 534; *Syst. Eleuth.*, II, p. 607, Germany.

medicatus, Panzer, *Ent. Germ.*, p. 360; Marshall, *Ent. Brit.*, p. 521, Britain.

Hab. Europe, [Ind. Mus., Pamir].

dilatatus Motschulsky, *Stud. Ent.*, 1859, p. 80.

Hab. Ceylon.*

evanescentus, Boheman, *Frag. Emp. Ross. Col.*, 1858, p. 26.

Hab. China.

Genus CONOSOMA.

Kraatz, *Naturg. Ins. Deutschl.*, II, 1898, p. 481; Horn, *Trans. Amer. Ent. S.*, vi, p. 146; Sharp, *Old. Centr. Amer.*, 1 (1), p. 213; Lacordaire & Horn, *Class. Col.*, p. 222.

Generos, Stephens, III, *Brit. Ent.*, v, 1832, p. 108 (*con. generos*); Erichson,

Gen. Staph., p. 216; Lacord., *Gen. Col.*, II, p. 53; Pandellé, *Ann. Soc.*

Ent. Fr., (64), 1st 1869, p. 272; Jaoq. Dural, *Gen. Col.*, II, p. 23, t. 9, f. 47.

Mun. Cat., p. 530; Payet, *Faun. Gall. Hém.*, III, p. 800; *Id.*, *Ann. Mus.*

Ch. Gen., xii, p. 286.

biguttatus (*Chenopus*), Motschulsky, *Bull. Mosc.*, xxi (7), 1858, p. 42.

distigma Kraatz, *Wiegand. Arch.*, xiv (1), 1859, p. 61.

Hab. India.

brevipennis, Motschulsky, *Stud. Ent.*, 1859, p. 82.

Hab. Ceylon.

ceylanensis, Kraatz, *Wiegand. Arch.*, xiv (1), 1859, p. 62.

Hab. Ceylon.

clavatus (*Chenopus*), Motschulsky, *Bull. Mosc.*, xxi (7), 1858, p. 42.

Hab. India.

stridula, Kraatz, *Wiegand. Arch.*, xiv (1), 1859, p. 62.

Hab. Ceylon.

stompenis, Kraatz, *l. c.*, p. 63.

Hab. Ceylon.

rufus, Kraatz, *l. c.*, p. 63.

Hab. N. India.

run

irTLOPFCRUS.

[^]ohiUsky, Bull. Mi ic, rxxi (2), iSGfl, p, 657.
dfe.

i»_t Mob-cliulsky, 1. c, p.
Bab.

r, ?c, p.

■m. Arch., -

Hab. I

3nus EURJPORUS

>_x Mark Brand,, i, 1837, p. ., ii, p. 8t>: J»<.*q.
Duv;il, Gen* CG1.» u> p-> ii Bora, Class, Col,, p.
^fn>rnt_t Kuidiaatui, SytnL

t*tus, Fuuv

UUQ., 11, 1B8J, i'.

Hab. Sumatra.

HETEROTHOPS-

111. B

Gen. 0

o. C

toll. Kli

>n. Mar;.

j, Biol, CentT, Amer., Col., I [i]_t p. 823 : * & Horn,
JtVi^h ', Notdmann . Mon. SUiph.j Ig37,

a, Mior BrunBT._t 1802, p. 125 : Kraal?., Nat. Ini, Douts

liwten Ann Mag. N H (3a) Ti
MotschlwlBky, Bull. Moan., xx , p. G50.
1852, Ann. d. Mus., 1852, p. 228.

Ins. SGV II i/rtti.

. Hon.

-

navicollis

quadripunctata, Grs

Deutschl., II, p. 18

Genus BOLITOBITUS.

Maauerhuim., Bmcbel., 1830, p. 18 : Stephens, III. Brit. But., v, 1832,]
' > uval, Gen. Col., ii, p. 27, t. 10, L 49 ; Hun,
r., (4s.)¹ ix, 1SG9. p. 279 : 0 1., i
(2), p. 316 : Lecimte & Horn,

ii, p. 57: Kraatz, V,"icgin. Arcli., *, Boisd. &
Lucord., Paua. Eut. Paris., i, 1[^] *Jithun*, Thomsou, Skand. Col., i, p.
47 ; iii. p. 71. 1359. *J&tgaercmis*, Stephens, IU. Bi-it, Eat., v,
1832, p, j

Bitldus, 1 :sty(Bi xxi (3), 1858, p. 215.
m. Arch., xxv i p. 63.

Genus MYCETOFORITS.

;htf., 1830, p. 62 : Erichson, Gen. Stapkj p. 231 : Miiklin.
»47 : Lacord., Gen. Ool.,ii, p, 69 ; Pandell[^] Aon, Soc.
fini

[. Duvai, Uen, Col.,ii, p 11, f. 51 : Mun. Cat
Sharp, Rioi. i 3*20 : Lecimte *be* Horn, Ola
p.]

r, 1832, p. 1C
-is, RecL., 1886, p. 14.

">}, 1858, t>. "215.

>. India.

^{^^} *T,nr*n*

sal,
Aua. ilas. Civ. Gen., xfi, p. 238 :

5.
;* I:- , Nordmanti;

Geuw TANYGWAXHUS.

Erichson, ESier Mark Brand., i, 1837, p. 417 i %d~t Gen. Staph., p. -2\$\$: I
.. Col., ii, p..60 ; Kraata,Natarg. Ins. Dentschl., ii, p. 4?7 : J;i
Col., ii, p. 29, t. 11, f. 5a : Una. Cat., p, 5G5 : Sharp, Trn
id., Uiol. Centr. Amer., CoL, i (2], p. 321: Lewnte & nora, Claw.
Ool.

fuscus, ixounz, Wieg, Arc!

ptceus

Motschulsk

pictus, Motschulsky, & c., p. 213.
Hafl. India.

Bull. Mosc, xxxi (3), 1858, p. 213.

859, p. 65.

·
-

,1*4

CYRTOTHORAX.

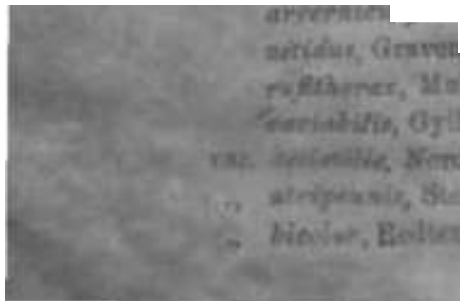
ciitr Ai

!Q.

Soc. Linn. Horn

, Fa Hab. Cothin
Cr

onus



- var. *erythrogastrus*, Melsheimer, Bull. Mus., xxv (3), 1854, p. 314. Burma.
sericeus, Lacordaire, Faun. Ent. Paris, i, 1835, p. 380. Styria.
fulvus, Scriba, Berlin. Ent. Zeits., 1850, p. 378. Fiedel, Fabeille, vii, p. 186. Hance.
fulvipes, Black, Verzeichn. Ina. Pissen, 1799, p. 116, t. 4, f. 4. Russia.
griseolabris, Zetterstedt, Faun. Ins. Lapp., 1838, p. 61. Lapland.
leucopneus, Stephens, Ill. Brit. Ent., v, 1833, p. 217. Britain.
leucodius, Say, Trans. Am. Acad. Sci. Phil., iv, p. 445. N. Amer.
fulvus, Fiedelmann, Fauna Ent. Transc., i, 1834, p. 127. Armenia.
maculipes, Marsham, Ent. Brit., 1802, p. 510. Britain.
nigricornis, Stephens, Ill. Brit. Ent., v, 1833, p. 222. Britain.
occultus, Lacordaire, Faun. Ent. Paris, i, 1835, p. 379. France.
ochripennis, Ménétrie, Cat. raisonné, 1832, p. 14. (= *quadripunctatus*, Thomson.) Talyk.
peruanus, Muls & Rey, Ann. Soc. Agric. Lyon, (4) 1835, p. 10. Peru.
vulgaris, Marsham, Ent. Brit., 1802, p. 512. Britain.
chrysiviridis, Stephens, Ill. Brit. Ent., v, 1833, p. 225. Britain.
cinereus, Rottenburg, Berlin. Ent. Zeits., xiv, 1870, p. 38. Sicily.
 Hab. Europe, N. India, Java, Australia, N. America.
pectoralis, Boheman, Freg. Eug. Ross., Col., 1855, p. 31.
 Hab. China.
spectabilis, Kraatz, Wieg. Arch., xxv (4), 1859, p. 64.
 Hab. N. India.

fecnaanaai

B

PALAESTRINTTS.

. Supli.

erythrocephalus (Staphylinidæ) Fabr., Syst. Nat., 1775, p. 265; Spec. Inv., l. p. 225; Mant. Ins., l. p. 230; Ent. Syst., l. (2), p. 623; Syn. Eleuth., ii, p. 593; Olivier, Ent., iii, 42, p. 12, t. 2, f. 9; Erichson, Gen. Staph., p. 651; Fausol, Tijds. v. Ent., xviii, 1875, p. 55; Id., Ann. Mus. Civ. Gen., x, 1877, p. 242. Hab. Australia, Tonga, Tahiti, New Caledonia [Fed. Mex. India].

insularis, Fausol, Ann. Mus. Civ. Gen., xv, 1879-80, p. 71. Hab. Sumatra.

maxillosus, Linn., Faun. Suec., 1746, p. 330, no 541; Donovan, Brit. Ins., iii, t. 55, p. 2; Fabr., Syst. Eleuth., ii, p. 592; Erichson, Gen. Staph., p. 348; Kraatz, Naturg. Ins. Deutsch., ii, p. 375; Id., Wiegman Arch., xiv (3), 1872, p. 68; Jacq. Duval, Gen. Staph., t. 13, f. 62; Chapuis & Card., Mém. Lige, 1839, p. 339, t. 2, f. 1; Men. Cat., p. 575; Fausol, Tijds. v. Ent., xviii, p. 53. [Fausol, l.c. says would make *ellipticus*, Stephens, the type, as *maxillosus*, Linn., is the most abundant of the varieties].

serripennis, Solier, Renthia, Ins. nach Linn., 1761, p. 17, t. 7, f. 49; Schweizer. Ent.

serripennis, Erichson, Gen. Staph., 1840, p. 343; Solsky, Bull. Mosc., xiii (2), 1863, p. 262; Karschewsky.

serripennis, De Geer, Mém., iv, 1774, p. 13, t. 1, f. 7-8, Europe.

serripennis, Eschscholtz, Bull. Mosc., xvi (3), 1842, p. 229; Solsky, ib., xiii (2), 1863, p. 262, Russ. America.

serripennis, Erichson, Gen. Staph., 1840, p. 343; Sharp, Trans. Ent. Soc. Lond., 1874, p. 27, Egypt.

serripennis, Villers, Verrucaria, Schw. Ins., 1775, p. 21, f. 10, or Casteln.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Fausol, Fausol, Ent. Paris, l. 1885, p. 165, France.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

serripennis, Linn., Cat. Ins., 1760, p. 123, 2, Europe.

. P. 31

.a, Chi

a LEISTOTROPEBS-

ΛΛΛΛ
H

B. T. ^

fi), 18U9, p.
68,

fa> 1-

\rcil
I. SftM.-

TBICHOCOSMETES.

.Ian. On

or,

ana ETJCIBDELTJS

itR, Wieg. Arch., x v (i), 1850. p, 70 p.

Tl, t. 2, ■

Eab, 3s

Gwm EHYNCHOCHILUS.

Sharp, Ann. Ma

aureua (St «), Pabt., W

Sy

ph., p. 3*4 i KVB;

>. Asslm, Si:i::', Oochloc

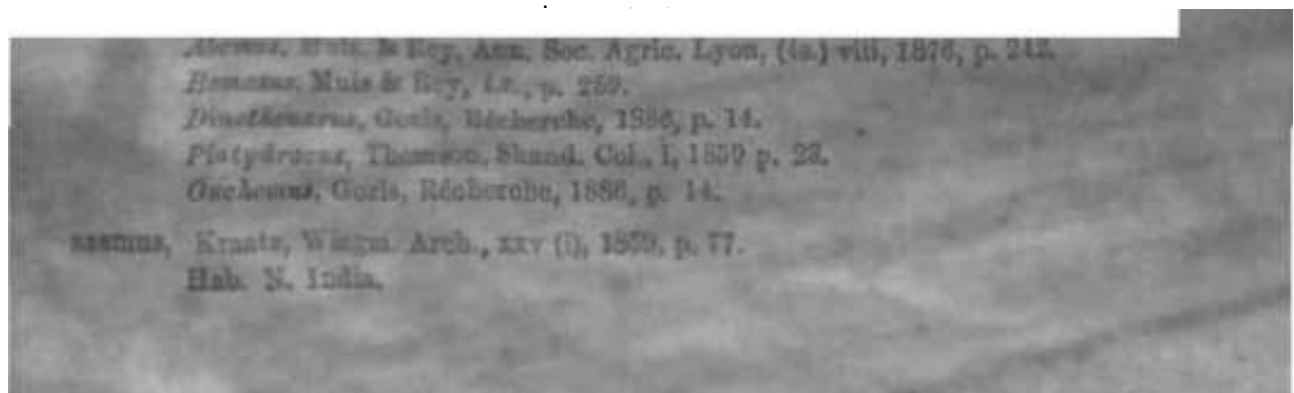
►.J20,D

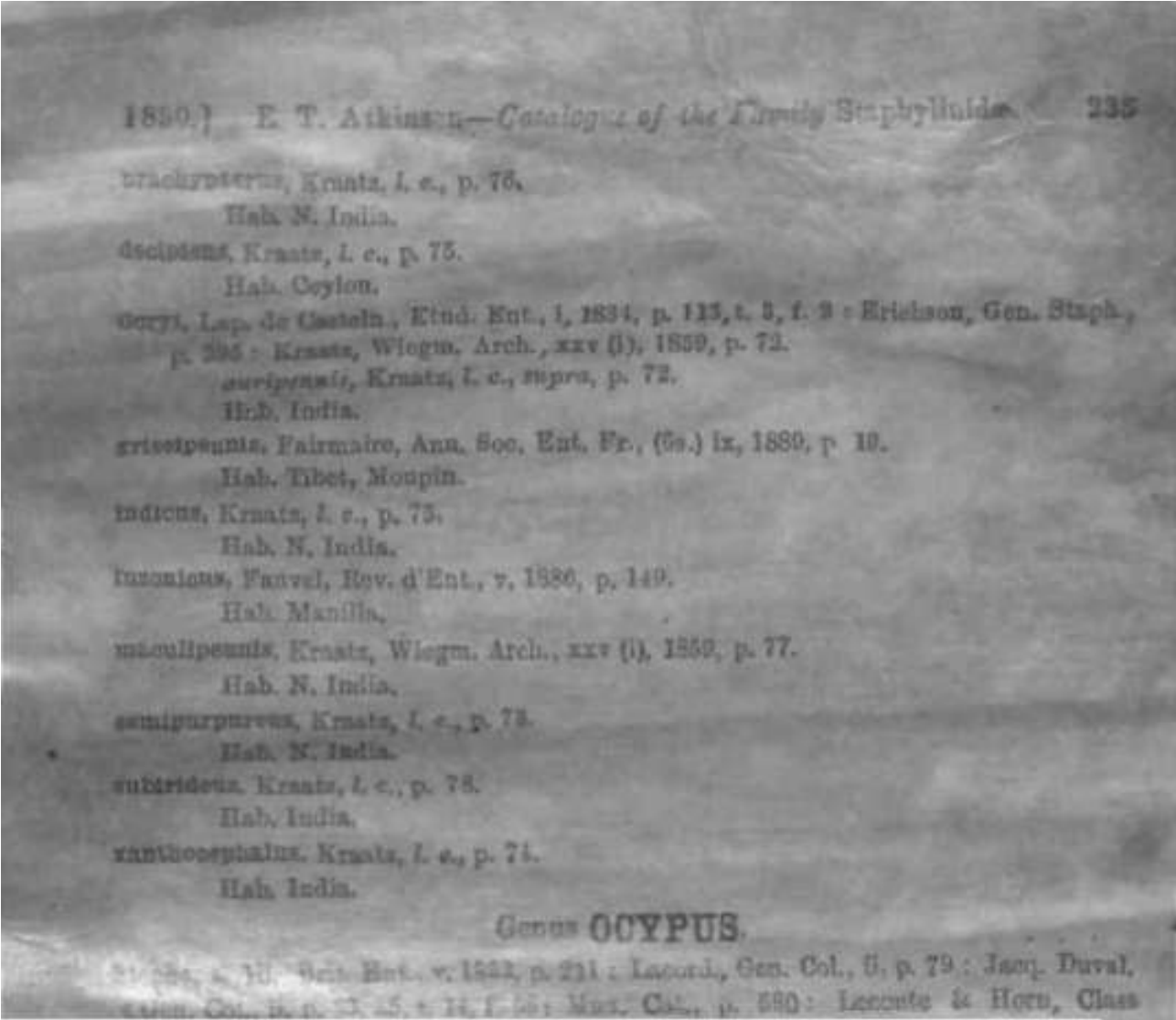
Hat.

