

KEY WORKS TO THE TAXONOMY OF
FLOWERING PLANTS
OF
INDIA

M. P. NAYAR

VOLUME I

BOTANICAL SURVEY OF INDIA

Key Works to the Taxonomy of Flowering Plants of India by Dr. M. P. Nayar, M. Sc., Ph. D. (London), FLS, Joint Director, Botanical Survey of India with up-to-date references, annotations, systematic position of the families is under publication in five volumes in the following sequence :

- Volume I : A-Cr (Acanthaceae
to Crypteroniaceae)
- Volume II : Cu-L (Cucurbitaceae
to Lythraceae)
- Volume III : M-P (Magnoliaceae
to Pyrolaceae)
- Volume IV : R-Z (Rafflesiaceae to
Zygophyllaceae)
- Volume V : Gymnosperms :
General Index

The above mentioned volumes present data on the circumscription of families, modern classificatory systems and data on the families and genera arranged in alphabetical sequence. Under each family there is main data source dealing with monographic work on the family or particular subfamily or tribe with additional information on cytotaxonomy, palynology and chemotaxonomy. This source book of reference will be useful in the study of taxonomy, plant genetic resources and conservation of flora.

FLORA OF INDIA (Series IV)

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FLOWERING PLANTS OF INDIA

FLORA OF INDIA (Series IV)

**KEY WORKS TO THE TAXONOMY OF
FLOWERING PLANTS OF INDIA**

VOLUME I

ACANTHACEAE TO CRYPTERONIACEAE

M. P. Nayar



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DEPARTMENT OF ENVIRONMENT**

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FOREWORD

The Botanical Survey of India (BSI) is undertaking the study of natural plant resources of the country, and preparation of national and regional floras. The publication of the new National *Flora of India* was started in 1978 in the form of fascicles dealing with families, tribes and large genera of flowering plants.

Abundant herbarium materials based on exhaustive collections and good support of literature and bibliographic works are essential for the preparation of critical taxonomic accounts. Scientists of the headquarters and regional offices of the BSI have been exploring different regions of the country for the last about 25 years; these collections supplemented with the materials in some other large herbaria provide adequate plant material for most of the critical taxonomic work.

Of late, immense literature is being published on taxonomy, floristics and biosystematics in India and other countries, but their documentation has received limited attention.

Due to lack of trained staff and some infrastructural facilities, documentation of literature relevant to BSI could not reach the desired levels, and there is paucity of ready bibliographic works on taxonomic groups as also on geographic regions of the country.

I have written on several earlier occasions about the immense utility of bibliographic works (Jain, *Proc. Nation. Acad. Sci. India* 31 : 382, 1961; Jain *et al.*, *Bull. Bot. Surv. India* 14 : 24-45, 1972). Several short botanical bibliographies on India have been published during last one decade.

Dr. M. P. Nayar, Jt. Director in the BSI has been interested in documenting literature, and the present publication is an outcome of several years' work.

In the present work the references are arranged authorwise alphabetically under families and genera. The families, their references, the genera under families and references on the genera are all arranged alphabetically.

All references under a family have been given a code number for the family and a serial number for facilitating processing of this data for purposes of retrieval.

The arrangement of data has been explained in detail in the Introductory chapter.

It is hoped the work will be found useful by scientists working on floristics, plant taxonomy and allied fields in this region.

Botanical Survey of India
Howrah 711 103
January 25, 1984

S. K. Jain
Director

PREFACE

During the last two decades knowledge on the systematics, phylogeny and evolution of plant taxa derived rich dividends from biosystematics, cytotaxonomy, palynology and chemotaxonomy. The study of the subject taxonomy requires a holistic approach with up-to-date data inputs from interdisciplinary areas. In such a field, it is not easy to include all references and no data index can hope to achieve cent percent inclusion of all relevant data. This book deals with the families of flowering plants in India and they are arranged in alphabetical sequence with cross references. The families are circumscribed as per modern classificatory systems.

I was fortunately present on the occasion when Prof. A. K. Sharma, F.N.A., Professor of Botany, University of Calcutta released the publication of Applied Botany Abstracts compiled by National Botanical Research Institute on 10th April 1981 presided over by Dr. T. N. Khoshoo, F.N.A., the then Director of National Botanical Research Institute, Lucknow. Dr. T. N. Khoshoo asked me to prepare comprehensive work on the taxonomy of Indian plants with annotated references in family and genuswise sequence as this is a field for the Botanical Survey of India. This book in series of five volumes has taken shape from this germinal idea kindled in me by Dr. Khoshoo for which I am thankful to him. The vast personal reference collection which I have assembled during the last 25 years for my research has further helped me in achieving the above objective.

Wherever useful plants are cited, the taxonomy of such taxa are more or less comprehensively covered as this may serve as a data source for genetic resources, plant variations and genotypic differences. In an age when extinction of species is the order of the day, it is essential to comprehend the data of wild progenitors of useful and less known useful groups of plants so that further work can be undertaken without loss of time.

This book is presented in five volumes. The Volume I deals with families from Acanthaceae to Crypteroniaceae in alphabetical sequence and it includes 3662 references. I hope this data index with annotations will be an useful tool to advance the study of taxonomy and conservation of genetic resources.

Botanical Survey of India
Howrah-711103
15 Sept., 1983

M. P. Nayar

INTRODUCTION

The Botanical Survey of India is working on a programme of Flora of India revisions. In order to help the preparation of the revisions and monographs of the families and to retrieve taxonomic and other source data, it is necessary to have a bibliographic index, subjectwise, *i.e.*, family and genuswise so that a taxonomic worker in India gets a holistic view of the families by scanning the key titles under consideration. The author has compiled this taxonomic bibliography from his personal collections of bibliography and nomenclature reference cards of over 30,000 entries which he has written over the last 25 years for his research. This data is now presented in the form of a book so that it is useful to taxonomists in India. The citations presented in this book are coded and each citation bears a coded number for easy retrieval of data and for future computerization.

In 1911 Blatter published the first bibliography dealing with all branches of Indian botany in an authorwise index (*Journ. Bombay Nat. Hist. Soc.* 20 : IXXIX—CIXXVI) and Santapau in 1952 added a supplement (*Journ. Bombay Nat. Hist. Soc.* 50 : 520-548 & 51 : 205-259). In 1958 Santapau published an index of floristic and taxonomic literature in the *History of Botanical Researches in India, Burma, Ceylon—Part II—Systematic Botany of Angiosperms 1-75*. Narayanaswamy (*A Bibliography of Indology Vol. 2. Indian Botany, Parts 1 & 2, 1961 & 1965*) published an index of botanical literature dealing with all branches of Indian botany authorwise. The bibliography of Indian grasses were covered by Jain (*Proc. Natn. Acad. Sci. India 31B : 361—382, 1961*) and Jain *et al* [*Bull. Bot. Surv. India 14 : 24-45 : (1972) 1975*]. In 1981 Karthikeyan *et al* published a bibliography of peninsular Indian flora arranged familywise for the period 1959-1978 (*An Annotated Bibliography of Taxonomic Botany of Peninsular India 1959-1978, 1-201*). Recently Basak (1983) published the work done by the Botanical Survey of India scientists since its reorganisation (1955) up to the year 1981 in an authorwise index (*Botanical Survey of India—an account of its establishment, development & activities 1-300*). During the last three decades there is steady flow of taxonomic information and in order to help the retrieval of such information, an up-to-date annotated index of key citations pertaining to the families of flowering plants occurring in India is prepared, subjectwise (*i.e.* familywise and genuswise). In the field of taxonomy and allied sub-

jects of cytotaxonomy, evolution, palynotaxonomy and chemotaxonomy. data is rapidly expanding and no one can achieve cent percent inclusion of all relevant citations. But considering the necessity of source data bank which can be used for ready reference and cross reference in an easily accessible source, this book is presented with the hope it will be an useful tool for the workers dealing with the taxonomy of the flowering plants of India. Economic, medicinal and other data connected with the utility of plants, their cultivation, breeding are not included in this work and if any reference is cited it is incidental to the main subject taxonomy. All the citations are coded as per family code devised by Weber (Taxon 31 : 74-88, 1982). These code numbers will be uniformly followed in future reference.

Method of Presentation

All the families of flowering plants occurring in India are arranged in alphabetical order from A to Z. (Acanthaceae to Zygophyllaceae). Gymnosperms are treated separately and the families are arranged in alphabetical sequence. The families are delimited as per modern concept and for families segregated from the main family there are cross references and annotations. Under each family the genera occurring in India are enumerated in alphabetical sequence. A separate list of genera which are cultivated in India is also included. Under each family there is main data source dealing with monographic work on the family, or particular sub-family or tribe with additional informations as are available on cytotaxonomy, palynology and chemotaxonomy. Monographs which are basic to the family are cited in order to get a holistic view of the family. Pre-1900 references are quoted only for critical and monographic citations. Since this book deals with key references for taxonomic literature, distributional records of local or narrow geographical range are excluded in the citations. Wherever cytological, palynological and other data which may help in the synthesis of taxonomic concepts of a taxon are available, such references are included. But purely morphological, embryological or anatomical data which are not readily relevant to the taxonomy are not considered in this book.

As mentioned earlier under each family and under each genus citations are arranged authorwise alphabetically. Where more than one reference is cited for the same author they are indexed chronologically. Where references to joint authors are cited they are

arranged first alphabetically and followed by their datewise sequence. In the references where the actual date of publication is different from the accredited date of publication, the date of effective publication is the date of the actual publication as per Art. 30 & 32 of International Code of Botanical Nomenclature (1978). The accredited date is given in parenthesis before the actual date of publication. The abbreviation *ibid.* for denoting the same journal repeated in separate citations, is avoided in order to help computer scanning of journals. In the same way each author name is repeated without giving the usual *ditto* sign. Each citation is complete on its own with standard abbreviations with a code number. Brief annotations wherever relevant are given: In the annotations abbreviations are used: *descr.* for description, *distr.* for distribution, *enum.* for enumeration. For references to the publication of the classification of Airy Shaw, Bentham & Hooker, Cronquist, Dahlgren, Engler, Hutchinson, Takhtajan and Thorne, the reference is not repeated. A common reference of their classification system is given below. In a subject where such vast information system is assembled there may be some omissions and the author considers it useful if additional information or data are brought to his attention.

Acknowledgements

I am grateful to Dr. Khoshoo, Secretary to the Department of Environment, Government of India for giving the idea of the preparation of a familywise and genuswise taxonomic bibliography. I wish to thank Dr. S. K. Jain, Director, Botanical Survey of India for encouragements.

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ACANTHACEAE

The family Acanthaceae is included in the order Scrophulariales by Cronquist, Dahlgren and Takhtajan. While Engler included the family in the order Tubiflorae, Bentham & Hooker and Hutchinson treated this family in the order Personales and Thorne included it in the order Bignoniales.

The family is divided into four subfamilies *i.e.* Nelsonioideae, Mendoncioideae, Thunbergioideae and Acanthoideae. The first three subfamilies lack cystoliths and the hook-shaped funicles "retinacula"; while in the subfamily Acanthoideae, cystoliths are present and capsules are provided with retinacula. Hence Airy Shaw considered the sub-families Mendoncioideae and Thunbergioideae to the rank of separate families. The subfamily Nelsonioideae is an intermediate group between Scrophulariaceae and tribe Acanthoideae. The subfamilies Thunbergioideae and Mendoncioideae are considered as the connecting link between the families Bignoniaceae and Acanthaceae.

The family is represented in India by the following genera : *Acanthopale*, *Acanthus*, *Adhatoda*, *Aechmanthera*, *Andrographis*, *Asystasia*, *Asystasiella*, *Baphicacanthus*, *Barleria*, *Blepharis*, *Calacanthus*, *Calophanoides*, *Carvia*, *Codonacanthus*, *Dicliptera*, *Didyposandra*, *Diolacanthus*, *Dipteracanthus*, *Ditrichospermum*, *Dyschoriste*, *Ecboium*, *Echinacanthus*, *Eranthemum*, *Gantelbua*, *Goldfussia*, *Gymnostachyum*, *Haplantodes*, *Hemigraphis*, *Hygrophila*, *Hypoestes*, *Indonesiella*, *Justicia*, *Kanjarum*, *Lepidagathis*, *Leptacanthus*, *Listrobanthus*, *Mackenzia*, *Monechma*, *Monothecium*, *Nelsonia*, *Neuracanthus*, *Nilgirianthus*, *Perilepta*, *Peristrophe*, *Petalidium*, *Phaulopsis*, *Phialacanthus*, *Phlebophyllum*, *Phlogacanthus*, *Pleocaulus*, *Pseudaechmanthera*, *Pseuderanthemum*, *Pseudostenosiphonium*, *Pteracanthus*, *Pyrrothrix*, *Rhinacanthus*, *Rostellularia*, *Rungia*, *Santapaua*, *Sericocalyx*, *Sphinctacanthus*, *Staurogyne*, *Stenosiphonium*, *Strophacanthus*, *Supushpa*, *Sympagis*, *Taeniandra*, *Tarphochlamys*, *Tetragoga*, *Thelepaepale*, *Tri-aenacanthus*, *Xenacanthus*.

Several species of the following genera are cultivated in gardens : *Aphelandra*, *Crossandra*, *Graptophyllum*, *Fittonia*, *Jacobinia*, *Odontonema*, *Pachystachys*, *Ruellia*, *Sanchezia*.

For recent taxonomic revisions refer Bremekamp (1944, 1948, 1953, 1955, 1965) ; for cytological and palynological studies refer De

(1966, 1967, 1968), Grant (1955) ; for chromosome numbers refer Ellis (1962), Joseph (1964) ; for phylogeny refer Mohan Ram & Wadhi (1965), Sahi & Dixit (1969).

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- ACA 68 Phatak, V. G. & Oza, G. M. 1959
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Dipteracanthus Nees

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79 : 321-323.

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Jap. Bot. 50(4) : 97-103.

Dyschoriste Nees

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A monograph of the American species of the genus
Dyschoriste. *Ann. Missouri Bot. Gard.* 18 : 9-90.

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A new variety of *Hemidelphis polyspermus* Nees (Acanthaceae) from India. *Indian Forester* 94 : 657-658. *H. polyspermus* var. *joshianus* from Varanasi.

Hemigraphis Nees

ACA 81 Oza, G. M. (1974) 1976

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Hygrophila R. Br.

ACA 82 Heine, H. (1971) 1972

Notes sur les Acanthacees africaines. *Adansonia* 11(4) : 641-659. Key, notes on nomenclature.

ACA 83 Kundu, B. C. 1943

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ACA 84 Miegé, J. 1962

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Cytomorphological studies in *Asteracantha longifolia* Nees (*Hygrophila spinosa* A. And.). *Proc. Indian Acad. Sci. B.* 14 : 149-165.

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ACA 86 Thothathri, K. 1965

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- ACA 87 Sreemadhavan, C. P. 1968
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- ACA 92 Mohan Ram, H. Y. & Sehgal, P. P. 1958
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- ACA 93 Raj, B. 1965
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 A new genus of Acanthaceae from Kerala State, South India. *Bull. Bot. Surv. India* 13 : 153-155. 2 fig. *Kanjarum palghatense* sp. nov., descr.

Lepidagathis Willd.

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Lepidagathidis.....illustratio monographica, Vratislaviae ad Viadrum.

Neesiella Sreem.

(Reduced to *Indoneesiella*)

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Neesiella—a new genus of Acanthaceae. *Phytologia* 15 : 270-271. Refer Sreemadhavan, C. P. 1968 : *Indoneesiella* a substitute name in Acanthaceae.

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 A note on *Neuracanthus sphaerostachyus* Dalz. *Journ. Bombay Nat. Hist. Soc.* 50 : 428-430.

- ACA 100 Shah, G. L. & Santapau, H. 1957
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 Über *Pseuderanthemum metallicum* sp.n. und das System der Acanthaceen. *Ann. Jard. Bot. Buitenzorg* 15 : 26-36.

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Rostellularia Reichb.

ACA 102 Ellis, J. L. (1969) 1972

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ACA 103 Henry, A. N. (1966) 1967

A hitherto unlocalised *Rostellularia* Reichb. (Acanthaceae). *Bull. Bot. Surv. India* 8 : 361-362. *Rostellularia simplex* Wt. from Tirunelveli Dist., Tamil Nadu.

Ruellia Linn. emend. Bremek.

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Rungia Nees

ACA 109 Oza, G. M. 1977

Rungia muralis Nees for India (Acanthaceae). *Indian Forester* 103 : 157, pl. 1.

ACA 110 Raj, B. 1965

Pollen morphology of two species of Acanthaceae. *Curr. Sci.* 34 : 319-320. *Justicia prostrata* (Clarke) Gamble & *Rungia repens* Nees.

Santapaua Balakr. & Subr.

ACA 111 Balakrishnan, N. P. & Subramanyam, K. 1963

A new genus of Acanthaceae from peninsular India. *Journ. Indian Bot. Soc.* 42 : 411-415. *S. madurensis* from Madurai, Tamil Nadu; key to allied genera *Plaesianthera*, *Cardanthera*, *Nomaphila* & *Santapaua*.

Staurogyne Wall.

ACA 112 Henry, A. N. & Balakrishnan, N. P. 1961

A new species of *Staurogyne* from Central India. *Bull. Bot. Surv. India* 3(2) : 205-206. *S. perpusilla* Henry et Bal. from Madhya Pradesh.

Strobilanthes Bl. s.l.

[Assigned to different genera, refer Bremekamp (1944)]

ACA 113 Bremekamp, C. E. B. 1944

Materials for a monograph of the Strobilanthinæ. *Verh. Kon. Wet. A'dam sect. 2, 41* (No. 1) : 1-306, tab. 1-6.

ACA 114 Daly, W. M. 1895

Periodical flowering of *Strobilanthes kunthianus*. *Journ. Bombay Nat. Hist. Soc.* 9 : 487. At Yercaud, S. India.

ACA 115 Ellis, J. L. & Swaminathan, M. S. 1975

Notes on some interesting plants from South India-3. *Journ. Bombay Nat. Hist. Soc.* 72 : 230-236. photo 1, flowering of *Strobilanthes* spp.

- ACA 116 Gamble, J. S. 1888
The Nilgiri *Strobilanthes*. *Indian Forester* 14 : 153-158.
- ACA 117 Hutton, A. F. 1949
Mass flowering of *Strobilanthes kunthianus* on the Highway Mts. in August 1948. *Journ. Bombay Nat. Hist. Soc.* 48 : 614. General.
- ACA 118 Matthew, K. M. 1971
The flowering of the *Strobilanthes* (Acanthaceae). *Strobilanthinac sensu Bremekamp*. *Journ. Bombay Nat. Hist. Soc.* 67 : 502-506. General.
- ACA 119 Morris, R. C. 1958
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- ACA 120 Santapau, H. 1944, 1950, 1952
The flowering of *Strobilanthes*. *Journ. Bombay Nat. Hist. Soc.* 44 : 605. 1944 ; 49 : 320-321, 575-576. 1950 ; 50 : 430-431. 1952.
- ACA 121 Santapau, H. 1959
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- ACA 123 Suryanarayana, M. C. 1970
Rare flowering of *Strobilanthes scrobiculata* Dalz. ex Clarke—a plietesial member of the family Acanthaceae in the Western Ghats (India). *Indian Forester* 96 : 850-851, photo 2. Flowered in 1968 in Mahabaleshwar ; flowering cycle 16 years.
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Plietesial species of *Strobilanthinac* (Acanthaceae) in the Western Ghats (India). *Journ. Bombay Nat. Hist. Soc.*

67 : 607-607. tab. 1. Flowering and mass flowering of spp. of various gen., localities.

ACA 125 Suryanarayana, M. C. (1976) 1977

Pollen morphology of *Strobilanthes reticulata* Stapf and its taxonomic implications. *Journ. Palynol.* 12(1-2) : 105-114.

ACA 126 Vajravelu, E. & Srinivasan, S. R. (1973) 1976

Strobilanthes walkeri Arn. ex Nees (Acanthaceae) : a new record for India from Nilgiris. *Bull. Bot. Surv. India* 15(3-4) : 280.

ACA 127 Vishnu Mittre & Gupta, H. P. 1966

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ACA 128 Williams, J. 1938

General flowering of *Strobilanthes* in S. India. *Journ. Bombay Nat. Hist. Soc.* 40 : 580-581. Flowering of *Strobilanthes luridus* at Valparai, Anaimalais.

ACA 129 Williams, J. L. H. 1944

Flowering of *Strobilanthes*. *Journ. Bombay Nat. Hist. Soc.* 44 : 493-494. *S. kunthianus*—flowering in Nilgiris.

Supushpa Suryanarayana

ACA 130 Paul, S. R. 1979

A new species of *Supushpa* (Acanthaceae) from India. *Bot. Notiser* 132 : 149-150.

ACA 131 Suryanarayana, M. C. 1970

A taxonomic study of *Strobilanthes scrobiculata* Dalz. ex Clarke. *Koninkl. Ned. Akad. V. Wetensch. Amsterdam* 73C(4) : 422-430, pl. 1. *Supushpa scrobiculata* (Dalz. ex Cl.) Suryanarayana = *Strobilanthes scrobiculata* Dalz. ex Cl.

Sympagis (Nees) Bremek.

ACA 132 Suryanarayana, B. & Radhakrishna Murthy, D. 1974

On the occurrence of *Sympagis petiolares* (Nees) Brem. and *Canscora perfoliata* Lamk. on the Eastern Ghats. *Journ. Bombay Nat. Hist. Soc.* 71 : 176-178. *Sympagis petiolares* (Nees) Bremekamp = *Strobilanthes petiolares* Nees.

Synnema Benth.

ACA 133 Hossain, A. B. M. E. 1974

Taxonomic and nomenclatural notes on *Synnema* Benth. *Bangladesh Journ. Bot.* 3(1) : 45-49.

ACERACEAE

(Refer also Sapindaceae)

The family Aceraceae is assigned to the order Sapindales by Cronquist, Engler, Hutchinson, Takhtajan and Dahlgren; while Thorne kept it under the order Rurales. Bentham & Hooker included it in the family Sapindaceae.

Aceraceae, a segregate of the family Sapindaceae differs from the family Sapindaceae in having opposite leaves and bicarpellate fruit, a 2-seeded samara or schizocarp.

However the closely related family Hippocastanaceae has palmately compound leaves and tricarpetate ovary and irregular flowers.

In India the family Aceraceae is represented by the genus *Acer*. For recent taxonomic revisions, refer Fang (1978), Nayar & Dutta (1982), Murray (1969, 1974). For chromosomes and cytology refer Mehra, Khosla & Sareen (1972).

GENERAL

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Pollen morphology of the Aceraceae. *Grana* 15(1-3) : 19-27.

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Aceraceae. In : van Steenis, *Fl. Males.* 1, 4 : 3-4, fig. 1.

- ACE 3 Brizicky, G. K. 1963
The genera of Sapindales in the South-eastern United States. *Journ. Arn. Arb.* 44 : 462-501.
- ACE 4 Candolle, A. P. de 1824
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- ACE 5 Fang, Wen-p'ei 1932
Preliminary notes on Chinese Aceraceae. *Contr. Biol. Lab. Sci. China Bot. ser.* 7 : 143-189, fig. 1. Enum. of collections.
- ACE 6 Fang, Wen p'ei 1939
A monograph of Chinese Aceraceae. *Contr. Biol. Lab. Sci. China Bot. ser.* 11 : i-x, 1-346, fig. 2.
- ACE 7 Fang, Wen p'ei 1978
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- ACE 8 Koidzumi, Genichi 1911
Revisio Aceracearum Japonicarum. *Journ. Coll. Sci. Univ. Tokyo* 32 : 1-75, pl. 1-33. Key, deser., distr., phylogeny.
- ACE 9 Koidzumi, Genichi 1912
The Aceraceae of eastern continental Asia. *Bot. Mag. Tokyo* 26 : 21. In Japanese ; synopsis of sections of *Acer*.
- ACE 10 Mehra, P. N., Khosla, P. K. & Sareen, T. S. 1972
Cytological studies of Himalayan Aceraceae, Hippocastanaceae, Sapindaceae and Staphyleaceae. *Silvae Genet.* 21(3-4) : 96-102.
- ACE 11 Nayar, M. P. & Dutta, A. 1982
Aceraceae. *Fasc. Fl. India* No. 9 : 1-22. Revision ; 16 spp.
- ACE 12 Pax, F. 1902
Aceraceae. In : Engler, *Pflanzenr.* 8(IV. 163) 1-89. fig. 1-14,, maps 1, 2. Monographic.

Acer Linn.

- ACE 13 Banerjee, M. L. 1961
Critical notes on *Acer campbellii* Hiern. *Journ. Bombay Nat. Hist. Soc.* 58(1) : 305-307.
- ACE 14 Banerjee, M. L. & Das, S. 1971
Acers in Nepal. *Indian Forester* 97(5) : 243-250. Revision of 13 spp.
- ACE 15 Bate-Smith, E. C. 1978
Systematic aspects of the astringent tannins of *Acer* species. *Phytochemistry* 17(11) : 1945-1948.
- ACE 16 Chien, Sung-Shu & Tang, Wen-p'ei 1934
Geographical distribution of Chinese *Acer*. *Proc. Fifth Pacific Sci. Congr.* 4 : 3305-3310. Phytogeographic.
- ACE 17 Delendick, Thomas J. 1980
The correct name for the *Acer* of Malesia. *Reinwardtia* 9 : 395-401. Proper name for the maple of Malesia is *Acer laurinum* Hasskarl.
- ACE 18 Helmich, D. E. 1963
Pollen morphology in the maples (*Acer* L.) *Pap. Michigan Acad. Sci. Arts. Lett.* 48 : 151-162.
- ACE 19 Jong, P. C. de 1976
Flowering and sex expression in *Acer* L. : a biosystematic study. *Proefschrift.....Meded. Landbouwhogeschool Wageningen* 76(2) : [xii]. 202 p.
- ACE 20 Metcalf, F. P. 1938
Geographical distribution of *Acer* (section *Integrifolia* Pax) in China. *Lingnan Sci. Journ.* 17 : 609-614, pl. 27. Descr., enum. ; distr.
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On *Acer cappadocicum* var. *indicum* Rehd. *Act. Phytotax. Geobot.* 16 : 162-165, pl. 1, fig. 1-3. Notes on var. *sinicum* and *A. mono* (*A. pictum*) ; summary in Japanese.

- ACE 22 Murray, E. 1966
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- ACE 23 Murray, E. 1969
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- ACE 24 Murray, E. 1970
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- ACE 25 Murray, E. 1971
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- ACE 26 Murray, E. 1974
Himalayan maples. *Kalmia* 6 : 2-8. Key.
- ACE 27 Murray, E. 1978
Acer notes No. 8. *Kalmia* 8(3) : 17-20. Key.
- ACE 28 Nicholson, G. 1881.
The Kew Arboretum. The Maples I. *Gard. Chron. n. ser.* 15 : 10, (II) 42, (III) 74. f. 12, 13, (IV) 136-137, f. 24, 25, (V) 172-173, f. 29-31, (VI) 268, f. 48, (VII) 299-300. (VIII) 365, f. 68, 69, (IX) 499 f. 93, (X) 532, f. 100, (XI) 564-565. f. 105, 106, (XII) 725-726, f. 132, (XIII) 788, (XIV) *n. ser.* 16 : 75. f. 14, (XV) 136-137, f. 30. Includes descr. of Asian species.
- ACE 29 Pax, F. 1885, 1889 & 1893
Monographie der Gattung *Acer*. *Bot. Jahrb.* 6 : 287-374. 1885 ; *Ibid.* 7 : 177-263. 1885-86 ; *Ibid.* 11 : 72-83. 1889 ; Supplement *Ibid.* 16 : 392-404. 1893. Monographic.
- ACE 30 Pax, F. 1926-27
Acer L. I. Gesamtareal der Gattung *Acer* and einiger Sektionen.—Verbreitung einiger Sektionen der Gattung *Acer* Zur Tertiärzeit *Pflanzenr.* 1 : [8-9], maps 4, 5. 1926 ; II. 1 : 45-46, maps 31-33. 1927.
- ACE 31 Poiarkova, A. I. 1933
[Botanico-geographical survey of the maples in USSR

in connection with the history of the whole genus *Acer* L.] *Act. Inst. Bot. Acad. Sci. USSR. Ser. I Fasc. 1* : 225-374. f. 1-35. pl. 1-14. Russian with English resume pp. 364-374 ; descr., Keys, synonymy distr.

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The maples of eastern continental Asia. *In* : C. S. Sargent, *Trees and shrubs* 1 : 175-181. Enum. of species.
- ACE 33 Spach, E. 1834
Revisio generis *Acerum*. *Ann. Sci. Nat. II. Bot.* 2 : 160-180. Monographic.
- ACE 34 Tanai, T. 1978
[Taxonomical reinvestigations of the genus *Acer* L., based on vein architecture of leaves.] *Journ. Jap. Bot.* 53(3) : 65-83. In Japanese.
- ACE 35 Veitch, J. H. 1904
Far eastern maples. *Journ. Roy. Hort. Soc. (London)* 29 : 327-360. figs. 75-103. Notes.
- ACE 36 Weaver, R. E. Jr. 1976
Selected maples for shade and ornamental planting. *Arnoldia* 36(4) : 146-176.
- ACE 37 Wesmael, A. 1890
Revue critique des especes du genre *Acer*. *Bull. Soc. Bot. Belg.* 29(1) : 17-65. Enum. of 57 spp., notes on some Asiatic spp.

ACORACEAE—refer ARACEAE

ACTINIDIACEAE

(Refer also Dilleniaceae, Theaceae)

The family Actinidiaceae is assigned to the order Theales by Cronquist, Thorne and Hutchinson ; while Takhtajan kept this under the order Ericales. Engler assigned the family Actinidiaceae in the order Guttiferales, Bentham & Hooker treated this under the family

Theaceae. Hallier included the genera *Actinidia* and *Saurauia* in the family Clethraceae under the Ericales.

The family Actinidiaceae is recognised by Tieghem (1899) and it is separated from the Dilleniaceae by the nature of its stamens which are distinct or adnate to the petals, ovules with single integument and non arillate seeds.

In India the family is represented by the genus *Actinidia* (2 spp.).

GENERAL

- ACT 1 Gilg, E. & Werdermann, E. 1925
Actinidiaceae, Engler & Prantl, *Pflanzenf.* ed. 2, 21 : 36-45. Includes Saurauiaceae.
- ACT 2 Keng, H. 1972
Actinidiaceae. In : Smitinand, T., Kai Larsen & Bertel Hansen (ed.), *Fl. Thailand* 2(part 2) : 139-141.
- ACT 3 Schmid, R. 1978
Actinidiaceae, Davidiaceae and Paracryphiaceae. Systematic consideration, *Bot. Jahrb.* 100 : 196-204.

Actinidia Lindl.

- ACT 4 Astridge, S. J. 1975
Cultivars of Chinese gooseberry (*Actinidia chinensis*) in New Zealand. *Econ. Bot.* 29(4) : 357-360.
- ACT 5 Chevalier, A. 1940
Sur des lianes fruitieres interessantes : les *Actinidia*. *Rev. Bot. Appl.* 20 : 10-15, pl. 1, 2. Notes & Key.
- ACT 6 Dunn, Stephen T. 1911
A revision of the genus *Actinidia*. *Journ. Linn. Soc. Bot.* (Lond.) 30 : 394-410.
- ACT 7 Fairchild, D. G. 1913
Some asiatic actinidias. *U. S. Dept. Agr. Bur. Pl. Ind. Circular* 110 : 7-12, pl. 1, 2. fig. 1, 2. Notes on economic importance.

- ACT 8 Favorskaya, N. A. 1934
 [Survey of the literature on the genus *Actinidia*] *Bull. Appl. Bot. & Pl. Breeding* VIII, 2 : 187-198, fig. 1-5. In Russian with an English resume ; descr., notes on distr.
- ACT 9 Li, Hui-lin 1952
 A taxonomic review of the genus *Actinidia*. *Journ. Arn. Arb.* 33 : 1-61. Key, descr., discussion.
- ACT 10 Liang, Chou-Fen 1975
 [Classification of *Actinidia chinensis* Planch.] *Acta Phytotax. Sin.* 13(4) : 32-35.
- ACT 11 Tieghem, P. van 1899
 Sur les genres Actinidie et Sauravie. considerees comme types d'une famille nouvelle les Actinidiacees. *Journ. Bot. (Paris)* 13 : 170-174.
- ACT 12 Titlianov, A. A. 1959
Aktinidi i limonnik [*Actinidia* and *Schizandra chinensis*] 1-40, fig. 1-4. In Russian ; taxonomy, distr. economic importance.
- ACT 13 Youngman, B. J. 1954
 Chinese gooseberry. *Kew Bull.* 1953 : 567-568. General notes on *Actinidia chinensis*.

ADOXACEAE

(Refer also Caprifoliaceae)

The family Adoxaceae, a segregate of the family Caprifoliaceae is included in the order Dipsacales by Cronquist, Takhtajan, Thorne, Engler and in the order Saxifragales by Hutchinson. However Bentham & Hooker considered Adoxaceae as part of the family Caprifoliaceae. In India the family Adoxaceae is represented by the species *Adoxa moschatellina*. The family Adoxaceae differs from the Caprifoliaceae in the nature of its semi-inferior ovary and the longitudinal splitting of each stamen.

GENERAL

- ADX 1 Sprague, T. A. 1927
The morphology and taxonomic position of the Adoxaceae, *Journ. Linn. Soc.* 47 : 471-487.
- ADX 2 Wu, Cheng-yi 1981
Another new genus of Adoxaceae with special reference on the infra familiar evolution and the systematic position of the family. *Acta Bot. Yunnanica* 3 : 383-388, tab. 1-2. In Chinese.

AEGICERATACEAE—refer **MYRSINACEAE**

AESCULACEAE—refer **HIPPOCASTANACEAE**

AGAPANTHACEAE—refer **ALLIACEAE**

AGAVACEAE

(Refer also *Amaryllidaceae* & *Liliaceae*)

The family *Agavaceae*—a segregate of the families *Amaryllidaceae* and *Liliaceae* is treated in the order *Liliales* by Cronquist and Takhtajan. Engler treated it under the order *Liliiflorae*, while Hutchinson considered it under the order *Agavales*. However Thorne did not recognise *Agavaceae* as a separate family and included it under the family *Liliaceae*. While Bentham & Hooker considered it under the families *Amaryllidaceae* and *Liliaceae* in the order *Epigynae*. Dahlgren assigned *Agavaceae* to the order *Asparagales*.

Hutchinson segregated the xerophytic fibrous-leaved members of the families *Liliaceae* and *Amaryllidaceae* and placed it in the family *Agavaceae* which have morphologically same appearance and inflorescence, probably derived through parallel evolution for a particular xerophytic habitat. The family represents a heterogenous assemblage.

In India, excepting the genera *Pleomele* and *Sansevieria*, the following genera *Agave*, *Cordylina*, *Dracaena*, *Furcraea*, *Nolina*, *Polyanthes* and *Yucca* are introduced for ornamental purposes and cultivated in gardens.

GENERAL

- AGA 1 Baker, J. G. 1888
Handbook of the Amryllideae including the Alstroemerieae and Agaveae i-xii, 1-216. Monographic.
- AGA 2 Cave, M. S. 1964
 Cytological observations of some genera of the Agavaceae.
Madrono 17 : 163-170.

Agave Linn.

- AGA 3 Bhattacharya, G. N. & Ghosh, R. N. (1977) 1978
 Chromosomes in some varieties of a wild species of
Agave. *Bull. Bot. Soc. Bengal* 31(1-2) : 31-34.
- AGA 4 Drummond, J. R. & Prain, D. 1906
 Notes on *Agave* and *Furcraea* in India. *Agric. Ledg.*
 1906(7) : 77-271.
- AGA 5 Granick, E. B. 1944
 A karyosystematic study of the genus *Agave*. *Amer.*
Journ. Bot. 31 : 283-298.
- AGA 6 Menninger, E. A. 1972
 The self-sacrificers : they die for their young. *Gard.*
Journ. 22(6) : 166-169.
- AGA 7 McKelvey, Susan Delano & Sax, K. 1933
 Taxonomic and cytological relationships of *Yucca* and
Agave. *Journ. Arn. Arb.* 14 : 76-81.
- AGA 8 Oza, G. M. 1974
 Botanical identity of 'century plant' in Western India.
Journ. Bombay Nat. Hist. Soc. 71 : 178-181, photo 1.
 Discussion of *Agave* spp. in W. India ; critical notes.

Dracaena Vand. ex Linn.

- AGA 9 Anderson, T. 1971
 Dracaenas : *Bull. Fairchild Trop. Gard.* 26(4) : 4-12.

- AGA 10 Baker, J. G. 1873
Synopsis of the East Indian species of *Dracaena* and *Cordyline*. *Journ. Bot.* 11 : 261-266.
- AGA 11 Datta, P. C. 1971
Variation in chromosome number and its role in speciation in *Dracaena metallica* Hort. *Caryologia* 24(2) : 167-172. Chrom. nos.

Pollanthes Linn.

- AGA 12 Joshi, A. C. & Pantulu, J. V. 1941
A morphological and cytological study of *Pollanthes tuberosa* Linn. *Journ. Indian Bot. Soc.* 20 : 37-41.
- AGA 13 Trueblood, E. W. F. 1973
"Omioxochitl" the tuberose (*Pollanthes tuberosa*). *Econ. Bot.* 27(2) : 157-173.

Sansevieria Thunb.

- AGA 14 Brown, N. E. 1915
Sansevieria. A monograph of all the known species. *Bull. Misc. Inf. Kew* 1915 : 185-261. Monographic.
- AGA 15 Wijnands, D. O. 1973
Typification and nomenclature of two species of *Sansevieria* (Agavaceae). *Taxon* 22(1) : 109-114. The correct name for the species commonly known as *Sansevieria thyrsiflora* Thunb. or *S. guineensis* (L.) Willd. is *S. hyacinthoides* (L.) Druce ; *S. zeylanica* Willd. is a correct name.

Yucca Linn.

- AGA 16 McKelvey, Susan Delano 1938
Yuccas of the south-western United States, Part I, 1-150, pl. 1-80, maps. *Arnold Arboretum, Jamaica Plain*.
- AGA 17 McKelvey, Susan Delano 1947
Yuccas of the south-western United States, Part II, 1-192, pl. 1-65, maps. *Arnold Arboretum, Jamaica Plain*.

AGA 18 Mitich, L. W. (1977) 1978

The uses of the genus *Yucca*. *Excelsa* No. 7 : 45-56.

AGA 19 Sharma, A. K. & Sarkar, A. K. 1964

A study on the structure and behaviour of chromosomes in different species of *Yucca*. *Botanisk. Tidskrift*. 60 : 180-190.

AIZOACEAE (FICOIDACEAE)

(Refer also Molluginaceae)

The family Aizoaceae is also designated as Ficoideae Juss. (1789) & Mesembryanthemaceae Lindl. (1836) but Aizoaceae Braun (1864) is conserved.

The family Aizoaceae is considered under the order Caryophyllales by Cronquist, Hutchinson, Takhtajan and Dahlgren. Thorne considered Aizoaceae under the order Chenopodiales, while Engler assigned it under Centrospermae. Bentham & Hooker included it in the order Ficoidales.

Aizoaceae is divided into subfamilies and tribes (Buxbaum, 1944) on the basis of the type of placentation and position of the ovary. It is considered that this family is derived from ancestral stocks of Phytolaccaceae. Due to dry environments many genera develop xeromorphy as an adaptation to tide over extreme drought conditions. The presence of betalains in place of anthocyanin as a floral pigment indicates its affinity with Centrospermales. (Wohlpert & Mabry, 1968).

Following genera occur in India : *Corbichonia*, *Gisekia*, *Glinus*, *Limeum*, *Sesuvium*, *Trianthema*, *Zaleya*. Some of the ornamental genera cultivated in India are *Conophytum*, *Cryophytum*, *Lithops* (Commonly called "Living stones").

GENERAL

AIZ 1 Backer, C. A. 1951

Aizoaceae. In : van Steenis, *Fl. Males.* I, 4 : 267-275. fig. 1-2. Includes Molluginaceae & Ficoideae.

AIZ 2 Bogle, A. L. 1970

The genera of Molluginaceae and Aizoaceae in the south-eastern United States. *Journ. Arn. Arb.* 51 : 433-462.

- AIZ 3 Buxbaum, F. 1944
 Untersuchungen Zur Morphologie der Kakteenblute 1.
 Das Gynoecium. *Bot. Arch.* (Leipzig) 45 : 190-247.
- AIZ 4 Buxbaum, F. 1948
 Zur Klärung der phylogenetischen Stellung der Aizoaceae
 und Cactaceae in Pflanzenreich. *Jahrb. Schweiz. Kakt.-
 Ges.* 1948 : 3-16.
- AIZ 5 Candolle, A. P. de 1828 & 1830
 Ficoideae. *In* : DC. *Prodr.* 3 : 203-204, 1828 ; 4 : 267, 1830.
- AIZ 6 De Vos, M. P. 1943
 Cytological studies in genera of Mesembryanthemaceae.
Beitr. Sukkulentenk. u. Pflege 1943 : 1-160, 71 fig.
- AIZ 7 Eckardt, T. 1964
 Aizoaceae. *In* : H. Melchior, *Engler's Syllabus der pflanzenf.*
ed. 12. 2 : 87-90.
- AIZ 8 Greenfield, E. J. 1976
 Living stones. *Gard. Journ.* 26(4) : 110-114. Notes on
 genera *Lithops*, *Mesembryanthemum*.
- AIZ 9 Jeffrey, C. 1960
 Notes on tropical African Aizoaceae. *Kew Bull.* 14 : 235-
 238. Review of *Trianthema*.
- AIZ 10 Muller, K. 1908
 Beiträge zur Systematik der Aizoaceen. *Bot. Jahrb.* 42
 (Beibl. 97) : 54-94.
- AIZ 11 Pax, F. & Hoffmann, K. 1934
 Aizoaceae. *In* : Engler & Prantl, *Pflanzenf. ed.*, 2. 16C.
 179-233.
- AIZ 12 Sharma, H. P. 1973
 Pollen morphology of some species of families Ficoida-
 ceae, Molluginaceae, Nyctaginaceae and Portulacaceae.
Journ. Indian Bot. Soc. 42 : 637-645.

- AIZ 13 Sprague, T. A. 1922
The nomenclature of plant families. *Journ. Bot. London* 60 : 69-73.
- AIZ 14 Tardieu-Blot, M. L. 1967
Aizoaceae. Molluginaceae. *Fl. Camb., Laos & Vietn.* No. 5 : 79-100. pl. 2.
- AIZ 15 Wohlpart, A. & Mabry, T. J. 1968
The distribution and phylogenetic significance of the betalains with respect to the Centrospermae. *Taxon* 17 : 148-152.
- AIZ 16 Wulf, H. C. 1948
Cytological research of the Mesembryanthemeae. *Cactus & Succ. Journ. Great Britain* 10 : 42-43.

Glinus Linn.

- AIZ 17 Sharma, A. K. & Bhattacharya, N. K. 1956
Cytogenetics of some members of Portulacaceae and related families 8 : 257-274. Chrom. nos. of *Glinus lotoides*.
- AIZ 18 Steenis, C. G. G. J. van 1965
Miscellaneous botanical notes-15. *Blumea* 13 : 167-169. *Glinus lotoides*, discussion.

Trianthema Linn.

- AIZ 19 Jeffrey, C. 1960
Notes on tropical African Aizoaceae. *Kew Bull.* 14 : 235-238. Revision of *Trianthema*, two subgenera recognised and genus *Zaleya* segregated.
- AIZ 20 Jeffrey, C. 1962
Further note on typification in *Trianthema* L. (Aizoaceae). *Kew Bull.* 16 : 137-138. Taxonomic discussion.

Zaleya Burm. f.

- AIZ 21 Nair, N. C. 1966
Three new combinations in Aizoaceae. *Bull. Bot. Surv.*

India 8 : 86. 1 sp. & 2 vars. ; key to *Zaleya* & *Triantha*.

ADDITION : GENERAL

AIZ 22 Clarke, C. B. 1879

Ficoideae. In : Hooker, J. D. ed., *Fl. Brit. India* 2 : 658-665.

ALISMATACEAE

(Refer also Butomaceae)

The family Alismataceae is included in the order Alismatales (Alismales) by Cronquist, Hutchinson, Takhtajan, Thorne and Dahlgren. Engler considered it under the order Helobiac ; while Bentham & Hooker included it under the order Apocarpae.

The name Alismataceae is conserved as *nomen conservandum* in place of Alismaceae.

The family Alismataceae is characterised by the bisexual flowers having a 2-seriate perianth and it differs from the Butomaceae in the ovary having one or more basal or marginal ovules and in the presence of schizogenous secretory canals and multiaperturate pollen.

The family shows superficial morphological resemblance to Ranunculaceae but there are considerable anatomical differences. This family is considered as one of the most primitive monocot families. For details of phylogeny refer Pichon (1946) and Welder (1975).

The following genera occur in India : *Alisma*, *Caldesia*, *Limnophyton*, *Sagittaria* & *Wiesneria*.

GENERAL

ALI 1 Argue, C. L. (1974) 1975

Pollen studies in the Alismataceae (Alismaceae). *Bot. Gaz.* 135(4) : 338-344.

ALI 2 Brown, W. V. 1946

Cytological studies in the Alismaceae. *Bot. Gaz.* 108 : 262-267.

- ALI 3 Buchenau, F. 1868
*Index criticus Butomacearum, Alismatearum, Juncagina-
 cearumque hucusque descriptarum. Abh. Nat. ver Bremen*
 1. pp. 61.
- ALI 4 Engler, A. 1903
 Alismaceae. *In* : Engler, *Pflanzenr.* 16(IV. 15) : 1-66.
- ALI 5 Ghaffoor, A. 1974
 Alismataceae. *Fl. W. Pakistan* No. 68 : 1-12.
- ALI 6 Hartog, C. den 1957
 Alismataceae. *In* : van Steenis, *Fl. Males. I.* 5 : 317-334,
 fig. 1-12.
- ALI 7 Micheli, M. 1881
 Alismaceae, Butomaceae, Juncagineae. *In* : DC. *Monogr.*
Phan. 3 : 7-112. Monographic.
- ALI 8 Pichon, M. 1946
 Sur les Alismatacees et les Butomacees' *Not. Syst.* (Paris)
 12 : 170-183. Critical notes ; Key to genera of Alisma-
 taceae.
- ALI 9 Welder, George J. 1975
 Phylogenetic trends in the Alismatidae (Monocotyled-
 oneae) *Bot. Gaz.* 136 : 159-170. Discussion on phylogeny.
- ALI 10 Wodehouse, R. P. 1936
 Pollen grains in the identification and classification of
 plants VIII. The Alismataceae. *Amer. Journ. Bot.* 23 :
 535-539.

Alisma Linn.

- ALI 11 Aleksandrova, L. A. 1967
 Material pour la systematique des especes d' *Alisma* L.
Bot. Zh Moscow 52(3) : 362-370.
- ALI 12 Daumann, E. 1966
 Pollenkitt Bestaubungsart und phylogenia der Gattungen,

Trillium, *Paris*, *Potamogeton* und *Alisma*. *Novit. Bot. Inst. Bot. Univ. Carolinae, Pragensis* 19-20.

ALI 13 Hendricks, A. J. (1957) 1958

A revision of the genus *Alisma* (Dill.) L. *Amer. Midl. Nat.* 58 : 470-493, fig. 1-13. See E. G. Voss, *Taxon* 7 : 130-133. 1958.

ALI 14 Pogan, E. 1967

Cytotaxonomical remarks on two Asiatic representatives of *Alisma* L. *Act. Biol. Cracov.* 10 : 183-193, fig. 1, tab. 2, pl. 26. Asiatic *A. plantago-aquatica* L. ssp. *orientale* Sam. is a diploid $2n=14$.

ALI 15 Samuelsson, G. 1933

Alisma L. *Pflanzenar.* 3 : 88-90, maps. 73-75. Distr. of Asiatic spp. included.

Caldesia Parl.

ALI 16 Komarov, V. L. 1901

[*Typha orientalis* Presl. and *Caldesia parnassifolia* Parl. and their geographical distribution]. *Trav. Soc. Nat. St. Petersb.* 32 : *Compt. Rend.* : 269-274. In Russian.

ALI 17 Lai, M. -J. 1976

Caldesia parnassifolia (Alismataceae), a neglected monocot in Taiwan. *Taiwania* 21(2) : 276-278.

Limnocharis HBK.

ALI 18 Kammathy, R. V. & Subramanyam, K. 1967

Limnocharis HBK—a genus new to India. *Journ. Bombay Nat. Hist. Soc.* 64 : 389-390. *L. flava* (L.) Buchanan from Kerala ; Key to *L. flava* and *Limnophyton obtusifolium* : distr., notes.

Limnophyton Miq.

ALI 19 Sheriff, A. & Nagaraj, M. 1966

A note on the karyomorphology of *Limnophyton obtusifolium* Miq. *Curr. Sci.* 35 : 19-20.

Sagittaria Linn.

- ALI 20 Bogin, C. 1955
Revision of the genus *Sagittaria* (Alismataceae). *Mem. N. Y. Bot. Gard.* 9 : 179-233, fig. 1-20. Mainly American species.
- ALI 21 Buchenau, F. 1903
Sagittaria. In : Engler, *Pflanzenr.* 16(IV. 15), 37-59.
- ALI 22 Gluck, H. 1942
Critical research concerning the Indian arrowhead *Sagittaria sinensis* Sims. = *S. sagittifolia* Aut.). *150th Anniv. Vol. Bot. Gard. Calcutta* : 59-90, map 1, fig. 1-22. Phyto-geographical treatment.
- ALI 23 Gorodkov, B. N. 1913
[On the taxonomy of the European and Asiatic species of the genus *Sagittaria*]. *Trav. Mus. Bot. Acad. Sci. St. Petersb.* 10 : 128-167, fig. 1-6. In Russian.
- ALI 24 Porterfield, W. M. 1940
The arrowhead as a food among the Chinese. *Journ. N. Y. Bot. Gard.* 41 : 45-47, fig. 3. A horticultural account of *Sagittaria*.
- ALI 25 Rataj, K. 1972
Revision of the genus *Sagittaria* Part 1 (Old World species). *Annot. Zool. Bot. Slov. Narod. Muz. Bratislava* 76 : 1-31.

ADDITION : GENERAL

- ALI 26 Hooker, J. D. 1893
Alismaceae. In : Hooker, J. D. *ed.*, *Fl. Brit. India* 6 : 559-562.

ALANGIACEAE(Refer also *Cornaceae*)

Cronquist, Takhtajan, Thorne and Dahlgren considered the family Alangiaceae under the order Cornales. While Engler included this

family under the order Umbelliflorae, Hutchinson assigned it to the Araliales. Bentham & Hooker did not recognise this as a separate family and included it in the family Cornaceae sensu lato.

A unigeneric family, it is related to the family Cornaceae but differs in the nature of ovule (one pendulous anatropous ovule developing in each locule) and in the pollen development.

The family is represented in India by the genus *Alangium*. Awasthi (1968), reported fossil wood *Alangioxylon scalariforme* from the Neyvely lignites. Eyde *et al* (1969) and Reitsma (1970) have reviewed fossil *Alangium* and pollen types. Bloembergen (1939) revised the genus *Alangium* on world basis and Eyde (1972) has given an evolutionary account of the genus *Alangium* on the basis of pollen studies.

GENERAL

- ALG 1 Awasthi, N. 1968
A new fossil wood belonging to the family Alangiaceae from the Tertiary of South India. *Palaeobotanist* 17 : 322-325, pl. 1.
- ALG 2 Candolle, A. P. de 1828 & 1830
Alangieae. *In* : DC. *Prodr.* 3 : 203-204, 1828 ; 4 : 267, 1830.
- ALG 3 Eyde, R. H. 1968
Flowers, fruits and phylogeny of Alangiaceae. *Journ. Arn. Arb.* 49 : 167-192, fig. 10. Affinity with Cornales is not supported by anatomy ; some affinity with Rubiaceae.
- ALG 4 Gopinath, D. M. 1945
A contribution to the embryology of *Alangium lamarekii* Thw. with a discussion of the systematic position of the family Alangiaceae. *Proc. Indian Acad. Sci. B.* 22 : 225-231.
- ALG 5 Melchior, H. 1929
Die Chinesischen Arten der Familie der Alangiaceen. *Notizbl. Bot. Gard. Berlin* 10 : 822-830. 7 spp. of *Alangium* included.

- ALG 6 Miki, Shigeru 1956
Endocarp remains of Alangiaceae, Cornaceae and Nyssaceae. *Japan Journ. Inst. Polytech. Osake City Univ.* Ser. D. 7 : 275-295, pl. 1, fig. 1-7.
- ALG 7 Rehder, A. 1916
Alangiaceae. *In : Sarg. Pl. Wils.* 2 : 552-554.
- ALG 8 Tardieu-Blot, M. L. 1968
Alangiaceae. *Fl. Camb., Laos & Vietn.* No. 8 : 35-49.
- ALG 9 Wangerin, W. 1910
Alangiaceae. *In : Engler. Pflanzenr.* 41(IV. 220b). : 1-24.

Alangium Lamk.

- ALG 10 Bloembergen, S. 1939
A revision of the genus *Alangium*. *Bull. Jard. Bot. Buitenzorg ser. 3*, 16 : 139-235.
- ALG 11 Cave, G. H. & Smith, W. W. 1914
Note on the East Himalayan species of *Alangium*. *Rec. Bot. Surv. India* 6 : 93-98, pl. 1, 2. Critical notes.
- ALG 12 Eramjan, E. N. 1968
Morphologie du pollen du genre *Alangium* Lam. en fonction de sa phylogenie. *Biol. Zh. Armenii* 21(1) : 85-92. In Russian.
- ALG 13 Eyde, R. H. 1972
Pollen of *Alangium* : toward a more satisfactory synthesis. *Taxon* 21 : (4) : 471-477.
- ALG 14 Eyde, R. H., Bartlett, A. & Barghoorn, E. S. 1969
Fossil record of *Alangium*. *Bull. Torr. Bot. Club* 96(3) : 288-314.
- ALG 15 Govindarajalu, E. & Swamy, B. G. L. 1956
Petiolar anatomy and subgeneric classification of the genus *Alangium*. *Journ. Madras Univ. B.* 26 : 583-588.

ALG 16 Mukerjee, S. K. (1968) 1969

The genus *Alangium* in India. *Bull. Bot. Surv. India* 10 : 330-331. Discussion ; key to spp. ; synonymy, notes.

ALG 17 Reitsma, T 1970

Pollen morphology of the Alangiaceae. *Rev. Palaeobot. Palynol.* 10 : 249-332.

ADDITION : GENERAL

ALG 18 Hutchinson, J. 1967

Alangiaceae. *The Genera of Flowering Plants* 2 : 48-49.

ALLIACEAE

(Refer also Amaryllidaceae & Liliaceae)

Takhtajan recognised the family Alliaceae and placed it under the order Liliales, while Dahlgren placed it in the order Asparagales. However Cronquist, Engler, Thorne and Bentham & Hooker did not accept Alliaceae as a separate family and considered it as part of the family Liliaceae *sensu lato*. Hutchinson however considered it under the family Amaryllidaceae under the order Amaryllidales.

The Alliaceae is intermediate between the families Liliaceae and Amaryllidaceae. It is allied to Liliaceae in having superior ovary ; while it is related to Amaryllidaceae in having umbellate inflorescence. These combinations of characters justify the separation of the family Alliaceae. Stearn (1960) however suggested the inclusion of *Allium* and *Mitula* in the family Amaryllidaceae as the umbels of *Allium* and its allies result from contracted cymes to a single level.

The family is represented in India by the genera *Allium* and *Mitula*. The genus *Agapanthus* (*A. africanus* Hoffmgg.) is cultivated for ornamental purposes.

GENERAL

ALL 1 Fulvio, T. E. di 1973

Sobie el gineceo de *Allium* y *Nothoscordum*. *Kurtziana* 7 : 241-253.

- ALL 2 Nasir, E. 1975
 Alliaceae. *Fl. W. Pakistan No. 83* : 1-31, fig. 10. Key to 41 spp.

Allium Linn.

- ALL 3 Baker, J. G. 1874
 On the Alliums of India, China and Japan. *Journ. Bot. Brit. & For.* 12 : 289-295. An annotated enum.
- ALL 4 Boothman, H. S. 1932
 Blue alliums for the garden. *Nat. Hort. Mag.* 11 : 123-125, fig. 1. General and hort. notes.
- ALL 5 Cheshmedjiev, I. V. 1974
 Cytotaxonomical study of certain onion species of the section *Allium*. *Dokl. Bolg. Akad. Nauk.* 27(8) : 1909-1112.
- ALL 6 De Janke, V. 1946
 Key to the Alliums of Europe. *Herbertia* 11 : 219-225.
- ALL 7 Don, G. 1827
 A monograph of the genus *Allium*. *Mem. Wern. Nat. Hist. Soc.* 6 : 1-102.
- ALL 8 Ekberg, L. 1969
 Studies in the genus *Allium* II, a new subgenus and new sections from Asia. *Bot. Notiser* 122 : 57-68.
- ALL 9 Ekberg, L. 1970
 Studies in the genus *Allium* III. Wind dispersal of *Allium* bulbs. *Bot. Notiser* 123 : 115-118.
- ALL 10 Gohill, R. N. & Kaul, A. K. 1973
 Some adaptive genetic evolutionary processes accompanying polyploidy in the Indian *Alliums*. *Bot. Notiser* 126 (4) : 426-432.
- ALL 11 Irving, W. 1904
 The *Alliums*. *Garden* 65 : 218-219, 234-235, 252, 266. Data on Asiatic spp.

- ALL 12 Kaul, C. L. 1975
Cytology of a spontaneously occurring desynaptic *Allium cepa*. *Cytologia* 40(2) : 243-248.
- ALL 13 Kupriyanova, L. A. & Aliev, T. A. 1979
[Palynological data on the taxonomy of the genus *Allium* L. Alliaceae J. R. Agardh.] *Bot. Zhurn.* 64(9) : 1273-1284. In Russian.
- ALL 14 Maia, L. de O. 1941
Le grain de pollen dans l'identification et la classification des plantes 1. Sur la position systematique du genre *Allium*. *Bull. Soc. Portugaise des Sci. Nat.* 13(25) : 135-147.
- ALL 15 Mathew. B. 1974
Attractive alliums. *Amat. Gard.* 91(4670) : 24.
- ALL 16 Moore, H. E. Jr. 1954-55.
The cultivated alliums (I) *Baileya* 2 : 103-113, 1954 ; (II) 2 : 117-123, fig. 36-37. 1955 ; (III) 3 : 137-149, fig. 49-52 ; (IV) 3 : 156-167, fig. 53-54. 1955. A review ; hort. notes.
- ALL 17 Pandita, T. K. & Mehra, P. N. 1981
Cytology of *Allium* of Kashmir Himalayas I. Wild species. *Nucleus* 24 : 5.
- ALL 18 Prokhanoff, J. I. 1931
[A contribution to the knowledge of the cultivated alliums of China and Japan] *Bull. Appl. Bot. & Pl. Breed.* 24(2) : 123-188, fig. 1-17. In Russian.
- ALL 19 Regel, E. 1874
Alliorum adhuc cognitorum. *Act. Hort. Petrop.* 3(2) : 1-266.
- ALL 20 Regel, E. 1887
Allii species Asiae Centralis in Asia Media. 1-87, tab. 8. Petropoli.
- ALL 21 Sharma, A. K. & Aiyangar, H. R. 1961
Occurrence of B. Chromosomes in diploid *Allium straa-*

- cheyii* Baker and their elimination in polyploids. *Chromosoma* 12 : 310-317.
- ALL 22 Stearn, W. T. 1929
Some decorative alliums. *Gard. Chron.*, III 86 : 162-163.
General notes.
- ALL 23 Stearn, W. T. 1943
The welsh onion and the ever-ready onion. *Gard. Chron.*
III, 114 : 86-88, fig. 43-47.
- ALL 24 Stearn, W. T. 1946
The floristic regions of the USSR with reference to the
genus *Allium*. *Herbertia* 11 : 45-63, pl. 263, maps 1-3.
- ALL 25 Stearn, W. T. 1946
Notes on the genus *Allium* in the Old World. *Herbertia*
11 : 11-34, fig. 117-120.
- ALL 26 Stearn, W. T. 1960
Allium and Milula in the Central and Eastern Himalayas.
Bull. Brit. Mus. Nat. Hist. Bot. 2 : No. 6, 161-191, pl. 9-12,
fig. 1-10. Stearn suggested the inclusion of *Allium* and
Milula in the family Amaryllidaceae as the umbel of
Allium and its allies results from a contraction of cymes
to a single level.
- ALL 27 Traub, H. P. 1972
Genus *Allium* L.—subgenera, sections and subsections. *Pl.*
Life 28(1-4) : 132-137.
- ALL 28 Turrill, W. B. 1962
Allium tuberosum—Liliaceae. *Curtis, Bot. Mag.* 173 : t.
386. Descr.
- ALL 29 Vvedensky, A. I. 1946
The genus *Allium* in the USSR. *Herbertia* 11(1944) : 65-
218. Translated from the Russian. *Komarov, V. L. Fl.*
USSR 4 : 112-280. 1935 ; recognises 288 spp.
- ALL 30 Wilde-Dyfjes, B. E. E. de, 1973
Typification of 23 *Allium* species described by Linnaeus
and possibly occurring in Africa. *Taxon* 22(1) : 57-91.

Milula Prain

ALL 31 Prain, D. 1895

On *Milula*, a new genus of the Liliaceae from East Himalaya. *Journ. Bombay Nat. Hist. Soc.* 10 : 55.

ALTINGIACEAE

(Refer also Hamamelidaceae)

The family Altingiaceae, a segregate of the family Hamamelidaceae, is recognised by Airy Shaw and Dahlgren. While Cronquist, Takhtajan, Thorne, Engler, Hutchinson and Bentham & Hooker did not recognise Altingiaceae as a separate family. Dahlgren included the Altingiaceae in the order Hamamelidales. Airy Shaw mentions that it is intermediate between Hamamelidaceae and Platanaceae. The female inflorescence in the shape of a globose head suggests affinities with Platanaceae.

The family is represented in India by the following genera : *Altingia* and *Liquidambar*.

GENERAL

ALT 1 Chang, T. T. 1964

Morphologie du pollen des Hamamelidaceae et Altingiaceae (en russe). *Ukrain Bot. Zh.* 21(3) : 173-232.

Altingia Noron.

ALT 2 Chang, S. T. 1959

The pollen morphology of *Liquidambar* L. and *Altingia*. *Nor. Bot. Zh. Moscow* 44(10) : 1375-1380.

Liquidambar Linn.

ALT 3 Kuprianova, L. A. 1960

Palynological data contributing the history of *Liquidambar*. *Pollen et Spores* 2(1) : 71-78.

ALT 4 Santamour, F. S. 1972

Chromosome number in *Liquidambar*. *Rhodora* 74 : 287-290.

AMARANTHACEAE

The family Amaranthaceae is included in the order Caryophyllales by Cronquist, Dahlgren and Takhtajan. While Hutchinson and Thorne considered it under the order Chenopodiales. Engler assigned the Amaranthaceae to the order Centrospermae and Bentham & Hooker treated it under the Currembryae.

The Amaranthaceae is allied to the Chenopodiaceae but differs in having a scarious perianth and connate filaments. The presence of betalain pigments in Amaranthaceae instead of anthocyanin pigments is characteristic of the order Centrospermae. According to Schinz (1934) Amaranthaceae and Chenopodiaceae are systematically allied and may be considered as one family. For recent taxonomic work on the family refer Townsend (1973, 1974, 1980), for revision of the genus *Amaranthus* and their germplasm refer Sauer (1950, 1955, 1967) and for cytogenetics refer Pal & Khoshoo (1974), Khoshoo & Pal (1973).

Following genera occur in India : *Achyranthes*, *Aerva*, *Allmania*, *Alternanthera*, *Amaranthus*, *Bosea*, *Cyathula*, *Deeringia*, *Digera*, *Indobanalia*, *Nothosaerva*, *Psilotrichum*, *Pupalia* and *Stilbanthus*. Ornamental species belonging to the following genera : *Celosia*, *Gomphrena* and *Iresine*, are cultivated in India.

GENERAL

- AMA 1 Backer, C. A. 1949
Amaranthaceae. In : van Steenis, *Fl. Males.* I. 4 : 69-98, 593-594. fig. 8.
- AMA 2 Bakhuizen van den Brink Jr., R. C., van Steenis, C. G. G. J. & Veldkamp J. F. 1972
Amaranthaceae. In : van Steenis, *Fl. Males.* I. 6 : Add. & Corr. 915-917. fig. 1. Key to the genus *Alternanthera*.
- AMA 3 Behera, B. & Patnaik, S. N. 1974
Cytotaxonomic studies in the family Amaranthaceae. *Cytologia* 39(1) : 121-131.
- AMA 4 Cavaco, A. 1962
Les Amaranthaceae de l' Afrique au sud du Tropique

- du Cancer et de Madagascar. *Mem. Mus. Hist. ser. B. Bot.* 13 : 1-254, fig. 16. A monograph.
- AMA 5 Desai, S. R. 1971
Morphological and cytological studies in Amaranthaceae. *Cytologia* 36 : 349-353.
- AMA 6 Kuan, Ke-Chien, 1979
Amaranthaceae. *Flora Reipubl. Pop. Sinicae* 25(2) : 194-241, fig. 44-51. In Chinese ; 13 genera.
- AMA 7 Lopriore, G. 1901
Ueber geographische verbreitung der Amaranthaceae in Beziehung Zu ihren Verwandtschafts Verhältnisse. *Bot. Jahrb.* 30 : 1-38, t. 1. Discussion.
- AMA 8 Livingstone, D. A., Tomlinson, M., Friedman, G. & Broome, R. 1973
Stellate pore ornamentation in pollen grains of the Amaranthaceae. *Pollen et Spores* 15(3-4) : 345-351.
- AMA 9 Mabry, T. J. 1966
"The Betacyanins and Betaxanthins". In : Swain, T. ed. *Comparative Phytochemistry*, London & New York. Academic Press, 231-244.
- AMA 10 Martius, K. F. P. von 1825
Beitrag Zur Kenntnis der naturalichen Familie der Amarantaceen. *Nov. Act. Acad. Caes. Leop. Carol.* 13 : 209-322, pl. 14A-14B. Includes Asiatic species.
- AMA 11 Moquin-Tandon, A. 1849
Amaranthaceae. DC., *Prodr.* 13(2) : 231-424, 462-463. Monographic.
- AMA 12 Nair, P. K. K. & Rastogi, K. 1966
Pollen grains of Indian plants VIII. Amaranthaceae. *Bull. Natn. Bot. Gard. Lucknow* 118 : 1-18.
- AMA 13 Pedersen, T. M. 1967
Studies in South American Amaranthaceae. *Darwiniana* 14 : 430-462, pl. 1.

