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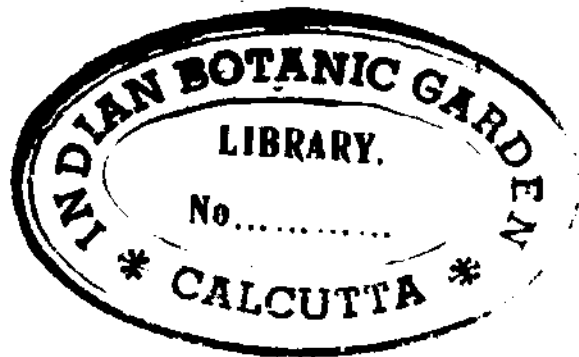
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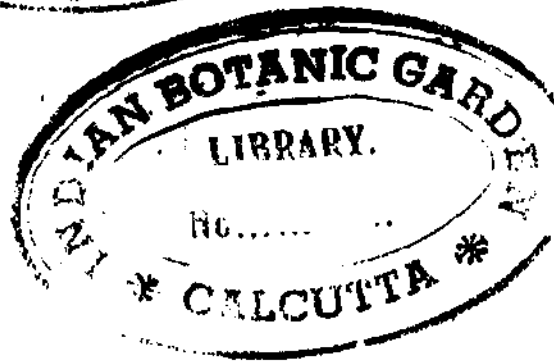
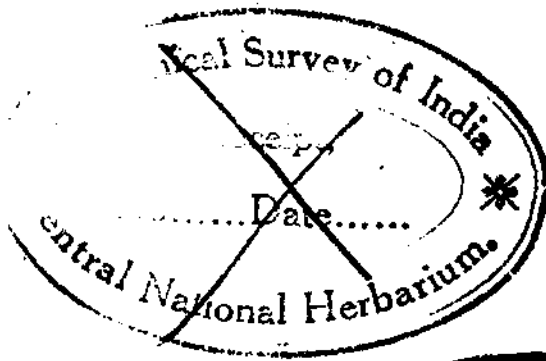
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# FLORA

OF THE

## PRESIDENCY OF MADRAS

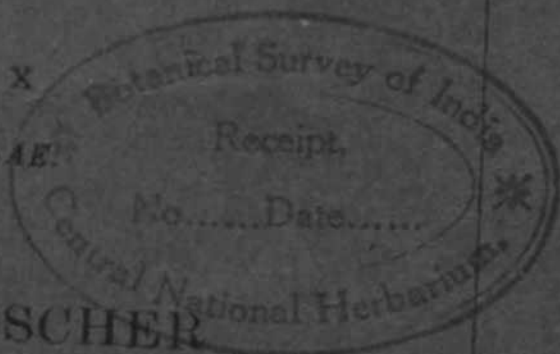
J. S. GAMBLE

PART X

GRAMINEAE

BY

C. E. C. FISCHER



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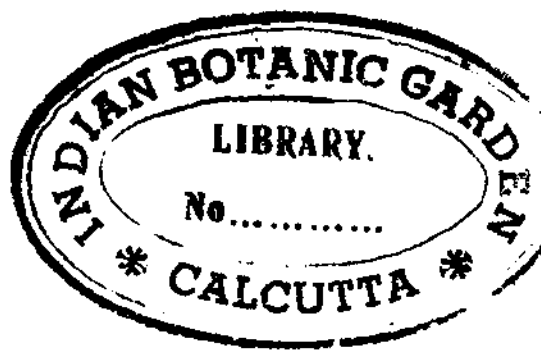
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FLORA  
OF THE  
PRESIDENCY OF MADRAS