'Tico, Btiia.-

Oenua STAPHYLLirUS.

it Kftt., (^ 12) ii_s 1767, p. 688 t\, Oen.
l., Ocn,





... p. ii.

Btit Eat., v, 1832, (

. Ana. Boa Affric, Lynn., (is.) viti, 1S76, p.

er, Ann, Mag. N. H., (3s.) U. 1358^ p. 2

Htib. Cejlon.

Uneatus, Walker, f, c, iii, 1859, p, 6L

h. Ceylon.

iMBipwun* Walker, t.e^ ii(1S58, p. 205.

Hub, Ceylon.

tranetllinea. \v; ;, igf,a_r p. 205.

cl, AHD. SOO. Eat,

, 1857, p.

Genue PHILONHTTS.

^r!V EL

^richsonG

:i., p, 42* : W

Qol., u,

'*i*)gm. Areli, xx» (ij

ii>.b. In

iMpdcci* Bofau&aa

CoL, 1853, ^

UB

^. c, p. 86.

HB

'ipp'u

Mm., Mtttree).

Beea, Col., 1858, p.

p. 587.

(2),)

1302, p. 170: ..

ii, p, 5

161 • Gei •

Ilxu

i

ib.

Mot, Ci

EUI

im.

L.

p. 80.

-xv (i), 1859, p. 95,

Uotsclmtslj, E'

Uklu*

venliv

111.

Uuoopjpw, Kraatz, Witgro. Arck, xxr (i), 1850, p. *HO*.

i. India.

leucotii

Brit, Ent,

Fauvci, Ami. Mus. Civ. Gfln., xv, 187"-30^ p-
101.

%, ia32i ^ 237 :

Fauvel, Faun, C;

, Awer-, Col.,M (2),

;>uUky, Boll. Mosc-, XXJ ,

llor. Sic. JSnt, ROM,, **jinati**,

Symh, M e,| p.

Wi«giu, ATCIU, saif (i). p.

^o.

rsrurtu, var. i.,

i* 183V

ASAOi i^uropCi St America, ■

^HU; Au^ti.'

'hts), MotsthuldEy, Ball, ilosc., sxxi (2)t 18S8. p.'

Eab. India,

luaonicos, ffaavd, Ann. iijo. Eut.

Be*. d'Eui

149.

Kab. Philippines.

mlOttUventriB, Buarp,

Hub, Japan, Ctiua.

Kraatz, Wieg. Arch., x&r (i), 1S50, p,

Hal*. Ccjlou.

79.ITiib, N. India,

Ceylon, Aunara, Phtlippi

i (*Gabrito*), MotschnL

I. Hose, iixi (2>, U

c, iwpro, p. 83.

I

■ OB, Siflin

ia,

PhQlppi

, Sharp. Jl. As. Boc. Ben.jxWii (2), 187§, p. 1

Tauir, [7:ui. Jsft<>,(typi

parvlMiiii Krimti. wisgr

II cib. Oejion,

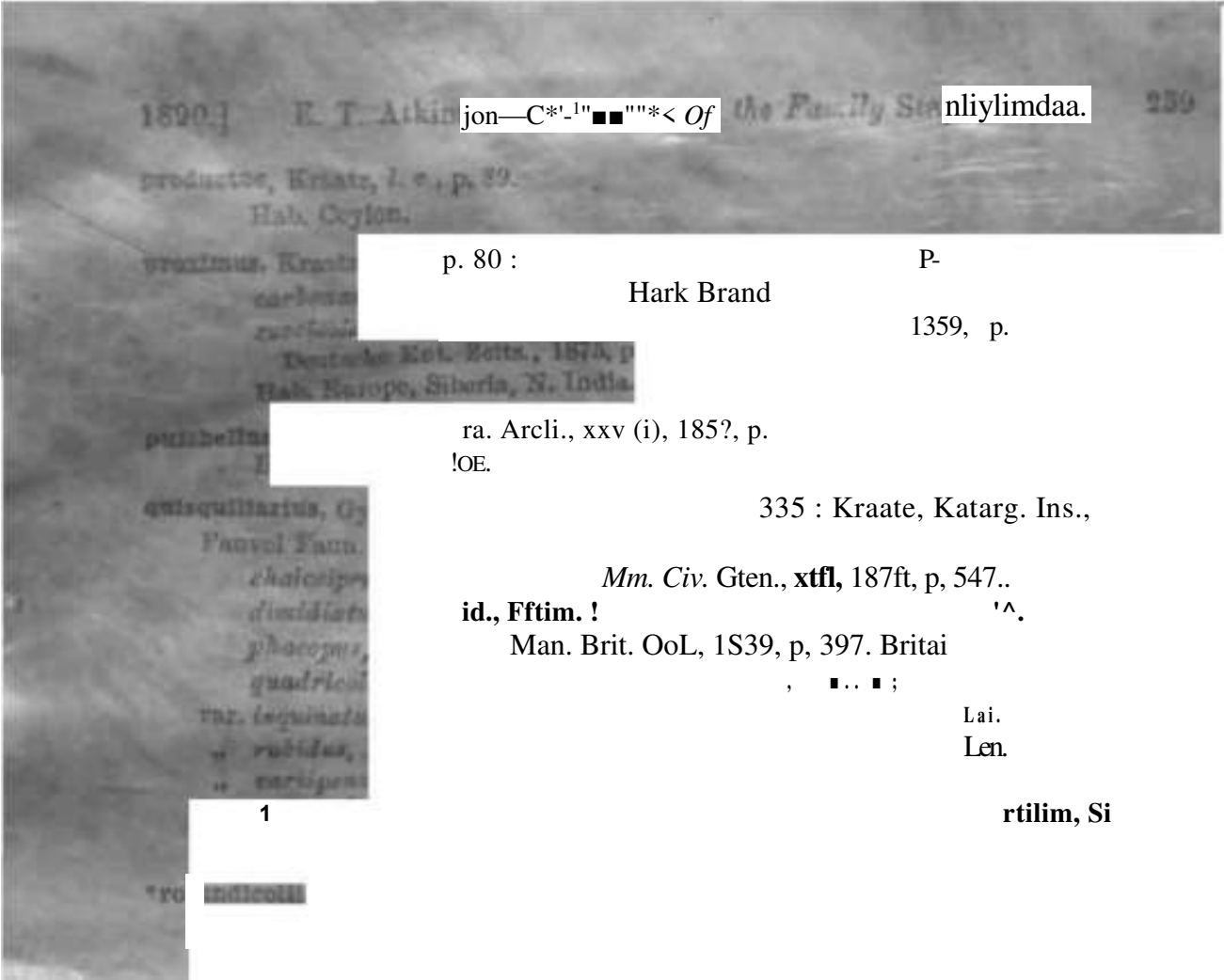
pedeulris, Walker, Aon. Mag. K. H., (3

61.

ciuttilbus, Kraal x, Wieg.

pellomerua, Kiaatz, WU 'nem. Axc.,

&xv



ymgm. Arch., xxv (i), 1859, p. 90.

•metlcolUt. iii,:
ll&b, Boraao, New
S, Sharp, Tn . S. Loud., U7i, p. 4S.
i China.

•Stollozkao, Sharp. Jl Asu Soc. 1 2), 1878, p. 170.
Hi: r/»<i. *Mutmi* typie.]

saHtUnu. Wieg. Arch., *xr (i), M59, p. 8).

^ajaiTitn • Fr. (2a.) viii, H 316 : Kraat

r. A >
,is:-

dni
Km:.i/, TT i

i* CAFITJS.

.Has (PUilnnthvt^ Kraatz,
WiejjnL. Ajeh., w
>IUs(iiemnu, Freg, Eug. Tieaftj *lB5H_t* p. 31.
.iftTp, A;

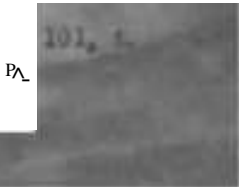
ana ACTOBIUS.

LEUCITU&

•m. CV1. Jlier., lSOfi, p, 00 . Ericl
{i.94 note ; Fmivcl,

PACHYCORYNUS-
Cht.,j

, Bull. Host, *xxxi* i. . t. 1, r. *
c\$fi-ent /iti* [*LJolit&HwrpItus*)! Kr&ftt£. ^Yicgm. Arcl^, x&v *l*}_M IV
2, I, 6 o-c.
Ua'j lu'.Ut, Ceyloa, Java. Arn Islaada, _ ^ ^ |



LONUCHt]

ifcratn .

a. Ai

a

TBAPEZIDERUS*

'Ion.

nlnc toe

ipli., 18'

WiegtiLArch.,5:

ab.

i_t

242 E. T. [redacted]—*Catalogue of the Family Staphylinidae*. [Suppl.
Deutschl., p. 642; id., *Wiegum. Arch.*, xxv (5), p. 105; Jacq. Duval, *Gen. Col.*
Eur., II, p. 22, t. 12, f. 57.
angularis, Kister, *Käfer Europ.*, p. 12.
pyropterus, Gravenuhart, *Mon. Col. Micr.*, 1806, p. 102.
var. infusoides, Kister, *l. c. supra*, p. 12.
Hab. Europe, Ceylon.
hongkongensis, [redacted] Stenbacher, *Reise Novara, Col.*, 1868, p. 28.
Hab. Hongkong.
inclinata, Walker, *Ann. Mag. N. H.*, (3a.) II, 1859, p. 51.
Hab. Ceylon.
laticops, Eschschon, *Gen. Staphyl.*, 1840, p. 308; Kraatz, *Wiegum. Arch.*, xxv (5), 1859,
p. II.
Hab. Java.

ulsertrnuis ••.; • ■; ,xxv (i), 1859»p. I' ■■
punctu
De
18
; : Be
1832, p. 255, Britr.
irmce.
-, v;.. .. liruaa, .main.
■odr.. 11
■!9, 111, Brit. Eut., v, 1832, [i
HA.

MITOMORFHUS-

..iroli., ssv fo, 10S: M
ndicus. Kr
Hab, India,
nigrona»U8, Kmnt/,: ' . <■., p.
Hub. C"

•u* LEPTACINUS..

I, I, 1837, &>isd, k
*] « : ! . . ■
.. Arcta.j xxv (i), Vi.
10 .
187S,|
.. Ct»<*t Oct., p, *
Weichau, Käfer Mark
Isacrl., Faun. Ent. I
535 : Kraatz, Naturg
Duval, Gen. Col., II, 1
Ann. Mus. Civ. Gen.
Biol. Centr. Amer., G
Leptacina. Kraatz, *l. c.*, p. 111.
Hab. Ceylon.

rra.

- l* fci
M

-nua SPIROSOMA.

an.

MSTAFONCTJS.

, p. CM : M»n- Cat., p,

flu. *xx?* (i), 1659, p. 108.

XASTHO:

853, ft *ij** - M ::: Cat

1 **DIOCHUS.**

p. 300 : Lacord., Gen- Col. ii, p. 65 : Miin.
Ul. lihfir., p. 385 : Sharp., Tranf. **Eat**, 8. LontL, 1
id., Bid Amer.^Ool., i (2), p. **4C0** : £i Horn, Olaa.
(

if, ilyr. Bull Mosc, x«i (2), 1858, p. **657**.
hulalcy, Bui /f'. , p.

wn), Dlotsbat&y, Bull. Mosc, /.<?. , ,
mtz, Wiog ■ 'i.r xsv (i), 1859, p.

ctipenn: .M-II y, Bull..¹



Genus **PLATYPROSOPUS**

Hannerhalm, Brachid., 1835, p. 35; Lacord., Gen. Col., ii, p. 63; Man. Cat., p. 978.
Sharp, Trans. Ent. Soc. Lond., 1876, p. 161; Gt. Brit. Centr. Amer., Col., i (2),
p. 783.

status, Esuvel, in *Rev.*

indica, Kraatz, Wiegma, Arch., xxx (1), 1859, p. 111 (cor. Motsch).

Hab. N. India, Salibganj.

fuliginosus, Erichson, Gen. Staph., 1849, p. 425; Kraatz, Wiegma, Arch., xxx (1), 1859,
p. 115.

orientalis, Motschulsky, Bull. Mosc., xxi (3), 1856, p. 312.

Hab. Bengal.

fulvicollis, Motschulsky, *loc. cit.* p. 313.

tamulus

LATHI

Geyrenhorst, Mo

Gen. Staphyl.

Ent., ii, p. 4

p. 235; Hoppel

Sharp, Trans.

Lacord. & Ho

Bathra

Glypta

Glypta

Lebea

Notula

Threba

Typula

chinensis, Bohm

Hab. S.

tractatum, B

Hab. S.

LB.

1
-M. V,

Genus SCIMBALIXTM



roVomorphHtj.

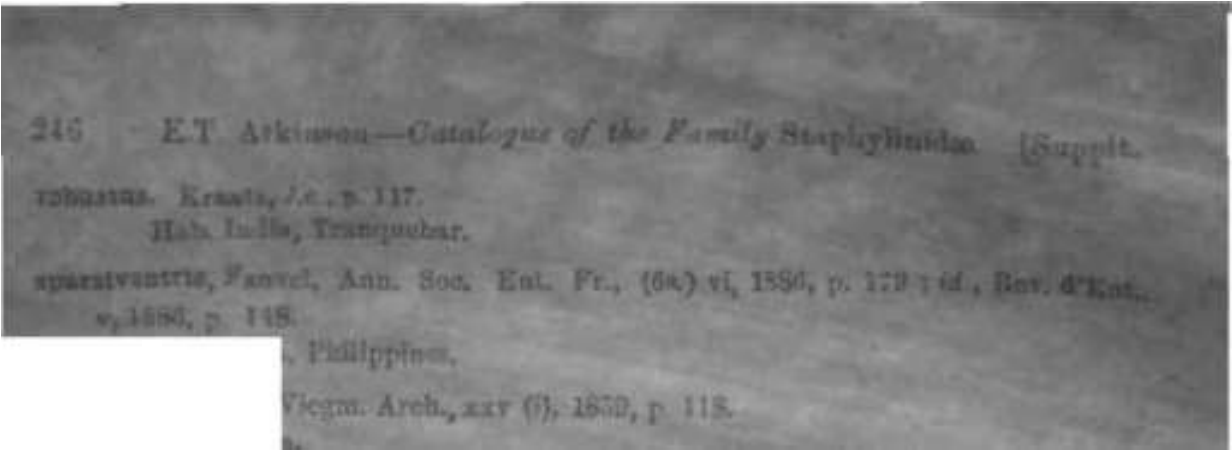
Genus CEYPTOPORUS.

Bull. M<*
Cot *

India.

Gimui, DOLICAON.

Lieu



lift!

ranncrheim.