- AMA 14 Radulescu, D. 1974
 Contribution a la morphologie du pollen de la famille
 Amaranthaceae. *Lucr. Grad. Bot. Bucuresti* 119-124.
- AMA 15 Schinz, H. 1934
 Amaranthaceae. Engler & Prantl. *Pflanzenf.* ed. 2. 16C :
 7-85, fig. 1-46.
- AMA 16 Suessenguth, K. 1938
 Amaranthaceae aus Amerika, Asien, Australien. *Fedde
 Repert. Sp. Nov.* 44 : 36-48. Notes on Asian species of
Deeringia.
- AMA 17 Townsend, C. C. 1973
 Notes on Amaranthaceae I. *Kew Bull.* 28 : 141-146.
- AMA 18 Townsend, C. C. 1974
 Notes on Amaranthaceae II. *Kew Bull.* 29(3) : 461-475.
- AMA 19 Townsend, C. C. 1974
 Amaranthaceae. *Fl. W. Pakistan* No. 71 : 1-49, fig. 8.
- AMA 20 Townsend, C. C. 1980
 Amaranthaceae. *Revised Handb. Fl. Ceylon ed.* New
 Delhi 1 : 1-57.
- AMA 21 Tsukada, M. 1967
 Chenopod and Amaranth pollen. Electron microscopic
 identification. *Science* 157 (3784) : 80-82.
- AMA 22 Vishnu-Mittre, 1963
 Pollen morphology of Indian Amaranthaceae. *Journ.
 Indian Bot. Soc.* 42 : 86-101.

Achyranthes Linn.

- AMA 23 Standley, P. C. 1915
 The application of the generic name *Achyranthes*. *Journ.
 Wash. Acad. Sci.* 5 : 72.

- AMA 24 Thakur, V. 1972

Cytology of some members of the genus *Achyranthes* in Bihar. *Journ. Bihar Bot. Soc.* 1 : 12-21.

Alternanthera Forsk.

- AMA 25 Mears, J. A. (1978) 1979

The nomenclature and type collections of the widespread taxa of *Alternanthera* (Amaranthaceae). *Proc. Acad. Nat. Sci. Philadelphia* 129 : 1-21.

- AMA 26 Melville, R. 1958

Notes on *Alternanthera*. *Kew Bull.* 13 : 171-175.

- AMA 27 Santapau, H. & Shah, G. L. 1961

New plant record from Bombay : *Alternanthera pungens* HBK. *Journ. Bombay Nat. Hist. Soc.* 58 : 551-553. Synonymy ; descr., notes.

- AMA 28 Shrivastava, G. P. & Santapau, H. 1955

Alternanthera polygonoides R. Br. var. *erecta* Mart—a new record for Bombay State. *Journ. Bombay Nat. Hist. Soc.* 52 : 957, pl. 1.

- AMA 29 Veldkamp, J. F. 1971

Alternanthera paronychioides St. Hil. (Amaranthaceae) in Indo-Malesia. *Blumea* 19 : 167-169, fig. 1. Distinction of *A. paronychioides* and *A. ficoidea*.

Amaranthus Linn.

- AMA 30 Brennan, J. P. M. 1961

Amaranthus in Britain. *Watsonia* 4 : 261-280.

- AMA 31 Desai, S. R. 1971

Morphological and cytological studies in Amaranthaceae. *Cytologia* 36(2) : 349-353. Chrom. nos.

- AMA 32 Fillias, F. 1980

Amaranthus blitum vs. *A. lividus* (Amaranthaceae). *Taxon* 29 : 149-150.

- AMA 33 Gopal. B. 1974
Autecological study of *Amaranthus spinosus* L. *Ann. Arid Zone* 13(3) : 187-195.
- AMA 34 Khoshoo, T. N. & Pal, M. 1972
Cytogenetic patterns in *Amaranthus*. In : Darlington, C. D., Lewis, K. R. eds. *Chromosomes today* : 4 : 259-267.
- AMA 35 Khoshoo, T. N. & Pal, M. 1973
The probable origin and relationships of the garden cockscomb. *Bot. Journ. Linn. Soc.* 66(2) : 127-141. *Chrom. nos.*
- AMA 36 Merrill, E. D. 1936
On the application of the binomial *Amaranthus viridis* Linnaeus. *Amer Journ. Bot.* 23 : 609-612. *Distr. and nomencl.*
- AMA 37 Naik, V. N. 1967
Amaranthus polygonoides Linn. from Osmanabad Dt. : a new record for India. *Journ. Bombay Nat. Hist. Soc.* 64 : 134-135. *Descr., loc. phenology.*
- AMA 38 Nair, N. C. 1966
A note on the nomenclature of *Amaranthus polygamus* of Hooker's 'Flora of British India'. *Bull. Bot. Surv. India* 8 : 88-89. *Key to A. polygamus auct. non L. & Roxb. & A. tricolor L., nomencl.*
- AMA 39 Nair, N. C. 1976
Identity of *Amaranthus polygamus* of Hooker's Flora of British India and related taxa. *Journ. Bombay Nat. Hist. Soc.* 73 : 59-62. *A. roxburghianus* Nevski = *A. polygonoides* Roxb. non Linn. (c. f. Nair, N. C. 1966, *supra*) ; *discussion, nomencl.*
- AMA 40 Pal, M. (1972) 1973
Evolution and improvement of cultivated amaranths. 1. Breeding system and inflorescence structure. *Proc. Indian Natn. Sci. Acad. B.* 38 : 28-37.

- AMA 41 Pal, M. & Khoshoo, T. N. 1974
Grain amaranths. *Evolutionary studies in World crops—diversity and change in Indian subcontinent*. Hutchinson, J. (ed.) Cambridge University Press, London (U.K.). 129-137.
- AMA 42 Sauer, J. D. 1950
The grain Amaranths. A survey of their history and classification. *Ann. Missouri Bot. Gard.* 37 : 561-632.
- AMA 43 Sauer, J. D. 1955
Revision of the dioecious Amaranths. *Madrono* 13 : 5-46.
- AMA 44 Sauer, J. D. 1957
Recent migrations and evolution of the dioecious Amaranths. *Evolution* 11 : 11-31.
- AMA 45 Sauer, J. D. 1967
The grain Amaranths and their related relatives. A revised taxonomic and geographical survey. *Ann. Missouri Bot. Gard.* 54 : 103-137.
- AMA 46 Sauer, J. D. 1972
Amaranthus palmeri S. Wats. in India. *Journ. Indian Bot. Soc.* 43 : 573-576.
- AMA 47 Thakur, V. 1967
The identity of *Amaranthus caturus* Heyne. *Kew Bull.* 21 : 63-65, pl. 2. Taxonomic discussion & proposal to cite the sp. as *Amaranthus* × *Caturus* Heyne ex Hk. f.

Bosea Linn.

- AMA 48 Bramwell, D. (1976) 1977
The systematic position of the genus *Bosea* L. (Amaranthaceae). *Bot. Macronesica* 2 : 19-24.

Celosia Linn.

- AMA 49 Bose, R. B. (1976) 1979
The correct identity of "Cockscomb". *Bull. Bot. Surv. India* 18(1-4) : 218-219.

- AMA 50 Grant, W. F. 1961
Speciation and basic chromosome number in the genus *Celosia*. *Canad. Journ. Bot.* 39 : 45-50, fig. 4.
- AMA 51 Grant, W. F. 1962
Speciation and nomenclature in the genus *Celosia*. *Canad. Journ. Bot.* 40 : 1355-1363.

Cyathula Bl.

- AMA 52 Bakshi, T. S. 1955
The genus *Cyathula* Lour. in India. *Journ. Bombay Nat. Hist. Soc.* 52 : 533-535.

Gomphrena Linn.

- AMA 53 Manum, S. 1955
Some remarks on the pollen grains of *Gomphrena globosa* and *Chrysanthemum carinatum*. *Blyttia* 13 : 90-95.
- AMA 54 Mears, J. A. 1980
The Linnaean species of *Gomphrena* L. (*Amaranthaceae*). *Taxon* 29 : 85-95, tab. 1. 11 names critically noted.
- AMA 55 Stuchilik, J. 1912-13.
Zur synonymik der Gattung *Gomphrena*. *Fedde Repert. Spec. Nov.* 11 : 36-151.

Indobanalia Henry & Roy

- AMA 56 Sohmer, S. H. 1976
Studies in the *Amaranthaceae*. 1. The genus *Indobanalia*. *Phytologia* 34(3) : 235-239.

Psilotrichum Bl.

- AMA 57 Townsend, C. C. 1974
Notes on *Amaranthaceae*-2. *Kew Bull.* 29 : 461-475, 2 pl.
Key to Asiatic spp. of *Psilotrichum* ; critical notes.

Pupalia Juss.

AMA 58 Townsend, C. G. 1979

A survey of *Pupalia* Juss. Notes on Amaranthaceae: *Kew Bull.* 34 : 131-142. key ; *P. lappacea* with one variety.

ADDITION : GENERAL

AMA 59 Hooker, J. D. 1885

Amaranthaceae. In : Hooker, J. D. ed., *Fl. Brit. India* 4 : 713-732.

AMARYLLIDACEAE

(Refer also Agavaceae, Alliaceae & Liliaceae)

Cronquist and Thorne did not recognise the family Amaryllidaceae and it is included under the family Liliaceae in the order Liliales. The family Amaryllidaceae is accepted by Takhtajan in the order Liliales, Engler in the order Liliiflorae, Hutchinson in the order Amaryllidales, Dahlgren in the order Asparagales and Bentham & Hooker in the order Epigynae.

The family Amaryllidaceae sensu lato is a heterogenous assemblage. Hutchinson appropriately separated the tribes *Agapantheae*, *Allieae* and *Gilliesieae* to form the family Alliaceae. Other segregates of the family Amaryllidaceae are Agavaceae, Hypoxidaceae, Alstroemeriaceae, Velloziaceae, Taccaceae. The Amaryllidaceae is closely related to Liliaceae and Iridaceae.

The family consists of many well known ornamental species. In India excepting the genera *Crinum* and *Pancratium* which have indigenous species, the following genera are cultivated in gardens for their ornamental beauty : *Amaryllis*, *Clivia*, *Eucharis*, *Euryclis*, *Haemunthus*, *Hymenocallis*, *Lycoris*, *Narcissus*, *Nerine*, *Sprekelia*, *Zephyranthes*.

For recent taxonomic revisions refer Sealy (1937, 1939, 1954) for chromosomal evolution refer Flory (1977) and for chromosomal evolution of ornamental Amaryllidaceous genera refer Khoshoo & Raina (1971, 1972).

GENERAL

- AML 1 Baker, J. G. 1978
A new key to the genera of Amaryllidaceae. *Journ. Bot.* 16 : 161-169.
- AML 2 Baker, J. G. 1888
Handbook of the Amaryllideae including the Alstroemerieae and Agaveae. i-xii, 1-216. Monographic.
- AML 3 Belval, H. 1938
A propos des idees de Hutchinson sur les Amarylliacées
Bull. Soc. Bot. Fr. 85:486-489.
- AML 4 Bose, S. 1962
Cytotaxonomy of Amaryllidaceae. *Bull. Bot. Surv. India* 4:27-38.
- AML 5 Flory, Walter S. 1977
Overview of chromosome evolution in the Amaryllidaceae. *Nucleus* 20 : 70-88. Hybridization is playing an important part in the evolution of the Amaryllidaceae.
- AML 6 Herbert, W. 1837
Amaryllidaceae. 1-428, pl. 1-48. London.
- AML 7 Khoshoo, T. N. & Raina, S. N. 1971
Mitotic instability and its role in evolution in *Crinum*, *Hymenocallis* and *Zephyranthes*. *Journ. Indian Bot. Soc.* 50(A) : 318-331. Golden Jubilee Vol.
- AML 8 Nasir, E. 1980
Amaryllidaceae. *Fl. Pakistan* No. 134 : 1-7, fig. 1.
- AML 9 Pax, F. & Hoffmann, G. F. 1930
Amaryllidaceae. In : Engler & Prantl, *Pflanzenf.* ed. 2. 15a: 391-430, fig. 163-187.
- AML 10 Radulescu, D. 1972
Recherches morpho-palynologiques sur les especes d'Amaryllidaceae. *Acta Bot. Hort. Bucurest* 1970-1971 : 245-273.

- AML 11 Traub, H. P. 1938
The tribes of the Amaryllidaceae. *Herbertia* 5 : 110-113.
Key to tribes.
- AML 12 Traub, H. P. 1963
The genera of Amaryllidaceae. *Amer. Pl. Life Soc. Publ.*
1-85, fig. 10, t. 1.
- AML 13 Traub, H. P. & Moldenke, H. N. 1949
Amaryllidaceae : tribe Amaryllaceae. *Amer. Plant Life Soc.*
Stanford, California 1-194, pl. 1-15, fig. 1-3. Monograph-
ic; Systematic account.

Amaryllis Linn.

- AML 14 Narain, P. 1974
Hybridization and polyploidy in relation to *Amaryllis*
species and cultivars. *Plant Life* 30(1-4): 94-96.
- AML 15 Narain, P. 1977
Cytogenetics of garden *Amaryllis* 1. Systematic position
and taxonomic treatment of Indian cultivars. *Plant Life*
33 : 38-64. Discussion & classification.
- AML 16 Sealy, J. R. 1939
Amaryllis and *Hippeastrum*. *Bull. Misc. Inf. Roy. Bot.*
Gard. Kew 1939 : 49-68, fig. 1, 2. Generic distribution :
Typification.
- AML 17 Traub, H. P. & Uphof, J. C. T. 1938
Tentative revision of the genus *Amaryllis* (Linn. ex parte)
Uphof. *Herbertia* 5 : 114-131.

Crinum Lindl.

- AML 18 Baker, J. G. 1881
A synopsis of the known species of *Crinum*. *Gard. Chron.*
n.s. 15 : 763, 786 ; 16 : 30-40, 72, 180, 398-399, 495-496,
588-589, 760, 784-785.

- AML 19 Koshimizu, Takuji 1939
Phytogeographical distribution of *Crinum* throughout the world. *Bot. Mag. Tokyo* 52 : 32-39. 164 species, distr.; bibliography.
- AML 20 Raicu, P., Radu, M., Bogden, D. & Kirillova, M. 1971
[Cytogenetic researches of some bulbous ornamental plants]. *Ann. Univ. Bucuresti Biol. Veg.* 20 : 49-60. In Russian.
- AML 21 Raina, S. N. 1975
Genetic mechanisms underlying evolution in *Crinum*. *Cytologia, Japan* 43 (3-4) : 575-580.
- AML 22 Raina, S. N. & Khoshoo, T. N. 1971
Cytogenetics of tropical ornamentals. 2. Variations in mitotic complements. *Nucleus* 14(1) : 23-39.
- AML 23 Sealy, J. R. 1969
Crinum amoenum Roxb. *Curtis Bot. Mag. n.s.* 177 : t. 528, 1-4.
- AML 24 Sprenger, C. 1906
Die *Crinum* Asiens Oesterr. *Gart. Zeit.* 1 : 361-366. Review, distr.
- AML 25 Uphof, J. C. T. (1942) 1943
A review of the species of *Crinum*. *Herbertia* 9 : 63-84. Enum., discussion & distr.

Hymenocallis Salisb.

- AML 26 Raina, S. N. & Khoshoo, T. N. 1971
Cytogenetics of the tropical bulbous ornamentals. 5. Chromosomal variations and evolution in *Hymenocallis*. *Cellule* 68(3) : 239-255.
- AML 27 Sealy, J. R. 1954
Review of the genus *Hymenocallis*. *Kew Bull.* 1954 : 201-240. Nomenclature, distr.

Lycoris Herb.

- AML 28 Adams, P. 1976
Lycoris-surprise lilies. *Pac. Hort.* 37(3) : 23-29. Illust.
- AML 29 Muller, W. 1929
Die Gatting *Lycoris*. *Gartenflora* 78 : 42-44, fig. 1. General notes.
- AML 30 Worsley, A. 1928
Lycoris : A garden review. *Gard Chron.*, III, 84 : 169, fig. 72. Notes of hort. nature.

Narcissus Linn.

- AML 31 Baker, J. G. 1869
Review of the genus *Narcissus*. *Gard. Chron.* 1869 : 416-417, 529, 686-687, 1015. Monographic.
- AML 32 Burbridge, F. W. 1875
The Narcissus : its history and culture, with coloured plants and descriptions of all known species and principal varieties. 1-95, Pl. 48. London. A review.
- AML 33 Haworth, A. 1831
Narcissineaurum Monographia i-vi, 7-23. London.
- AML 34 Niven, J. C. 1875
All the daffodils. *Garden* 7 : 3-12, 27 fig. Notes.
- AML 35 Wheeler, W. H. 1961
A preliminary report on the examination of *Narcissus* pollen. *Amer. Daffodil Year Book* 60-61.

Pancratium Linn.

- AML 36 Ponnamma, M. G. 1978
Studies on bulbous ornamentals. 1. Karyomorphology of diploid and triploid taxa of *Pancratium triflorum* Roxb. *Cytologia* (Japan) 43 (3-4) : 717-725. Chroms. nos.

Zephyranthes Herb.

- AML 37 Hume, H. H. 1935
The correlation of classification and distribution in *Zephyranthes*. *Nat. Hort. Mag.* 14 : 258-275.
- AML 38 Raina, S. N. & Khoshoo, T. N. 1971
Cytogenetics of tropical bulbous ornamentals : 7. Male meiosis in some cultivated taxa of *Zephyranthes*. *Cytologia* 37(2) : 217-224. Chrom. nos.
- AML 39 Raina S. N. & Khoshoo, T. N. 1972
Cytogenetics of tropical bulbous ornamentals : 9. Breeding systems in *Zephyranthes*. *Euphytica* 21(2) : 317-323. Chrom. nos.
- AML 40 Rao, A. N. & Ling, L. F. 1974
Pollen morphology of certain tropical plants. *Reinwardtia* 9 : 153-176. *Zephyranthes alba* p. 158.
- AML 41 Sealy, J. R. 1937
Zephyranthes, *Pyrolirion*, *Habranthus* and *Hippeastrum*. *Journ. Roy. Hort. Soc.* 62 : 195-209.
- AML 42 Singh, U. K. & Roy, S. K. 1973
Somatic chromosomes of *Zephyranthes*, *Herb. Rev. Biol.* 9 : 141-149.

ADDITION : GENERAL

- AML 43 Hooker, J. D. 1892
Amaryllidaceae. In : Hooker, J. D. ed., *Fl. Brit. India.* 6 : 227-286.

AMPELIDACEAE—refer VITACEAE

ANACARDIACEAE

Bentham & Hooker, Cronquist, Engler, Hutchinson and Dahlgren considered the family Anacardiaceae in the order Sapindales. Takhtajan and Thorne, however assigned the family to the order Rutales.

The family Anacardiaceae differs from the related families Sapindaceae, Aceraceae and Hippocastanaceae by the combination of the following characters : the presence of resin ducts, intrastaminal disc., unilocular ovary and drupaceous fruit. In the nature of specialized resin ducts Anacardiaceae resembles Burseraceae and Julianaceae. Engler (1883) distinguished the following tribes on the basis of the number and nature of carpels : Anacardieae, Spondiadeae, Rhoeeae, Semecarpeae and Dobineae.

For recent taxonomic revisions refer Ding Hou (1978) for studies on Mangoes refer Mukherjee (1949, 1972), for cytological studies refer Khosla, Sareen & Mehra (1974).

The following genera are reported from India : *Bouea*, *Buchanania*, *Choerospondias*, *Cotinus*, *Dracontomelon*, *Drimycarpus*, *Gluta*, *Holigarna*, *Lannea*, *Mangifera*, *Nothopegia*, *Parishia*, *Pegia*, *Poupartia*, *Rhus*, *Semecarpus*, *Sorindeia*, *Spondias* and *Swintonia*. The following genera are cultivated : *Anacardium*, *Harpephyllum*, *Pistacia*, *Schinus*, *Sclerocarya*.

GENERAL

- ANA 1 Barkley, F. A. 1942
A key to the genera of the Anacardiaceae. *Amer. Midl. Nat.* 28 : 465-474.
- ANA 2 Brizicky, George K. 1962
The genera of Anacardiaceae in the south-eastern United States. *Journ. Arn. Arb.* 43 : 359-375.
- ANA 3 Cheng, Mien & Ming, Tien lu 1980
Anacardiaceae. *Flora Reipubl. Pop. Sinicae* 45(1) : 66-135, pl. 16. In Chinese; key to 16 genera.
- ANA 4 Engler, A. 1883
Anacardiaceae. In : DC., *Monogr. Phan.* 4 : 171-500, t. 4, 5. Monographic.
- ANA 5 Hou, Ding 1978
Florae Malesianae Praecursores LVI. Anacardiaceae *Blumea* 24 : 1-41, fig. 1, pl. 4. Critical notes; Genus *Melanorrhoea* Wall. is reduced to the genus *Gluta* L.

- ANA 6 Hou, Ding 1978
Anacardiaceae. In : van Steenis, Fl. Males. I, 8 : 395-548, fig. 69. Monographic.
- ANA 7 Khosla, P. K. 1973
Cytology in systematics of tribe Dobineae (Anacardiaceae). *Indian Forester* 99(12) : 721-722.
- ANA 8 Khosla, P. K., Sareen, T. S. & Mehra, P. N. (1973) 1974
Cytological studies on Himalayan Anacardiaceae. *Nucleus* 16(3) : 205-209.
- ANA 9 Marchand, L. 1869
Revision du groupe des Anacardiacees. 1-198, pl. 1-3. Monographic.
- ANA 10 Ming, Tien-lu 1980
The geographic distribution and floristic character of Chinese Anacardiaceae. *Acta Bot. Yunnanica* 2 : 390-401, maps 7. In Chinese ; English Summary.
- ANA 11 Rehder, A. & Wilson, E. H. 1914
Anacardiaceae. In : *Sarg. Pl. Wils.* 2 : 172-184.
- ANA 12 Salomon, C. 1874
Die Familie der Anacardiaceen. *Gartenflora* 23 : 10-12.
- ANA 13 Sweet, H. R. & Barkley, F. A. 1936
A most useful plant family, the Anacardiaceae. *Bull. Missouri Bot. Gard.* 24 : 216-229. Uses listed.

Anacardium Linn.

- ANA 14 Ascenso, J. C. & Mota, M. I. 1972
Phylogenetic derivation of the cashew flower. *Bol. Soc. Brot.* 46 : 253-257.
- ANA 15 Copeland, H. F. 1961
Observations on the reproductive structures of *Anacardium occidentale*. *Phytomorphology* 11 : 315-325.

ANA 16 Johnson, D. 1973

The botany, origin and spread of the cashew — *Anacardium occidentale* L. *Journ. Pl. Crops* 1 : 1-7.

Buchanania Spreng.

ANA 17 Hou, Ding 1978

Florae Malesianae praecursores LVI. Anacardiaceae. *Blumea* 24 : 1-41. *Buchanania* pp. 4-5; The two sections of *Buchanania* dealt with.

Choerospondias Burt & Hill

ANA 18 Chandra, D. (1978) 1979

Choerospondias auriculata (Anacardiaceae) : A new species from India. *Journ. Bombay Nat. Hist. Soc.* 75 : 457-460. New species from Uttar Pradesh.

Dracontomelon Bl.

ANA 19 Tardieu-Blot, M. L. 1961

Sur les *Dracontomelon*. d'Indochina. *Adansonia* 1 : 55-58. pl. 1.

Gluta Linn.

ANA 20 Hou, Ding 1978

Florae Malesianae praecursores LVI. Anacardiaceae. *Blumea* 24 : 1-41. *Gluta* L. pp. 8-21. 30 spp., genus *Melanorrhoea* reduced as a synonym.

ANA 21 Tardieu-Blot, M. L. 1961

Sur les *Gluta*, *Swintonia* et *Melanorrhoea* indo-chinois. *Adansonia* 1 : 192-197, fig. 1.

Holigarna Buch.-Ham.

ANA 22 Bennet, S. S. R. & Sahni, K. C. 1976

A note on the name *Holigarna grahamii* (Anacardiaceae). *Indian Forester* 102 : 89. Hold *Holigarna wightii* Balak. is superfluous.

- ANA 23 Kadambi, K. 1955
Holigarna arnottiana Hook. f. (Syn. *H. longifolia* Wt. & Arn.) *Indian Forester* 81 : 103-106, fig. 2. loc. name, descr., distr., assoc. trees.

Mangifera Linn.

- ANA 24 Bhatt, S. S. 1944
 Classification of Mangoes. *Curr. Sci.* 13 : 135-136.
- ANA 25 Gangolly, S. R. & Singh, D. 1950
 Distribution of the mango (*Mangifera indica* L.) and its varieties. *Indian Journ. Hort.* 7 : 7-16.
- ANA 26 Maries, C. 1902
 Indian Mangoes. *Journ. Roy. Hort. Soc.* 26 : 755-770.
- ANA 27 Mukherjee, S. K. 1948
 The varieties of Mango (*Mangifera indica* L.) and their classification. *Bull. Bot. Soc. Beng.* 2 : 101-133, fig. 1-36.
- ANA 28 Mukherjee, S. K. 1949
 A monograph on the genus *Mangifera* L. *Lloydia* 12 : 73-136.
- ANA 29 Mukherjee, S. K. 1949
 The Mango and its relatives. *Sci. Cult.* 15 : 5-9.
- ANA 30 Mukherjee, S. K. 1950
 Cytological investigation of the mango (*Mangifera indica* L.) and the allied Indian species. *Proc. Natn. Inst. Sci. India* 16 : 287.
- ANA 31 Mukherjee, S. K. 1950
 Wild mangoes of India. *Sci. Cult.* 15 : 469-471.
- ANA 32 Mukherjee, S. K. 1951
 The origin of the Mango. *Indian Journ. Genet. & Pl. Breeding* 11 : 49-56.

- ANA 33 Mukherjee, S. K. 1951
Pollen analysis in *Mangifera* L., in relation to fruit-set and taxonomy. *Journ. Indian Bot. Soc.* 30 : 49-55.
- ANA 34 Mukherjee, S. K. 1953
The Mango — Its botany, cultivation, uses and future improvement, especially as observed in India. *Econ. Bot.* 7(2) : 130-162.
- ANA 35 Mukherjee, S. K. 1953
Origin, distribution and phylogenetic affinity of the species of *Mangifera* L. *Journ. Linn. Soc. (Bot.)* 55 : 65-83, maps 3.
- ANA 36 Mukherjee, S. K. 1972
Origin of Mango (*Mangifera indica*) *Econ. Bot.* 26 : 260-264, fig. 1, map 1., t. 1.
- ANA 37 Naik, K. C. 1941
South Indian Mangoes. *Bull. No. 24, Dept. Agriculture.*
- ANA 38 Naik, K. C. & Gangolly, S. R. 1950
A monograph on Classification and nomenclature of South Indian Mangoes. Madras.
- ANA 39 Rhodes, A. M. et al. 1970
A numerical taxonomic study of the mango (*Mangifera indica* L.) *Journ. Amer. Soc. Hort. Sci.* 95 : 252-256.
- ANA 40 Singh, L. B. 1968
The mango. London, Leonard Hill. 1-420.
- ANA 41 Singh, S. N. 1961
Studies on the morphology and viability of the pollen grains of mango. *Hort. Adv.* 5 : 121-144.
- ANA 42 Wester, P. J. 1922
A descriptive list of mango varieties in India. *Bull. Bur. Agric. Phil. Is.* No. 36.
- ANA 43 Woodrow, M. 1904.
The Mango : Its culture and varieties. Paisley.

Nothopegia Bl.

- ANA 44 Ellis, J. L. & Chandrasekharan, V. (1970) 1972
 A new variety of *Nothopegia beddomei* Gamble (Anacardiaceae) from Kerala, South India. *Bull. Bot. Surv. India* 12 : 257-258, fig. 6, t. 1.

Pistacia Linn.

- ANA 45 Copeland, H. F. 1955
 The reproductive structures of *Pistacia chinensis* (Anacardiaceae). *Phytomorphology* 5 : 440-449.
- ANA 46 Kuprianova, L. A. 1961
 Palynological data elucidating the taxonomy of the genus *Pistacia*. *Bot. Zh. Moscow* 46(6) : 803-814. In Russian.

Rhus Linn.

- ANA 47 Bean, W. J. 1898
 The hardy sumachs (*Rhus*). *Garden* 54 : 505-507.
- ANA 48 Brizicky, George K. 1963
 Taxonomic and nomenclatural notes on the genus *Rhus* (Anacardiaceae). *Journ. Arn. Arb.* 44 : 60-80. Generic delimitation of genera *Rhus* and *Toxicodendron*.
- ANA 49 Engler, A. 1881
 Über die morphologischen Verhältnisse und die geographische Verbreitung der Gattung *Rhus*, wie der mit ihr Verwandten leben und ausgestorbenen Anacardiaceae. *Engl., Bot. Jahrb.* 1 : 365-426, pl. 4.
- ANA 50 Furtado, C. X. 1939
 The typification of *Rhus javanica* L. *Gard. Bull. Straits Settem.* 10 : 330-335. Critical discussion.
- ANA 51 Greene, E. L. 1905
 Segregates of the genus *Rhus*. *Leaflet Bot. Obs. Crit.* 1 : 114-144.

ANA 52 Young, D. A. 1979

Heartwood flavonoids and the infrageneric relationships of *Rhus* (Anacardiaceae). *Amer. Journ. Bot.* 66(5) : 502-510.

Semecarpus Linn. f.

ANA 53 Tardieu-Blot, M. L. 1961

Anacardiacees nouvelles d' Indo-chine. *Adansonia* 1 : 198-207, fig. 2.

Spondias Linn.

ANA 54 Airy Shaw, H. K. & Forman, L. L. 1967

The genus *Spondias* L. (Anacardiaceae) in tropical Asia. *Kew Bull.* 21 : 1-19, fig. 3, pl. 2. 10 spp., nomencl., notes, *Allospondias* and *Solenocarpus* reduced to *Spondias*.

ADDITION : GENERAL

ANA 55 Hooker, J. D. 1876

Anacardiaceae. In : Hooker, J. D. ed., *Fl. Brit. India* 2 : 7-44.

ANCISTROCLADACEAE

(Refer also Dipterocarpaceae)

The family Ancistrocladaceae is assigned to the order Violales by Cronquist, to the order Theales by Takhtajan, to the order Geraniales by Thorne, to the order Ochnales by Hutchinson. Dahlgren tentatively included this family in the order Theales, but indicated that its systematic position is uncertain. Bentham & Hooker did not recognise this as a family and considered it in the family Dipterocarpaceae. Engler however placed it in the order Guttiferales.

A tropical family of lianes with only genus *Ancistrocladus*, it is an isolated family and its affinities and systematic position are uncertain. Characteristically branching in a sympodial fashion, each branch ending in a coiled hook, it has woody fruit surrounded by the spreading accrescent sepals. Affinities with Dipterocarpaceae, Violaceae, Ochnaceae and Dioncophyllaceae have been suggested.

The family is represented in India by the genus *Ancistrocladus*.

For recent studies refer Keng (1967, 1970) and for its systematic affinities refer Gottwald & Parameswaran (1968).

GENERAL

- ANC 1 Gilg, E. 1925
Ancistrocladaceae. Engler & Prantl, *Pflanzenf.* ed. 2, 21 : 589-592.
- ANC 2 Gottwald, H. & Parameswaran, N. 1968
Das sekundäre xylem und die systematische Stellung der Ancistrocladaceae und Dioncophyllaceae. *Bot. Jahrb.* 88 : 49-69. Woody climbing habit by non homologous hooks.
- ANC 3 Steenis, C. G. G. J. van 1949
Ancistrocladaceae. In : van Steenis, *Fl. Males.* I. 4 : 8-10, fig. 2.

Ancistrocladus Wall.

- ANC 4 Keng, H. 1967
Observations on *Ancistrocladus tectorius*. *Gard. Bull. Singapore* 22 : 113-121.
- ANC 5 Keng, H. 1970
Further observations on *Ancistrocladus tectorius* (Ancistrocladaceae). *Gard. Bull. Singapore* 25 : 235-237.
- ANC 6 Thwaites, G. H. K. 1854
Notes on the genus *Ancistrocladus* of Wallich. *Trans. Linn. Soc.* 21 : 225-226.

ANNONACEAE

The family Annonaceae is assigned to the order Magnoliales by Cronquist, Engler, Takhtajan and Dahlgren, to the order Annonales by Hutchinson and Thorne, to the order Ranales by Bentham & Hooker.

The Annonaceae, one of the primitive group of flowering plants is characterised by the spirally arranged stamens, multipistillate

gynoccium and ruminant endosperm of the seeds. This family is allied to the Magnoliaceae, but differs in having ruminant endosperm and exstipulate leaves. Fries (1931) divided the family into two sub-families Annonoideae and Monodoroideae based on the spiral or cyclical arrangement of the carpels.

The following genera occur in India : *Alphonsea*, *Anaxagorea*, *Annona*, *Artabotrys*, *Cananga*, *Cyathostema*, *Cyathocalyx*, *Desmos*, *Ellipeiopsis*, *Fissistigma*, *Friesodielsia*, *Goniothalamus*, *Meiogyne*, *Milusa*, *Mitrephora*, *Orophea*, *Phaeanthus*, *Polyalthia*, *Popowia*, *Pseuduvaria*, *Sageraea*, *Trivalvaria*, *Uvaria* & *Xylopia*.

For recent taxonomic revisions, refer Sinclair (1953, 1955, 1956), Mitra (1982); for pollen morphology and phylogeny refer Canright & Paden (1962), Walker (1971, 1972); for phylogeny refer Thorne (1974) and for chromosome numbers and phylogeny, refer Raven *et al.*, (1971) & Walker (1972).

GENERAL

- ANN 1 Agababian, V. Ch. 1967
Memoire sur la famille des Annonacees. *Biol. Zh. Armenii* 20(3) 102-105.
- ANN 2 Baillon, H. 1868
Memoire sur la famille des Annonacees. *Adansonia* 8 : 162-184, 295-344. Synopsis of genera.
- ANN 3 Bentham, G. 1861
Notes on Annonaceae. *Journ. Proc. Linn. Soc. Bot.* 5 : 67-72.
- ANN 4 Bowden, W. M. 1948
Chromosome numbers in the Annonaceae. *Amer. Journ. Bot.* 35 : 377-381.
- ANN 5 Candolle, A. P. de 1824
Annonaceae. In DC. *Prodr.* 1 : 83-94.
- ANN 6 Candolle, A. P. de 1832
Memoire sur la famille des Anonacees. *Mem. Soc. Phys. & Hist. Nat. Geneve* 5 : 177-221, t. 1-5. Enumeration.

- ANN 7 Canright, J. E. & Paden, M. P. 1962
Contributions of pollen morphology to the phylogeny of the Annonaceae, Eupomatiaceae and Myristicaceae. *Amer. Journ. Bot.* 49(6) : 674.
- ANN 8 Corner, E. J. H. 1949
The Annonaceous seed and its four integuments. *New Phytologist* 48 : 332-364, fig. 31.
- ANN 9 Das, D. 1963
Annonaceae. In : Mukerjee, S. K., Enumeration of Indian Flowering Plants VI. *Bull. Bot. Surv. India* 5 : 39-47. 22 genera, 110 species enumerated.
- ANN 10 Das, D. 1963
Studies on Indian and Burmese Annonaceae. *Bull. Bot. Surv. India* 5 : 93. Nomencl. of *Unona ramarowii* Dunn = *Desmos ramarowii* (Dunn) Das.
- ANN 11 Diels, L. 1932
Die Gliederung der Annonaceen und ihre phylogenie. *Sitz.-Ber. Preuss. Akad. Wiss. Phys.-Math. Kl.* 1932 : 77-85. Generic alliances and phylogeny.
- ANN 12 Dunal, M. F. 1817
Monographie de la famille des Annonacees. 1-144, pl. 1-33. Monographic.
- ANN 13 Fries, R. E. 1931 & 1939
Revision der Arten einiger Annonaceen-Gattungen I-V. *Acta Hort. Bergiani* 10 : 1-341, 1931; *Ibid.* 12 : 1-220, 289-577. 1939.
- ANN 14 Fries, R. E. 1959
Annonaceae. Engler & Prantl, *Pflanzenf.* ed. 2. 17a 11 : 1-171, fig. 1-40. Monographic.
- ANN 15 Hutchinson, J. 1923
The genera of Annonaceae. *Kew Bull.* 1923 : 241-261. Key to genera.

- ANN 16 Hutchinson, J. 1964
Annonaceae. In : Hutchinson, *The Genera of Flowering Plants* 1 : 71-108. Key to genera.
- ANN 17 King, G. 1893
The Annonaceae of British India. *Ann. Roy. Bot. Gard. Calcutta* 4 : 1-169, t. 1-220.
- ANN 18 Li, P.-T. 1976
[Some notes on the Annonaceae of China] *Acta Phytotax. Sin.* 14(1) : 96-113. In Chinese ; Key.
- ANN 19 Raven, P. H., Kyhos, D. W. & Cavc., M. S. 1971
Chromosome numbers and relationships in Annoniflorae. *Taxon* 20 : 479-483.
- ANN 20 Sinclair, J. 1953
Notes on Indian and Burmese Annonaceae. *Gard. Bull. Singapore* 14 : 45-48.
- ANN 21 Sinclair, J. 1955
A revision of the Malayan Annonaceae. *Gard. Bull. Singapore* 14 : 149-516.
- ANN 22 Sinclair, J. 1956
Miscellaneous notes on Annonaceae. *Gard. Bull. Singapore* 15 : 14-17.
- ANN 23 Thorne, R. F. 1974
A phylogenetic classification of the Annoniflorae. *Aliso* 8 : 147-209.
- ANN 24 Vander Wyk, R. W. & Canright, J. E. 1956
The anatomy and relationships of the Annonaceae. *Trop. Woods* 104 : 1-24.
- ANN 25 Walker, J. W. 1971
Unique type of angiosperm pollen from the family Annonaceae. *Science* 172 : 565-567.
- ANN 26 Walker, J. W. 1971
Annonaceae : Angiosperm family with an unique type of pollen. *Amer. Journ. Bot.* 58(5 : 2) : 467.

- ANN 27 Walker, J. W. 1971
Pollen morphology, phytogeography and phylogeny of Annonaceae. *Contrib. Gray Herb.* No. 202 : 1-130.
- ANN 28 Walker, J. W. 1971-1972
Contributions to the pollen morphology and phylogeny of the Annonaceae 1. *Grana* 11(1) : 45-54, 1971; *Ibid.* 2. *Journ. Bot. Linn. Soc.* 65(2) : 173-178, 1972.
- ANN 29 Walker, J. W. 1972
Chromosome numbers, phylogeny, phytogeography of the Annonaceae and their bearing on the (original) basic chromosome numbers of angiosperms. *Taxon* 21 : 57-65.

Annona Linn.

- ANN 30 Thakur, D. R. & Singh, R. N. 1965
Studies on pollen morphology, pollination and fruit-set in some *Annonas*. *Indian Journ. Hort.* 22(1) : 10-19.

Artabotrys R. Br.

- ANN 31 Bhandari, M. M. 1964
Artabotrys hexapetalus : Correct name for *A. odoratissimus* R. Br., *Baileya* 12 : 147-150, pl. 1. Nomencl. discussion.
- ANN 32 Das, D. (1969) 1971
Artabotrys nicobarianus D. Das—a new species from the Nicobar islands. *Bull. Bot. Surv. India* 11 : 194-195. From Great Nicobar island, allied to *A. stolonifera* Elm.

Desmos Lour.

- ANN 33 Nguyen, T'en Ban 1974
Critical notes on some species of the genus *Desmos* Lour. (Annonaceae). *Bot. Zhurn.* 59(12) : 1766-1780.
- ANN 34 Safford, W. E. 1912
Desmos the proper generic name for the so called *Unonas* of the Old World. *Bull. Torr. Bot. Club* 39 : 501-508.

Fissistigma Griffith

- ANN 35 Das, D. (1968) 1969
Two new species of Annonaceae from Eastern India. *Bull. Bot. Surv. India* 10 : 263-266. *Fissistigma santapani* descr. from Assam.
- ANN 36 Ying, Tsiang & Li, Ping-t'ao 1965
Revisio Specierum sinensium Fissistigmatis Griffith. *Acta Phytotax. Sin.* 10 : 315-328.

Friesodielsia van Steenis

- ANN 37 Das, D. 1963
Studies on Indian and Burmese Annonaceae. *Bull. Bot. Surv. India* 5 : 93.

Goniothalamus Hook. f. & Thoms.

- ANN 38 Nguyen, Tien Ban 1974
On the taxonomy of the genus *Goniothalamus* (Bl.) Hook. f. & Thoms. I. *Bot. Zhurnal URSS* 59 : 547-555.
- ANN 39 Nguyen, Tien Ban 1974
On the taxonomy of the genus *Goniothalamus* (Bl.) Hook. f. & Thoms. II. *Bot. Zhurnal URSS* 59 : 660-672.

Orophea Bl.

- ANN 40 Thoathathri, K. 1965
The "Tonyoge" plant of Little Andamans. *Indian Forester* 92 : 530-532. *Orophea katschallica* Kurz, descr. & illustr., the leaves crushed and applied on the body repel stinging insects.

Sageraea Dalz.

- ANN 41 Chatterjee, D. 1941
A revision of the Indian and Burmese species of *Sageraea* (Annonaceae). *Proc. Linn. Soc. Lond.* 154 : 263-269.

Trivalvaria Miq.

ANN 42 Das, D. (1968) 1969

Two new species of Annonaceae from Eastern India. *Bull. Bot. Surv. India* 10 : 263-266. *Trivalvaria kanjilalii*, descr. from Meghalaya.

Uvaria Linn.

ANN 43 Mitra (nee Das), D. 1982

Annonaceae—Tribe Uvariae. *Fasc. Fl. India* 10 : 1-21.

ADDITION : GENERAL

ANN 44 Hooker, J. D. & Thomson, T. 1872

Annonaceae. In : Hooker, J. D. ed., *Fl. Brit. India* 1 : 45-94.

APIACEAE—refer UMBELLIFERAE

APOCYNACEAE

Bentham & Hooker, Cronquist, Dahlgren, Engler, Takhtajan and Thorne included the family Apocynaceae in the order Gentianales ; while Hutchinson considered this family in the order Apocynales.

The family Apocynaceae is allied to the Asclepiadaceae, but differs in having a single style, absence of a corona and translators. The stamens in this family are free from stigma and pollen grains are distinct or in tetrads. While in the family Asclepiadaceae the stamens are adherent to the gynoceum to form a gynostegium and the pollen grains are agglutinated to form a sac shaped pollinium, and such pollinia are united in pairs through translators.

Schumann (1895) divided the family under two subfamilies *Plumierioideae* and *Apocynoideae* based on the nature of stamens. However, Pichon (1948) proposed *Cerberoideae* as a new subfamily and recognised the following tribes : Carisseae, Tabernaemontaneae, Plumeireae, Rauwolfiaceae, Allemandeae, Cerbereae, Parsonsiae, Nerieae, Apocynae and Ichnocarpeae. The following tribes are

recognised : Arduinae, Pleiocarpeae, Plumeireae, Apocynae, Parsonsiae.

Hutchinson (1948) while including the Apocynaceae in the order Apocynales, suggested the derivation of the family from ancestral stocks of the Loganiaceae. Woodson & Moore (1938) considered the vestigial calycine scales, gynoeceal nectaries, corolline scales of the Apocynaceae bearing a possible relationship with Rosales.

The following genera occur in India : *Aganosma*, *Allemanda*, *Alstonia*, *Alyxia*, *Anodendron*, *Beaumontia*, *Carissa*, *Cerbera*, *Chilocarpus*, *Chonemorpha*, *Ecdysanthera*, *Ellertonia*, *Holarrhena*, *Hunteria*, *Ichnocarpus*, *Melodinus*, *Microchites*, *Ochrosia*, *Parabarium*, *Parameria*, *Parsonsia*, *Pottsia*, *Rauwolfia*, *Rhazya*, *Rhynchodia*, *Strophanthus*, *Tabernaemontana*, *Testudipes*, *Trachelospermum*, *Vallaris*, *Willughbeia*, *Wrightia*.

The following genera are cultivated in gardens and farms : *Acokanthera*, *Adenium*, *Catharanthus*, *Dyera*, *Forsteronia*, *Funtumia*, *Kopsia*, *Landolphia*, *Maloutia*, *Mascarenhasia*, *Nerium*, *Plumeria*, *Thevetia*, *Voacanga*.

For recent taxonomic revisions refer Huber (1973), Pichon (1948, 1949, 1950, 1952), Markgraf (1971, 1974), for cytotoxic studies refer Roy (1964), Datta & Maiti (1972) and for chemotaxonomic studies refer Allorge *et al.* (1981).

GENERAL

- APO 1 Allorge, L. & Husson, J. P. & Sastre, C. 1981
Morphologie et chemotaxonomic des Apocynacees conclusions phylogenetiques et biogeographiques. *C. R. Soc. Biogeogr.* 57 : 112-126, 6 maps.
- APO 2 Bissett, N. G. 1958 & 1961
The occurrence of alkaloids in the Apocynaceae. *Ann. Bogor* 3 : 105-236. 1958 ; 4 : 395-418. 1961.
- APO 3 Bullock, A. A. 1962
Types of some generic names in Apocynaceae. *Kew Bull.* 15 : 394-396.
- APO 4 Candolle, A. de 1844
Apocynaceae. *In* : DC., *Prodr.* 8 : 317-489.

- APO 5 Chauhan, A. K. S. & Raghuvanshi, S. S. 1977
Cytogenetical studies of some members of Apocynaceae. *Cytologia* (Japan) 42 : 723-729.
- APO 6 Datta, P. C. & Maiti, R. K. 1972
Relationships of Plumeireae (Apocynaceae). 1. Based on karyology. *Bull. Bot. Soc. Bengal* 26 : 9-19. Chrom. nos.
- APO 7 Huber, H. 1973
Apocynaceae. *Revised Fl. Ceylon* 1 : 1-27.
- APO 8 Kumar, L. S. S., Vasavada, J. A. and Bhagat, S. P. 1952
Chromosome number in some members of Apocynaceae and Lythraceae. *Curr. Sci.* 21 : 70.
- APO 9 Markgraf, F. 1935
Die Gliederung der Asiatischen Tabernaemontanoideen. *Notizbl. Berl.-Dahlem* 12 : 540-552. Key to genera.
- APO 10 Markgraf, F. 1974
Florae Malesianae Praecursores LIV Apocynaceae III. 9. *Alstonia. Blumea* 22 : 20-29, Photo 1. Key to 12 spp.
- APO 11 Monachino, J. 1946
A resume of the American Carisseae (Apocynaceae). *Lloydia* 9 : 293-309.
- APO 12 Paris, R. R. & Duret, S. 1974
Sur les flavonoides de diverses Apocynacees. *Pl. Med. Phytother* 8(4) : 318-325.
- APO 13 Planchon, L. 1894
Produits fournis a la matiere medicale par la famille des Apocinees. i-viii, 9-364, pl. 1, f. 1-24.
- APO 14 Pichon, M. 1948
Classification des Apocynacees. I Carissees et Ambelaniees. *Mem. Mus. Hist. Nat. Paris n.s.* 24 : 111-181, t. 1-4.
- APO 15 Pichon, M. 1948
Classification des Apocynacees. V Cerberoidees. *Not. Syst.* 13 : 212-229, t. 1-2. Treated as a new subfamily.

- APO 16 Pichon, M. 1948
Classification des Apocynacees. IX Rauvolfiees, Alstoniees, Allemandees et Tabernaemontanoidees *Mem. Mus. Hist. Nat. Paris n.s.* 27 : 153-251, t. 10-20.
- APO 17 Pichon, M. 1949
Classification des Apocynacees. XXVI Determination des echantillons fleuris des Plumerioidees. *Bull. Mus. Hist. Nat. Paris II*, 21 : 140-146.
- APO 18 Pichon, M. 1949
Classification des Apocynacees. XXVII Determination des graines des Plumerioidees et des Cerberioidees. *Bull. Mus. Hist. Nat. Paris II*, 21 : 226-269. Keys based on seed character.
- APO 19 Pichon, M. 1950
Classification des Apocynacees. XXVIII Supplement aux Plumerioidees. *Mem. Mus. Hist. Nat. Paris n.s. Bot.* 1 : 145-172, t. 11.
- APO 20 Pichon, M. 1952
Classification des Apocynacees. XXXIII Les sous-tribus des Carissees. *Nat. Syst.* 14 : 310-315.
- APO 21 Raizada, M. B. 1942
New or noteworthy Apocynaceae from India and Burma. *Indian Forester* 68 : 361-368, t. 23.
- APO 22 Roy Tapadar, N. N. 1964
Cytotaxonomic studies in Apocynaceae and delineation of the different evolutionary tendencies operating within the family. *Caryologia* 17(1) : 103-138.
- APO 23 Schneider, C. K. 1916
Apocynaceae. In : Sarg. *Pl. Wils.* 3 : 331-342. Enum. of species of *Trachelospermum* ; Key.
- APO 24 Schumann, K. 1895
Apocynaceae. In : Engler & Prantl, *Pflanzenf.* IV (2) : 109-189.

- APO 25 Tsiang, Ying 1932
Notes on Chinese Apocynaceae. I *Sinensia* 3 : 157-160, f. 2. Critical notes.
- APO 26 Tsiang, Ying 1934 & 1936
Notes on Chinese Apocynaceae II *Sungatsenia* 2 : 89-202, pl. 21-35. f. 5-21. 1934 ; III *Ibid.* 3 : 121-239, pl. 14-30, f. 9-20, 1936. Critical notes.
- APO 27 Tsiang, Ying & Li, Ping-Tao 1973
Praecursores Florae Apocynacearum Sinensium. *Acta Phytotax. Sin.* 11 : 347-397, pl. 36-54.
- APO 28 Woodson, Robert E. Jr. & Moore, J. A. 1938
The vascular anatomy and comparative morphology of apocynaceous flower. *Bull Torrey Bot. Club* 65 : 135-166.

Allemanda Linn.

- APO 29 Pichon, M. 1948
Classification des Apocynacees. IX Rauvolfiees, Alstoniees, Allemandees et Tabernaemontanoidees. *Mem. Mus. Hist. Nat. Paris n.s.* 27 : 153-251, pl. 10-20. Critical notes.

Adenium Roem. & Schult.

- APO 30 Plaizier, A. C. 1980
A revision of *Adenium* Roem. & Schult. and *Diplorhynchus* Welw. ex Fic. & Hiern (Apocynaceae). *Belmontia n.s.* 11(63) : 1-39. *A. obsesum* cultivated as indoor plant.
- APO 31 Rowley, G. D. 1974
A key to the succulent Apocynaceae (*Adenium* & *Pachypodium*). *Cact. Succ. Journ. (USA)* 46(4) : 160-165.

Alstonia R.Br.

- APO 32 Markgraf, F. 1974
Florae Malesianae Praecursores LIV Apocynaceae III, 9. *Alstonia, Blumea* 22 : 20-29. Key to 12 spp.

APO 33 Monachino, J. 1949

A revision of the genus *Alstonia* (Apocynaceae). *Pacific Sci.* 3 : 133-182.

APO 34 Pichon, M. 1947

Classification des Apocynacees. IV Genre *Alstonia* et genres voisins. *Bull. Mus. Hist. Nat. Paris* 19 : 294-301.
Critical taxonomic notes.

Beaumontia Wall.

APO 35 Pichon, M. 1948

Classification des Apocynacees XX Deux genres souvcuax voisins de *Vallaris* et de *Beaumontia*. *Bull. Mus. Hist. Nat. Paris n.s.* 20 : 381-382.

Carissa Linn.

APO 36 Haines, H. H. 1919 & 1921

Indian species of *Carissa*. *Indian Forester* 45 : 375-388, t. 1-7. 1919 ; *Ibid.* 47 : 377-379. 1921.

APO 37 Markgraf, F. 1971

Florae Malesianae Praecursores LI Apocynaceae I. 1. *Carissa*, 2. *Catharanthus*, 3. *Melodinus*, 4. *Leuconotis*, 5. *Chilocarpus*. *Blumea* 19 (1) : 149-166. Critical notes on delimitation ; *C. carandas* L. is a cultivar of the Indian *C. spinarum* DC.

Catharanthus G. Don

APO 38 Dnyansagar, V. R. & Sudhakaran, I. V. 1972

Pollen grains of diploid and induced tetraploid *Vinca rosea* L. Syn. *Catharanthus roseus* (L.) G. Don. *Journ. Palynol.* 8 : 69-74.

APO 39 Dwyer, J. D. 1964

The taxonomy of the genera *Vinca*, *Lochnera* and *Catharanthus*. *Lloydia* 27 : 282-285.

APO 40 Lawrence, G. H. M. 1959

Vinca and *Catharanthus*. *Baileya* 7 : 113-119.

- APO 41 Markgraf, F. 1971
Florae Malesianae Praecursores LI Apocynaceae 1. *Carissa*, 2. *Catharanthus*, 3. *Melodinus*, 4. *Leuconotis*, 5. *Chilocarpus*. *Blumea* 19(1) : 149-166. *Catharanthus roseus* (L.) G. Don is native of Madagascar; source of bis indolic alkaloids, Vincristine and Vinblastine; Malagasian people chew the leaves in order to dull the feeling of hunger.
- APO 42 Merrill, E. D. 1935
Validity of *Lochnera* Reichenbach. *Lignan Sci. Journ.* 14 : 329. A correction of this genus in Tsiang, Ying. 1932-34. Refer APO 25.
- APO 43 Plaizier, A. C. 1981
A revision of *Catharanthus roseus* (L.) G. Don (Apocynaceae). *Med. Landbouwhogesch Wageningen* 18-89 :1-12, 1 fig., 1 photo.
- APO 44 Rizzini, C. T. 1978
Sobre *Catharanthus roseus* (L.) G. Don (Apocynaceae) e suas variedades. *Arq. Jard. Bot. Rio de Janeiro* 22 : 5-28, fig. 4. In Spanish; Key to 4 varieties based on flower colours.
- APO 45 Stearn, W. T. 1966
Catharanthus roseus, the correct name of the "Madagascar periwinkle" *Lloydia* 29 : 196-200.
- APO 46 Stearn, W. T. 1975
A synopsis of the genus *Catharanthus* (Apocynaceae). In : Taylor W. I. & Farnsworth, N. R. (eds.) *The Catharanthus alkaloids: botany, chemistry, pharmacology and clinical use*. New York, Dekker. 9-44.
- APO 47 Svoboda, G. H. 1962
The current status of research on the alkaloids of *Vinca rosea* (*Catharanthus roseus*) *Lloydia* 25 : 334-335. 28 alkaloids identified.

Cerbera Linn.

- APO 48 Lippold, H. 1980
Die Gattungen *Thevetia* L., *Cerbera* L. und *Cascabela* Rafin. (Apocynaceae) *Fedde Repert.* 91 : 45-55, t. 1.
- APO 49 Rao, A. N. & Ling, L. F. 1974
Pollen morphology of certain tropical plants. *Reinwardtia* 9 : 153-1976. *Cerbera odollam* Gaertn.

Chilocarpus Bl.

- APO 50 Markgraf, F. 1971
Florae Malesianae praecursores LI Apocynaceae I. 1. *Carissa*, 2. *Catharanthus*, 3. *Melodinus*, 4. *Leuconotis*, 5. *Chilocarpus*, *Blumea* 19(1) : 149-166. Critical notes; Keys.
- APO 51 Sundara Raghavan, R. (1964) 1965
A note on *Chilocarpus malabaricus* Bedd. (Apocynaceae). *Bull. Bot. Surv. India* 6 : 309-310, fig. 13. Descri., comparison with *C. atroviridis*; distr.

Chonemorpha G. Don

- APO 52 Chatterjee, D. 1947
The genus *Chonemorpha* G. Don (Apocynaceae). *Kew Bull.* 1947 : 47-52.
- APO 53 Pichon, M. 1950
Classification des Apocynacees XXV Echioidees. *Mem. Mus. Hist. Nat. Paris n.s. Bot.* 1 : 1-142.
- APO 54 Rao, R. S. 1953
A revision of the Indo-Malayan species of *Chonemorpha* G. Don. *Journ. Indian Bot. Soc.* 32 : 34-45, f. 1-4. *Chonemorpha pedicellata* Rolla Rao, new species.

Ecdysanthera Hook. f. & Arn.

- APO 55 Pichon, M. 1948
Classification des Apocynacees XVI Clef des genres d'*Ecdysantheres*. *Mem. Mus. Hist. Nat. Paris n.s.* 20 : 296.

303. Critical taxonomic notes ; refer *Indian Forester* 105 : 588, 1979. *Ecdysanthera rosea* Hook. f. & Arn. reported from Arunachal Pradesh

Holarrhena R. Br.

APO 56 Kruif, A. P. M. de 1981

A revision of *Holarrhena* R. Br. (Apocynaceae). *Meded. Landbouwhoges. Wageningen* 81-82, 1-40, 5 fig., 5 maps, 2 photo. Key to 4 spp., reductions.

APO 57 Ross, J. H. 1977

Holarrhena pubescens — India, tropical east and Central Africa southwards to the Transvaal. *Flow. Pl. Afr.* 44(3-4) : pl. 1758.

Ichnocarpus R. Br.

APO 58 Yamazaki, T. 1971

New and noteworthy gamopetalous plants from eastern Himalaya. *Journ. Jap. Bot.* 46(2) : 49-55. *Ichnocarpus himalaicus* Yamazaki

Melodinus J. R. & G. Forst.

APO 59 Markgraf, F. 1971

Florae Malesianae Praecursores LI Apocynaceae I. 1. *Carissa*, 2. *Catharanthus*, 3. *Melodinus*, 4. *Leuconotis*, 5. *Chilocarpus*. *Blumea* 19(1) : 149-166. *Clitandropsis* S. P. Moore and *Pseudowillughbeia* Markgr. call under *Melodinus* Forst.

Ochrosia Juss.

APO 60 Markgraf, F. 1979

Florae Malesianae Praecursores LIX Apocynaceae V. *Ochrosia*, *Neiosperma*. *Blumea* 25 : 233-247, fig. 1. Revision.

APO 61 Pichon, M. 1947

Classification des Apocynacees III Genre *Ochrosia*. *Bull. Mus. Hist. Nat. Paris* 19 : 205-212. Critical notes.

Parsonia R. Br.

APO 62 Merrill, E. D. 1933

The generic name *Parsonia* and the status of *Parsonia helicandra* Hooker & Arnott. *Brittonia* 1 : 232-237. Accepts *Parsonia helicandra* Hook. & Arn., the type from the vicinity of Macao for the name of the plant *P. spiralis* Wall.

Plumeria Linn.

APO 63 Banerjee, P. K. 1974

Structural alteration of chromosome in the evolution of *Plumeria*. *Bull. Bot. Soc. Bengal* 28 : 57-62. Chrom. nos.

APO 64 Bose, T. K. & Mukherjee, D. 1969

Studies in *Plumerias* in Calcutta and neighbourhood. *Sen. Mem. Volume. Bull. Bot. Soc. Bengal, Calcutta* 455-460.

APO 65 Dransfield, J. 1971

Fruiting frangipani. *Malayan Nat. Journ.* 24(2) : 98.

APO 66 Lippold, H. 1979

Die Gattung *Plumeria* L. (Apocynaceae) auf Kuba. *Feddes Repert.* 90(4) : 193-215.

APO 67 Prowse, G. A. 1970

Fruits and seeds of Frangipani. *Mal. Nat. Journ.* 24 : 32. Fruiting of *P. rubra* L. descr.

APO 68 Raghuvanshi, S. S. & Chauhan, A. K. S. 1971

Apocynaceae. 6. Evolutionary role of numerical alteration in chromosomes in varietal differentiation in *Plumeria*. *Cytologia* 36(2) : 321-331.

APO 69 Raghuvanshi, S. S. & Chauhan, A. K. S. 1975

Evolution within certain species of Apocynaceae. In : Kachroo, P. (ed.) *Advancing Frontiers in Cytogenetics in Evolution and Improvement of Crops* 231-235.

APO 70 Woodson, R. E. Jr. 1938

Studies in the Apocynaceae VII : An evaluation of the

genera *Plumeria* L. and *Himatanthus* Willd. *Ann. Missouri Bot. Gard.* 25 : 189-224.

Rauwolfia Linn.

- APO 71 Bhore, D. P. 1960
 Indian Rauwolfias and their botanical aspects. *Poona Agri. Coll. Mag.* 51(2) : 1-4, pl. 1., 4 spp., descr., distr., loc. name for 1 sp.
- APO 72 Chakravorty, H. L. 1955
 Revision of Indo-Burmese *Rauwolfia*. *Bull. Bot. Soc. Bengal* 9(1) : 1-9. 9 spp. descr.
- APO 73 Haque, A. & Hossain, M. A. 1973
 Observations on the chromosomes of some *Rauwolfia* species. *Bangladesh Journ. Bot.* 2(1) : 101-111. Chrom. nos.
- APO 74 Monachino, J. 1954
Rauwolfia serpentina—Its history, botany and medical use. *Econ. Bot.* 8 : 349-365, fig. 2. Synonyms, vern. names, distr., field obs. related spp., chemistry, bibliography.
- APO 75 Nair, N. G. 1978
Rauwolfia sumatrana Jack from South Andamans Island—new to Indian flora. *Geobios (Jodhpur)* 5(4) : 178-180.
- APO 76 Nair, P. K. K. & Kaul, K. N. 1965
 Pollen grains in a gigantic plant of *Rauwolfia serpentina*. *Curr. Sci.* 34 : 256.
- APO 77 Rao, A. S. 1956
 A revision of *Rauwolfia* with particular reference to the American species. *Ann. Missouri Bot. Gard.* 43 : 253-354, pl. 3, map 4, Asiatic spp. mentioned.
- APO 78 Santapau, H. 1956
 The botanical aspects of *Rauwolfia serpentina* Benth. *Indian Journ. Pharm.* 18 : 117-125, map 1.

- APO 79 Santapau, H. 1956
Correct spelling of *Rauwolfia* with a note on *Rauwolf*.
Sci. Cult. 22 : 285. General.
- APO 80 Sulochana, C. B. 1959
Indian species of *Rauwolfia*. *Journ. Indian Bot. Soc.* 38 :
575-594, fig. 5, pl. 3. 5 spp. descr., synonymy, key to
spp., local names, distr., notes.
- APO 81 Tsiang, Ling, Lan, Shish-Lun & Li, Pang-T'ao 1962
A taxonomic study of the Chinese species of *Rauwolfia*
Linn. Sci. Report Kwantung Coll. Forestry Jan. 1962. 1-
23, pl. 1-12, fig. 1., map 1.

Strophanthus DC.

- APO 82 Franchet, A. 1893
Etudes sur les Strophanthus de l'Herbier du Museum de
Paris. Nouv. Arch. Mus. Hist. Nat. Paris IV. 5 : 221-294,
pl. 7-17.
- APO 83 Loddiges, C. 1823
Strophanthus dichotomus Lodd. *Bot. Cab.* 8 : pl. 759.
- APO 84 Pax, F. 1892
Über Strophanthus mit Berücksichtigung der Stammpflanzen
des "Semen Strophanthi", Engler. *Bot. Jahrb.* 15 :
362-386, pl. 10, 11.

Tabernaemontana Linn.

- APO 85 Markgraf, F. 1935
Die Gliederung der asiatischen Tabernaemontanoideen.
Notizbl. Bot. Gart Berlin 12 : 540-552. Revision.
- APO 86 Raghuvanshi, S. S. & Chauhan, A. K. S. 1975
Evolution within certain species of Apocynaceae. In :
P. Kachroo (ed.) *Advancing Frontiers in Cytogenetics*
in Evolution and Improvement of Crops 231-235.

Thevetia Juss. ex Endl.

- APO 87 Rao, A. N. & Ling, L. F. 1974
Pollen morphology of certain tropical plants. *Reinwardtia* 9 : 153-176.

Trachelospermum Lem.

- APO 88 Pichon, M. 1948
Classification des Apocynacees. XV Genres *Trachelospermum*, *Baijsea* et *Oncinotis*. *Bull. Mus. Hist. Nat. Paris n.s.* 20 : 190-197. Critical notes.
- APO 89 Woodson, R. E. 1936
Studies in the Apocynaceae V A revision of the Asiatic species of *Trachelospermum* Lem. *Sunyatsenia* 3 : 67-105.

Voacanga Thouars

- APO 90 Sahni, K. C. & Bahadur, K. N. 1979
Voacanga grandifolia (Miq.) Rolfe (Apocynaceae) — a tree new to the flora of India. *Indian Journ. Forestry* 2(1) : 33-35. Reported from Goa.

Wrightia R. Br.

- APO 91 Bahadur, K. N. & Bennet, S. S. R. 1978
A new species of *Wrightia* R. Br. (Apocynaceae) from India. *Indian Forester* 104 : 32-35, fig. 3. *W. dollichocarpa* from Nagar-Haveli, descr.
- APO 92 Ngan, P. T. 1965
A revision of the genus *Wrightia* (Apocynaceae). *Ann. Missouri Bot. Gard.* 52 : 114-175, fig. 14. *W. indica* sp. nov. (Tamil Nadu); notes, descr., distr.
- APO 93 Pichon, M. 1951
Classification des Apocynacees. XII Genre "Wrightia" et genre voisins. *Not. Syst. Paris* 14 : 77-91. Critical notes.

ADDITION : GENERAL

APG 94 Hooker, J. D. 1882

Apocynaceae. In : Hooker, J. D. ed., *Fl. Brit. India* 3 : 621-672.

APONOGETONACEAE

(Refer also Najadaceae)

Cronquist and Takhtajan included the family Aponogetonaceae in the order Najadales. Thorne considered this family under the order Zosteriales, Engler treated it under the order Helobiae, Hutchinson included it under the order Aponogetonales, Dahlgren placed it under the order Hydrocharitales ; while Bentham & Hooker did not recognise it as a separate family and considered it under the family Najadaceae.

A family of single genus *Aponogeton*, it is allied to Potamogetonaceae-Najadaceae group. It is distinguished from Potamogetonaceae by the coloured perianth and straight embryo.

The family is represented in India by the genus *Aponogeton*. For recent taxonomic revisions refer Bruggen (1968, 1971).

GENERAL

APG 1 Bruggen, H. W. E. van, 1971

Aponogetonaceae. In : van Steenis, *Fl. Males.* I, 7 : 213-218, fig. 5

APG 2 Bruggen, H. W. E. van, 1977

Die Aponogetonaceae. *Aqua Planta* 2(1) : 8.

Aponogeton Linn. f.

APG 3 Bruggen, H. W. E. van, 1968

Revision of the genus *Aponogeton* (Aponogetonaceae) II. A new species of *Aponogeton* from India. *Blumea* 16 : 264-265, fig. 1. *A. appendiculatus* van Bruggen sp. nov. from Kerala, descr., distr., ecology, notes. The above species is wrongly mentioned as *A. crispus* in Gamble, *Fl. Mad. Pres.* 3 : 1597. 1931.

- APG 4 Bruggen, H. W. E. van, 1970
Revision of the genus *Aponogeton*. IV The species of Asia and Malasia. *Blumea* 18(2) : 457-487. 9. spp. from continental Asia and Indonesia and 2 spp. from New Guinea.
- APG 5 Camus, A. 1912
Note sur les especes asiatiques du genre *Aponogeton*. *Not. Syst. Lecomte* 2 : 202-204.
- APG 6 Camus, A. 1923
Le genre *Aponogeton* L. f. *Bull. Soc. Bot. France* 70 : 670-676. A revision.
- APG 7 James, B. 1975
Aponogetons : *Aquarist Pond Keeper* 39(12) : 472-475.
- APG 8 Krause, K. & Engler, A. 1906
Aponogeton. In : Engler, *Pflanzenr.* 24 (IV. 13) : 9-23.
- APG 9 Misra, M. P. 1972
Cytological studies in some Indian *Potamogeton* and *Aponogeton* species. *Bull. Bot. Soc. Bengal* 26 : 47-51. Chrom. nos.
- APG 10 Singh, V. 1972
The identity of *Aponogeton crispus* Thunb. *Curr. Sci.* 41 : 825. Comparison of *A. crispus* & *A. undulatus* ; refer Bruggen, H. W. E. van, 1968.
- APG 11 Sundara Raghavan, R., Kulkarni, A. R., Yadav, S. R. 1982
Aponogeton satarensis (Aponogetonaceae), a new species from India. *Kew Bull.* 38(4) : 687-689. The new species descr. from Satara dist., Maharashtra is allied to *A. decaryi* Jumelle of Madagascar.