J. S. GAMBLE

PART X  
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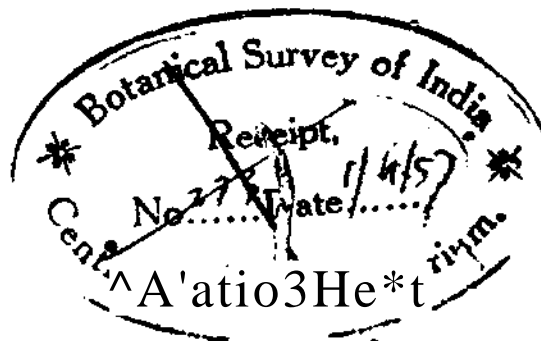
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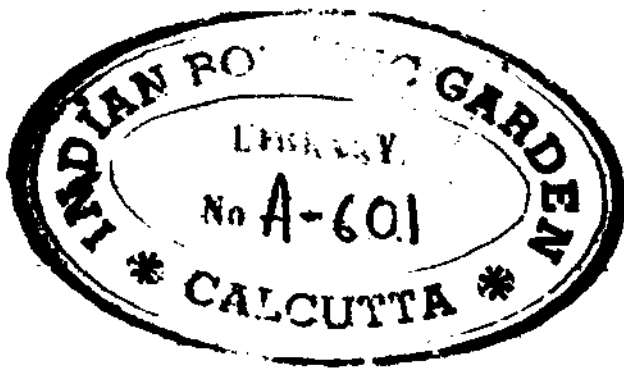
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1934



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CECIL E. C. FISCHER.

ROYAL BOTANICAL GARDENS, KEW;  
21st November, 1934.

R.851

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## FLORA OF MADRAS.

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### Family CLXXVI. GRAMINEAE.

Erect, decumbent or creeping, sometimes floating herbs, or tall reeds, shrubs or trees or climbers ; annual or perennial by means of rhizomes. Stems simple or more commonly branched from the base, generally terete and hollow between the nodes. *Leaves* alternate, commonly 2-ranked, nearly always with a sheathing base split down one side ; ligule at the junction of the blade (or petiole) and the sheath consisting of a membrane or a fringe of hairs, rarely absent; blades usually long and narrow, rarely ovate, parallel-nerved, sessile or sometimes petioled. *Inflorescence* terminal, rarely terminal and lateral, composed of paniced, racemose, simply or compoundly spicate, or capitate spikelets, rarely reduced to a single spikelet; rarely dioecious. *Flowers* solitary or 2-many aggregated in a spikelet. *Spikelets* homogeneous or differing in sex and shape ; 1-sexual or 2-sexual with all the florets 2-sexual or 2-sexual with \$ only or \$ and £ in the same spikelet. The two, seldom more, lowest bracts of the spikelet (*glumes*), one sometimes absent, empty, the rest (*lemmas*) containing a naked floret or sometimes empty by reduction, usually with a smaller bract (*palea*) between the floret and the axis. Usually there are 2, rarely 3-several, hyaline, usually minute scales (*lodicules*) within the palea, representing the reduced perianth. *Stamens* 3, rarely 6, 4, 2 or 1, very rarely more than 6 ; filaments slender, often very long, free, rarely united; anthers versatile with 2 parallel cells. *Ovary* entire, 1-celled ; styles 2, rarely 3 or 1, free or connate at the base, usually clothed above with simple or branched stigmatic hairs ; ovule solitary; erect, anatropous. *Fruit* a grain, free within the lemma and palea or adnate to either or both. *Seed* erect, albumen copious, floury ; embryo minute or large, at the base of and outside the albumen. Mature spikelets falling entire from the tips of their pedicels or together with the pedicel or a part of it or with a part of the rhachis, or else breaking up above the glumes into separate false fruits, rarely persistent and shedding the grain.



The genera are those adopted by Stapf in the 'Flora of Tropical Africa' which is the key to the necessary modifications much assistance from the 'Botany of Bihar and Orissa,' Cooke's 'Flora of the Bombay Presidency,' together with Blatter and McCann's 'Melle. A. Camus's key in 'Flore générale de l'Inde.'

Mr. C. E. Hubbard, of Kew, has given much help and advice, but he is in no way responsible for the ultimate result.

The measurements given for culms exclude the those of the leaves refer to the blades only, and those of the and lemmas exclude cusps, aristas or awls if present, unless otherwise stated.