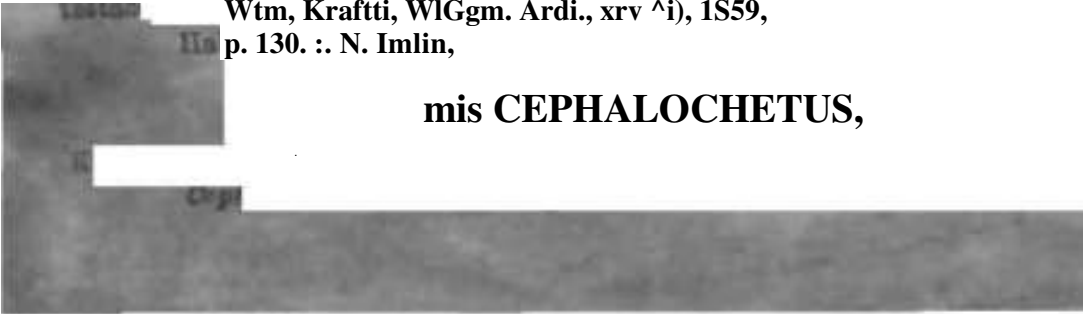


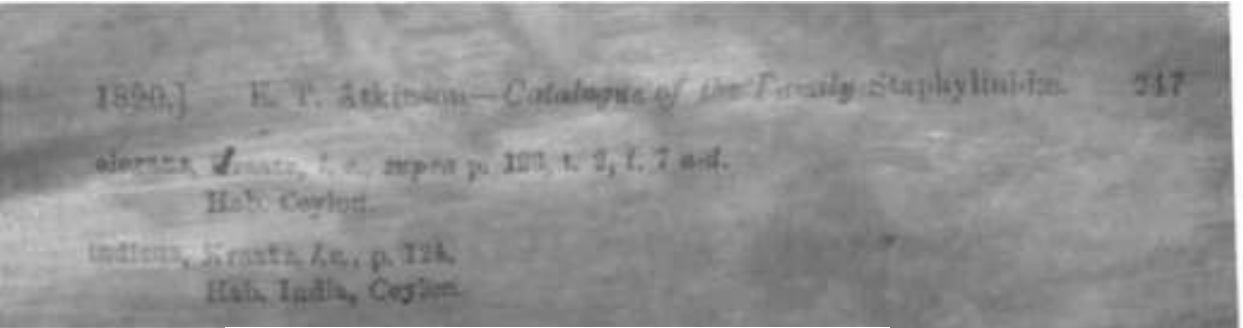
ccyiaaenw, Xrwitf;, Wiegman Arch., s*v
(i)

-FHT.

tnm. , xxv (i), 1859, p. 121.
, Indin.
tnar«Uw,tin -ky, Bull. Mom., xxxi (2), 1855, p. <•
limb. IJ;
, Motachulfikj I.e., p. •>
Hall. India.
a. Arch., SXT (i), 1850, p. 118.

tar.-Ue,M i, Mosc., xx^i (.:





.us PSILOTRACHELTJS

iegia. Arch., xrv /i), 1 1£* ■ "



jus CALLIDERMA

i

J, i. i.

ua STILICUS-



nylon.

Wbttlskj ^xsxi (2), 1868, (,,

nns SCOPAETJS

ricl.

aan. G^il.

oi, p,

, Cft>
Motschoiskjr, fiuLL jfosc # xxxi

|

IfttfUu, Krr>t
U; a.

123.

i .viv Fhittppi

Ocleljca. Phi

i>, ii

•

HAI

Genus

i. *U* *, Faun. £r 1\$\$?.
vtTal, Gen.. I

tkntntmu

OaUt

alllr.' I

12,

dim
HCULfi, *I.* *c.* 137.
Ceylon.
raatz,

-,uT Ca". atler.. 1«'.;. t,. MelCDA,r
:UySa.(iii_r p. 3^2, L i , f . 8 i *id.*, Aiui. i! u.,

tktj, Bull. Mo8C, xxxi (2), 1858, p. *6ii*.

A«, Lynch Arribals , BoleU Ac-tJj Oarda!/a, vii, **1885**, p. 2
Hfte*U'. Iuiiiea, United States, T vlgwift. Cape Veid, Ma
Persia) Bijtm, Japan, Aostralii, l^Tcw O^

MotscUuisky, Bu' , *xxi* (2), 1858# p. **645**.
ПТТ< fob., ijtv (I), 185D, p,
Hab. India, Ojlon, Uoraco, Oolebe%

errtiroptera. rtetnm. & Hiu:..# Mun. Cat, p. 62*.

Kttiafe («<w Motsch.j, Wieg. Arch., IXT (i), 1859, p. lag.
y)oa, Oelebe*.

. MoU)chu!«ltT, Bu". Mosc, xxii (2), 1868, p. 643.
Hab. Ir

*Hab.



em.

•

. no;
K

palliaa,
lriana, n*t>.

igm.

.repe, Oeeanla. Cvnit. A»w
i t
., xxv(i), 185&, p. i

, p. UOt

Ann. Genus ISOCBILUS.

Aiag/jS. n , (<>s,) iii, IS89, p. 263. •» ' kari*), Ers&tz,
Wicgm. Axck, xxv (i¹, 185?, p. 154 : E

GeuuK THINOAHEIS*
p. 623; Bh»rp, Tnuu. 1 254 : Fauvcl, Ann, Mu»

OPSI

wfc , «* (Or
1*&-

v*. B

P

Eta

x Krart
TRah. C

tz, /. c, p. 14S.

Genoa STYLIDERTTS-

ritlll. JIotFC, XXX

■ ■. O«

ttrtconw

Qen^is NEOGNATHUS.

« SONIUS.

[32, p. 27."? : Er-

R
ORI

Staph . p. 637 : **Laoozd., Qea.** Col
 \ f. S3 : Muti p, 6J8 : ' Fair

Rh^n., iii, p. 292 : *id.,* BioK C«

i., Col, i (2)_r p. BM, ftfl : Lciontc, it 1

Ajtfctiut, .iiis., i,

"Recherclie,

*JtfeCifitfutitA-u**, *WaUzitou.* Ins. Mad or. JS.J-*, r

*8t*nid***, Motschul^ty, Bull. Mow., i 58, p. fi

ttt*, **nUty**, Bull. **Mows.**, /e., p. 6

■«■.,, **xxi** (2), 1S5S, p.

m Arch., IXT {/\ 1858, p. I■>
., tndia, Crjlon,

g

tnniM, K'j'aaU, i

Hab. Ceylon.

oculatas, Sharp. **XcM&** Wni. S, I

Bab. China, Ji;-

'al\6r, A-lj.

C«yloQ.

trinotatas, Kraats, Wieg. Arc/

b. Cejloa,

Ueniia PAEDERUS.

r,j pt, By«t Em.

ii, 187S,

I

u», Otvuiior, Ann. AXJ. 1

T, Ann. Mag. N. H. (SsOJ ", 1851*, p. 1^

Eah. Ceylotu

tjnpUcoUta, KtAat.7., Wieg. Arch, xsv (ij, i **p. 16a**

Hub. Ceylou.

Fansel, Bull. Soc. Wnn. Norm., i, <ryan<> ■.'<*>ft a llt>, Baci', tlfir., Ann.

Hali.

tiptoes.

148.
J VI, 1889, p. 107 (acc
182 : Kraats, Wieg. Arch., xiv (i),

Bull. Mosc., xxxi (2), 1858, p. 634.

Philippines.

Stephyl. p.

(i), p. 151.

Bengal

MTictltimann, Z00L M«^..t ii (i), 1823, p. 113: Erichso»,
O«a. Kraali, "W! **Hab,**

malampus, Erichson, Gen. Staphyl., 1840, p. 555: Kraatz, Wiegum. Arch., xiv (3), 1860, p. 153.

Hab. Java.

maculipes, Curtis, Brit., Ent., iii, 1834, t. 108: Stephens, Ill. Brit. Ent., v, p. 280: Fawcett, Fauna Gall. Rhén., iii, p. 377.

zebrinus, Gyllenhal, Ann. Soc. Ent. fr., (4s.) 1861, p. 393.

edax, Sharp, Trans. Ent. S. Lond., 1874, p. 75; Siam, China, Japan.

longipennis, Erichson, Käfer Mark Brand., i, 1837, p. 517: Kraatz, Naturg. Ins., p. 723.

pergriseus, Erichson, Gen. Staph., 1840, p. 555: Kraatz, Wiegum. Arch., xiv (3), 1860, p. 153; Blanchard, J. Soc. Ent., iv, p. 55, t. 4, f. 10: Kraatz, Wiegum. Arch., xiv (3), 1860, p. 153.

capensis, Graenicher, Misc., 1897, p. 65.

Hab. S. Europe, Caucasus, Africa, Madagascar, Persia, Indian Valley, Ceylon, S. India, Ceylon, Siam, China, Japan, Annam, Cochinchina, Sumatra, Java, Lombok, New Caledonia, Philippines (Ind. Mal. Indian Valley).

intermedius, Rohdendorf, Pres. Ent. Soc., 1895, p. 22.

Hab. Philippines, Manila.

javanus, Lap. de Casteln., Rend. Ent., i, 1851, p. 123: Erichson, Gen. Staphyl., 1840, p. 555: Kraatz, Wiegum. Arch., xiv (3), 1860, p. 153.

Hab. Java.

malampus, Erichson, Gen. Staphyl., 1840, p. 560: Kraatz, Wiegum. Arch., xiv (3), 1860, p. 153.

Hab. Java.

mixtus, Sharp, Trans. Ent. S. Lond., 1874, p. 75.

Hab. China, Hongkong, Japan.

pittiferus, Motschulsky, Etud. Ent., viii, 1859, p. 74.

Hab. India, Tranquebar.

pallidus, p. 74

Hab. Pen. Malaya.

rufooxia, Kraatz, Wiegum. Arch., xiv (3), 1860, p. 153.

Hab. Ceylon.

rugosus, Motschulsky, Etud. Ent., viii, 1859, p. 74.

Hab. India, Nilgiris.

taeniatus, Erichson, Gen. Staph., 1840, p. 555: Kraatz, Wiegum. Arch., xiv (3), 1860, p. 153.

definis, Kraatz, l. c., p. 151.

Hab. Singapore, Ceylon.

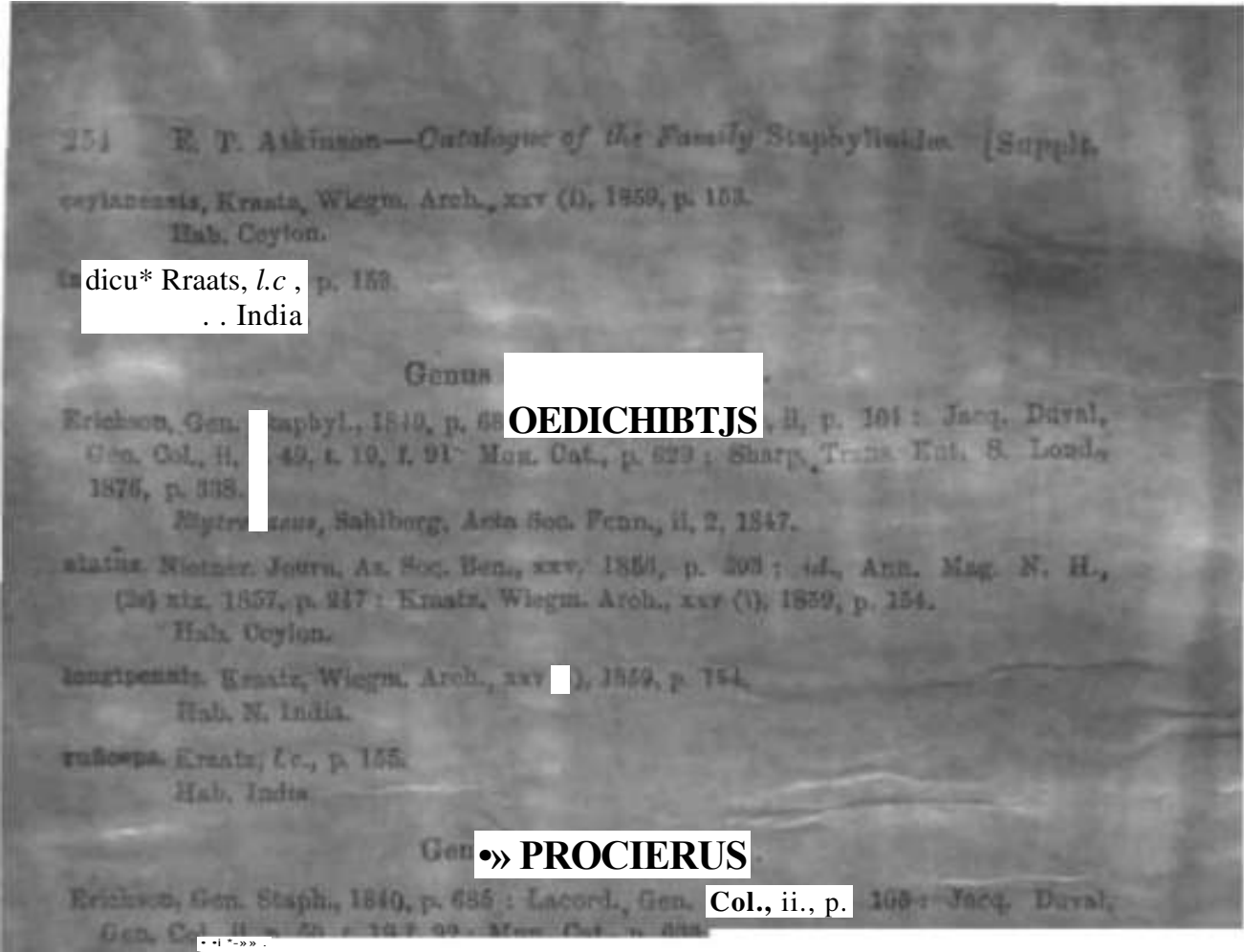
varicosus, Kraatz, Wiegum. Arch., xiv (3), 1860, p. 153.

Hab. Ceylon.

Genua PALAMINUS-

Erichson, Gen. Staphyl., 1840, p. 555: Kraatz, Wiegum. Arch., xiv (3), 1860, p. 153; Blanchard, J. Soc. Ent., iv, p. 55, t. 4, f. 10: Kraatz, Wiegum. Arch., xiv (3), 1860, p. 153.

MO; I; 878, p. 25: Hon), Class. ' "J.



fe... ■■■. !<Tv; N-^U 'S^i V'- 324, D0tc.

HUB PINOPHILUS-

. p. 102 : Jk'

'.. C

, C1«B«. CoL, p, »9.

. 1337, p. 7ft

Knwta. Wiegman. Atchb._r *ixv* (t), 1859, p. I
H»h. Ceylon,

Km. r^o.
Oeylon.

K:: hflon. Gen 1840, p. f!72 : Kmats, i. a. w\$*r*«
*_ -ohoUbi ., m (i)_r 1857, p- B

...