APOSTASIACEAE

(Refer also Orchidaceae)

The Apostasiaceae is recognised as a family by Hutchinson and included this in the order Haemodorales. Dahlgren considered the

family Apostasiaceae in the order Orchidales. Bentham & Hooker, Cronquist, Engler, Takhtajan and Thorne did not recognise Apostasiaceae as a separate family and considered it as part of the family Orchidaceae.

The family Apostasiaceae consisting of 3 genera is characterised in having erect racemose inflorescence, actinomorphic flowers, 2-3 stamens which are united at base with the style and having pollen present as separate grains. The family Apostasiaceae is considered as a primitive group and according to Hutchinson related to Hypoxidaceae.

In India the family is represented by *Apostasia* and *Adactylus*. Vogel (1969) reduced *Adactylus* to a sectional status under *Apostasia*.

For recent taxonomic revisions, refer Larsen & Vogel (1972) and Vogel (1969).

GENERAL

- APS 1 Godfrey, M. J. 1932
Apostasiaceae. *Orchid Rev.* 40 : 355-359.
- APS 2 Larsen, K. & Vogel, E. F. de 1972
Apostasiaceae. In : Smitinand, T., Larsen, K. & Hansen, B. (eds.) *Fl. Thailand* 2 (Part 2) : 132-138, fig. 2.
- APS 3 Rao, V. S. 1974
The relationships of the Apostasiaceae on the basis of floral anatomy. *Bot. Journ. Linn. Soc.* 68 : 319-327, fig. 5. No opinion on family.
- APS 4 Rolfe, R. A. 1889
A morphological and systematic review of the Apostasiaceae. *Journ. Linn. Soc. Bot.* 25 : 211-243, t. 48. Revision.
- APS 5 Vogel, E. F. de 1969
Monograph of the tribe Apostasiaceae (Orchidaceae) *Blumea* 17 : 313-350.

AQUIFOLIACEAE (ILICINEAE)

Cronquist, Engler, Hutchinson, Takhtajan and Dahlgren included the family Aquifoliaceae in the order Celastrales. Thorne considered this family under the order Theales; while Bentham & Hooker included it under the order Olacales.

The family is distinguished by the absence of interstaminal disc. It differs from the Celastraceae by the absence of annular nectary disk. The polygamodioecious character of the plants belonging to the family Aquifoliaceae is quite characteristic.

The family is represented in India by the genus *Ilex*.

For recent taxonomic revisions and phylogeny refer Baas (1973) and Thorne (1977). Thorne suggests relationship of the family Aquifoliaceae with Theaceae and not with Celastraceae.

GENERAL

- AQF 1 Brizicky, George K. 1964
The genera of Celastrales in the south eastern United States. *Journ. Arn. Arb.* 45(2) : 206-234. Aquifoliaceae 227-234; Bibliography.
- AQF 2 Hu, S. Y. 1967
The evolution and distribution of the species of Aquifoliaceae in the Pacific area (1). *Journ. Jap. Bot.* 42 : 13-27; (2). *Ibid.* 42 : 49-58, maps 14.
- AQF 3 Loesener, Th. 1892
Vorstudien Zu einer monographie der Aquifoliacean. *Verh. ver. Prov. Brandenburg* 33 : 1-45, fig. 1-12.
- AQF 4 Loesener, Th. 1901
Monographia Aquifoliacearum. *Nova Acta Acad. Caes. Leop.-Car. Nat. Cur.* 78 : i-viii, 1-570. Monographic.
- AQF 5 Loesener, Th. 1908
Monographia Aquifoliacearum. *Nova Acta Acad. Caes. Leop.-Car. Nat. Cur.* 89 : 1-313. Monographic.
- AQF 6 Loesener, Th. 1942
Aquifoliaceae. In : Engler & Prantl, *Pflanzenf.* ed. 2. 20b : 36-86.

- AQF 7 Nasir, Y. J. 1978
Aquifoliaceae. *Fl. W. Pakistan* No. 124 : 1-4, fig. 1. 2 spp. of *Ilex*.
- AQF 8 Pennington, M. J. 1953
A comparative study of wood anatomy of fifty four species of the family Aquifoliaceae. *Thesis (unpublished)*, Univ. V a., Charlottes Ville.
- AQF 9 Thorne, R. F. 1977
Some realignments in the Angiospermac. *Plant Syst. Evol. Suppl.* 1 : 299-319. Suggests relationship of the family Aquifoliaceae with Theaceae and not with Celastraceae.

Ilex Linn.

- AQF 10 Baas, P. 1973
The wood anatomical range in *Ilex* (Aquifoliaceae) and its ecological and phylogenetic significance. *Blumea* 21 : 193-258. The wood anatomy of 81 spp. of *Ilex* described.
- AQF 11 Bean, W. J. 1904
Evergreen hollies (*Ilex*). *Garden* 65 : 95, 114, 130-131, 146, 162.
- AQF 12 Clark, J. 1904
Ilex crenata, *Garden* 65 : 149. Critical notes.
- AQF 13 Comber, H. F. 1933
Notes on the distribution of certain Chinese and Himalayan species of *Ilex* with description of new species. *Notes Roy. Bot. Gard. Edinb.* 18 : 37-62. Enum., descr., notes. new spp. *Ilex longicaudata* Comber reported from Nagaland. *Bull. Bot. Surv. India* 17 : 199-200. (1975) 1978.
- AQF 14 Copeland, H. F. 1963
Structural notes on hollies (*Ilex aquifolium* & *I. cornuta*, family Aquifoliaceae). *Phytomorphology* 13 : 455-464.

- AQF 15 Dallimore, W. 1908
Holly, Yew and Box with notes on other evergreens i-xiv,
1-284, fig. 175. A horticultural account.
- AQF 16 Dengler, H. W. (ed.) 1957
Handbook of Hollies, i-vi, 1-193. London.
- AQF 17 Eisenbeiss, G. K. & Dudley, T. R. 1973
International Checklists of cultivated *Ilex* Part II *Ilex*
opaca, *Nat. Arb. Contrib.* No. 3, *Agricultural Research*
Service, US Dept. Agriculture.
- AQF 18 Hu, S.-Y. 1937
Oriental hollies, *Journ. Amer. Hort. Soc.* 36 : 31-64, fig.
11-20. Summary ; keys, descr., illust.
- AQF 19 Hu, S.-Y. 1949-50
The genus *Ilex* in China I *Journ. Arn. Arb.* 30 : 233-344,
fig. 1-7, 1949 ; II *Ibid.* 348-387, fig. 8, 1949 ; III *Ibid.*
31 : 39-80, 1950 ; IV *Ibid.* 31 : 214-240, fig. 9, 1950 ; V
Ibid. 31 : 242-263, 1950. Monographic.
- AQF 20 Ishikura, N. 1971
Anthocyanin pattern in the genera *Ilex* and *Euonymus*.
Phytochemistry 10(10) : 2513-2517.
- AQF 21 King, G. 1886
On two new species of *Ilex* from the Eastern Himalaya.
Journ. Asiat. Soc. Bengal 55 : 265-266.
- AQF 22 Loesener, T. 1919
Über die Aquifoliaceen, besonders über *Ilex*. *Mitt.*
Deutsch. Dendr. Ges. 28 : 1-66, pl. 1-4. Detailed notes.
- AQF 23 Maximowicz, C. J. 1881
De *Coriaria*, *Ilice* et *Monochasmate* hujusque generibus
proxime affnibus *Bungea* et *Cymbaria*. *Mem. Acad. Sci.*
St. Petersb. VII 29(3) : 1-70, pl. 1-4. A revision of Asiatic
species of *Ilex*, *Coriaria* and *Monochasma*. See also Engl.,
Bot. Jahrb. 3 : 186-187, 1882.

ADDITION : GENERAL

AQF 24 Hooker, J. D. 1875

Illicineae. *In* : Hooker, J. D. *ed.*, *Fl. Brit. India* 1 : 598-606.

ARACEAE

(Includes Acoraceae)

Cronquist, Hutchinson, Takhtajan, Thorne and Dahlgren included the family Araceae in the order Arales ; while Engler considered this family under the order Spathiflorae. Bentham & Hooker included it under the order Nudiflorae.

The family Araceae is characterised by its inflorescence which has non-bracteate flowers crowded together in a cylindrical spadix enclosed by a large spathe. Many species have poisonous latex and it is seen that by heating, the poisonous nature is diminished. According to Engler (1879) the family is divided into the following sub-families : Pothoideae, Monsteroideae, Calloideae, Lasioideae, Philodendroideae, Colocasioideae, Aroideae and Pistioideae.

According to Engler (1920), the family is derived from the Palmae through the Cyclanthaceae. Bessey considered palms and aroids as different evolutionary lines arising from the common liliaceous stock. Hutchinson proposed the derivation of the family from the tribe Aspidistreae of Liliaceae. The family Lemnaceae is considered as the reduced Araceae. However the family Lemnaceae differs in having free floating thalloid habit and its flowers not having a definite spadix. The family Araceae is highly successful in having larger number of species and range of distribution because of its adaptive strategy in marshy environments and dark humid tropic forests. The adaptation of spathe which encloses the spadix as an insect trapping mechanism helps pollination. While its closely related family Cyclanthaceae is restricted to tropical America. Dahlgren indicates that a close connection among Arales, Arecales, Pandanales and Cyclanthales seems rather unlikely.

The family is represented in India by the following genera : *Acorus*, *Aglaonema*, *Alocasia*, *Amorphophallus*, *Anaphyllum*, *Ariopsis*, *Arisaema*, *Arum*, *Colocasia*, *Cryptocoryne*, *Epipremnum*, *Gonatanthus*, *Homalomena*, *Lagenandra*, *Lasia*, *Pavella*, *Pistia*, *Plesmonium*, *Pothos*, *Remusatia*, *Rhaphidophora*, *Sauromatum*, *Scindapsus*, *Stuednera*, *Theriophonum*, *Thomsonia*, *Typhonium*.

The following genera are cultivated in gardens : *Caladium*, *Dieffenbachia*, *Dracontium*, *Monstera*, *Philodendron*, *Xanthosoma* and *Zantedeschia*.

For recent taxonomic studies refer Bunting (1961), Croat (1979), Nicolson (1960, 1975) ; for recent cytotaxonomic studies refer Bhattacharya (1978), Jones (1957), Marchant (1971, 1972), Mookerjee (1955), Ramachandran (1978), Sharma & Bhattacharya (1966) ; for phylogeny refer Gow (1913) ; for palynology refer Thanikaimoni (1969).

GENERAL

- ARA 1 Bhattacharya, G. N. (1976) 1978
 A cytological study in the tribe Anthurieae (Araceae).
 Bull. Bot. Soc. Bengal 30(1-2) : 51-56. Chrom. nos.
- ARA 2 Birdsey, M. R. 1951
 The cultivated aroids 1-140. Gillick Press, Berkley.
- ARA 3 Bogner, J. 1978
 A critical list of the aroid genera. *Aroideana* 1 : 63-73.
 fig. 17.
- ARA 4 Bunting, G. S. 1961
 Generic delimitation in the Araceae, sub fam. Monsteroideae. *Baileya* 10 : 21-31.
- ARA 5 Croat, T. B. 1979
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Genera Aroidearum exposita 1-101, pl. 1-98.
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 New combinations in cultivated *Aglaonema*. *Baileya* 15 : 124-126. Reduction of several species to the status of varieties.

ARA 58 Nicolson, D. H. 1969

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A note on the karyology of *Amorphophallus rivieri* (Araceae). *Baileya* 19 : 42-43.

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- ARA 79 Engler, A. 1920
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Chromosome numbers of taros in Nepal and India. *Chrom. Inf. Ser. No.* 24 : 4-5.
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Taro, ancient food plant of tropical region. *Journ. N. Y. Bot. Gard.* 45 : 11-16, fig. 2. Data on the uses of *Colocasia esculenta*.
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- ARA 91 De Wit, H. C. D. 1970
A Key to the species of *Cryptocoryne* Fisch. ex Wydl. (Araceae). *Belmontia* 4(13) : 257-280.

- ARA 92 Mahlmann, F. 1977
Die ceylonesischen *Cryptocoryne* Arten. *Aqua Planta* 2(1) : 8-9.
- ARA 93 Petch, T. 1929
Notes on *Cryptocoryne*. *Ann. Roy. Bot. Gard., Peradeniya* 11 : 11-26, t. 2-5.
- ARA 94 Rataj, K. 1974
New cultivated species of the genus *Cryptocoryne* (Araceae). *Folia Geobot. Phytotax.* 9(3) : 313-314.
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Revision of the genus *Cryptocoryne* Fischer. *Studie CSAU. Academia. Praha*, 1-174, pl. 63. Revision ; Key to sections and species ; 52 spp. descr.
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Chromosome studies in *Cryptocoryne* (Araceae). *Caryologia* 32(1) : 1-4.

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The correct name of two common Dieffenbachias. *Baileya* 10 : 145-146.

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Revisie van het genus *Lagenandra* Dalzell (Araceae) *Meded. Landbouwhoges. Wageningen* 78-13 : 5-45, fig. 12, Photo 19. In Dutch ; revision.

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Species of *Lagenandra* of Bombay and Madras. *Journ. Bombay Nat. Hist. Soc.* 54 : 967-969. Notes on 2 spp.
- ARA 101 Sastry, A. R. K. 1967 (1968)
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- ARA 102 Tomey, W. A. & De Wit, H. C. D. 1967
Lagenandra thwaitesii. *Het Aquarium* 9 : 196-198, Photo 2. List of spp. of *Lagenandra*.
- Pauella** Ramam. et Seb.
(Refer *Theriophonum*)
- Pistia** Linn.
- ARA 103 Arber, A. 1919
On the vegetative morphology of *Pistia* and the Lemnaceae. *Proc. Roy. Soc. London B.* 91 : 96-103.
- ARA 104 Ito, T. 1899
Floating apparatus of the leaves of *Pistia stratiotes* L. *Ann. Bot.* 13 : 466.
- ARA 105 Jaeger, P. 1945
Observations sur la fleur du *Pistia stratiotes* L. *Compt. Rend. Acad. Sci. Paris* 220 : 467-469.
- ARA 106 Klotzsch, J. F. 1853
Über *Pistia*. *Abh. Akad. Wiss. Berlin* 1852 : 329-359, pl 1-3.
- ARA 107 Schleiden, M. J. 1838
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Theriophonum Bl.

- ARA 108 Bogner, J. (1968) 1969
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ARA 109 Ramamurthy, K. & Sebastine, K. M. (1966) 1967

A new genus of Araceae from Madras State, India. *Bull. Bot. Surv. India* 8 : 348-351, fig. 9. *Pauella* gen. nov.; *P. sivagangana* sp. nov. (c.f. Bogner, J. *l.c. supra*).

ARA 110 Sivadasan, M. & Nicolson, D. H. 1981

A new species of *Therophonum* Bl. (Araceae) from India. *Aroideana* 4 : 64-67, 7 fig.

Typhonium Schott.

ARA 111 Nicolson, D. H. & Sivadasan, M. 1981

Four frequently confused species of *Typhonium* Schott. (Araceae). *Blumea* 27 : 483-497.

Xanthosoma Schott.

ARA 112 Nicolson, D. H. 1975

A new lectotypification of the genus *Xanthosoma* Schott. (Araceae). *Taxon* 24 (2 & 3) : 345-347.

Zantedeschia Spreng.

ARA 113 Letty, C. 1973

The genus *Zantedeschia*. *Bothalia* 11(1-2) : 5-26. Key to spp.

ADDITION : GENERAL

ARA 114 Hooker, J. D. 1893

Aroideae. In : Hooker, J. D. ed., *Fl. Brit. India* 6 : 490-556.

ARALIACEAE

(Refer also Helwingiaceae)

Cronquist, Bentham & Hooker considered the family Araliaceae in the order Umbellales. Thorne and Takhtajan included this family

under the order Cornales. Hutchinson and Dahlgren considered it under the order Araliales and Engler treated it under the order Umbelliflorae. The Helwingiaceae is included in the family Araliaceae by Hutchinson and Bentham & Hooker.

The name Araliaceae Vent. (1799) is conserved over Hederaceae Gisecke (1792). The family Araliaceae is characterised by the umbellate inflorescence, inferior ovary with one anatropous pendulous ovule in each locule. It is distinguished from the allied family Umbelliferae in having usually baccate, rarely drupaceous fruit; whereas in the Umbelliferae, fruit is a schizocarp, splitting into two mericarps.

Harms (1894) divided the family into three tribes, Schefflereae, Aralieae and Mackinlayeae, based on the nature of valvate or imbricate petals and clawed or unclawed petals.

Thorne (1973, 1983) supports in favour of merging the family Umbelliferae in the family Araliaceae and marshalls support from the study of palynology, chemotaxonomy and fruit morphology. Roth (1977) after a detailed study of fruits, considers Umbelliferae as an overdeveloped tribe of Araliaceae. The occurrence of sesquiterpene lactones and polyacetylenes in the families Araliaceae and Umbelliferae is considered as an indication of their close affinities. There are also number of common morphological characters like the presence of bicarpellate flowers, flowers arranged in heads or umbels, general absence of stipules, multilacunar nodes and trinuclear pollen grains. The overwhelming evidence is in support of general grouping of Araliaceae and Umbelliferae.

The family is represented in India by the following genera : *Acanthopanax*, *Aralia*, *Arthrophyllum*, *Brassaiopsis*, *Dendropanax*, *Euaraliopsis*, *Gamblea*, *Hedera*, *Heteropanax*, *Macropanax*, *Merrillio-panax*, *Panax*, *Parapentapanax*, *Pentapanax*, *Pseudobrassaiopsis*, *Schefflera*, *Tetrapanax*, *Trevesia*, *Tupidanthus*. The following genera are cultivated in gardens : *Brassaia*, *Polyscias*.

For recent taxonomic revisions refer Banerjee (1972), Hoo & Tseng (1978), Hutchinson. (1967, 1969, 1973), Philipson (1951, 1971).

GENERAL

ARL 1 Banerjee. R. N. 1972

Generic delimitation in Indian Araliaceae. *Bull. Bot. Soc. Bengal* 26 : 77-78. Key to 17 genera.

- ARL 2 Candolle, A. P. de 1830
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- ARL 3 Eyde, R. H. & Tseng, C. C. 1971
What is the primitive floral structure of Araliaceae. Journ. Arn. Arb. 52 : 205-239.
- ARL 4 Ghazanfar, S. 1975
Araliaceae. Fl. W. Pakistan No. 86 : 1-5, fig. 1.
- ARL 5 Graham, Shirley A. 1966
The genera of Araliaceae in the south eastern United States. Journ. Arn. Arb. 47 : 126-136.
- ARL 6 Harms, H. 1894
Araliaceae. Engler & Prantl, Pflanzenf. III, 8 : 1-62.
- ARL 7 Ho, Ch'un-nien 1952
Additamenta Araliaceis Chinensis. Acta Phytotax. Sin. 2 : 71-78, pl. 1-6. In Chinese, with latin diagnosis of new taxa.
- ARL 8 Hoo, G. & Tseng, C. J. 1978
Araliaceae. Flora Republ. Pop. Sinicae 54 : 1-ix, 1-210. In Chinese ; key to genera & spp.
- ARL 9 Hutchinson, J. 1959 & 1973
Araliaceae. Families of Flowering Plants ed. 2. 177-178. 1959 ; ed. 3 : 220. 1973.
- ARL 10 Hutchinson, J. 1967
Araliaceae. The genera of Flowering Plants. Oxford 2 : 52-81.
- ARL 11 Hutchinson, J. 1969
Araliaceae. Evolution and Phylogeny of flowering plants 123-130.
- ARL 12 Koch, K. 1859
Die Araliaceen in Allgemeinen und Aufzählung der in

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- ARL 14 Li, Hui-lin 1942
The Araliaceae of China. *Sargentia* 2 : 1-134, fig. 1-14. Monographic.
- ARL 15 Li, Hui-lin 1944
The phytogeographic division of China, with special reference to the Araliaceae. *Proc. Acad. Nat. Sci. Philad.* 96 : 249-277, 1 folded map. 14 regions recognised.
- ARL 16 Maheshwari, J. K. 1960
Nomenclatural note on some Indian species of Araliaceae. *Bull. Bot. Surv. India* 2 : 375-378.
- ARL 17 Nekrassova, V. L. 1933
[Revue des Araliacées de l'URSS. : leur distinction géographique et leur utilisation] *Souetsk. Bot.* 6 : 82-100. fig. 1. In Russian with French resume ; detailed distr. of spp.
- ARL 18 Philipson, W. R. 1951
Contribution to our knowledge of Old world Araliaceae. *Bull. Brit. Mus. Nat. Hist. (Bot.)* 1 : 1-20.
- ARL 19 Philipson, W. R. 1970
Constant and variable features of the Araliaceae. In : *New Research in Plant Anatomy—Supplement 1, Bot. Journ. Linn. Soc.* 63 : 87-100.
- ARL 20 Philipson, W. R. 1979
Araliaceae 1. In : van Steenis, *Fl. Males.* 1, 9(pt. 1) : 1-105, fig. 1-39. 16 genera and 120 spp.
- ARL 21 Radulescu, D. 1974
Contribution a l'etude de la morphologie du pollen des

familles Cornaceae et Araliaceae. *Lucr. Grad. Bot. Bucuresti* 125-131.

ARL 22 Rodriguez, R. L. 1971

The relationships of the Umbellales. *Bot. Journ. Linn. Soc.* 64 : Suppl. 1. 63-91.

ARL 23 Seemann, B. 1864-68

Revision of the natural order Hederaceae. *Journ. Bot. Brit. & For.* 2 : 289-309, fig. 9. 1864 ; 3 : 173-181. 1865 ; 5 : 236-239. 1867 ; 6 : 52-58, 129-142, 161-165, pl. 79-80. 1868.

ARL 24 Thorne, R. F. 1973

Inclusion of the Apiaceae (Umbelliferae) in the Araliaceae. *Notes Roy. Bot. Gard Edinb.* 32(2) : 161-165.

ARL 25 Viguiet, R. 1906

Recherches anatomiques sur la Classification des Araliacees. *Ann. Sci. Nat. IX. Bot.* 4 : 1-208, fig. 1-54. For description of new species refer Viguiet, R., 1909.

ARL 26 Viguiet, R. 1909

Nouvelles recherches sur les Araliacees. *Ann. Sci. Nat. IX. Bot.* 9 : 305-405, fig. 1-13. Enumeration of Asian spp.

ARL 27 Viguiet, R. 1909

Verzeichnis der neuen Namen und Beschreibung der neuen Gattungen aus : Rene Viguiet, Recherches Anatomiques sur la classification des Araliacees. *Fedde Repert Sp. Nov.* 6 : 45-48. Republication of new species, refer Viguiet, R., 1906.

ARL 28 Viguiet, R. 1919

Les Araliacees cultivees. *Rev. Hort. (Paris)* 1919 : 228-229, 250-252. Descr. of many Asian spp.

ARL 29 Wilson, K. A. 1960

Genera of Araliales in south eastern United States. *Journ. Arn. Arb.* 41 : 41-47.

Acanthopanax (Decne. & Planch.) Miq.

- ARL 30 Harkness, B. 1953
Selection from the genus *Acanthopanax*. *Baileya* 1 : 102-104, fig. 51. Horticultural notes.
- ARL 31 Harms, H. 1895
Zur Kenntnis der Kultivierten Arten der Gattung *Acanthopanax*. *Gartenflora* 44 : 477-480. Notes on Asiatic spp.
- ARL 32 Harms, H. 1918
Übersicht über die Arten die Gattung *Acanthopanax*. *Mitt. Deutsch. Dendr. Ges.* 27 : 1-39, pl. 1-8b. A revision ; 27 spp.

Aralia Linn.

- ARL 33 Berry, E. W. 1903
Aralia in American palaeobotany. *Bot. Gaz.* 36 : 421-428. Fossil record of *Aralia* leaves.
- ARL 34 Faulkner, R. P. 1939
Aralia chinensis. *Gard. Chron.* III, 106 : 304.
- ARL 35 Harms, H. 1896
Zur Kenntnis der Gattungen *Aralia* and *Panax*. Engler, *Bot. Jahrb.* 23 : 1-23. Enum., descr. of old and new spp., without Key.

Brassaia Endl.(Refer also *Schefflera*)

- ARL 36 Fosberg, F. R. 1973
The name of the Octopus tree. *Baileya* 19 : 45-46. *Brassaia actinophylla* Endl.

Brassaiopsis Decne. et Planch.

- ARL 37 Banerjee, R. N. 1968
An undescribed species of *Brassaiopsis* Decne. et Planch. (Araliaceae) from Andamans. *Indian Forester* 94 : 775-

777. *Brassaiopsis andamanica* R. N. Ban. is described from S. Andamans ; illust.

ARL 38 Bui. N. S. 1966

Notes sur la genre *Brassaiopsis* Decne. et Planch. (Araliaceae) en Indochine orientale. *Adansonia* 6 : 437-447.

Hedera Linn.

ARL 39 Hibberd, S. 1872

The Ivy, a monograph comprising the history, uses, characteristics and affinities of the plant and a descriptive list of all the garden Ivies in cultivation. i-viii, 1-115. London.

ARL 40 Jacobsen, P. 1954

Chromosome numbers in the genus *Hedera* L. (Abstr.) *Hereditas* 40 : 252-254.

ARL 41 Lamermayr, L. 1930

Die Gattung *Hedera* L. *Pflanzenar.* 2 : 64-69, maps 65-68. Distr.

ARL 42 Lawrence, G. H. M. 1956

The cultivated Ivies [*Hedera*]. *Morris Arboretum Bull.* 7 : 19-31, fig. 5-16. Keys to spp. and cultivars.

ARL 43 Lawrence, G. H. M. & Schulze, A. E. 1942

The cultivated *Hedera*s. *Gentes Herb.* 8 : 107-173, fig. 74-86.

ARL 44 Tobler, F. 1912

Die Gattung Hedera. Studien uber Gestalt und Leben des Efeus, seine Arten und Geschichte 1-151, fig. 1-57.

ARL 45 Tobler, F. 1927

Die Gartenformen der Gattung *Hedera*. *Mitt. Deutsch. Dendr. Ges.* 38 : 1-33, pl. 1-12, fig. 10-16. Includes Asiatic forms.

Panax Linn.

- ARL 46 Balandin, D. A. 1955
The chemical composition of *Panax* Ginseng. A survey of the literature. *Mater. Izuch. Zhen-Sheria Limonnika* 2 : 77-96, pl. 1. Monographic survey ; In Russian.
- ARL 47 Bui, N. S. 1970
Contribution palynologique a l'etude du genre *Panax* L. (Araliaceae). *Pollen et Spores* 12 : 5-19.
- ARL 48 Banerjee, R. N. 1968
A taxonomic revision of Indian *Panax* Linn. *Bull. Bot. Surv. India* 10 : 20-27, fig. 2, pl. 1. Descr., distr. *Panax sikkimensis* R. N. Ban., new species descr. from Sikkim.
- ARL 49 Burkill, I. H. 1906
Ginseng in China (*Aralia quinquefolia*). *Kew Bull. Misc. Inf.* 1902 : 4-11, pl. 1. Key and descr. spp., 7 varieties.
- ARL 50 Grushvitzky, I. V. 1955
Panax Ginseng. C. A. Mey—the real name of Ginseng. *Mater. Izuch. Zhen-Sheria. Limonnika* 2 : 35-70, fig. 1-25. In Russian.
- ARL 51 Hance, H. F. 1873
Ginseng. *China Rev.* 2 : 131-132. Review.
- ARL 52 Hoo, Gin & Tseng. Chiang-Jiang 1973
[On the Chinese species of *Panax* Linn.] *Acta Phytotax. Sin.* 11(4) : 431-438.
- ARL 53 U. S. Dept. of Agriculture, 1895
American Ginseng, its commercial history, protection, and cultivation. *U. S. Dept. Agricult. Bull.* No. 16.
- ARL 54 Williams, L. O. 1957
Ginseng. *Econ. Bot.* 11 : 344-348. Review.

Polyscias J. R. & G. Forst.

- ARL 55 Philipson, W. R. 1978
A synopsis of the Malesian species of *Polyscias* (Araliaceae). *Blumea* 24 : 169-172. Sections discussed.
- ARL 56 Stone, B. C. 1965
Notes on the type species of *Polyscias* Forst. *Taxon* 14 : 281-285. *P. pinnata*.
- ARL 57 Viguier, R. 1905
Sur les Araliacees due groupe des *Polyscias*. *Bull. Soc. Bot. Fr.* 52 : 285-314.

Pseudobrassaiopsis R. N. Ban.

- ARL 58 Banerjee, R. N. 1975
Pseudobrassaiopsis, a new genus of Araliaceae with a note on the status of *Euaraliopsis* Hutch. *Journ. Bombay Nat. Hist. Soc.* 72 : 71-73. New combinations.

Schefflera J. R. & G. Forst.

- ARL 59 Banerjee, R. N. 1966
A new species of *Schefflera* J. R. & G. Forst. from Bhutan. *Bull. Bot. Surv. India* 8 : 100-101. *S. bhutanica* allied to *S. venulosum* (Wt. & Arn.) Harms.
- ARL 60 Frodin, D. G. 1975
Studies in *Schefflera* (Araliaceae) : the *Cephaloschefflera* complex. *Journ. Arn. Arb.* 56 : 427-448, pl. 5. Synopsis of 13 spp. ; *Brassaia* reduced.
- ARL 61 Tseng, C. C. & Shoup, J. R. 1978
Pollen morphology of *Schefflera* (Araliaceae). *Amer. Journ. Bot.* 65(4) : 384-394.

Tupidanthus Hook. f. & Thoms.

- ARL 62 Tseng, C. C. 1973
Systematic palynology of *Tupidanthus* and *Pterandra* (Araliaceae). *Grana* 13(1) : 51-56.

ADDITIONS : GENERAL

ARL 63 Clarke, C. B. 1879

Araliaceae. *In* : Hooker, J. D. ed., *Fl. Brit. India* 2 : 720-740.

ARL 64 Roth, I. 1977

Fruits of Angiosperms. *Encycl. Pl. Anat.* 10(1) : 1-675.

ARL 65 Thorne, R. F. 1983

Proposed new realignments in the angiosperms. *Nord. Journ. Bot.* 3 : 85-117.

ARECACEAE—refer PALMACEAE

ARISTOLOCHIACEAE

Cronquist, Engler, Hutchinson, Takhtajan and Dahlgren included the family Aristolochiaceae in the order Aristolochiales. Thorne considered it in the order Annonales ; while Bentham & Hooker included it under the order Multiovulatae terrestriales.

The family Aristolochiaceae is characterised by the three united petaloid perianths, 6-36 stamens which are either free or united with the style to form a gynostemium and inferior ovary. The systematic position of the family is uncertain. The presence of ethereal oils and benzyloquinoline alkaloids is characteristic of Magnolianae type. It is probably related to Annonaceae through the genera *Apama* and *Thottea*. The features of pollen also suggest magnolian affinity. It is one of the magnoliaceous groups which has adapted to the tropical or temperate understorey by becoming herbaceous or lianous and floral parts adapting strategies for tropical or subtropical understorey pollinators. The following three tribes are recognised : Aristolochieae, Bragantieae and Sarumeae.

The systematic position of the family Aristolochiaceae in the Magnoliidae is supported by the presence of nitrocompounds, aristolochic acid which is closely related to benzyloquinoline alkaloids (Gershenzon & Mabry, 1983). The family Aristolochiaceae presents combinations of primitive and advanced characters (Cronquist 1968).

The presence of uniaperturate or nonaperturate pollen which is a primitive character aligns the family with the sub-class Magnoliidae. Whereas the perigynous to epigynous nature of apetalous flowers are advanced features indicating its evolution to a particular strategy of attracting pollinators. The affinities of the genus *Asarum* to species of *Piper* (Piperaceae) and the pollen of *Saruma* to that of the Chloranthaceae suggest multiple ancestry from a common ancient stock of Magnoliales and Piperales.

The family is represented in India by the following genera : *Apama*, *Aristolochia*, *Asarum*, *Isotrema*.

For recent taxonomic revisions refer Huber (1960) ; for phylogeny refer Gregory (1956) and Hegnauer (1960) ; for pollinators refer Kennedy (1978) and Peattie (1940).

GENERAL

- ARS 1 Gregory, M. P. 1956
A phyletic rearrangement in the Aristolochiaceae. *Amer. Journ. Bot.* 43 : 110-122.
- ARS 2 Hegnauer, R. 1960
Chemotaxonomische Betrachtungen II. Phytochemische Hin Weise für die Stellung der Aristolochiaceae in System der Dicotyledonen. *Pharmacie* 15 : 634-642.
- ARS 3 Kennedy, K. 1978
Aristolochias and butterflies. *N. Queensland Nat.* 44(172) : 3-5.
- ARS 4 Klotzsch, F. 1859
Die Aristolochiaceae der Berliner Herbarium, Monatsber Koenigl. Akad. (Berlin). 1859 : 571-626.
- ARS 5 Lorch, J. W. 1959
The perianth of *Aristolochia*—a new interpretation. *Evolution* 13 : 415-416.
- ARS 6 Rehder, A. & Wilson, E. H. 1916
Aristolochiaceae. In : *Sarg. Pl. Wils.* 3 : 323-324.

- ARS 7 Schmidt, O. C. 1935
 Aristolochiaceae. In : Engler & Prantl, *Pflanzenf.* ed. 2
 16b : 204-242, fig. 103-123.

Aristolochia Linn.

- ARS 8 Daumann, E. 1959
 Zur Kenntinis der Blüten nektarien von *Aristolochia*.
Preslia 31 : 359-372.
- ARS 9 Davis, P. H. & Khan, M. S. 1959
Aristolochia in the near East. *Notes Roy. Bot. Gard.*
Edinb. 23 : 515-556.
- ARS 10 Huber, H. 1960
 Die Abgrenzung der Gattung *Aristolochia*. *Mitt. Bot.*
Staatsamst. Munchen 3 : 531-553, fig. 18. The subgenera
 are raised to the status of genera : *Endotheca*, *Isotrema*,
Pararistolochia & *Siphidia*.
- ARS 11 Nair, N. C. (1968) 1969
 A new species of *Aristolochia* from Kumaon Himalayas.
Bull. Bot. Surv. India 10 : 332-333. *A. gourigangaica* sp.
 nov., descr. from Gouriganga valley allied to *A. griffithii*
 Hook. f. & Thoms.

Asarum Linn.

- ARS 12 Hemsley, W. B. 1890
 The genus *Asarum*. *Gard. Chron.* III. 7 : 420-422. Includ-
 ing Asiatic species.
- ARS 13 Peattie, D. C. 1940
 How is *Asarum* pollinated ? *Castanea* 5 : 24-29.

ADDITIONS : GENERAL

- ARS 14 Gershenzon, J. & Mabry, T. J. 1983
 Secondary metabolites and the higher classification of
 angiosperms. *Nord. Journ. Bot.* 3 : 5-34.

ARS 15 Hegnauer, R. 1963

The taxonomic significance of alkaloids. In : Swain, T. ed., *Chemical Plant Taxonomy*, Academic, London 389-427.

ARS 16 Hooker, J. D. 1886

Aristolochiaceae. In : Hooker, J. D. ed., *Fl. Brit. India* 5 : 72-77.

ASCLEPIADACEAE

(Refer also Periplocaceae)

Bentham & Hooker, Cronquist, Engler, Takhtajan and Dahlgren included the family Asclepiadaceae in the order Gentianales. Hutchinson considered this family under Apocynales. Hutchinson treated Periplocaceae as a separate segregate family under the order Apocynales. Thorne however did not recognize Asclepiadaceae as a separate family and treated it under the family Apocynaceae. The Periplocaceae is distinguished from the Asclepiadaceae by the free stamens, spathulate pollen carriers and granular pollen, whereas in the Asclepiadaceae, the stamens are adnate to gynoecium to evolve a gynostegium and pollen grains agglutinised to form pollinia.

The Asclepiadaceae is closely allied to the Apocynaceae but differs in having specialized stamens with translators and gynostegium which is a highly specialised pollinator vector adaptation.

The evolution of the union of carpels by a common stigma to form gynostegium and the provision of pollen grains in a group to form pollinia in the Asclepiadaceae are evolutionary necessities for this group to vect particular pollinators. Thorne (1983) has included the Asclepiadaceae and Periplocaceae under the family Apocynaceae as there is a gradation of characters. The absence of iridoid compounds in the family Asclepiadaceae is quite paradoxical. Gershenzon & Mabry (1983) indicate that iridoid synthesis may be evolutionarily lost in particular lineages as in the family Asclepiadaceae.

The tribes recognised in this family are : Asclepiadeae, Secamoneae and Tylophoreae.

The family is represented in India by the following genera : *Brachystelma*, *Calotropis*, *Caralluma*, *Ceropegia*, *Cosmostigma*, *Cynan-*

chum, Dischidia, Dittoceras, Dregea, Frerea, Gentianthus, Glossonema, Gongronema, Gymnema, Heterostemma, Holostemma, Hoya, Leptadenia, Marsdenia, Micholitzia, Oianthus, Orthanthera, Oxystelma, Pentabothra, Pentasacme, Pentatropis, Pergularia, Raphistemma, Riocreucia, Sarcolobus, Sarcostemma, Secamone, Seshagiria, Streptocaulon, Telosma, Toxocarpus, Treutlera, Tylophora.

The following genera are cultivated in India : *Asclepias, Stapelia, Stephanotis.*

For recent taxonomic revisions refer Bullock (1957), Huber (1973), Ying & Li (1974) ; for palynology refer El-Gazzar *et al.* (1974) and for chromosome studies refer Jash & Sharma (1972).

GENERAL

- ASC 1 Brack, S. 1973
Key to the succulent Asclepiadaceae. *Bull. Afr. Succ. Pl. Soc.* 7(6) : 230-233.
- ASC 2 Brown, R. 1809
On the "Asclepiadeae", a natural order of plants separated from the Apocineae of Jussieu. *Mem. Wern. Soc. Edinb.* 1 : 12-78. [1808-10].
- ASC 3 Bullock, A. A. 1957
Notes on African Asclepiadaceae-8. *Kew Bull.* 1956 : 503-522, fig. 1. Key to Asclepiadaceae and Periplocaceae.
- ASC 4 El-Gazzar, A. & Hamza, M. K. 1973
Morphology of the twin pollinia of Asclepiadaceae. *Pollen et Spores* 15(3-4) : 459-470.
- ASC 5 El-Gazzar, A., Hamza, M. K. & Badawi, A. A. 1974
Pollen morphology and taxonomy of Asclepiadaceae. *Pollen et Spores* 16(2) : 227-238.
- ASC 6 Good, R. 1952
An atlas of the Asclepiadaceae. *New Phytol.* 51 : 198-209, map. 17.
- ASC 7 Huber, H. 1973
Periplocaceae ; Asclepiadaceae. *Revised Fl. Ceylon* 1 : 28-57.

- ASC 8 Jash, M. & Sharma, A. 1972
Cytology of some Indian Asclepiadaceae. *In* : Darlington, C. D. & Lewis, K. R. eds., *Chromosomes today* 3 : 238-247.
- ASC 9 Manders, W. 1979
Pollination of Asclepiads—a preliminary report. *Asclepiadaceae* No. 18 : 36-37.
- ASC 10 Rao, O. M. & Kumari, O. L. 1979
Germination loci of pollinia and their taxonomic significance. *Geobios (Jodhpur)* 6(4) : 163-165.
- ASC 11 Santapau, H. & Irani, N. A. 1962
The Asclepiadaceae and Periplocaceae of Bombay. *Univ. Bombay Mem.* 4, i-iv, 1-118. 28 genera, 61 spp. Key to genera & spp. ; descr., synonymy, phenology, distr., notes.
- ASC 12 Schneider, C. K. 1916
Asclepiadaceae. *In* : Sarg., *Pl. Wils.* 3 : 343-354.
- ASC 13 Sundell, E. 1980
The subfamilial, tribal and subtribal nomenclature of the Asclepiadaceae. *Taxon* 29 : 257-265. Type of genera mentioned.
- ASC 14 Ying, Tsiang & Li, Pingo T'AO 1974
Praecusores Florae Asclepiadacearum Sinensium. *Acta Phytotax. Sin.* 12 : 79-149, pl. 26 Critical notes ; new spp.

Asclepias Linn.

- ASC 15 Galil, J. & Zeroni, M. 1969
On the organization of the pollinium in *Asclepias curassavica*. *Bot. Gaz.* 130(1) : 1-4.

Brachystelma R. Br.

- ASC 16 Char, M. B. S. 1978
A new species of *Brachystelma* R. Br. (Asclepiadaceae)

from India. *Curr. Sci.* 47 : 965-966, fig. 2. *B. etenadensis* sp. nov., descr. from Karnataka.

ASC 17 McCann, C. 1944

The genus *Brachystelma* R. Br., an addition to the flora of the Bombay Presidency. *Journ. Bombay Nat. Hist. Soc.* 44 : 494-495.

Calotropis R. Br.

ASC 18 Hooker, J. D. 1886

Calotropis gigantea, *Curtis's Bot. Mag.* 112 : pl. 6862. Native of India.

ASC 19 Sharma, B. M. 1971

Ecological studies on *Calotropis procera* R. Br. *Indian Forester* 97(3) : 172-175.

ASC 20 Watt, G. 1900

Madar (*Calotropis gigantea* R. Br.) *Kew Bull. Misc. Inf.* 1900 : 8-12. Botanical and economic notes.

Caralluma R. Br.

ASC 21 Gravely, F. H. & Mayuranthan, P. V. 1931

The Indian species of genus *Caralluma* (Fam. Asclepiadaceae). *Govt. Mus. Madras Bull. n. s. (Nat. Hist. Sect.)* 4(1) : 1-22, t. 4.

ASC 22 Kumari, G. R. & Subba Rao, G. V. 1976

A new species of *Caralluma* (Asclepiadaceae) from India. *Journ. Bombay Nat. Hist. Soc.* 73 : 194-196, fig. 12. *C. nilagiriana* sp. nov. from Nilgiris, Tamil Nadu ; descr., allied to *C. truncatocoronata* (Sedgwick) Grav. & Mayur., notes.

ASC 23 Sarkaria, J. S. & Saxena, B. P. 1978

The hunt for *Caralluma edulis* (Edgew.) Benth. et Hook. in Rajasthan, India. *Asclepiadaceae* No. 12. : 2-9.

ASC 24 Walker, C. 1978

The tree *Caralluma* (*Caralluma* R. Br. sect. *Caralluma*).
Asclepiadaceae No. 12. : 13-18.

***Ceropegia* Linn.**

ASC 25 Ansari, M. Y. (1968) 1969

A new species of *Ceropegia* L. (Asclepiadaceae) from Western Ghats, Maharashtra. *Bull. Bot. Surv. India* 10 : 219-221. fig. 10. *C. huberi* sp. nov. descr., phenology, notes.

ASC 26 Ansari M. Y. (1969) 1971

Ceropegia media (Huber) Ansari stat. nov. from Western Ghats (Maharashtra). *Bull. Bot. Surv. India* 11 : 199-210, fig. 2, pl. 1, tab. 1. Emended descr., phenology, notes, key to var. *evansii* and *media*, comparison.

ASC 27 Ansari, M. Y. 1972

A new *Ceropegia* Linn. (Asclepiadaceae) from Sahyadri Range in Maharashtra State. *Journ. Bombay Nat. Hist. Soc.* 69 : 250-253, pl. 1. *C. noorjahaniae* sp. nov., descr., phenology, notes ; Key to *C. fimbriifera*, *C. attenuata* & *C. noorjahaniae*.

ASC 28 Ansari, M. Y. (1971) 1974

Ceropegia vincaefolia Hook. (Asclepiadaceae) from Maharashtra its history and identity. *Bull. Bot. Surv. India* 13 : 187-191. fig. 6, pl. 1. Emended descr., synonymy, phenology, loc. name, distr., taxonomic discussion.

ASC 29 Ansari, M. Y. (1980) 1982

Ceropegia panchganiensis Blatt. et McCann (Asclepiadaceae)—a little known species rediscovered. *Bull. Bot. Surv. India* 22 : 199-201.

ASC 30 Ansari, M. Y. & Kulkarni. B. G. 1971

Ceropegia sahyadricea Ansari & Kulkarni—a new species of Asclepiadaceae from Sahyadri ranges in Maharashtra State. *Indian Forester* 97 : 688-690, pl. 2. Descr., notes, comparison with *C. rollae* & *C. lawii*.

- ASC 31 Babu, C. R. 1977
Ceropegia raizadiana Babu, *Herb. Fl. Dehradun* 305-306. A new species from Dehradun, Uttar Pradesh.
- ASC 32 Hara, H. (1968) 1969
 A new species of *Ceropegia* from Bhutan, *Bull. Bot. Surv. India* 10 : 273. *C. bhutanica* descr., allied to *C. ugeni* and *C. ludlowii*.
- ASC 33 Hemadri, K. (1968) 1969
 New *Ceropegia* Linn. (Asclepiadaceae) from Western Ghats, Maharashtra. *Bull. Bot. Surv. India* 10 : 123-125. *C. rollae* sp. nov. descr., allied to *C. lawii* & *C. panchganiensis*.
- ASC 34 Hemadri, K. & Ansari, M. Y. 1971
Ceropegia mahabalei Hemadri & Ansari—a new species of Asclepiadaceae from Sahyadri range, Western Ghats (Maharashtra). *Indian Forester* 97 : 105-108, fig. 4, pl. 1. Descr., phenology, loc. name ; allied to *C. attenuata*.
- ASC 35 Huber, H. 1957
 Revision der Gattung *Ceropegia*. *Mem. Soc. Broteriana* 12 : 1-203, pl. 16. Synonymy, descr., key.
- ASC 36 Kanodia, K. C. & Venkata Reddi, B. (1964) 1965
Ceropegia fantastica Sedgwick (Asclepiadaceae). An imperfectly known species. *Bull. Bot. Surv. India* 6 : 311-312, pl. 1. Descr., phenology, distr.
- ASC 37 McCann, C. 1945
 New species of *Ceropegia* and the synonymy of the Indian species. *Journ. Bombay Nat. Hist. Soc.* 45 : 209-211.
- ASC 38 Rao, R. S. 1947
 The genus *Ceropegia*—a comment. *Journ. Bombay Nat. Hist. Soc.* 46 : 742-743. Nomencl. of *C. blatteri* McC.
- ASC 39 Sabnis, S. D. & Bedi, S. J. 1971
Ceropegia odorata Hook. f. (Asclepiadaceae)—a little

known plant of Western India. *Kew Bull.* 25 : 57-59.
Taxonomic notes, descr., illust.

- ASC 40 Santapau, H. 1948
The genus *Ceropegia*--further comments. *Journ. Bombay Nat. Hist. Soc.* 47 : 775-777. Nomencl. notes.
- ASC 41 Santapau, H. 1949
The genus *Ceropegia*—still further comments. *Journ. Bombay Nat. Hist. Soc.* 48 : 613-614. Nomencl. of *C. odorata* Nimmo.
- ASC 42 Santapau, H. & Irani, N. A. 1958
The genus *Ceropegia* in Bombay. *Bull. Bot. Soc. Bengal* 12 : 6-17, fig. 4. Key to spp. (10 spp. 2 var.), synonymy, descr. of gen. & spp., distr., phenology, loc. name, notes.
- ASC 43 Scholes, M. A. 1975
Some notes on *Ceropegia*. *Aloe* 13(2) : 52-56.
- ASC 44 Sundara Raghavan, R. & Ansari, M. Y. 1975
Chromosome numbers in the genus *Ceropegia* Linn. *Curr. Sci.* 44 : 863-864, tab. 1. Taxonomic notes on 8 spp.
- ASC 45 Venkata Reddi, B. 1968
Ceropegia lawii Hook. f. and *Ceropegia panchganiensis* Blatt. & McC. *Willdenowia* 5 : 29-33, fig. 4.
- ASC 46 Wadhwa, B. M. & Ansari, M. Y. 1968
A new species of *Ceropegia* Linn. (Asclepiadaceae) from Western Ghats, Maharashtra. *Bull. Bot. Surv. India* 10 : 95-97, fig. 9. *C. santapau* sp. nov. descr., loc. name ; key to *C. santapau* & *C. evansii*.

Dischidia R. Br.

- ASC 47 Rintz, R. E. 1980
The peninsular Malayan species of *Dischidia* (Asclepiadaceae). *Blumea* 26 : 81-126. 23 spp. descr., ecology and floral biology ; species of distributional range to India : *D. imbricata* (Bl.) Steud. ; *D. major* (Vahl) Merr. ; *D.*

albiflora Griff. ; *D. bengalensis* Colebr. ; *D. nummularia*
R. Br.

Frerea Dalz.

- ASC 48 Bent, P. 1975
Frerea indica Dalzell or *Caralluma frerei*, *Bull. Afr. Succ. Pl. Soc.* 10(4) : 111-113.
- ASC 49 Bombay, R. D. 1940
On *Frerea indica*. *Journ. Bombay Nat. Hist. Soc.* 41 : 679. Field notes.
- ASC 50 Santapau, H. 1951
Frerea indica Dalz., a new record in Bombay. *Journ. Bombay Nat. Hist. Soc.* 50 : 427.
- ASC 51 Sundara Raghavan, R. 1976
A short note on *Frerea indica* Dalz. *Curr. Sci.* 45 : 36.
Taxonomic notes.

Gongronema (Endl.) Decne.

- ASC 52 Mathew, K. M. 1979
A new combination in *Gongronema* (Asclepiadaceae) from India. *Kew Bull.* 34 : 68. *Gongronema thomsonii* (Hook. f.) Mathew comb. nov.

Hoya R. Br.

- ASC 53 Deb, D. B. 1955
A new species of *Hoya* from Manipur. *Journ. Indian Bot. Soc.* 34 : 50-52. *Hoya manipurensis* Deb from Manipur.
- ASC 54 Henry, A. N. & Swaminathan, M. S. 1979
A new *Hoya* R. Br. (Asclepiadaceae) from South India. *Journ. Bombay Nat. Hist. Soc.* 75 : 462-464, fig. 5. *Hoya kangakumariana* sp. nov. from Tamil Nadu.
- ASC 55 Traill, J. 1827
Accounts and descriptions of the several plants belong-

ing to the genus *Hoya*, which are cultivated in the gardens of the Horticultural Society at Chiswick. *Trans. Hort. Soc. London* 7 : 16-30, pl. 1.

ASC 56 Walfried, B. 1973

Hoya bella Hook. *Succulenta* 52(7) : 137-138.

ASC 57 Wills, A. J. 1973

Notes on *Hoya imperialis* and others of the genus. *Journ. Roy. Hort. Soc.* 98(5) : 224-225.

Marsdenia R. Br.

ASC 58 Henry, A. N. & Subramanyam, K. 1976

A new *Marsdenia* R. Br. (Asclepiadaceae) from South India. *Journ. Bombay Nat. Hist. Soc.* 73 : 186-187, pl. 1. *Marsdenia tirunelvelica* sp. nov. from Agastyamalai, Tamil Nadu, descr., notes.

ASC 59 Rothe, W. 1915

Über die Gattung *Marsdenia* R. Br. und die Stammpflanze der Condurangorinde. *Engler, Bot. Jahrb.* 52 : 354-434, fig. 1-15. Distributional records in Asia. The Old World spp. not included in enumeration and keys.

ASC 60 Yoganarasimhan, S. N. & Subramanyam, K. 1976

New species of *Marsdenia* R. Br. (Asclepiadaceae) from South India. *Proc. Indian Acad. Sci.* 83B : 147-149, fig. 10. *M. raziana* sp. nov. from Karnataka.

Pentabothra Hook. f.

ASC 61 Mitra (nee Das), Debika & Roy, Bhabesh (1971) 1973

Pentabothra nana Hook. f., a little known Asclepiadaceae member. *Bull. Bot. Surv. India* 13 : 163-164, fig. 1.

Pentanura Bl.

(Refer Periplocaceae)

ASC 62 Baillon, H. 1889

Le Pentanura du Yunnan. *Bull. Soc. Linn. Paris* 2 : 812.

Stelmacrypton gen. nov. proposed basing *Pentanura khasiana*.

Pergularia Linn.

ASC 63 Brown, N. E. 1907

The genus *Pergularia*. *Kew Bull. Misc. Inf.* 1907 : 323-325. Critical notes.

Riocreuxia Decne.

ASC 64 Smith, A. R. 1967

Riocreuxia Decne.: an asclepiadaceous genus new to Nepal. *Kew Bull.* 21 : 296. *Riocreuxia nepalensis* A. R. Smith from Nepal.

Sarcolobus R. Br.

ASC 65 Rintz, R. E. 1980

A revision of the genus *Sarcolobus* (Asclepiadaceae). *Blumea* 26 : 65-79, fig. 4. Key to 4 spp., descr.

Secamone R. Br.

ASC 66 Safwat, F. M. 1962

The floral morphology of *Secamone* and the evolution of the pollinating apparatus in the Asclepiadaceae. *Ann. Missouri Bot. Gard.* 49 : 95-130.

Seshagiria Ansari & Hemadri

ASC 67 Ansari, M. Y. & Hemadri, K. 1971

Seshagiria Ansari & Hemadri—a new genus of Asclepiadaceae from Sahyadri ranges, India. *Indian Forester* 97 : 126-127. *S. sahyadricea* sp. nov.

ASC 68 Ansari, M. Y. & Hemadri, K. (1971) 1974

Seshagiria Ansari et Hemadri (Asclepiadaceae) from Maharashtra State, India. Additional data. *Bull. Bot. Surv. India* 13 : 357-358, pl. 1. *S. sahyadricea*, descr., phenology, loc. name, notes.

Toxocarpus Wt. & Arn.

- ASC 69 Henry, A. N. & Swaminathan, M. S. (1979) 1981
 Rediscovery of *Rhynchosia velutina* Wt. & Arn. (Papilionaceae) and *Toxocarpus beddomei* Gamble (Asclepiadaceae). *Bull. Bot. Surv. India* 21 : 227-228.

Tylophora R. Br.

- ASC 70 Henry, A. N. 1967
 A new *Tylophora* R. Br. (Asclepiadaceae) from South India. *Proc. Indian Acad. Sci.* 65 : 161-164, fig. 7.
Tylophora subramanii sp. nov. from Tirunelveli, Tamil Nadu ; descr.
- ASC 71 Banerjee, S. P. & Banerjee, R. N. (1966) 1967
 Notes on the distribution of *Tylophora tenerrima* Wall. ex Wight (Asclepiadaceae). *Bull. Bot. Surv. India* 8 : 356.
 Illustration, distr.

ADDITIONS : GENERAL

- ASC 72 Gershenzon, J. & Madry, T. J. 1983
 Secondary metabolites and the higher classification of angiosperms. *Nord. Journ. Bot.* 3 : 5-34.
- ASC 73 Hooker, J. D. 1883
 Asclepiadaceae. In : Hooker, J. D. ed., *Fl. Brit. India* 4 : 1-78.
- ASC 74 Thorne, R. F. 1983
 Proposed new realignments in the angiosperms. *Nord. Journ. Bot.* 3 : 85-117.

ASPARAGACEAE : refer **LILIACEAE**

ASTERACEAE : refer **COMPOSITAE**

AVERRHOACEAE

(Refer also Oxalidaceae)

Hutchinson recognised Averrhoaceae as a family segregated from the Oxalidaceae. Hutchinson included the Averrhoaceae in the order

Rutales, whereas Dahlgren considered it under Geraniales. Cronquist, Dahlgren, Takhtajan, Thorne and Engler considered it under the Oxalidaceae. Bentham & Hooker included it in the Geraniaceae sensu lato.

The family Avertroaceae is characterised by its arborescent or lianous habit, 1-3 to multi foliolate exstipulate leaves, bisexual heterodistylous and androdioecious 5-merous flowers, 5-carpelled superior ovary with 5 free styles. The Avertroaceae is closely allied to the Oxalidaceae.

The family is represented in India by the genus *Avertroa*. *A. bilimbi* and *A. carambola* are cultivated throughout India for their edible fruits.

AVR 1 Kupfer, L. 1930

The Yangtao. *China Journal* 12 : 365-366. The nomenclature relationship in literature of *Actinidia* and *Avertroa*.

AVR 2 Reddy, B. B. & Narayana, L. L. 1982

Systematic position of Avertroaceae. *Journ. Econ. Tax. Bot.* 3(2) : 343-348.

AVICENNIACEAE

(Refer also Verbenaceae)

Airy Shaw recognised the family Avicenniaceae segregated from the family Verbenaceae. Bentham & Hooker, Cronquist, Engler, Hutchinson, Thorne and Takhtajan included Avicenniaceae in the family Verbenaceae. Moldenke (1963, 1971) recognised the family Avicenniaceae. For recent taxonomic revision refer Moldenke (1960), Padmanabhan (1962).

This is a monogeneric family represented by the genus *Avicennia*.

GENERAL

AVI 1 Erdtman, G. 1945

Pollen morphology and plant taxonomy. IV Labiatae, Verbenaceae and Avicenniaceae. *Sevensk. Bot. Tidsk.* 39 : 279-285.

- AVI 2 Jafri, S. M. H. 1973
 Avicenniaceae. *Fl. W. Pakistan* No. 49 : 1-4, map 1.
 fig. 1.
- AVI 3 Moldenke, H. N. 1963
 Studies in the Flora of Thailand 22 : Avicenniaceae—
 Symphoremaceae—Verbenaceae. *Dansk. Bot. Ark.* 23 :
 85-92, fig. 2.
- AVI 4 Moldenke, H. N. 1971
 A fifth summary of the Verbenaceae, Avicenniaceae,
 Stilbaceae, Dicrostylidaceae, Symphoremaceae, Nyctan-
 thaceae and Eriocaulaceae of the world as to valid taxa,
 geographic distribution and synonymy. (Privately
 published Wayne, N. J.) *Phytologia* 34(3) : 247-281.

Avicennia Linn.

- AVI 5 Bakhuizen van den Brink, R. C. 1921
 Revisio generis Avicenniae (cum annotationibus diversis).
Bull. Jard. Bot. Buitenzorg III 3 : 199-223, pl. 12-22.
 Monographic.
- AVI 6 Biswas, K. 1934
 A comparative study of Indian species of *Avicennia*.
Notes Roy. Bot. Gard. Edinb. 18 : 159-166, t. 243-246.
 Descr.
- AVI 7 Moldenke, H. N. 1960
 Materials towards a monograph of the genus *Avicennia*
 L. I & II. *Phytologia* 7 : 123-168, 179-232.
- AVI 8 Moldenke, H. N. 1975
 Additional notes on the genus *Avicennia* V. *Phytologia*
 32 : 343-370 ; *Ibid.* VI. 436-457.
- AVI 9 Moldenke, H. N. 1976
 Additional notes on the genus *Avicennia* VII. *Phytologia*
 33 : 238-270.

- AVI 10 Mukherjee, J. & Chanda, S. 1975
 Biosynthesis of *Avicennia* L., in relation to taxonomy.
Geophytology 3(1) : 85-88.
- AVI 11 Padmanabhan, D. 1962
 Taxonomic notes on the genus *Avicennia* L. *Curr. Sci.*
 31 : 434-435. Delimitation of family Avicenniaceae.

BALANITACEAE

(Refer also Simaroubaceae)

The family Balanitaceae is recognised by Takhtajan and it is included in the order Geraniales ; while Dahlgren considered Balanitaceae family in the order Geraniales, Hutchinson included this family in the order Malpighiales ; Bentham & Hooker, Cronquist and Thorne included this in the family Simaroubaceae. Engler however considered it in the family Zygophyllaceae as the subfamily Balanitoideae. According to Airy Shaw, Balanitaceae is allied to the Zygophyllaceae but differs in having exstipulate leaves. Palynologically the Balanitaceae is allied to the Simaroubaceae (Basak, 1964).

The family is represented in India by the genus *Balanites*. For recent taxonomic revision, refer Basak (1980) and Paris et al. (1946).

- BLT 1 Basak, R. K. (1963) 1964
 Pollen morphology of Indian Simaroubaceae. *Bull. Bot. Surv. India* 5 : 381-397.
- BLT 2 Basak, R. K. (1967) 1968
 Studies on the pollen morphology of Simaroubaceae. *Bull. Bot. Surv. India* 9 : 63-67.
- BLT 3 Basak, R. K. 1980
 Balanitaceae. *Fasc. Fl. Ind.* 4 : 19-23.
- BLT 4 Hutchinson, J. 1967
 Balanitaceae. *The Genera of Flowering Plants* 2 : 621. Oxford.

BLT 5 Paris, R. & Aubrat, Mlle M. Y. 1946

Le genre *Balanites*, ses affinités et la place en systématique. *Bull. Soc. Bot. Fr.* 93 : 202.

BALANOPHORACEAE

The family Balanophoraceae is included in the order Santalales by Hutchinson, Cronquist, Takhtajan and Thorne. While Engler and Dahlgren included this in a separate order Balanophorales; Bentham & Hooker considered it in the order Achlamyosporeae.

The Balanophoraceae is a family of obligate parasites with reduced structures having club-shaped inflorescences and flowers having superior ovary. The affinities of Balanophoraceae is obscure and its nearest allied family is Cynomoriaceae which has inferior ovary. Dahlgren considered the Balanophoraceae and Cynomoriaceae in the order Balanophorales which he placed in the super order Balanophoranae. Since they are parasitic in nature this family is compared with Hydnoraceae and Rafflesiaceae by phylogenists. Harms (1935) classified the following subfamilies under Balanophoraceae: Balanophoroideae (rhizomes containing resinous substance balanophorin); the following subfamilies have rhizomes containing starch: Mystropetaloidae, Dactylanthoideae, Sarcophytoideae, Helosidoideae, Lophophytoideae.

The family is represented in India by the following genera: *Balanophora*, *Rhopalocnemis*. For recent taxonomic revisions refer Hansen (1972), Harms (1935).

GENERAL

- BNP 1 Eichler, A. W. 1873
 Balanophoraceae. In: DC., *Prodr.* 17 : 117-150. Monographic.
- BNP 2 Fagerlind, F. 1959
 Beiträge Zur Kenntnis der Gynaceummorphologie und phylogenie der Santalales Familien. *Sevensk Bot. Tidskr.* 42 : 195-229.
- BNP 3 Hansen, B. 1972
 Balanophoraceae. In: Smitinand, T., Kai Larsen, Bertel Hansen eds.; *Fl. Thailand* 2(part 2) : 177-182.

- BNP 4 Hansen, B. 1973
 Balanophoraceae. *Fl. Camb. Laos & Vietn.* 14 : 49-58.
 1 pl. 5 spp. of *Balanophora* ; 1 sp. of *Rhopalocnemis*.
- BNP 5 Hansen, B. 1976
 Balanophoraceae. In : van Steenis, *Fl. Males.* I, 7(4) :
 783-805.
- BNP 6 Hansen, B. 1976
 Pollen and stigma conditions in the Balanophoraceae
 s. lat. *Bot. Notiser* 129(3) : 341-345.
- BNP 7 Harms, H. 1935
 Balanophoraceae. Engler & Prantl, *Pflanzenf.* 16b :
 296-339.
- BNP 8 Hooker, J. D. 1859
 On the structure and affinities of Balanophoraceae.
Trans. Linn. Soc. London 22 : 1-68, tab. 1-16 Synopsis
 of the family.
- BNP 9 Nasir, Y. J. 1980
 Balanophoraceae. *Fl. Pakistan* No. 139 : 1-3. One spp.
B. involucrata.

Acroblastum Soland. ex Setchell

- BNP 10 Venkata Reddi, B. 1969
 A new species of *Acroblastum* (Balanophoraceae) from
 Poona Dist., India. *Willdenowia* 5 : 389-393, pl. 1. Descr.,
 taxonomic discussion ; reduced to *Balanophora abbreviata*.
 Refer BNP 11. *Curr. Sci.* 44 : 96-97. 1975.

Balanophora J. R. & G. Forster

- BNP 11 Arekal, G. D. & Shivamurthy, G. R. 1975
Balanophora abbreviata Blume in Karnataka. *Curr. Sci.*
 44 : 96-97, 1 fig. New record for India, descr.
- BNP 12 Blatter, E. 1929
 A new species of *Balanophora* from Mahabaleshwar,

Bombay Presidency. *Journ. Bombay Nat. Hist. Soc.* 33(2) : 309-310. *B. elkinsi* Blatt.

- BNP 13 Fagerlind, F. 1945
Blute und Blütenstand der Gattung *Balanophora*. *Bot. Notiser* 1945 : 330-350.
- BNP 14 Govindappa, D. A. & Shivamurthy, G. R. 1975
The pollination mechanism in *Balanophora abbreviata* Blume. *Ann. Bot. (U. K.)* 39(163) : 977-978.
- BNP 15 Griffith, W. 1846
On the Indian species of *Balanophora* and on a new genus of the family Balsaminaceae. *Trans. Linn. Soc.* 20 : 93-108, tab. 3-8.
- BNP 16 Hansen, B. 1972
The genus *Balanophora* J. R. & G. Forst. A taxonomic monograph. *Dansk. Bot. Ark.* 28 : 1-188, 44 fig. 8 pl.
- BNP 17 Rao, T. S. 1963
Pollen morphology of two Indian species of *Balanophora* Forst. *Curr. Sci.* 32 : 373.

ADDITION : GENERAL

- BNP 18 Hooker, J. D. 1886
Balanophoreae. In : Hooker, J. D. ed., *Fl. Brit. India* 5 : 236-239.

BALSAMINACEAE

(Refer also Geraniaceae)

The family Balsaminaceae is included in the order Geraniales by Cronquist, Hutchinson, Takhtajan and Thorne. Engler included the Balsaminaceae in the order Sapindales. Dahlgren proposed a new order Balsaminales for the family Balsaminaceae. Bentham & Hooker did not recognise the family Balsaminaceae and considered it under the family Geraniaceae.

The family is distinguished by the nature of anthers cohering to one another and forming a cap over the ovary and the elastically

dehiscent fruits. The nectariferous spur in the family Balsaminaceae is a modified outgrowth of the calyx; whereas in the family Geraniaceae and Tropaeolaceae the spur formation is receptacular in origin. Hence it is appropriate to treat the family Balsaminaceae in the order Balsaminales instead of grouping unrelated families in the order Geraniales.

Dahlgren (1983) mentions that the family Balsaminaceae with their lack of glucosinolates, their cellular or helobial endosperm formation, terminal endosperm haustoria and diverging zygomorphic flowers forms an isolated family.

The family is represented in India by the following genera: *Hydrocera*, *Impatiens*. For recent taxonomic revisions refer Nasir (1980) and for chromosome studies refer Jones & Smith (1966), Khoshoo (1966).