Sexes in different inflorescences or if in the same then at the base and ♂ above :—

Monococious; leaves **^rer** : ♂ paniced or spicate :—  
 Sexes in separate ♂ lar

an axilla sheath, fused together to form Paniclo 8, ? Spikes in  
 •Sexes in the same inflorescence; & SPolyg bod V h Zea.  
 or few :— In genera, pairs, ♀ solitary

♀ solitary w. **SSSSp** stony bract ..... 2. Coix.  
 ♀ 1-several, oblong, dorsally compressed,  
 coriaceous lvs

dioecious; leaves involute Pen Ventral ^ \_ \_ 3 - Chionachne.  
 heads. e, nglcl - spiny; inflorescence in globo\*<sup>1</sup>  
 Sexes mixed :— 4. Spinifex

Mature spikelets falling entire from or with their pedicels or with the co. guous joint of the rachis, all alike or differing in sex and structure, perfect ones with 2 heteromorphous florets, lower ♂ or empty, upper bisexual :— (5-67)

Spikelets usually in pairs, one sessile, the **r** rarely both, pedicelled, rarely 3-nate or solitary on the axes variously arranged. often spiciform racemes; glumes firmer than the lemmas; lemmas membranous, often hyaline, the upper sometimes awned or reduced to an awn :— (5-44)

Joints and pedicels not bulbous, not adnate to one another, if thick then the spikes digitate or ,,, spathaceous panicles : (5-38)

All spikelets alike in shape and pa cas very short or absent :—  
 Spikes in compound panicles or racemes on an elongated common axis; spikelets 1-flowered :—

Rhachis tough ; all spikelets pedicelled :—

Panicle thyrsoid ; callus long-silky-hairy ; spikelets 2-nate, one long-, one short-pedicelled :—

Panicle narrow-thyriform, silvery hairy; lemmas awnless. . . . . 5. **Imperata.**

Panicle broadly fan-shaped, brownish-hairy ; lemmas usually awned . . . . . 6. **Miscanthus.**

Panicle narrow ; spikelets solitary ; glumes shortly brown-hairy. . . . . 7. **Cleistachne.**

Rhachis readily disarticulating ; spikelets 2-nate, one sessile, the other pedicelled :—

Spikelets awnless. Leaves not narrowed to the base, not petioled :—

Glumes membranous or chartaceous at the base only. Panicles wide, more or less silvery-plumose

8. **Saccharum.**

Glumes chartaceous or coriaceous throughout. Panicles narrow, rufous-hairy, not plumose

9. **Eriochrysis.**

Spikelets awned. Leaves narrowed at the base, often long petioled . . . . . 10. **Spodiopogon.**

Spikes ^digitate or solitary ; spikelets 1-flowered, or if 2-flowered then the lower glumes channelled :—

Rhachis inarticulate; spikelets not paired 11. **Dimeria.**

Rhachis articulate :—

Spikes solitary, capillary ; spikelets 2-awned

12. **Pogonatherum.**

Spikes digitate ; spikelets 1-2-awned :—

Rhachis fragile ; pairs of spikelets always one sessile and one pedicelled; glumes \*1 in. or more long; upper lemma much wider than its awn

13. **Eulalia.**

Rhachis more or less persistent; pairs of spikelets often both pedicelled ; glumes less than \*1 in. long ; upper glume hardly wider than its awn :—

Lower glume flat or depressed on the back, not channelled . . . . . 14. **Pseudopogonatherum.**

Lower glume deeply channelled on the ba^k

15. **Microstefjum.**

Sessile and pedicelled spikelets dissimilar, sessile bisexual, pedicelled ^, empty or 0, or if similar (*Pollfnidiuni*) the^ the paleas well-developed and the rhachis compressed :—

Fertile spikelets 2-flowered :—

Pedicelled spikelets present:—

Both spikelets awned ; joints of rhachis and pedicels flattened or thickened ; paleas well developed :—

Rootstock and base of culm clothed with woolly sheaths ; rhachis flattened ; spikelets all simil\*<sup>1</sup> and homogamous . . . . . 16. **Pollinidium.**

Culm not woolly at base ; joints and pedicels stout ; spikelets heterogamous :—

Spikes clustered or digitate ; lower glumes not channelled . . . . . 17. **Ischaemum.**

Spikes solitary ; lower glumes channelled on the back . . . . . 18. **Sehima.**

Sessile spikelet awnless ; lower glumes 3-toothed

19. **Lophopogon.**

Pedicelled spikelets suppressed, pedicels only present :—

Spikes usually 2 ; margins of glumes smooth

20. **Apocopsis.**

Spikes solitary ; margins of lower glumes spinuloso- or bristle-pectinate . . . . . 21. **Eremochloa.**