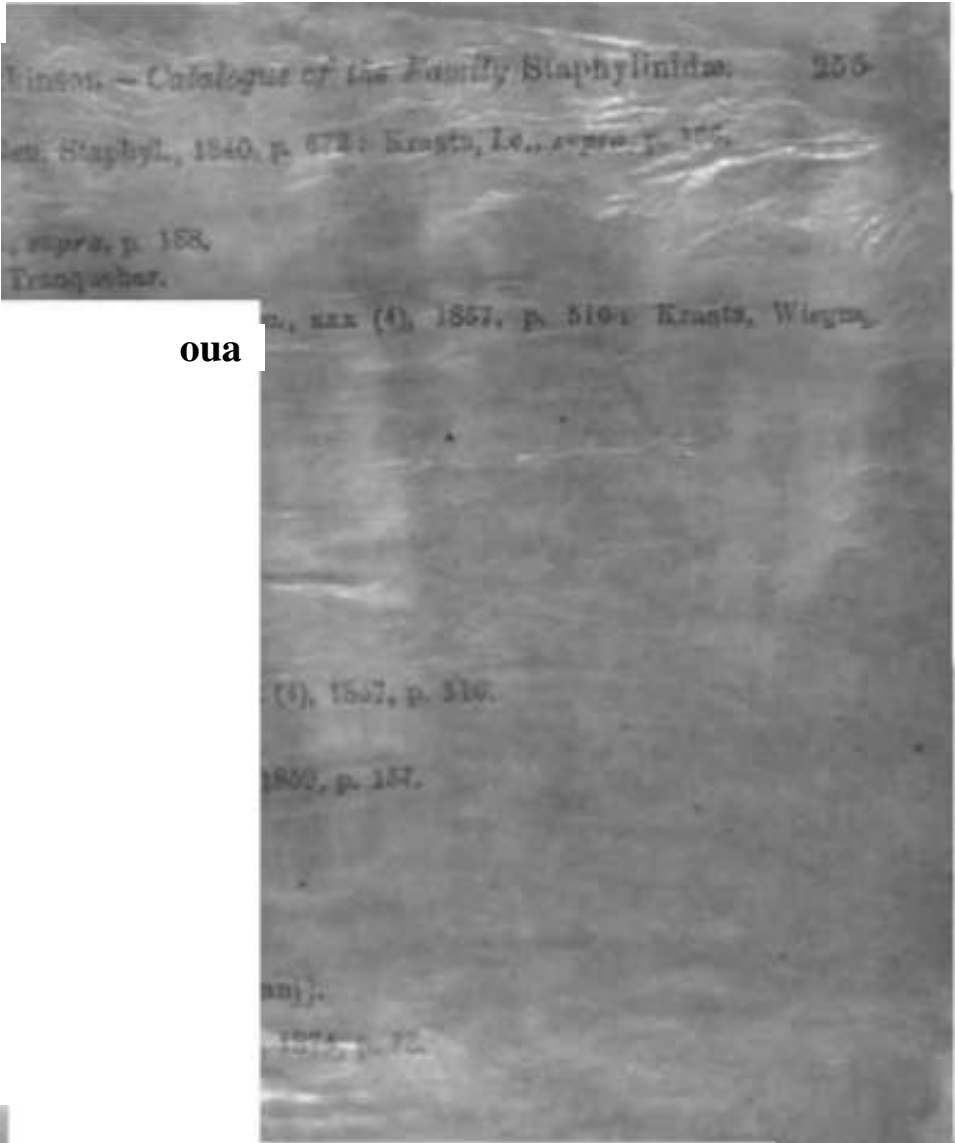
K X

■RH

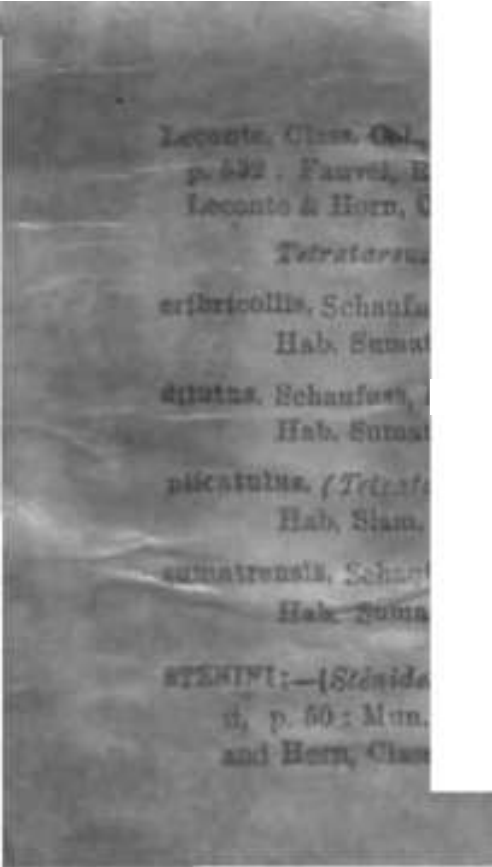
refcundko

ru

V



oua



EBAPHTJb

Clusa. i,
Ball. Brc

Nuna,
Eat, EoEi, xil^ 1S37, p. 109.

PMI.8Umir'

HOT. J''nt,

lin. Mu



Genus

Sharp, Trans. Ent. S. Lond., 1874, p. 69; id., ib., 1876, p. 356; Biol. Centr. Amer.,
Col., 1 (2), p. 610.

■ Japan.

i«, Prdcis caract, In-p.

107

Auo. .S

77:

STENUS

tut, O*»r, Ret

aauminatus, Krast-

n. Arck^ x^i P'ij# 1^59, I>- U

B, Nietu

.b. Ceylon.

Kraatx, Wicgm. Arch., nT (.

-lj.

»«J_r

Motwibolsky, t,e, infra, p.

51 , lia.

otaroa. Kraut*:.. Wiegln, Arob., XX7 (

, Motscliulsky, Ball. Mosc, ±Ja-(4>, 1857,

Kraim,

(i,#p, 162.

Ilab. tudla.

Sharp, Tranii, Erit. S. LouJ.. 1874, pw

85. Eak Cbiua, Japan.

■lUtt, otmidqr, BuH.

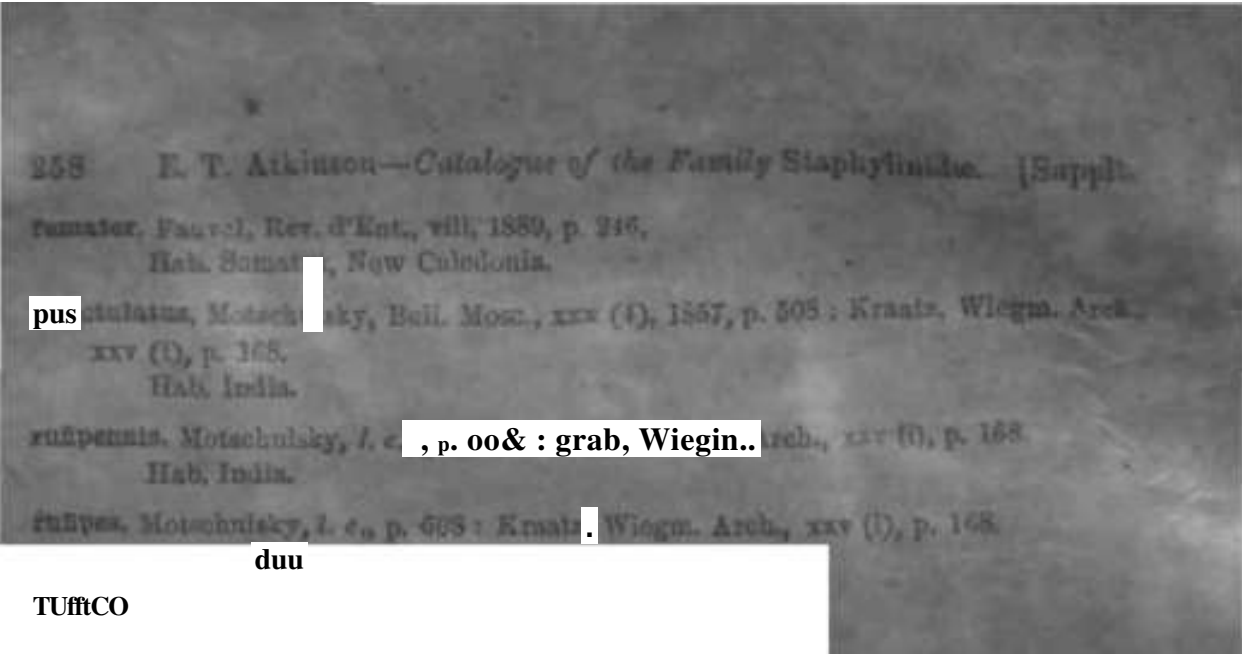
r

cylindri ns, M

,,, ,, , w

MI). «

p.



, E

HOLOTEOGHUS.

Genus BLEIDIS-

in, Br»cb61. 1830. p. 44 : SU,
; L»fKjr>.l, Gfiu p. Ill : Ja
100 ', MUD, Oat., p. '■ .as. fflot.
S. I. ite & Horn. •it'opt, TUomsoQ,
SbaucL CoS., i, p.

Bar\$n.
percphi.: ■

3X7.

. Krwta, WiepiL Arch., x:
Hab. IL<

1801, p, 5SG : Ertchgon, Qfja. S

, I.

*), Krantr, Wicgto, Acch., ssv (

of tiie Jfti

iccr, Ji l. Soe.
2H.) *xix*, 1857, p. 3S
Ha: a.
jltus, Motfichulsky, Ball.
Hab. ITI
4>Utferus, Jlotschnlsky, U- : Kran wjjru, ;
.. India.
joloJier, Mitschul 1859, p.
rugicollia, Kraatz, Wic_{gm}. Arch., ^xv (i), 18-^f p. I
lliih. India.
Trans. Bat. S. LomL, 1874, p. SO.
Hab. K-inkiaag oa 5"angtso, Japan.
tricarinatu *m^ra*, p. 164.
jes. Fftuvel, Rev. d'Bnt., v, 1S86_f p. *lid* : Ann. Soc. Eat- Fr, vi,
18?ft.
J79. Hab-
riilippineg,
h lu-a&tz, W , yxv (i), 1859, p. ifi2,
Hal

^ ^ ^ ^ ^

.LOPS,

hflon, Geu. .T. .vph., 1840, p. 751 : LacorcL, Geo, Col., ii, p. III: Mun, Cat-,
p 641 : Sharp. Trnna. Bnt. 3. Loud., 1376, p, 378; *id.* Biol, Ceutr. An; : C2)_t
p. 667, 668.

18

Waterhoase, Anil. Mag. N. H_M (5s.) xit, 1SS3, p. 336. Hab.
Java.

DXTTELINI -(*OxyUii&et*) Lacori., Oen. Col., If, 135*. p. 109 : Jacq. Dav;il. G
Col., ii, p. 54 : BLu^ Cat., p. 641 • . Ana. Mua. Oir, Oen._t xii, p.
Lecoute & Horn, Class. Got., 1883, p. j

Geuna OSORIUS-

■*ti*. Nut., 1325, p. :ie Aaim . iv, IS *u'u*
■tftph., p. 753 : Lacowl p. 112 : Mnn. I *vsej'*
An Civ. Gten.i stU, 1878, p. 209 : Lecont^, Tram. Araci.
Sharp, Trana. Bat. S. Urnd., 187?, p 381; *id.*, Biol. Cenfer, Amor., Col., i (2), p>
Kolosoina, Say, Trans. Atner, Phil. Soc, n. s., iv, 1834, p. 462,
oorupacttts, Walker, Ann. Mag. N. H-, (3s.) iU, 1659, p. 52.
Hab. Ceylon.
jrdieollis, Fauvcl, Notes LeyJen Miw., iv, 1882,

c? (i), 1

J, . .

.xoaiatn

iai, s>

naa PLATYSTETHUS.

'

teg.

. M

il. Mouo., Jtxx (-1), 1

OXYTELr

ibo

. Alkiciron—C

'Jen. StaplL, 1840. p. 1

Suranum, Java, i

rxv(Q, 1858

liab. Cejloa.

Kr. Hob.
Ceylon, India.

e.

Hab. Ceylon,

toctm sciulaky, Boll Mosc, SSJ (4

lauaaaiins. 1-

.'.>. Cej'Ion,

undue

1!

Hub. Cejlou.

altldttlaa, Gi

Kraata.

ii? p. S60.

angnttatm,

'. T, 1832, p. 320. Britr.

pw^f^ScL

. Ina. Ai

Austria.

Faun. 6

8w...

rvjicrus.

TM*praf]*

Britttia.

Suy, I cans, Anwr. 1

1834, p. £60. K^r

viii, 1359,1

prwJoctus, Wilktr. Ann, Mag. JT. EL, (3«.) ii, 185\$, p. 81

TI»b, Ceylon,

r, Ktftatas, WJ^gm; AWh., xsy(i), 1859, p. 1. Ua.

Krantis. /.*,, p,

I

li;

B,

nitnplt-

S5&, p, J

sparsu

iif K&P& TL

THIJfODROMUS.

U«u» XEEOPHYGUS.

ifrm. Anrh., xxv (0, 18W_t p *MutL* Cat, p. i
Bull Moao.> sxjdir (i), 1 143.

(y (4), ltJST, p. 505 : K&

Genu« TROGOPELOEUS-

: Erlichson, U«o. Sfeapli.,

P

Carpenter, Carpenter, Ill. Fam. Ent., v. 1882, p. 321.
Ternstroem, Mannerheim, Brachel, 1830, p. 40.

Gen. Qol. iiy j>.

LacorU.,

262 E. T. Athinso **u—Ca** *atalogue of the Family Staphylinidae*. [Suppl.

exiguus. Erichson, Käfer, Mark Brand., i, 1837, p. 564; Krantz, Naturg. Ins.,
p. 577; Fauvel, Faun. Gall. Rhén., III, p. 187.

depressus, Doal. & Lacordaire, Faun. Paris, i, 1855, p. 457.

Hab. Europe, Cameroun, Japan, Sumatra, Java, New Caledonia, Australia,
Zanzibar, W. Africa.

foveicollis. Krantz, Weigum. Arch., xxv (9), 1859, p. 180.

Hab. India.

tndlectia, Km,

B, K«w Cslwlonti, Philippines.

minimus, K

Hab. Ceylon.

scabrosus, Kruto, .v;., p.

Hab. 173. . Ir

stamenata. Fauvel, Rev. d'Ent., v, 186, p. 144; id., Ann. Soc. Ent. Fr. (6a.) vi
1866, p. 178.

Hab. Siam, Sumatra, i, Java. Philippines.

simplex. Motschulsky, Bull. Mosc., xxx (4), 1857, p. 180; Krantz, Weigum. Arch.,
xxv, (9) 1859, p. 180; Fauvel, Ann. Mus. Civ. Genéve, p. 180.

Hab. India, Ceylon, Annam, Java, Ceylon, Philippines, Australia.

taprobanae. Walker, **Ana.** Mag. N. H., (3a.) III, 1839, p. 52.

Hab. Ceylon.

HOMALINI— (*Omalini*) Lacord., Gen. Col. R., 1864, p. 132; Jacq. Darw., Gen. Col.
R., [K 09: •] .m. Col., p. 457; Leconte & Horn, Class. Col., p. 104.

Genus **A3PEDIUM.**

Erichson, Käfer, Mark Brand., i, 1837, p. 18; G. L. Gen. Staph., p. 823; Lacord.,
Cat.,

y, Bull.

a«2i v

xxv (9), p. 182.

Hab. Bombay.

Genus **EUPIESTUS.**

Krantz, **Wi** .m. Arch., xxv (9), 1859, p. 182; Mun. Cat., p. 662.

sculpticollis, Krantz, *l. c. supra*, p. 182, t. 2, f. 4 a-b.

Hub, Ceylon.

Genus **HOMALITTM.**

Gravenhorst (*Omalini*), Micr. Bravour, 1802, p. 111; Erichson, Käfer Mark Brand.,
i, p. 623; id., Gen. Staph., p. 871; Mun. Cat., p. 665; Fauvel, Faun. Gall.
Rhénan., III, p. 57; Sharp, Trans. Ent. S. Lond., 1876, p. 402; id., Biol. Centr.
Amer., Col., i (2), p. 744; Leconte & Horn, Class. Col., p. 104.

E.

200*.

■UbnMi

rcli,, xx

»L

.mia ELE0SIS.

153' p. , p.
187 :
Biol. 1

l (/'
185&, p,
hffirtafiu)_f K
Tfaan. Eqt, 3
• ., Aftn. J India.

4. Arch., \: v (i)_t
: Waterltonao, Lond((j ;

., xii, 1S7^, p.
rah., x*v { p. 183 |

Genus HOLOSUS.

Motschulsky, Bull. Mosc., xxx (4), 1857, p. 496 : Men. Cat., p. 670 : Kraatz, Wiegma.
Arch., xiv (3), p. 184 : Faavel, Ann. Mus. Civ. Gen., xii, 1873, p. 195.

ovoidiformis, Motschulsky, Bull. Mosc., xxx (4), 1857, p. 499 : Kraatz, *l.c.* *supra*,
p. 184.

Hab. India.

conulatus (*Holotrochus* ?), Motschulsky, *l.c.*, p. 496 : Kraatz, *l.c.*, p. 185.