GENERAL

- BLS 1 Candolle, A. P. de 1824
Balsamineae. *In*: DC. *Prodr.* 1: 685-688.
- BLS 2 Nasir, Yasin J. 1980
Balsaminaceae. *Fl. Pakistan* No. 133: 1-17. 12 spp. descr., key to spp.
- BLS 3 Walker-Arnott, G. A. 1836
New species of Indian Balsamineae. *Hook. Comp. Bot. Mag.* 1: 320-325, t. 18.

Hydrocera Bl.

- BLS 4 Venkateswarlu, J. & Dutta, B. S. M. 1961
Amended description of *Hydrocera triflora* Wt. & Arn. *Journ. Bombay Nat. Hist. Soc.* 58: 544-546, pl. 1.

Impatiens Linn.

- BLS 5 Barnes, E. 1939
The species of Geraniaceae occurring on the Travancore High Range, including the description of a new balsam. *Journ. Indian Bot. Soc.* 18(3): 95-105.

- BLS 6 Beddome, R. H. 1858
The genus *Impatiens*. Description of new species from the Anamalai hills. *Madras Journ. Litt. & Sci. n. s. 4* : 66-70.
- BLS 7 Beddome, R. H. 1858
Synopsis of the peninsular species of the genus *Impatiens*. *Madras Journ. Litt. & Sci. n. s. 4* : 66-70.
- BLS 8 Beddome, R. H. 1859
Alterations in the paper on the genus *Impatiens*. *Madras Journ. Litt. & Sci. n. s. 5* : 59-60.
- BLS 9 Bhaskar, V. & Razi, B. A. (1972) 1973
Studies on South Indian Balsaminaceae : 1. Chromosome numbers in some species of *Impatiens* L. *Mysore Univ. B. Sci.* 25(1-2) : 115-122. Chrom. nos.
- BLS 10 Bhaskar, V. & Razi, B. A. 1973
A new kind of exine sculpturing in *Impatiens* L. (Balsaminaceae) from South India. *Curr. Sci.* 42 : 510-512.
- BLS 11 Bhaskar, V. & Razi, B. A. 1974
Nocturnal pollen germination in *Impatiens* (Balsaminaceae) *Curr. Sci.* 43(19) : 626-628.
- BLS 12 Bhaskar, V. & Razi, B. A. 1978
Studies on South Indian *Impatiens* L. General. *Indian Journ. Forestry* 1(3) : 191-198.
- BLS 13 Bhaskar, V. & Razi, B. A. 1978
Studies on South Indian *Impatiens* L. -III. Further notes. *Indian Journ. Forestry* 1(1) : 68-78.
- BLS 14 Chandrabose, M. 1979
A new species of *Impatiens* L., (Balsaminaceae) from South India. *Journ. Bombay Nat. Hist. Soc.* 75 : 901-902, fig. 9. *Impatiens chandrasekharanii* Chandrabose.

- BLS 15 Chadefaud, M. 1952
 Le pollen des *Impatiens* et la theorie de Wodehouse. *Bull. Soc. Bot. Fr.* 99 : 182-183.
- BLS 16 Chen, Yi-ling 1978
 Notulae de genere *Impatiens* L. Florae Sinicae. *Acta Phytotax. Sin.* 16(2) : 36-55, fig. 3, pl. 3-5. Key to 65 spp., in Chinese.
- BLS 17 Clevenger, S. 1971
 Anthocyanidins of some *Impatiens* species. *Evolution* 25(4) : 669-677.
- BLS 18 Dunn, T. C. 1977
 Pollination of Himalayan balsam. *Vasculam* 62(4) : 61. *Impatiens glandulifera*.
- BLS 19 Hara, H. 1972
 New or noteworthy flowering plants from Eastern Himalaya (10). *Journ. Jap. Bot.* 47 : 137-143. *Impatiens williamsii* Hara from Nepal Himalaya.
- BLS 20 Hooker, J. D. 1904
 On the species of *Impatiens* in the Wallichian herbarium of the Linnean Society. *Journ. Linn. Soc. (Bot.)* 37 : 22-32.
- BLS 21 Hooker, J. D. 1904
 An epitome of the British Indian species of *Impatiens*. *Rec. Bot. Surv. India* 4 : 1-58.
- BLS 22 Hooker, J. D. 1908
 Les especes du genre "Impatiens" dan l' herbier due Museum de Paris. *Nouv. Arch. Mus. Hist. Nat. (Paris)* IV 10 : 233-272, pl. 2-6. Introduction, key to spp., enum., descr.
- BLS 23 Hooker, J. D. 1910
 Indian species of *Impatiens*. Generis *Impatiens* species indicae novae et minus rite cognitae a cl. A. Meebold detectae. *Kew Bull.* 1910 : 291-300.

- BLS 24 Hooker, J. D. 1910
Impatiens species novae. [ex Hooker's *Ic. Pl.* 1908, t. 2851-2857]; *Fedde Repert Sp. Nov.* 8 : 172-181 ; II : 338-342.
- BLS 25 Hooker, J. D. 1911
 Indian species of *Impatiens*. On some Western Peninsular Indian Balsamineae, collected by Mr. A. Meebold. *Kew Bull.* 1911 : 353-356.
- BLS 26 Huynh, K. L. 1968
 Morphologie du pollen des Tropaeolacees et des Balsaminees-I & II. *Grana Palynologica* 8 : 88-184, 277-516.
- BLS 27 Huynh, K. L. 1969
 Morphologie du pollen des Tropaeolacees et des Balsaminees-III. *Grana Palynologica* 9(1-3) : 34-39.
- BLS 28 Jones, K. & Smith, J. B. 1966
 The cytogeography of *Impatiens* L. *Kew Bull.* 20 : 63-70. Basic chromosome number $X=7, 8, 10, 11$ have distinct geographic distribution.
- BLS 29 Khoshoo, T. N. 1966
 Cytology of pollen with particular reference to *Impatiens* and *Allieue*. *Proc. Ind. Acad. Sci. B.* 63 : 35-45.
- BLS 30 Schemske, D. W. 1978
 Evolution of reproductive characteristics in *Impatiens* (Balsaminaceae), significance of cleistogamy and chasmogamy. *Ecology* 59(3) : 596-613.
- BLS 31 Sedgwick, L. J. 1919
 A new Indian *Impatiens*. *Rec. Bot. Surv. India* 6 : 351. *Impatiens kleiniformis* L. J. Sedgwick from N. Kanara.
- BLS 32 Shimizu, T. 1969
 Classification and geography of *Impatiens* in Thailand and Malay Peninsula. *Acta Phytotax. Geobot.* 24 : 43-51, fig. 2, t. 3.

BLS 33 Wagner, R. 1907

Herkunft und Einfuhrung einier newer Balsaminen.
Oesterr. Gart. Zeit. 2 : 337-341, 389-392, 411-451.

BLS 34 Valentine, D. H. 1971

Flower colour polymorphism in *Impatiens glandulifera*
Royle. *Boissiera* 19 : 339-343.

ADDITIONS : GENERAL

BLS 35 Bhaskar, V. & Razi, B. A. (1982) 1983

Two more species of *Impatiens* L. from South India.
Journ. Bombay Nat. Hist. Soc. 79 : 382-384.

BLS 36 Dahlgren, R. 1983

General aspects of angiosperm evolution and macrosystematics.
Nord. Journ. Bot. 3 : 119-149.

BLS 37 Hooker, J. D. 1874 & 1875

Geraniaceae—Balsamineae. In : Hooker, J. D. ed., *Fl. Brit. India* 1 : 440-483.

BARCLAYACEAE

(Refer also Nymphaeaceae)

Takhtajan and Dahlgren recognised the family Barclayaceae from the allied family Nymphaeaceae. Cronquist, Engler, Hutchinson, Thorne, Bentham & Hooker did not recognise it as a family, but included it in the family Nymphaeaceae in the order Nymphaeales.

The family Barclayaceae is represented by the genus *Barclaya* which are totally submersed water plants having hydrocleistogamous flowers with inferior ovary and seeds covered with setae.

The family Barclayaceae is characterised by the flowers with 4-5 lobed calyx adnate to ovary, 8 to many petals in two to three series, 8 to many stamens, inferior ovary with many ovules on parietal placenta, fleshy baccate fruit having densely setose seeds.

BARRINGTONIACEAE

(Refer also Lecythidaceae & Myrtaceae)

Airy Shaw recognised Barringtoniaceae as a separate family, while Cronquist, Engler, Hutchinson, Thorne and Takhtajan considered this as part of the family Lecythidaceae. Bentham & Hooker, however considered this in the family Myrtaceae. Most of the Old World genera of Lecythidaceae are grouped under Barringtoniaceae (*Barringtonia*, *Careya*, *Planchonia*, *Chydenanthus* and *Combretodendron*), while the New World genera are grouped in the family Lecythidaceae.

The family is represented in India by the following genera : *Barringtonia*, *Careya*, *Chydenanthus* and *Planchonia*.

For recent taxonomic revisions refer Payens (1967) and Kartawinata (1965).

GENERAL

BRR 1 Miers, J. 1875

On the Barringtoniaceae. *Trans. Linn. Soc. Lond. Bot.* 9 : 47-118. t. 10-18. Monographic ; Key to Genera ; no key to spp.

Barringtonia J. R. & G. Forst.

BRR 2 Payens, J. P. D. W. 1967

A monograph of the genus *Barringtonia* (Lecythidaceae). *Blumea* 15 : 157-263, fig. 23, Photo 5. Synonymy, descr., typification, distr., ecol. notes.

BRR 3 Tarnvschi, I. T. & Serbanescu-Jitariue, G. 1967

Morphologie du pollen de quelques representants des familles Lythraceae et Myrtaceae et de *Barringtonia asiatica* (Lecythidaceae) (en roumain). *Lucr. Grad. Bot. Bucuresti* 155-167.

Careya Roxb.

BRR 4 Santapau, H. 1946

Abnormal flowering of *Careya arborea* Roxb. in Khandala. *Journ. Bombay Nat. Hist. Soc.* 46 : 409-410. Discussion.

Planchonia Bl.

- BRR 5 Kartawinata, E. K. 1965
The genus *Planchonia* Blume (Lecythidaceae). *Bull. Bot. Surv. India* 7 : 162-167. Key to spp. : 8 spp.

ADDITION : GENERAL

- BRR 6 Clarke, C. B. 1879
Barringtonieae. *In* : Hooker, J. D. *ed.*, *Fl. Brit. India* 2 : 506-512.

BASELLACEAE

(Refer also Chenopodiaceae)

The family Basellaceae is included in the order Caryophyllales by Cronquist, Takhtajan and Dahlgren, in the order Chenopodiales by Hutchinson and Thorne, in the order Centrospermae by Engler. However Bentham & Hooker did not recognise this as a separate family and it is included in the family Chenopodiaceae.

The family is distinguished by the nature of habit *i.e.* climbing vines with uniseriate perianth represented by a calyx of 5 sepals. While in the Chenopodiaceae the flowers have biseriate perianth. The Basellaceae is allied to Portulacaceae and other groups of Centrospermales. In the family Basellaceae the fruit is a berry or a drupe, while in the Portulacaceae the fruit is capsular. Ulbrich (1934) classified the family into the following tribes : *Baselleae* having erect and straight filaments in bud ; *Anredereae* having curved outward filaments in bud.

The family is represented in India by the following genera : *Basella*, *Boussingaultia*. For recent taxonomic revisions refer van Steenis (1957).

GENERAL

- BAS 1 Khan, M. S. & Huk, A. M. 1975
Flora of Bangladesh : 2. Moringaceae, Polemoniaceae, Pedaliaceae, Basellaceae, Butomaceae 1-13. Bangladesh Agricultural Research Council.
- BAS 2 Moquin-Tandon, A. 1849
Basellaceae. *In* : DC. *Prodr.* 13(2) : 220-230. Monographic.

- BAS 3 Steenis, C. G. G. J. van 1957
 Basellaceae. In : van Steenis, *Fl. Males.* I, 5 : 300-304,
 fig. 1-2.
- BAS 4 Ulbrich, E. 1934
 Basellaceae. Engler & Prantl, *Pflanzenf.*, ed., 2, 16C :
 263-291.
- BAS 5 Winters, Harold F. 1963
 Ceylon Spinach (*Basella rubra*). *Econ. Bot.* 17 : 195-199.

BEGONIACEAE

The family Begoniaceae is included in the order Violales by Cronquist, Engler and Dahlgren, in the order Passiflorales by Bentham & Hooker, in the order Cucurbitales by Hutchinson and in the order Begoniales by Takhtajan and in the order Cistales by Thorne.

The family Begoniaceae is characterised by the numerous stamens in whorls, winged or angled inferior ovary, usually twisted stigmas. Though it is placed in Violales, it differs from the majority of the allied families in having inferior ovary. Its alliance with Datisceae is quite prominent. While in Datisceae the leaves are exstipulate, the leaves of Begoniaceae are stipulate.

According to Kolbc & John (1979) the families with hypogynous flowers in the order Violales (Flacourtiaceae, Passifloraceae, Violaceae and Turneraceae) are serologically separated from families with epigynous flowers (Cucurbitaceae, Datisceae and Begoniaceae).

The family is represented in India by the genus *Begonia*.

GENERAL

- BEG 1 Baranov, A. I. 1981
 Studies in the Begoniaceae. *Phytol. Memoirs* 4 : i-vi, 1-88,
 23 pl.
- BEG 2 Barkley, F. 1972
 The species of the Begoniaceae. *Buxtonian* 1. Suppl. 5.
 1-120. Alphabetical lists.

- BEG 3 Barkley, F. A. 1972
Begoniaceae : the genera, sections and known species of each. *Buxtonian* 1. Suppl. 4 : 1-20. List of accepted spp.
- BEG 4 Barkley, F. A. 1972
Key to the sections of the Begoniaceae. *Buxtonian* 1. Suppl. 3. 1-7.
- BEG 5 Barkley, F. A. & Golding, J. 1974
The species of the Begoniaceae : an alphabetical list of the species (and varities) which have been published for the Begoniaceae, as far as can be encountered. *ed.*, 2. *North Eastern Univ. Boston*. 1-144.
- BEG 6 Bencke, F. 1882
Beitrag Zur Kenntnis der Begoniaceen. *Bot. Jahrb.* 3 : 288-318.
- BEG 7 Boghdan, K. S. & Barkley, F. A. 1975
Botanically speaking, what are the Begoniaceae ? *Begonian* 42(12) : 296-300.
- BEG 8 Candolle, A. De 1859
Memoire sur la famille des Begoniacees. *Ann. Sci. Nat. Bot.* IV, 11 : 93-149. Subdivision of family.
- BEG 9 Candolle, A. De 1864
Begoniaceae. *In* : DC., *Prodr.* 15(1) : 266-408.
- BEG 10 Ghazanfar, S. & Aziz, P. 1976
Begoniaceae. *Fl. W. Pakistan* No. 96 : 1-4.
- BEG 11 Golding, J. 1977
The nomenclature of the genus *Begonia*. *Phytologia* 37(5) : 425-440.
- BEG 12 Golding, J. 1978
Corrections to "The nomenclature of the genus *Begonia*. *Phytologia* 38(3) : 216. Corrections to Golding, L. 1977. *Phytologia* 37(5) : 425-440.

- BEG 13 Irmischer, E. 1925
 Begoniaceae. Engler & Prantl, *Pflanzenf.*, ed. 2. 21 : 548-588.
- BEG 14 Irmischer, E. 1939
 Die Begoniaceen Chinas und ihre Bedeutung für die Frage der Formbildung in Polymorphen Sippen. *Mitt. Inst. Bot. Hamburg* 10 : 427-557, fig. 1-17. 52 spp. ; Taxonomy ; critical notes.
- BEG 15 Klotzsch, J. F. 1855
 Begoniaceen-Gattungen und Arten. *Abh. Akad. Wiss. Berlin Phys.* 1854 : 121-255, pl. 1-12.
- BEG 16 Smith, L. B. & Schubert, B. G. 1946
 Studies in the Begoniaceae—II Mexico. Central America *Contr. Gray Herb.* 161 : 26-29.
- BEG 17 Smith, L. B. & Schubert, B. G. 1947
 Some mexican Begonias. *Contr. Gray Herb.* 165 : 90-94.

Begonia Linn.

- BEG 18 Baranov, A. I. & Barkley, F. A. 1972
 Some nomenclatural changes in the sections of *Begonia* L. *Phytologia* 24(2) : 155-157.
- BEG 19 Barkley, F. A. & Boghdan, K. S. 1972
 An unusual *Begonia* inflorescence. *Phytologia* 23(4) : 323-326.
- BEG 20 Chum, W. Y. & Chun, Faith 1939
 Notes on *Begonia*. *Sunyatsenia* 4 : 20-25, pl. 8, fig. 4-7.
 Notes on southern China spp. of *Begonia*.
- BEG 21 Clarke, C. B. 1880
 On Indian Begonias. *Journ. Linn. Soc.* 18 : 114-122, t. 1-3.
- BEG 22 Doorenbos, J. 1975
 How *Begonia wallichiana* got its name by mistake. *Begonian* 42(9) : 213-215.

- BEG 23 Doorenbos, J. 1976
Begonia "Kew species". *Begonian* 43(9) : 246-249. Illust.
- BEG 24 Dryander, J. 1791
Observations on the genus *Begonia*. *Trans. Linn. Soc.* 1 : 155-173, pl. 14-16.
- BEG 25 Golding, J. 1971
The spelling of *Begonia* names. *Begonian* 39(1) : 4-7.
- BEG 26 Golding, J. 1977
The nomenclature of the genus *Begonia*. *Phytologia* 37(5) : 425-440.
- BEG 27 Golding, J. 1978
Begonia nomenclature notes—2. The *Begonia* in Wallich's numerical list. *Phytologia* 40 : 7-20. Evaluation of names.
- BEG 28 Hara, H. 1972
New or noteworthy flowering plants from Eastern Himalaya (9). *Journ. Jap. Bot.* 47 : 107-115.
- BEG 29 Hara, H. 1973
New or noteworthy flowering plants from Eastern Himalaya (12). *Journ. Jap. Bot.* 48 : 97-104. *Begonia leptoptera* Hara from Nepal Himalayas allied to *B. josephii* A. DC.
- BEG 30 Hara, H. 1973
New or noteworthy plants from Eastern Himalaya (13). *Journ. Jap. Bot.* 48 : 353-361. *Begonia flagellaris* Hara from Nepal allied to *B. pecta* Smith.
- BEG 31 Irmscher, E. 1927
Beitrage Zur Kenntniss der ostasiatischen Begonien. *Mitt. Inst. Bot. Hamburg* 6 : 343-360. Critical notes.
- BEG 32 Irmscher, E. 1951
Some new Chinese species of *Begonia*. *Notes Roy. Bot. Gard, Edinb.* 21 : 35-45. 13 new taxa descr.
- BEG 33 Kalmbacher, G. 1971
Begonia flowers. *Begonian* 38(2) : 32-34.

- BEG 34 Legro, R. A. H. & Doorenbos, J. 1971
Chromosome numbers in Begonia-2. *Netherlands Journ. Agric. Sci.* 19 : 176-183.
- BEG 35 Seitner, P. G. 1972
Some observations on Begonia seeds. *Begonian* 39(3) : 47-55.
- BEG 36 Yu, Te-chun 1948
An enumeration of Begonias of south-western China. *Bull. Fan. Mem Inst. Biol.* n.s. 1 : 113-130. 13 spp. recognised, 8 new additions ; summary in Chinese.

ADDITIONS : GENERAL

- BEG 37 Clarke, C. B. 1879
Begoniaceae. In : Hooker, J. D. ed., *Fl. Brit. India* 2 : 635-656.
- BEG 38 Hutchinson, J. 1967
Begoniaceae. *The Genera of Flowering Plants* 2 : 419-422.
- BEG 39 Kolbe, K. -P. & John, J. 1979
Serologische Untersuchungen Zur Systematik der Violales. *Bot. Jahrb. Syst.* 101 : 3-15.

BERBERIDACEAE

(Refer also Nandinaceae & Podophyllaceae)

Berberidaceae sensu lato includes Lardizabalaceae, Nandinaceae and Podophyllaceae. The above mentioned families segregated from Berberidaceae are considered here as separate families. Cronquist, Engler, Takhtajan and Dahlgren included the family Berberidaceae in the order Ranunculales ; while Hutchinson and Thorne considered this under the order Berberidales. Bentham & Hooker included the family Berberidaceae sensu lato (including Podophyllaceae, Lardizabalaceae, Nandinaceae) in the order Ranales.

The family Berberidaceae is characterised by a perianth of four whorls, the two outer are considered as calyx, the two inner usually with nectaries at base are considered as petals and the presence of

introrse anthers with valves. In the Podophyllaceae the perianth segments are clearly differentiated into calyx and corolla. The family Podophyllaceae is generally considered intermediate between the Ranunculaceae and Berberidaceae. Hutchinson (1959) placed Podophyllaceae in the Ranales, while the Berberidaceae is placed in a separate order Berberidales.

Nowicke & Skvarla's (1981) studies on palynology of Berberidaceae confirm the recent classification of the family by Meacham (1980). It is also considered the genera *Berberis* and *Mahonia* are congeneric palynologically. Meacham (1980) states that the genus *Nandina* should be segregated as a monotypic family Nandinaceae.

The family is represented in India by the following genera : *Berberis*, *Epimedium* and *Mahonia*.

For recent taxonomic revisions refer Ahrendt (1961), for phylogeny refer Janchen (1949), Kumazawa (1933), Meacham (1980) and for palynology refer Kumazawa (1936), Nowicke & Skvarla (1981).

GENERAL

- BER 1 Ahrendt, L. W. A. 1961
Berberis and *Mahonia*—a taxonomic revision. *Journ. Linn. Soc. (Bot.)* 57 : 1-410, fig. 67, maps 51. Diagnostic characters of both genera, sections, groups & spp., descr. of spp., distr.
- BER 2 Bauer, G. 1932
 Beitrage Zur Kenntnis der Berberidaceen. *Mitt. Deutsch. Dend. Ges.* 44 : 42-46. An annotated synopsis of spp.
- BER 3 Candolle, A. P. de 1824
 Berberideae. *In* : DC., *Prodr.* 1 : 105-110.
- BER 4 Chatterjee, R. 1953
 Studies on Indian Berberidaceae from botanical, chemical and pharmacological aspects. *Rec. Bot. Surv. India* 16(2) : i-iv, 1-86. illust.
- BER 5 Ernst, Wallace, R. 1964
 The genera of Berberidaceae, Lardizabalaceae and Menispermaceae in the south-eastern United States. *Journ. Arn. Arb.* 45(1) : 1-35. Berberidaceae pp. 1-20,

- BER 6 Himmelbaur, W. 1914
Die Berberidaceen und ihre Stellung in System *Denkschr. Akad. Wiss. Wien, Math. Naturw.* 89 : 733-796, pl. 1-4. References to Lardizabalaceae & Menispermaceae.
- BER 7 Janchen, E. 1949
Die systematische Gliederung der Ranunculaceen und Berberidaceen. *Denkschr. Akad. Wiss. Wien. Math. Naturw.* 108(4) : 1-82. Infra familial taxonomic notes, biochemistry.
- BER 8 Kitamura, T. & Sugamoto, M. 1961
Studies on the alkaloids of berberidaceous plants. XXXI. *Journ. Pharm. Soc. Japan* 81(2) : 254-261. In Japanese with English Summary.
- BER 9 Kumazawa, M. 1936
Pollen grain morphology in Ranunculaceae, Lardizabalaceae and Berberidaceae. *Jap. Journ. Bot.* 8 : 19-46, pls. 2-6.
- BER 10 Kumazawa, M. 1938
Systematic and phylogenetic consideration of the Ranunculaceae and Berberidaceae. *Bot. Mag. Tokyo* 52 : 9-15.
- BER 11 Langlet, O. 1928
Einige Beobachtungen über Zytologie der Berberidaceae. *Sv. Bot. Tidskr.* 22 : 169-184.
- BER 12 Miyaji, Y. 1930
Beiträge zur Chromosomen phylogenie der Berberidaceen. *Planta* 11 : 650-659. The genera *Hydrastis* and *Glauucidium* included.
- BER 13 Prantl, K. 1891
Berberidaceae. In : Engler & Prantl, *Pflanzenf.* III 2 : 70-77.
- BER 14 Schmidt, E. 1928
Untersuchungen über Berberidaceen. *Beih. Bot. Centralbl.* 45(2) : 329-396, fig. 1-37. Morphological notes.

- BER 15 Schneider, C. K. 1913
Berberidaceae. In : Sarg. *Pl. Wils.* 1 : 353-386. Key to spp. of Sect. *Wallichiana* of the genus *Berberis* and Asiatic spp. of *Mahonia*.
- BER 16 Singh, V., Jain, D. K. & Sharma, M. 1978
Leaf architecture in Berberidaceae and its bearing on the circumscription of the family. *Journ. Indian Bot. Soc.* 57(3) : 272-280.
- BER 17 Tischler, G. 1902
Die Berberidaceen und Podophyllaceen. Versuch einer morphologisch-biologischen Monographia. *Bot. Jahrb.* 1 : 590-727, fig. 1-30. Key to genera.
- BER 18 Tomita, M. & Ishi, H. 1957
Studies on the alkaloids of berberidaceous plants XII. *Journ. Pharm. Soc. Japan* 77 : 114-116. Epimedium.
- BER 19 Wyman, D. 1958
Two new *Mahoberberis* hybrids. *Arnoldia* 18 : 9-12. Hybrids and cultivated spp.
- BER 20 Wyman, D. 1962
Barberries [*Berberis*]. *Arnoldia* 22 : 9-16, cultivated spp. & vars.

***Berberis* Linn.**

- BER 21 Ahrendt, L. W. A. 1939
Some new Asiatic barberries in cultivation. *Kew Bull. Misc. Inf.* 1939 : 261-275. New spp. & new vars., mainly from China.
- BER 22 Ahrendt, L. W. A. 1941-45
A survey of the genus *Berberis* L. in Asia—New and old species from Bhutan, Assam, southern Tibet, Upper Burma and N. W. Yunnan in their relationship to the analytical framework of the genus. *Journ. Bot.* 79 : Suppl. 1-64. 1941 ; 65-80. 1942 ; 80 : 81-88. 1942 ; 89-96, 97-104. (1942) 1943 ; 105-112. (1942) 1944 ; 113-116 (1942) 1945. Systematic notes ; Key.

- BER 23 Ahrendt, L. W. A. 1945
Some new or little known *Berberis* from India. *Journ. Roy. Asiat. Soc. Bengal* II, 11 : 1-5.
- BER 24 Ahrendt, L. W. A. 1961
Berberis and *Mahonia*. A taxonomic revision. *Journ. Linn. Soc. Bot.* 57 : 1-410, fig.67, maps 51. Diagnostic characters of both genera, sections, groups & spp., descr. of spp., distr.
- BER 25 Bauer, G. 1932
Beitrage Zur Kenntnis der Berberidaceen. *Mitt. Deutsch Dendr. Ges.* 1932 : 42-46.
- BER 26 Bean, W. J. 1903
The barberries (*Berberis*). *Garden* 63 : 71-73, 94-95, 124-125, 195-196. General notes.
- BER 27 Byhouwer, J. T. P. 1928
Notes on Chinese *Berberis*. *Journ. Arn. Arb.* 9 : 131-137. *Distr.*, new spp.
- BER 28 Chatterjee, R. 1949
The Rasanjana of the Hindus. *Lloydia* 12 : 178-182. Medicinal uses of *Berberis*.
- BER 29 Derman, H. 1931
A study of chromosome number in two genera of Berberidaceae : *Mahonia* and *Berberis*. *Journ. Arn. Arb.* 12 : 281-287.
- BER 30 Griffen, M. H. 1937
The chromosome numbers of *Berberis*. *Trans. Roy. Soc. S. Afr.* 24 : 203-206.
- BER 31 Hsiao, Pei-Ken 1974
Study on the medicinal plant resources of *Berberis* in China, including their taxonomy, distribution and evaluation medicinal. *Acta Phytotax. Sin.* 12 : 383-406, fig. 12, pl. 2. In Chinese; Key to sections; enum. of spp.

- BER 32 Lindley, J. 1850
A short account of the more ornamental evergreen berries, cultivated in the gardens of Great Britain. *Journ. Hort. Soc. London* 5 : 1-21.
- BER 33 Schneider, C. K. 1905
Die Gattung *Berberis* (Euberberis). *Mitt. Deutsch. Dendr. Ges.* 14 : 111-124. Critical notes, enum. of 170 spp.
- BER 34 Schneider, C. K. 1905
Die Gattung *Berberis* (Euberberis). Vorarbeiten für eine Monographie. *Bull. Herb. Boiss.* II. 5 : 33-48, 133-148, 391-403, 449-464, 655-670, 800-812.
- BER 35 Schneider, C. K. 1908
Weitere Beiträge zur Kenntnis der Gattung *Berberis* (Euberberis). *Bull. Herb. Boiss.* II. 8 : 192-204, 258-266. Enum. of spp. ; critical notes.
- BER 36 Schneider, C. K. 1923
Notes on hybrid *Berberis* and some other garden forms. *Journ. Arn. Arb.* 4 : 193-232.
- BER 37 Schneider, C. K. 1925
The best evergreen Chinese barberries. *Garden* 89 : 585-586.
- BER 38 Schneider, C. K. 1926
Some flowering barberries. *Garden* 90 : 263-264.
- BER 39 Schneider, C. K. 1929
Notes on *Berberis*. *New Fl. & Silva* 1 : 56-63, fig. 18-20, 126-136, fig. 39, 212-216.
- BER 40 Schneider, C. K. 1942
Die *Berberis* der Section *Wallichianae*. *Mitt. Deutsch. Dendr. Ges.* 55 : 1-60, pl. 1-6, maps 1, 2. Monographic. 71 spp. enum.

- BER 41 Teuseher, H. 1932
Trees and shrubs of the Orient. I Barberries. *Journ. N. Y. Bot. Gard.* 33 : 219-226, fig. 1-3 ; II. 239-245, fig. 1-3.
- BER 42 Tomita, M., Young, T. H. & Liu, S. T. 1960
Studies on the alkaloids of Berberidaceous plants. XXIV-XXVI. *Journ. Pharm. Soc. Japan* 80 : 845-851.
- BER 43 Usteri, A. 1899
Das Geschlecht der Berberitzen. *Mitt. Deutsch. Dendr. Ges.* 8 : 77-94, fig. 1-7. Key and critical notes.
- BER 44 Usteri, A. 1903
Beitrage Zu einer Monographie der Gattung *Berberis*. *Deutsch. Bot. Monatschr* 21 : 161-171.
- BER 45 Vaarama, A. 1947
Contributions to the cytology of the genus *Berberis*. *Hereditas* 33 : 422-424. Somatic chromosomes of x *Mahoberberis* spp.

Epimedium Linn.

- BER 46 Baker, J. G. 1880
A synopsis of the species and forms of *Epimedium*. *Gard. Chron. n.s.* 13 : 620, 683-684. Monographic, 11 spp.
- BER 47 Duncan, J. 1870
Epimediums. *Gard. Chron.* 1870 : 698. General notes.
- BER 48 Leacuyer, O. 1854
Les Epimedium. *Hort. Franc.* 1854 : 145-147. pl. 13.
- BER 49 Maekawa, Fumio 1955
Species problem and phylogenetic appreciation for diagnostic characters—a case of *Epimedium*. *Journ. Jap. Bot.* 30 : 353-358. In Japanese ; 4 Japanese spp.
- BER 50 Morren, C. & De Caisne, J. 1835
Epimedium. *Bull. Acad. Sci. Brux.* 2 : 204-206. Two Sections proposed.

- BER 51 Stearn, W. T. 1938
Epimedium and Vancouveria (Berberidaceae)—a monograph. *Journ. Linn. Soc. Bot.* 51 : 409-535, pl. 24-31, fig. 1-20, text maps 1-6.
- BER 52 Stearn, W. T. 1944
 Epimediums. *Gard. Chron.* III. 115 : 150-151, fig. 75, 76.
- BER 53 Ying, Tsiün-Shen 1975
 On the Chinese species of *Epimedium* L. *Acta Phytotax. Sin.* 13 : 49-55, pl. 1. In Chinese ; key.
- Mahonia** Nutt.
- BER 54 Fedde, F. 1899
 Pflanzengeographische Verbreitung der Gattung *Mahonia*. *Jahresb. Schles. Ges. Vaterb. Cult. Zool.-Bot.* 77 : 8-17.
- BER 55 Fedde, F. 1901
 Versuch einer Monographie der Gattung *Mahonia*. *Bot. Jahrb.* 31 : 30-133.
- BER 56 Gordon, G. 1876
 The Mahonias or pinnate-leaved berberries. *Garden* 9 : 17-19, fig. 1. General notes.
- BER 57 Li, H. L. 1963
 The cultivated Mahonias. *Morris Arb. Bull.* 14 : 43-50. Cultivated spp. of horticultural value.
- BER 58 Sealy, J. R. 1942
Mahonia lomariifolia. *Curtis's Bot. Mag.* 163 : pl. 9634, fig. 1. Native of Burma, Yunnan in China.
- BER 59 Takeda, H. 1917 & 1921
 Contributions to the knowledge of the Old World species of the genus *Mahonia*. *Notes Roy. Bot. Gard. Edinb.* 6 : 209-245, index 246-248. 1917 ; pl. 1-37. 1921.

ADDITIONS : GENERAL

- BER 60 Hooker, J. D. & Thomson, T. 1872
Berberidaceae. In : Hooker, J. D. ed., *Fl. Brit. India* 1 :
 107-113.
- BER 61 Meacham, C. A. 1980
 Phylogeny of the Berberidaceae with an evaluation of
 classification. *Syst. Bot.* 5 : 149-172.
- BER 62 Nowicke, J. W. & Skvarla, J. J. 1981
 Pollen morphology and phylogenetic relationships of the
 Berberidaceae. *Smithsonian Contr. Bot.* 50 : 1-83.

BETULACEAE

(Refer also Carpinaceae & Corylaceae)

Cronquist, Engler, Hutchinson, Thorne and Dahlgren considered the family Betulaceae in the order Fagales. Takhtajan assigned the family Betulaceae to the order Betulales ; while Bentham & Hooker treated this as Cupuliferae in the order Unisexuales. Hutchinson separated the genus *Corylus* and treated it as a separate family Corylaceae ; while Airy Shaw recognised Carpinaceae as a separate family. On the other hand Corylaceae is treated as part of the family Betulaceae by Cronquist, Takhtajan, Thorne and Engler.

The family is distinguished from the related families by the presence of 3-flowered cymules (subtended by a bract and 2 to 3 bracteoles) which form collectively catkins. According to phylogenists Tippo (1938) and Hutchinson it is derived from hamamelidaceous stock. While Hjelmquist (1948) has traced the ancestry from stocks ancestral to Fagales. Abbe (1935) proposed that the pistillate flower of the family Betulaceae consisting of female flower without a perianth and ovary of 2 united carpels, is derived from a 3-carpellary ancestor similar to hamamelidaceous ancestor.

The family is represented in India by the genera *Alnus* and *Betula*. For recent phylogeny studies refer Hall (1952) ; for pollen morphology refer Cherevko (1969) ; for chromosome studies refer Mehra & Sareen (1973).

GENERAL

- BET 1 Abbe, E. C. 1935 & 1938
 Studies in the phylogeny of the Betulaceae I. Floral and inflorescence anatomy and morphology. *Bot. Gaz.* 97 : 1-67. 1935 ; I. Extreme in variation in the range of variation of floral and inflorescence anatomy. *Ibid.* 99 : 369-431. 1938.
- BET 2 Abbe, E. C. 1974
 Flowers and inflorescences of the "Amentiferae". *Bot. Rev.* 40(2) : 159-261.
- BET 3 Anderson, E. & Abbe, E. C. 1934
 A quantitative comparison of specific and generic differences in the Betulaceae. *Journ. Arn. Arb.* 15 : 43-50.
- BET 4 Bailey, I. W. 1910
 Notes on the wood structure of the Betulaceae and Fagaceae. *Forestry Quart.* 8 : 178-185.
- BET 5 Candolle, A. de 1864
 Cupuliferae. In : DC., *Prodr.* 16(2) : 1-123. Monographic.
- BET 6 Hall, J. W. 1952
 The comparative anatomy and phylogeny of the Betulaceae. *Bot. Gaz.* 113 : 225-270.
- BET 7 Hjelmquist, H. 1948
 Studies on the floral morphology and phylogeny of the Amentiferae. *Bot. Notiser Suppl.* 2 : 1-171.
- BET 8 Kuprianova, L. A. 1965
 The palynology of the Amentiferae—*Komarov Bot. Inst., Acad. Sci. URSS*, 1 : 1-214.
- BET 9 Mehra, P. N. & Sarcen, T. S. 1973
 Cytology of West Himalayan Betulaceae and Salicaceae. *Journ. Arn. Arb.* 54(3) : 412-418. Chrom. nos.
- BET 10 Nasir, Y. J.
 Betulaceae. *Fl. W. Pakistan* No. 95 : 1-5.

- BET 11 Regel, E. 1861
Monographia Betulacearum hucusque Cognitarum 1-129,
 pl. 1-14.
- BET 12 Regel, E. 1868
 Betulaceae. In : DC., *Prodr.* 16(2) : 161-189. Monographic.
- BET 13 Schneider, C. K. 1916
 Betulaceae. In : Sarg., *Pl. Wils.* 2 : 423-508. Key to sections and spp.
- BET 14 Spach, E. 1841
 Revisio Betulacearum. *Ann. Sci. Nat. II. Bot.* 15 : 182-212. Monographic.
- BET 15 Tippe, E. 1938
 Comparative anatomy of the Moraceae and their presumed allies. *Bot. Gaz.* 100 : 1-99.
- BET 16 Woodworth, R. H. 1929-1930
 Cytological studies in the Betulaceae I-IV. *Bot. Gaz.* 87 : 331-363. 1929 ; *ibid.* 88 : 383-399. 1929 ; *ibid.* 89 : 402-409. 1930 ; *ibid.* 90 : 108-115. 1930.

Alnus Mill.

- BET 17 Callier, A. 1911
 Diagnoses formarum novarum generis *Alnus*. *Fedde Repert Sp. Nov.* 10 : 225-237. Descr. of new spp. & vars.
- BET 18 Callier, A. 1918
Alnus Foremen der europäischen Herbarien und Gärten. *Mitt. Deutsch. Dendr. Ges.* 27 : 39-185, pl. 9-24.
- BET 19 Cherevko, M. V. 1969
 On pollen morphology in some species of *Betula* L. and *Alnus* Gaertn. *Ukrain Bot. Zh.* 26(6) : 39-45.
- BET 20 Kuprianova, P. A. 1958
 Palinologischeskie dannye k sistematike roda *Alnus* s.l. [The palynological data on the systematics of the

genus *Alnus* s.l. *Trudy Bot. Inst. Komarov* 12 : 167-196, pl. 1-5. In Russian. Key based on pollen.

- BET 21 Murai, S. 1964
Phytotaxonomical and geobotanical studies on genus *Alnus* in Japan. 3. Taxonomy of the whole world species and distribution of each Section. *Bull. Forest. Exp. Stat. Meguro, Tokyo* 171 : 1-107.
- BET 22 Nair, P. K. K. & Saxena, A. K. 1974
A re-examination of the pollen grains of *Alnus nepalensis* D. Don. *Journ. Palynol.* 10(1) : 81-83.
- BET 23 Osborn, A. 1924
The alders. *Gard. Chron.* III 76 : 355-356, f. 130. Notes Asiatic spp.
- BET 24 Spach, E. 1841
Revisio Betulacearum. *Ann. Sci. Nat. Ser.* 2. 15 : 203-209.
- BET 25 Vishnu-Mittre & Sharma, B. D. 1963
Pollen morphology of the Indian species of *Alnus*. *Grana Palynologica* 4(2) : 302-305.
- BET 26 Winkler, H. 1904
Alnus. In : Engler, *Pflanzenr.* 19 (IV. 61) : 101-134. Monograph.

Betula Linn.

- BET 27 Burbidge, F. W. 1901
The paper-bark birch of Thibet. *Garden* 60 : 169-170. fig. 1. *Betula utilis*.
- BET 28 Cherevko, M. V. 1969
On pollen morphology in some species of *Betula* L. and *Alnus* Gaertn. *Ukrain Bot. Zh.* 26(6) : 39-45.
- BET 29 Clausen, K. E. 1960
A survey of variations in pollen size within individual plants and catkins of three taxa *Betula*. *Pollen et Spores* 2(2) : 299-304.

- BET 30 Clausen, K. E. 1962
Size variations in pollen of three taxa of *Betula*.
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- BET 31 Fernald, M. L. 1902
Relationship of some American and Old World birches.
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- BET 32 Jansson, C. A. 1962
Some species and varieties of *Betula* Section *verrucosae*
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Trad. 25 : 103-156.
- BET 33 Regel, A. 1861
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- BET 35 Schneider, C. K. 1915
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Oesterr. Bot. Zeitschr. 65 : 305-312.
- BET 36 Vassilijev, I. G. 1961
De Genera *Betula* L. notulae Systematicae et geogra-
phicae. *Not. Syst.* (Leningrad) 21 : 93-103.
- BET 37 Vasilev, V. N. 1958
Baikalo-Saianskaia oblast Kak odin iz glavneishikh
pozdnikh tsentrov formirovaniia roda *Betula* L. [The
Baikal-Saian territory, one of the most important later
centers of formation for the genus *Betula* L.] *Trudy*
Inst. Lesa Akad. Nauk. SSSR 37 : 120-141, fig. 1-10. In
Russian ; discussion ; 8 new spp., descr.
- BET 38 Vasilov, V. N. 1959
Zametki po sistematike roda *Betula* L. [Notulae syste-
maticae de genere *Betula* L.] *Bot. Mat. Gerb. Inst.*
Komarov. Akad. Nauk. SSSR 19 : 89-95, fig. 1-2. In
Russian.

- BET 39 Weaver, R. E. 1978
The ornamental birches. *Arnoldia* 38(4) : 117-131.
- BET 40 Wilson, E. H. 1925
The birches. *Garden* 89 : 682-683, fig. 2 ; 697-698, fig. 2 ; 719-720, fig. 2. Asian spp. of birches enum.
- BET 41 Winkler, H. 1904
Betula. In : Engler, *Pflanzenr.* 19 (IV. 61) 56-101. Monograph.

ADDITION : GENERAL

- BET 42 Hutchinson, J. 1967
Betulaceae. *The Genera of Flowering Plants* 2 : 124-126.

BIEBERSTEINIACEAE

(Refer also Geraniaceae)

Takhtajan recognised the family Biebersteiniaceae, a unigeneric family based on the genus *Biebersteinia* which was formerly assigned to the family Geraniaceae. Besides this segregated family, Takhtajan further segregated Dirachmaceae and Vivianiaceae from the family Geraniaceae. Cronquist, Engler, Hutchinson, Bentham & Hooker and Thorne included Biebersteiniaceae in the family Geraniaceae. Takhtajan and Dahlgren included the family Biebersteiniaceae in the order Geraniales.

The presence of beaked ovary in the Geraniaceae and unbeaked ovary in the Biebersteiniaceae are quite characteristic. The ovary consists of five carpels and each carpel fused around a central axis and each of the five styles connate into a stigma. The fruit is a schizocarp and each carpel (mericarp) with persistent styles separates from the central axis.

The family is represented in India by a single genus *Biebersteinia*.

- BBS 1 Jaubert, H. & Spach, E. 1846
Conspectus generis *Biebersteinia*. *Ann. Sci. Nat. III. Bot.* 6 : 137-142.

BBS 2 Warbürg, E. F. 1938

Taxonomy and relationships in the Geraniales in the light of their cytology. *New Phytol.* 37:130-159, 189-210.

BIGNONIACEAE

Cronquist, Takhtajan and Dahlgren treated the family Bignoniaceae under the order Scrophulariales. Engler considered it under the order Tubiflorae, while Bentham & Hooker assigned it to the order Personales. Hutchinson and Thorne included this family under the order Bignoniales.

The family Bignoniaceae is characterised by the opposite usually compound exstipulate leaves and usually capsular fruit with winged seeds, rarely fleshy with unwinged seeds and non-endospermous seeds. Schumann (1895) divided the family into the following tribes based on the number of locules in the ovary and the nature of capsules and berry: Bignonieae, Tecomeae, Eecremocarpeae and Crescentieae. The family Bignoniaceae is related to the Scrophulariaceae. The genus *Paulownia* with arborescent habit, winged seeds and copious endosperm serve as an interlink between the Bignoniaceae and Scrophulariaceae.

The family is represented in India by the following genera: *Dolichandrone*, *Fernandoa*, *Heterophragma*, *Incarvillea*, *Nyctocalos*, *Oroxylum*, *Pajanelia*, *Radermachera*, *Stenolobium*, *Stereospermum*. Since many members of the family have large beautiful flowers, several species of the following genera are cultivated in India: *Adenocalymma*, *Bignonia*, *Campsis*, *Clytostoma*, *Colea*, *Crescentia*, *Doxantha*, *Jacaranda*, *Kigelia*, *Millingtonia*, *Pandorea*, *Parmentiera*, *Phyllarthron*, *Pyrostegia*, *Spathodea*, *Tabebuia*, *Tecomaria*, *Tecomella*.

For recent taxonomic revisions refer Chatterjee (1948), Pichon (1946), Santisuk (1973), van Steenis (1927, 1977); for pollen morphology refer Burman (1977), Ferguson & Santisuk (1973).

The family Bignoniaceae are mostly large flowered wind-dispersed woody tropical plants. Gentry (1974) has shown that the family has diverse floral patterns and morphology to attract all potential pollinators and there is co-evolution seen in the polli-

nators and bignon flowers. Another phenomena which attracts pollinators is the mass flowering in synchronized shorter flowering periods. This concentrated reproductive energy resulting into a single burst of flowering helps in attracting large number of pollinators.

Many bignons have chemical defences against herbivores. Some species harbour ants which serve as an effective deterrent to herbivores.

GENERAL

- BIG 1 Bureau, L. E. 1864
Monographie des Bignoniacees, ou histoire generale et particuliere des plantes qui composent cet ordre naturel. 1-125, atlas 1-35 ; pl. 1-31. Monograph.
- BIG 2 Burman, J. 1977
 Contribution to the pollen morphology of the Bignoniaceae with special reference to the tricolpate type. *Pollen et Spores* 19(4) : 447-519.
- BIG 3 Candolle, A. P. de 1845
 Bignoniaceae. In : DC. *Prodr.* 9 : 142-248.
- BIG 4 Chatterjee, D. 1948
 A review of Bignoniaceae of India & Burma. *Bull. Bot. Soc. Bengal* 2 : 62-67.
- BIG 5 Chatterjee, D. 1948
Amphicome—a superfluous genus of Bignoniaceae. *Kew Bull.* 1948 : 183-185. Reduced to the genus *Incarvillea*.
- BIG 6 Dop, P. 1929
 La Classification des Bignoniacees asiatiques et Africaines. *Bull. Soc. Hist. Nat. Toulouse* 58 : 641-644. Asiatic genera ; key to genera.
- BIG 7 Fabris, H. A. 1965
 Bignoniaceae, Flora of Argentina. *Revista Mus. La Plata Secc. Bot.* 9(43) : 273-419.

- BIG 8 Ferguson, I. K. & Santisuk, T. 1973
Notes on the pollen morphology of some Asiatic Bignoniaceae. *Kew Bull.* 28(2) : 187-194.
- BIG 9 Gentry, A. H. 1974
Bignoniaceae, Flora of Panama. *Ann. Missouri Bot. Gard.* 60 : 781-977.
- BIG 10 Gentry, A. H. 1974
Co-evolutionary patterns in Central American Bignoniaceae. *Ann. Missouri Bot. Gard.* 61 : 728-759.
- BIG 11 Goldblatt, P. & Gentry, A. H. 1979
Cytology of Bignoniaceae. *Bot. Notiser* 132(4) : 475-482. Chrom. nos.
- BIG 12 Jain, D. K. 1978
Studies in Bignoniaceae : 3 Leaf architecture. *Journ. Indian Bot. Soc.* 57 : 369-386.
- BIG 13 Macbride, J. F. 1961
Bignoniaceae, Flora of Peru. *Field Mus. Nat. Hist. Bot. ser.* 13(95) : 11-101.
- BIG 14 Mitra, K. (1968) 1969
Pollen morphology in Bignoniaceae in relation to taxonomy. *Bull. Bot. Surv. India* 10 : 319-326.
- BIG 15 Nasir, Y. J. 1979
Bignoniaceae. *Fl. Pakistan* No. 131 : 1-22.
- BIG 16 Pichon, M. 1946
Sur le centre de dispersion des Bignoniacees. *Bull. Soc. Bot. France* 93 : 121-123.
- BIG 17 Record, S. J. & Hess, R. W. 1940
American timbers of the family Bignoniaceae. *Tropical Woods* 63 : 9-38.
- BIG 18 Rehder, A. 1912
Bignoniaceae. In : *Sarg. Pl. Wils.* 1 : 303-305.

- BIG 19 Santisuk, T. 1973
Notes on Asiatic Bignoniaceae. *Kew Bull.* 28 : 171-185.
Barnettia gen. nov., nomencl. notes in the genera *Radermachera* and *Stereospermum*.
- BIG 20 Schumann, K. 1894
Bignoniaceae. Engler & Prantl, *Pflanzenf.* 4(3b) : 189-252.
- BIG 21 Seemann, B. 1862
Revision of the natural order Bignoniaceae. *Ann. Mag. Nat. Hist.* III. 10 : 29-33. Subdivision of the family discussed.
- BIG 22 Seemann, B. 1863-1870
Revision of the natural order Bignoniaceae. *Journ. Bot.* 1 : 18-23, 87-91. 225-228, 257-258. 1863 ; *ibid.* 3 : 329-333. 1865 ; *ibid.* 5 : 311-375. 1867 ; *ibid.* 8 : 145-149, 337-341, 379, 383. 1870.
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Nomenclature of Bignoniaceae of the Southern United States. *Castanea* 26 (3) : 109-118.
- BIG 24 Seibert, R. J. 1940
The Bignoniaceae of the Maya area. *Carnegie Inst. Wash. Publ.* No. 522 : 375-434.
- BIG 25 Seibert, R. J. 1948
The use of glands in a taxonomic consideration of the family Bignoniaceae. *Ann. Missouri Bot. Gard.* 35 : 123-136, t. 3-7.
- BIG 26 Seibert, R. J. 1970
Bignoniaceae. In : Menninger, *Flowering Vines of the World* 102-117. New York.
- BIG 27 Steenis, C. G. G. J. van 1927
Malayan Bignoniaceae, their taxonomy, origin and geographical distribution. *Rec. Trav. Bot. Neerl.* 1927 : 787-1049, fig. 1-16,

- BIG 28 Steenis, C. G. G. van 1928
The Bignoniaceae of the Netherlands Indies. *Bull. Jard. Bot. Botz.* III, 10 : 173-290, fig. 1-13. Revision.
- BIG 29 Steenis, C. G. G. J. van 1977
Bignoniaceae. In : van Steenis, *Fl. Males.* I, 8 : 114-186, fig. 1-36. Keys to spp., descr., critical notes.
- BIG 30 Theobald, W. L. 1973
Bignoniaceae. *Revised Fl. Ceylon* 1 : 76-81, fig. 1. Key to spp. ; descr.
- BIG 31 Theobald, W. L. 1981
Bignoniaceae. *Rev. Hand. Fl. Ceylon, New Delhi ed.*, 2 : 387-396.
- BIG 32 Urban, I. 1916
Über Ranken und Pollen der Bignoniaceen. *Ber. Deutsch. Bot. Ges.* 34 : 728-758.

Bignonia Linn.

- BIG 33 Blake, S. F. 1923
On the type species of *Bignonia*. *Journ. Bot.* 61 : 191-192.
- BIG 34 Gentry, A. H. 1972
The type species of *Bignonia* L. *Taxon* 21 : 659-664. *Bignonia capreolata* designated as the lectotype, discussion & critical notes.
- BIG 35 Sprague, T. A. 1922
The type species of *Bignonia*. *Journ. Bot.* 60 : 236-238.
- BIG 36 Sprague, T. A. 1922
The type species of *Bignonia*. *Journ. Bot.* 60 : 363-364.
- BIG 37 Sprague, T. A. 1923
On the type species of *Bignonia*. *Journ. Bot.* 61 : 192-193.

Crescentia Linn.

BIG 38 Seemann, B. 1860

Synopsis Crescentiacearum : an enumeration of all crescentiaceous plants at present known. *Trans. Linn. Soc.* 23 : 1-22. Keys to genera.

Dolichandrone (Fenzl.) Seem.

BIG 39 Sprague, T. A. 1919

Dolichandrone and *Markhamia*. *Kew Bull. Misc. Inf.* 1919 : 302-314.

Fernandoa Welw. ex Seem.

BIG 40 Steenis, C. G. G. J. van 1976

Conspectus of the genera *Radermachera* and *Fernandoa* in Indo-Malesia (Bignoniaceae). *Blumea* 23 : 121-138, fig. 1. The genera *Haplophragma*, *Spathodeopsis*, *Hexaneurocarpon* and *Kigelianthe* reduced.

Incarvillea A. Juss.

BIG 41 Andre, E. 1899

Les *Incarvilleas*. *Rev. Hort* (Paris). 1899 : 12-13. Notes *Incarvillea grandiflora*.

BIG 42 Anonymous, 1885

Incarvilleas. *Garden* 28 : 653-654, fig. 1.

BIG 43 Watson, W. 1898

Incarvilleas (with a coloured plate of *I. delavayi*). *Garden* 54 : 430-431. General notes.

BIG 44 Watson, W. 1899

Incarvillea grandiflora. *Garden* 56 : 22-23, pl. 1230.

Radermachera Zoll. & Moritz.

BIG 45 Bureau, E. 1861

Remarques sur la classification des Bignoniacees et obser-

vations sur les genres *Radermachera* et *Stereospermum*. *Adansonia* 2 : 182-197, t. 2-4.

BIG 46 Steenis, C. G. G. J. van 1976

Conspectus of the genera *Radermachera* and *Fernandoa* in Indo-Malesia (Bignoniaceae). *Blumea* 23 : 121-138, fig. 1. 16 spp. of *Radermachera* ; key.

***Stereospermum* Cham.**

BIG 47 Mabberley, D. J. 1978

The Latin name of the 'Padri tree' (Bignoniaceae). *Taxon* 27 : 553. Refer also *Kew Bull.* 28 : 178. 1973 ; 'Padri tree' is currently known as *Stereospermum personatum* (Hassk.) Chatterjee based on *Dipterosperma personatum* Hassk. (1842). The correct name is *Stereospermum colais* (Dillw.) Mabberley based on *Bignonia colais* Dillw.

BIG 48 Santisuk, T. 1973

Notes on Asiatic Bignoniaceae. *Kew Bull.* 28(2) : 171-185. Nomencl. notes, key.

BIG 49 Theobald, William L. 1972

Notes on the Bignoniaceae. *Ceylon Journ. Sci. (Biol. Sci.)* 10 : 75. *Stereospermum personatum* (Hassk.) Chatterjee is the correct name for the pubescent one. Refer also Chatterjee (1948).

***Tabebuia* Gomez ex DC.**

BIG 50 Gentry, A. H. 1969

Tabebuia : the tortuous history of a generic name (Bignoniaceae). *Taxon* 18(6) : 635-642.

BIG 51 Gentry, A. H. 1970

A revision of *Tabebuia* (Bignoniaceae) in Central America. *Brittonia* 22 : 246-264.

BIG 52 Sprague, T. A. & Sandwith, N. Y. 1932

The *Tabebuias* of British Guiana and Trinidad. *Kew Bull.* 1932 : 18-28.

Tecoma Juss.

The genus *Tecoma* is split up as follows : viz. *Campsis* Lour., *Pandorea* Spach., *Stenolobium* D. Don and *Tecomella* Seem.

BIG 53 Melchior, H. 1941

Beitrag zur Systematik und phylogenie der Gattung *Tecoma*. *Ber Deutsch. Bot. Ges.* 59 : 18-31.

Tecomaria Spach

BIG 54 Rao, A. N. & Ling, Leong Fong 1974

Pollen morphology of certain tropical plants. *Reinwardtia* 9 : 153-176. *Tecomaria capensis* Spach p. 170.

ADDITIONS : GENERAL

BIG 55 Bir, S. S., Gill, B. S. & Bedi, Y. S. 1982

Cytopalynological studies on some members of Bignoniaceae from India. *Indian Journ. Bot.* 5 : 7-12.

BIG 56 Clarke, C. B. 1884

Bignoniaceae. In : Hooker, J. D. ed., *Fl. Brit. India* 4 : 376-386.

BISCHOFIACEAE

(Refer also Euphorbiaceae)

The family Bischofiaceae is treated by Airy Shaw (1966) as a separate family ; while Bentham & Hooker, Cronquist, Engler, Hutchinson, Takhtajan and Thorne treated the genus *Bischofia* under the family Euphorbiaceae. Dahlgren mentions that the family Euphorbiaceae may be divided into several families. Airy Shaw proposed the following families segregated from Euphorbiaceae sensu lato : Androstachyaceae, Bischofiaceae, Hymenocardiaceae, Peraceae, Stilaginaceae, Uapacaceae and Scepacaceae.

A monogeneric family based on the genus *Bischofia*, the family is characterised 3-5 pinnately foliolate leaves. According to Airy Shaw it is probably related to Staphyleaceae but differing in the apetalous, absence of disk, few ovules and long reflexed styles.

Bhatnagar & Kapil (1974) indicate that the pollen, anther and embryological characters of the genus *Bischofia* agree with the Phyllanthoideae of the family Euphorbiaceae. According to them (l.c.) there is no justification for recognition of a separate family Bischofiaceae.

The family is represented in India by the following genus: *Bischofia*. For recent taxonomic revisions refer Airy Shaw (1967).

BIS 1 Airy Shaw, H. K. 1967

Notes on the genus *Bischofia* Bl. (Bischofiaceae). *Kew Bull.* 21 : 327-329. Taxonomic discussion; leaves pinnately 3-5 foliolate.

BIS 2 Bhatnagar, A. K. & Kapil, R. N. (1973) 1974

Bischofia javanica, its relationship with Euphorbiaceae. *Phytomorphology* 23 : 264-267, fig. 1.

BIXACEAE

The family Bixaceae is included in the order Violales by Cronquist, Engler and Takhtajan. Hutchinson considered it in the order Bixales. Bentham & Hooker treated it under the order Parietales. Thorne and Dahlgren however included it in the order Cistales.

A monogeneric family based on the genus *Bixa*, the family is characterised by reddish sap, stamens with horse shoe-shaped anthers which dehisce through short slits at the apex and seeds with bright red testa. This family is allied to the Cochlospermaceae, but differs in having unlobed leaves, 2-valved capsules and seeds having starchy endosperm. While the family Cochlospermaceae has palmately lobed leaves, three to five valved fruits and oily endospermous seeds. The family Bixaceae shows affinities with Dilleniaceae.

The family is represented in India by the genus *Bixa*. (*B. orellana* L. is introduced and cultivated in India).

BIX 1 Backer, C. A. 1951

Bixaceae. *In* : van Steenis, *Fl. Males.* 1, 4 : 239-241, fig. 2.

BIX 2 Hooker, J. D. & Thomson, T. 1872

Bixiacae. *In* : Hooker, J. D. ed., *Fl. Brit. India* 1 : 189-196.

- BIX 3 Hutchinson, J. 1967
 Bixaceae. *The Genera of Flowering Plants* 2 : 197-198.
- BIX 4 Pilger, R. 1925
 Bixaceae. In : Engler & Prantl, *Pflanzenf. ed.*, 2. 21 : 313-315, fig. 139.
- BIX 5 Tieghem, P. van 1900
 Sur les Bixaces les Cochlospermacees et les Sphaerosepalaces. *Journ. Bot.* (Paris) 14 : 33-42.
- BIX 6 Venkatesh, C. S. 1956
 The curious anther of *Bixa*—its structure and dehiscence. *Amer. Midl. Nat.* 55 : 473-476.

BOMBACACEAE

A family of tropical trees comprising about 31 genera and 225 species, they are known for their light weighted wood useful for match industries and plywood. The Balsa tree of America (*Ochroma lagopus*) has the lightest commercial wood of value. Other well known trees are the Monkey bread tree or the Boab tree (*Adansonia digitata*) having grotesque shape and sizes, Kapok tree or Silk cotton tree (*Ceiba pentandra*) and Red silk cotton tree or Salmali (*Bombax ceiba*).

The family Bombacaceae is allied to the Malvaceae from which it differs in having smooth pollen grains. In the family Malvaceae the ornamentation of the pollen grains is characteristic. The family Malvaceae consists of mainly herbaceous or semi woody herbs and shrubs, whereas the Bombacaceae are mainly trees.

The Bombacaceae is treated as a family and included in the order Malvales by Cronquist, Engler, Takhtajan, Thorne and Dahlgren ; whereas Hutchinson included this family in the order Tiliales. Bentham & Hooker did not recognise this as a separate family and hence included it under the family Malvaceae.

Following tribes are recognised in the family :

Durioneae, Hampeae, Matisieae, Catostemmataeae, Adansonieae and Ceibeae.

Of the six tribes, four tribes (Hampeae, Matisieae, Catostemmaeae, Ceibae) are restricted to the American tropics. One is Australasian (Durioneae) and the other is pantropical.

Of the seven genera in the tribe Adansonieae, four genera are American and the genus *Bombacopsis* connects American-African tropics, the genus *Adansonia* links Africa-Madagascar with Australia and the genus *Bombax* is south-east Asian connecting New Guinea to India and Ceylon.

The family is represented in India by the following genera : *Bombax*, *Ceiba*, *Cullenia*. The genera introduced and cultivated in India are *Adansonia*, *Durio*, *Ochroma*.

For recent taxonomic revisions refer Robyns (1961, 1963, 1970), Kostermans (1956), for palynology refer Fuchs (1967), Robyns (1971), Sharma (1970), Tsukada (1964, 1965) ; for cytology refer Baker & Baker (1968), Mehra & Sareen (1973).

GENERAL

- BOM 1 Aubreville, A. 1975
Essais de geophyletique des Bombacacees. *Adansonia* 15(1) : 57-64.
- BOM 2 Baker, H. G. & Baker, I. 1968
Chromosome numbers in the Bombacaceae. *Bot. Gaz.* 129(4) : 294-296.
- BOM 3 Bakhuizen van den Brink, R. C. 1924
Revisio Bombacacearum. *Bull. Jard. Bot. Btzg.* III 6 : 161-240, t. 26-38. Family revision.
- BOM 4 Beccari, O. 1889
Le Bombaceae Malesi descritte ed illustrate. *Malesia* 3 : 201-280, t. 12-36. Revision of Malesian spp.
- BOM 5 Davis, T. A. 1967
Stamen number and pollen size in levo and dextro-rotatory flowers of Bombacaceae. *Rev. Palaeobot. Palynol.* 3(1-4) : 133-139.

- BOM 6 Edlin, H. L. 1935
A critical revision of certain taxonomic groups of the Malvales. *New Phytol.* 14 : 1-20, 122-143.
- BOM 7 Fuchs, H. P. 1967
Pollen morphology of the family Bombacaceae. *Rev. Palaeobot. Palynol.* 3(1-4) : 119-132.
- BOM 8 Huynh, K. L. 1972
Etude de l'arrangement des pollen dans la tetrade chez les Angiospermes sur la base de donnees cytologiques VI. Lythraceae et Bombacaceae. *Bot. Soc. Brot.* 46 : 171-181.
- BOM 9 Mehra, P. N. & Sareen, T. S. 1973
Cytology of some Himalayan trees : Thalamiflorae. *Silvae Genet.* 22(3) : 66-70.
- BOM 10 Moreira, A. X. 1959
Dimorfismo polinico da familia Bombacaceae. *Atas. Soc. Biol. Riode Janeiro* 3(3) : 5-6.
- BOM 11 Qaiser, M. 1978
Bombacaceae. *Fl. W. Pakistan* No. 119 : 1-6, fig. 1.
- BOM 12 Robyns, A. 1971
On pollen morphology of Bombacaceae. *Bull. Jard. Bot. Nat. Belg.* 41 : 451-456.
- BOM 13 Robyns, A. G. 1980
Bombacaceae. *Revised Handb. Fl. Ceylon ed.* New Delhi 1 : 59-71.
- BOM 14 Sharma, B. D. 1970
Contribution to the pollen morphology and plant taxonomy of the family Bombacaceae. *Proc. Ind. Natn. Sci. Acad. B.* 36(3) : 175-191.
- BOM 15 Tsukada, M. 1964
Pollen morphology and identification III. Modern and fossil tropical pollen with emphasis on Bombacaceae. *Pollen et Spores* 6(2) : 393-462.

- BOM 16 Tsukada, M. 1965
Taxonomic significance of Bombacaceae pollen morphology. *Amer. Journ. Bot.* 52(6 : 2) : 652-653.

Adansonia Linn.

- BOM 17 Adam, J. G. 1963
Le baobab (*Adansonia digitata*). *Notes Africaines* No. 94 : 33-44.
- BOM 18 Armstrong, P. H. 1977
The Boab-tree—Oceanic wanderer or fragment of Gondwanaland's flora? *Austr. Plants* 9 : No. 73 : 226-229.
Photo 3. Critical notes on *Adansonia* L.
- BOM 19 Armstrong, P. H. 1977
Baobabs, remnants of Gondwanaland? *New Scientist* 73 : 212-213.
- BOM 20 Breitenbach, F. von & Breitenbach, J. von. 1974
Baobab flower. *Trees S. Afr.* 26(1) : 10,12 : 14-15.
- BOM 21 Burton-Page, J. 1969
The problem of the introduction of *Adansonia digitata* into India : In : Ueko, P. J. & Dimbleday, G. W. (eds.). *The Domestication and Exploitation of Plants and Animals* 331-335. London.
- BOM 22 Carr, J. D. 1971
How old is that baobabs? *Trees S. Afr.* 22(3) : 71-72, 74.
Adansonia digitata.
- BOM 23 Carr, W. R. 1955
Ascorbic acid content of baobab fruit. *Nature* 176.
- BOM 24 Carr, W. R. 1958
The Baobab tree : a good source of ascorbic acid. *Central Afr. Journ. Med.* 4 : 372-374.

- BOM 25 Guy, G. L. 1971
The baobabs : *Adansonia* spp. (Bombacaceae). *Journ. Bot. Soc. S. Afr.* 57 : 30-37.
- BOM 26 Maheshwari, J. K. 1971
The baobab tree : disjunctive distribution and conservation. *Biol. Conserv.* 4(1) : 57-60.
- BOM 27 Miegé, J. 1975
Contribution à l'étude du genre. *Adansonia* L. 3 : Interrel taxonomique et l'examen électrophorétique des protéines des graines. *Boissiera* 24a : 345-352. Chrom. nos.
- BOM 28 Miegé, J. & Burdet, H. M. 1968
Etude du genre *Adansonia* L. 1 Caryologie. *Candollea* 23 : 59-66.
- BOM 29 Newton, L. 1974
Is the baobab tree succulent ? *Cact. & Succ. Journ. Gt. Brit.* 36 : 57-58.
- BOM 30 Nicol, B. M. 1957
Ascorbic acid content of Baobab fruit. *Nature* 180 : 287.
- BOM 31 Vaid, K. M. 1964
Concluding chapter of a "Kalpa Vriksha". *Indian Forester* 9 : 1963-1964.
- BOM 32 Vaid, K. M. 1978
Where is the mythical "Wishing tree" ? *Science Today* April 1978 : 35-44.
- BOM 33 Varmah, J. C. & Vaid, K. M. 1978
Baobab, the historic African tree at Allahabad. *Indian Forester* 104 : 461-464.
- BOM 34 Wickens, G. E. 1982
The Baobab. African's upside-down tree. *Kew Bull.* 37 (2) : 173-209. A detailed state of art study on the species *Adansonia digitata*.