Fertile spikelets 1-flowered :—

Panicles not subtended by spathes :—

All pairs of spikelets alike :—

Upper lemma awned from the back below the middle ; spikes digitate . . . . . 22. **Arthraxon.**

Upper lemma awned from the tip or the middle

Upper lemma reduced to the hyaline stipitiform base of the awn ; joints and pedicels filiform with a translucent longitudinal depression :—

Racemes in compound panicles

23. **Capillipedium.**

Racemes subdigitate, fasciated or verticillate on an elongate axis . . . . . 24. **Amphilophis.**

Upper lemma not reduced, 2-fid, awned from the sinus ; joints and pedicels solid :—

Raceme of many pairs of spikelets :—

Primary branches of the panicle whorled ; lower glumes coriaceous, mucronate or tuberculate . . . . . 25. **Vetiveria.**

Primary branches not whorled ; lower glumes chartaceous, smooth

26. **Pseudosorghum.**

Raceme of few pairs of spikelets, rarely 6, sometimes reduced to 1 sessile and 2 pedicelled :—

Spikelets dorsally compressed; pedicelled spikelet sometimes reduced to a pedicel only ; sessile spikelet awned or not. .27. **Sorghum.** Spikelets laterally compressed, raceme nearly always reduced to 1 sessile and 2 pedicelled spikelets on the tips of slender peduncles, all awned . . . . . 28. **Chrysopogon.**

Lowest 1 or more pairs of spikelets homogeneous and differing from all above them :—

Spikes digitate, rarely solitary; sessile spikelets dorsally compressed ; callus of lemma short

29. **Dichanthium.**

Spike solitary ; sessile spikelets subcylindric ; eajlus elongate, pungent . . . . . 30. **Heteropogon.**

Panicles subtended by spathes; spikes usually 2, or 1, rarely more, on a, common peduncle sheathed by a spatheole :—

Spikes reduced to 1 or a few nodes with or without a surrounding involucre of modified \$ or empty spikelets :—

Involucre of modified spikelets present :—

Involucral spikelets persistent, the rest "jointed on the rhachis and falling separately

31. **Themedia.**

Involucral spikelets jointed on the peduncle and falling together with the rest . . . . . 32. **Iseilema.**

No involucre present:—

Callus of spikelet not inflated

33. **Pseudanthistiria.**

Callus much inflated . . . . . 34. **Apluda.**

Spikes many-noried, not reduced nor involucrcd :—

Spikes solitary in each spatheole :—

Joints and pedicels slender . . . . . 35. **Eremopogon.**

Joints and pedicels thickened upwards to a cupped apex, often with a dentate tei^iinal appendage . . . . . 30. **Schizachyfum.**

Spikes twin in each spatheole :—

All pairs of spikelets similar ; raeffmes termin' ting the culms. . . . . 37. **Androp(feon.**

## FLORA OF MADRAS.

- Lowest pair of spikelets of one or both <sup>spikes</sup> homogeneous; lowest joint sometimes <sup>m<sup>u</sup>ch</sup> thickened; plant often aromatic; panicle <sup>s</sup> decomposed. . . . . 38. **Cymbopogon**
- Joints of the rachis and often the pedicels much swollen\* sometimes joint and pedicel fused to form a cylindric axis <sup>in</sup> which the lower glume is sunk; pedicelled spikelet sometimes <sup>H<sup>h</sup></sup> suppressed:—
- Sessile and pedicelled spikelets very unlike, sessile, globose
39. **Hackelochloa**
- Spikelets more or less alike and compressed or the pedicel <sup>JK<sup>il</sup></sup> suppressed:—
- Spike readily disarticulating:—
- Lower <sup>g</sup> glumes convex; pedicelled <sup>p</sup> spikelets <sup>p</sup> suppresses <sup>l<sup>o</sup></sup> pedicels fused with the joints. . . . . 40. **Ophiuros**
- Lower glumes flat; ends of joints hollowed out:—
- Pedicelled spikelets as large as or only slightly smaller <sup>H<sup>i</sup></sup> than the sessile:—
- Raceme terete: lower glumes of sessile spikelets <sup>U\*<sup>t</sup></sup> not or very narrowly winged, awnless
41. **Rottboellia**
- Raceme compressed; lower glume of sessile <sup>e</sup> spikelets broadly winged or if only winged in upper <sup>r</sup> half then 1-2-awned. . . . . 42. **Manisuris**
- Lodicules <sup>Ued</sup> spikelets rudimentary; sessile <sup>s</sup> spikelets deeply sunk in opposite cavities. . . . . 43. **Mnesithea**
- Spike with cohering joints with truncate tips, compressed
44. **Hemarthria**
- Spikelets in usually continuous spikes, racemes or panicles; glumes herbaceous or membranous, the lower generally small\* sometimes minute or absent; lower lemma generally resembling the upper glume, the upper always fertile, ultimately rigid\* chartaceous or crustaceous, muticous, mucronate or awned:—
- Upper floret only fertile; lower lemma not hardened:— (45-66)
- Inflorescence of usually slender, spiciform, digitate, subdigitate or distant, very rarely solitary racemes; fruiting lemma usually with flat thin margins with the usually minute lower palea attached to its base:—
- Spikelets muticous; lower lemmas with 5-7 close, prominent nerves. . . . . 45. **Digitaria**\*
- Spikelets awned or aristate; lower lemma smooth
40. **Alloteropsis**.