Hab. India.

foveolatus (*Holotrochus* ?), :huUty, 19ft

Hab. India.

mycetoporiformis, Motschulsky

elliptic keriformis, A%kjtt \:

taeniiformis, , lx., p.

-ayporiformis. Motschulsky, *l.c.* p. 488 : Kraatz, *l.c.*,

Genus THOACOPHORITS.

Note

ii. t BtoL Oentr
p. 2

p :

p. Mus. Cat. p. 677.

duplicationa, | p.

■..in JBUi

submissa, , £

Hub. India.

Genus

Brichson, Gen. Staphyl.
Mus. Cat., p. 677
ii. 1854, p. 40 : Ann.
Lent., 1876, p. 411 ;
Col., p. 108.

mtr. Amer.

breviscornis, Kraatz, Wiegma. Arch., xiv (3),
Hab. India.

occarcticollis. Kraatz, *Le.*, p. 188, t. 3, f. 6.
Hab. India.

curticollis. Fairv., *Ann. Mus. Civ. Gen.*, xii, 1878, p. 204.
Hab. Java, Island Ke.

fulvus, Motschulsky, *Bull. Mosc.*, xxx (1), 1857, p. 193.
Hab. Calcutta.

impunctatella. Motsch.
Hab. India.

aevisgator. Kraatz, *W* tfig.
Hab. Ceylon.

laevipennis. Kraatz, *Le.*, p. 153.
Hab. Ceylon.

lineipennis. Fairv. in, *Maa. Civ. Gen.*, xii, 1878, y
Hab. Java.

sculptus. Kraatz, *Le. super.*, p. 188.
Hab. Ceylon.

virgiventris. Kraatz, *Le. super.*, p.
Hab. India.

subopacus. Kraatz, *Le.*, p. 187: F.
Hab. Ceylon, Aru Islands, &

vestigatus. Kraatz, *Le.*, p. 187.
Hab. Ceylon.

testaceus. Kraatz, *Le.*, p. 188.
Hab. Ceylon.

GENERAL INDEX

The Oriental Coleoptera catalogued in the Supplement for 1890.

- abacus*, 138, 199, 200.
abacus, 212.
abacus, 31, 37.
abacus, 42.
abacus, 72, 239.
abacus, 179, 215.
abacus, 53.
abacus, 137.
abacus, 219.
abacus, 24, 25.
abacus, 231.
abacus, 23.
abacus, 61.
abacus, 87.
abacus, 24, 83.
abacus, 167.
abacus, 174.
abacus, 174.
abacus, 204.
abacus, 49.
abacus, 14.
abacus, 153.
abacus, 234.
abacus, 139.
abacus, 78.
abacus, 235.
abacus, 109.
abacus, 201.
abacus, 154.
abacus, var. 72.
abacus, 161.
abacus, 144.
abacus, 210.
abacus, 10.
- Bacani*, 31, 57, 70, 89.
Bacani, 163.
Bacani, 214, 215.
Bacani, 50.
Bacani, 52.
Bacani, 130, 245.
Bacani, 236.
Bacani, 218.
Bacani, 134, 146, 154.
Bacani, 233.
Bacani, 50.
Bacani, 145.
Bacani, 20.
Bacani, 235.
Bacani, 238.
Bacani, 77.
Bacani, 213, 239.
- Bacani*, 110.
Bacani, 70, 134, 143, 195.
Bacani, 235.
Bacani, var. 60, 79, 227.
Bacani, 235.
Bacani, 27.
Bacani, 28.
Bacani, 179, 195, 204.
Bacani, 145.
Bacani, 55.
Bacani, 35.
Bacani, 244.
Bacani, 43.
Bacani, 201.
Bacani, 195, 196, 197.
Bacani, 198.
Bacani, 201.
Bacani, 128.
Bacani, 195.
Bacani, 183.
Bacani, 62.
Bacani, 191.
Bacani, 200.
Bacani, 64.
Bacani, 61.
Bacani, 233.
Bacani, 72.
Bacani, 241.
Bacani, 244.
Bacani, 34.
Bacani, 34.
Bacani, 34, 57, 99.
Bacani, 145.
Bacani, 89, 160.
Bacani, 128.
Bacani, 167.
Bacani, 83.
Bacani, 213.
Bacani, 217.
Bacani, 208.
Bacani, 333.
Bacani, var. 42.
Bacani, 72.
Bacani, 233.
Bacani, 231.
Bacani, 72, 94, 161, 241.
Bacani, 240.
Bacani, 41, 35, 112, 197.
Bacani, 231.
Bacani, 202.
Bacani, 28.
Bacani, 248.
Bacani, 138.
Bacani, 138.
Bacani, 141.
- Bacani*, 175.
Bacani, 160, 133.
Bacani, 29.
Bacani, 193.
Bacani, 215.
Bacani, 202.
Bacani, 63.
Bacani, 49, 95, 117.
Bacani, 142, 228.
Bacani, var. 22.
Bacani, 24.
Bacani, 23, 145.
Bacani, 165.
Bacani, 182.
Bacani, 63.
Bacani, 63.
Bacani, 67.
Bacani, 94, 92, 99.
Bacani, 175.
Bacani, 87, 229.
Bacani, 22, 108.
Bacani, 83.
Bacani, 99.
Bacani, 102.
Bacani, 209.
Bacani, 37, 93.
Bacani, 111.
Bacani, 57.
Bacani, 154.
Bacani, 49, 114, 251.
Bacani, 46.
Bacani, 49, 145.
Bacani, 125.
Bacani, 171.
Bacani, 99, 139.
Bacani, 183.
Bacani, 45, 110, 172.
Bacani, 195.
Bacani, 47.
Bacani, 149.
Bacani, 245, 240.
Bacani, 57, 71, 100, 251.
Bacani, 256, 258.
Bacani, 19.
Bacani, 140.
Bacani, var. 12.
Bacani, 234.
Bacani, 203.
Bacani, 151.
Bacani, 256.
Bacani, 13.
Bacani, 11.
Bacani, 67.
Bacani, 75.
Bacani, 258.

Chelostoma, 43.
CHENOPEDIA, 213.
chequilestus, 112.
chignatus, 155, 148, 162.
chiloserus, 183.
chillaris, 119.
chillatum, 35.
chilumbensis, 196.
chilumpe, 51.
Chilodina, 218.
Chilobates, 142, 144, 145.
CHILYMERIS, 141, 144.
CHILYTOPHILAPUS, 201.
chima, 151.
Chimatoeris, 190.
Chimotia, 160.
chinctia, 42.
chiripatus, 50, 357.
chiripatus, 87.
chiripatus, 254.
chiripatus, 135.
chiripatus, 118.
chiripatus, 115.
chiripatus, 42.
chiripatus, 183.
chiripatus, 102, 237.
chiripatus, 145, 233, 251.
chiripatus, 137.
Chiripatus, 94.
chiripatus, 145, 149.
chiripatus, 147.
chiripatus, 235.
chiripatus, 204.
chiripatus, 243, 252.
chiripatus, 147.
chiripatus, 111.
chiripatus, 183.
chiripatus, 114.
chiripatus, 228.
chiripatus, 137.
chiripatus, 142.
chiripatus, 220.
chiripatus, 116.
chiripatus, 144.
chiripatus, 154.
chiripatus, 92.
chiripatus, 94.
chiripatus, 221.
chiripatus, 190.
chiripatus, 234.
Chiripatus, 228.
chiripatus, 17.
chiripatus, 61, 77.
chiripatus, 175.

convexiusculus, 168.
convexus, 80, 100, 148, 183.
COPIALATI, 143.
COPIALATI, 148.
Coplati, 213.
Coprocara, 213.
Coprocara, 220, 227.
Coprocara, 218.
Coprocara, 72.
Coprocara, 44.
Coprocara, 73.
Coprocara, 17.
Coprocara, 19.
Coprocara, 37.
Coprocara, 200.
Coprocara, 154.
Coprocara, 24, 33, 47, 53, 257.
Coprocara, 207.
Coprocara, 12.
Coprocara, 89, 164.
Coprocara, 162.
Coprocara, 115.
Coprocara, 237.
Coprocara, 253.
Coprocara, var. 12.
Coprocara, 175.
Coprocara, 175.
Coprocara, 177.
Coprocara, 36.
Coprocara, 32.
Coprocara, 44.
Coprocara, 14.
Coprocara, 82.
Coprocara, 16.
Coprocara, 45.
Coprocara, 100.
Coprocara, 80, 189.
Coprocara, 97.
Coprocara, 27, 29.
Coprocara, 162.
Coprocara, 89, 205, 253.
Coprocara, 183, 184.
Coprocara, 82.
Coprocara, 189.
Coprocara, 154.
Coprocara, 65, 224.
Coprocara, 148, 247.
Coprocara, 217.
Coprocara, 112.
Coprocara, 10.
Coprocara, 110.
Coprocara, 85.

Coprocara, 100.
Coprocara, 22, 42.
Coprocara, 89.
Coprocara, 54.
Coprocara, 212.
Coprocara, 232.
Coprocara, 95.
Coprocara, 96.
Coprocara, 153, 254.
Coprocara, 43.
Coprocara, 69, 255.
Coprocara, 214.
Coprocara, 175.
Coprocara, 192.
Coprocara, 82.
Coprocara, 75.
Coprocara, 49.
Coprocara, 85.
Coprocara, 67.
Coprocara, 231.
Coprocara, 166.
Coprocara, 44.
CRIPTOCEPHALON, 179.
CRIPTOCEPHALON, 179.
CRIPTOCEPHALON, 243.
Cryptocarya, 199.
Cryptocarya, 54.
Cryptocarya, 54.
Cryptocarya, 218.
Cryptocarya, 243.
Cryptocarya, 54.
Cryptocarya, 191.
Cryptocarya, 183.
Cryptocarya, 10.
Cryptocarya, 14.
Cryptocarya, 33.
Cryptocarya, 100.
Cryptocarya, 102.
Cryptocarya, 78.
Cryptocarya, 109.
Cryptocarya, 81.
Cryptocarya, 49.
Cryptocarya, 100.
Cryptocarya, 79.
Cryptocarya, 203.
Cryptocarya, 251.
Cryptocarya, 69.
Cryptocarya, 220.
Cryptocarya, 220.
Cryptocarya, 219.
Cryptocarya, 45.
Cryptocarya, 263.
Cryptocarya, 80.

|

|

.

|

1

S

■',«[#], l l l.

v

fulgidicollis, 42.
fulgidus, 151, 231, 241.
fulgidus, 231.
fuliginosus, 244.
fulva, 199.
fulvipes, 233.
fulvipes, 24.
fulvescens, 133, 137, 143,
243, 248, 256.
fulvicollis, 244.
fulvicornis, 253.
fulvipennis, 63.
fulvipes, 165, 226.
fulvitarsis, 237.
fulvus, 162, 224, 265.
fulvus, 227.
fumatus, 258.
fumatus, 30, 148.
fumigatus, 37, 93.
fumosa, 238.
fuscofasciatus, 196.
fungi, 220.
fureata, 223.
fureatus, 230.
fusa, 76.
fuscatus, 166, 237.
fuscicornis, 117.
fusicopa, 95, 263.
fusicollis, 93.
fusicornis, 238.
fusicornis, 60, 63, 139,
204, 208, 212, 242.
fusicornis, 212, 242.
fusicornis, 95, 253.
fusicornis, 145.
fuscoventris, 79.
fuscoventris, 237.
fuscoventris, 101.
fuscula, 70, 37, 137, 248,
254.
fuscus, 96, 229.
Fustiger, 190.
fusus, 23.

G

Gabriel, 236, 237, 238.
gagates, 45.
GALERITA, 66.
gallatensis, 155.
Gallatensis, 186.
Gallatensis, 141.
Gallatensis, 119.
gallatensis, 149.
Gallatensis, 236.

gemellus, 237.
gemina, 216.
geminus, 237.
gemmifer, 13.
geniculatus, 68, 143.
geniculatus, 28.
Gendyses, 178.
Gendyses, 219.
germana, 31.
germanus, 101.
Geratocert, 110.
Geryon, 20.
Gestrol, 139.
Gestrol, 101, 155.
gibboides, 189.
gibbiventris, 191.
gibbus, 188.
gigantes, 193.
gilvipes, 73.
Girionieri, 93.
Girionieri, 93.
glaber, 225.
glaber, 150.
glabra, 83.
glabrella, 83.
glabricollis, 109.
glabricollis, 19.
glabricollis, 178.
GLANDULARIA, 196.
glandularia, 189.
glandulifer, 184.
glanduliferus, 180.
Glophus, 219.
GLOPHUS, 187.
glophus, 180.
glophus, 192.
GLOPHUS, 176.
gloriosa, 18.
Glossocantha, 215.
Glossola, 219.
Glyptoderus, 92.
Glyptoderus, 264.
Glyptoderus, 244, 246.
Glyptoderus, 70.
Glyptoderus, 44.
Glyptoderus, 189, 191.
GNATHAPHANUS, 113.
Goebell, 79.
Goniognathus, 10.
goniina, 114.
Goniocarpus, 10.
gonioides, 74.
Gonderus, 44.
Gonogonia, 87.
Goberus, 236.

Gori, 160.
Gory, 236.
Gory, 145.
Gutheil, 149.
Grabowskyi, 200, 202.
gracilentum, 244.
gracilicornis, 259.
gracilis, 37, 79, 148, 211,
228, 244, 252.
gracilis, 227.
gracilis, 87.
gracilicollis, 181.
graminis, 25.
grandiceps, 241.
grandis, 181, 186.
grandis, 60, 108, 187, 188.
Grandis, 33.
granulatus, 182.
granulifer, 223.
granulum, 228.
Graptodytes, 141.
graciosa, 71.
gracipennis, 235.
gracilicollis, 141.
gracilis, 142.
gracilis, 147.
gracilicornis, 232.
Gronvall, 196.
Gryphus, 176.
gryphus, 196.
Guerini, 21, 43, 148.
Guerini, 84.
guttatus, 81, 117.
guttatus, var. 99.
guttiferus, 29.
guttiger, 77.
guttula, 47, 101, 114.
Gyllenhal, 110.
Gynandromorphus, 118.
Gynandromorphus, 118.
Gyretes, 164.
GYRINUS, 150, 151.
GYRINUS, 152.
GYRINUS, 153.
Gyrinus, 151, 152, 153,
155.
Gyrolinus, 241.
GYROPHANA, 228.

H

Haagii, 133.
Haagii, 149.
Haemaphysalis, 10.
haematopogon, 214.

■"5.

■*

|

.

|

|

|

14.

'

Hydrocarabus, 11.
HYDROPTERA, 223.
HYPERAEON, 119.
HYPERBAX, 119.
Hyperbaea, 44.
Hyphidrus, 138, 140, 141.
HYPHOTRUS, 140.
Hyphotrus, 140.
HYPHYDINI, 139.
HYPHYDRES, 139.
Hyphidrus, 131, 140.
Hypnata, 219.
HYPOCRITA, 76, 90.
Hypocryptus, 225.
HYPOCRYPTUS, 225.
Hypocryptus, 225.
HYPOCRITUS, 111.
Hypocryptus, 263.
HYPOCRITUS, 111.
HYSTRIX, 162.

I

Ilae, 253.
Illocheila, 174.
IDIOCERUS, 237.
IDIDOMORPHUS, 43.
ILLOCATUS, 55.
ILLOTUS, 94.
ILUSTRI, 78.
ILLOCELLUS, 233.
IMMISCELATOR, 73, 86.
IMMATURE, 223.
IMPERATRIX, 200.
IMPIETUS, 86.
IMPRETA, 189.
IMPRESSICOLLIS, 47, 101, 216, 222, 265.
IMPRISPENNIA, 37.
IMPRETUS, 37, 52, 77.
IMPRETUS, 262.
IMPUNCTATUS, 23, 46.
IMTEMPUS, 205.
IMAEQUALIS, 194.
INCERTUS, 58, 145, 196.
INCISUS, 260.
INCISUS, 260.
INCLINATA, 242.
INCONSPICUA, 200.
INCONSPICUA, 67.
INCONSPICUA, 70, 75, 165.
INCRUSTATA, 178.
INDERENTIA, 105.