Bombax Linn.

- BOM 35 Chatterjee, D. & Raizada, M. B. 1954
Notes on the typification of the generic name *Bombax* L. *Taxon* 3 : 102. A proposal recommending the name *Salmaalina* to replace *Gossampinus* and *Bombax* for the eastern Asiatic species.
- BOM 36 Davis, T. A. & Ghosh, R. B. 1971
Comparative morphology of *Bombax albidum* and *B. ceiba*, *Phytomorphology* 20 : 339-350.
- BOM 37 Dugand, A. 1943
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Durio Adans.

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The genus *Durio* Adans. *Reinwardtia* 4 : 357-460, fig. 37.
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The species of *Durio* with edible fruits. *Econ. Bot.* 16 : 270-282.

ADDITION : GENERAL

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BORAGINACEAE

(Refer also Ehretiaceae)

Cronquist and Thorne included the family Boraginaceae in the order Lamiales. Engler considered this under the order Tubiflorae; while Hutchinson proposed a separate order Boraginales. Bentham & Hooker and Takhtajan considered this family under the order Polemoniales. Dahlgren treated the family Boraginaceae in the order Boraginales and further segregated the family Ehretiaceae.

The family Boraginaceae is distinguished from the allied families Verbenaceae and Labiatae by the presence of mainly alternate leaves and coiled cincinnus inflorescence (scorpioid cyme) which is termed "borogoid", a dorsiventral monopodia, uncoiling as flowers open. Engler (1964) considered the following subfamilies Boraginoideae, Heliotropioideae, Cordioideae and Ehretioideae. Some taxonomists elevated the subfamilies Heliotropioideae, Cordioideae and Ehretioideae to the family status. The family Boraginaceae circumscribed and considered here includes two subfamilies Boraginoideae and Heliotropioideae, while the family Ehretiaceae includes subtribes Ehrelioideae and Cordioideae. Johnston (1951, 1954, 1956) and Lawrence (1937) preferred the subfamily status to the components of Boraginaceae instead of microfamily status.

The presence of gynobasic style and the characteristic four-nutlets which develop into a drupaceous fruit in the families Boraginaceae, Verbenaceae and Labiatae indicate that the above mentioned characters have originated independently from a common ancestor. (Cronquist, 1968). For pollination, boraginaceous flowers are specially adapted for bees having long proboscises. The special features are the usually pendulous flowers, presence of downwardly projecting corolla scales from the throat of corolla and heterostylous flowers.

The assessment of iridoid compounds in plant families by Dahlgren (1975) led the grouping of morphologically similar iridoid containing families in different clusters. Cronquist (1968) on the basis of the presence of iridoid compounds and morphological similarities placed the family Boraginaceae in the order Lamiales.

The family Boraginaceae sensu stricto is represented in India by the following genera: *Actinocarya*, *Adelocaryum*, *Anchusa*, *Anaplocaryum*, *Arnebia*, *Asperugo*, *Bothriospermum*, *Chionocharis*, *Cynoglossum*, *Eritrichium*, *Gastrocotyle*, *Heliotropium*, *Hackelia*, *Ivanjohnstonia*, *Lacaitaea*, *Lappula*, *Lindelofia*, *Laslocaryum*, *Lithospermum*,

Lycopsis, Maharanga, Mattiastrum, Messerschmidia, Microcaryum, Microula, Moltkia, Myosotis, Nonea, Onosma, Paracaryum, Pedinogyne, Pseudomertensia, Rochelia, Sericostoma, Solenanthus, Symphytum, Tournefortia, Trichodesma and *Trigonotis*.

The species of the genus *Borago* (*B. officinalis* L.) is cultivated in India.

For recent taxonomic revisions refer Johnston (1924, 1928, 1937, 1940, 1951, 1952, 1954, 1956), Kazmi (1970, 1971); for phylogeny refer Lawrence (1937); for cultivated species refer Ingram (1961); for palynology refer Gupta (1972).

GENERAL

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A revision of the Boraginaceae of West Pakistan and Kashmir. *Journ. Arn. Arb.* 51(2) : 133-184. Key & description of genera *Cordia*, *Ehretia*, *Coldenia*, *Heliotropium*, *Sericostoma*, *Bothriospermum*.

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A revision of the Boraginaceae of West Pakistan and Kashmir. *Journ. Arn. Arb.* 51(3) : 367-402. Critical notes on *Pseudomertensia*, *Anoplocaryum*, *Eritrichium*, *Lasiocaryum*, *Hackelia* and *Microula*.
- BOR 17 Kazmi, S. M. A. 1970
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A revision of the Boraginaceae of West Pakistan and Kashmir. *Journ. Arn. Arb.* 52 : 110-136, 334-363, 486-522, 666-690.
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Arnebia Forsk.

BOR 26 Huynh, K. L. 1971

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caryum pp. 383-384.

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Pollen morphologie von *Borago officinalis* L. *Grana*
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- BOR 32 Biswas, M. 1972
Meiotic studies in *Cynoglossum denticulatum* A. DC. *Journ. Bihar Bot. Soc.* 1(1-2) : 30-34.
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- BOR 34 Lindley, J. 1842
Cynoglossum anchusoides. *Bot. Reg.* 28 : pl. 14. Species from Kashmir.

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Heliotropium Linn.

- BOR 37 Arora, R. K. & Banerjee, S. P. (1966) 1967
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Ivanjohnstonia Kazmi.

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Lappula U. Wolf

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BOR 49 Stroh, G. 1938

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BOR 50 Kuznetsov, N. I. 1911

[The genus *Lycopsis* L. and the history of its development] *Trav. Mus. Bot. Acad. Sci. Petersb.* 8 : 83-120. pl. 1-3. Revision in Russian with Latin description of spp.

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BOR 51 Banerjee, S. P. (1969) 1971

A note on *Lycopsis arvensis* auct. non. Linn. (Boraginaceae) on the flora of Assam. *Bull. Bot. Surv. India* 11 (1-2) : 213. *Maharanga lycopsoides*.

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Mattiastrum Brand

BOR 53 Brand, A. 1915

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Microula benthami C. B. Clarke, *Hook. Icon. Pl.* 23 : pl. 2257. Native of Tibetan Himalayas ; reduced to *Microula tibetica* Benth. & Hook. f.

BOR 57 Beguinot, A. 1904

Materiali per una Monografia del genere *Myosotis* L. *Ann. Bot. (Roma)* 1 : 275-295.

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Die Gattung *Myosotis* L. Versuch eines systematischen Übersicht über die Arten. *Beih. Bot. Centralbl.* 61 : Abt. B. 317-345. Enum. synonymy, distr. without descr.

Onosma Linn.

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Study on the genus *Onosma* L. of China. *Acta Phytotax. Sin.* 18(1) : 63-70, fig. 1. 6 new spp. ; in Chinese.
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Sericostoma Stocks ex Wight. A revision of the Boraginaceae of West Pakistan and Kashmir. *Journ. Arn. Arb.* 51(2) : 181-182.

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BOR 70 Bucknall, C. 1913

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BOR 71 Banerjee, S. P. 1967

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BRASSICACEAE-refer **CRUCIFERAE**

BROMELIACEAE

Cronquist, Engler, Hutchinson, Takhtajan and Dahlgren considered the family Bromeliaceae in the order Bromeliales. While Bentham & Hooker included this in the order Epigynae. Thorne however treated this family under the order Commelinales.

The success of the family Bromeliaceae with about 1700 species, forming characteristic elements of neotropical flora, is due to their adaptive strategies of occupying different habitats from mesic to xerophytic conditions. Vegetative multiplication also plays an impor-

tant part in the spread and dispersal of some bromeliads occurring in the same habitat. Interesting bromeliads range from the largest inflorescence bearing *Puya raimondii*, a bolivian plant having inflorescence cluster of about 10.7 m height and 2.4 m diameter to small epiphytic *Tillandsia usneoides*.

The family Bromeliaceae is distinguished by the rosette of fleshy leaves, multicellular or stellate scaly hairs which function as water absorbing tissues, the usually coloured floral bracts and perianth differentiated into greenish calyx and showy corolla. Harms (1930) classified the family into four subfamilies based on the nature of leaves, fruit (capsule or berry) and seeds (presence of wings, hairs or naked) : Navioideae, Pitcairnioideae, Tillandsioideae and Bromelioideae. The family Bromeliaceae represents an isolated stock in the monocotyledons, probably related to the Commelinaceae and Zingiberaceae. The differentiation of calyx and corolla, indicates dicotyledonous stock.

The affinity of the Bromeliaceae is generally with the Commelinaceae having starchy endosperm. Whereas in the Liliidae the endosperm is usually fatty. Dahlgren (1983) who included the Bromeliaceae in the order Bromeliales under the super order Bromeliflorae indicates that the family Bromeliaceae represents one of the evolutionary lines from a procommelinifloreal-zingiberifloreal-bromeliifloreal branch which itself derived from the liliifloreal ancestors. This is evident in the family Bromeliaceae which has a basically liliifloreal appearance, but having starchy endosperm. Insect-pollination syndrome and wind pollination (*Navia*) adaptations co-exist in the family Bromeliaceae.

The family is represented in India by the following genera : *Ananas*, *Billbergia*. The above mentioned genera are cultivated in India.

For recent taxonomic revisions refer Smith (1939) ; for phylogeny refer Benzing (1973). Smith (1934), Utley (1979) ; for palynology refer Erdtman (1958), Ehler & Schill (1973) ; for cytotaxonomy refer Sharma & Ghosh (1971)

GENERAL

BML 1 Benzing, D. 1973

The monocotyledons : their evolution and comparative biology : 1 Mineral nutrition and related phenomena in

Bromeliaceae and Orchidaceae. *Quart. Rev. Biol.* 48(2) : 277-296.

- BML 2 Ehler, N. & Schill, R. 1973
Die pollenmorphologie der Bromeliaceae. *Pollen et Spores* 15(1) : 13-45.
- BML 3 Erdtman, G. 1958
On the pollen morphology in the Bromeliads. *The Bromeliad Society Bull.* 8 : 70.
- BML 4 Gilmartin, A. J. 1973
Trans Andean distribution of Bromeliaceae in Ecuador. *Ecology* 54(6) : 1389-1393.
- BML 5 Harms, H. 1930
Bromeliaceae. In : Engler & Prantl, *Pflanzenf.* 15a : 65-159, fig. 31-54.
- BML 6 Innes, C. F. 1973
Terrestrial bromeliads : preamble. *Ashingtonia* 1(3) : 32-33.
- BML 7 Medina, E. (1974) 1975
Dark CO₂ fixation, habitat preference and evolution within the Bromeliaceae. *Evolution* 28(4) : 677-686.
- BML 8 Mez, C. 1896
Bromeliaceae. In : DC., *Monogr. Phan.* 9 : 1-990.
- BML 9 Pereira, E. 1973
Variegated bromeliads. *Journ. Bromeliad Soc.* 22(4) : 99-103.
- BML 10 Pittendrigh, C. S. 1948
The Bromeliad—Anopheles-Malaria complex in Trinidad. 1. The bromeliad flora. *Evolution* 2 : 58-59.
- BML 11 Rauh, W., Schill, R., Ehler, N. & Barthlott, W. 1973
Some remarks on the water supply of bromeliads. *Journ. Bromeliad Soc.* 23(3) : 89-111.

- BML 12 Sharma, A. K. & Ghosh, I. 1971
Cytotaxonomy of the family Bromeliaceae. *Cytologia* 36 : 237-247.
- BML 13 Smith, L. B. 1934
Geographical evidence on the lines of evolution in the Bromeliaceae. *Bot. Jahrb.* 66 : 446-468.
- BML 14 Utley, J. F. 1979
Foliar trichomes and evolution of taxonomic affinities in Bromeliaceae. *Journ. Bromeliad Soc.* 29(5) : 208-211.

Ananas Linn.

- BML 15 Degener, O. & Degener, I. 1977
Whence the pineapple? *Garden* (London) 102(3) : 124-125.
- BML 16 Krauss, B. H. 1948
Anatomy of the vegetative organs of the pineapple, *Ananas comosus* (L.) Merr. *Bot. Gaz.* 110 : 159-217.
- BML 17 Smith, L. B. 1939
Notes on the taxonomy of *Ananas* and *Pseudananas*. *Harvard Univ. Bot. Mus. Leaflet* 7 : 73-81.

Billbergia Thunb.

- BML 18 Flower, A. 1972
Billbergias—a listing of species, hybrids and synonyms. *Bromeliads* 2(12) : 104-109, 117-120.
- BML 19 Smith, L. B. 1978
The watch-spring Billbergias in cultivation. *Bromeliads* 437-440.

ADDITION : GENERAL

- BML 20 Dahlgren, R. 1983
General aspects of angiosperm evolution and macrosystematics. *Nord. Journ. Bot.* 3 : 119-149.

BML 21 Hamann, U. 1961

Merkmalsbestand und Verwandtschaftsbeziehungen der 'Farinosae' *Willdenowia* 2 : 639-768.

BML 22 Hamann, U. 1962

Weiteres über Merkmalsbestand und Verwandtschaftsbeziehungen der 'Farinosae'. *Willdenowia* 3 : 169-207.

BUDDLEJACEAE

(Refer also Loganiaceae)

A family of shrubs and trees with about 150 species occurring in tropical and temperate regions, the Buddlejaceae differs from the family Loganiaceae in the absence of intraxylary phloem and in having tetramerous flowers. The family name is based on the genus *Buddleja* [named after Rev. Adam Buddle (1660—1715)].

The genus *Buddleja* is cultivated in gardens for its attractive flowers. eg. *B. alternifolia* ("Fountain Butterfly Bush") with lilac coloured flowers ; *B. asiatica* with white fragrant flowers ; *B. davidii* ("Orange Butterfly Bush") with lilac flowers.

The family Buddlejaceae is recognised by Cronquist and Takhtajan and assigned it under the order Scrophulariales ; Engler included it in the order Tubiflorae while Hutchinson considered it in the order Loganiales. However Bentham & Hooker and Thorne did not recognise the family Buddlejaceae and considered it as part of the family Loganiaceae.

The genus *Buddleja* shows close affinity with the Scrophulariaceae which is also supported from its iridoid chemistry and embryology. The Buddlejaceae, a segregate of the family Loganiaceae has been usually placed in the Gentianales and according to Cronquist and Takhtajan the family Buddlejaceae is out of place in this group. The four-lobed and four-stamened flower of *Buddleja* is said to be derived from the five-lobed corolla with four stamens of the genera *Peltanthera* and *Sanango* (Cronquist, 1968). The presence of carbocyclic iridoids in the family Buddlejaceae (Jensen *et al.*, 1975) rather than the seco-iridoids characteristic of the Gentianales (Loganiaceae, Gentianaceae, Apocynaceae, Rubiaceae, Oleaceae) and its flavonoid chemistry suggest scrophularian affinity (Harborne, 1966, 1967). Hence it is appropriate to consider the Buddlejaceae in the order Scrophulariales.

GENERAL

- BUD 1 Abdulla, P. 1974
 Buddlejaceae. *Fl. W. Pakistan* 56 : 1-5, fig. 1. 4 spp.,
 descr., Keys.
- BUD 2 Leenhouts, P. W. (1961) 1962
 Over der systematische positie van de Buddlejaceae.
Jaarb. Kon. Ned. Bot. Ver. Over. 1961 : 57-58,
- BUD 3 Leeuwenberg, A. J. M. & Vidal, J. E. 1972
 Buddlejaceae. *Fl. Camb. Laos & Vietn.* No. 13 : 90-97.
- Buddleja Linn.**
- BUD 4 Ammal, Janaki, E. K. 1954
 Cytogeography of the genus *Buddleia* in Asia. *Sci. Cult.*
 19 : 579-581.
- BUD 5 Anonymous, 1930
Buddleia. *Gard. Chron.*, III, 88 : 90. General ; notes on
 cultivated spp.
- BUD 6 Boynton, K. R. 1928
Buddleia asiatica. *Addisonia* 13 : 5-6, Pl. 419.
- BUD 7 Cotton, A. D. 1947
 The spring-flowering *Buddleias*. *Journ. Roy. Hort. Soc.*
 (London) 72 : 427-437, fig. 168. Descr., hort. notes.
- BUD 8 Gagnepain, F. 1912
 Revision des *Buddleia* d'Asie. *Not. Syst. Lecomte* 2 : 182-
 194.
- BUD 9 Hemsley, W. B. 1889
 The Chinese and Japanese species of *Buddleia*. *Gard.*
Chron. III. 5 : 595-596. 7 spp., notes.
- BUD 10 Marquand, C. V. B. 1930
 Revision of the Old World species of *Buddleja*. *Kew Bull.*
Misc. Inf. 1930 : 177-208,

- BUD 11 Teuscher, H. 1933 & 1935
Trees and shrubs of the Orient III. The hardy buddleias.
 34 : 209-218, fig. 1-3. 1933 ; IV. 36 : 163-166, fig. 1-3. 1935.
 Cultivated spp., notes.
- BUD 12 Wilson, E. H. 1905
Buddleia, Flora & Sylva 3 : 334-340.
- BUD 13 Wyman, Donald 1964
 Few buddleias of value for ornamental planting. *Amer. Nurseryman* 120(3) : 11, 77-80.
- BUD 14 Yamazaki, T. 1971
 New and noteworthy gamopetalous plants from eastern Himalaya. *Journ. Jap. Bot.* 46(2) : 49-55. *B. bhutanica* Yamazaki.

ADDITIONS : GENERAL

- BUD 15 Harborne, J. B. 1966
 The evolution of flavonoid pigments in plants. *In* : Swain, T. ed., *Comparative phytochemistry*, Academic, London, 271-295.
- BUD 16 Harborne, J. B. 1967
Comparative biochemistry of the flavonoids. Academic, London.
- BUD 17 Jensen, S. R., Nielsen, B. J. & Dahlgren, R. 1975
 Iridoid compounds, their occurrence and systematic importance in the angiosperms. *Bot. Notiser* 128 : 148-180.

BURMANNIACEAE

The family Burmanniaceae represents about 125 species of annual or perennial herbs of tropical and subtropical distribution, usually saprophytic in habit. The family is divided into three tribes : Burmannieae, Haplothismieae and Thismieae. Hutchinson considered the tribe Thismieae as a separate family. The genera *Burmannia* and *Haplothismia* occur in India. The occurrence of monotypic endemic

genus *Haplothismia* in a restricted area in southern W. Ghats representing the tribe Haplothismieae is taxonomically interesting.

Cronquist included the family Burmanniaceae in the order Orchidales; while Takhtajan considered this family in the order Iridales. Thorne, Engler, Hutchinson and Bentham & Hooker included this in the orders Liliales, Liliiflorae, Burmanniales and Microspermae respectively.

The tribe Corsieae is regarded as a separate family since it has highly irregular flowers, whereas the Burmanniaceae has regular flowers. Hutchinson treated the three tribes as separate families, Burmanniaceae, Thismiaceae and Corsiaceae. While Wettstein accepted the following families: Burmanniaceae (includes tribe Thismieae) and Corsiaceae. According to Cronquist (1968) though the family Burmanniaceae has the combinations of characters, mycotrophy and numerous tiny seeds just as in the family Orchidaceae, it failed to exploit the evolutionary opportunity. While the family Orchidaceae through a combination of floral adaptations, presence of pollen in groups (which helps in large scale transfer of pollen) have successfully adapted to changing environment.

GENERAL

- BMN 1 Beccari, O. 1878
Burmanniaceae. *Malesia* 1 : 240-254. Synopsis of Indo-malesian spp.
- BMN 2 Chakrapani, P. & Raj, B. 1971
Pollen morphological studies in the Burmanniaceae. *Grana* 11 : 164-169.
- BMN 3 Engler, A. 1889
Burmanniaceae. In: Engler & Prantl, *Pflanzenf.* II(6) : 44-51.
- BMN 4 Hooker, J. D. 1888
Burmanniaceae. In: Hooker, J. D. ed., *Fl. Brit. India* 5 : 664-667.
- BMN 5 Jonker, F. P. 1938
A monograph of the Burmanniaceae. *Meded. Bot. Mus. Herb. Rijksuniv. Utrecht* 51 : (i-v), 1-279, f. 1-20.

- BMN 6 Jonker, F. 1948
 Burmanniaceae. In : van Steenis, *Fl. Males.* I, 4 : 13-26,
 fig. 1-11.
- BMN 7 Wu, Te lin & Chen, Sen-jen 1981
 Burmanniaceae. *Fl. Reipubl. Pop. Sinicae* 16(2) : 169-175,
 1 pl. In Chinese. 8 spp. of *Burmannia*.

Burmannia Linn.

- BMN 8 Balakrishnan, N. P. (1976) 1979
Burmannia championii Thw.—an addition to the flora of
 the Andaman and Nicobar islands. *Bull. Bot. Surv. India*
 18 : 230-231.

Haplothismia Airy Shaw

- BMN 9 Airy Shaw, H. K. 1952
 A new genus and species of Burmanniaceae from South
 India. *Kew Bull.* 1952 : 277-279, fig. 1-3. *Haplothismia*
annulata Airy Shaw, descr.

ADDITIONS : GENERAL

- BMN 10 Cramer, L. H. 1983
 Burmanniaceae. In : Dassanayake, M. D. & Fosberg, F.
 R. eds. *Rev. Handb. Fl. Ceylon* 4 : 153-159. New Delhi
 edition.
- BMN 11 Li, H. 1983
 A preliminary study on the floristic features of the genus
Burmannia in China. *Acta Phytotax. Sin.* 21(2) : 121-129.
 Key, maps.

BURSERACEAE

The family Burseraceae consists of tropical trees and shrubs and it is distinguished from the closely related families Rutaceae and Simaroubaceae by the presence of lysigenous or schizogenous resin ducts in the bark. The genera occurring in India are : *Boswellia*, *Bursera*, *Canarium*, *Commiphora*, *Garuga*, *Protium*.

'The Balm of Gilead' is derived from the Arabian tree *Commiphora opobalsmum*. This is used in preparing a fragrant gum called 'Balm of Mecca'. 'Guggal' of Indian medicine comes from *Commiphora mukul*. "Frankincense of commerce" is obtained from several species of the genus *Boswellia*. The gum of *Boswellia carteri* was used by ancient Egyptians in embalming the dead. In India the gum of *B. serrata* is used as incense; while the gum resin known as myrrh is derived from *Commiphora myrrha*.

Cronquist considered the family Burseraceae in the order Sapindales; while Takhtajan, Thorne, Engler, Hutchinson and Dahlgren included this family in the order Rutales. However Bentham & Hooker treated it under the order Geraniales.

The following tribes are recognised in the family Burseraceae on the basis of the nature of drupe: (i) Drupe with an endocarp of fused parts and (ii) drupe with two to five free or adhering parts but not fused with the endocarp; Bursereae, Canarieae and Protieae. Cronquist (1968) placed the Burseraceae in the order Sapindales on the basis of morphology supported by anatomical similarities (Heimsch, 1942). Dahlgren (1983) justifies the placement of the Burseraceae in the order Rutales on the basis of chemical characters and mentions close similarities among the main families, Rutaceae, Cneoraceae, Surianiaceae, Simaroubaceae, Burseraceae and Meliaceae, making up the order Rutales.

GENERAL

- BRS 1 Engler, A. 1883
 Burseraceae. In: DC., *Monogr. Phan.* 4: 1-169, pl. 1-3.
 Monographic.
- BRS 2 Engler, A. 1931
 Burseraceae. In: Engler & Prantl, *Pflanzenf.* ed. 2.
 19a: 405-456, fig. 191-220.
- BRS 3 Lam, H. J. 1932
 The Burseraceae of the Malay Archipelago and Peninsula with annotations concerning extra-Malayan species, especially of *Dacryodes*, *Santiria* and *Canarium*.
Bull. Jard. Bot. Buitenzorg III, 12: 281-561, pl. 1-14.
 Notes on morphology, taxonomy & distr.

- BRS 4 Lam, H. J. 1933
Burseraceae. *Bull. Jard. Bot. Btzg.* III, 12 : 281-561.
Revision.
- BRS 5 Leenhouts, P. W. 1978
The pollen morphology of Burseraceae : a taxonomic
comment. *Grana* 17(3) : 175-177.
- BRS 6 Leenhouts, P. W. & Kalkman, C. 1972
Burseraceae. In : van Steenis, *Fl. Males.* I, 6 : 917-928.
Add. & Corr.
- BRS 7 Mitra, K., Mondal, M. & Saha, S. 1977
The pollen morphology of Burseraceae. *Grana* 16(2) :
75-80. See Leenhouts, P. W. 1978.
- BRS 8 Pernet, R. 1972
Phytochimie des Burseracees. *Lloydia* 35(3) : 280-287.

Boswellia Boxb. ex Colebr.

- BRS 9 Balakrishnan, N. P. & Henry, A. N. 1961
Boswellia ovalifolialata sp. nov. : a new species of
Boswellia from South India. *Journ. Bombay Nat. Hist.*
Soc. 58 : 546-548, pl. 2, tab. 1. Descr. from Tirupathi,
Andhra Pradesh.

Bursera Linn.

- BRS 10 Hussain, A. M. M., Subramanian, K. N. & Nair, J. M. 1974
Some observations on *Bursera penicillata* (DC.) Engl.
(*B. delpechiana* Poiss ex Engl.). *Indian Forester* 100
(5) : 315-319.

Canarium Stickm.

- BRS 11 King, G. 1893
On some Indian species of *Canarium*. *Journ. Asiat. Soc.*
Beng. n. s. II, 62 : 184-188, t. 10-13.

- BRS 12 Leenhouts, P. W. 1959

Revision of the Burseraceae of the Malaysian area in a wider sense. 10a. *Canarium* Stickm. *Blumea* 9 : 275-475, fig. 33. Descr., Gen. & spp., synonymy, key to sections & spp.

Commiphora Jacq.

- BRS 13 Atal, C. K., Gupta, O. P. & Afaq, S. H. 1975

Commiphora mukul : source of Guggal in Indian system of medicine. *Econ. Bot.* 29(3) : 208-218.

Garuga Roxb.

- BRS 14 Kalkman, C. 1953

Revision of the Burseraceae of the Malaysian area in a wider sense VI. Revision of the genus *Garuga* Roxburgh. *Blumea* 7 : 459-472, fig. 1-3. 4 spp. and 2 var. descr., Keys to spp. notes.

ADDITIONS : GENERAL

- BRS 15 Heimsch, C. 1942

The comparative anatomy of the secondary xylem in the 'Gruinales' and 'Terebinthales' of Wettstein with special reference to taxonomic grouping. *Lilloa* 8 : 83-198.

- BRS 16 Bennett, A. W. 1875

Burseraceae. In : Hooker, J. D. ed., *Fl. Brit. India* 1 : 527-540.

- BRS 17 Webber, I. E. 1941

Systematic anatomy of the woods of the Burseraceae. *Lilloa* 6 : 441-465.

BUTOMACEAE

(Refer also Limnocharitaceae)

A monotypic family of aquatic herbs (*Butomus umbellatus*) with erect linear leaves, attractive flowers having petaloid perianth, it

differs from the family Alismataceae in having follicles. The family is represented in India by the genus *Butomus*.

Cronquist included the family Butomaceae in the order Alismatales, while Takhtajan and Thorne considered it under the order Alismales. However Engler included this in the order Helobiales: Hutchinson considered it in the order Butomales. Bentham & Hooker did not recognise it as a family and considered it in the family Alismaceae. Dahlgren assigned this family to the order Hydrocharitales.

According to Takhtajan the most primitive type of flower is seen in the families Butomaceae and Limnocharitaceae. The families Alismaceae, Butomaceae and Limnocharitaceae form the order Alismales, one of the most primitive amongst the monocots. In the families Butomaceae and Limnocharitaceae laminar placentation is seen which is a primitive character. On the basis of the studies on the origin of vessels, Cheadle (1953) concluded that the vessels in dicots and monocots originated independently. There is increasing evidence of the assumption that the order Alismales forming the connecting link between dicotyledons and monocotyledons is rather far-fetched. (Huber, 1969; Tomlinson, 1970). However the family Cabombaceae of the dicots and the family Butomaceae of the monocots have common characters in the nature of the lack of vessels in the stem, short-lived radicle, trimerous flowers, monosulcate pollen grains, apocarpy, laminar placentation and helobial endosperm formation (Dahlgren, 1983).

GENERAL

- BUT 1 Aziz, K. 1974
Butomaceae. Ceratophyllaceae. *Fl. W. Pakistan* 70 : 1-6.
Descr.
- BUT 2 Buchenau, F. 1869
Index criticus Butomacearum Alismacearumque hucusque descriptarum. *Abh. Naturw. Ver. Bremen* 2 : 1-49.
- BUT 3 Buchenau, F. G. Ph. 1882
Beitrag zur Kenntnis der Butomaceen, Alismaceen und Juncaginaceen. *Bot. Jahrb.* 2 : 465-510.

- BUT 4 Cheadle, V. I. 1953
Independent origin of vessels in the monocotyledons and dicotyledons. *Phytomorphology* 3 : 23-44.
- BUT 5 Dahlgren, R. 1983
General aspects of angiosperm evolution and macro-systematics. *Nord. Journ. Bot.* 3 : 119-149.
- BUT 6 Dahlgren, R. & Clifford, H. T. 1981
The Monocotyledons : a comparative study. Academic, London.
- BUT 7 Huber, H. 1969
Die Samenmerkmale und Verwandtschaftsverhältnisse der Liliiflorae. *Mitt. Bot. Staatssamml. München* 8 : 219-538.
- BUT 8 Khan, M. S. & Huq, A. M. 1975
Moringaceae, Polemoniaceae, Pedaliaceae, Basellaceae and Butomaceae. *Fl. Bangladesh* 2 : 1-13.
- BUT 9 Micheli, M. 1881
Alismaceae, Butomaceae, Juncagineae. In : DC. *Monogr. Phan.* 3 : 7-112. Monographic.
- BUT 10 Pichon, M. 1946
Sur les Alismatacees et les Butomacees (includes *Albidella* gen. nov., key to genera of redefined Alismaceae.) *Not. Syst. Paris* 12 : 170-183.
- BUT 11 Rao, Y. S. 1953
Karyosystematic studies in Helobiales. 1. Butomaceae. *Proc. Natn. Inst. Sci. India* 19 : 563-581.
- BUT 12 Steenis, C. G. G. J. van 1954
Butomaceae. In : van Steenis, *Fl. Males.* I, 5 : 118-120, fig. 1.
- BUT 13 Tomlinson, P. B. 1970
Monocotyledons : towards an understanding of their morphology and anatomy. In : Preston, R. D. ed.

Advances of Botanical Research. Academic Press, London & New York.

Butomus Linn.

BUT 14 Gupta, S. C. & Rajeswari, V. M. 1976

Distribution of *Butomus umbellatus* Linn. *Geobios (Jodhpur)* 3(3) : 108.

BUXACEAE

(Refer also Simmondsiaceae)

The Buxaceae is commonly known as the Boxwood family based on the genus *Buxus*. Several species of the genus *Buxus* are used for wood engravings. The following species of *Buxus* are well known : *Buxus sempervirens*, 'Common Box'; *Buxus balearica*, 'Turkey Box'; *Buxus microphylla*.

The family Buxaceae consists of about 100 species of evergreen trees, shrubs and herbs and it is closely allied to the family Euphorbiaceae in having male and female flowers in one inflorescence and having tricarpellate ovaries. This family differs from the Euphorbiaceae in having 2 seeds in each locule.

Cronquist, Takhtajan and Thorne included the Buxaceae in the order Euphorbiales ; while Engler considered it in the Celastrales and Hutchinson in the Hamamelidales. Bentham & Hooker included Buxaceae in the family Euphorbiaceae.

The family Buxaceae is allied to the Euphorbiaceae in having three carpels and usually carunculate seeds. The absence of milky sap and exstipulate leaves distinguish the family Buxaceae from that of the Euphorbiaceae and the Celastraceae. The monotypic *Simmondsia*, commonly known as 'Jojoba' yielding 'Jojoba wax of commerce' has opposite leaves and numerous stamens. Whereas in the Buxaceae there are only 4 to 6 stamens, rarely ten. Hence it is considered as a separate family Simmondsiaceae.

Benzylisoquinoline alkaloids have been reported in the Euphorbiaceae, Buxaceae, Rhamnaceae, Rutaceae and Symplocaceae. (Dahlgren et al., 1981). It is interesting to note that Cronquist (1968) closely aligned the families Buxaceae Euphorbiaceae and Rhamnaceae.

The family Buxaceae is represented in India by the following genera : *Buxus*, *Sarcococca*.

GENERAL

- BUX 1 Baillon, H. 1859
Monographie des Buxacees et des Stylocerees 1-89, pl. 1-3.
- BUX 2 Cheng, Mien & Ming, Tien-lu 1980
Buxaceae. Fl. Republ. Pop. Sinicae 45(1) : 16-59, pl. 16.
- BUX 3 Dahlgren, R., Jensen, S. R. & Nielsen, B. J. 1981
A revised classification of the angiosperms with comments on the correlation between chemical and other characters. In : Young, D. A. & Seigler, D. S. eds., *Phytochemistry and angiosperm phylogeny*. Praeger, New York, 149-204.
- BUX 4 Ghafoor, A. 1974
Buxaceae. Fl. W. Pakistan No. 65 : 1-6.
- BUX 5 Muller, J. 1869
Buxaceae. In : DC., Prodr. 16(1) : 7-23.
- BUX 6 Pax, F. 1892
Buxaceae. Engler & Prantl, Pflanzenf. III(5) : 130-136.
- BUX 7 Pax, F. 1927
Buxaceae. Pflanzenar. 1 : 82, map 70.
- BUX 8 Tieghem, P. van 1897
Sur les Buxacees. *Ann. Sci. Nat. VIII. Bot.* 5 : 289-338.

Buxus Linn.

- BUX 9 Fosberg, F. R. 1973
Type specimens of *Buxus sempervirens* Linnaeus. *Boxwood Bull.* 13 : 18-21.
- BUX 10 Goldblatt, P. 1976
Taxonomy of the cultivated *Buxus*, Buxaceae. *Boxwood Bull.* 16(1) : 12-13. Chrom. nos.

- BUX 11 Hatusima, Sumihiko 1942
A revision of the Asiatic *Buxus*. *Journ. Dept. Agr. Kyushu Univ.* 6 : 261-342, pl. 16-27, f. 1-25. Monographic.
- BUX 12 Koehne, E. 1896
Zur Kenntnis der Gattung. *Buxus*. *Mitt. Deutsch. Dendr. Ges.* 5 : 46-48.
- BUX 13 Puri, G. S. 1948
The genus *Buxus* in India. *Indian Forester* 74 : 354-357.

Sarcococca Lindl.

- BUX 14 Mulligan, B. O. 1930
Notes on *Sarcococca*. *Gard. Chron.* III. 87 : 285-287, f. 113, 115-117. Notes and descr.
- BUX 15 Gray, J. & Sohma, K. 1964
Fossil *Pachysandra* from western America with a comparative study of pollen in *Pachysandra* and *Sarcococca*. *Amer. Journ. Science* 262 : 1159-1197.
- BUX 16 Sealy, J. R. 1947
Sarcococca hookeriana Baillon. *Hook. Icon. Pl.* 35 : pl. 3470. Native of N. India & Tibet.
- BUX 17 Sealy, J. R. 1947
Sarcococca wallichii Stapf. *Icon. Pl.* 35 : pl. 3469.
- BUX 18 Sealy, J. R. 1949
Species of *Sarcococca* in cultivation. *Journ. Roy. Hort. Soc. (London)* 74 : 301-306. 5 spp. descr. & Keys.

BYTTNERIACEAE—refer STERCULIACEAE

CABOMBACEAE

(Refer also Nymphaeaceae)

The Cabombaceae is considered as a separate family under the order Nymphaeales by Takhtajan and Dahlgren. While Cron-

quist, Engler, Thorne and Bentham & Hooker included it in the family Nymphaeaceae; while Hutchinson considered the family Cabombaceae under the order Ranales.

The family is distinguished by the 3-6 stamens, the apocarpous and multipistillate gynoecium and follicular fruit.

It is generally accepted that Cabomba type of flower, a small trimerous flower, represents the primitive type. The genus *Cabomba* exhibits scattered vascular bundles, lack of vessels in the stem, a short-lived radicle, a short-lived root-cap, monosulcate pollen grains, apocarpous, laminar placentation and helobial endosperm formation as seen in monocotyledonous genera such as *Butomus* (Dahlgren, 1983). According to Takhtajan the families Cabombaceae and Nymphaeaceae have much in common with the monocots.

Benzylisoquinoline alkaloids are not seen in the families Cabombaceae and Nymphaeaceae. While the family Nelumbonaceae has benzylisoquinoline alkaloids which supports the separation of the family Nelumbonaceae.

The family Cabombaceae resembles the families Butomaceae and Limnocharitaceae in the nature of their apocarpous gynoecia. In the presence of scattered closed vascular bundles and reduced primary root, the families Cabombaceae and Nymphaeaceae show resemblance to the monocots.

The family is represented in India by the genera *Brasenia* and *Cabomba*.

For recent taxonomic studies refer Inamdar & Aleykutty (1976).

GENERAL

- CAB 1 Aleykutty, K. M. & Inamdar, J. A. 1978
Cabomba aquatica Aubl.—a new record from Kerala.
Curr. Sci. 47 : 136-137.
- CAB 2 Dahlgren, R. 1983
 General aspects of angiosperm evolution and macrosystematics. *Nord. Journ. Bot.* 3 : 119-149.
- CAB 3 Inamdar, J. A. & Aleykutty, K. M. 1976
 Studies on *Cabomba aquatica* (Cabombaceae). *Pl. Syst. Evol.* 132(3) : 161-166.

CAB 4 Nitzschke, J. 1914

Beitrage zur Phylogenie der Monokotylen. *Cohn's Beitr. zur Biol. Pfl.* 7 : 223.

CACTACEAE

The family Cactaceae is included in the order Caryophyllales by Cronquist, Takhtajan and Dahlgren ; while Engler and Hutchinson considered it under the order Cactales. Bentham & Hooker assigned the family to the order Ficoidales. Thorne however treated the family in the order Chenopodiales.

The name Cactaceae Lindl.(1836) is conserved over Opuntiaceae HBK (1823).

The family Cactaceae is characterised by the succulent habit, presence of sunken cushions or areoles which are considered as rudimentary lateral branches, solitary flowers, spiral or clustered arrangement of numerous stamens and glochidiate spiny berry. The family is divided into three subfamilies based on the presence or absence of leaves, glochids and arils : Pereskioideae, Opuntioideae and Cereoideae.

The traditional parietalian affinity of the family Cactaceae is not accepted in view of the morphological, palynological and chemical studies (Thorne, 1963). The studies on vegetative anatomy, flower pigments support caryophyllian (centrospermous) affinity. Boke (1964) on the basis of the studies of primitive members of the tribe Pereskieae showed incongruities in the parietalian affinity of Cactaceae. Buxbaum (1948) traced the evolutionary derivation of parietalian placentation from centrospermous condition. The presence of betalains in the Cactaceae and Didiereaceae further supports the inclusion of the families Cactaceae and Didiereaceae in the order Caryophyllales (Cronquist, 1973 ; Takhtajan, 1973).

Some of the well-known cacti are given below : The symbol of American desert is the Saguaro cactus, *Cereus giganteus* (*Carnegiea gigantea*) which is the largest of all cacti, but one of the slowest growing plants. Saguaro cactus is the state emblem of Arizona state and it can attain a height of about 10 m with life span of about 200 years. Other well-known cacti are 'Queen of the Night' (*Selenicereus*

grandiflorus) and 'Princess of the Night' (*Selenicereus nycticalus*). Spineless top of *Lophophora williamsii* known as 'Mescal buttons' or Peyote are consumed by native Americans and American Indians for inducing hallucinations. Some of the well-known ornamental cacti cultivated in gardens come under the following genera : *Echinopsis*, *Astrophytum*, *Ferocactus*, *Lobivia*, *Mammillaria*, *Notocactus*, *Parodia*.

The family Cactaceae is native of America. Several species are cultivated in India as ornamental and horticultural plants. The following genera are naturalized in India : *Cereus*, *Opuntia*, *Pereskia*.

GENERAL

- CAC 1 Bailey, I. W. 1966
The significance of the reduction of vessels in the Cactaceae. *Journ. Arn. Arb.* 47 : 288-292.
- CAC 2 Boke, N. 1964
The cactus gynoeccium : a new interpretation. *Amer. Journ. Bot.* 51 : 598-610.
- CAC 3 Britton, N. L. & Rose, J. N. 1919-1923
Descriptions and illustrations of the Cactus family. *Carnegie Inst. Washington* 248. 1 : vii, 1-236. 1919 ; *ibid.* 2 : vii, 1-239. 1920 ; *ibid.* 3 : vii, 1-255. 1922 ; *ibid.* 4 : viii, 1-318. 1923.
- CAC 4 Kurtz, E. B. Jr. 1948
Pollen grain characters of certain Cactaceae. *Bull. Torrey Bot. Club* 75 : 516-522.
- CAC 5 Kurtz, E. B. Jr. 1963
Pollen morphology of the Cactaceae. *Grana Palynologica* 4(3) : 367-372.
- CAC 6 Launchbury, P. 1979
Cactus alkaloids and biochemical aids to taxonomy. *Natn. Cact. Succ. Journ.* (U.K.) 34(3) : 68.
- CAC 7 Lauenberger, B. E. 1976
Pollen morphology of the Cactaceae : an SEM—Survey of exine sculpturing and its tentative implications for

- taxonomy and phylogeny. *Cact. Succ. Journ. Gr. Brit.* 38(4) : 79-94.
- CAC 8 Lauenberger, B. E. 1978
Type specimens of Cactaceae in the Berlin--Dahlem Herbarium. *Cact. Succ. Journ. Gr. Brit.* 40(4) : 101-104.
- CAC 9 Marshall, W. T. & Bock, T. M. 1941
Cactaceae, with illustrated keys of all tribes, subtribes and genera 1-227. Pasadena, Cal. Monograph.
- CAC 10 Mayna, P. 1975
The chemical taxonomy of the Cactaceae. *Cact. Succ. Journ. Gr. Brit.* 37(2) : 39-40.
- CAC 11 Schumann, K. 1982
The distribution of the Cactaceae in relation to their systematic classification. *Natn. Cact. Succ. Journ. (U.K.)* 37(4) : 114-117.
- CAC 12 Schwegmann, L. M. 1977
The Cactaceae : a general survey of the family with emphasis on the classification and nomenclature. *Aloe* 15(2) : 47-52.
- CAC 13 Speirs, D. G. 1978
The evolution of Cacti. *Cact. Succ. Journ. (USA)* 50(4) : 179.
- CAC 14 Tsukada, M. 1964
Pollen morphology and identification II. Cactaceae. *Pollen et Spores* 6(1) : 45-84.
- CAC 15 Vaupel, F. 1925
Cactaceae. In : Engler & Prantl, *Pflanzenf.* ed. 2, 21 : 594-651.
- CAC 16 Yuasa, H., Shimizu, H., Kashiwai, S. & Kondo, N. 1973
Chromosome numbers and their bearing on the geographic distribution in the subfamily Opuntioideae (Cactaceae). *Rep. Inst. Breed. Res. Tokyo Univ. Agri.* No. 4 : 1-10.

Cactus Linn.

- CAC 17 Borg, J. 1937
Cacti, 1-419. New York.

Epiphyllum Haw.

- CAC 18 Haselton, S. E. 1946
Epiphyllum handbook. Pasadena. California.

Lophophora Coult.

- CAC 19 Bruhn, J. G. & Holmstedt, B. 1975
 Early peyote research. an inter-disciplinary study. *Econ. Bot.* 28(4) : 353-390.

Mammillaria Haw.

- CAC 20 Craig, R. T. 1945
The Mammillaria handbook, with descriptions, illustrations and key to the species of the genus Mammillaria of the Cactaceae, Pasadena, California.
- CAC 21 Hunt, D. R. 1974
 Review of *Mammillaria* names in current usage. Parts 35-40 : *Journ. Mammillaria Soc.* 14 : 3-11, 22-27, 34-37, 48-51, 61-66, 76-80.
- CAC 22 Hunt, D. R. 1975
 Review of *Mammillaria* names in current usage : Part 41. *Journ. Mammillaria Soc.* 15(1) : 12-15 ; *ibid.* Part 42. *Journ. Mammillaria Soc.* 15(2) : 21-25 ; *ibid.* Part 43. *Journ. Mammillaria Soc.* 15(3) : 31-34.

Opuntia (Tourne.) Mill.

- CAC 23 Burkill, I. H. 1911
 Determination of the prickly pears now wild in India. *Rec. Bot. Surv. India* 4 : 287-322.

- CAC 24 Moran, V. C., Zimmermann, H. G. & Anneche, D. P. 1976
The identity and distribution of *Opuntia aurantiaca*
Lindley. *Taxon* 22(2-3) : 281-287.

Pereskia (Plum.) Mill.

- CAC 25 Mace, T. 1975
The genus *Pereskia* (Plum.) Mill. [including *Rhodocactus*
(Berg.) Kunth.] *Natn. Cact. Succ. Journ. (U.K.)* 30(2) : 38.

Rhipsalis Gartn.

- CAC 26 Lorens, E. J. 1976
Rhipsalis anyone ? *Pac. Hort.* 37(3) : 30-36.

ADDITIONS : GENERAL

- CAC 27 Boke, N. 1966
Ontogeny and structure of the flower and fruit of *Pereskia aculeata*. *Amer. Journ. Bot.* 53 : 534-542.
- CAC 28 Buxbaum, F. 1948
Zur Klärung der phylogenetischen Stellung der Aizoaceae und Cactaceae in Pflanzenreich. *Jahrb. Schweiz. Kakt. -Ges.* 1948 : 3-16.
- CAC 29 Clarke, C. B. 1879
Cactaceae. In : Hooker, J. D. ed., *Fl. Brit. India* 2 : 657-658.
- CAC 30 Cronquist, A. 1973
Chemical plant taxonomy : a generalist's view of a promising speciality. In : Bendz, G. & Santesson, J. eds., *Chemistry in botanical classification*. Nobel Foundation, Stockholm, 29-39.
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Cactaceae. *The Genera of Flowering Plants* 2 : 427-467.
- CAC 32 Takhtajan, A. 1973
The chemical approach to plant classification with special

reference to the higher taxa of Magnoliophyta. In : Bendz, G. & Santesson, J. eds., *Chemistry in botanical classification*. Nobel Foundation, Stockholm. 17-28.

CAC 33 Thorne, R. F. 1963

Some problems and guiding principles of angiosperm phylogeny. *Amer. Naturalist* 97 : 287-305.

CAESALPINIACEAE

(Refer also Leguminosae)

The Caesalpinaceae, a family of tropical-subtropical trees and shrubs, comprising about 180 genera and 3000 species show a range of floral zygomorphy and colour patterns just as the floral display of the Orchidaceae and Zingiberaceae. Some of the well-known beautiful species are seen in the following genera : *Bauhinia*, *Brownea*, *Caesalpinia*, *Cassia*, *Amherstia*, *Delonix*, *Phanera*.

The family Caesalpinaceae a segregate of the family Leguminosae *sensu latiore*, is given the family status by Takhtajan and Dahlgren under the Fabales. Hutchinson included it under the order Leguminales. While Cronquist, Thorne, Engler and Bentham & Hooker treated it in the rank of subfamily Caesalpinioideae under the family Leguminosae in the order Rosales.

The family Caesalpinaceae is distinguished from its allied families Papilionaceae and Mimosaceae by the combination of the following characters : Flowers are generally irregular with imbricate petals, lateral petals i.e. wings enclosing the standard petal in the bud, 10 or fewer stamens which are free or monadelphous.

The family consists of the following tribes, based on the nature of leaves, the degree of the fusion of sepals, the mode of dehiscence of anthers and the nature of bracteoles : Dimorphandreae, Caesalpinieae, Cassieae, Sclerolobieae, Cynometreae, Amherstieae, Cercideae (Bauhinieae) and Swartzieae. The tribe Swartzieae having entire calyx which gets divided into lobes as the flowers open, is considered sometimes as a separate subfamily.

Among the beautiful trees and shrubs, following caesalpinaceous species are well-known : Orchid tree (*Bauhinia purpurea*), Royal Poinciana (*Delonix regia*), Barbados-pride (*Caesalpinia pulcherrima*), Noble Amherstia (*Amherstia nobilis*), Judas tree (*Cercis siliquastrum*)

and Carob tree (*Ceratonia siliqua*) are mentioned in the Bible.

Biochemically from the occurrence of flavones, flavonoids and cyanogenic glycosides there is a mosaic of affinities between the Fabaceae and the Rutaceae on the one hand and between the Fabaceae and the Rosaceae on the other hand. The presence of phenylated flavones, flavonoids with a methylenedioxy group and 5- and 7-deoxy-flavonoids in Fabaceae and Rutaceae (Wollenweber, 1982; Young, 1981) and the occurrence of furanocoumarins (Seigler, 1981) in both the families Fabaceae and Rutaceae indicate their close alliance. But in the families Fabaceae and Rosaceae cyanogenic glycosides are present and this is absent in the Rutaceae (Hegnauer, 1977).

The family Caesalpinaceae is represented in India by the following genera: *Acrocarpus*, *Bauhinia*, *Caesalpinia*, *Cassia*, *Cynometra*, *Dialium*, *Gymnocladus*, *Hardwickia*, *Humboldtia*, *Intsia*, *Kingiodendron*, *Lasiobema*, *Lysiphyllum*, *Maniltoa*, *Mezoneuron*, *Peltophorum*, *Phanera*, *Ptilostigma*, *Pterolobium*, *Saraca*, *Tamarindus*, *Wagatea* (*Moullava*).

Some of the species of the following genera are cultivated in gardens: *Amherstia*, *Brownea*, *Ceratonia*, *Colvillea*, *Copaifera*, *Delonix*, *Gleditsia*, *Lysidice*, *Parkinsonia*, *Schizolobium*, *Schotia*, *Sindora*, *Trachylobium*.

For recent taxonomic revision refer Pettigrew & Watson (1977), Wit (1956), Hul Thol (1976); for palynology refer Fassbender (1959), Schmitz (1973); for chromosome number refer Bandel (1974).

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Caesalpinaceae. *Fl. W. Pak.* No. 54 : 1-47.
- CSL 2 Bandel, G. 1974
Chromosome numbers and evolution in the Leguminosae. *Caryologia* 27(1) : 17-32.
- CSL 3 Brenan, J. P. M. 1967
Leguminosae, subfamily Caesalpinioideae. *Fl. Trop. East Afr.* 1-231.

- CSL 4 Cusset, G. 1966
Essai d'une taxinomie foliaire dans la tribu des Bauhinieae. *Adansonia* 6: 251-280.
- CSL 5 Evens, C. S. & Bell, E. A. 1978
'Uncommon' aminoacids in the seeds of 64 species of Caesalpiniaceae. *Phytochemistry* 17(7): 1127-1129.
- CSL 6 Fassbender, M. U. 1959
Pollen grain morphology and its taxonomic significance in the Amherstieae, Cynometreae, Selerobieae (Caesalpiniae) with special reference to American genera. *Lloydia* 22(2): 107-162.
- CSL 7 Hul Thol, S. 1976
Contribution a'la revision de quelques de Caesalpiniaceae representes in Asia. These.....I" Universite Pierre et Marie Curie [Paris] 1976 [vii] 1-209.
- CSL 8 Khin Khin Thi (1971) 1972
The Burmese Caesalpiniaceae (in part). *Union Burma Journ. Life Sci.* 4(3): 373-417.
- CSL 9 Pettigrew, C. J. & Watson, L. 1977
On the classification of Caesalpinioideae. *Taxon* 26(1): 57-64. Computer analysis supports Bentham's classification than that of Hutchinson.
- CSL 10 Schmitz, A. 1973
Contribution palynologique a la taxonomie des Bauhinieae (Caesalpiniaceae). *Bull. Jard. Bot. Nation. Belg.* 43(3-4): 369-423.
- CSL 11 Smith, F. G. 1964
Some pollen grains in the Caesalpiniaceae of East Africa. *Pollen et Spores* 6(1): 85-96.
- CSL 12 Tsukada, M. 1963
Pollen morphology and identification-1. Eucaesalpinieae. *Pollen et Spores* 5(2): 239-284.

- CSL 13 Wit, H. C. D. de 1956
A revision of Malaysian Bauhinieae. *Reinwardtia* 3 : 381-541, fig. 1-30.

Bauhinia Linn.

- CSL 14 Ali, S. I. (1965) 1966
A taxonomic study of the genus *Bauhinia* L. from W. Pakistan. *Portug. Act. Biol.* 8 : 239-246, 1 pl.
- CSL 15 Gagnepain, F. 1915
Classification des *Bauhinia* d'Extreme--Orient. *Compt. Rend. Assoc. Franc.* 43 me Sess. Havre 411-419. Key to 66 spp.
- CSL 16 Gagnepain, F. 1915
Distribution géographique des "*Bauhinia*" d'Extreme-Orient. *Compt. Rend. Assoc. Franc.* 43 me Sess. Havre 419-426.
- CSL 17 Gupta, R. K. 1978
Seedling morphology and phytomass of *Bauhinia retusa* Buch.-Ham. ex Roxb. a promising species for reforestation of limestone soils in W. Himalaya. *Indian Forester.* 104(7) : 385-490.
- CSL 18 Larsen, S. S. 1975
Pollen morphology of Thai species of *Bauhinia* (Caesalp.) *Grana* 14 : 114-131, 6 pl., 1 tab. Pollen study does not support the splitting of *Bauhinia* into many genera.
- CSL 19 Larsen, K. & Larsen, S. S. 1973
The genus *Bauhinia* in Thailand. *Nat. Hist. Bull. Siam Soc.* 25(1-2) : 1-22. Key.
- CSL 20 Larsen, K. & Larsen, S. S. 1979
Nomenclatural notes on some Old World *Bauhinia*. *Taxon* 28 : 591-592.
- CSL 21 Larsen, K. & Larsen, S. S. 1982
Notes on some Asian *Bauhinia*. *Nord. Journ. Bot.* 2 : 329-332.

- CSL 22 Maung Soe, 1972
Burmese species of *Bauhinia*. *Union of Burma Journ. Life Sci.* 5 : 307-317, 6 fig., 1 tab. Key to genera & 15 spp.
- CSL 23 Saoji, A. R. & Chitale, S. D. 1972
Palynological studies in *Bauhinia variegata* Linn. *The Botanique (Nagpur)* III (1) : 27-34.
- CSL 24 Thothathri, K. 1965
Studies in Leguminosae---5, Taxonomic and nomenclatural notes on the Indo-Burmese species of *Bauhinia* Linn. *Bull. Bot. Soc. Bengal* 19 : 130-134, 2 fig., 1 tab. Comparison of *Bauhinia*, *Phanera* & *Ptilostigma*.
- CSL 25 Wit, H. C. D. de, 1956
A revision of the Malaysian Bauhinieae. *Reinwardtia* 3 : 381-539. Monograph.
- CSL 26 Wunderlin, R. P. 1976
A new name for an Old World *Bauhinia* (Fabaceae). *Taxon* 25 : 361-362. *B. semla* Wunderlin=*B. retusa* Hamilton ex Roth.

Caesalpinia Linn.

(Refer also CSL 67)

- CSL 27 Dandy, J. E. & Exell, A. W. 1938
On the nomenclature of the species of *Caesalpinia*. *Journ. Bot.* 76 : 175-180.
- CSL 28 Fosberg, F. R. 1973
Caesalpinia major, a legitimate name. *Taxon* 22(1) : 162-163. *Caesalpinia major* (Medic.) Dandy & Exell is accepted against *C. globulorum* Bakh. et van Royen.
- CSL 29 Hattink, T. A. 1974
A revision of Malesian *Caesalpinia* including *Mezoneuron* (Leguminosae---Caesalpinaceae). *Reinwardtia* 9 : 1-89. The genera *Mezoneuron* and *Wagatea* have been merged with *Caesalpinia* L. Key to 21 spp.

- CSL 30 Vidal, J. E. & Hul Thol, S. 1976
Revision des *Caesalpinia asiaticques*. *Bull. Mus. Natn. Hist. Nat. (Paris)* 3e Ser. No. 395 : Bot. 27 : 1-136.

Cassia Linn.

(Refer also CSL 71 & CSL 72)

- CSL 31 Alston, R. E. & Irwin, H. S. 1961
The comparative extent of variation of amino acids and certain 'secondary' substances among *Cassia* sp. *Amer. Journ. Bot.* 48 : 35.
- CSL 32 Bentham, G. 1871
Revision of the genus *Cassia*. *Trans. Linn. Soc.* 27 : 503-591, t. 60-63.
- CSL 33 Brenan, J. P. M. 1958
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- CSL 34 Brenan, J. P. M. 1958
New and noteworthy *Cassias* from Tropical Africa. *Kew Bull.* 13 : 231-252.
- CSL 35 Chatterjee, D. 1960
The correct name of *Cassia glauca* and its varieties. *Journ. Bombay Nat. Hist. Soc.* 57 : 695-698. Descr., distr. & nomenclature of *C. glauca* Lam.—*C. surattensis* Burm. f.
- CSL 36 Daiya, K. S., Sharma, H. K., Chavan, D. D. & Sen, D. N. 1979
Ecology of Indian arid zone weeds 8. *Cassia pumila* Lamk. *Geobios (Jodhpur)* 6(4) : 185-187.
- CSL 37 De Wit, H. C. D. 1955
A revision of the genus *Cassia* (Caesalp.) as occurring in Malaysia. *Webbia* 11 : 197-292. Revision & Keys.
- CSL 38 Irwin, H. S. 1964
Monographic studies in *Cassia* (Leguminosae—Caesalpi-

- nioideae)-I Section. *Xerocalyx*. *Mem. N. Y. Bot. Gard.* 12(1) : 7-13.
- CSL 39 Irwin, H. S. & Barneby, Rupert C. 1976
Nomenclatural notes on *Cassia* Linnaeus (Leguminosae : Caesalpinioideae). *Brittonia* 28 : 435-442.
- CSL 40 Kothari, M. J., Moorthy, S. & Nayar, M. P. 1981
Interesting new species of *Cassia* Linn. (Leguminosae) from Kolaba (Maharashtra). *Proc. Indian Acad. Sci. (Plant Sci.)* 90 : 199-201. *C. kolabensis*, descr.
- CSL 41 Narayanaswami, V. 1940
A note on *Cassia javanica* L. and *Cassia nodosa* Ham. with a key to the cultivated Cassias. *Journ. Roy. Asiat. Soc. Beng.* II, 6 : 31-38.
- CSL 42 Pandey, Y. N. 1971
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- CSL 43 Sareen, T. S. & Pratap, R. 1975
Chromosome numbers in some species of *Cassia* Linn. *Indian Forester* 101(2) : 142-144.
- CSL 44 Sharma, B. D., Vivekananthan, K. & Rathakrishnan, N. C. 1974
Cassia intermedia (Caesalpinaceae)—A new species from South India. *Proc. Indian Acad. Sci.* 80 : 301-306, fig. 16. Deser. from Kerala & Tamil Nadu.
- CSL 45 Singh, N. P. 1972
Cassia sericea Sw., a new record for India. *Bull. Bot. Surv. India* 21 : 203-205.
- CSL 46 Singh, V. (1976) 1979
A taxonomic study of the genus *Cassia* Linn. in Rajasthan. *Bull. Bot. Surv. India* 18 : 85-101, fig. 3. Key to 21 spp.

- CSL 47 Singh, V. (1978) 1979
Critical taxonomic notes on some species of *Cassia* Linn. found in India. *Journ. Bombay Nat. Hist. Soc.* 75(2) : 434-443, fig. 3.
- CSL 48 Srivastava, S. K. 1957
Studies on pollen grains of *Cassia* sp. *Bull. Bot. Soc. Bengal* 11(2) : 98-103.
- CSL 49 Symon, D. E. 1966
A revision of the genus *Cassia* L. (Caesalpinaceae) in Australia. *Trans. Roy. Soc. S. Austr.* 90 : 73-146, 15 maps, 9 photo.
- CSL 50 Tandon, S. L. & Bhat, R. N. 1971
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Chrom. nos.

Cynometra Linn.

- CSL 51 Le'onard, J. 1951
Les *Cynometra* et les genres Voisins en African tropicale. *Bull. Jard. Bot. Brux.* 21 : 373-400.
- CSL 52 Meeuwen, M. S. Knaap-van 1970
A revision of four genera of the tribe Leguminosae—Caesalpinioideae—Cynometreae in Indomalesia and the Pacific. *Blumea* 18 : 1-52, fig. 7, pl. 1. Key to genera : *Cynometra*, *Maniltoa*, *Kingiodendron* & *Hardwickia*, descr., key to spp., descr., Synonymy, distr., ecol., notes.

Hardwickia Roxb.

- CSL 53 Meeuwen, M. S. Knaap-van 1970
A revision of four genera of the tribe Leguminosae—Caesalpinioideae—Cynometreae in Indo-malesia and the Pacific. *Blumea* 18 : 1-52.

Kingiodendron Harms.

CSL 54 De Wit, H. C. D. 1949

Spicilegium Malaianum VII. A note on the genus *Kingiodendron* Harms. *Bull. Bot. Gard. Btzg.* III, 18 : 211-212:

CSL 55 Meeuwen, M. S. Knaap-van 1970

A revision of four genera of the tribe Leguminosae—Caesalpinioideae—Cynometreae in Indo-malesia and the Pacific. *Blumea* 18(1) : 1-52. fig. 7. pl. 1. Key to genera *Maniltoa*, *Kingiodendron*, *Hardwickia*.

Moullava Adans.

CSL 56 Nicolson, D. H. 1980

Moullava [Rhcede] Adanson, recently *Wagatea* Dalzel (Fabaceae/Caesalpinioideae). In : K. S. Manilal (ed.), *Botany & History of Hortus Malabaricus* 181-185.

Phanera Lour.

CSL 57 Balakrishnan, N. P. & Thothathri, K. (1975) 1978

Phanera nicobarica Balakr. & Thoth. (Caesalpinaceae) —a new and interesting species from Great Nicobar Island. *Bull. Bot. Surv. India* 17 : 201-203. Allied to *P. stipularis* (Korth.) Benth.

Piliostigma Hochst.

CSL 58 De Wit, H. C. D. 1956

A revision of Malaysian Bauhineae. *Reinwardtia* 3 : 381-539, fig. 30. Nomencl. of *Bauhinia malabarica* Roxb. = *Piliostigma malabaricum* var. *acidum* (Korth.) De Wit, synonymy, descr., distr., ecol., uses, notes.

Pterolobium R. Br. ex Wt. & Arn.

CSL 59 Vidal, J. E. & Thol, S. H. 1974

Revision du genre *Pterolobium* (Caesalpinaceae). *Bull. Mus. Natn. Hist. (Paris)* 3e Ser. No. 227. Bot. 17 : 1-29,

4 pl., 1 map. Keys, 10 spp., mainly Indo-Malesian, 1 in Africa.

Saraca Linn.

CSL 60 Wilde, W. J. J. O. de 1967

A new combination and a new species in *Saraca* L. *Blumea* 15 : 393-395, 1 fig. *S. celebica* and *S. asoca* (Roxb.) de Wilde ; to the latter, the name *S. indica* has always been given but its type came from Java and is another species.

CSL 61 Zuyderhoudt, G. F. P. 1967

A revision of the genus *Saraca* L. *Blumea* 15 : 413-425, 3 maps. Key, 8 spp., descr.

Sindora Miq.

CSL 62 De Wit, H. C. D. 1949

Revision of the genus *Sindora* Miquel (Legum.) *Bull. Bot. Gard. Buitenzorg* 18 : 5-82, fig. 1-15. Monographic, 18 spp. descr.

CSL 63 Van Campo, M. 1963

Quelques reflexions sur les pollens de *Sindora*. *Grana Palynologica* 4(3) : 361-366.

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CSL 64 Baker, J. G. 1878

Suborder Caesalpinieae, Leguminosae. *In* : Hooker, J. D. ed., *Fl. Brit. India* 2 : 254-285.

CSL 65 Hegnauer, R. 1977

Cyanogenic compounds as systematic markers in Tracheophyta. *Plant Syst. Evol. Suppl.* 1 : 191-209.

CSL 66 Leelavathi, P. & Ramayya, N. 1983

Structure, distribution and classification of plant trichomes in relation to taxonomy 2 : Caesalpinioideae. *Indian Journ. For.* 6(1) : 43-56.

- CSL 67 Sastry, T. C. S. & Kale, G. B. 1983
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- CSL 68 Seigler, D. S. 1981
 Secondary metabolites and plant systematics. In :
 Conn, E. E. ed., *The biochemistry of plants*, Academic
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- CSL 69 Wollenweber, E. 1982
 Flavones and flavonols. In : Harborne, J. B. & Mabry,
 T. J. eds. *The Flavonoids : Advances in research from
 1975-1981*, Chapman & Hall, London, 189-259.
- CSL 70 Young, D. A. 1981
 The usefulness of flavonoids in angiosperm phylogeny :
 some selected examples. In : Young, D. A. & Seigler,
 D. S. eds., *Phytochemistry and angiosperm phylogeny*,
 Praeger, New York, 205-232.

Cassia Linn.

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CALLITRICHACEAE

(Refer also Haloragaceae)

The family Callitrichaceae consists of submerged aquatics (genus *Callitriche* with about 25 species). All the species are small delicate annual perennial herbs. The family is considered as allied to the Labiatae or Boraginaceae because of the presence of four nutlets. In this family the septum is transverse, while in the Boraginaceae and Labiatae the septum is median.

Cronquist, Takhtajan and Thorne included this family in the order Lamiales. While Engler considered it in the order Tubiflorae, Hutchinson treated it in the order Lythrales and Bentham & Hooker included it in the family Haloragaceae.

While considering the affinities of the order Lamiales where the family Callitrichaceae is placed and the order Boraginales on the basis of the four-parted schizocarp and gynobasic style, Dahlgren (1983) appropriately mentions that it is "an artificial constellation of families where more important morphological, embryological and chemical features have been disregarded."

Cronquist (1983) after analysing the similarities of the fruits of the families Callitrichaceae and Lamiaceae, indicates that the genus *Callitriche* has collateral carpels, distinct or basally united styles and endospermous seeds. While the Lamiaceae has median carpels, single style and non endospermous seeds. Allied to the Plantaginaceae, it is seen that the Callitrichaceae together with Hydrostachyaceae and Hippuridaceae have adapted floral reduction due to aquatic habitat closely allied to the aquatic genus *Littorella* of the Plantaginaceae.

According to Cronquist (1983) the families Callitrichaceae, Hydrostachyaceae, Hippuridaceae form a single order Callitrichales closely allied to the order Scrophulariales and Plantaginales.

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Callitriche in the New World. *Rhodora* 53 : 137-155,
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Zur Systematik von *Callitriche*. *Verh. Bot. Ver. Branden-
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Trav. Inst. Sci. Nat. Peterhof 8 : 149-172, fig. 1-6. In
Russian.