Inflorescence usually different, various ; fruiting lemma with more or less inrolled margins; lower palea not attached to the upper lemma :—

Spikelets falling entire and singly from the persistent pedicels, rarely falling with the contiguous joints of an articulate rhachis (51. *Stenotaphrum*):— (47-64)

Spikelets muticous, or if awned then sessile in false secund spikes with the awns from the entire or the very slightly notched tips of the upper glumes and the lower lemmas, or the tips of the lower or both glumes ; fruiting lemmas crustaceous :— (47-63)

Inflorescence never an open or contracted-cylindric panicle :—

Back of fruit turned away from the axis :—

Spikelets strongly laterally compressed ; lower glume herbaceous, as long as the spikelet

**47. Pseudechinolaena.**

Spikelets more or less dorsally compressed ; lower glume never herbaceous :—

Bases of spikelets with a swollen annular callus formed by the rudimentary lower glume and the base of the rhachilla . . . . . 48. **Eriochloa.**

Bases of spikelets devoid of swollen callus, lower glume distinct . . . . . 49. **Brachiaria.**

Back of fruit turned towards the axis :—

Lower glume absent or reduced to a scale; spikelets usually conspicuously plano-convex with the flat side turned away from the rhachis

**50. Paspalum.**

Lower glume well developed :—

Rhachis flat, articulated ; spikelets in cavities of the rhachis, ultimately falling with the contiguous joint . . . . . 51. **Stenotaphrum.**

Rhachis not articulated ; spikelets falling from their pedicels :—

Glumes muticous :—

Fruiting lemmas acute, not mucronate ; spikelets solitary, their sides contiguous

**52. Paspalum.**

Fruiting lemmas obtuse, abruptly mucronate ; spikelets paired & if solitary then their backs contiguous . . . . . 53. **Urochloa.**

Glumes, at least the upper, caudate <sup>or</sup>  
awned:—

Leaves linear; glumes entire, the <sup>lower</sup>  
awnless. . . . . 54. **Echinochloa**-

Leaves lanceolate; glumes slightly notched <sup>at</sup>  
the lower awned. . . . . 55. **OpilsmenUS**.

Inflorescence an open or a contracted, cylindrical <sup>or</sup>  
spiciform panicle:—

Spikelets not supported by bristle-like branchlets,  
rarely replaced by a minute bristle (57. *Hole*  
*lemma*):—

Spikelets not gibbous, or if slightly so then not  
in cylindrical, spiciform racemes:—

Panicles open, or if contracted the branches <sup>are</sup>  
spreading, not spiciform:—

Glumes similar, subequal, shorter than the  
spikelet:—

Rhachis branched, branches long; base of  
rather broad leaves rounded; glumes <sup>are</sup>  
lanceolate, acuminate, prominently nerved <sup>at</sup>  
fruiting lemmas smooth. . . . . 50. **Ottochloa**-  
Rhachis simple; base of very narrow  
leaves narrowed; glumes broadly ovate,  
subacute, not prominently nerved; fruiting  
lemmas finely transversely rugulose

**57. Holcolemma.**

Glumes dissimilar, the lower much the  
shorter, rarely absent. . . . . 58. **FaniCulfi**\*

Panicles contracted, dense, branches appressed  
spiciform. . . . . 59. **Hymenachne**.