INDICA, 23, 42, 51, 66, 84, 88, 167, 213, 222, 223, 263.
INDICA, 213, 222, 223.
INDICANS, 162.
INDICOLA, 112.
INDICINA, 15, 176.
INDICINA, 246.
INDICUS, 12, 16, 23, 24, 28, 40, 49, 50, 167, 118, 134, 139, 141, 143, 151, 153, 155, 167, 208, 235, 242, 244, 245, 247, 249, 252, 254, 262.
INDICUS, 149, 243, 244, 252.
INDISTINCTA, 168.
INDUS, 20, 53, 152, 196.
INDUTA, 31.
INEFFICIENTIA, 135.
INERENTIA, 262.
INFANS, 38.
INFIXUS, 111.
INFIRMUS, 205.
INFUSCATA, 71.
INFUSCATA, 220.
INFUSCATUS, 176, 208.
INGENS, 41.
INGRATA, 200.
INGRUM, 16.
INLOPACHYS, 11.
INOPE, 101.
INORNATA, 220.
INORNATUS, 114.
INQUINATUS, 239.
INIGNIS, 41, 146.
INSULARE, 169.
INSULARIS, 90, 233.
INSULICOLA, 12.
INTERCHUUS, 144.
INTERGROSTRATA, 200.
INTERMEDIA, 76.
INTERMEDIA, 33, 90, 161, 184, 253.
INTERMEDIUS, 242.
INTERMIXTUS, 139.
INTERPALLUS, 140.
INTERPUNCTATA, 117.
INTERPUNCTATUS, 23.
INTERRUPTA, 72, 166.
INTERRUPTUS, 141, 207.
INTERRUPTUS, var. 93.
INTERSTITIALIS, 54.
INTRICATUS, 150.
INTUSCURVATA, 200.

INUTILLA, 230.
INVALIDA, 200.
INVESTIGATOR, 15.
IOPLERA, 173.
IRACUNDUS, 232.
IRICKRUS, 9.
IRIDEUS, 55.
IRIDESCENTIA, 113.
IRIDICOLOR, 114.
IRREGULARIS, 161.
IRREGULARIS, 237.
ISCHOCARABUS, 11.
ISCHOCARABUS, 229.
ISCHOCARABUS, 250.
ISOMALUS, 263.
ISOPLEURUS, 50.
ISOTARRUS, 27, 29, 30.
ITAMUS, 32.
ITERATUS, 58.

J

Jannianus, 61.
JANTHINA, 41, 106.
JAPONICA, 214.
JAPONICUS, 58, 109, 139, 148, 172.
JAPONICUS, 113.
JAVANICA, 25.
JAVANICUS, 194.
JAVANUS, 77, 93, 101, 111, 118, 119, 133, 143, 144, 155, 192, 196, 203, 265.
JERDANI, 162.
JESSENCIS, 93.
JORDANIA, 160.
JOUSSIELINII, 162.
JOUSSIELINII, 163.

K

Kacupferii, 12.
KIRBYI, 62.
KLUGII, 38.
KOLLARI, 54.
KOLMANII, 152.
KRAAZII, 220, 263.
KNECHTENSTADTII, 51.

L

LABORATOR, 184.
LABROSCUS, 85.
LACONECTES, 143.

- lividus*, 260.
lobata, 26.
Lobius, 75.
Lobrothium, 244.
Lopium, 222.
Lomchosternus, 108.
longiceps, 258.
longicollis, 66, 81.
longicornis, 30, 90, 184,
 189, 211, 226, 238.
longinquis, 45.
longipalpis, 94.
longipalpis, 178.
longipennis, 197, 235, 254.
longipennis, 253.
longipilis, 181.
longithorax, 63.
longiusculus, 67.
longiusculus, 21.
longulus, 207, 238, 240.
Lopha, 34.
Loricithon, 229.
LOBOSTEMMA, 29.
Larvatus, 29.
Laccroptis, 56, 57.
Larvatus, 115.
Leydæ, 18.
locens, 119.
lucidatus, 19.
lucidus, 103, 114, 155,
 259.
luctuosus, 133.
luculentus, 181.
luculentus, 145.
Ludkingii, 162.
lugens, 15, 65, 220.
lugubris, 15.
lugubris, 142.
lunatus, 261.
lunipennis, 170.
lunulatus, 170.
LUTINCA, 17.
lurilipennis, 35.
luridus, 176.
luridus, 74.
luritanicus, 150.
luteicauda, 101.
luteipennis, 247.
luteus, 42, 61.
luxurius, 33, 58, 90, 94,
 101, 235, 238.
Lysnuchus, 34.
lynx, 191.
Lyperophorus, 44.
Lyperosomus, 44.
Lyperus, 44.
Lyprocarphe, 219.
lyratus, 140.
Lyropelias, 44.
Lyrolhorax, 44.
- Ma**
- macrocerus*, 188.
Macrocheilus, 85.
MACROCHILUS, 85.
Macrogonus, 11.
macropus, 101.
Macrothorax, 11, 13.
maculata, 26.
maculata, 26.
maculatus, 102, 116, 137,
 147.
maculatus, 137.
maculifer, 99.
maculipennis, 130, 214,
 252.
maculipennis, 101.
maculipes, 48.
maculosus, 9.
magnus, 55.
Magnus, 12.
majus, 252.
majus, 243.
Matabronis, 90.
malacrus, 180.
magachinus, 104.
malicollis, 102.
Malintz, 83.
manilla, 200.
manus, 31.
mandarinus, 28.
mandibularis, 65, 236, 118.
manicellus, 114.
Mannerheimii, 84, 220.
mantleatus, 184.
Mareus, 89.
marcida, 220.
marcidus, 237.
margaritifer, 197.
marginalis, 115.
marginalis, 51.
marginalis, 55, 93.
marginata, 85.
marginatam, 246.
marginatus, 63, 152.
marginatus, 102, 119.
marginellus, 76.
marginicollis, 25, 43, 48,
 93, 226.
marginicollis, 74.
marginifer, 74, 102.
marginipennis, 155.
maritimus, 250.
marmoratus, 234.
- MASTAY**, 90.
Mastay, 142.
Mastiger, 190.
Mastus, 83.
maxillaris, 46.
maxillosus, 233.
MECHANICA, 206.
Mechelia, 180.
Mecognathus, 251.
Mecorhynchus, 214.
medialis, 135.
medialis, 233.
medioguttatus, 102.
megacephala, 32.
Megacronus, 229.
Megaladerus, 179.
Megalimus, 241.
MEDALORA, 257.
megathela, 181.
megaristernus, 117.
Megista, 219.
Megistella, 11.
Megranus, 114.
Meladroma, 85.
melampus, 253.
melanaria, 24.
melanaria, 117.
melanarius, 90, 227.
Melanarchus, 11.
melancholicus, 93.
melaneus, 112.
Melaninus, 44.
melanocephalus, 253.
melanocephalus, 228.
MELANODES, 109.
melanotermis, 255.
melanopterus, 102.
MELANOPTERUS, 159.
melanura, 173.
melus, 142.
mellus, 76.
Melli, 161.
Melli, 90, 153.
Melli, 102.
Melli, 161.

|

'ort>hi\'< ■ ■ ■ ihltM J 1

i.

|

l

t. 17JJ

E4a
r

nigripennis, 66, 103.
nigripes, 149.
nigrita, 137.
nigritulus, 181.
nigroannuus, 242.
nigrocephala, 200.
nigrofasciata, 64.
nigrolineata, 82.
nigrosolatus, 140.
nigropiceus, 167.
nigrovittatus, 170.
niguberriensis, 58.
niloticum, 35.
nipalensis, 108.
niponensis, 25.
Nisa, 198.
Nisaria, 199.
nitens, 23, 51, 114, 238.
nitens, 153, 211.
nitidicollis, 42, 103, 205.
nitidissima, 200.
nitidula, 225.
nitiduloides, 174.
nitidulus, 106, 153, 183,
 206, 248, 260.
nitidulus, 79, 153, 188, 227.
nitidum, 169.
nitidus, 174, 229.
nitidus, 19, 242, 227,
 237.
notabilis, 97.
notifrons, 188.
notulus, 188.
NOTULUS, 174.
Noguchii, 45.
notabilis, 238.
notaphoides, 38, 69.
Notaphus, 35.
NOTOPHILUS, 16.
notaticus, 149.
notatus, 144.
NOTULIDES, 132.
NOTULINI, 132.
notuloides, 139.
NOTULUS, 132.
Notobium, 244.
NOTOMICRINI, 132.
NOTOMICRUS, 132.
notulans, 28.
Nova Caledonia, 150.
nubifer, 34.
nubila, 290.
nucens, 56.

O

Oberthuri, 31.
Oberthuri, 155.
obfuscata, 220.
obliqua, 153, 252.
obliqua, 12.
oblatus, 143.
oblongiusculus, 155.
oblongus, 43.
obscura, 32, 65, 211, 216.
obscuripes, 31.
obscuritarsis, 58.
obscuriventris, 173.
obscurum, 263.
obscurus, 41, 119, 187.
obscurus, 242.
obtusus, 185, 138, 184.
OCALIA, 213.
occidentalis, 147.
occipitalis, 93.
ocellata, 72.
ocellatus, 232.
occidentalis, 130, 153.
ocellatus, 172.
ochracea, 250.
ochraceus, 215.
ochraceus, 249.
ochripennis, 232.
ochropus, 217.
Ochthodonta, 35.
Ochthophilus, 246.
ochthophilus, 82.
octodecimmaculatus, 142.
octodecim, 207.
ocularis, 184.
oculata, 63.
oculatus, 252.
Ocybatus, 98.
Ocydromus, 35, 98.
OCYRUS, 235.
Ocys, 35.
ODONTALGUS, 192.
Odontium, 35.
Odontomyz, 53.
ODONCHIRUS, 254.
Oicoptoma, 173.
Oistius, 111.
olens, 67.
OLIGOTA, 222.
olisthaeriformis, 264.
olivaceus, 165.
olivaceus, 149.
olivinus, 58.
Omala, 35.

Omataldes, 262.
Omatalus, 262, 263.
Omatalomorphus, 70.
Omatalricinus, 92.
Omasus, 40, 44.
Omiatus, 57.
Omodon, 19.
OMPHRON, 2.
OMPHRA, 87.
OPHYOCARPA, 53.
OPHYOCARPUS, 51.
opacus, 53.
opacus, 108.
Opales, 107, 108, 109, 109.
Opalus, 107.
Opasus, 110.
opaea, 32, 217.
opacicollis, 201.
opacicollis, 211.
opacipennis, 64, 103.
opaculus, 60, 84, 114.
opacus, 21, 52, 77, 91, 106,
 169, 192, 205.
OPHONETES, 54.
Ophionia, 63.
OPITHIUS, 16.
Ophryodactylus, 57.
opulectum, 35.
orbicollis, 56, 103, 197, 189.
ordinatus, 23.
ORIENTALIS, 154.
ORIENTALIS, 154.
ORIENTALIS, 11.
Ornithobius, 11.
Ornithobius, 11.
Ornithobius, 141.
Ornithobius, 44.
orientalis, 15, 175.
orientalis, 15, 23, 32, 33,
 38, 51, 60, 62, 66, 88,
 111, 134, 138, 139, 140,
 153, 176.
orientalis, 39, 104, 133,
 135, 233, 244.
ornatissima, 290.
ornatus, 38, 81, 96, 147.
ornatus, 111.
Orthidus, 240.
ORTHOGONIX, 80.
orthogonoides, 75.
ORTHOGONIX, 82.
orthomus, 21.
Orthomus, 44.
Orthoplerus, 159.
osculans, 172.
osorius, 257.

m

1,

TAIV

mi
Hi

|

.11

fi

|

•17.

■'9^

19fi

4 i

152.

Z

R, 264.

U'UUb, L

3t.

R!

'V,

- 7.

taehin

215.

!

It!3.

185.

■ 1.

|

taehiporo

217.

629, |

transfuga, 39.
 translata, 216.
 transparipes, 85.
 transversa, 26, 73.
 transversalis, 134.
 transversicornis, 182.
 transversum, 99.
 transversum, 134, 139.
 TRAPEZOIDES, 241.
 TRACHOCERA, 219.
 Trachicus, 61.
 trechoides, 113.
 TRECHUS, 40.
 Trepanes, 35.
 Trepana, 50.
 triangularis, 39.
 trianguliger, 156.
 Tribas, 12.
 tricarinatus, 257.
 TRICHISIA, 30.
 trichocera, 182.
 Trichochloenina, 38.
 TRICHOCOSMETES, 234.
 Trichoderma, 234.
 TRICHONYX, 203.
 Trichopoda, 153, 170.
 Trichopygus, 230.
 Trichotheca, 84.
 tricolor, 110, 170.
 tricolor, 243.
 tricornis, 259.
 tricuspidata, 216.
 tricotatus, 41.
 tridens, 113.
 tridentata, 221.
 trifasciatus, 69.
 trifida, 224.
 trigonocephalus, 243.
 trigonocornis, 163.
 Trigonoductyla, 62.
 TRIGONOMATRA, 42.
 TRIGONOMIRA, 43.
 Trigonothops, 81.
 TRIGONOTOMA, 42.
 Trigonotoma, 40.
 Trigonotomides, 40.
 trimaculatus, 85.
 Trinitum, 189.
 Trinotus, 52.
 trinotus, 182.
 trinotatus, 105, 252.
 triophthalmus, 207.
 Triplectes, 118.
 TRIPLOGENIUS, 40.
 Triplagenys, 43.

tripunctatus, 149.
 tripustulatus, 65.
 Trirammatas, 49.
 tristis, 65.
 Tritonus, 166.
 trivialis, 215.
 trivittatus, 145.
 Trochilus, 149.
 troglodytes, 19.
 TROGOPYGUS, 201.
 Trogoniphaeus, 261.
 trogonitoides, 83.
 Trogon, 148.
 tropica, 221.
 tropicus, 33.
 TROPIDOCERUS, 59.
 Tropistocerus, 165.
 troscillus, 203.
 truncatus, 39.
 Trychina, 83.
 tuberculata, 221.
 tuberculatus, 259.
 tuberculicollis, 221.
 tuberiventris, 215.
 turbidus, 240.
 turculus, 113.
 TURTA, 204.
 Tychus, 203.
 Typhlobius, 244.
 TYRAPHUS, 203.
 TYRUS, 194.
 tythus, 207.

U

umbrosus, 39, 192.
 umbrosus, 192.
 uncinatus, 185.
 undatus, 81.
 undulifer, 136.
 unicolor, 26, 52, 78, 177, 245.
 unicolor, 161.
 unidentatus, 66, 152.
 unifasciata, 70.
 unifasciatus, 174.
 uniformis, 74, 136.
 unipunctatus, 203.
 urnula, 201.
 ustulatus, 67.
 utilana, 115.
 uvida, 250.

V

vaga, 214.
 validicornis, 88.
 variabilis, 130.
 variabilis, 231.
 varians, 108.
 varians, 137, 238.
 varipes, 253.
 varicornis, 213.
 varicornis, 105.
 varipennis, 231.
 varipes, 105.
 varipennis, 261.
 varius, 145.
 variventris, 222.
 VATHLLINI, 134.
 Velleus, 231.
 velocipes, 105, 257.
 veluticollis, 211.
 velutinus, 248.
 ventralis, 150.
 ventralis, 185.
 ventratus, 207.
 vicaris, 222.
 vicina, 250.
 vicinalis, 170.
 vicinum, 170.
 vicinus, 245.
 vigilans, 95.
 vils, 211, 218, 250, 257.
 villa, 108.
 villipennis, 215.
 villosus, 182, 191.
 villorus, 233.
 violaceomicans, 160.
 verrucifer, 77.
 versicolor, 80.
 ceratus, 29.
 Vertagus, 38.
 verticalis, 23, 207.
 vestigifer, 128.
 vestita, 174, 211.
 vestitus, 192.
 vestitus, 191.
 vexillifer, 161.
 viciicollis, 144.
 violaceus, 50.
 virens, 150.
 virens, 232.
 virescens, 153.
 virgata, 63.
 virgulifera, 64.
 virgulifer, 105.
 virens, 80, 108.