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CAMPANULACEAE

(Refer also Lobeliaceae)

The family Campanulaceae, a name based on latin *Campanula*, "a little bell" comprises about 2000 species in about 70 genera, which are mainly perennial herbs, rarely shrubs or undershrubs with showy flowers. The colour of flowers is mainly blue and the flowers are protandrous. The male stage of the flower is represented by the early maturing of anthers followed by the deposition of pollen on the stylar hairs when the stigmas remain closed-up. The female stage of the flower follows the opening up of the stigmatic lobes which curl downwards, touching the stylar hairs for any pollen for self-pollination. This protandrous nature is an adaptation for cross pollination. Further, if cross pollination fails, self pollination is effected through this mechanism.

Based on the capsule and ovary, the following subtribes are recognised (i) *Campanulinae*, (ii) *Wahlenberginae*, (iii) *Platycodinae*.

The family Campanulaceae is considered to represent the basic stock from which the family Compositae might have evolved. The presence of the following characters i.e. head-like inflorescences in the genus *Phyteuma*. connate anthers in certain genera, protandry, presence of inulin, a polysaccharide occurring in Campanulales and Asterales and the presence of latex, support its close alliance with the family Compositae.

Takhtajan, Thorne, Engler, Dahlgren and Cronquist included the family Campanulaceae in the order Campanulales ; while Hutchinson and Bentham & Hooker named the order as Campanales. Takhtajan, Dahlgren and Hutchinson segregated Lobeliaceae as a separate family. Cronquist, Thorne, Engler and Bentham & Hooker did not recognise Lobeliaceae as a separate family and considered the Lobeliaceae in the family Campanulaceae.

The occurrence of polyacetylenes and of inulin are characteristic chemical properties of Campanulales and Asterales. According

to Mabry & Bohlmann (1977), the Campanulaceae shows close chemical affinities with the Compositae and Umbelliferae. Though placed in different orders, the families Campanulaceae, Compositae and Umbelliferae show a mosaic of chemical alliances. Though morphologically, Cronquist and Takhtajan kept apart the families Umbelliferae, Compositae and Campanulaceae, Dahlgren (1980) and Thorne (1981) tried to align the above mentioned families in the same super order or in the adjacent super order.

Studies on pollen morphology by Dunbar (1978) indicates that *Pentaphragma* may be given the family status adjacent to the Campanulaceae. It is also seen that the tribe Cyphioideae connects the Campanuloideae and Lobelioideae (Dunbar & Wallentinus, 1976).

The family is represented in India by the following genera : *Campanula*, *Codonopsis*, *Cyananthus*, *Leptocodon*, *Peracarpa*, *Phyteuma*, *Wahlenbergia*.

The species of the genera *Campanula* and *Laurentia* (*L. longiflora*) are cultivated in gardens.

For recent taxonomic revisions refer Gadella (1966), Thulin (1975) ; for palynology refer Dunbar (1973, 1975), Avetisian (1967) ; for cultivated genera refer Fletcher (1937), Cowan (1938) ; for cytotoxic studies of the genus *Campanula* refer Gadella (1964).

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Campanulaceae. *In* : DC. *Prodr.* 7(2) : 414-496.

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Campanula Linn.

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La Campanule a'e grandes fleurs (*Platycodon grandiflorum*). *Rev. Hort. (Paris)* 1907 : 88-89, 1 pl.

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CANNABIDACEAE

A family of two genera (*Cannabis*, *Humulus*) and three species, it is an economically important family since *Cannabis sativa* yields narcotic resin, variously known as bhang, charas, ganja, hashish and marijuana. While the genus *Humulus* (*H. lupulus*) yields hops (resin yielding fruiting inflorescence heads) used in brewing industry.

The family Cannabidaceae is included in the order Urticales by Cronquist, Dahlgren, Hutchinson and Takhtajan. Engler and Thorne did not recognise Cannabidaceae in the family rank and considered it as part of family Moraceae. Bentham & Hooker included it in the order Unisexuales.

The family Cannabidaceae is characterised by its herbaceous climbing habit, plants without milky juice, flowers with five perianth segments, stamens short and erect in bud, and female flowers subtended by large bracts and fruit an achene. The family Moraceae is characterised by four perianth lobes, anthers usually inflexed in bud and plants usually with milky juice.

The family is variously designated as Cannabaceae, Cannabiaceae, Cannabinaceae and Cannabidaceae. Grammatically Cannabidaceae is the appropriate name.

The family is represented in India by the genus *Cannabis*.

Hops (*Humulus* spp.) are cultivated for their fruits used in flavouring beers.

For recent taxonomic studies refer Emboden (1977), Small & Cronquist (1976), Stearn (1974); for chromosome studies refer Mackay (1939); for palynology refer Tsukada (1968) and for morphology refer Mohan Ram & Nath (1964).

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1086-1088]
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Humulus Linn.

- CAN 57 Beard, F. H. 1943
Hops—their varieties and cultivation. *Journ. Inst. Brewing* 39 : 118-125.
- CAN 58 Bishop, L. R. 1949
The resins of hops as antibiotics. *Soc. Exper. Biol. Symp.* 3 : 101-104.
- CAN 59 Burgess, A. H. 1964
Hops—botany, cultivation and utilization. In : N. Polunin, ed. *World Crop Books*. xx+300 pp. London & New York.
- CAN 60 Edwardson, J. R. 1952
Hops—their botany, history, production and utilization. *Econ. Bot.* 6 : 160-175.
- CAN 61 Jacobsen, P. 1957
The sex chromosomes in *Humulus*. *Hereditas* 43 : 357-370. *H. japonicus*, *H. lupulus*, Chrom. nos.
- CAN 62 Lebreton, P. & Me'neret, G. 1964
Elements de chimie taxinomique botanique I. Generalites ; notion d'espe'ce biochimique ; cas des flavanoides chez *Humulus lupulus* L. *Bull. Soc. Bot. France* 111 : 69-80.
- CAN 63 Myrick, H. 1914
The Hop. viii+300 pp. New York.
- CAN 64 Neve, R. A. 1958
Sex chromosomes in the hop *Humulus lupulus*. *Nature* 181 : 1084-1085.
- CAN 65 Ono, T. 1955
Studies in hop I. Chromosomes of common hop and its relatives. *Bull. Brewing Sci.* 2 : 1-65.

CAN 66 Small, E. (1978) 1979

A numerical and nomenclatural analysis of morpho-geographic taxa of *Humulus*. *Syst. Bot.* 3(1) : 37-76. Key, illust., maps.

CANNACEAE

The family Cannaceae is based on the genus *Canna* with about 60 species and having a number of hybrid garden decorative Cannas, commonly known as *Canna generalis*. They are native of tropical and subtropical America though some species have become naturalised in Asia. The Queensland Arrow root comes from *Canna edulis*, a central American species, cultivated for its starchy rhizome.

The family Cannaceae is included in the order Zingiberales by Cronquist, Hutchinson, Thorne and Takhtajan. Engler considered it in the order Scitamineae; while Bentham & Hooker included Cannaceae as part of the family Scitamineae in the order Epigynae.

A monogeneric family based on the genus *Canna*, the family Cannaceae is characterised by the absence of ligule, the presence of large showy flowers, the perianth differentiated into two series, outer three sepals, the inner three petals fused at the base with the staminal column consisting of 4 to 6 petaloid stamens in two series. The outer three petaloid stamens are sterile, one of them larger than the rest which takes the shape of large labellum, the inner series consists of one or two staminodes and a free petaloid fertile stamen with a single one loculed anther adnate to the petaloid margin.

In the Zingiberaceae, Costaceae, Cannaceae and Marantaceae, there is one functional stamen. While in the Zingiberaceae and Costaceae the anthers are 2-loculed, in the Cannaceae and Marantaceae the anthers are 1-loculed. However in the Cannaceae ovules are numerous in each of the 1-3 locules; while in the Marantaceae ovules are solitary in each of the (1-2)-3 locules.

The family is represented in India by the genus *Canna*. For taxonomic revisions refer Winkler (1930); for evolution and chromosome studies refer Khoshoo & Guha (1976), Mukherjee & Khoshoo (1970, 1971).

GENERAL

- CNA 1 Kranzlin, F. 1912
Cannaceae. Engler, *Pflanzenr.* 56(IV, 47) : 1-77, fig. 1-16.
- CNA 2 Winkler, H. 1930
Cannaceae. Engler & Prantl, *Pflanzenf.* 15a : 640-654, fig. 290-295.

Canna Linn.

- CNA 3 Bailey, L. H. 1923
Canna, *Gentes Herb.* 1 : 118-120.
- CNA 4 Baker, J. G. 1893
A synopsis of the species of *Cannas*. *Gard. Chron.* III 13 : 42-43, 70, 164, 196.
- CNA 5 Khoshoo, T. N. & Guha, I. 1976
Origin and evolution of cultivated *Cannas*. *Glimpses of Pl. Res.* 3 : 1-81.
- CNA 6 Mukherjee, I. & Khoshoo, T. N. 1971
Genetic-evolutionary studies on cultivated *Cannas* : 5. Intraspecific polyploidy in starch yielding *Canna edulis*. *Genet. Iber.* 23(1-2) : 35-42.
- CNA 7 Mukherjee, I. & Khoshoo, T. N. (1970) 1971
Genetic-evolutionary studies on cultivated *Cannas* : 7. Taxonomic treatment and horticultural classification. *Journ. Bombay Nat. Hist. Soc.* 67(3) : 390-397, 11 fig., 1 tab. Key to horticultural varieties.
- CNA 8 Tomlinson, B. 1962
Phylogeny of the Scitamineae—morphological and anatomical considerations. *Evolution* 17 : 192-213.
- CNA 9 Wu, Te-lin & Chen, Sen-jen 1981
Cannaceae. *Fl. Reipubl. Pop. Sinicae* 16(2) : 152-158, 2 pl.

CAPPARIDACEAE

(Includes Cleomaceae)

A family of small trees and shrubs rarely herbs, the family Capparidaceae comprises about 30 genera and 650 species, occurring in tropical and temperate regions of the world.

The family Capparidaceae is included in the order Capparales by Cronquist, Takhtajan, Dahlgren, Hutchinson and Thorne. However Engler considered it under the order Papaverales ; while Bentham & Hooker treated it under the order Parietales. Hutchinson recognised Cleomaceae as a separate family ; while Cronquist, Takhtajan, Dahlgren, Thorne, Engler and Bentham & Hooker considered Cleomaceae as a part of the family Capparidaceae which is accepted here.

The family Capparidaceae is characterised by the presence of the gynophore, sometimes androgynophore, uniloculate ovary with parietal placentation. While in the closely allied family Cruciferae, the ovary is biloculate through the formation of a membranous false septum. The Capparidaceae is divided into the following tribes based on the nature fruit : Capparidoideae, Podandrogynoideae, Dipterygioideae, Buhsioideae, Cleomoideae. The family shows affinities with the Resedaceae and Moringaceae.

Capparales and Violales are closely allied as seen in the common occurrence of parietal placentation, the common presence of gynophores or androgynophores and the same embryological characters. The synthesis of glucosinolates is a characteristic feature of the Capparales and it is rare in the Violales. The glucosinolates are found in profusion in the families Cruciferae, Capparidaceae, Moringaceae, Resedaceae and Tovariaceae consisting the core families of the Capparales. It is seen methylglucosinolate is the predominant glucosinolate in the Capparidaceae. While the glucosinolate sinigrin is restricted to species of Brassicaceae. (Ettlinger & Kjaer, 1968). However in the families Moringaceae and Resedaceae the glucosinolates are with rhamnose substituted side chains (Rodman, 1981).

After studying the trichomes and stomata of five genera Cleomeae and Cappareae, Aleykutty & Inamdar (1978) considered the separation of Cleomaceae from Capparidaceae unnecessary. On the basis of chromosome studies Cochrane (1978) suggested phyletic relationship among species of *Podandrogyne* and species of *Cleome* as they have high basic chromosome number of $n=29$.

The family is represented in India by the following genera : *Cadaba*, *Capparis*, *Cleome*, *Crateva*, *Dipterygium*, *Gynandropsis*, *Maerua*, *Stixis*.

For recent taxonomic studies, refer Jacobs (1960), Jafry (1954) ; for palynology refer Mitra (1971, 1978) ; for phylogeny refer Das & Rao (1975), Norris (1941).

GENERAL

- CPP 1 Candolle, A. P. de 1824
Capparideae. In DC., *Prodr.* 1 : 237-254.
- CPP 2 Crosswhite, F. S. & Iltis, H. H. 1966
Studies in the Capparidaceae X. Orthography and conservation. Capparidaceae vs. Capparaceae. *Taxon* 15 : 205-214.
- CPP 3 Daniel, M. & Sabnis, S. D. 1977
Chemotaxonomical studies on Capparidaceae—Cleomaceae. *Curr. Sci.* 46(14) : 472-474.
- CPP 4 Das, V. S. R. & Rao, K. N. 1975
Phytochemical phylogeny of the Brassicaceae (Cruciferae) from the Capparidaceae. *Naturwissenschaften* 62(12) : 577-578.
- CPP 5 De Wolf, G. P. 1962
Notes on African Capparidaceae III. *Kew Bull.* 16 : 75-83.
- CPP 6 Ernst, Wallace, R. 1963
The genera of Capparaceae and Moringaceae in the south-eastern United States. *Journ. Arn. Arb.* 44 : 81-93.
Capparis & *Cleome*, generic descr., notes.
- CPP 7 Gilg, E. & Benedict, C. 1915
Monographische Zusammenstellung sämtlicher Capparidaceae des tropischen und subtropischen Afrika. *Bot. Jahrb.* 53(1/2) : 144-274 ; *Ibid.* 452-454.
- CPP 8 Jacobs, M. 1960
Capparidaceae. In : C. G. G. J. van Steenis. *Fl. Males.* I, 6(1) : 61-105. Literature notes and revision.

- CPP 9 Jafry, S. M. H. 1954
Taxonomic study on the Capparidaceae and Cruciferae of West Pakistan, Afghanistan and north west Himalayas. *Thesis University of Edinburgh*.
- CPP 10 Mitra, K. (1970) 1971
Pollen morphology of some Indian Capparaceae. *Journ. Indian Bot. Soc.* 49(1-4) : 136-141.
- CPP 11 Mitra, K. (1975) 1978
Contribution to the pollen morphology of the family Capparaceae. *Bull. Bot. Surv. India* 17 : 7-31.
- CPP 12 Norris, T. 1941
Torus anatomy and nectary characteristics as phylogenetic criteria in the Rhoadales. *Amer. Journ. Bot.* 28 : 101-113. Considers Capparaceae and Resedaceae amongst the primitive families of the order Rhoadales.
- CPP 13 Orr, M. Y. 1921
Observations on the structure of the seed in the Capparidaceae and Resedaceae. *Notes Roy. Bot. Gard. Edinb.* 12 : 259-260. Similar seed structure.
- CPP 14 Pax, F. 1887
Beitrage Zur Kenntnis der Capparidaceae. *Bot. Jahrb.* 9 : 39-69, pl. 2.
- CPP 15 Pax, F. 1891
Capparidaceae. *In* : Engler & Prantl, *Pflanzenf.* III, 2 : 209-236.
- CPP 16 Pax, F. & Hoffmann, K. 1936
Capparidaceae. *In* : Engler & Prantl, *Pflanzenf.* ed. 2, 17b : 146-223.
- Capparis Linn.**
- CPP 17 Gagnepain, F. 1908
Essai d'une classification des Capparis d'Asie. *Journ. Bot.* 21 : 53-65, Key to 43 spp.

- CPP 18 Hooper, D. 1931
Some persian drugs. *Kew Bull.* 1931 : 299-344. *Capparis spinosa* p. 307.
- CPP 19 Jacobs, M. 1960
Provisional keys to *Capparis* in Asia and Malaysia. *Misc. rec.* 2 : 1-22. Artificial & natural keys ; list of recognised spp.
- CPP 20 Jacobs, M. 1965
The genus *Capparis* (Capparaceae) from Indus to the Pacific. *Blumea* 12 : 385-541. Phytogeography, gen. & spp., descr., key to section & spp.
- CPP 21 Jafry, S. M. H. 1956
The genus *Capparis* in W. Pakistan, Afghanistan and N. W. Himalaya. *Pakistan Journ. Forestry* 6 : 191-202.
- CPP 22 Joseph, J. & Chandrasekaran, V. (1978) 1979
A critical note on *Capparis fusifera* Dunn (Capparaceae). *Bull. Bot. Surv. India* 20 : 156-158. W. Ghats in Kerala, descr.
- CPP 23 Nicolson, D. H. (1975) 1978
The reinstatement of *Capparis rheedii* DC. (Capparaceae). *Bull. Bot. Surv. India* 17 : 160-161. Instead of *C. heyneana* Wall. ex Wt. & Arn., *Capparis rheedii* is reinstated.
- CPP 24 Puri, G. S. & Jain, S. K. 1960
A note on *Capparis moonii* Wight. *Bull. Bot. Surv. India* 2 : 170-171. Descr. & distr.
- CPP 25 Radlkofer, L. 1884 & 1887
Ueber einige *Capparis* Arten. *Sitzber. Akad. Wiss. Munchen* 14 : 101-182. 1884 ; *ibid.* 17 : 365-422. 1877.
- CPP 26 Raghavan, R. Sundara 1972
A note on the typification of *Capparis roxburghii* DC. *Blumea* 20 : 356. Designation of type.

- CPP 27 Raghavan, R. Sundara 1982
 A new name for an Indian *Capparis*. *Kew Bull.* 37(1) : 72. *Capparis shevoroyensis* Sundara Raghavan nom. nov. for *Capparis parviflora* Hook f. & Thoms.
- CPP 28 Raghavan, R. Sundara & Rao, R. S. 1965
 Critical notes on three species of *Capparis* Linn. from Peninsular India. *Journ. Bombay Nat. Hist. Soc.* 62 : 412-424, 1 map, 4 pl. Descr. of *C. moonii*, *C. roxburghii* & *C. cleghornii*.
- CPP 29 Rao, R. S. & Raghavan, R. Sundara 1964
Capparis moonii Wt. : a reinvestigation of its identity and value as a drug. *Journ. Sci. & Ind. Res.* 23 : 53-57.
- CPP 30 Rao, R. S. & Raghavan, R. Sundara 1964
Capparis cleghornii Dunn, a species from Southern India. *Blumea* 12 : 313-316, 2 fig. Detailed descr., distr., notes.
- CPP 31 St. John, H. 1965
 Revision of *Capparis spinosa* and its African, Asiatic and Pacific relatives. *Micronesica* 2 : 25-44, 2 maps. Not in agreement with the views of Jacobs (1965).
- CPP 32 Subba Rao, G. V., Kumari, G. R. & Chandrasekaran, V. 1981
 A new species of *Capparis* Linn. (Capparaceae) from south India. *Journ. Bombay Nat. Hist. Soc.* 78 : 146-148, 1 pl. Allied to *C. brevispina* DC.
- CPP 33 Vaitak, V. D. 1958
 More about "Rudanti". *Aymoidya Mag.* 22 : 1-3, pl. 1. *Capparis moonii* Wt., descr., phenology, local names, distr., key to 5 spp.
- CPP 34 Zohary, M. 1960
 The species of *Capparis* in the Mediterranean and the Near Eastern countries. *Bull. Res. Council. Israel* 8D : 49-64. 6 spp. descr.

Cleome Linn.

- CPP 35 Babu, C. R. & Majumdar, N. C. (1974) 1976
Taxonomical notes on *Cleome aspera* Koen. ex DC., *C. burmanii* Wt. & Arn. and *C. rutidosperma* DC. (Cleomaceae). *Journ. Bombay Nat. Hist. Soc.* 71 : 629-632. Key, synonymy, descr., distr.
- CPP 36 Bessey, C. E. 1907
Notes on spider-flowers. *Pl. World* 10 : 208, 209.
- CPP 37 Iltis, H. H. 1959
Studies in the Capparidaceae VI. *Cleome* Sect. *Physostemon* : taxonomy, geography and evolution. *Brittonia* 11 : 123-162.
- CPP 38 Iltis, H. H. 1960
Studies in the Capparidaceae VII. Old World *Cleomes* adventive in the New World. *Brittonia* 12 : 279-294.
- CPP 39 Johnson, A. & Seng, T. K. 1959
Cleome ciliata Schum. et Thonn. in Singapore. *Gard. Bull. Singapore* 17 : 325-330. Seeds attractive to ants.
- CPP 40 Kumar, P. V. & Bahadur, Bir 1978
Seed morphology of thirteen species of *Cleome* L. (Capparidaceae). *Journ. Indian Bot. Soc.* 57 : 39-46. Key to seed coat morphology.
- CPP 41 Mukherjee, P. K. 1969
Cleome rutidosperma DC. : A new record for India. *Indian Forester* 95 : 237.
- CPP 42 Woodson, R. E. 1948
Gynandropsis, *Cleome* and *Podandrogyne*. *Ann. Missouri Bot. Gard.* 35 : 139-146, t. 8.

Crateva Linn.

- CPP 43 Jacobs, M. 1964
The genus *Crateva* (Capparaceae). *Blumea* 12 : 177-208,

7 fig. Key to sections, spp. & subspp., descr., synonymy, distr., ecol., notes.

CPP 44 Kurz, S. 1874

Note on the Indian species of *Crateva*. *Journ. Bot. Brit. & For.* 12 : 193-196, pl. 147-148.

Dipterygium Decne.

CPP 45 Jain, S. K. 1960

The genus *Dipterygium* Decne. in India. *Bull. Bot. Surv. India* 2 : 171.

Gynandropsis DC.

(refer also *Cleome*)

CPP 46 Raghavan, T. S. 1938

Morphological and cytological studies in the Capparidaceae II. Floral morphology and Cytology of *Gynandropsis pentaphylla* DC. *Ann. Bot.* II, 2 : 75-95.

CPP 47 Raghavan, T. S. 1938

Studies in the Capparidaceae III. The pro-chromosomes of *Polanisia trachysperma* Torr. et Gray and *Gynandropsis pentaphylla* DC. *Cytologia* 8 : 563-578. *Gynandropsis pentaphylla* n=17.

CPP 48 Woodson, R. E. Jr. 1948

Gynandropsis, *Cleome* and *Podandrogyne*. *Ann. Missouri Bot. Gard.* 35 : 139-146.

Maerua Forsk.

CPP 49 White, F. 1958

Two new combinations in *Maerua* Forsk. *Bot. Soc. Brot.* II, 32 : 33-35.

Stixis Lour.

CPP 50 Jacobs, M. 1963

The genus *Stixis* (Capparaceae)—A census. *Blumea* 12 : 5-12, 1. fig.

GENERAL

- CPP 51 Aleykutty, K. M. & Inamdar, J. A. 1978
Structure, ontogeny and taxonomic significance of trichomes and stomata in some Capparidaceae. *Feddes Repert.* 89 : 19-30.
- CPP 52 Cochrane, T. S. 1978
Podandrogynne formosa (Capparidaceae), a new species from Central America. *Brittonia* 30 : 405-410.
- CPP 53 Ettliger, M. G. & Kjaer, A. 1968
Sulfur compounds in plants. *In* : Mabry, T. J., Ashton, R. E. & Runeckles, V. C. eds., *Recent advances in phytochemistry* 1. New York, 59-144.
- CPP 54 Hooker, J. D. & Thomson, T. 1872
Capparideae. *In* : Hooker, J. D. ed., *Fl. Brit. India* 1 : 167-180.
- CPP 55 Hutchinson, J. 1967
Capparidaceae. *The Genera of Flowering Plants* 2 : 303-317.
- CPP 56 Rodman, J. E. 1981
Divergence, convergence and parallelism in phytochemical characters : the glucosinolates-myrosinase system. *In* : Young, D. A. & Seigler, D. S. eds., *Phytochemistry and angiosperm phylogeny*. Praeger, New York, 43-79.

CAPRIFOLIACEAE

(Refer also Adoxaceae, Carlemanniaceae & Sambucaceae)

The family Caprifoliaceae, commonly known as Honeysuckle family, comprises about 12 genera and 450 species. Some of the well-known ornamental plants of this family are Honeysuckles (*Lonicera*), *Leycesteria formosa* with pendent white inflorescence, *Kokwitzia amabilis* having pink trumpet-shaped flowers, *Symphoricarpos albus* having bell-shaped flowers. Several species of *Viburnum* are cultivated in gardens.

The family Caprifoliaceae is included in the order Dipsacales by Cronquist, Dahlgren, Takhtajan, Engler and Thorne ; while Hutchinson treated this in the order Araliales. Bentham & Hooker however assigned this to the order Rubiales. Airy Shaw erected the family Carlemaniaceae based on the genera *Carlemaunia* and *Silvianthus* and proposed the family Sambucaceae for the genus *Sambucus*.

The Caprifoliaceae is characterised by the inferior ovary, opposite leaves and multicarpellate ovary and is readily distinguished from the Rubiaceae by the absence of stipules. The genus *Viburnum* has small or obsolete stipules, an exception in the family Caprifoliaceae.

The family Adoxaceae differs from the Caprifoliaceae in the nature of its semi-inferior ovary and the longitudinal splitting of each stamen.

The Adoxaceae is considered as the herbaceous derivative of the Caprifoliaceae characterised by lengthwise splitting of each stamen. According to Hillebrand & Fairbrothers (1970) the serological studies support the relationship of the Caprifoliaceae with the family Cornaceae. Airy shaw supports the separation of the family Carlemaniaceae on the basis of pollen studies.

Studies of Reitsma & Reuvers (1975) showed that the pollen grains of *Sambucus* and *Adoxa* are closely related while Danoghue (1981) indicated that the pollen of *Viburnum* is allied to the above group.

In India the family is represented by the following genera : *Abelia*, *Leycesteria*, *Lonicera*, *Triosteum*, *Viburnum*.

For recent taxonomic revisions refer Fukuoka (1972, 1974), Kern & van Steenis (1951) ; for phylogeny refer Horne (1914) ; for chromosome studies refer Os' Kina (1974), Sax & Kribs (1930) ; for chemosystematic studies refer Bohm & Glennie (1971).

GENERAL

- CPR 1 Bohm, B. A. & Glennie, C. W. 1971
A chemosystematic study of the Caprifoliaceae. *Canad. Journ. Bot.*, 49(10) : 1799-1807.
- CPR 2 Candolle, A. P. de 1830
Caprifoliaceae. *In*: DC., *Prodr.* 4 : 321-340.

- CPR 3 Fukuoka, N. 1972
Taxonomic study of the Caprifoliaceae. *Mem. Fac. Sci. Kyoto Univ. Ser. Biol.* 6 : 15-58. Key to genera. *Carlemannia* is excluded.
- CPR 4 Fukuoka, N. 1974
[Taxonomy of the Caprifoliaceae]. *Acta Phytotax. Geobot.* 26(1-2) : 18-27. Key.
- CPR 5 Hao, Kin-shen 1933
Caprifoliaceae of China. *Bull. Natn. Acad. Peiping* 4 : 1-40. Descr. and nomenclature changes.
- CPR 6 Hillebrand, G. R. & Fairbrothers, D. E. 1970
Phytoserological survey of the Caprifoliaceae. *Brittonia* 22 : 125-153.
- CPR 7 Horne, A. S. 1914
A contribution to the study of the evolution of the flower with special reference to the Hamamelidaceae, Caprifoliaceae and Cornaceae. *Trans. Linn. Soc.* III, 8 : 239-309.
- CPR 8 Os' Kina, L. D. 1974
Dannye Kariologii i sistema Caprifoliaceae [Karyological data and the system of Caprifoliaceae]. *Byull. Mosk. Obshch. Ispyt. Prir. Biol.* 79(3) : 27-129. Chrom. nos.
- CPR 9 Kern, J. H. & Steenis, C. G. G. J. van 1951
Caprifoliaceae. In : van Steenis, *Fl. Males.* I, 4 : 175-194, fig. 1-5.
- CPR 10 Rehder, A. 1911-12
Caprifoliaceae. In : Sarg., *Pl. Wils.* 1 : 106-144, 306-312. Synopsis, Key, enumeration of species of the genus *Abelia*, pp. 122-129.
- CPR 11 Rehder, A. 1916
Caprifoliaceae. In : Sarg., *Pl. Wils.* 2 : 617-619.

- CPR 12 Sax, K. & Kribs, D. A. 1930
Chromosomes and phylogeny in Caprifoliaceae. *Journ. Arn. Arb.* 11 : 141-153.
- CPR 13 Steenis, C. G. G. J. van & Kern, J. H. 1972
Caprifoliaceae. Additions & Corrections. *Fl. Males.* I, 6 : 928-930.
- CPR 14 Troll, W. & Weberling, F. 1966
Die Infloreszenzen der Caprifoliaceae und ihre systematische Bedeutung. *Abh. Akad. Wiss. Lit. Mainz. Math. Nat. Kl.* 459-605.

Abelia R. Br.

- CPR 15 Anonymous, 1885
The abelias. *Garden* 27 : 424, 2 fig. Notes on *A. uniflora* & *A. rupestris*.
- CPR 16 Anonymous, 1903
Abelias. *Flora & Sylva* 1 : 279-280, 1 fig.
- CPR 17 Graebner, P. 1900
Die Gattung *Linnaea* (einschliesslich *Abelia*). *Engler Bot. Jahrb.* 29 : 120-145. Introduction, Key, descr. in Latin.
- CPR 18 Hemsley, W. B. 1876
The abelias (with a coloured figure of *Abelia triflora*). *Garden* 10 : 58-59, pl. 29. General notes.
- CPR 19 Vatke, W. 1872
Ueber die Gattung *Abelia* R. Br. *Oesterr. Bot. Zeit.* 22 : 290-291. Reduces *Abelia* to *Linnaea* and lists the Asiatic species.
- CPR 20 Wood, M. 1930
The abelias. *Gard. Chron.* III, 87 : 246-247. General and horticultural notes.
- CPR 21 Zabel, H. 1893
Uber die Gattung *Abelia*. *Mitt. Deutsch. Dendr. Ges.* 2 : 32-34. Review of the genus *Abelia*.

Carlemannia Benth.
(Refer Carlemanniaceae)

Leycesteria Wall.

- CPR 22 Airy-Shaw, H. K. 1932
Leycesteria gracilis (Kurz.) Airy Shaw. *Hook. Icon. Pl.* 32 : pl. 3166. Native of Sikkim, Bhutan & Yunnan (China).
- CPR 23 Airy-Shaw, H. K. 1932
A revision of the genus *Leycesteria*. *Kew Bull. Misc. Inf.* 1932 : 161-176. Revision.

Lonicera Linn.
(Refer also CPR 56)

- CPR 24 Airy-Shaw, H. K. 1932
Lonicera hispida var. *bracteata*. *Curtis Bot. Mag.* 157 : pl. 9360. Native of north eastern Himalayas.
- CPR 25 Goldring, W. 1894
The twining honeysuckles (with a coloured plate of *Lonicera semperflorens*). *Garden* 45 : 306-308, pl. 957. Includes an enumeration of the Asiatic spp.
- CPR 26 Ingwersen, W. E. T. 1930
Lonicera fragrantissima. *Gard. Chron.* III, 87 : 226. Introduced from China ; a general and horticultural note.
- CPR 27 Janaki Ammal, E. K. & Saunders, B. 1952
Chromosome numbers in species of *Lonicera*. *Kew Bull.* 1952 : 539-541, fig. 1, 2. Includes distributional maps.
- CPR 28 Nayar, M. P. & Giri, G. S. 1982
A new species of *Lonicera* L. (Caprifoliaceae) in Eastern Himalaya. *Journ. Econ. Tax. Bot.* 3 : 593-595, A new species *L. magnibracteata*, descr.
- CPR 29 Poiarkova, A. I. 1935
[Contribution to the taxonomy of the representatives of the genus *Lonicera* L. from Middle Asia]. *Journ. Bot.*

URSS 20 : 144-145, fig. 1-4. In Russian with a brief English resume.

CPR 30 Rehder, A. 1903

Synopsis of the genus *Lonicera*. *Rept. Missouri Bot. Gard.* 14 : 27-232, pl. 1-20. Revision, 157 spp.

CPR 31 Rehder, A. 1909

Lonicerae generis species varietatesque asiaticae novae vel recentius alio loco ab auctore descriptae. *Repert. Sp. Nov. Fedde* 6 : 269-276. 16 new spp. & varieties, mostly from Tibet & China.

CPR 32 Rudenburg, Lily & Green, Peter S. 1966

A karyological survey of *Lonicera* 1. *Journ. Arn. Arb.* 47(3) : 222-247. Chromosome nos.

Sambucus Linn.

(Refer Sambucaceae)

Silvianthus Hook. f.

(Refer Carlemanniaceae)

Viburnum Linn.

(Refer also CPR 57 & CPR 58)

CPR 33 Anonymous, 1904

The Viburnums. *Flora & Sylva* 2 : 185-188, 205-209.

CPR 34 Bean, W. J. 1899

Viburnums. *Garden* 56 : 77-79.

CPR 35 Bean, W. J. 1901

Viburnums. *Garden Chron.* III, 30 : 320-322. Includes Asiatic spp.

CPR 36 Hsu, Ping-Sheng 1975

Notes on genus *Viburnum* of China. *Acta Phytotax. Sin.* 13 : 111-129, 1 fig.

CPR 37 Janaki Ammal, E. K. 1953

Chromosomes and the species problem in the genus *Viburnum*. *Curr. Sci.* 22 : 4-6.

- CPR 38 Kern, J. H. 1951
The genus *Viburnum* (Caprifoliaceae) in Malaysia. *Reinwardtia* 1 : 197-170, fig. 10. 2 spp., synonymy, descr. of the genus & spp., key to sections & spp., separate keys for flowering and fruiting specimens.
- CPR 39 Orsted, A. S. 1860
Til Belysning of Slaegten *Viburnum*. *Vid. Medd. Nat. Foren. Kjobenhavn*. 1860 : 267-305, pl. 6, 7. Reviewed in *Bull. Soc. Bot. France* 8 : 482-490. 1861.
- CPR 40 Osborn, A. 1924
Viburnums. The Asiatic species. *Garden* 88 : 221-223. General notes.
- CPR 41 Rehder, A. 1908
The *Viburnums* of eastern Asia. In : C. S. Sargent, *Trees and shrubs* 2 : 105-116. Enumeration and a conspectus of the genus.
- CPR 42 Thomas, J. L. 1961
The cytology of some cultivated species of *Viburnum*. *Journ. Arn. Arb.* 42 : 157-164.
- CPR 43 Ugolini, G. 1899
Die *Viburnum*. *Bull. Soc. Tosc. Ort.* 24 : 271-278. A review of some cultivated species.
- CPR 44 Zabel, H. 1886
Eintheilung der Gattung *Viburnum* nach C. J. Maximowicz. *Deutsche Gart. Zeit (Wittmack)* 1 : 196.
- CPR 45 Zabel, H. 1886
Uebersicht der in Deutschland in Freien aushaltenden *Viburnum*-Arten nach C. J. Maximowicz. *Deutsche Gart. Zeit. (Wittmack)* 1 : 197, 209-212.

ADDITIONS : GENERAL

- CPR 46 Bassett, I. J. & Crompton, C. W. 1970
Pollen morphology of the family Caprifoliaceae in Canada. *Pollen et Spores* 12 : 365-380, fig. 1-28.

- CPR 47 Bedi, Y. S., Bir, S. S. & Gill, B. S. 1982
Cytological studies in certain woody members of family
Caprifoliaceae. *Journ. Tree Sci.* 1 : 27-37.
- CPR 48 Clarke, C. B. 1880
Caprifoliaceae. In : Hooker, J. D. ed., *Fl. Brit. India*
3 : 1-17.
- CPR 49 Donoghue, M. 1981
The cladistic relationships of *Viburnum* equivocal out-
groups and a robust hypothesis. *Amer. Journ. Bot. Ser.*
Publ. 160 : 67-68.
- CPR 50 Hara, H. 1983
A revision of Caprifoliaceae of Japan with reference to
allied plants in other districts and the Adoxaceae. *Gink-*
goana No. 3 : 1-336, pl. 1-55. Monograph, revision of
the family Adoxaceae.
- CPR 51 Hillebrand, G. R. 1971
Serological correspondence of the Caprifoliaceae with
the Dipsacaceae and Valerianaceae. *Amer. Journ. Bot.*
58 : 464.
- CPR 52 Hillebrand, G. R. & Fairbrothers, D. E. 1969
A serological investigation of the systematic position of
the Caprifoliaceae. 1. Correspondence with selected
Rubiaceae and Cornaceae. *Amer. Journ. Bot.* 57 : 810-
815.
- CPR 53 Hutchinson, J. 1967
Caprifoliaceae. *The Genera of Flowering Plants* 2 : 81-89.
- CPR 54 Reitsma, T. J. & Reuvers, A. A. M. L. 1975
Adoxaceae. *Rev. Palaeobot. Palynol.* 19 : NEPF 4 : 71-74.
- CPR 55 Weberling, F. 1957
Morphologische Untersuchungen Zur Systematik der
Caprifoliaceen. *Akad. Wiss. Lit. Mainz. Abh. Math.-*
Naturw. Kl. 1957(1) : 1-50.

Lonicera Linn.

CPR 56 Steenis, C. G. G. J. van 1946

Preliminary revision of the genus *Lonicera* in Malaysia.
Journ. Arn. Arb. 27 : 442-452, fig. 2.

Viburnum Linn.

CPR 57 Egolf, D. R. 1962

A cytological study of the genus *Viburnum*. *Journ. Arn. Arb.* 43 : 132-172.

CPR 58 Hillebrand, G. R. & Fairbrothers, D. E. 1969

A serological investigation of intrageneric relationships
 in *Viburnum*. *Bull. Torrey Bot. Club* 96 : 556-567.

CARDIOPTERIDACEAE-refer **CARDIOPTERYGACEAE****CARDIOPTERYGACEAE**

The family Cardiopterygaceae is included in the order Celastrales by Engler, Hutchinson and Cronquist ; while Takhtajan and Thorne considered it in the order Santalales. Bentham & Hooker did not recognise the Cardiopterygaceae as a family, but treated it under the family Olacaceae. Dahlgren included it in the order Solanales.

A monogeneric family based on the genus *Peripterygium*, the family Cardiopterygaceae is characterised by climbing herbaceous habit with milky latex, alternate exstipulate leaves, with scorpioid cymes and flowers with two dissimilar styles and dry indehiscent 2-winged fruits. The family is allied to Convolvulaceae, Boraginaceae and Hydrophyllaceae.

The family is represented in India by the genus *Peripterygium* (*P. quinquelobum* Hassk. occurring in Eastern India).

CRP 1 Sleumer, H. O. 1971

Cardiopteridaceae. In : van Steenis, *Fl. Males.* I, 7 : 93-96, 2 fig.

CRP 2 Sleumer, H. O. 1972

Cardiopteridaceae. In : Smitinand, T., Kai Larsen and Bertel Hansen, ed., *Fl. Thailand* 2 : (part 2) : 93-94.

CARICACEAE

The Caricaceae is a family of small trees comprising about 4 genera and 55 species, native of tropical America and Africa. *Carica papaya* is cultivated in the tropical countries for its edible fruits. Latex of unripe fruits of *Carica papaya* is a source of papain. The genus *Cylicomorpha*, which is presumably a primitive genus occurs in tropical Africa whereas *Jacaratia*, *Jarilla* and *Carica* are neotropical in origin.

The Caricaceae is included in the order Violales by Cronquist, Engler and Dahlgren. Takhtajan considered the family Caricaceae in the order Passiflorales. Bentham & Hooker did not consider it in the family rank and treated it as part of the family Passifloraceae. Thorne included the Caricaceae in the order Cistales. Hutchinson, however assigned this to the order Cucurbitales.

The family Caricaceae is characterised by its sparsely branching arborescent habit having a crown of large exstipulate leaves giving a palm like appearance. The milky latex, wood formed mainly from the phloem giving soft pith instead of secondary xylem, usually dioecious, rarely monoecious or polygamous nature and floral polymorphism distinguish this family. The Caricaceae is related mainly to the Passifloraceae. According to Airy Shaw, the family Caricaceae shows affinities with Euphorbiaceae through the genus *Jatropha*.

According to Baker (1976) the ancestor of the family Caricaceae bore hermaphrodite flowers. He considered that the staminate and pistillate flowers in Caricaceae are derived by the abortion of gynoecium in the former and the replacement of stamens in the latter. Baker (1976) who studied the reproductive system of Caricaceae indicates that "mistake" pollination takes place through visits to pistillate flowers by hawkmoths though pistillate flowers have no nectaries. Whereas the staminate flowers have nectaries at the basal part. The selective loss of nectaries in the pistillate flowers may be necessary in order to avoid prolonged stay of pollinators in the pistillate flowers as pollinators may cause injury to the succulent gynoecium. Hence "mistake" pollination is considered as a good strategy.

The family is represented in India by the genus *Carica*.

For recent taxonomic revisions refer Abraham & Kumar (1943), Badillo (1972); for chromosome studies refer Datta (1971); for sex expressions and pollination refer Storey (1958, 1967).

GENERAL

- CRC 1 Badillo, V. M. 1972
Monografía de la familia Caricaceae. Assoc. de profesores, Maracay. 1-221, 38 pl.
- CRC 2 Harms, H. 1925
 Caricaceae. *In* : Engler & Prantl, *Pflanzenf.* ed. 2. 21 : 510-522, fig. 235-241.
- CRC 3 Khan, M. S. & Huq, A. M. 1975
Flora of Bangladesh 1 : Casuarinaceae, Phytolaccaceae, Hydrophyllaceae, Martyniaceae and Caricaceae, 1-13.
 Bangladesh Agricultural Research Council, Dacca.

Carica Linn.

- CRC 4 Abraham, A. & Kumar, L. S. S. 1943
 The Papaya, its botany, culture and uses. *Journ. Bombay Nat. Hist. Soc.* 44 : 252-256, t. 1-4.
- CRC 5 Bahadur, Bir & Venkateshwarlu, V. 1976
 Isomerism in flowers of *Carica papaya* L. *Journ. Indian Bot. Soc.* 55 : 89-94.
- CRC 6 Dave, Y. S. & Patil, N. D. 1974
 Pearl glands in *Carica papaya* L. *Curr. Sci.* 43(10) : 326.
- CRC 7 Datta, P. C. 1971
 Chromosomal biotypes of *Carica papaya* Linn. *Cytologia* 36(4) : 555-562.
- CRC 8 Heilborn, O. 1936
 Taxonomical studies on *Carica*. *Svensk. Bot. Tidsk.* 30 H(3) : 217-224.
- CRC 9 Kumar, L. S. S. & Abraham, A. 1945
 A new variety of Papaya (*Carica papaya* var. *flava*)—a correction. *Journ. Bombay Nat. Hist. Soc.* 45 : 443-444.
 Nomenclature,

CRC 10 Storey, W. B. 1958

Modification of sex-expression in Papaya. *Hort. Adv. Saharanpur* 2 : 49-60.

CRC 11 Storey, W. B. 1967

Theory of the derivation of the unisexual flowers of Caricaceae. *Agronomia trop.* 17 : 273-321.

CRC 12 Storey, W. B. 1969

Pistillate Papaya flower: a morphological anomaly. *Science N. Y.* 163 : 401-405.

ADDITION : GENERAL

CRC 13 Baker, H. G. 1976

Mistake pollination as a reproductive system in the special reference to the Caricaceae. In: Burley, J. & Styles, B. T. eds., *Tropical trees, variation, breeding and conservation*, Academic, London, 161-169.

CARLEMANNIACEAE

(Refer also Caprifoliaceae)

The family Carlemanniaceae based on the genera *Carlemannia* and *Silvianthus*, is segregated from the family Caprifoliaceae by Airy Shaw. Cronquist and Takhtajan treated the Carlemanniaceae as part of the family Caprifoliaceae.

The Carlemanniaceae is an intermediary link between the families Rubiaceae and Caprifoliaceae. The genera *Carlemannia* and *Silvianthus* were previously included in the Rubiaceae. Their assignment in the Rubiaceae is questionable as the genera *Carlemannia* and *Silvianthus* have exstipulate leaves and anisomerous androecium. Their inclusion in the family Caprifoliaceae is debatable as pollen is different from that of the other Caprifoliaceae. Hence Airy Shaw (1965) on the basis of anatomical and palynological evidence supports the status of the family Carlemanniaceae.

The family is represented in India by the genera : *Carlemannia* and *Silvianthus*.

Carlemannia Benth.

CRL 1 Bremekamp, C. E. B. 1939

On the position of the genera *Carlemannia* Benth. and *Silvianthus* Hook. f. *Rec. Trav. Bot. Neerl.* 36 : 372.

Silvianthus Hook. f.

CRL 2 Airy-Shaw, H. K. 1965

On a new species of the genus *Silvianthus* Hook. f. and on the family Carlemanniaceae. *Kew Bull.* 19 : 507-512.

CARPINACEAE

(Refer also Betulaceae & Corylaceae)

A family of northern temperate regions, the Carpinaceae includes 3 genera and 47 species.

The family Carpinaceae is segregated from the family Betulaceae by Kuprianova. On the basis of the following characters, the family is distinguished from the Betulaceae and Corylaceae: Leaves plicate in vernation, male flowers without any bracteoles, pollen grains 3-5 porate, pores having an operculum, female flowers in catkins, each flower with a large membranous involucra formed by the bract and two bracteoles, fruit a small nutlet, attached to the accrescent involucre. The family Carpinaceae is included in the family Betulaceae by Cronquist, Takhtajan and Dahlgren.

The family is included in the order Fagales. Though Fagales, Juglandales, Myricales and Casuarinales formerly known as amentifers are considered to have been originated polyphyletically from insect pollinated groups, it is worth noting the recent views of Ehrendorfer (1977) and Mecuse (1975) indicating that they are comparably not so recent.

The family is represented in India by the genus *Carpinus*. For recent taxonomic revisions refer Berger (1953), Hu (1933, 1935) and Radde-Fomina (1932).

GENERAL

CPN 1 Ehrendorfer, F. 1977

New ideas about the early differentiation of angiosperms. *Plant Syst. Evol. Suppl.* 1 : 227-234.

- CPN 2 Kuprianova, L. A. 1965
The palynology of the Amentiferae. Moscow & Leningrad. In Russian.
- CPN 3 Meeuse, A. D. J. 1975
 Floral evolution in the Hamamelidae. I. General assessment of the probable phylogeny and taxonomic position of the group. *Acta Bot. Neerl.* 24 : 155-164.
- CPN 4 Meeuse, A. D. J. 1975
 Floral evolution in the Hamamelidae. II. Interpretative floral morphology of the Amentiflorae. *Acta Bot. Neerl.* 24 : 165-179.

Carpinus Linn.

- CPN 5 Berger, W. 1953
 Studien Zur Systematik und Geschichte der Gattung *Carpinus*. *Bot. Not.* 1953 : 1-47, fig. 1-15. Critical notes.
- CPN 6 Hu, H. H. 1933
 A review of the genus *Carpinus* in China. *Sunyatsenia* 1 : 103-120, pl. 29. Recognises 23 spp.; Key.
- CPN 7 Hu, H. H. 1935
 Analytical key to the genus *Carpinus* in China. *Act. Fauna Flora Univ.* II. Bot. 1 : 1-10.
- CPN 8 Radde-Fomina, O. 1932
 Kurze Systematik der Gattung *Carpinus* L. *Mitt. Deutsch Dendr. Ges.* 44 : 31-33. A synopsis of sections, spp., varieties and formas ; brief descr.
- CPN 9 Winkler, H. 1904
Carpinus. In : Engler, *Pflanzenr.* 19 (iv-61) : 24-43.
- CPN 10 Winkler, H. 1914
 Neue Revision der Gattung *Carpinus*. *Bot. Jahrb.* 50 : Supplement 488-508. A critical enumeration, new spp. & varieties.

CARYOPHYLLACEAE
(includes Illecebraceae)

A cosmopolitan family, the Caryophyllaceae commonly known as the pink family comprises about 70 genera and 1750 species mostly herbs and includes some of the well-known ornamental herbs : Carnation (*Dianthus caryophyllus*), Sweet William (*Dianthus barbatus*), Baby's-breath (*Gypsophila paniculata*), Cuckoo-flower. (*Lychnis flos-cuculi*).

The family Caryophyllaceae is included in the order Caryophyllales by Cronquist, Takhtajan, Dahlgren and Hutchinson and in the order Caryophyllinae by Bentham & Hooker. Thorne however treated the family in the order Chenopodiales and Engler assigned it to the order Centrospermae.

The Caryophyllaceae is distinguished by the presence of opposite leaves, swollen nodes, connate and sheathing bases of leaves, ovary having 2-5 united carpels with free central placentation, fruit usually a capsule dehiscent by valves or teeth, rarely indehiscent 1-seeded nutlet and usually curved, rarely straight embryo.

Hutchinson accepted Illecebraceae in the family rank and assigned it to the order Polygonales. Bentham & Hooker included it in the order Curembryae. Almost all recent phylogenists (Cronquist, Thorne, Takhtajan) considered Illecebraceae as part of the family Caryophyllaceae.

According to Pax (1927) the family forms two natural sub-families Caryophylloideae and Alsinoideae based on the gamosepalous flowers of the former and polysepalous flowers of the latter. Pax recognised the following tribes based on the nature of fruit and style : Alsineae, Sperguleae, Polycarpeae, Paronychieae, Scleranthaeae, Pteranthaeae, Lychnideae and Caryophylleae. However, recently taxonomists (Tutin et al, 1964, Fl. Europaea Vol. I) recognised three subfamilies, Alsinoideae, Paronychioideae and Silenoideae based on the nature gamosepalous or polysepalous calyx and the presence or absence of stipules. In Silenoideae (Caryophylloideae) the calyx tube is tubular and hence the flowers accept long-tongued pollinators ; whereas in the other subfamilies the sepals are not united into a tube and hence the flowers open widely accepting all pollinators.

The morphology of the curved embryo and the ovary having free central or basal placentation are quite characteristic. The pre-

sence of anthocyanin pigments in the Caryophyllaceae instead of betalain pigments led some botanists doubt about the present systematic position of the family Caryophyllaceae.

It is seen that within the order Caryophyllales the families Caryophyllaceae and Molluginaceae do not produce betalains. Kimler et al. (1970) indicate that betalain and anthocyanin pigments are mutually exclusive. Hence Cronquist (1981) and Dahlgren (1980) treat the Caryophyllaceae and Molluginaceae at the end of the order Caryophyllales, while Takhtajan (1980) assigns the above families to a separate order revising his earlier views. But the over all mosaic of morphological, anatomical and palynological characters support the general view that the anthocyanin producing Caryophyllaceae is closely knit with the betalain producing families of the order. According to Harborne (1977) the ancestors of the order Caryophyllales produce anthocyanins. Ehrendorfer (1976) indicates that possibly through selection pressures to attract pollinators from the proto-caryophylloids (which are anthocyanin or pigment free apetalous and anemophilous) some of the members of the order developed betalains in a strategy to develop attractive pigments in its floral parts. Since a part of this strategy succeeded, some families of the order Caryophyllales (Basellaceae, Portulacaceae, Cactaceae, Chenopodiaceae, Amaranthaceae) developed betalains, while others continue to have or develop anthocyanins. In the family Caryophyllaceae (Silenoideae), the development of calyx-tube through partial union of calyx and development of attractive floral display are evolutionary strategies for attracting long-tongued pollinators.

There is similarity in the distribution of flavonoids in the family Caryophyllaceae (Caryophyllales) and that of the Polygonales and Plumbaginales (Young, 1981).

The family is represented in India by the following genera: *Acanthophyllum*, *Arenaria*, *Cerastium*, *Cucubalus*, *Dianthus*, *Drymaria*, *Gypsophila*, *Holosteum*, *Lychnis*, *Minuartia*, *Pleioneura*, *Polycarpaea*, *Polycarpon*, *Pseudostellaria*, *Sagina*, *Scleranthus*, *Silene*, *Spergula*, *Stellaria*, *Thylacospermum*, *Tunica*, *Vaccaria*.

For recent taxonomic revisions refer Majumder (1963, 1965), McNeill (1962, 1963); for palynology refer Vishnu-Mittre & Gupta (1964); for cultivated species refer Lawrence (1953).

GENERAL

- CRY 1 Bor, N. L. & Fischer, C. E. C. 1939
A new genus and species of Caryophyllaceae (Illecebra-
ceae). *Indian Forester* 65 : 611-613.
- CRY 2 Buxbaum, F. 1961
Vorläufige Untersuchungen über Umfang, systematische
Stellung und Gliederung der Caryophyllales (Centrosper-
mae). *Beitr. Biol. Pfl.* 36 : 3-56.
- CRY 3 Caius, J. F. 1937
The medicinal and poisonous champions of India. *Journ.*
Bombay Nat. Hist. Soc. 39 : 561-568. Key and 13 genera
of Caryophyllaceae.
- CRY 4 Candolle, A. P. de 1824
Caryophylleae. In : DC., *Prodr.* 1 : 351-422.
- CRY 5 Hara, H. 1976
New or noteworthy flowering plants from Eastern Hima-
laya 18 : *Journ. Jap. Bot.* 51(5) : 129-135. *Arenaria depau-*
perata, *A. ludlowii*, *Pseudostellaria sylvatica*, *P. hete-*
rantha.
- CRY 6 Luders, H. 1907
Systematische Untersuchungen über die Caryophyllaceae
mit einfachem Diagram. *Engler's Bot. Jahrb.* 40(91) :
1-38.
- CRY 7 Majumdar, N. C. 1963
Nomenclatural transfers in the Indian Caryophyllaceae—
Silenoideae. *Journ. Indian Bot. Soc.* 42 : 646-652. New
Comb. in *Silene*.
- CRY 8 Majumdar, N. C. 1965
On the Indian Alsinoideae : some new names and new
combinations. *Journ. Indian Bot. Soc.* 44 : 138-144. 2
comb. nov. Nomenclature notes on *Stellaria*, *Cerastium*
& *Alsine*.

- CRY 9 Majumdar, N. C. (1972) 1975
A note on the family Caryophyllaceae with special reference to the Indian species. *Bull. Bot. Surv. India* 14 : 71-75. Distr., phylogeny and systematic position.
- CRY 10 Mc Neill, J. 1962
Taxonomic studies in the Alsinoideae-1. Generic and infrageneric groups. *Notes Roy. Bot. Gard. Edinb.* 24 : 79-155, fig. 5. Synonymy of the genus *Arenaria*, key to subgenera, sections & series.
- CRY 11 Mc Neill, J. 1963
Taxonomic studies in the Alsinoideae-2. A revision of the species in the Orient. *Notes Roy. Bot. Gard. Edinb.* 24 : 241-404, fig. 15. Key to genera, infra generic groups & spp. of *Arenaria*.
- CRY 12 Mizushima, M. 1963
Notes on some Caryophyllaceous plants from Sikkim Himalaya. *Journ. Jap. Bot.* 38 : 149-154.
- CRY 13 Mizushima, M. 1968
Remarks in the Alsinoideae—Caryophyllaceae. *Journ. Jap. Bot.* 43 : 49-56, t. 5-6.
- CRY 14 Pax, F. 1927
Zur phylogenie der Caryophyllaceae. *Engl. Bot. Jahrb.* 61 : 223-241.
- CRY 15 Pax, F. & Hoffmann, G. F. 1934
Caryophyllaceae. In : Engler & Prantl, *Pflanzenf. ed.* 2, 16C : 275-367.
- CRY 16 Rohrbach, P. 1870-73
Beitrage Zur Systematik der Caryophyllinen. *Linnaea* 36 : 651-690. 1870 ; 37 : 183-312. 1871-73.
- CRY 17 Vishnu-Mittre & Gupta, H. P. 1964
Studies of Indian pollen grains III—Caryophyllaceae. *Pollen et Spores* 6(1) : 99-111.

- CRY 18 Williams, F. N. 1908

The Caryophyllaceae of Tibet, *Journ. Linn. Soc. Bot.* 38 : 395-407. Enumeration and new spp.

Acanthophyllum C. A. Mey

- CRY 19 Yukhananov, D. Kh. 1974

Sistematicheskie otnosheniya rodov *Acanthophyllum* C. A. Mey i *Allochrusa* Bunge (Taxonomic relations of genera *Acanthophyllum* C. A. Mey and *Allochrusa* Bunge). *Bot. Zhurn.* 59(3) : 414-417. Key.

Arenaria Linn.

- CRY 20 Fernald, M. L. 1919

The unity of the genus *Arenaria*. *Rhodora* 21 : 17. *Moehringia* is reduced to *Arenaria*.

- CRY 21 Majumdar, N. C. 1980

A new species of *Arenaria* (Caryophyllaceae) from the Western Himalaya. *Blumea* 26 : 445-448. *Arenaria curvifolia* Majumdar described from Garhwal Himalaya, allied to *A. kashmirica* Edgew.

- CRY 22 Majumdar, N. C. & Babu, C. R. 1969

A new species of *Arenaria* from the Bhutan Himalaya. *Journ. Arn. Arb.* 50 : 626-628. *Arenaria bhutanica* Majumdar & Babu.

- CRY 23 Mc Neill, J. 1962

Taxonomic studies in the Alsinoideae 1. Generic and infrageneric groups. *Notes Roy. Bot. Gard. Edinb.* 24 : 79-155.

- CRY 24 Mc Neill, J. & Majumdar, N. C. 1980

A new species of *Arenaria* subgenus *Odontostemma* from Tibet with a review of the status of the genus *Gooringia* (Caryophyllaceae). *Bot. Journ. Linn. Soc.* 80 : 371-378. Refer Williams, F. N. 1897. *Gooringia*, a new genus of Caryophyllaceae. *Bull. Herb. Boiss.* 5 : 530-531.

- CRY 25 Williams, F. N. 1895
On the genus *Arenaria* Linn. *Bull. Herb. Boiss.* 3 : 593-603.
- CRY 26 Williams, F. N. 1898
A revision of the genus *Arenaria* Linn. *Journ. Linn. Soc. Bot.* 33 : 326-437.
- Cerastium** Linn.
- CRY 27 Candau, P. 1978
Palinologia del genero *Cerastium* L. (Caryophyllaceae). *Palinologia. Suppl.* 1 : 115-119.
- CRY 28 Grenier, J. C. M. 1841
Monographia de Cerastio pp. ii+95, Vesontione.
- CRY 29 Hulten, A. 1956
The *Cerastium alpinum* complex : a case of world wide introgressive hybridisation. *Svensk. Bot. Tidskr.* 50 : 412-495.
- CRY 30 Jalas, J. 1963
Notes on *Cerastium* L. subsect. *Perennia* Fenzl. (Caryophyllaceae). *Arch. Soc. Zool. Bot. Fenn. Vanamo* 18 : 57-65.
- CRY 31 Solner, R. 1954
Recherches cytotaxonomiques sur le genre Cerastium. *Ber. Schweiz. Bot. Ges.* 64 : 221-354.
- CRY 32 Williams, F. N. 1898
Enumeration provisoire des especes du genre *Cerastium.* *Bull. Herb. Boiss.* 6 : 893-904.
- CRY 33 Williams, F. N. 1898-99
Critical notes on some species of *Cerastium.* *Journ. Bot.* 36 : 341-344, 382-387. 1898 ; *ibid.* 116-124, 209-216, 310-315, 474-477. 1899.

Dianthus Linn.

- CRY 34 Bailey, L. H. 1938
The garden of pinks, with decorations, i-viii, 1-142.
Descr. of cultivated spp. of *Dianthus*; horticultural notes.
- CRY 35 Harvey, J. H. 1978
Gilliflower and carnation. *Gard. Hist.* 6(1) : 46-47.
- CRY 36 Lemperg, F. 1936
Studies in the perennial species of the genus *Dianthus* L. 1. *Act. Hort. Gothob.* 11 : 71-134. Descr. of *D. chinensis* and other Asiatic spp.
- CRY 37 Javeid, G. N. 1973
A new *Dianthus* from Kashmir. *Curr. Sci.* 42(19) : 692-693. *Dianthus minimus* sp. nov.
- CRY 38 Kmetova, E. 1979
Dianthus seguieri agg., *Dianthus collinus* agg. *CSSR Acta Bot. Slov. Acad. Sci. Slov. A Taxon Geobot.* No. 5 : 119-151. Key; Chrom. nos.
- CRY 39 Rohweder, H. 1934
Beitrage Zur Systematik und phylogenie des genus *Dianthus* unter Berucksichtigung der Karyologischen Verhältnisse. *Engler Bot. Jahrb.* 66 : 249-368. Taxonomic discussions of *D. sinensis* and its allied species *D. neglectus*.
- CRY 40 Schischkin, B. 1936
Dianthus. In : Komarov, V. L. et al. eds., *Flora URSS* 6 : 803-861.
- CRY 41 Weissmann-Kollmann, F. 1965
A taxonomic study in *Dianthus* of Palestine and of the neighbouring countries. *Israel Journ. Bot.* 14 : 141-148.
- CRY 42 Williams, F. N. 1885
Enumeratio specierum Varietatumque generis *Dian-*

thus; Characters communes sectionibus includens.
Journ. Bot. Brit. & For. 23 : 340-349.

CRY 43 Williams, F. N. 1889

Enumeratio specierum Varietatumque Generis Dianthus, pp. 1-23. London.

CRY 44 Williams, F. N. 1892

A monograph of the genus *Dianthus*. *Journ. Linn. Soc. Bot.* 29 : 346-478. Key, descr. of all spp., an index of spp. & hybrids.

Drymaria Willd. ex Roem. & Schult.

CRY 45 Duke, J. A. 1961

Preliminary revision of the genus *Drymaria*. *Ann. Missouri Bot. Gard.* 48 : 173-268, 18 fig.

CRY 46 Majumdar, N. C. (1968) 1969

The genus *Drymaria* in India. *Bull. Bot. Surv. India* 10 : 293-295. Key, synonymy, descr., distr.

CRY 47 Malick, K. C. & Majumdar, N. C. (1974) 1977

Observations and critical notes on Indian *Drymaria* Willd. *Bull. Bot. Surv. India* 16 : 151-153, fig. 5. Taxonomic notes; *D. villosa* merged with *D. cordata*.

CRY 48 Mizushima, M. 1957

A revision of *Drymaria cordata* Willd. *Jap. Journ. Bot.* 32 : 69-81, 2 fig.

Gypsophila Linn.

CRY 49 Barkoudah, Y. I. 1962

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- CRY 51 Mc Neill, J. 1973
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- CRY 52 Schischkin, B. K. 1936
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- CRY 56 Williams, F. N. 1896
 A systematic revision of the genus *Herniaria* L. *Bull. Herb. Boiss.* 4 : 556-570.

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- CRY 57 Gay, J. 1845
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- CRY 58 Lawrence, G. H. M. 1953
 Keys to cultivated plants 2. The cultivated species of *Lychnis*. *Baileya* 1 : 105-111, 114.
- CRY 59 Majumdar, N. C. (1974) 1977
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distribution. *Bull. Bot. Surv. India* 16 : 153-155, fig. 11.
 Descr., new comb.

CRY 60 Rohrbach, P. 1869

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Minuartia Linn.

(Refer also CRY 101)

CRY 61 Mattfeld, J. 1921

Enumeratio specierum generis *Minuartia* (L.) emend.
 Hiern, *Bot. Jahrb.* 57 : *Beibl.* 126, 27-33.

CRY 62 Mattfeld, J. 1922

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Jahrb. 57 : *Beibl.* 127. 13-63.

CRY 63 Mattfeld, J. 1922

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 tung *Minuartia* (L.) Hiern, *Repert. Sp. Nov. Fedde*
Beih. 15 : 1-228, pl. 1-5.

CRY 64 Mattfeld, J. 1929

Minuartia (L.) Hiern. *Pflanzenar.* 2 : 43-57, maps 51-61.
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CRY 65 Mc Neill, J. 1962

Taxonomic studies in the Alsinoideae 1. Generic and
 infrageneric groups. *Notes Roy. Bot. Gard. Edinb.* 24 :
 79-155.

CRY 66 Mc Neill, J. & Bassett, I. J. 1974

Pollen morphology and the infrageneric classification of
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CRY 67 Bakker, K. 1957

Revision of the genus *Polycarpaea* (Caryophyllaceae) in
 Malaysia. *Acta Bot. Neerl.* 6 : 48-53, 1 fig.

CRY 68 Gagnepain, F. 1908

Contribution a' la connaissance du genre *Polycarpaea* Lamk. *Journ. de Bot.* 21 : 275-280. Key to 10 spp.

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(Refer also CRY 99)

CRY 69 Majumdar, N. C. 1969

The Indian representatives of the genus *Pseudostellaria* Pax (Caryophyllaceae). *Sen Mem. Vol. Bot. Soc. Bengal* 427-432. Key to 3 spp.

CRY 70 Ohwi, Jisaburo 1937

A revision of the genus *Pseudostellaria*. *Jap. Journ. Bot.* 9 : 95-105. Pax proposed the name *Pseudostellaria* for *Krascheninnikovia* Turcz ; includes *P. tibetica* and *P. cashmiriana*. Refer Takeda, H. 1913. *Krascheninnikovia*, *Kew Bull.* 1913 : 86-90.

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CRY 71 Mizushima, M. 1960

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CRY 72 Simmler, G. 1910

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CRY 73 Bocquet, G. 1969

Reviso *Physolychnidem* (*Silene* sect. *Physolychnis*). *Phaner. Monogr.* 1 : 1-342, 43 tab.

CRY 74 Bocquet, G. & Saxena, N. P. (1972) 1975

Silva ad silenologiam : 4. *Silene turbinatigemma* et *S. purii* Bocquet et Saxena sp. novae Caryophyllacearum.

In : Murty, Y. S., Johri, B. M., Mohan Ram, H. Y. & Varghese, T. M. ed. *Advances in plant morphology* : 423-428.

- CRY 75 Chowdhuri, P. K. 1957
 Studies in the genus *Silene*. *Notes Roy. Bot. Gard, Edinb.* 22 : 221-278. Review, generic limits.
- CRY 76 Kruckeberg, A. 1954
 Chromosome numbers in *Silene* I. *Madrono* 12 : 238-246.
- CRY 77 Kruckeberg, A. 1960
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 Notes on *Spargula jallax* (Lowe) E. H. L. Krause and *S. vernalis* Willd. *Journ. Bombay Nat. Hist. Soc.* 68 : 492-494, 1 fig. Descr. & distr.
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 [On the species of *Camelina* and *Spargula* found as weeds in the flax crops and their origin]. *Trav. Mus.*

Bot. Acad. Sci. St. Petersburg 6 : 1-303, pl. 1-9, fig. 1-11.
In Russian, includes Asiatic spp.

Spergularia (Pers.) J. & C. Presl.

CRY 84 Bhat, J. L. & Kumar, S. 1975

A note on the distribution of *Spergularia rubra* (Linn.)
J. & C. Presl. (Caryophyllaceae). *Journ. Bombay Nat.
Hist. Soc.* 72(1) : 230.

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CRY 85 Majumdar, N. C. 1968

A new species of *Stellaria* (Caryophyllaceae) from the
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CRY 86 Majumdar, N. C. 1970

Notes on *Stellaria saxatilis* Buch.-Ham. ex D. Don,
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cussion, synonymy, distr.

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CRY 88 Majumdar, N. C. & Vartak, V. D. 1971

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Stellaria—Studien Zur Zytologie, Genetik, Ökologie und
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CRY 90 Pobedimova, E. G. 1929

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ADDITIONS : GENERAL

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- CRY 98 Kinler, L., Mears, J., Mabry, T. J. & Rosler, H. 1970
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- CRY 99 Majumdar, N. C. 1967
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and of some taxa of the family Caryophyllaceae available at the Calcutta (CAL). *Bull. Bot. Surv. India* 15 : 39-44.