Spikelets distinctly gibbous and oblique, <sup>or</sup>  
only slightly so then in cylindrical, spiciform  
racemes:—

Spikelets laterally much compressed

**60. Cyrtococcini.**

Spikelets turgid, not compressed

**61. Saccolepis.**

Spikelets, at least the upper of each branch, sup-  
ported by bristle-like branchlets:—

Terrestrial, erect; panicle contracted, usually  
spiciform; bristles many, not produced beyond  
the terminal spikelet. . . . . 62. **Setaria**.

Aquatic, decumbent; panicle open; bristle solitary, much produced beyond the terminal spikelet . . . . . 63. **Pseudoraphis.**

Spikelets finely awned or mucronate from the sinus of the distinctly notched upper glumes and lower lemmas, the latter rarely muticous, delicately pedicelled, paniced; lower glume minute; fruiting lemma rigidly membranous. . . . . 64. **Rhynchelytrum.**

Spikelets involucrate with spines or bristles, falling in groups, seldom singly :—

Involucre of free, naked or feathery bristles

. . . . . 65. **Pennisetum.**

Involucre of spines or rigid bristles united into a hard cup . . . . . (Hi. **Cenchrus.**

Both florets fertile, or if the lower 3 then its lemma hardened and more or less resembling the upper. . . . . 67. **Isachne.**

Mature spikelets breaking up, leaving the persistent or subsistent flumes on the rhachis or pedicels, or if falling entire then not consisting of 2 heteromorphous florets :—

Blades of leaves not transversely veined or articulate on the sheaths, or if so (112. *Lophatherum*, 113. *Cenchrus*) not large woody shrubs or trees :— (68-126)

Awn of fertile floret if present kned and twisted below the knee (rarely straight in reduced forms) :— (68-85)

Spikelets 2-several-flowered :—

Florets 2 only, dissimilar; lower lemma awnless; awn of upper lemma, when present, from the entire tip :—

Tall reeds; leaves distichous; panicles large, decompound; spikelets very small, jointed on the pedicels; upper lemma awnless. . . . . 68. **Thysanolaena.**

Small or moderate-sized plants; leaves not distichous; panicles small, not decompound; spikelets not jointed on the pedicels; upper lemma usually awned, sometime\* also with 2 setae. . . . . 69. **Arundinella.**

Florets 2-several, all alike or the uppermost reduced; lemmas membranous, often with hyaline margins; awn, when present, from the back or the sinus or from between bristles :— %

Small or moderate-sized plants; panicles not decompound; rhachilla rarely jointed between the lemmas :—

Florets 2-several; lemmas 2-cleft, usually awned from the back below the sinus :—



Perennials ; spikelets moderate-sized, erect or s<sup>\*ib-</sup>  
 erect; glumes usually 1-3-nerved . .70. **AvenastrUfill'**  
 Annuals; spikelets large, pendulous; glu<sup>m<sup>es</sup></sup>  
 7-9-nerved. . . . .71. **Aven\*-**

Florets 2 only ; lemmas entire :—

Weak marsh plants ; glumes not keeled ; rhach<sup>ill<sup>s</sup></sup>  
 elongate between the lemmas ; upper lemma <sup>the</sup>  
 longer, coriaceous. . . . .72. **Coelachn<sup>o-</sup>**

Rigid, erect, terrestrial plants; glumes <sup>keeled ;</sup>  
 rhachilla short between the equal, chartaceo<sup>us</sup>  
 lemmas. . . . .73. **Zenkerj<sup>\*illa</sup>**

Very tall reeds; panicles decomposed ; rhachni<sup>lla</sup>  
 jointed between the lemmas :—

Lemmas silky-hairy ; rhachilla elongate, glabrous <sup>ll<sup>s</sup></sup>  
 short-hairy at the base :—