■.JL

.

88.

:l.

P-

1
PI

■>j 11.

05

181,

v;

pilf^a, 87.

- -

.

55.

pin

4 4 A

Q

I

114. :

; LD.K, 187, T

104.
W

14.

04.
107.

.10.

:0.

35.

'ID.

Uta, 31.

punotiilatiig, 91, \ / 2, 15U,

32

" 24! 3.

pvinctu

puui

puHitum, 21.

uio»t 243.

141

US, 197.

- sarawakensis*, 197, 201.
SATHYTES, 201.
saunderi, 28, 163.
saunderii, 27.
Sauridus, 231.
Savrellus, 249.
scabripennis, 15.
scabratus, 262.
scalaris, 156.
SCALIDON, 72.
Scallidus, 20.
Scaphiodactylus, 57.
Scaphonotus, 2.
SCAPTEGUS, 21.
scapularis, 86, 104.
scapulata, 166.
SCARITES, 20.
Scarites, 12.
SCARITODERUS, 18.
Schaufussii, 191, 201.
Schaumii, 80, 91.
Schiodtei, 163.
SCHIVTOCKIA, 212.
Schmidtgoebeli, 91.
Schmidti, 23.
Schmidti, 71.
Schonherrii, 104.
Schulzei, 103.
SCHUBALIM, 245.
scutellans, 56.
Scutispa, 174.
scutulus, 25.
SCYTHOCHITON, 242.
Scytus, 2.
SCYTHUS, 247.
scopodera, 247.
scoponema, 247, 248.
scotomedia, 85.
scriptus, 145.
serobicollis, 221.
sculpticollis, 262.
sculpticollis, 188.
scriptifrons, 206.
sculptilis, 18.
sculptilis, 18.
sculptipennis, 251.
sculptipennis, 247.
sculpturatus, 156, 197.
scutellus, 265.
scutatus, 239.
scutellaria, 228.
scutellatus, 25.
scutellatus, 238.
scydaenoides, 38.
scydaenoides, 37.
scydaenus, 178, 179, 180.
 181, 182, 183, 184, 185.
SCYDMENIDAE, 177, 178.
Scytodites, 142.
secernendus, 87.
Selene, 20.
Selenidia, 45.
SELINA, 22.
sellata, 71.
semilaevis, 59.
semibrunnea, 223.
semicarina, 26.
semicircularis, 21.
semicupreus, 56.
semifuscus, 248.
semilucidus, 34.
semilunaris, 138.
semialbum, 245.
semimundus, 181.
semipactus, 203.
semipunctatus, 176.
semipurpureus, 235.
semipurpureus, 103.
semirugosus, 21.
semistriatus, 59, 166.
semisulcatus, 181, 197.
semisulcus, 197.
semiviolaceus, 41.
semivittatus, 110.
semivittatus, 166.
Semperii, 105, 133.
senilis, 117.
Sepidulum, 168.
sericeipennis, 197.
septemfoveolatus, 137.
sericans, 60.
sericeicollis, 185, 239.
sericeipennis, 60.
sericeolimbatus, 153.
sericeum, 15.
sericeum, 15.
sericeus, 38, 247.
sericeus, 60.
sericimicans, 165.
SERRODERUS, 176.
serpentinus, 243.
seraticollis, 41.
seraticollis, 217.
sericorolis, 215.
SERRIMARGO, 77.
serpentinatus, 146.
setosus, 62.
sexguttata, 83.
sexmaculatus, 95.
serpentinus, 76, 134.
serpentinatus, 19.
serpentinus, 203.
Sharpii, 130, 132, 134.
SHAWA, 31.
shimense, 67.
shimense, 49, 60, 93, 106.
 136, 149, 192, 257.
shimense, 201.
shimica, 26.
shimicum, 15.
signatipennis, 147.
signatus, 118.
signifer, 74.
signifer, 83.
silencius, 142.
SILPHA, 172.
Silphales, 171.
SILPHIDE, 171.
silphus, 61.
SILPHA, 212.
similis, 21, 42, 185, 197.
similis, 135, 236.
simillimus, 45.
SIMON, 109.
Simoniana, 204.
Simonis, 161, 179, 191, 205.
simplex, 60, 80, 87, 162, 261, 262.
simplex, 189.
simplicifrons, 206.
simplicipes, 119.
simulator, 181.
simulus, 185.
Sinacanthus, 25.
sinensis, 53, 105, 130.
singalanensis, 182.
singulare, 263.
singularis, 204.
sinicus, 113, 115, 163.
Sintectes, 192.
SINTECTODEA, 192.
Sintectodes, 192.
sinaticollis, 61.
sinuatus, 105.
sinuipennis, 152.
SINURUS, 77.
SIOPIUS, 118.
Sipalia, 213.
Skrinshonius, 282.
amaragdinus, 153.
amaragdipennis, 59.
amaragdinus, 80, 115.
sobrinus, 100.
sobrinus, 93.

TJ.

INDEX.

18, 181.

m.

ru

iL 179,192

4.

ftapkirus, 231. i,
192. 45.

224.

rectan^ulum, 51.

S 119.

80.

Regimbartii, 143.

185.

R< 22.

Reich

Reicheubackia.

J 201.

*acJni*_y 188.

Reitterii, 185.

rub;

, 112, 113.
, 51.

76.

itus. 58.

1.

pit*

tus, '225.

181,

retracing, 73.

retusnfi, 58,

2

RYXAB]

R h b l

, It.

fif

3, Cfi,

*Rhagm]*_{us}_y 45.

87.

i"ci? 147.

RHANTUS, 144.

lis, 61, 85, 45,

RBATHTXUS, 45,

*Rteomatocerii*Si 243.

KHEMBrs, 51.

R?u r, 213.

2.

ruti:

rubipennis, 255, 258.

rubra, 26, 80, 87, 163,
258.

rubra, 51, 97.

rubrarsia, 58, 163.

rubrarsia, 239.

rubrithorax, 104, 178.

rubrithorax, 231.

rubiventris, 78, 165.

rubromarginatus, 239.

rubroniger, 132.

rubroniger, 48.

170.

182.

-i>ic

sps-

10.f*.

II.

11.

247.

11.

lilis, 105, 198.

194.

198.4.

Bpiuiger, 156. J22.

Hubnif

i

, 152.,

243.

p r r « ,

eplond

spyliat

stricta, 12.
stricta, 26.
stricticollis, 59.

aliiU, '

viridans, 105.
viridicollis, 41, 165.
viridicollis, 42.
viridifossulatus, 13.
viridimaculatus, 154.
viridipennis, 71.
viridipennis, 14.
viridis, 173.
vitreus, 177.
vittatus, 9, 76, 132, 146,
 185.
vittatus, 226.
vitticollis, 74, 95.
vittigerum, 67.
vividus, 106.
vixtristis, 39.
Vollenhovenii, 80.
Voleulus, 167.
vulgaris, 25.
vulneratus, 106, 231.
vulneratus, 115.
vulso-ripennis, 113.
vulso-ripennis, 113.

W

Wagae, 13.
Wakefieldia, 84.
Walkerii, 34.

Wallichii, 13.
Waterhousei, 41, 163.
Wehnckei, 156.
Wehrckianus, 150.
Weisel, 134.
Westermanni, 62, 109,
 159, 232.
Westwoodii, 26, 88, 107,
 161, 206.
Westwoodii, 183.
Whitbilli, 80.

X

xanthacra, 17.
xanthacrum, 85.
xanthacrus, 106.
xanthocephalus, 235.
Xanthodyle, 142.
XANTHOLINTUS, 241.
xanthomelas, 140.
xanthomerus, 240.
XANTHOPHYTUS, 243.
xanthoptera, 220.
xanthopus, 75.
xanthomerus, 91.
xanthopleurus, 106.
xanthopua, 81.
xanthospilus, 106.

xanthotelia, 96.
XENEDES, 225.
Xenochora, 214.
Xenor, 59.
Xenothorax, 81.
Xenota, 219.
XENOPHYTUS, 261.
Xestonotus, 118.
Xylodrepa, 173.
Xylodromus, 263.

Y

yanellus (cyanellus), 114.
Yala, 141.
Yunnanus, 10, 13, 40, 45.

Z

ZABRUS, 110.
zealandicus, 52.
Zelastomus, 243.
ZETHOPSUS, 206.
Zethus, 206.
zeylanicus, 149.
Zonitica, 219.
Zophium, 67.
ZUPHIUM, 67.
Zyras, 216.



i N D £



S, MO, UI
111

187

ill

- Carcharias* *basimaculata*, 51, 53
 melanopectus, 51, 52, 53, 54
Carcharias *holomaculata*, 247
Carica *papaya*, 239, 243, 260
Carissa *carolinensis*, 248
Cassia *barbata*, 240
Cassia *alata*, 247, 274, 279, 280
 pitula, 240
 occidentalis, 231
 tora, 231
Castanea *malacensis*, 247
Cassia *equisetifolia*, 240
Cassia, 247
Cassia *coccinea*, 247
 corvina, 247
 pauciflora, 247
 strabo, 247
Catopoda *landmarkia*, 248
Cassipoula *catilla*, 247
 truncata, 247
 gemma, 247
 pyramidalis, 247
Cassipoula *niagara*, 272, 285, 287.
Cassia *argentea*, 249
 crispata, 249
Cassipoula *orbicularis*, 248
Centrosema *calceolatum*, 52
Cephaelis *hyemalis*, 245
Ceratophyllum, 243, 245, 270
 thalictroides, 243, 274, 285,
 287
Cereus, 249
Chaetochloa *calceoloides*, 273
 glabra, 274, 285
Chaetochloa, 273
Chamaecyparis, 130
 repens, 130
 var. robusta, 130
Chamaecyparis, 309
 brachylova, 309
Chamaecyparis, 268
Chamaecyparis, 268
Chamaecyparis, 311
Chamaecyparis, 268
 tennifolia, 243
Chamaecyparis, 268
Chamaecyparis, 268
Chamaecyparis, 75, 93, 95, 104
 atensis, 95
 illinoensis, 93, 104, 111
 pinus, 94, 110, 111
 rhododendri, 93
Chamaecyparis, 95
Chamaecyparis *apiculata*, 250
Chamaecyparis, 238
Chamaecyparis *zeylanicum*, 245
Chamaecyparis, 216
Chamaecyparis *valeriana*, 239
Chamaecyparis, 274
 decussata, 235
 media, 239, 274, 278, 280
Chamaecyparis, 221, 222
Chamaecyparis, 109
 Buddha-lana, 80, 94
 puberula, 109
 montana, 80, 90, 104
Chamaecyparis, 247
Chamaecyparis *maritima*, 273, 274, 275
Chamaecyparis, 225, 240
Chamaecyparis, 273, 278, 280
Chamaecyparis, 273, 274, 275, 287
Chamaecyparis, 245
Chamaecyparis, 243, 275
Chamaecyparis, 24, 82, 84, 87, 88, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000
Chamaecyparis *arborescens*, 140
 var. Miquelii, 140
 coccinea, 146
 cuneata, 140
 formosa, 147
 lanceolata, 146
 Malagasy, 147
 polyantha, 145
 var. ligustrina, 146
 var. Widdowsonii, 145
Chamaecyparis *japonica*, 254
Chamaecyparis, 98
Chamaecyparis *retusa*, 250
Chamaecyparis *Melo*, 229
 sativa, 229
Chamaecyparis *maritima*, 240
Chamaecyparis, 253, 260
Chamaecyparis *Gymnocarpium*, 240
Chamaecyparis, 239
Chamaecyparis *torulosa*, 22
Chamaecyparis, 211
Chamaecyparis, 213
Chamaecyparis *pauciflora*, 269
 thalia, 266
Cyclosa *pellata*, 275, 277, 285
Cyclosa *argentea*, 213
 brunnea, 213
 formosa, 213

j -
i

#1

Bergsi

S

I

ly

- Cylas involucrata*, 315
 " *submetallica*, 314
 " *variegata*, 315
Cynodon Dactylon, 343, 346
Cynopharan micranthum, 348
Cyperaceae, 284
Cyperus compressus, 240
 " *distans*, 240
 " *Iris*, 240
 " *pennatus*, 273, 281, 297
 " *polystachyus*, 249
Cyphogonum, 221
Cynanthe cardinalis, 306
Cyrtanthus andamanensis, 72, 74
 " *erectum*, 73
 " *orientale*, 73
Dactyloctenium aegyptium, 345
Dacnis chrysippus, 298
 " *geminata*, 256, 266
 " *limicola*, 266
 " *septentrionalis*, 266
Datura, 241
 " *fastuosa*, 241, 246
Daucus Carota, 245
Decaschia celastroides, 245, 246
Delaia eucharis, 263
Dendroica epiphras, 207
Dendroica striata, 245
Dentella rupestris, 247
Desmodium andamanense, 251, 252
 " *polycarpum*, 251
 " *tridactylum*, 247, 251
 " *umbellatum*, 273, 279, 280
Desmia corymbosa, 100
Dilophus gracilis, 205
Disocoria, 284
 " *glabra*, 275, 284, 287
 " *sativa*, 243
Disocoria, 284
Diospyros serrata, 195
Dipterocarpus, 203
Dioscorea rostrata, 153
Dolichos Lablab, 229
Drocephalum, 205
 " *heterophyllum*, 205
 " *longicaule*, 206
Drosera rotundifolia, 275, 281, 285, 287
Duranta Plancheri, 241
Durio Eibachiana, 244
Dysophylla, 298, 299
 " *Andersoni*, 298
 " *aristata*, 299, 318
 " *commutata*, 299, 318
 " *peruviana*, 299
 " *rugosa*, 298
 " *salicifolia*, 298
 " *versicolor*, 299
 " *var. gracilis*, 299
Echinocactus, 240
Echinops, 245
Echinops, 217
Elytis laevis, 275, 281, 287
Elephantopus scaber, 246
Eleusine scutellaria, 209
 " *indica*, 220, 274, 285, 287
Ellipanthus, 208
 " *calceolaria*, 209
 " *crinita*, 209
 " *halimifolia*, 208
 " *maritima*, 209, 275, 278, 285, 289
 " *Thunbergii*, 208
 " *lanceolata*, 209
Elodea, 145
 " *formosa*, 147
Elodea, 209
 " *Gleditsia*, var. *acuta*, 209
 " *typica*, 209
Entola scandens, 275, 278, 280
Epiphyllum, 210
Euphorbia, 121, 123
Euphorbia perfoliata, 212
 " *quadrangulata*, 212
Eragrostis amabilis, 258
Eremostachys, 213
 " *chrysantha*, 213, 214
Erythraea arifolia, 206
Erythraea amabilis, 250
Erythraea yunnanensis, 276
 " *var. peruviana*, 280, 287
Erythraea indica, 273, 279, 286
Erythraea Wallichiana, 203
Erythraea, 213, 214
 " *Scutellaria*, 213
Euphorbia, 209
Euphorbia Javanica, 245
Euphorbia andamanensis, 245
 " *palustris*, 245
 " *palustris*, 245
 " *thymifolia*, 249, 271, 283, 287
Euphorbia, 125, 263
Euphorbia, 125
Euphorbia, 79
Euphorbia, 205
 " *aristata*, 206
Euphorbia, 205
Eurya, 185, 195
 " *acuminata*, 185, 195
 " *var. capricornis*, 195
 " *Wallichiana*, 195
 " *signata*, 195
 " *lanceolata*, 195
 " *chrysantha*, 195
 " *fruticulosa*, 195
 " *indica*, var. *acuminata*, 195
 " *lanceolata*, 195
 " *membranacea*, 195
 " *multiflora*, 195
 " *salicifolia*, 195
 " *serrata*, 195
 " *Wrayi*, 195

iL7

• •, 0

1G6

—

✓

otella, .':

....1

.311

17

-17

| *

111

>nweraa, 220

|

t.v

;;

|

I

1 If* '

fullerl .