CRY 101 Majumdar, N. C. & Giri, G. S. 1983

The genus *Minuartia* L. (Caryophyllaceae) in the western Himalaya. *Candollea* 38 : 341-348.

CRY 102 Takhtajan, A. 1980

Outline of the classification of flowering plants (Magnoliophyta). *Bot. Rev.* 46 : 226-359.

CRY 103 Young, D. A. 1981

The usefulness of flavonoids in angiosperm phylogeny : some selected examples. In : Young, D. A. & Seigler, D. S. eds., *Phyto-Chemistry and angiosperm phylogeny*, Praeger, New York, 205-232.

CASSYTHACEAE-refer LAURACEAE

CASUARINACEAE

A family of south-eastern Asian region mainly concentrated in N. E. Australia and Polynesia, there are about 2 genera (*Casuarina*, *Gymnostoma*) and 65 species. The most common species is the Beefwood of Australia (*Casuarina equisetifolia*) and *Casuarina cunninghamiana* cultivated for its wood.

The family Casuarinaceae is included in the order Casuarinales by Cronquist, Thorne, Hutchinson, Engler, Takhtajan and Dahlgren. This family is treated under Unisexuales by Bentham & Hooker.

The Casuarinaceae is distinguished by its jointed stems with short internodes (equisetoid appearance) and leaves appearing in whorls of reduced sheaths, surrounding the articulations and by its woody inflorescence.

The systematic position of the family is isolated. It is a bigeneric family and it represents an unifamilial order—Casuarinales. In Englerian system it is considered as a primitive group since the wind-pollinated flowering plants were considered as the oldest group of flowering plants. The work of Tippo (1938) and Mosley (1948) in-

dicates that the simplicity is due to reduction because of the habitat and not due to primitiveness. It is considered that the family has originated from a common hamamelidaceous stock. The family is represented in India by the genus *Casuarina*.

According to Chanda (1969) palynologically *Casuarina* is not considered as a primitive genus and it is not derived from Hamamelidales. Pollen grains of Casuarinaceae are considered as allied to the pollen grains of Betulaceae, Juglandaceae, Corylaceae and Myricaceae.

The Casuarinaceae shows the following specialised characters which are considered as highly evolved: unisexual anemophilous flowers, absence of a perianth, reduction of the posterior locule of the ovary, the reduction in the number of ovules, the absence of endosperm in the seeds and the large embryo (Takhtajan, 1969). The pollens of Casuarinaceae are allied to the Betulaceae and Myricaceae (Kuprianova, 1965).

For recent taxonomic studies refer Friis (1980); for palynology refer Chanda (1969), Ueno (1963), Kershaw (1970); for chemotaxonomy refer Natarajan *et al.* (1971).

GENERAL

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Chromosome numbers in the Casuarinaceae. *Austr. Journ. Bot.* 7 : 230-237.
- CAS 2 Chanda, S. 1969
A contribution to the palynotaxonomy of Casuarinaceae. *In: J. Sen Memorial Volume, Bot. Soc. Bengal* 191-208.
- CAS 3 Hjelmquist, H. 1948
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- CAS 5 Khan, M. S. & Huq, A. M. 1975
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Hydrophyllaceae, Martyniaceae and Caricaceae. *Bangladesh Agricultural Research Council*, 1-13. Taxonomy & Chrom. nos.

- CAS 6 Kuprianova, L. A. 1965
The palynology of the Amentiferae—Komarov *Bot. Inst. Acad. Sci. URSS* 1 : 1-214.
- CAS 7 Miquel, F. A. W. 1848
Revisio critica Casuarinarum. *Verh. Ned. Inst.* 1. Kl. 13 : 1-84.
- CAS 8 Miquel, F. A. W. 1865
Synopsis specierum Casuarinae. *Flora* 48 : 17-24.
- CAS 9 Moseley, M. F. Jr. 1948
Comparative anatomy and phylogeny of the Casuarinaceae. *Bot. Gaz.* 110 : 232-280.
- CAS 10 Rendle, A. B. 1892
A new group of flowering plants. *Nat. Sci.* 1 : 132-143.
- CAS 11 Tippe, O. 1938
Comparative anatomy of the Moraceae and their presumed allies. *Bot. Gaz.* 100 : 1-99.

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- CAS 12 Friis, I. 1980
The authority and date of publication of the genus *Casuarina* and its type species. *Taxon* 29 : 499-501.
- CAS 13 Natarajan, S., Murti, V. V. S. & Seshadri, T. R. 1971
Chemotaxonomical studies of some *Casuarina* species. *Phytochemistry* 10(5) : 1083-1085.
- CAS 14 Swamy, B. G. L. 1948
A contribution to the life history of *Casuarina*. *Proc. Amer. Arts & Sci. Acad.* 77 : 1-32.

CAS 15 Ueno, J. 1963

On the fine structure of the pollen walls of Angiospermae
III. *Casuarina*. *Grana Palynologica* 4(2) : 189-194.

ADDITIONS : GENERAL

CAS 16 Hooker, J. D. 1888

Casuarinaceae. *In* : Hooker, J. D. *ed.*, *Fl. Brit. India* 5 :
598.

CAS 17 Hutchinson, J. 1967

Casuarinaceae. *The Genera of Flowering Plants* 2 : 142-
143.

CECROPIACEAE

(Refer also Urticaceae)

Berg (1978) proposed the family Cecropiaceae, a segregate from the family Urticaceae on the basis of straight stamens in the bud, sometimes inflexed but not bending outwards elastically and arborescent habit. The species are woody and do not show tendencies towards herbaceous habit which is seen in the family Moraceae.

The family Cecropiaceae has several characters in common with the Urticaceae *i. e.* the pistil with single stigma and a basal or sub-basal orthotropous ovule. As in the Urticaceae, the system of latex canal is reduced. The plants do not exude milky latex but produce a mucilage sap. The leaves of the species belonging to Cecropiaceae are always spirally arranged whereas in the Urticaceae the leaves are in two rows.

Key to the identification of the segregated families of Urticales is given by Berg (1978) which is as follows :

1. Ovule apical (to lateral) and anatropous ; style usually bifid :
 2. Plants without latex ; stamens straight :
 3. Arborescent plants— Ulmaceae
 3. Herbaceous plants— Cannabidaceae
 2. Plants with latex (except the herbaceous *Fatoua*) ; stamens straight or inflexed— Moraceae

1. Ovule basal or subbasal (sub) orthotropous ; style unbranched :

4. Stamens straight in the bud, sometimes inflexed but not bending outward elastically ; plants arborescent—

Cecropiaceae

4. Stamens inflexed in the bud and bending elastically ; plants herbaceous or woody—

Urticaceae

The family consists the following genera : *Cecropia*, *Musanga*, *Myrianthus*, *Pourouma*, *Coussapoa* and *Poikilospermum*. In India the family Cecropiaceae is represented by the genus *Poikilospermum*.

For phylogeny refer Grudzinskaya (1967), Tippe (1938) ; for taxonomy refer Berg (1978), Chew Wee Lew (1963).

GENERAL

CEC 1 Berg, C. C. 1978

Cecropiaceae, a new family of the Urticales. *Taxon* 27 : 39-44. Includes the genus *Poikilospermum* Zipp. ex Miq. hitherto included under Urticaceae.

CEC 2 Grudzinskaya, I. A. 1967

Ulmaceae and reason for distinguishing Celtoideae as a separate family Celtidaceae Link. *Bot. Zurn. (Moscow & Leningrad)* 52 : 1723-1749.

CEC 3 Guerin, P. 1923

Les Urticées. Cellules à mucilage lactificeres et canaux secreteurs. *Bull. Soc. Bot. France* 70 : 125-136, 207-215, 255-263.

CEC 4 Tippe, O. 1938

Comparative anatomy of the Moraceae and their presumed allies. *Bot. Gaz.* 100 : 1-99.

Poikilospermum Zipp. ex Miq.

CEC 5 Chew Wee Lek, 1963

Florae Malesianae Precursores xxxiv—A revision of the genus *Poikilospermum* (Urticaceae). *Gard. Bull. Singapore* 20 : 1-103.

CEC 6 Merrill, E. D. 1934

An enumeration of plants collected in Sumatra by W. N. and C. M. Bangham. *Contr. Arn. Arb.* 8 : 1-178, pl. 1-4. The status of *Conocephalus* is discussed and *Poikilospermum* is accepted.

CELASTRACEAE

(Refer also Hippocrateaceae)

A family of shrubs and small trees, it comprises about 55 genera and 850 species and it includes some of the ornamental plants having handsome foliage and decorative fruits (*Euonymus alatus*, *E. japonicus*), "the spindle tree" yielding wooden spindle used in textile machinery (*Euonymus europaeus*) and Khat plant, the leaves used in making Arabia tea (*Catha edulis*) and Burning-bush (*Euonymus atropurpureus*) where the leaves turn purplish red during autumn and hence the name "Burning-bush".

The family Celastraceae is included in the order Celastrales by Cronquist, Engler, Hutchinson, Bentham & Hooker, Takhtajan and Dahlgren. Thorne however treated the Celastraceae under the order Santalales.

The family Celastraceae is distinguished by having flowers with distinct glandular disk, stamens inserted on the disk and petals and sepals inserted below the margin of the disk and seeds usually covered by a brightly coloured aril.

The Celastraceae is allied to Aquifoliaceae but differs in having the glandular disk in flowers and the brightly coloured arillate seeds. The family Hippocrateaceae segregated from the Celastraceae has anthers which dehisce transversely and has seeds which are non-arillate and non-endospermous.

In India the family is represented by the following genera : *Bhesa*, *Cassine*, *Celastrus*, *Euonymus*, *Glyptopetalum*, *Kokoona*, *Lophopetalum*, *Maytenus*, *Microtropis*, *Pleurostyliia*.

Catha edulis Forsk., a native of Ethiopia is introduced and cultivated since the leaves are used for making Arabian tea.

For recent taxonomic studies refer Ding Hou (1962, 1963) ; for palynology refer Lobreau-Callen (1974, 1975, 1978) ; for cytology refer Sareen *et al.* (1974).

GENERAL

- CEL 1 Bennet, S. S. R. & Sahni, K. C. 1977
Nomenclatural notes on three celastraceous species from India. *Indian Forester* 103 : 387-388.
- CEL 2 Berkeley, E. 1953
Morphological studies in the Celastraceae. *Journ. Elisha Mitchell Sci. Soc.* 69 : 185-206, pl. 3, 4. Includes floral anatomy of *Celastrus* (2 spp.) & *Euonymus* (4 spp.).
- CEL 3 Brizicky, George K. 1964
The genera of Celastrales in the south-eastern United States. *Journ. Arn. Arb.* 45(2) : 206-234. Celastraceae pp. 206-223.
- CEL 4 Candolle, A. P. de 1825
Celastrineae. In : DC., *Prodr.* 2 : 2-18.
- CEL 5 Croizat, L. 1947
A study in the Celastraceae, Siphonodonoideae subf. nov. *Lilloa* 13 : 31-43. A hypothesis on the derivation of the typical celastraceous flower of *Siphonodon* from an ancestral flower (or inflorescence).
- CEL 6 Hou, Ding 1962
Celastraceae. In : van Steenis, *Fl. Males.* I, 6 : 227-291.
- CEL 7 Hou, Ding 1963
Florae Malesianae Precursores XXXIV. Notes on some genera of Celastraceae in Malaysia. *Blumea* 12 : 31-38.
- CEL 8 Hou, Ding 1972
Celastraceae. In : van Steenis, *Fl. Males.* I, 6 : Addition & corrections 930-932. fig. 4.
- CEL 9 Lobreau-Callen, D. & Lugardon, B. (1972-73) 1974
L'aperture a ropli du pollen des Celastraceae. *Nat. Monspel. Bot.* 23-24 : 205-210.

- CEL 10 Loesener, T. 1892
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- CEL 11 Loesener, T. 1897
 Über die geographische Verbreitung einiger Celastraceen. *Engler Bot. Jahrb.* 24 : 197-201. Notes on the genera *Perrottetia*, *Celastrus* & *Microtropis*.
- CEL 12 Loesener, T. 1901-02
 Übersicht über die bis jetzt bekannten chinesischen Celastraceen. *Engler Bot. Jahrb.* 30 : 446-474. A revision ; pp. 446-448 published in 1901 ; pp. 449-474 in 1902.
- CEL 13 Loesener, T. 1936
 Celastraceae novae etc. *Notizbl. Berl. Dahlem.* 13 : 220-225.
- CEL 14 Loesener, T. 1937
 Celastraceae novae etc. *Notizbl. Berl. Dahlem.* 13 : 563-564.
- CEL 15 Rehder, A. & Wilson, E. H. 1915
 Celastraceae. *In* : Sarg., *Pl. Wils.* 2 : 346-359.
- CEL 16 Sareen, T. S., Khosla, P. K. & Mehra, P. N. 1974
 Meiotic studies in Himalayan Celastraceae and Rhamnaceae. *Cytologia* 39(2) : 335-339. Chrom. nos.
- CEL 17 Siddiqu, M. A. 1977
 Celastraceae. *Fl. W. Pakistan* No. 119 : 1-15. 4 genera, Key.
- CEL 18 Wang, Chen-hua 1936
 The studies of Chinese Celastraceae. *Chin. Journ. Bot.* 1(1) : 35-68, pl. 7.
- Bhesa** Buch.-Ham. ex Arn.
- CEL 19 Hou, Ding 1958
 A conspectus of the genus *Bhesa* (Celastraceae). *Blumea*

Suppl. 4 : 149-153. Correct name for *Kurrimia* ; Key to spp. distr., notes, ecol.

Cassine Linn.

CEL 20 Lobreau-Callen, D. 1975

Deux genres de Celastraceae, *Cassine* L. et *Maytenus* Mol. revus a la lumiere de la palynologie. *Adansonia* 15(2) : 215-223, 1 tab., 3 pl. Taxonomic discussion ; *Cassine diocca* (Griseb) Lobreau-Callen = *Elaeodendron dioccum* Griseb ; *Cassine paniculata* (Wt. & Arn.) Lobreau-Callen = *Elaeodendron paniculatum* Wt. & Arn.

Catha Forsk. ex Scop.

CEL 21 Getahun, A. & Krikorian, A. D. 1973

Chat : Coffee's rival from Harar, Ethiopia : 1. Botany, cultivation and use. *Econ. Bot.* 27(A) : 353-377. *Catha edulis*, illust.

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CEL 22 Basu, N. K. & Pabrai, P. R. 1946

A chemical investigation of *Celastrus paniculata* Willd. *Journ. Amer. Pharm. Assoc. Sci. Ed.* 35 : 272-273.

CEL 23 Hou, Ding 1955

A revision of the genus *Celastrus*. *Ann. Missouri Bot. Gard.* 42 : 215-302. f. 1-14, text maps 1-4.

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The genus *Celastrus*. *Gard. Chron.* III, 90 : 196, 1 pl.

Euonymus Linn.

CEL 25 Andre, E. 1833

Les varietes de l' *Euonymus japonicus*. *Rev. Hort. (Paris)* 1883 : 233-237. Cultivars, notes.

CEL 26 Blakelock, R. A. 1948

Euonymus frigidus Wall. and its allies. *Kew Bull.* 1948 : 237-244. 1 fig. A systematic treatment.

- CEL 27 Blakelock, R. A. 1951
A synopsis of the genus *Euonymus* L. *Kew Bull.* 1951 : 210-290, fig. i-iv.
- CEL 28 Hemsley, W. B. 1876
Spindle trees. *Garden* 9 : 213-215. General notes.
- CEL 29 Ishikura, N. 1971
Anthocyanin pattern in the genera *Ilex* and *Euonymus*. *Phytochemistry* 10(10) : 2513-2517.
- CEL 30 Lawrence, G. H. M. 1955
Euonymus europaea, *E. hamiltoniana* and relatives. *Baileya* 3 : 113-114. Key to varieties of *E. hamiltoniana*.
- CEL 31 Leonova, T. G. 1960
A contribution to the knowledge of the genus *Euonymus* L. *Bot. Zhur.* 45 : 750-758. A new classification is proposed different from that of Blakelock's.
- CEL 32 Nakai, T. 1941
Subdivisions of the genus *Euonymus*. *Journ. Jap. Bot.* 17 : 615-619.
- CEL 33 Nath, J. & Clay, S. N. (1972) 1973
Cytogenetic studies on some species of *Euonymus*. *Caryologia* 25(4) : 417-427.
- CEL 34 Sprague, T. A. 1908
The prickly fruited species of *Euonymus*. *Kew Bull. Misc. Inf.* 1908 : 29-36. Key, descr., 12 spp.
- CEL 35 Sprague, T. A. 1928
The correct spelling of certain generic names 6. *Euonymus* or *Evonymus*. *Kew Bull.* 1928 : 294-296.
- CEL 36 Stapf, O. & Ballard, F. 1929
Euonymus grandiflorus, f. *salicifolia*. *Curtis's Bot. Mag* 153 : pl. 9183. Native of India & S. China.

Gymnosporia (Wt. & Arn.) Benth. &
Hook. f.
(Refer *Maytenus*)

- CEL 37 Venkata Reddi, B. (1966) 1967
Gymnosporia puberula and *G. konkanensis* of Talbot.
Bull. Bot. Surv. India 8 : 201. Discussion.

Glyptopetalum Thw.

- CEL 38 Prain, D. 1891
Noviciae Indicae 4. Two additional species of *Glyptopetalum*.
Journ. Asiat. Soc. Bengal 60 : 206-210.

Lophopetalum Wt. & Arn.

- CEL 39 Jansen, W. T. & Baas, P. 1973
Comparative leaf-anatomy of *Kokoona* and *Lophopetalum* (Celastraceae).
Blumea 21 : 153-178.

Maytenus Molina.

[In Indian floras, this genus goes under the name of *Gymnosporia* (Wt. & Arn.) Benth. & Hook. f.]

- CEL 40 Bennet, S. S. R. & Sahni, K. C. 1977
Nomenclatural notes on three celastraceous species from India.
Indian Forester 103(6) : 387-388.
- CEL 41 Raju, D. C. S. & Babu, C. R. (1968) 1969
Some new names and new combinations in the genus *Maytenus* Molina. (Celastraceae).
Bull. Bot. Surv. India 10 : 348-349.

Microtropis Wall. ex Meisn.

- CEL 42 Merrill, E. D. & Freeman, F. L. 1940
The old World species of the celastraceous genus *Microtropis* Wallich.
Proc. Amer. Acad. 73 : 271-310. A revision.

GENERAL

- CEL 43 Lawson, M. A. 1875
 Celastrineae. *In* : Hooker, J. D. *ed.*, *Fl. Brit. India* 1 : 606-629.
- CEL 44 Lobreau-Callen, D. 1975
 Les pollens colpes dans les Celastrales : interpretation nouvelle d l'aperture simple. *C. R. Acad. Sci. Paris* 280, ser. D. : 2547-2550.
- CEL 45 Lobreau-Callen, D. 1977
 Les pollens des Celastrales illustrations, Commentaires. *E. P. H. E., Memoires et Travaux de l'Institut de Montpellier* 3, 1-73, 43 tab.
- CEL 46 Lobreau-Callen, D. 1978
 New interpretation of the variation of the exine structure of simple apertured pollen grains in the Celastrales. *IV. Int. Palynol. Conf. Lucknow (1976-1977)* 1 : 185-188.

CERATOPHYLLACEAE

The Ceratophyllaceae is a cosmopolitan monogeneric family with about ten species.

The family Ceratophyllaceae is included in the order Nymphaeales by Cronquist, Thorne, Takhtajan and Dahlgren. While Engler considered it under the order Ranunculales, Hutchinson treated the family under Ranales. Bentham & Hooker treated it under "Anomalous family" without indicating its systematic position.

The Ceratophyllaceae is a family of aquatic herbs and is readily distinguished by the whorled leaves with 3 to 10 leaves at each node, by the unisexual flowers, solitary in the axil of one leaf in each whorl, stem never developing more than one branch at a node. The flower consists of 8 to 12 linear perianth segments, male flowers with 12-16 stamens and female flowers with 1-carpelled superior ovary with single pendulous ovule.

The adaptation for cross pollination under water in the genus *Ceratophyllum* is quite characteristic. The anthers break off and

with the aid of a float at the top of the theca, they float through water till they establish on a stigma of another flower of *Ceratophyllum* which is quite interesting. The family is specialised and the reduction is due to its aquatic habitat. It is generally considered that the Ceratophyllaceae is allied to Nymphaeaceae.

The families Ceratophyllaceae, Cabombaceae and Nymphaeaceae belong to the order Nymphaeales and they lack benzyloquinoline alkaloids, while in the family Nelumbonaceae benzyloquinoline alkaloids are present. From the genus *Cabomba* which has a simple trimerous flower, there are two lines of evolution: one line towards large number of floral parts as in the family Nymphaeaceae, while in the other line, there is reduction in the floral parts, reduction from bisexual to unisexual flowers, reduction of carpel to one, dissection of leaves and loss of stomata and apertures of pollen grains.

The family is represented in India by the single genus *Ceratophyllum*.

For recent taxonomic revisions refer van Steenis (1949).

GENERAL

- CTP 1 Aziz, K. 1974
Ceratophyllaceae. *Fl. W. Pakistan* No. 70. 1-6.
- CTP 2 Steenis, C. G. G. J. van 1949
Ceratophyllaceae. In: van Steenis, *Fl. Males.* I, 4: 41-42, fig. 1.
- CTP 3 Wood, Carroll, E. Jr. 1959
The genera of Nymphaeaceae and Ceratophyllaceae in the south-eastern United States. *Journ. Arn. Arb.* 40: 94-112.

Ceratophyllum Linn.

- CTP 4 Gluck, H. 1906
Biologische und Morphologische Untersuchungen über Wasser-und Sumpfgewächse 2. pp. xvii+256, tab. 6. Jena.
- CTP 5 Jones, E. N. 1931
The morphology and biology of *Ceratophyllum demersum*. *Univ. Iowa Stud. Bot.* 13: 11-46.

- CTP 6 Muenscher, W. C. 1940
Fruits and seedlings of *Ceratophyllum*. *Amer. Journ. Bot.* 27 : 231-233.
- CTP 7 Pearl, R. 1907
Variation and differentiation in *Ceratophyllum*. *Carnegie Inst. Washington Publ.* 58.
- CTP 8 Spiengin, A. A. 1903
[Sur le genre *Ceratophyllum*]. *Trudy Obshch. Ispytat. Prir. Khar'kof Univ.* 37 : 309-318, 1 pl. A systematic treatment in Russian.

ADDITION : GENERAL

- CTP 9 Hooker, J. D. 1888
Ceratophylleae. In : Hooker, J. D. ed., *Fl. Brit. India* 5 : 639-640.

CHAILLETIACEAE-refer DICHAPETALACEAE

CHENOPODIACEAE

A family of mostly halophytes, Chenopodiaceae comprises about 102 genera and 1400 species and it includes economic important plants like Sugar beet (*Beta vulgaris*) which supplies about 40% of world's sugar output, Spinach (*Spinacia oleracea*), Palong-sag (*Beta vulgaris* var. *orientalis*), Quinoa (*Chenopodium quinoa*) and ornamental plants like Summer cypress (*Kochia scoparia*, *K. trichophylla*) cultivated in gardens.

The family Chenopodiaceae is placed in the order Caryophyllales by Cronquist, Takhtajan and Dahlgren. Hutchinson and Thorne included the family in the order Chenopodiales, Engler in the order Centrospermae and Bentham & Hooker in the order Curvembryae.

The family Chenopodiaceae together with its closely allied family Amaranthaceae represent the core of the order Centrospermales having curved embryo surrounding the food storage tissue, presence of betalain pigments, basal or free-central placentation

and anomalous secondary thickening. The family Chenopodiaceae is differentiated from the Amaranthaceae by the presence of non scarious perianth and mostly free filaments ; whereas in the Amaranthaceae the perianth is scarious and the filaments are mostly connate below.

Ulbrich (1934) classified the family into two groups : *Cyclolobeae* (i.e.) having ring-shaped or semicircular embryo and *Spirolobeae* (i.e.) having spirally twisted embryo. Following subfamilies are recognised under Cyclolobeae : Polynemoideae, Betoideae, Chenopodioideae, Corispermoideae, Salicornioideae. Following subfamilies are recognised under Spirolobeae : Sarcobatoideae, Suaedoideae, Salsoloideae.

The presence of betalains (which are structurally different from the anthocyanins) in the family Chenopodiaceae, is a core characteristic of the order Caryophyllales (Centrospermales). The flavonoid chemistry (Young, 1981) of Chenopodiaceae is allied to the Dilleniiflorae and Malviflorae than to Magnoliiflorae. According to Hartley & Harris (1981), ferulic acid is present in the cell walls of the ten families investigated in Chenopodiales and this feature is not seen in any other orders including Polygonales and Plumbaginales.

In India the following genera constitute its chenopodiaceous flora : *Acroglochis*, *Anabasis*, *Arthrocnemum*, *Atriplex*, *Axyris*, *Beta*, *Chenopodium*, *Halocharis*, *Halostachys*, *Haloxylon*, *Hammada*, *Kochia*, *Microgynoecium*, *Salicornia*, *Salsola*, *Spinacia*, *Suaeda*.

For recent taxonomic revisions and classifications refer Blackwell (1977), Iljin (1936), Scott (1975), Williams & Ford Lloyd (1974) ; for chemotaxonomy refer Mears (1974), Piattelli & Imperato (1971) ; for palynology refer Nair (1966), Nowicke (1976), Tsukada (1967).

GENERAL

- CHN 1 Backer, C. A. 1949
Chenopodiaceae. In : van Steenis, *Fl. Males.* I, 4 : 99-100, 1 fig.
- CHN 2 Blackwell, W. H. Jr. 1977
The subfamilies of the Chenopodiaceae. *Taxon* 26(4) :

395-397. Two subfamilies *Salsoloideae* and *Chenopodioideae* are recognised.

- CHN 3 Bunge, A. 1880
Pflanzen-geographische Betrachtungen über die Familie der Chenopodiaceen. *Mem. Acad. Sci. St. Petersb.* 27(8) : 1-36.
- CHN 4 Hall, H. M. & Clements, F. E. 1923
The phylogenetic method in taxonomy. The genus *Atriplex*. *Carnegie Inst. Wash. Pub.* 326 : 235-346.
- CHN 5 Iljin, M. 1936
Chenopodiaceae. In : V. L. Komarov & B. K. Schischkin, *Fl. USSR* 6 : 2-354.
- CHN 6 Mears, J. A. (1973) 1974
Chemical constituents and systematics of Amentiferae. *Brittonia* 25(4) : 385-394.
- CHN 7 Monoszon, M. Ch. 1954
[On the resemblance and differences in the pollen of the genera *Arthrophytum* Schrenk, *Hammada* Iljin, *Haloxylon* Bunge and *Anabasis* L.]. *Pustyni SSSR i Osvoenie* 2 : 746-749. f. 1-10. In Russian ; systematics of the family Chenopodiaceae.
- CHN 8 Moquin, A. 1831
Memoires sur la famille des Chenopodees. *Ann. Sci. Nat.* 23 : 274-325.
- CHN 9 Moquin-Tandon, A. 1835
Conspectus Generum Chenopodearum (Atriplicearum Juss. et Chenopodearum DC. Gen.). *Ann. Sci. Nat. ser.* 2, 4 : 209-218.
- CHN 10 Moquin-Tandon, A. 1840
Chenopodearum Monographica Enumeratio pp xi + 168. Paris.

- CHN 11 Moquin-Tandon, A. 1849
Salsolaceae. *In* : DC., *Prodr.* 13(2) : 41-219. Monographic.
- CHN 12 Nair, P. K. K. 1966
Pollen morphology of Indian Chenopodiaceae. *Palynological Bull. Lucknow*, II & III : 50-56.
- CHN 13 Nasser, M. M., Sahrigy, M. A. & Rakha, F. A. 1973
Karyotype analysis of three chenopodial species. *Alexandria Journ. Agric. Res.* 21(2) : 255-260. Chrom. nos.
- CHN 14 Nowicke, J. M. (1975) 1976
Pollen morphology in the order Centrospermae. *Grana* 15(1-3) : 51-77.
- CHN 15 Piattelli, M. & Imperato, F. 1971
Betocyanins of some Chenopodiaceae. *Phytochemistry* 10(12) : 3133-3134.
- CHN 16 Scott, A. J. 1975
The systematics of the Chenopodiaceae. *Unpublished thesis. University of Birmingham.*
- CHN 17 Stern, W. L. (1973) 1974
Development of the amentiferous concept. *Brittonia* 25(4) : 316-333.
- CHN 18 Stone, D. E. (1973) 1974
Patterns in the evolution of amentiferous fruits. *Brittonia* 25(4) : 371-384.
- CHN 19 Tsukada, M. 1967
Chenopod and Amaranth pollen. Electron-microscopic identification. *Science* 157(3784) : 80-82.
- CHN 20 Ulbrich, E. 1934
Chenopodiaceae. *In* : Engler & Prantl, *Pflanzenf.* 16C : 379-584.

- CHN 21 Williams, J. T. & Ford Lloyd, B. V. 1974
The systematics of the Chenopodiaceae. *Taxon* 23(2-3) : 353-354.
- CHN 22 Wolfe, J. A. (1973) 1974
Floral forms of Amentiferae. *Brittonia* 25(4) : 334-355.
- CHN 23 Zappettini, G. 1953
The taxonomy of *Halogeton glomeratus*. *Amer. Midl. Nat.* 50 : 238-247, fig. 1, 2. Includes treatment of allied species and key.

Atriplex Linn.

- CHN 24 Aellen, P. 1939
Die Atriplex—Arten des Orients. *Bot. Jahrb. Syst.* 70 : 1-66.
- CHN 25 Tawakley, M. & Tandon, S. L. 1974
Cytotaxonomic studies of some *Atriplex* species. *Acta Bot. Indica* 2(1) : 17-22.

Beta Linn.

(Refer also CHN 52)

- CHN 26 Aellen, P. 1938
Die Orientalischen *Beta*-Arten. *Ber. Schweiz Bot. Ges.* 48 : 470-484.
- CHN 27 Basu, R. K. & Mukherjee, K. K. 1975
Investigations on a new *Beta* (Chenopodiaceae). *Canad. Journ. Bot.* 53(12) : 1166-1175. *Beta palonga* R. K. Basu & K. K. Mukherjee, *Chrom. nos.*
- CHN 28 Fellenberg, G. 1965
Untersuchungen über Keimporenzahlen an Pollenkörnern der Gattung *Beta*. *Flora B. Dtsch.* 156(1) : 1-7.
- CHN 29 Ford-Lloyd, B. V. & Williams, J. T. 1975
A revision of *Beta* section *vulgares* with new light on

the origin of cultivated beets. *Journ. Linn. Soc. (Bot.)* 71 : 89-102.

- CHN 30 Krassochkin, V. N. 1971
Beta (Tourn.) L. In : P. M. Zhukovsky (ed.), *Flora of cultivated plants* 19 : 27-31. Leningrad. Pub. House, Kolos.
- CHN 31 Nath, P. & Purohit, S. P. 1970
 Studies on pollen morphology and physiology in spinach beet (*Beta vulgaris* var. *benghalensis* Hort.). *Journ. Palynol. Lucknow* 5 : 111-121.
- CHN 32 Nayar, M. P. & Ramamurthy, K. 1977
Beta vulgaris var. *orientalis*, a useful green vegetable of northern India. *Econ. Bot.* 31 : 372-373.
- CHN 33 Zossimovitch, V. P. 1939
 Evolution of cultivated beet *B. vulgaris*. *Dokl. Acad. Sci. USSR.* 24 : 73-76.

Chenopodium Linn.

(Refer also CHN 53, CHN 54 & CHN 55)

- CHN 34 Andrews, J. H. Mc. & Swanson, A. R. 1967
 The pore number of periporate pollen with special reference to *Chenopodium*. *Rev. Palaeobot. Palynol.* 3 : 105-117.
- CHN 35 Beauge, A. 1974
Chenopodium album et especes affines i-xxii, 1-447. Paris. *Chenopodium album* species complex studied in detail.
- CHN 36 Scott, A. J. 1978
 A review of the classification of *Chenopodium* and related genera (Chenopodiaceae). *Bot. Jahrb.* 100(2) : 205-220. Key is presented.

Hammada Iljin.

- CHN 37 Monoszon, M. Ch. 1954
 Similarity and difference between pollen of *Arthrophytum* Schrenk, *Hammada* Iljin, *Haloxylon* Bunge and *Anabasis* L. *Pustyni SSSR i Osvoenie* 2 : 746-749. In Russian.

Kochia Roth

- CHN 38 Aellen, P. 1954
Kochia Roth. *Mitt. Basle Bot. Ges.* 2, 4-16.

Salicornia Linn.

- CHN 39 Ball, P. W. 1964
 A taxonomic review of *Salicornia* in Europe. *Fedde Rep.* 69 : 1-8.
- CHN 40 Mc Cann, C. 1952
 Notes on the genus *Salicornia* Linn. *Journ. Bombay Nat. Hist. Soc.* 50(4) : 870.
- CHN 41 Ungern-Sternberg, F. 1866
Versuch einer Systematik der Salicornieen i-xiv, 1-114. Dorpat.
- CHN 42 Ungern-Sternberg, F. (1874) 1876
Salicorniearum synopsis. Atti Congr. Int. Bot. Firenze 1874 : 259-343. Monograph. Revisions of *Salicornia* & *Arthrocnemum*.

Salsola Linn.

- CHN 43 Botschantzev, V. P. 1969
 The genus *Salsola* : a concise history of its development and dispersal. *Bot. Journ. Bot. Soc. USSR* 54 : 989-1001, 2 fig. English Summary given ; 114 spp. in 7 sections.

- CHN 44 Marschall de Biberstein, F. A. 1806
 Sur le genre *Salsola*, *Anabasis* et *Polycnemum*, *Mem. Soc. Nat. Moscow* 1 : 132-154.
- CHN 45 Marschall de Biberstein, F. A. 1812-1813
 Supplement au Tabelaue des genres *Salsola*, *Anabasis* et *Polycnemum* Contenu dans le premier volume des Memoires de la Societe. *Mem. Soc. Nat. Moscou* 4 : 3-25.

***Spinacia* Linn.**

- CHN 46 Aellen, P. 1938
 Beitrag zur Kenntnis von *Spinacia* L. *Ber. Schweiz. Bot. Ges.* 48 : 485-490.
- CHN 47 Nair, P. K. K. & Kapoor, S. K. 1973
 Comparative pollen morphology of Japanese and Indian specimens of *Spinacia oleracea* Linn. *Curr. Sci.* 42(17) : 621-622.

***Suaeda* Forsk. ex Scop.**

- CHN 48 Iljin, M. M. 1936
 [Contribution a l' Systematique du genre *Suaeda* et la tribu Suaedae]. *Sovetsk. Bot.* 1936 : 39-49, fig. 1-3. In Russian with a brief English resume.

ADDITIONS : GENERAL

- CHN 49 Carolin, R. C. 1983
 The trichomes of the Chenopodiaceae and Amaranthaceae. *Bot. Jahrb.* 103(4) : 451-466.
- CHN 50 Hartley, R. D. & Harris, P. J. 1981
 Phenolic constituents of the cell walls of dicotyledons. *Biochem. Syst. Ecol.* 9 : 189-203.
- CHN 51 Hooker, J. D. 1886
 Chenopodiaceae. In : Hooker, J. D. ed., *Fl. Brit. India* 5 : 1-21.

CHN 52 Scott, A. J. 1977

Reinstatement and revision of Salicorniaceae J. Agardh.
Bot. Journ. Linn. Soc. 75 : 357-374.

Beta Linn.

CHN 53 Burenin, V. I. & Gavrilyuk, I. P. 1982

[Taxonomy, phylogeny and provenance of the representatives of the genus *Beta* L.], *Trudy Prikl. Bot. Genet. Selek.* 72(3) : 3-12.

Chenopodium Linn.

CHN 54 Nelson, D. C. 1968

Taxonomy and origins of *Chenopodium quinoa* and *Chenopodium nuttalliae* Ph. D. thesis. Indiana University.

CHN 55 Simmonds, N. W. 1965

The grain chenopods of the tropical American highlands, *Econ. Bot.* 19 : 223-234.

CHN 56 Wilson, H. D. 1974

Experimental hybridization of the cultivated chenopods (*Chenopodium* L.) and wild relatives. *Proc. Indiana Acad. Sci. (Abstract)* 82.

CHLORANTHACEAE

The family Chloranthaceae comprises about 5 genera and 65 species occurring in tropical and subtropical regions and the species range from herbaceous to arborescent habit.

The family Chloranthaceae is included in the order Piperales by Cronquist, Engler and Hutchinson. However Takhtajan and Dahlgren placed it in the order Laurales. Thorne considered the family in the order Annonales and Bentham & Hooker in the order Micrembryae.

The family Chloranthaceae is characterised by its stipulate leaves, often fusing petiolate bases, cymose or spicate inflorescence,

absence of petals, one or three stamens, when three stamens they unite to one another and inferior unilocular ovary having one pendulous ovule. The Chloranthaceae differs from the Piperaceae in the presence of opposite stipulate leaves, united petiole bases and inferior ovary with one pendulous ovule. The family differs from the Piperaceae and the Saururaceae in having unilacunar nodes whereas in Piperaceae and Saururaceae the nodes are trilacunar or multilacunar.

In 1983 Dahlgren reviewed his earlier opinion and placed the family Chloranthaceae in the order Chloranthales. Leroy (1983) proposed the importance of the genus *Hedyosmum* (a tropical American genus of about 40 species with one aberrant species in Hainan), as the ancestral prototype of angiosperm evolution. Leroy critically evaluated the strobiloid flower of *Hedyosmum* which is considered as an ancestral prototype of dicotyledonous flower. According to Leroy (1983) "the male flower of *Hedyosmum* has been described by all authors for almost two centuries as unispermate naked and ebracteate. It is not so at all, but a flower that bears up to several hundred stamens, spirally arranged along in axis. It is an extraordinary structure in the angiosperm, precisely a gymnosperm cone. The female flower pattern is like the male one, but more reduced. There is a spectacular evolutionary trend from the common ancestor of both *Hedyosmum* and *Ascarina* (another Chloranthaceae), the latter genus being possibly insect pollinated and having male flowers 1-5 staminate". The pollen *Clavatipollenitis* which is likely to represent an angiosperm known from the early Cretaceous (110 million years) is like the pollen of *Ascarina* of the family Chloranthaceae (Muller, 1981). The vesselless wood of the genus *Sarcandra* (Swamy & Bailey, 1950), cellular endosperm formation (Wunderlich, 1959), copious endosperm and minute embryo are primitive attributes. Melville (1962, 1963), Mecuse (1972) and Burger (1977), propose the derivation of the typical angiosperm flower by the shortening of the axis and reduction of units from a chloranthaceous inflorescence.

The family is represented in India by the following genera : *Chloranthus*, *Sarcandra*.

For recent studies on morphology and taxonomy refer Swamy & Bailey (1950), Swamy (1953), Leroy (1983) ; for palynology refer

Kuprianova (1967) ; for morphology and phylogeny refer Vijaya-
raghavan (1964).

GENERAL

- CLR 1 Burger, W. C. 1977
The Piperales and the monocots : alternate hypotheses for
the origin of monocotyledonous flowers. *Bot. Rev.* 4 :
345-393.
- CLR 2 Hooker, J. D. 1886
Chloranthaceae. *In* : Hooker, J. D. *ed.*, *Fl. Brit. India* 5 :
99-101.
- CLR 3 Jacob de Cordemoy, C. 1863
Monographie du groupe des Chloranthacees. *Adansonia*
3 : 280-310.
- CLR 4 Leroy, Jean F. 1983
The origin of Angiosperms : an unrecognised ancestral
dicotyledon *Hedyosmum* (Chloranthales) with a strobiloid
flower is living today. *Taxon* 32(2) : 169-175.
- CLR 5 Kuprianova, L. A. 1967
Palynological data for the history of the Chloranthaceae.
Pollen et Spores 9(1) : 95-100.
- CLR 6 Meeuse, A. D. J. 1972
Taxonomic affinities between Piperales and Polycarpiae
and their implications in interpretative floral morpho-
logy. *Adv. Plant Morphology* 3-27.
- CLR 7 Melville, R. 1962-1963
A new theory of the angiosperm flower : I-II. *Kew Bull.*
16 : 1-50. 1962 ; *ibid.* 17 : 1-65. 1963.
- CLR 8 Muller, J. 1981
Fossil pollen records of extant angiosperms. *Bot. Rev.*
47 : 1-146.
- CLR 9 Solms-Laubach, H. 1869
Chloranthaceae. *In* : DC., *Prodr.* 16(1) : 472-485.

CLR 10 Swamy, B. G. L. 1953

The morphology and relationships of the Chloranthaceae.
Journ. Arn. Arb. 34 : 375-408, pl. 1-3, fig. 1-46.

CLR 11 Wunderlich, R. 1959

Zur Frage der phylogenie der Endospermtypen bei den Angiospermen. *Osterreich. Bot. Zeitschr.* 106 : 203-293.

Sarcandra Gardn.

CLR 12 Swamy, B. G. L. & Bailey, I. W. 1950

Sarcandra, a vesselless genus of the Chloranthaceae.
Journ. Arn. Arb. 31 : 117-129. Morphological and taxonomic studies.

CLR 13 Vijayaraghavan, M. R. 1964

Morphology and embryology of a vesselless dicotyledon—*Sarcandra irvingbaileyi* Swamy and systematic position of the Chloranthaceae. *Phytomorphology* 14 : 429-441.

CHRYSOBALANACEAE

(Refer also Rosaceae)

The family Chrysobalanaceae comprising about 10 genera and 400 species are mainly shrubby or arborescent in habit and they are distributed in tropical and subtropical regions.

The Chrysobalanaceae is included in the order Rosales by Cronquist, Dahlgren, Engler and Takhtajan. While Bentham & Hooker, Hutchinson and Thorne considered it under the family Rosaceae.

The family is characterised in having stipulate leaves with more or less zygomorphic 5-merous flowers with a gynoeceium of 2-3 carpels united by a gynobasic style or an apparently single carpel with a gynobasic style. The nature of habit, zygomorphic flowers and presence of gynobasic style is characteristic and on these features Chrysobalanaceae is separated from the family Rosaceae.

Dahlgren (1983) revised the placement of the family Chrysobalanaceae in the order Rosales and considered it in a separate order Chrysobalanales in the Myrtiliflorae. Dahlgren indicates the follow-

ing characters justifying a separate order Chrysobalanales : syncarpous pistil with a common gynobasic style, erect ovules, the more or less zygomorphic flowers, the paracytic stomata, the presence of silica and foliar sclerids, the nature of pollen grains and anatomical characters (Prance, 1970).

The family is represented in India by the genus *Atuna* (*Parinari*). The genus *Chrysobalanus* is represented by the species *C. icaco* commonly known as "Coco plum", cultivated in Kerala for its edible fruits.

GENERAL

- CHB 1 Dahlgren, R. 1983
General aspects of angiosperm evolution and macrosystematics. *Nord. Journ. Bot.* 3 : 119-149.
- CHB 2 Prance, G. T. 1968
A synopsis of Chrysobalanaceae. Oxford University Press.
- CHB 3 Prance, G. T. 1970
The genera of Chrysobalanaceae in the south-eastern United States. *Journ. Arn. Arb.* 51 : 521-528.

CIRCAEASTERACEAE

(Refer also Ranunculaceae)

Cronquist, Takhtajan and Dahlgren placed the family Circaeasteraceae in the order Ranunculales ; Hutchinson considered this in the order Berberidales. Bentham & Hooker did not recognise Circaeasteraceae in the family rank and considered it as part of the family Chloranthaceae. Thorne and Engler included it as part of the family Ranunculaceae.

The family Circaeasteraceae is represented by the monotypic genus *Circaeaster*, characterised by its herbaceous nature with leaves having dichotomous venation, reduced flowers without petals and stamens 1-3 with divergent thecae. In the Circaeasteraceae, the nodes are unilacunar, whereas in the Ranunculaceae the nodes are trilacunar or multilacunar.

Circaeaster agrestis Maxim. represents the genus *Circaeaster*, and it occurs in N. W. Himalayas.

For morphology and phylogeny refer Foster (1963, 1966, 1971) and for recent collections refer Bhattacharyya (1965).

Circaeaster Maxim.

- CIR 1 Bhattacharyya, U. C. (1964) 1965
Circaeaster agrestis Maxim. (Circaeasteraceae). A new record from North Garhwal Himalaya. *Bull. Bot. Surv. India* 6 : 297-298.
- CIR 2 Diels, L. 1932
Circaeaster, eine hochgradig reduzierte Ranunculaceae. *Beih. Bot. Centralbl.* 49. *Erganzungsh* : 55-60, fig. 1, 2. A revision.
- CIR 3 Foster, A. S. 1963
 The morphology and relationships of *Circaeaster*. *Journ. Arn. Arb.* 44(3) : 299-321, pl. 6. Justification for the monotypic family Circaeasteraceae on the basis of morphological and embryological data.
- CIR 4 Foster, A. S. 1966
 Morphology of anastomoses in the dichotomous venation of *Circaeaster*. *Amer. Journ. Bot.* 53 : 588-599.
- CIR 5 Foster, A. S. 1971
 Additional studies on the morphology of blind vein-endings in the leaf of *Circaeaster agrestis*. *Amer. Journ. Bot.* 58(3) : 263-272.
- CIR 6 Oliver, D. 1875
Circaeaster agrestis Maxim. *Hooker's Ic.* pl. IV, 4 : pl. 2366.

CLEOMACEAE-refer **CAPPARIDACEAE**

CLETHRACEAE

(Refer also Ericaceae)

The Clethraceae is a monotypic family of shrubs and trees represented by the genus *Clethra*, consisting of about 120 species occurring in Asia and America.

The family Clethraceae is included in the order Ericales by Cronquist, Dahlgren, Engler, Hutchinson and Takhtajan. While Bentham & Hooker considered it as a part of the family Ericaceae.

The family is characterised by exstipulate leaves, 5-merous flowers arranged in racemes or panicles without bracteoles, anthers bending outwards in buds opening by pores, superior 3-loculicidal ovary with numerous ovules in each locule. In the Clethraceae the pollen grains are borne singly, while in the Ericaceae the pollen grains are nearly always borne in tetrads.

The family is represented in India by the genus *Clethra*. (*Clethra monostachya* Rehder & Wilson, reported from Arunachal Pradesh, *Indian Journ. For.* 1 : 189. 1978.)

GENERAL

CLE 1 Dop, P. 1928

Les Clethracees asiatiques. *Bull. Soc. Bot. France* 75 : 729-733.

CLE 2 Giebel, K. P. & Dickison, W. C. 1976

Wood anatomy of Clethraceae. *John Elisha Mitchell Sci. Soc.* 92 : 17-26.

CLE 3 Hu, Shiu-Ying 1960

A revision of the genus *Clethra* in China. *Journ. Arn. Arb.* 41 : 164-190.

CLUSIACEAE-refer GUTTIFERAE

COCHLOSPERMACEAE

(Refer also Bixaceae)

The family Cochlospermaceae consists of 2 genera (*Cochlospermum*, *Amoreuxia*) and about 25 species occurring in the tropical regions. *Cochlospermum religiosum*, White silk cotton tree, is the source of "Kuteera gum" and is often planted in temple gardens. *C. planchonii* yields an yellow dye.

The family Cochlospermaceae is included in the order Violales by Engler and Takhtajan, in the order Bixales by Hutchinson and in the order Malvales by Dahlgren. However, Bentham & Hooker, Cronquist and Thorne did not consider it as a separate family, but included it as part of the family Bixaceae.

The family Cochlospermaceae is characterised by alternate, palmately lobed stipulate leaves, presence of numerous stamens which dehisce at the tip by pore-like slits, presence of 3 to 5-valved capsules and oily endospermous seeds. This family is allied to the Bixaceae in the nature of stamens. In the Bixaceae the leaves are unlobed, the capsules are 2-valved and seeds are granular or starchy endospermous.

The family is represented in India by the genus *Cochlospermum*.

For recent taxonomic studies refer Nicolson (1979), Poppendick (1980) and Robyns (1966).

GENERAL

- CCH 1 Keating, R. C. 1969
Comparative morphology of Cochlospermaceae I. Synopsis of the family and wood anatomy. *Phytomorphology* 18 : 379-392.
- CCH 2 Keating, R. C. (1972) 1973
The comparative morphology of the Cochlospermaceae : 3. The flower and pollen. *Ann. Missouri Bot. Gard.* 59(2) : 282-296.
- CCH 3 Pilger, R. 1925
Cochlospermaceae. In : Engler & Prantl, *Pflanzenf.* ed. 2. 21 : 316-320.
- CCH 4 Steenis, C. G. G. J. van 1949
Cochlospermaceae. In : van Steenis, *Fl. Males.* I, 4 : 61-63, fig. 1.
- CCH 5 Poppendick, H. -H. 1980
A monograph of the Cochlospermaceae. *Bot. Jahrb.* 10 : 191-265, fig. 49. Keys & distr. maps ; 12 spp.

Cochlospermum Kunth

CCH 6 Nicolson, D. H. 1979

Nomenclature of *Bombax*, *Ceiba* (Bombacaceae) and *Cochlospermum* (Cochlospermaceae) and their type species. *Taxon* 28(4) : 367-373. Proposal for retypification.

CCH 7 Robyns, A. 1966

The publication date of the genus *Cochlospermum* (Cochlospermaceae). *Ann. Missouri Bot. Gard.* 53 : 113. The year of publication is 1822 not 1824.

COMBRETACEAE

A family of trees, shrubs and lianes, with about 16 genera and 500 species, the family Combretaceae occurs in a variety of habitats throughout the tropics. Species of *Terminalia* are important timber yielding trees. The fruits of *Terminalia chebula*, *T. bellerica* and *T. arjuna* are known as myrobalans and used in tanning and in local medicine. Important ornamental species are *Combretum coccineum* from Madagascar and *Quisqualis indica*.

The family Combretaceae is included in the order Myrtales by Bentham & Hooker, Hutchinson, Cronquist and Thorne. Engler also assigned it to the same order but named the order Myrtiflorae instead of Myrtales.

The family Combretaceae is characterised by simple exstipulate leaves, flowers usually clustered in racemose inflorescence, calyx fusing with the ovary to form hypanthium, the one-loculed inferior ovary with 2-5 pendulous ovules.

Exell & Stace (1966) classified the Combretaceae into two subfamilies : Strephonematoideae and Combretoideae. The subfamily Combretoideae is further divided into tribes Combreteae and Laguncularieae.

The genus *Terminalia* is pantropical, while the genus *Combretum* occurs in tropics excepting Australasia and the Pacific islands. The mangrove genus *Lumnitzera* occurs in the three palaeotropical continents. The genus *Anogeissus* occurs in tropical Africa, Arabia, India and south-east Asia.

The family is represented in India by the following genera : *Anogeissus*, *Calycopteris* (*Getonia*), *Combretum*, *Lumnitzera*, *Quisqualis*, *Terminalia*.

For recent taxonomic studies refer Exell (1931, 1954, 1962), Exell & Stace (1972) ; for chromosome studies refer Sharma & Sarkar (1965).

GENERAL

- CMB 1 Brandis, D. 1898
Combretaceae. In : Engler & Prantl, *Pflanzenf.*, III, 7 : 106-130.
- CMB 2 Candolle, A. de 1828
Memoire sur la famille des Combretacees. *Mem. Soc. Phys. Hist. Nat. Geneve* 4 : 1-41. Discussion of family affinities.
- CMB 3 Chao, Ai-Cheng 1958
A census of the Chinese species of Combretaceae. *Acta Phytotax. Sin.* 7 : 225-252, pl. 53-59, fig. 1-5. In Chinese with English abstract.
- CMB 4 Exell, A. W. 1931
The genera of Combretaceae. *Journ. Bot. (Lond.)* 69 : 113-128.
- CMB 5 Exell, A. W. 1933
The Combretaceae of China. *Sungatsenia* 1 : 85-94, pl. 21-23. 4 genera & 12 spp. recognised.
- CMB 6 Exell, A. W. 1954
Combretaceae. In : van Steenis, *Fl. Males.* I, 4 : 533-589, fig. 1-33.
- CMB 7 Exell, A. W. 1962
Space problems arising from the conflict between two evolutionary tendencies in the Combretaceae. *Bull. Soc. Bot. Belg.* 95 : 41-49.
- CMB 8 Exell, A. W. & Stace, C. A. 1972
Patterns of distribution in the Combretaceae. In : Valen-

tine, D. H. ed., *Taxonomy, Phytogeography and Evolution*. 307-323.

- CMB 9 Graham, S. A. 1964
The genera of Rhizophoraceae and Combretaceae in the south-eastern United States. *Journ. Arn. Arb.* 45(3) : 285-301. Combretaceae 293-301 pp.
- CMB 10 Gray, J. 1960
Temperate pollen genera in the Eocene (Claiborne) flora, Alabama, *Science* 132 : 808-810. Fossil pollen grain of Combretaceae.
- CMB 11 Heiden, H. 1893
Anatomische Charakteristik der Combretaceen. *Bot. Centralbl.* 55 : 353-360, 385-391 ; 56 : 1-12, 65-75, 129-136, 163-170, 193-200, 225-230.
- CMB 12 Lefe'vre, G. R. 1905
Contribution a' l'etude anatomique et pharmacologique des Combretacees. 126 pp. Paris.
- CMB 13 Mehra, P. N. & Khosla, P. K. 1972
Cytogenetical studies of E. Himalayan Hamamelidaceae, Combretaceae and Myrtaceae. *Silvae Genet.* 21(5) : 186-190. Chrom. nos.
- CMB 14 Sharma, A. K. & Sarkar, A. K. 1965
Chromosome study on different genera of Combretaceae. *Journ. Ind. Agricult.* 9 : 100-106.
- CMB 15 Stooten, D. F. van 1924
The Combretaceae of the Dutch East Indies. *Bull. Jard. Bot. Btzg.* III, 6 : 11-64.
- CMB 16 Solereder, H. 1885
Zur Anatomie und Systematik der Combretaceen. *Bot. Centralbl.* 23 : 161-166.
- CMB 17 Stace, C. A. 1965
The significance of the leaf epidermis in the taxonomy of the Combretaceae I. A general review of tribal, gene-

ric and specific characters. *Journ. Linn. Soc. Bot.* 59 : 229-252.

Anogeissus Wall. ex Guillem. & Perr.

- CMB 18 Brandis, D. 1899
The Indian species of *Anogeissus*. *Indian Forester* 25 : 286-287.
- CMB 19 Gagnepain, F. 1916
Un genre nouveau de Combretacees voisin de *Anogeissus* Wall. *Phanerogamie* 3 : 276-280.
- CMB 20 Scott, A. J. 1979
A revision of *Anogeissus* (Combretaceae). *Kew Bull.* 33 : 555-566. Key to 8 spp.

Calycopteris Lamk.

- CMB 21 Hate, V. N. 1911
A note on *Calycopteris floribunda*. *Journ. Bombay Nat. Hist. Soc.* 20 : 837-840.

Combretum Loeffl.

- CMB 22 Stace, C. A. 1973
The significance of the leaf epidermis in the taxonomy of the Combretaceae IV. The genus *Combretum* in Asia. *Bot. Journ. Linn. Soc.* 66 : 97-115, 74 fig.

Lumnitzera Willd.

- CMB 23 Van Slooten, D. F. 1937
Die Verbreitung von *Lumnitzera* und einigen anderen Mangrovege-wachsen. *Blumea Suppl.* 1 : 162-175, fig. 1, 2.

Quisqualis Linn.

- CMB 24 Exell, A. W. & Stace, C. A. 1964
A reorganization of the genus *Quisqualis*. *Bol. Soc. Brot. ser. II.* 38 : 139-143.

Terminalia Linn.

- CMB 25 Blatter, E. 1929
The Indian species of *Terminalia* Linn. *Journ. Indian Bot. Soc.* 8 : 245-262.
- CMB 26 Kadambi, K. 1956
Terminalia paniculata (Roth) W. & A., its silviculture and management 1-14, fig. 2. Manager of Publications, Delhi.
- CMB 27 Parkinson, C. E. 1936
On some little known and confused Indian Terminalias. *Indian Forester* 62 : 406-409.
- CMB 28 Parkinson, C. E. 1937
Indian Terminalias of the section Pentiaptera. *Indian For. Rec.* 1(1) : 1-27, t. 1-3.
- CMB 29 Phatak, V. G. & Oza, G. M. 1960
4-winged fruit of *Terminalia crenulata* Roth. *Curr. Sci.* 29 : 25, fig. 1.
- CMB 30 Peixoto, A. R. 1959
Tropical almond *Terminalia* : Fruit, oil and tanning. *Bol. Agri. Minas Gerais Dep. Prod. Veg.* 8 : 69-71. In Portuguese.

ADDITIONS : GENERAL

- CMB 31 Clarke, C. B. 1878
Combretaceae. In : Hooker, J. D. ed., *Fl. Brit. India* 2 : 443-461.
- CMB 32 Gill, B. S., Bir, S. S. & Singhal, V. K. 1982
Cytogenetics of some timber species of *Terminalia* Linn. (Combretaceae). *Proc. Indian Natn. Sci. Acad.* 48B : 779-790.

COMMELINACEAE

A family of herbs occurring in tropical or subtropical regions, the Commelinaceae comprises about 38 genera and 500 species. Several species of *Commelina*, *Tradescantia* are cultivated as indoor house plants. *Zebrina pendula* commonly known as "Wandering Jew" having silvery striped leaves and *Rhoeo spathacea* with reddish leaf undersurface are often cultivated as foliage ornamental plants.

The family Commelinaceae is included in the order Commelinales by Cronquist, Dahlgren, Engler, Hutchinson, Takhtajan and Thorne and in the order Coronarieae by Bentham & Hooker.

The family Commelinaceae is characterised by sheathing leaves, flowers usually in cincinnus inflorescence or when solitary subtended by a boat-shaped spathe, stamens typically 3 + 3, sometimes reduced to staminodes, filaments provided with brightly coloured hairs, ovary superior of 3 united carpels and seeds often arillate with copious endosperm. The presence of calcium oxalate crystals in the tissues is characteristic.

The Commelinaceae is usually divided into the following tribes: Tradescantieae and Commelineae. Hutchinson separated Cartonemataceae from the family Commelinaceae. The Commelinales of Hutchinson comprises the natural grouping of Cartonemataceae, Commelinaceae, Flagellariaceae and Mayacaceae. The family Commelinaceae shows relationship with Flagellariaceae and Mayacaceae in the nature of sheathing leaves, flowers with distinct biseriate perianth constituting sepals and petals, superior fused ovary and seeds with copious endosperm.

On the basis of karyotype analysis, Sharma (1955) considers that the evolution of *Commelina*, *Cyanotis* and *Murdannia* have proceeded on parallel lines from an ancestral stock with four chromosomes. It is considered by Sharma (1971) that there are two series of chromosome numbers, one starting with six and the other with 10 chromosomes. There is high degree of polyploidy and aneuploidy noted in the series with 10 chromosomes. In the Commelinaceae asexual reproduction is frequent. According to Sharma (1979) that "asexual reproduction has resulted in the accumulation of somatic mutations due to diminished pressure of selection and

consequently in the origin of cytotypes which aids in the origin of new species".

The family is represented in India by the following genera : *Amischophacelus*, *Amischotolype*, *Aneilema*, *Belosynapsis*, *Commelina*, *Cyanotis*, *Floscopa*, *Murdannia*, *Pollia*, *Streptolirion*.

Several species of the following genera are cultivated in gardens as ornamental plants : *Rhoeo*, *Tradescantia*, *Zebrina*.

For recent taxonomic revisions and classifications refer Brenan (1961, 1966), Kammathy & Rao (1962, 1965), Pichon (1946), Rao (1964, 1966), Rao & Kammathy (1962) ; for cytology and cytotaxonomy refer Bhattacharya (1975), Faden (1980), Jones & Jopling (1972), Raghavan & Rao (1961, 1965), Rao *et al.* (1972), Sharma (1955), Sharma & Sharma (1958), Shetty & Subramanyam (1962) ; for anatomical data on the classification refer Tomlinson (1966).

GENERAL

- CMM 1 Barnes, E. 1946
Some observations on South Indian Commelinas : two new species of *Commelina* from South India. *Journ. Bombay Nat. Hist. Soc.* 46 : 70-89.
- CMM 2 Bhattacharya, B. 1975
Cytological studies on some Indian members of Commelinaceae. *Cytologia* 40(2) : 285-299.
- CMM 3 Brenan, J. P. M. 1952
Notes on African Commelinaceae. *Kew Bull.* 7 : 179-208. Includes *Murdannia nudiflora* n. comb.
- CMM 4 Brenan, J. P. M. 1961
Notes on African Commelinaceae III. *Kew Bull.* 15 : 207-228.
- CMM 5 Brenan, J. P. M. 1966
The classification of Commelinaceae. *Journ. Linn. Soc. (Bot.)* 59 : 349-370, fig. 49. Taxonomic discussions, key to generic groups. Author feels "evidence at present is insufficient to segregate *Zygomenes* Salisb. from *Cyanotis* as proposed by Rao, R. S., *Notes Roy. Bot. Gard. Edinb.* 25 : 187.1964.

- CMM 6 Bruickner, G. 1926
Beitrage Zur Anatomie Morphologie und Systematik der Commelinaceae. *Bot. Jahrb. Engler* 61 : *Beibl.* 137 : 1-70, pl. 1-7. Deals with keys to subfamilies, tribes and genera.
- CMM 7 Bruickner, G. 1927
Zur spezillen Systematik der Commelinaceae. *Notizbl. Bot. Gart. Berlin* 10 : 55-61.
- CMM 8 Bruickner, G. 1930
Commelinaceae. In : Engler & Prantl, *Pflanzenf. ed.* 2, 15a : 159-181, fig. 55-66.
- CMM 9 Caius, J. F. 1937
The medicinal spiderworts of India. *Journ. Bombay Nat. Hist. Soc.* 39 : 361-365. Includes keys to Commelinaceae.
- CMM 10 Clarke, C. B. 1881
Commelinaceae. In : De Candolle, *Monogr. Phan.* 3 : 113-324.
- CMM 11 Clarke, C. B. 1881
Notes on Commelinaceae. *Journ. Bot.* 19 : 193-202.
- CMM 12 De-Yuang, Hong 1974
Revisio Commelinacearum sinicarum. *Acta Phytotax. Sin.* 12(4) : 459-483, t. 4, pl. 3. Revision in Chinese ; citations and new taxa in English & Latin; Keys to genera and spp.
- CMM 13 Faden, R. B. 1980
Cytotaxonomy of Commelinaceae : Chromosome numbers of some African and Asiatic species. *Bot. Journ. Linn. Soc.* 81 : 301-302, 31 fig.
- CMM 14 Hasskarl, J. C. 1866
Sur les Commelinacees. *Bull. Congr. Internat. Bot. Hort. Amsterdam* 1865 : 90-107. Keys to genera.
- CMM 15 Hasskarl, J. C. 1870
Commelinaceae Indicae, imprimis Archipelagi Indici adjectis nonnullis hisce terris alienis 1-182.

- CMM 16 Jones, B. & Jopling, C. 1972
Chromosomes and the classification of the Commelinaceae. *Bot. Journ. Linn. Soc.* 65 : 129-162.
- CMM 17 Kammathy, R. V. & Rao, R. S. (1961) 1962
Notes on Indian Commelinaceae-3 : Cytological observations. *Bull. Bot. Surv. India* 3 : 393-394, pl. 1, tab. 1. 3 new comb.
- CMM 18 Kammathy, R. V. & Rao, R. S. (1961) 1962
Notes on Indian Commelinaceae-2. Cytological observations. *Bull. Bot. Surv. India* 3 : 167-169, pl. 1, tab. 1. 2 comb. nov. & 1 nom. nov.
- CMM 19 Kammathy, R. V. & Rao, R. S. (1964) 1965
Notes on Indian Commelinaceae-4 : Cytotaxonomic observation. *Bull. Bot. Surv. India* 6 : 1-6, tab. 1, pl. 1.
- CMM 20 Mitra, J. N. 1952
Review and revision of Commelinaceae of Eastern India. *Bull. Bot. Soc. Beng.* 6 : 63-70.
- CMM 21 Panigrahi, G. 1975
Notes on certain taxa of the Commelinaceae of Asia. *Phytologia* 29(5) : 337-338. 5 new combs. through recognition of the genera *Dictyospermum* and *Tricarpelema*.
- CMM 22 Pichon, M. 1946
Sur les Commelinacees. *Not. Syst. (Paris)* 12 : 217-242. Critical notes and keys to genera.
- CMM 23 Qaiser, M. & Jafri, S. M. H. 1975
Commelinaceae. *Fl. W. Pakistan* No. 84 : 1-14.
- CMM 24 Raghavan, R. S. & Rao, R. S. 1961
Cytological observations on the Indian species of Commelinaceae. *Curr. Sci.* 30 : 310-311, fig. 6, tab. 1.
- CMM 25 Raghavan, R. S. & Rao, R. S. 1965
Notes on Indian Commelinaceae IV. Cytological observations. *The Nucleus* 8 : 39-44.

- CMM 26 Rao, R. S. 1964
 Indian species of Commelinaceae—Miscellaneous notes.
Notes Roy. Bot. Gard. Edinb. 25 : 179-189.
- CMM 27 Rao, R. S. 1966
 Indian species of Commelinaceae. Miscellaneous notes-2.
Blumea 14 : 345-354, fig. 1, tab. 1. Nomencl. & distr.,
 notes on 12 spp.
- CMM 28 Rao, R. S. 1971
 Notes on Indian Commelinaceae. Nomenclature and dis-
 tribution. *M. V. M. Patrika* 6 : 52-55. 1 *comb. nov.*,
 nomencl. notes.
- CMM 29 Rao, R. S. & Kammathy, R. V. 1962
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Hist. Soc. 59 : 58-70, pl. 3, tab. 3. Distr., loc., taxonomic
 discussions.
- CMM 30 Rao, R. S., Kammathy, R. V. & Raghavan, R. S. 1968
 Cytotaxonomic studies on Indian Commelinaceae : a
 review. *Journ. Linn. Soc. Bot.* 60 : 357-380.
- CMM 31 Rao, R. S., Raghavan, R. S. & Kammathy, R. V. (1970)
 1972
 Biosystematic studies on Indian Commelinaceae, the
 chromosome pattern and evolutionary trends. *Bull. Bot.*
Surv. India 12 : 242-254. Review.
- CMM 32 Sharma, A. K. 1955
 Cytology of some members of Commelinaceae and its
 bearing on the interpretation of phylogeny. *Genetica* 27 :
 323-363.
- CMM 33 Sharma, A. 1971
 Chromosome evolution in Commelinaceae from Eastern
 India. *Journ. Cytol. Genet. (Suppl.)* : 19-25.
- CMM 34 Sharma, A. K. & Sharma, A. 1958
 Further investigations on cytology of members of Comme-

linaceae with special reference to the role of polyploidy and the origin of ecotypes. *Journ. Genet.* 56 : 63-84.

- CMM 35 Shetty, B. V. & Subramanyam, K. 1962
Cytological studies in Commelinaceae. *The Nucleus* 5(1) : 39-50. Chrom. nos. ; discussion on the status of genera.
- CMM 36 Tomlinson, P. B. 1966
Anatomical data on the classification of Commelinaceae. *Journ. Linn. Soc. Bot.* 59 : 371-395.