1

i 110,111

LI1

<

.111,113

ti

•12

112

ti

112

>t

112

I>

'12

))

ft

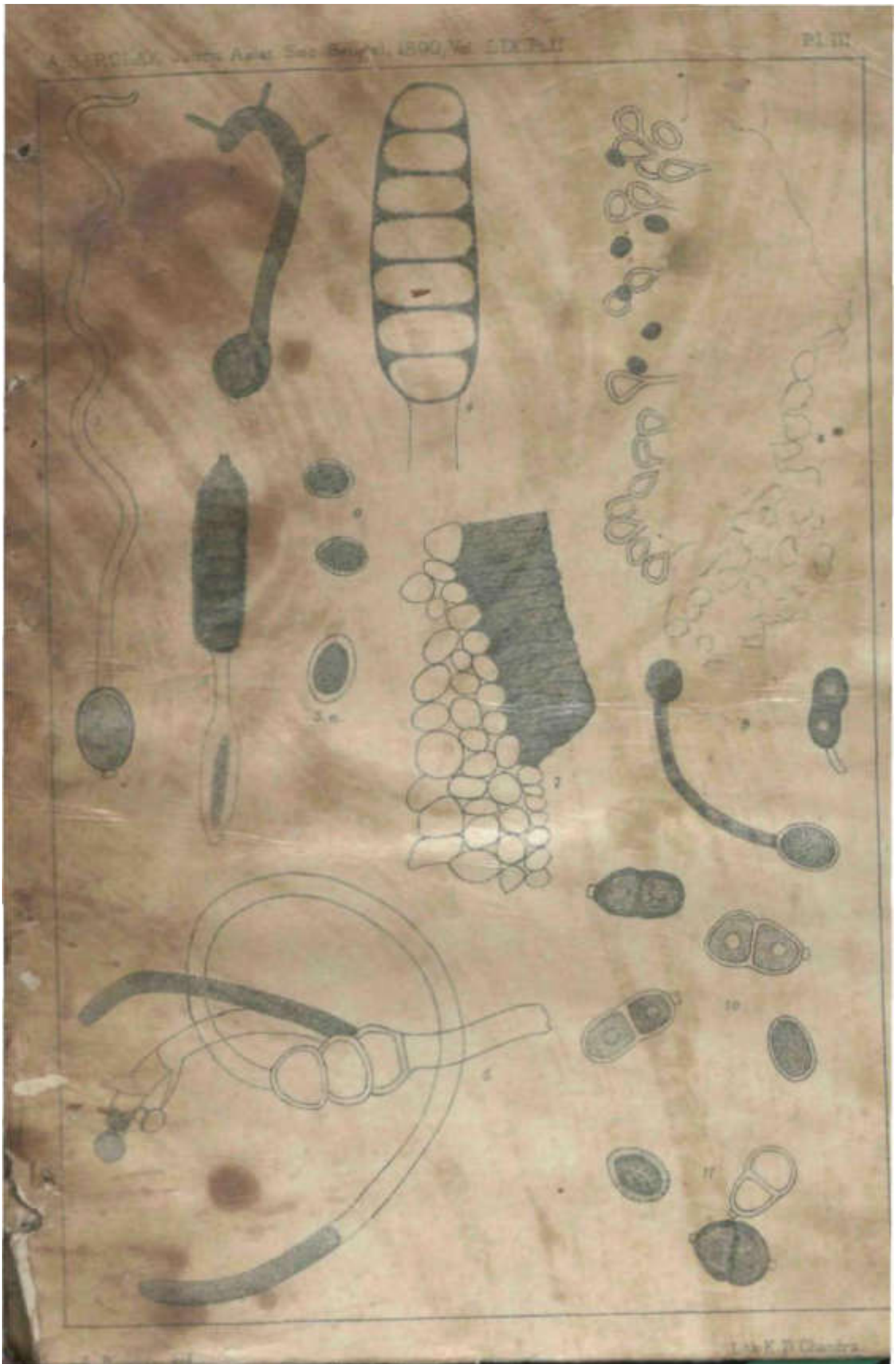
■i



,

—

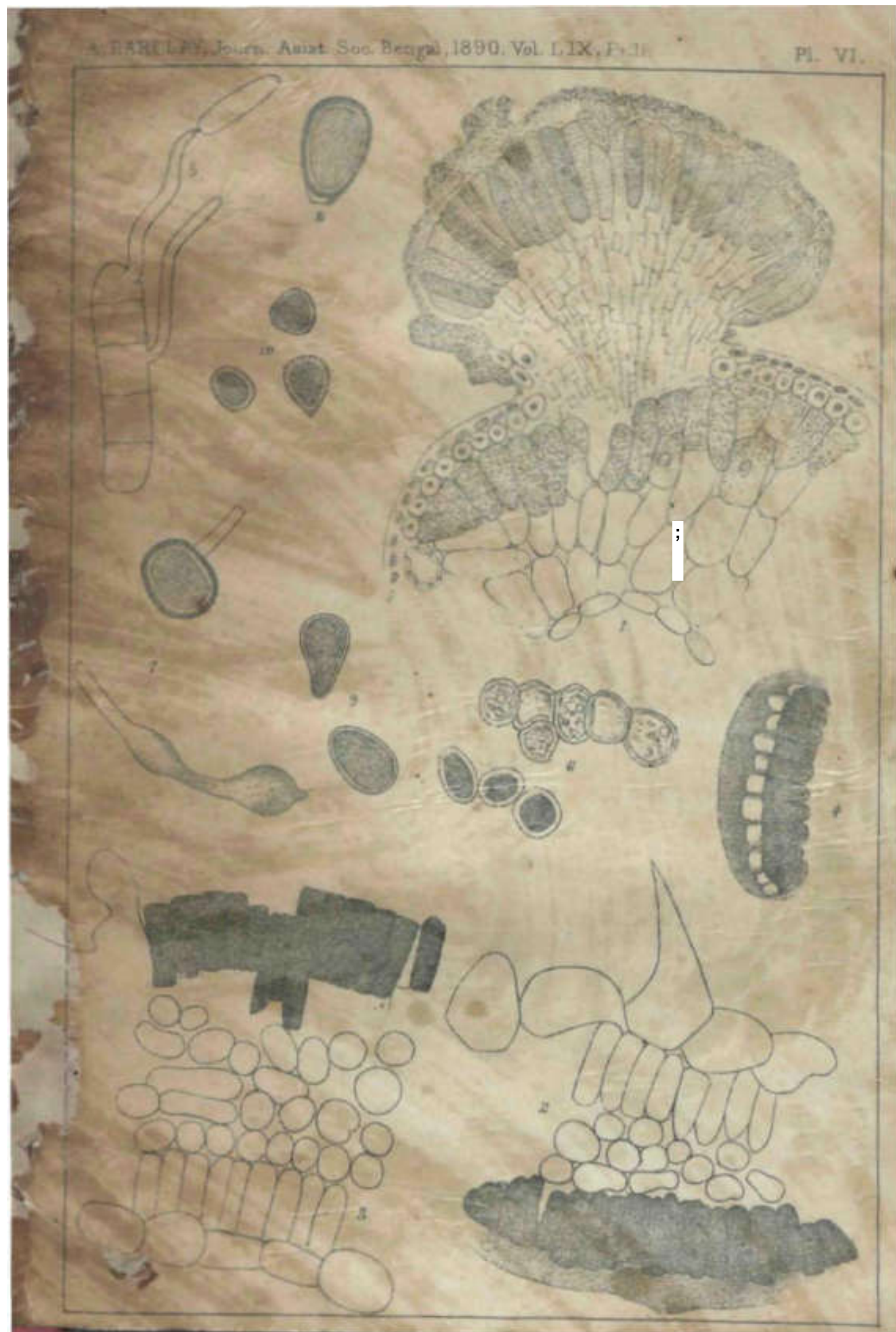


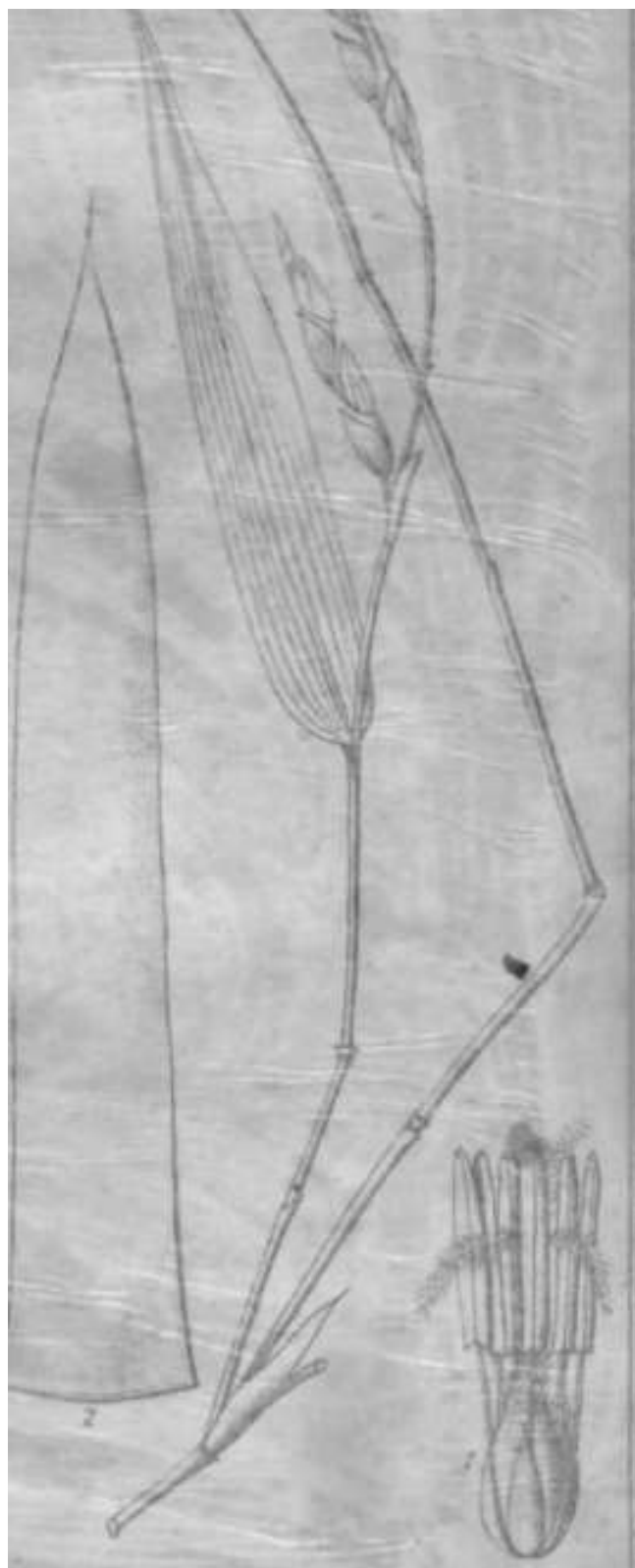






Litho by A. C. Singha





,-



K. C. Das det.

A. C. Mukerjee

ELIPANTHUS STERCULIACEUS Poin.

.

*,

|



BOOK CARD
Indian Botanic Garden Library
BOTANICAL SURVEY OF INDIA

Call No..... Ace. No.A:J7J££

Author

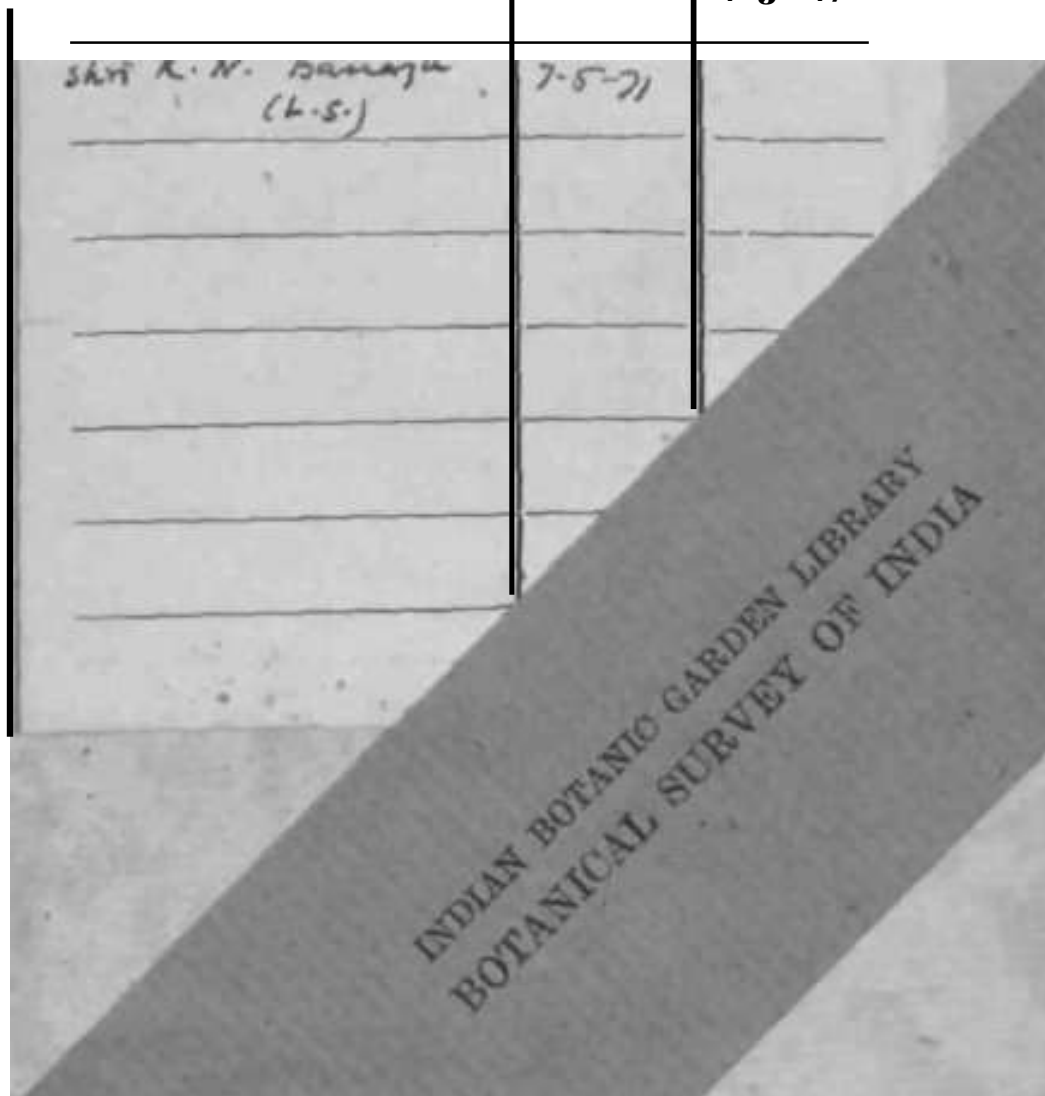
\

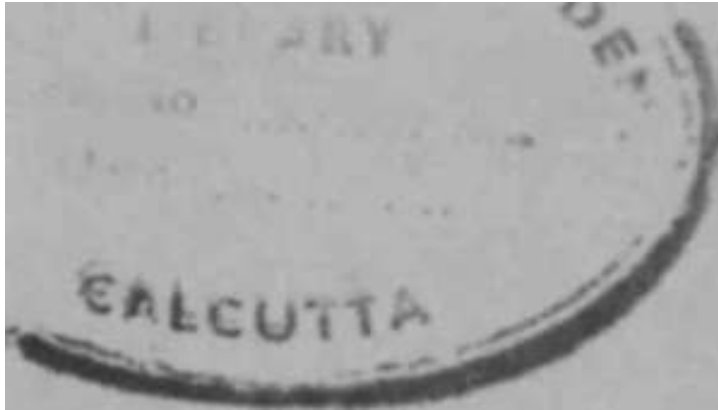
.^ tft.fbf.

£

fZ<£!t!!!f!!!\$

Name of Borrower/Code No.	Date of Issue	Date of Return
		7-J--7/





\LOO U

INC

m "TON

DAT*