Amischophacelus Rao & Kamm.

- CMM 37 Rao, R. S. & Kammathy, R. V. 1966
Notes on Indian Commelinaceae-5. *Journ. Linn. Soc. Bot.* 59 : 305-308, 6 fig. *Amischophacelus* gen. nov., descr., 2 comb. nov., *Cyanotis cerifolia* sp. nov.

Amischotolype Hassk.

- CMM 38 Rao, R. S. 1971
Notes on Indian Commelinaceae—Nomenclature and distribution. *M. V. M. Patrika* 6 : 52-55. Three new combs. under the genus *Amischotolype* Hassk. *Forrestia* A. Rich was rejected.

Anellema R. Br.

- CMM 39 Faden, R. B. 1978
Review of the lectotypification of *Anellema* R. Br. (Commelinaceae). *Taxon* 27 : 289-298.
- CMM 40 Joseph, J. & Rao, R. S. 1968
Anellema glanduliferum Joseph et Rolla Rao, a new species from NEFA. *Journ. Indian Bot. Soc.* 47 : 367-370. Allied to *A. thomsonii* C. B. Clarke.
- CMM 41 Morton, J. K. 1966
A revision of the genus *Anellema* R. Brown (Commelinaceae), with a cytotaxonomic account of the West African species. *Journ. Linn. Soc. Bot.* 59 : 431-478.

- CMM 42 Panigrahi, G. & Kammathy, R. V. 1963
Cytogenetical evolution in the genus *Aneilema* sensu lato in Eastern India. *Journ. Indian Bot. Soc. Memoir* 4 : 90-98, 1 fig., 1 table.
- CMM 43 Panigrahi, G. & Kammathy, R. V. 1963
Studies in the taxonomy and cytology of certain species of *Aneilema* sensu lato in Eastern India. *Proc. Natn. Acad. Sci. India* 33B : 491-506, fig. 1-15, 1 table.

Commelina Linn.

- CMM 44 Barnes, E. 1946
Some observations on South India Commelinas : two new species of *Commelina* from South India. *Journ. Bombay Nat. Hist. Soc.* 46(1) : 70-89.
- CMM 45 Nekrassova, V. L. 1932
[L'aire géographique et l'utilisation de *Commelina communis* L.]. *Bull. Jard. Bot. Acad. Sci. URSS* 30 : 659-668, 1 text map. In Russian with English resume, distr. of the species.
- CMM 46 Panigrahi, G. & Kammathy, R. V. 1964
Cytotaxonomic studies in certain species of *Commelina* Linn. in Eastern India. *Journ. Indian Bot. Soc.* 43 : 294-310, 19 fig., 1 pl.
- CMM 47 Pennell, F. W. 1916
Commelina communis. *Addisonia* 1 : 39-40, pl. 20.
- CMM 48 Rao, R. S. 1961
Commelina longifolia Lamk. and *C. salicifolia* Roxb. *Taxon* 10 : 253-254.
- CMM 49 Rao, R. S. 1966
Commelina undulata R. Br. *Notes Roy. Bot. Gard. Edinb.* 26 : 351-352. Nomenclature discussion.
- CMM 50 Zaman, M. A. & Ahmed, M. 1972
Cytogenetics on Commelinaceae : 1 Meiotic behaviour

and B-chromosomes in *Commelina benghalensis* L.
Bangladesh Journ. Bot. 1 : 141-148. Chrom. nos.

CMM 51 Zaman, M. A. & Begum, R. 1974

Cytogenetics of Commelinaceae : 4. Meiotic behaviour in polyploid *Commelina suffruticosa* Bl. from Bangladesh. *Bangladesh Journ. Bot.* 3(1) : 19-22.

Cyanotis D. Don

CMM 52 Jones, K. & Kukkonen, I. 1971

The comparative cytology of some *Cyanotis* species. *Journ. Indian Bot. Soc.* 50(A) : 332-339. Golden Jubilee Volume. Chrom. nos.

Floscopa Lour.

CMM 53 Zaman, M. A. & Chakraborty, B. N. 1977

Cytogenetics of Commelinaceae : 6. a new basic chromosome number of the genus *Floscopa*, *Curr. Sci.* 46(9) : 318.

Murdannia Royle

CMM 54 Brenan, J. P. M. 1962

Murdannia axillaris Brenan. *Hooker's Icon. Pl.* 36(4) : tab. 3578.

CMM 55 Faden, R. B. 1977

Aneilema ochraceum and *A. croceum* (Commelinaceae). *Kew Bull.* 32(1) : 188. *Murdannia crocea* (Griff.) Faden comb. nov. based on *Aneilema croceum* Griff.

CMM 56 Faden, R. B. 1977

The identity of *Commelina japonica* Thunb. (Commelinaceae). *Taxon* 26(1) : 142-144. *Murdannia crocea* (Griff.) Faden ; *Murdannia crocea* (Griff.) Faden subsp. *ochracea* (Dalz.) Faden based on *Aneilema ochraceum* Dalz.

CMM 57 Faden, R. B. 1980

The taxonomy and nomenclature of some Asiatic species of *Murdannia* (Commelinaceae): the identity of *Commelina medica* Lour. and *Commelina tuberosa* Lour. *Taxon* 29 : 71-83, fig. 3, tab. 1. Key, synonymy & 2 new combs.

CMM 58 Santapau, H. 1955

The genus *Murdannia* in Bombay State. *Journ. Bombay Nat. Hist. Soc.* 52 : 658.

CMM 59 Santapau, H. & Fernandes, R. R. 1954

Critical notes on the identity and nomenclature of some Bombay plants III. *Murdannia scapiflorum* (Roxb.) Royle. *Journ. Bombay Nat. Hist. Soc.* 52 : 137-141.

Streptolirion Edgew.

CMM 60 Forman, L. L. 1962

Aetheolirion, a new genus of Commelinaceae from Thailand, with notes on allied genera. *Kew Bull.* 16 : 209-222. *Aetheolirion* Forman and notes on *Streptolirion* Edgew.

Tradescantia Linn.

CMM 61 Anderson, E. & Sax, K. 1936

A cytological monograph of the American species of *Tradescantia*. *Bot. Gaz.* 97 : 433-476.

CMM 62 Darlington, C. D. 1929

Chromosome behaviour and structural hybridity in the Tradescantiae. *Journ. Genet.* 21 : 207-286.

CMM 63 Darlington, C. D. 1937

Chromosome behaviour and structural hybridity in the Tradescantiae II. *Journ. Genet.* 35 : 259-280.

ADDITIONS : GENERAL

- CMM 64 Blatter, E. 1928
New Commelinaceae from Western Ghats. *Journ. Bombay Nat. Hist. Soc.* 33 : 73-77.
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COMPOSITAE

(nom. altern. Asteraceae)

With about 920 genera and 19,000 species, the Compositae is the largest family among the Dicotyledons and it is distributed throughout the world from the Arctic wastes to the alpine meadows of mountain peaks and from arid regions to rain forests. It is considered that the family Compositae represents about 10% of the flowering plants of the world.

The family Compositae is included in the order Asterales by Bentham & Hooker, Cronquist, Dahlgren, Hutchinson, Takhtajan and Thorne. Engler considered the family in the order Campanulales.

The family Compositae is characterised by the involucrate head type of inflorescence, the usual presence of pappus which represents calyx, gamopetalous corolla, 5 syngenesious stamens, inferior uniloculate bicarpellate ovary with a single basal ovule, fruit a one-seeded indehiscent cypsela and non endospermous seeds. The presence of polysaccharide inulin instead of starch in the subterranean parts is a salient feature of the family.

The mechanism of pollination i.e., the role of floral parts first in helping cross-pollination and later in case cross-pollination fails in assuring or helping self-fertilization is an unique feature in the Compositae. The anthers are introrse and they cohere by their edges to form anther tube. In the initial stage pollen is shed into the anther tube which is presented to the visiting pollinators. Later the style with its stigma surfaces closely pressed against each other grows through the anther tube and it carries with it the pollen deposited in the anther tube. As the style finally comes out of anther

tube, the stigmas separate exposing the stigmatic surfaces to the pollinators. In case of failure of cross-pollination, the style arms recurve so that stigmas can make contact with the pollen of its own floret and thus self-fertilization is effected.

Cronquist (1955) classified the family into two sub-families Asteroideae and Lactucoideae based on the presence of latex (Lactucoideae) or usually absence of latex (Asteroideae). In the subfamily Lactucoideae all florets are ligulate and in the subfamily Asteroideae the florets of disc are not ligulate. The following tribes are recognised: Heliantheae, Astereae, Anthemideae, Arctotideae, Inuleae, Senecioneae, Calenduleae, Eupatorieae, Vernonieae, Cynareae, Mutisieae under the subfamily Asteroideae and tribe Lactuceae (Cichorieae) under the subfamily Lactucoideae.

It is considered that the Compositae may be divided into two families corresponding to Liguliflorae (subfam. Cichorioideae) and Tubiflorae (subfam. Asteroideae). Wagenitz (1975) has given phylogenetic interpretation while proposing subfamilies and tribes. Thorne (1983) has proposed two subfamilies Cichorioideae and Asteroideae. Under the subfamily Cichorioideae, the following tribes are recognised: Mutisieae, Vernoneae, Liabeae, Cichorieae, Cardueae, Echinopsideae, Eremothamneae, Arctotideae. Under the subfamily Asteroideae the following tribes are recognised: Heliantheae, Tageteae, Eupatorieae, Astereae, Inuleae, Anthemideae, Senecioneae and Calenduleae.

Mabry & Bohlmann (1977) indicated that the Compositae is chemically allied to Umbelliferae and Campanulaceae. It is seen that the Compositae and Campanulaceae synthesize polyactylene compounds and inulin-fructans (Bohlmann *et al.* 1973). Whereas the Compositae and Umbelliferae produce sesquiterpene lactones polyacetylenes, coumarins (Hegnauer, 1977). Cronquist (1981) considers that though there are close chemical similarities between the Compositae and Umbelliferae, it is absurd to align the two families as there are marked morphological differences. Whereas Dahlgren (1980) considers that besides chemical similarities there are close similarities between the Compositae and Umbelliferae embryologically and palynologically.

The family Compositae is the sole representative of the order Asterales. It is allied to Goodeniaceae, Stylidiaceae and Campanulaceae.

A family of great floral display and beauty, several species of the following genera are cultivated in gardens : Italian Aster (*Aster amellus*) ; Daisy (*Bellis perennis*) ; Black-eyed Susan (*Rudbeckia occidentalis*) ; Winking Mary-buds (*Calendula officinalis*) ; Cosmos (*Cosmos bipinnatus*), Marigolds (*Tagetes patula*) ; Zinnias (*Zinnia elegans*) ; Dahlias (*Dahlia pinnata*) ; Gaillardias (*Gaillardia aristata*) ; Senecios (*Senecio aureus*, *S. grandifolius*, *S. vulgaris*) ; Bachelor's button (*Centaurea cyanus*) ; Chrysanthemum (*Chrysanthemum leucanthemum*).

Some of the plants used in medicine are *Achillea* or fragrant Yarrow (*Achillea millefolium*) ; Tansy (*Tanacetum vulgare*) ; Eurasian wormwood (*Artemisia absinthium*) ; Dandelion (*Taraxacum officinale*) ; Chicory (*Cichorium intybus*) ; Arnica (*Arnica montana*).

Some of the vegetable and oil yielding plants are Lettuce (*Lactuca sativa*), Artichokes (*Cynara scolymus*), Niger oil (*Guizotia abyssinica*), Sunflower oil (*Helianthus annuus*).

The family is represented in India by the following genera which includes naturalized species : *Acanthospermum*, *Achillea*, *Adenocaulon*, *Adenoon*, *Adenostemma*, *Ainsliaea*, *Ageratum*, *Anaphalis*, *Antennaria*, *Anthemis*, *Arctium*, *Artemisia*, *Aster*, *Athroisma*, *Bidens*, *Blainvillea*, *Blepharispermum*, *Blumea*, *Blumeopsis*, *Brachyactis*, *Brachycome*, *Caesulia*, *Calendula*, *Carduus*, *Carpesium*, *Carthamus*, *Catamixis*, *Cavea*, *Centaurea*, *Centipeda*, *Centratherum*, *Chlamyditis*, *Chrysanthellum*, *Chrysanthemum*, *Cicerbita*, *Cirsium*, *Conyza*, *Cotula*, *Cousinia*, *Crassocephalum*, *Cremanthodium*, *Crepis*, *Cyathocline*, *Dichrocephala*, *Dicoma*, *Dolomiaea*, *Doronicum*, *Dubyaea*, *Dyssodia*, *Echinops*, *Eclipta*, *Elephantopus*, *Eleutheranthera*, *Emilia*, *Enydra*, *Epaltes*, *Epilasia*, *Erigeron*, *Ethulia*, *Eupatorium*, *Filago*, *Gerbera*, *Glossocardia*, *Glossogyne*, *Gnaphalium*, *Goniocaulon*, *Grangea*, *Guizotia*, *Gynura*, *Helichrysum*, *Hieracium*, *Hypochoeris*, *Istoga*, *Inula*, *Jurinea*, *Koelpinia*, *Lactuca*, *Lagenifera*, *Laggera*, *Lamprachaenium*, *Lapsana*, *Lasiopogon*, *Launaea*, *Leibnitzia*, *Leontopodium*, *Leucomeris*, *Matricaria*, *Mikania*, *Moonta*, *Myriactis*, *Nanothamnus*, *Notonia*, *Oligochaeta*, *Parthenium*, *Pegolettia*, *Phagnalon*, *Picris*, *Pluchea*, *Prenanthes*, *Pseudoelephantopus*, *Psychrogeton*, *Pulicaria*, *Reichardia*, *Rhagadiolus*, *Rhynchospermum*, *Saussurea*, *Sclerocarpus*, *Senecio*, *Serratula*, *Sigesbeckia*, *Silybum*, *Solidago*, *Solvia*, *Sonchus*, *Sorosaris*, *Sphaeranthus*, *Sphaeromorphaea*, *Spilanthes*, *Struchium*, *Synedrella*,

Tanacetum, Taraxacum, Thespis, Tragopogon, Tricholepis, Tridax, Tussilago, Verbesina, Vernonia, Vicoa, Waldheimia, Wedelia, Werneria, Xanthium, Youngia, Zoegea.

Several species of the following genera are cultivated in India as ornamental or food plants: *Amberboa, Callistephus, Charlieis, Cichorium, Coreopsis, Cosmos, Cynara, Dahlia, Flaveria, Gaillardia, Galinsoga, Helianthus, Helipterus, Lagascea, Melampodium, Scorzonera, Tagetes, Tithonia, Viguiera, Vittadinia, Zinnia.*

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CONNARACEAE

The Connaraceae is a family of about 25 genera and 200 species, mostly twining shrubs with alternate exstipulate leaves, occurring in the understorey of tropical forests.

The family Connaraceae is included in the order Rosales by Bentham & Hooker, Engler and Thorne, in the order Dilleniales by Hutchinson, in the order Sapindales by Cronquist and Dahlgren, in the order Connarales by Takhtajan.

The Connaraceae is characterised by the alternate exstipulate leaves, inflorescence in panicles, superior ovary with 1 to 5 carpels, each locule having two erect ovules and follicular fruit with usually arillate seeds.

The family Connaraceae is allied to Leguminosae and Averrhoaceae. Cronquist has placed the family Connaraceae in the order Sapindales instead of Rosales as some of them have secretory cells often seen in the Sapindales. Besides they have arillate seeds commonly found in many members of Sapindaceae.

Corner (1976) suggested the relationship of the seeds of Connaraceae with those of Meliaceae and Sapindaceae.

The family is represented in India by the following genera : *Connarus*, *Ellipanthus*, *Rourea*,

For recent taxonomic revision refer Leenhouts (1958, 1972).

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CONVOLVULACEAE

(Refer also Cuscutaceae)

The Convolvulaceae comprises about 55 genera and 1650 species which are mainly tropical and subtropical climbers, herbs and shrubs.

The family Convolvulaceae is included in the order Polemoniales by Bentham & Hooker, Cronquist and Takhtajan. While Hutchinson, Thorne and Dahlgren assigned the Convolvulaceae to the order Solanales. Engler considered it under the order Tubiflorae.

The Convolvulaceae is distinguished by the often presence of latex, bicollateral vascular bundles in most cases, large showy flowers, plaited corolla, superior biloculate ovary with 2 erect ovules in each locule. Often the seeds have folded cotyledons.

The family is divided into the following tribes: Dichondreae, Dicranostyleae, Hildebrandtieae, Convolvuleae, Poranaeae, Ipomoeae, Argyreieae and Erycibeae. The genus *Cuscuta* is treated as a separate family Cuscutaceae by Cronquist, Takhtajan and Hutchinson. The genera *Dichondra* and *Humbertia* are sometimes considered by botanists as belonging to separate families, Dichondraceae and Humbertiaceae.

The presence of tropane alkaloids in the Solanaceae and the Convolvulaceae indicate their close association (Romeike, 1978). Besides this the two families have same flavonoid profiles, caffeic acid esters and coumarins (Gornall *et al.* 1979; Harborne & Swain, 1979; Wagner, 1973).

Well-known ornamental plants are cypress-vine (*Ipomoea quamoclit*), Cardinal-creeper (*Ipomoea horsfalliae*), Midnapore-creeper (*Rivea hypocrateriformis*), Christmas-vine (*Porana paniculata*), Wood-rose (*Operculina tuberosa*), Miniature Morning Glory (*Jacquemontia pentantha*), Morning Glory (*Ipomoea violacea*), Indian Morning Glory (*Ipomoea indica*). The tubers of *Ipomoea batatas* are a source of edible starch. The leaves of *Ipomoea aquatica* are used as vegetable. The seeds of several species of *Rivea corymbosa*, *Ipomoea violacea* have hallucinogenic principles.

In India the following genera constitute its convolvulaceous flora: *Aniseia*, *Argyrea*, *Bonamia*, *Calystegia*, *Convolvulus*, *Cressa*, *Erycibe*, *Evolvulus*, *Hewittia*, *Ipomoea*, *Jacquemontia*, *Lettsomia*, *Merremia*, *Neuropeltis*, *Operculina*, *Porana*, *Rivea*, *Seddera*, *Stictocardia*.

Some of the species representing the following genera are cultivated in gardens: *Dichondra*, *Mina*, *Turbina*.

For recent taxonomic revisions refer Austin (1974, 1978, 1980), Ooststroom (1972); for cytology refer Sampathkumar (1979); for palynology refer Sen Gupta (1972).

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- CNV 106 Austin, D. F., Powell, D. A. & Nicolson, D. H. 1978
Stictocardia tiliifolia (Convolvulaceae) re-evaluated. *Brittonia* 30(2) : 195-198. Key ; *Ipomoea illustris* may give way to the earlier *I. campanulata* 1953 based on *Adamboe* Rheede.
- CNV 107 Gunn, Ch. R. 1972
Notes on *Stictocardia campanulata* (L.) Merr. and *S. jucunda* (Thw.) C. R. Gunn. *Brittonia* 24 : 169-176, 3 fig. One new comb. for Ceylon plant.

Xenostegia Austin & Staples

- CNV 108 Austin, D. F. & Staples, G. W. 1980
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the common *Merremia tridentata* is assigned to a new genus.

ADDITIONS : GENERAL

- CNV 109 Clarke, C. B. 1883
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 Flavonoids of the Solanaceae. *In* : Hawkes, J. G., Lester, R. N. & Skelding, A. D. *eds.*, *The biology and taxonomy of the Solanaceae*. Academic Press, London 257-268.
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 Tropane alkaloids—occurrence and systematic importance in angiosperms. *Bot. Notiser* 131 : 85-96.

CORIARIACEAE

Coriariaceae is an ancient disjunct monogeneric family with about 15 species occurring in Eurasia, Central & S. America and New Zealand. The species are shrubby with parallel veined exstipulate leaves.

The family Coriariaceae is included in the order Coriariales by Hutchinson, in the order Ranunculales by Cronquist, in the order Rosales by Thorne, in the order Sapindales by Dahlgren and Engler. Bentham & Hooker included it in the group of families whose systematic position is not well-established "Anomalous families". Takhtajan provisionally assigned the Coriariaceae in the order Rutales.

The Coriariaceae, a unigeneric family (*Coriaria*) is characteristic in having keeled petals which become fleshy after fertilization. The fleshy petals enclose the capsules forming a pseudo-drupe. The presence of ten stamens with large anthers and superior ovary with 5 to 10 locules, each having a pendulous ovule are important characters of the family.

The systematic position of the family is not certain and it may represent a relic of an ancient stock. Hence Hutchinson treated it as a distinct order Coriariales, allied to his Dilleniales and Pittosporales.

Sesquiterpene lactones known as picrotoxins are found in members of the Coriariaceae, Euphorbiaceae, Menispermaceae and Orchidaceae (Seigler, 1981). Cronquist (1981) placed the family Coriariaceae in the order Ranunculales next to Menispermaceae.

Palynologically the genus *Coriaria* (Garg, 1981) is allied to Sapindaceae. The flavonoid chemistry of the genus *Coriaria* (Bohm & Ornduff, 1981) indicates its distant relationships with the Rutaceae—Anacardiaceae—Meliaceae group. According to Thorne (1983) it is better to treat this relict family in a separate suborder Coriariineae.

The family is represented in India by the genus *Coriaria*.

For recent taxonomic revisions refer Cheng (1980), Rau (1978); for phytogeography refer Good (1930), Maekawa (1960).

GENERAL

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128-129.
- CRR 3 Rau, M. A. 1978
Coriariaceae. *Fasc. Fl. India* 1 : 1-4. Keys and descr. of
2 spp.
- CRR 4 Rehder, A. & Wilson, E. H. 1914
Coriariaceae. In : Sarg. *Pl. Wils.* 2 : 170-171.

Coriaria Linn.

- CRR 5 Anonymous, 1905
Coriaria : with a plate of *Coriaria terminalis*. *Flora & Sylva* 3 : 106-108.

- CRR 6 Bean, W. J. 1903
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- CRR 7 Good, R. O'. D. 1930
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- CRR 8 Maekawa, F. 1960
The palaeoequator and its relation to the recent distributional area of *Coriaria*. *Quart Res.* 6 : 212-218, 4 fig.
- CRR 9 Maekawa, F. 1964
Fossil *Coriaria* from Western Siberia. *Journ. Jap. Bot.* 39 : 255-256.
- CRR 10 Maximowicz, K. J. 1881
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The genus *Coriaria* in the western hemisphere. *Rhodora* 74 : 242-253.
- CRR 13 Sprague, T. A. 1913
Coriaria terminalis. *Curtis's Bot. Mag.* 139 : pl. 8525. Native of Sikkim, Tibet & China.
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Coriarias, Gard. Chron. III, 89 : 107-108. Notes on Asiatic spp.

ADDITIONS : GENERAL

- CRR 15 Bohm, B. A. & Ornduff, R. 1981
Leaf flavonoids and ordinal affinities of Coriariaceae.
Syst. Bot. 6 : 15-26.
- CRR 16 Cronquist, A. 1981
An integrated system of classification of flowering plants.
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- CRR 17 Hooker, J. D. 1876
Coriariae. In : Hooker, J. D., ed., *Fl. Brit. India* 2 : 44-45.
- CRR 18 Garg, M. 1981
Pollen morphology and systematic position of *Coriaria*.
Phytomorphology 30 : 5-10.
- CRR 19 Seigler, D. S. 1981
Terpenes and plant phylogeny. In : Young, D. A. & Seigler, D. S. eds., *Phytochemistry and angiosperm phylogeny*. Praeger, New York 117-148.

CORNACEAE

(Refer also Alangiaceae)

The Cornaceae is mainly a family of trees and shrubs, rarely herbs, occurring in the tropical and temperate regions of both hemispheres.

The family Cornaceae is included in the order Cornales by Cronquist, Dahlgren, Takhtajan and Thorne. It is assigned to the order Umbelliflorae by Engler. Hutchinson considered the family in the order Araliales and Bentham & Hooker in the order Umbellales.

The Cornaceae is distinguished by its woody habit, 4-5 merous flowers, inferior 1-4 loculed ovary with one pendulous ovule in each locule and fleshy indehiscent drupe or berry. On the basis of its woody habit and stem anatomy, Hutchinson transferred it from the order Umbellales to the order Araliales.

The family is divided into two subfamilies Curtisioidae and Coronoideae based on the position of raphe in the ovules and number of locules in the ovary. The family is related to Caprifoliaceae and Escalloniaceae.

Ferguson's (1977) palynological study indicated that the Cornaceae may be restricted to the genera *Mastixia*, *Cornus*, *Curtisia* and *Afrocrania*. The genus *Aucuba* is treated under the family Aucubaceae near the Alangiaceae, while the genus *Helwingia* is treated under the family Helwingiaceae and the genus *Toricellia* under the Toricelliaceae, monogeneric families within the order Araliales.

The occurrence of iridoids, proanthocyanidins, ellagitannins in the family Cornaceae and the absence of polyacetylenes and coumarins clearly indicate that the Cornaceae is not allied to Araliales (Bate-Smith *et al.*, 1975 ; Hegnauer, 1969). However Hutchinson treated the Cornaceae under the order Araliales.

The family Cornaceae is represented in India by the following genera : *Aucuba*, *Bothrocaryum*, *Dendrobenthamia* (reduced to the genus *Cornus* by Ferguson, 1966), *Mastixia*, *Sida*, *Toricellia*.

For recent taxonomic revisions refer Danser (1934), Hutchinson (1942) ; for phylogeny refer Eyde (1967), Horne (1911, 1914), Maekawa (1965) ; for cytology refer Goldblatt (1979) ; for palynology refer Chao (1954), Eramijan (1971), Radulescu (1974).

GENERAL

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Studies in the comparative anatomy of the Cornaceae. *Journ. Elisha Mitchell Sci. Soc.* 65 : 218-244.
- COR 2 Bate-Smith, E. C., Ferguson, I. K., Hutson, K., Jensen, S. R., Nielson, B. J. & Swain, T. 1975
Phytochemical interrelationships in the Cornaceae. *Biochem. Syst. Ecol.* 3(2) : 79-89.
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Corneae. *In* : DC., *Prodr.* 4 : 271-276.
- COR 4 Chao, C. Y. 1954
Comparative pollen morphology of the Cornaceae and

allies. *Taiwania* 5 : 93-106, pls. 1-4. Alangiaceae, Garryaceae, Helwingiaceae, Nyssaceae & Toricelliaceae.

- COR 5 Danser, B. H. 1934
The Cornaceae sensu stricto of the Netherlands Indies. *Blumea* 1 : 46-74. Key to *Mastixia* & *Mastixiodendron*; synonymy of the genus & sp., descr., distr., key.
- COR 6 Eramijan, E. N. 1971
The palynological datas on systematics and phylogeny of the Cornaceae Dumort and related families (in Russian). In : Kuprianova, L. A. & Jakovlev, M. S. ed., *Pollen Morphology, Acad. Sci. USSR, Komarov Bot. Inst. Leningrad.* 235-273.
- COR 7 Eyde, R. H. 1967
The peculiar gynoecial vasculature of Cornaceae and its systematic significance. *Phytomorphology* 17 : 172-182.
- COR 8 Fairbrothers, D. E. & Johnson, M. A. 1964
Comparative serological studies within the families Cornaceae (dogwood) and Nyssaceae (sourgum). In : Leone, C. A. ed., *Taxonomic biochemistry and serology*, New York, pp. 305-318.
- COR 9 Ferguson, I. K. 1977
World pollen and spore flora : Angiospermae, Cornaceae Dum. Stockholm. 1-34.
- COR 10 Ghazanfar, S. 1975
Cornaceae. *Fl. W. Pakistan* No. 88 : 1-4, fig. 1.
- COR 11 Goldblatt, P. (1978) 1979
A contribution to cytology in Cornales. *Ann. Missouri Bot. Gard.* 65(2) : 650-655. Chrom. nos. of genera *Mastixia*, *Cornus*, *Nyssa* etc.
- COR 12 Harms, H. 1897
Die Gattungen der Cornaceen. *Bericht. Deutsch Bot. Ges.* 15 : 21-29. General notes.

- COR 13 Harms, H. 1898
Cornaceae. In : Engler & Prantl, *Pflanzenf.* III, 8 : 250-270. Includes *Alangium*, *Davidia*, *Garrya* and *Nyssa*.
- COR 14 Hegnauer, R. 1965
Chemismus und systematische Stellung der Cornaceae pp. 235-246. In : *Beitrage Zur Biochemie und physiologie von Naturstoffen, Festschrift Kurt Mothes Zum 65. Geburtstag, G. Fischer, Jena.* The discovery of the alkaloids emetine, cephaeline and psychotrine in *Alangium salvi-folium* indicates its affinity with Rubiaceae.
- COR 15 Hohn, M. E. & Meinschein, W. G. 1976
Seed oil fatty acids : evolutionary significance in the Nyssaceae and Cornaceae. *Biochem. Syst. Ecol.* 4(3) : 193-199.
- COR 16 Horne, A. S. 1911
The polyphyletic origin of the Cornaceae. *Proc. Brit. Assoc. Sci.* 1911 : 585.
- COR 17 Horne, A. S. 1914
A contribution to the study of the evolution of the flower with special reference to the Hamamelidaceae, Capri-foliaceae and Cornaceae. *Trans. Linn. Soc.* II, 8 : 239-309.
- COR 18 Hutchinson, J. 1942
Neglected generic characters in the family Cornaceae. *Ann. Bot.* 6 : 83-93.
- COR 19 Johnson, M. A. & Fairbrothers, D. E. 1961
Serological correspondence between the Cornaceae and Nyssaceae. *Amer. Journ. Bot.* 48 : 534.
- COR 20 Kirschheimer, F. 1938
Umbelliflorae : Cornaceae. In : Jongmans, W. ed., *Fossilium Catalogus* II, 23 : i-xxii, 1-188. Fossil records ; includes Nyssaceae.
- COR 21 Li, Hui-lin & Chao, Chiuan-Ying 1954
Comparative anatomy of the woods of the Cornaceae and

allies. *Quart. Journ. Taiwan Mus.* 7 : 119-136, pl. 1-8.
Taxonomic and phylogenetic ; Alangiaceae, Garryaceae,
Helwingiaceae, Nyssaceae, Toricelliaceae.

- COR 22 Maekawa, F. 1965
Aucuba and its allies, the phylogenetic consideration
on the Cornaceae. *Journ. Jap. Bot.* 40 : 41-47. In
Japanese.
- COR 23 Mai, D. H. 1964
Die Mastixioideen—Floren im Tertiär der Oberlausitz.
Palaontol. Abhdlg. Dtsch., t. 2(1).
- COR 24 Matthew, K. M. 1977
Cornaceae. In : van Steenis, *Fl. Males.* 1, 8 : 85-97. 10 spp.
recognised in *Mastixia*.
- COR 25 Miki, Shigeru 1956
Endocarp remains of Alangiaceae, Cornaceae and Nyssa-
ceae in Japan. *Journ. Inst. Polytech. Osaka City Univ.*
Ser. D. 7 : 275-295, pl. 1, f. 1-7. Includes data on living
and fossil plants.
- COR 26 Radulescu, D. 1974
Contribution a l'étude de la morphologie du pollen des
familles Cornaceae et Araliaceae. *Lucr. Grad. Bot. Bucu-
resti*, 125-131.
- COR 27 Tardieu-Blot, M. L. 1968
Cornaceae. *Fl. Camb. Laos & Vietn.* fasc. 8 : 11-33, pl. 2.
- COR 28 Wangerin, W. 1906
Die Umgrenzung und Gliederung der Familie der Corna-
ceae. *Bot. Jahrb.* 38(Beibl. 86) : 1-88.
- COR 29 Wangerin, W. 1910
Cornaceae. In : Engler, *Pflanzenr.* 41(IV. 229) : 1-110.
- Aucuba* Thunb.**
- COR 30 Andre', E. 1866
Fructification des *Aucuba*. *Rev. Hort. (Paris)* 1866 : 289,
1 pl.

- COR 31 Carriere, E. A. 1866
 Les aucubas. *Rev. Hort. (Paris)* 1866 : 88-89. A synopsis of the horticultural varieties of *Aucuba japonica*.
- COR 32 Clark, J. 1902
 Aucubas. *Garden* 61 : 304-305. General notes on horticultural varieties.
- COR 33 Maekawa, F. 1965
 Aucuba and its allies—the phylogenetic consideration on the Cornaceae. *Journ. Jap. Bot.* 40 : 41-47, 1 fig.
- Cornus** Linn.
 (Refer also *Dendrobenthamia*)
- COR 34 Bugala, W. 1953
 A new system of the extent (sic) genus *Cornus* L. *Ann. Sect. Dendrol. Soc. Bot. Pologne* 9 : 205-210. Discussion of system proposed by Pojarkova, A. in *Not. Syst. Leningrad* 12 : 164-180. 1950.
- COR 35 Dallimore, W. 1915
 The uses of *Cornus* wood. *Bull. Misc. Inf. Kew* 1915 : 179-181.
- COR 36 Clay, S. N. & Nath, J. 1971
 Cytogenetics of some species of *Cornus*. *Cytologia* 36(4) : 716-730. Chrom. nos.
- COR 37 Dermen, H. 1932
 Cytological studies of *Cornus*. *Journ. Arn. Arb.* 13 : 410-416, pl. 53. Chrom. counts of 23 spp.
- COR 38 Eramjan, E. N. 1967
 Heterogeneite palynologique du genre *Cornus* L. *s.l.* en rapport avec sa taxonomie (en russe). *Biol. Zh. Armenii* 20(7) : 78-85.
- COR 39 Ferguson, I. K. 1966
 Notes on the nomenclature of *Cornus*. *Journ. Arn. Arb.* 47 : 100-105. Subgenera defined and typified.

- COR 40 Hara, H. 1948
The nomenclature of flowering dogwood and its allies. *Journ. Arn. Arb.* 29 : 111-115. Considers *Benthamidia* as a genus.
- COR 41 Hemsley, W. B. 1909
Cornus macrophylla. *Curtis's Bot. Mag.* 135 : pl. 8261.
- COR 42 Hemsley, W. B. 1909
Cornus macrophylla and some Asiatic congeners. *Kew Bull. Misc. Inf.* 1909 : 329-335.
- COR 43 Howard, R. A. 1961
Registration lists of cultivar names in *Cornus* L. *Arnoldia* 21 : 9-18. Horticultural notes.
- COR 44 Jensen, S. R., Kjaer, A. & Nielsen, B. J. 1975
The genus *Cornus*, non-flavonoid glucosides as taxonomic markers. *Biochem. Syst. Ecol.* 3(2) : 75-78.
- COR 45 Koehne, E. 1896
Ueber einige *Cornus*—Arten, besonders *C. macrophylla* Wall. und *C. corynostylis* n. sp. *Gartenflora* 45 : 236-239, 284-288, fig. 51.
- COR 46 Koehne, E. 1903
Die Sektion *Microcarpium* der Gattung *Cornus*. *Mitt. Deutsch. Dendr. Ges.* 12 : 27-49.
- COR 47 Koehne, E. 1909
Was ist *Cornus macrophylla*? *Mitt. Deutsch. Dendr. Ges.* 18 : 182-185.
- COR 48 Pojarkova, A. 1950
De systemate generis Linneani *Cornus* L. [In Russian & Latin]. *Not. Syst. Leningrad* 12 : 164-180. The genus *Cornus* is segregated into 6 genera.
- COR 49 Purkayastha, S. K. & Bahadur, K. N. 1977
A note on the taxonomy and wood anatomy of the Indian

Cornaceae with special reference to the genus *Cornus*.
Indian Forester 103(4) : 240-250.

COR 50 Rickett, H. W. 1950

Cornus in Mexico, with notes on the evolution of the
genus. *Anal. Inst. Biol. Mexico* 21 : 83-94.

COR 51 Stapf, O. 1912

Cornus controversa. *Curtis's Bot. Mag.* 138 : pl. 8464.
Occurs in Himalaya and E. Tibet.

COR 52 Wilson, E. H. 1925

The flowering dogwoods. *Garden* 89 : 286-288.

Dendrobenthamia Hutch.

(In Indian floras this genus is included in
Cornus Linn. *sensu lato*)

COR 53 Fang, Wen-p'ei 1953

Notes on *Dendrobenthamia*. *Acta Phytotax. Sin.* 2 : 89-
114. pl. 11-16. Accepts *Dendrobenthamia* for *Cornus* ; in
Chinese.

Mastixia Bl.

COR 54 Matthew, K. M. 1976

A revision of the genus *Mastixia* (Cornaceae). *Blumea*
23(1) : 51-93. Revision, 13 spp. recognised, 4 new spp. ;
two subgenera *Pentamastixia* and *Tetramastixia* of Wan-
gerin (1910) are shown to be artificial.

ADDITIONS : GENERAL

COR 55 Clarke, C. B. 1879

Cornaceae. *In* : Hooker, J. D. *ed.*, *Fl. Brit. India* 2 :
740-748.

COR 56 Hegnauer, R. 1969

Chemical evidence for the classification of some plant
taxa. *In* : Harborne, J. B. & Swain, T. *eds.*, *Perspectives*
in phytochemistry. Academic, London, 121-138.

COR 57 Hutchinson, J. 1967

Cornaceae, *The Genera of Flowering Plants* 2 : 132-134.

CORYLACEAE

(Refer also Betulaceae)

The family Corylaceae is included in the order Fagales by Hutchinson and Dahlgren. While Bentham & Hooker, Cronquist, Engler, Takhtajan and Thorne did not consider Corylaceae as a separate family and hence included Corylaceae in the family Betulaceae.

A monogeneric family (*Corylus*) the Corylaceae is characterised by the presence of flowers in catkins, male flowers devoid of perianth, male flowers solitary in the axil of each bract and female flowers possessing perianth two in the axil of each bract, 2 locular inferior ovary having a single pendulous ovule in each locule.

The family is represented in India by the genus *Corylus*.

For taxonomic revisions refer Bobrov (1936).

GENERAL

CRL 1 Candolle, A. de 1864

Corylaceae. In : DC. *Prodr.* 16(2) : 124-133.

CRL 2 Hutchinson, J. 1967

Corylaceae. *The Genera of Flowering Plants* 2 : 132-134.

Corylus Linn.

CRL 3 Bobrov, E. G. 1936

Histoire et systematique du genre *Corylus*. *Sovetsk. Bot.* 1936 : 11-39, fig. 1-7. In Russian ; see review in *Acta Phytotax. Geobot.* 5 : 271, 1936.

CRL 4 Kasapligil, B. 1972

A bibliography in *Corylus* (Betulaceae) with annotations. *Ann. Rep. North Nut Growers Ass.* 63 : 107-162.

CRL 5 Osborn, A. 1930

The tree *Coryluses*. *Gard. Chron.* III, 87 : 106, fig. 42, 43.

- CRL 6 Smolianinova, L. A. 1929
 [Survey of the literature on the genus *Corylus* L.], *Bull. Appl. Bot. & Pl. Breed.* 21(5) : 379-450, fig. 1-21. In Russian ; bibliography of 147 references.
- CRL 7 Vilmorin, [A. L.] M. L. de 1910
Corylus tibetica. *Rev. Hort. (Paris)* 1910 : 203-205, 1 pl., fig. 82, 83.
- CRL 8 Winkler, H. 1904
Corylus. In : Engler, *Pflanzenr.* 19(IV. 61) : 44-56.

COSTACEAE

(Refer also Zingiberaceae)

The family Costaceae, a family segregated from the Zingiberaceae *sensu latiore* is included in the order Zingiberales by Cronquist, Takhtajan and Dahlgren. Engler, Hutchinson and Thorne did not consider it as a separate family and hence the Costaceae is considered in the family Zingiberaceae. Bentham & Hooker included it in the Scitamineae under the order Epigynae.

The family Costaceae differs from Zingiberaceae in having spirally arranged leaves and bracts, closed sheath and without oil cells. Whereas in the Zingiberaceae the leaves and bracts are distichously arranged, sheath is open and plants having abundant oil cells.

The family is represented in India by the genus *Costus* (i.e.) *C. speciosus* (Koen. ex Retz.) Sm., growing throughout India.

- COT 1 Banerji, I. 1940
 A contribution to the life history of *Costus speciosus* Smith. *Journ. Ind. Bot. Soc.* 19 : 181-196.
- COT 2 Nam, T. V. 1975
 Costaceae et Zingiberaceae : leurs appareils ligulaires. *Adansonia* ser. 2, 14 : 561-570.
- COT 3 Ray Chaudhuri, E. & Chakraverty, R. K. 1977
Costus speciosus (Koenig) Sm. : a promising source of steroidal sapogenin. *Journ. Sci. Club, Calcutta* 31 : 27-37.

COT 4 Sharma, A. K. & Chattopadhyay, 1983

Relative amounts of nuclear DNA in populations of *Costus speciosus* (Koen.) Sm. *Curr. Sci.* 52 : 653-658.
Chrom. nos. ; studies on tetraploid, triploid and diploid populations.

CRASSULACEAE

The family Crassulaceae comprising about 35 genera and 1500 species and exhibiting xerophytic habit (development of succulent stem and leaves without spines) is distributed mainly in Southern Africa with representations in the subtropical or temperate regions of Asia, Europe and America.

The family Crassulaceae is included in the order Rosales by Cronquist, Engler, Thorne and Bentham & Hooker. While Dahlgren, Hutchinson and Takhtajan considered it in the order Saxifragales.

The Crassulaceae is characterised by its succulent stem and foliage, exstipulate leaves tightly crowded to form rosettes, presence of bulbils and adventive buds, superior ovary, carpels as many as petals joined at the base, fruit usually a group of follicles with small seeds.

Following subfamilies are recognised by Engler: Sedoideae, Sempervivoideae, Echeverioideae, Cotyledonoideae, Kalanchoideae and Crassuloideae.

The Crassulaceae is closely related to the Saxifragaceae which are non-succulent. In the Saxifragaceae carpels are seldom the same number as the petals.

While considering the family Crassulaceae in the order Saxifragales, Dahlgren (1983) mentioned that the order Saxifragales is a heterogenous assemblage. It is seen that the family Crassulaceae has isomerous free carpels with characteristic honey secreting scale at the base. In the Crassulaceae the embryogenesis is of caryophylloid type, whereas in the Saxifragaceae the embryogenesis is of helobial type.

Some of the well-known house or green house ornamental plants are *Aeonium tabuliforme*, *Crassula argentea*, *Echeveria secunda*, *Kalanchoe blossfeldiana*, *K. pinnata*, *Sedum spectabile*, *S. telephium*, *Sempervivum tectorum*,

The family is represented in India by the following genera : *Cotyledon*, *Kalanchoe*, *Rhodiola*, *Rosularia*, *Sedum*, *Sempervivella*, *Sinocrassula*, *Tillaea*.

Some species of the following genera are cultivated in gardens in India : *Aeonium*, *Echeveria*.

For recent taxonomic revisions refer Backer (1951), Ohba (1975, 1977, 1978) ; for cytotaxonomic studies refer Uhl (1948), Merxmuller *et al.* (1972), Baldwin (1938).

GENERAL

- CRS 1 Backer, C. A. 1951
Crassulaceae. In : van Steenis, *Fl. Males. I*, 4 : 197-202, 2 fig.
- CRS 2 Berger, A. 1930
Crassulaceae. In : Engler & Prantl, *Pflanzenf. ed.* 2, 18a : 352-483, fig. 183-212.
- CRS 3 Borissova, A. G. 1939
Crassulaceae. In : Komarov, *ed.*, *Fl. USSR* 9 : 8-134, 471-486.
- CRS 4 Candolle, A. P. de 1828
Memoire sur la famille des Crassulacees 2 : 1-47, pl. 1-13.
- CRS 5 Candolle, A. P. de 1828
Crassulaceae. In : DC., *Prodr.* 3 : 381-414.
- CRS 6 Fu, Shu-hsia 1965
Species et Combinationes Novae Crassulacearum Sini-carum. *Acta Phytotax. Sin.* Additions. 1 : 111-128.
- CRS 7 Ohba, H. 1977
New or critical species of Asiatic Sedoideae. II. *Journ. Jap. Bot.* 52(10) : 305-308.
- CRS 8 Ohba, H. 1978
Generic and infrageneric classification of the Old World

Sedoideae (Crassulaceae). *Journ. Fasc. Sci. Univ. Tokyo Bot.* 12(4) : 139-198. Chrom. nos. Keys.

- CRS 9 Subramanyam, K. & Nair, N. C. 1975
Trends of specialization in the Crassulaceae as revealed by floral anatomy. In : Mohan Ram, H. Y., Shah, J. J. & Shah, C. K. eds., *Form, structure and function in plants* 401-408.
- CRS 10 Uhl, C. H. 1948
Cytotaxonomic studies in the sub-families Crassuloidae, Kalanchoideae and Cotyledonoideae of the Crassulaceae. *Amer. Journ. Bot.* 35 : 695-706.

Crassula Linn.

- CRS 11 Friedrich, H. C. 1973
Zur cytotaxonomie der Gattung *Crassula*. *Garcia de Orta, Ser. Bot.* 1(1-2) : 49-65. Chrom. nos.
- CRS 12 Merxmüller, H., Friedrich, H. C. & Grau, J. (1971) 1972
Cytotaxonomische Untersuchungen Zur Gattungsstruktur Von *Crassula*. *Ann. Naturhist. Mus. Wien.* 75 : 111-119. Chrom. nos.

Echeveria DC.

- CRS 13 Bleck, J. 1973
Echeveria De Candolle. *Cact. Succ. Journ. (USA)* 45 (4) : 190-193.
- CRS 14 Carruthers, L. & Ginns, R. 1973
Echeverias : a guide to cultivation and identification. Edinburgh, Bartholomew 1-110. illust. & map.
- CRS 15 Poellnitz, K. von 1936
Zur Kenntnis der Gattung *Echeveria* DC. *Fedde Report. Spec. Nov.* 39 : 193-270.

Kalanchoe Adans.

(Species of *Bryophyllum* Salisb. is included in
Kalanchoe Adans.)

- CRS 16 Baldwin, J. T. Jr. 1938
Kalanchoe, the genus and its chromosomes. *Amer. Journ. Bot.* 25 : 572-579.
- CRS 17 Bleck, J. 1973
Kalanchoe Adans. *Cact. Succ. Journ. (USA)* 45(2) : 58-62.
- CRS 18 Hamet, R. 1907-1908
 Monographie du genre *Kalanchoe*. *Bull. Herb. Boissier* 7 (ser. 2) : 869-900. 1907 ; *ibid.* 8 : 17-48. 1908.
- CRS 19 Subba Rao, G. V. & Kumari, G. R. (1975) 1978
 A new species of *Kalanchoe* (Crassulaceae) from Andhra Pradesh. *Bull. Bot. Surv. India* 17 : 177-179. *Kalanchoe cherukondensis*.

Rhodiola Linn.

- CRS 20 Ohba, H. 1975
 A revision of the Eastern Himalayan species of the subgenus *Rhodiola* of the genus *Sedum* (Crassulaceae). In : *Fl. E. Himalaya* 3rd Report 283-362.
- CRS 21 Ohba, H. 1977
 New or critical species of Asiatic Sedoideae. *Journ. Jap. Bot.* 52(9) : 263-267. New spp. *R. ludlowii* H. Ohba from Bhutan and *R. serrata* H. Ohba from Tibet.
- CRS 22 Ohba, H. 1978
 New or critical species of Asiatic Sedoideae 4. *Journ. Jap. Bot.* 53(11) : 328-331.
- CRS 23 Singh, N. B. 1982
 A note on *Rhodiola imbricata* Edgew. (Crassulaceae). *Journ. Econ. Tax. Bot.* 3(2) : 625-626.

- CRS 24 Singh, N. B. & Bhattacharyya, U. C. 1982
Nomenclature notes on *Rhodiola* (Crassulaceae). *Journ. Econ. Tax. Bot.* 3(2) : 631-632.

Rosularia (DC.) Stapf

- CRS 25 Ohba, H. 1977
On the Himalayan species of the genus *Rosularia* (Crassulaceae). *Journ. Jap. Bot.* 52(1) : 1-13.

Sedum Linn.

- CRS 26 Bouvet, G. 1883
Revision des *Sedum* (Groupe reflexum) de l'Herbier Boreale. *Rev. Bot.* 1 : 156-160.
- CRS 27 Bhattacharyya, U. C. & Singh, N. B. & Goel, A. K. 1982
Ecological adaptations of *Sedum sinuatum* Royle ex Edgew. (Crassulaceae) in N-W Himalaya. *Indian Journ. For.* 4(4) : 256.
- CRS 28 Froderstrom, H. 1930, 1931, 1932 & 1936
The genus *Sedum* L., a systematic essay. *Acta Hort. Gothob.* 5 : Append. : 1-75, pl. 1-28, fig. 1-304, 1930 ; (II) 6 : Append. 1 : 1-111, pl. 1-65, fig. 1-828, 1931 ; (III) 7 : Append. : 1-126, pl. 1-68, fig. 1-985, 1932 ; (IV) 10 : Append. : 1-262, pl. 1-115, fig. 1-1360, 1936.
- CRS 29 Froderstrom, H. (1942) 1943
Enumeration of a *Sedum* collection from Himalaya. *Arkiv. For. Bot.* 30A (Art. 9) : 1-8.
- CRS 30 Fu, K. T. 1974
Revision of the section *Oreades* in Chinese *Sedum*. *Acta Phytotax. Sin.* 12 : 51-77.
- CRS 31 Hamet, R. 1909
Sedum praini, *S. levii*, *S. liciae* sp. novae. *Bull. Soc. Bot. France* 56 : 566-567.

- CRS 32 Hamet, R. 1913
 New species of *Sedum* preserved in the herbaria of Kew and the British Museum. *Kew Bull. Misc. Inf.* 1913 : 153-158.
- CRS 33 Hamet, R. 1927
 Crassulacees asiatiques critiques. *Bull. Soc. Bot. France* 74 : 264-271. Notes on *Sedum indicum*.
- CRS 34 Hamet, R. 1929
 Contribution a'letude phytographique du genre *Sedum*. *Candollea* 4 : 1-52.
- CRS 35 Hamet, R. 1930
 Sur le *Sedum indicum* (Decaisne). *Bull. Soc. Bot. France* 76 : 1099-1110.
- CRS 36 He'bert, L. -P. 1975
 Contribution a'la cytotaxonomie du genre *Sedum* L. *Bull. Soc. Neuchatel Sci. Nat.* 98 : 59-70. Chrom. nos.
- CRS 37 Huber, J. A. 1930
 Zur Systematik der Gattung *Sedum* 1-118, 1 map. Reviewed in *Engl. Bot. Jahrb.* 63 : Lit. 100, 1930.
- CRS 38 K., D. 1885
 Some cultivated stone crops. *Garden* 27 : 314-316, pl. 487. 12 fig.
- CRS 39 Masters, M. T. 1878
 Hardy stone crops : *Sedums*. *Gard. Chron.* n. ser. 10 : 266-268, 302, 303, 336-337, fig. 61, 62, 376, fig. 68, 463, 590-591, 626, 658, 684-685, 716-717, fig. 120.
- CRS 40 Ohba, H. 1973
 Notes on Himalayan *Sedum* (1). *Journ. Jap. Bot.* 48 : 327-331, 2 fig.
- CRS 41 Ohba, H. 1974
 Notes on Himalayan *Sedum* (2). *Journ. Jap. Bot.* 49 : 257-263, 2 fig.

- CRS 42 Ohba, H. 1974
Notes on Himalayan *Sedum* (3). *Journ. Jap. Bot.* 49 :
321-328, 1 fig.
- CRS 43 Ohba, H. 1975
On the genus *Sedum* in Burma. *Journ. Jap. Bot.* 50
(12) : 353-361.
- CRS 44 Ohba, H. 1976
Notes on Himalayan *Sedum* (5). *Journ. Jap. Bot.* 51
(12) : 385-387.
- CRS 45 Ohba, H. 1978
New or critical species of Asiatic Sedoideae : 4. *Journ.*
Jap. Bot. 53(11) : 328-331.
- CRS 46 Praeger, R. L. 1916
A preliminary list of the species of *Sedum* in culti-
vation. *Gard. Chron.* III, 60 : 92-93.
- CRS 47 Praeger, R. L. 1917
On the affinities of *Sedum praegerianum* W. W. Sm.
with a tentative classification of the section *Rhodiola*.
Trans. Bot. Soc. (Edinburgh) 27 : 107-119, pl. 2-4.
- CRS 48 Praeger, R. L. 1921
An account of the genus *Sedum* as found in cultiva-
tion. *Journ. Roy. Hort. Soc. (London)* 46 : 1-314, fig.
1-185. A monograph of the cultivated forms.
- CRS 49 Praeger, R. L. 1921
Some Asiatic *Sedums* in the Edinburgh herbarium ; with
supplementary notes from Kew and the British Museum.
Notes Bot. Gard. Edinb. 13 : 67-101, pl. 170-179.

Sempervivella Stapf

(includes *Sempervivum* Linn.)

- CRS 50 Correvoon, H. 1924
Les Joubrbes (Semperviva) 1-134. Bruxellers.

CRS 51 Praeger, R. L. 1932

An account of the Sempervivum group, 1-265. London.

ADDITIONS : GENERAL

CRS 52 Clarke, C. B. 1878

Crassulaceae. In : Hooker, J. D. ed., *Fl. Brit. India*
2 : 411-423.

CRS 53 Dahlgren, R. 1983

General aspects of angiosperm evolution and macro-
systematics. *Nord. Journ. Bot.* 3 : 119-149.

CRS 54 Singh, N. B. & Bhattacharyya, U. C. 1983

A note on the taxonomic treatment of the genera
Sedum L. and *Rhodiola* L. *Indian Journ. Forest.* 6(1) :
88-89.

CROOMIACEAE-refer **STEMONACEAE**

CRUCIFERAE

(*nom. altern.* Brassicaceae)

The Cruciferae is a large cosmopolitan family of herbs comprising about 350 genera and 3200 species.

The family Cruciferae is placed under the order Capparales by Cronquist, Dahlgren, Takhtajan and Thorne. Engler assigned it to the order Papaverales, Hutchinson to the order Cruciales and Bentham & Hooker to the order Parietales.

The Cruciferae is a very natural family with characteristic floral parts consisting of a calyx of four free sepals in two whorls and corolla of four free petals alternate with the sepals in the form of a cross (cruciform) and often clawed, six stamens, outer 2 short and an inner of 4 long (tetradynamous stamens) and an ovary with two parietal placentas. The fruit is a bilocular capsule with a false septum called "replum". The dehiscence takes place by the opening of valves from below upwards leaving the replum with seeds pressed against it.

Schulz (1936) classified the family into the following tribes : Pringleaceae, Stanleyaceae, Romanschulzieae, Streptanthaceae, Cremolobaceae, Chamireae, Brassiceae, Heliophilleae, Schizopetaleae, Lepidieae, Euclideae, Stenopetaleae, Lunarieae, Alysseae, Drabeae, Arabideae, Matthiolaceae, Hesperideae, Sisymbrieae.

The families Cruciferae and Capparidaceae are closely allied in the nature of androecium and gynoecium and it is considered that the families Cruciferae and Capparidaceae might have originated from a common ancestor. The genus *Cleome* in Capparidaceae (which is considered as a separate family Cleomaceae by Hutchinson) shows alliance with Cruciferae.

The family Cruciferae belongs to the core families of the Capparales (i.e.) Capparidaceae, Cruciferae, Tovariaceae and Resedaceae. It is seen that the floral parts vary widely in members of Capparales. In the Capparidaceae and Cruciferae the flowers are tetramerous while their ancestors might have pentamerous flowers. The universal characteristic of the families belonging to Capparales is the presence of myrosin cells and the synthesis of glucosinolates. Corner (1976) indicated the differences in the nature of seed coat structures among the closely allied families of Capparales. In the Capparidaceae the seeds have fibrous tegmen, whereas in the Cruciferae the seeds are endotestal and lack fibrous tegmen. The nature of glucosinolates present in the core families of the Capparales are also biosynthetically quite different. The glucosinolate sinigrin is quite characteristic of the family Cruciferae (Ettlinger & Kjaer, 1968). While methylglucosinolate is the main characteristic glucosinolate of the family Capparidaceae.

The family Cruciferae is a source of some of the important vegetable and salad yielding plants : Cauliflower (*Brassica oleracea* var. *botrytis*) ; Cabbage (*Brassica oleracea* var. *capitata*) ; Brussels sprouts (*Brassica oleracea* var. *gemmifera*) ; Italian broccoli (*Brassica oleracea* var. *italica*) ; Turnip (*Brassica rapa*) ; Black mustard (*Brassica nigra*) ; Leaf mustard (*Brassica juncea*) ; Chinese mustard (*Brassica chinensis*) ; Kohlrabi (*Brassica caulorapa*) ; Wild mustard (*Brassica campestris*) ; Radish (*Raphanus sativus*).

Some of the well-known ornamental plants are as follows : Candytuft (*Iberis amara*) ; Dame's violet (*Hesperis matronalis*) ; Gilliflower (*Matthiola incana*, *M. bicornis*) ; (*Pulmonaria longifolia*) ;

Sweet Alyssum (*Lobularia maritima*); Wall flower (*Cheiranthus cheiri*).

The cruciferous flora of India is represented by the following genera: *Alyssum*, *Aphragmus*, *Arabidopsis*, *Arabis*, *Alliaria*, *Arcyosperma*, *Atelantha*, *Barbarea*, *Brassica*, *Braya*, *Cardamine*, *Cardaria*, *Chorispora*, *Christolea*, *Chrysobraya*, *Cochlearia*, *Coronopus*, *Crambe*, *Descurainia*, *Diplotaxis*, *Draba*, *Erophila*, *Ermaniopsis*, *Eruca*, *Erysimum*, *Euclidium*, *Eutrema*, *Farsetia*, *Goldbachia*, *Hedinia*, *Iberidella*, *Isatis*, *Lepidium*, *Lepidostemon*, *Lignariella*, *Loxostemon*, *Malcolmia*, *Megacarpaea*, *Microsisymbrium*, *Moricandia*, *Neslia*, *Notoceras*, *Oreoblastus*, *Parrya*, *Parryodes*, *Pegaeophyton*, *Phaeonychium*, *Pycnoplithopsis*, *Physorrhynchus*, *Rorippa*, *Schouwia*, *Staintoniella*, *Sisymbrium*, *Solms-Laubachia*, *Tauscheria*, *Trochiscus*, *Uranodactylus*, *Vvedenskyella*.

Following ornamental genera are cultivated in gardens: *Armoracia*, *Capsella*, *Cheiranthus*, *Hesperis*, *Iberis*, *Lobularia*, *Matthiola*, *Nasturtium*, *Thlaspi*.

Raphanus (*R. sativus*) is cultivated in greater part of India.

For recent taxonomic revisions, refer Hedge (1976), Jafri (1973), Janchen (1942), Schulz (1936), Vaughan & Whitehouse (1975); for chemotaxonomy refer Curtis & Meade (1971), Das & Rao (1975), Vaughan *et al.* (1976); for cytology refer Mukherjee (1975), Mulligan (1964), Rollins (1966), Sikka & Sharma (1979).

GENERAL

- CRU 1 Botschantzev, B. 1955
De Cruciferis notae criticae. *Not. Syst. Herb. Inst. Bot. Komarov Acad. Sci. URSS* 17: 160-178, 1 fig.
- CRU 2 Caius, J. F. 1939
The medicinal and poisonous crucifers of India. *Journ. Bombay Nat. Hist. Soc.* 40: 693-712. Keys to genera and species.
- CRU 3 Candolle, A. P. de 1824
Cruciferae. In: DC., *Prodr.* 1: 131-236.
- CRU 4 Chou, T. -Y. 1949
Studies on the Cruciferae of Eastern China I. *Bot. Bull.*

Acad. Sin. 3 : 16-28, 109-126. Keys, descr. & citations of specimens.

- CRU 5 Curtis, P. J. & Meade, P. M. 1971
Cucurbitacins from the Cruciferae. *Phytochemistry* 10(2) : 3081-3083.
- CRU 6 Das, V. S. R. & Rao, K. N. 1975
Phytochemical phylogeny of the Brassicaceae (Cruciferae) from the Capparidaceae. *Naturwissenschaften* 62(12) : 577-578.
- CRU 7 Dvorak, F. 1971
On the evolutionary relationship in the family Brassicaceae. *Feddes Repert* 82(5) : 357-372.
- CRU 8 Eames, A. J. & Wilson, C. L. 1930
Crucifer carpels. *Amer. Journ. Bot.* 17 : 638-656.
- CRU 9 Feeny, P. (1977) 1978
Defensive ecology of the Cruciferae. *Ann. Missouri Bot. Gard.* 64(2) : 221-234.
- CRU 10 Gomez-Campo, C. & Tortosa, M. E. (1974) 1975
The taxonomic and evolutionary significance of some juvenile characters in the Brassicaceae. *Bot. Journ. Linn. Soc.* 69(2) : 105-124.
- CRU 11 Hedge, I. C. 1976
A systematic and geographical survey of the Old World Cruciferae. In : Vaughan, J. G. et al., eds., *The Biology and Chemistry of the Cruciferae*. 1-45.
- CRU 12 Hedge, I. C. & Rechinger, K. H. 1968
Cruciferae. In : Rechinger, K. H. ed., *Flora Iranica* Lfg. 57 : 372 pp.
- CRU 13 Jafri, S. M. H. 1973
Brassicaceae. *Fl. W. Pakistan* No. 55 : 1-308.

- CRU 14 Janchen, E. 1942
Das System der Cruciferen. *Oesterr. Bot. Zeits.* 91 : 1-28.
- CRU 15 Mukherjee, P. 1975
Chromosome study as an aid in tracing the evolution in Cruciferae. *Cytologia* 40(3-4) : 727-734. Chrom. nos.
- CRU 16 Mulligan, G. A. 1964
Chromosome numbers of the family Cruciferae I. *Canad. Journ. Bot.* 42 : 1509-1519.
- CRU 17 Murley, M. R. 1951
Seeds of the Cruciferae. *Amer. Mid. Nat.* 46 : 1-81.
- CRU 18 Rollins, R. C. 1966
Chromosome numbers of Cruciferae. *Contr. Gray Herb.* 197 : 43-65.
- CRU 19 Rollins, R. C. & Rudenberg, L. 1971
Chromosome numbers of Cruciferae II. *Contr. Gray Herb.* 201 : 117-133.
- CRU 20 Sarkar, A. K. & Mitra, J. N. 1969
The order Rhoedales in Eastern India I. Cruciferae. *Bull. Bot. Soc. Beng.* 23 : 93-107. Keys to genera & species.
- CRU 21 Schulz, O. E. 1919
Cruciferae, Brassiceae I. In : Engler, *Pflanzenr.* 70(IV. 105) : 1-290, fig. 1-35. The genera *Brassica*, *Rapistrum*, *Sinapsis*.
- CRU 22 Schulz, O. E. 1923
Cruciferae, Brassiceae II. In : Engler, *Pflanzenr.* 84(IV. 105) : 1-100, fig. 1-26.
- CRU 23 Schulz, O. E. 1924
Cruciferae : *Draba* & *Europhila*. In : Engler, *Pflanzenr.* 105) : 1-388, fig. 1-74.

- CRU 24 Schulz, O. E. 1927
Cruciferae, *Draba* & *Europhila*. In : Engler, *Pflanzenr.* 89(IV. 105) : 375-396, fig. 1-35.
- CRU 25 Schulz, O. E. 1936
Cruciferae. In : Engler & Pranti, *Pflanzenf.* ed. 2, 17b : 227-658, fig. 121-426.
- CRU 26 Sikka, K. & Sharma, A. K. 1979
Chromosome evolution in certain genera of Brassicaceae. *Cytologia* 44(2) : 407-477. Chrom. nos.
- CRU 27 Sinskaja, E. N. 1928
[The oleiferous plants and root crops of the family Cruciferae]. *Bull. Appl. Bot. & Pl. Breed.* 19(3) : 1-648, pl. 14, 15, fig. 1-108. In Russian.
- CRU 28 Vaughan, J. G., Macleod, A. J. & Jones, B. M. G. 1976
eds., *The Biology and Chemistry of Cruciferae*, London. Academic Press. i-xvi, 1-355. Maps, illust., Chrom. nos.
- CRU 29 Vaughan, J. G. & Whitehouse, J. M. (1974) 1975
Seed structure and the taxonomy of the Cruciferae. *Bot. Journ. Linn. Soc.* 64(4) : 383-409.

Alliaria Scop.

- CRU 30 Schulz, O. E. 1924
Alliaria. In : Engler, *Pflanzenr.* 86 (IV. 105) 2 : 20-26.

Alyssum Linn.

- CRU 31 Baumgartner, J. 1907-1911
Die ausdauernden Arten der sectio Eualyssum aus der Gattung *Alyssum*. *Jahresb. Landes—Lehresemin. Wiener—Neustadt.* 34 : i-xvi, 1-35, 1907 ; *loc. cit.* 35 : 3-57, 1908 ; *loc. cit.* 36 : 3-32, 1909 ; *Verh. Mäiser Franz Josef Landes—Gymnasium Baden bei Wien* 48 : 3-18, 1911.
- CRU 32 Dudley, T. R. 1964
Synopsis of the genus *Alyssum*. *Journ. Arn. Arb.* 45 :

358-373. A synoptic account of the infrageneric groups and accepted species in alphabetical order.

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CRYPTERONIACEAE

The family Crypteroniaceae is assigned to the order Myrtales by Cronquist, Thorne and to the order Myrtiflorae by Engler, to the order Cunoniales by Hutchinson and to the order Saxifragales by Takhtajan. Earlier Bentham & Hooker included this family under the Lythraceae.

Beusekom-Osinga & Beusekom (1975) in a monograph delimited the family by including genera *Dactylocladus* and *Axinandra*, formerly included under the family Melastomataceae and the American genera *Alzatea* and *Rhynchochalyx* formerly included under the Lythraceae. According to Vliet & Baas (1975) anatomical evidence supports the myrtalean affinity.

The genus *Crypteronia* represents the family *Crypteroniaceae* in India.

For studies on pollen refer Muller (1975).

- CPT 1 Beusekom-Osinga, R. J. van & Beusekom, C. F. van 1975
Delimitation and subdivision of the Crypteroniaceae (Myrtales). *Blumea* 22 : 255-266, 1 map. The following genera are included : *Dactylocladus*, *Axinandra* (previously included under the Melastomataceae, the American *Alzatea* and the African *Rhynchochalyx*, formerly included under the Lythraceae.
- CPT 2 Beusekom-Osinga, R. J. van 1977
Crypteroniaceae. In : van Steenis, *Fl. Males.* I, 8 : 187-207. Included genera, *Crypteronia*, *Dactylocladus* and *Axinandra*, formerly referred to Melastomataceae.
- CPT 3 Muller, Jan 1975
Note on the pollen morphology of Crypteroniaceae. *Blumea* 22 : 275-294.

- CPT 4 Vliet, G. J. C. M. van & Baas, P. 1975

Comparative anatomy of the Crypteroniaceae sensu lato. *Blumea* 22 : 175-195. Anatomical evidence only supports the Myrtalean character of all genera and a close affinity of *Axinandra* and *Crypteronia*.

Crypteronia Bl.

- CPT 5 Niedenzu, F. 1892

Zu kenntnis der Gattung *Crypteronia* Blume. *Engl. Bot. Jahrb.* 15 : 161-179.

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