Lemmas hairy all over the back below the mkUU<sup>c</sup>  
 74. **Arundo-**

Lemmas hairy from the nerves on the sides on<sup>l'</sup>  
 75. **Neyraudia-**

Lemmas glabrous ; rhachilla short, long-hairy  
 70. **Phragmites-**

Spikelets 1-flowered :—

Inflorescence paniced :—

Panicles dense, oblong-spiciform or lobulate  
 77. **Polypogon-**

Panicles effuse or narrow, not dense or spiciform :—

Lemma cylindric, coriaceous, tightly enfolding <sup>\*ll<sup>e</sup></sup>  
 grain, awned, awns often 3. . . . .78. **Aristid&'**

Lemma lanceolate, membranous or cartilaginous, no<sup>t</sup>  
 enfolding the grain :—

Spikelets not jointed on the pedicels ; awn, wh<sup>l<sup>ou</sup></sup>  
 present, from the back of the lemma. .79. **AgrostiS.**

Spikelets jointed on the pedicels ; usually a\vn<sup><<sup>ll</sup></sup>  
 from the tip of the lemma. . . . .80. **Garnotia.**

Inflorescence spicatc or racemose :—

Racemes 2-3, seldom solitary; rhachis broad, tt<sup>>\*»</sup>  
 disarticulating; spikelets mixed with rigid flowerloss  
 glumes. . . . .si. **Trachys.**

Racemes solitary ; rhachis narrow, not flat, not articu-  
 lated ; flowerless glumes absent:—

Upper glume 5-ribbed, armed with hooked spinules

82. **Tragus.**

Glumes neither ribbed nor spinulose :—

Rhachis straight; spikelets spreading :—

Spikelets minute, shaped like a shoe or a bird's head, awnless. . . . . 83. **Lopholepis.**

Spikelets larger, narrowly lanceolate; glumes tapering into a long fine awn . . . . . 84. **Perotis.**

Rhachis flexuous, forming recesses into which the spikelets are appressed . . . . . 85. **Zoysia.**

Awn of the fertile floret, when present, never kneed :—

Lemmas typically 3-nerved :—

Inflorescence paniced, or if spicate (some *Ermjroslia*) then not secund :—

Spikelets 1-flowered, very small ; glumes and lemmas very similar, awned . . . . . 86. **Sporobolus.**

Spikelets 2-many-flowered, or if only 1-flowered then glumes and lemmas dissimilar :—

Lemmas entire :—

Glumes rigid, coriaceous, awned 87. **Myriostachya.**

Glumes membranous or cartilaginous, not awned, at most caudate-acuminate :—

Upper glumes 1-nerved :—

Spikes short, straight, crowded ; spikelets closely packed . . . . . 88. **Desmostachya.**

Spikes slender, long, flexuous ; spikelets distant. . . . . 89. **Leptochloa.**

Upper glumes 3-5-nerved :—

Lower glume 1-nerved, upper 3-nerved ; lemmas moderately rigid ; rhachilla glabrous . . . . . 90. **Eragrostis.**

Lower glume 3-nerved, upper 5-nerved ; lemmas coriaceous ; rhachilla joints bearded . . . . . 91. **Halopyrum.**

Lemmas emarginate :—

Spikelets laterally compressed, sessile or subsessile, few-many-flowered ; rhachilla not produced beyond the lemmas . . . . . 92. **Diplachne.**

Spikelets terete, pedicelled, 1-flowered ; rhachilla produced beyond the lemma into a filiform arista . . . . . 93. **Dichaetaria.**

Inflorescence of sessile or subsessile spikelets in 2-ranked, secund, usually dense, solitary, digitate or racemosely arranged spikes :—

## FLORA OF MADRAS.

Spike solitary, rarely twin :—

Spikelets more or less sunk in the rhachis

94. *Oropetium-*

Spikelets not sunk in the rhachis :—

Spikelets awnless . . . . . 95. **Microchlo-**

Spikelets awned :—

Spikelets 1-2-flowered in pedicelled, articulate clusters; rhachilla produced beyond the <sup>U P ^r</sup> lemma . . . . . 96. *Melanocenchri\**

Spikelets 1-many-flowered, sessile, not in clusters :—

Spikelets 3-many-flowered; lower gl<sup>m</sup>e usually lodged in a furrow in the rhaeni's<sup>s</sup> rhachilla not produced beyond the term<sup>u1\*</sup> lemma . . . . . 97. **MpogO\***

Spikelets 1-3-flowered ; lower glume not lodged in the rhachis; rhachilla produced beyond . . . . . 98. **Enteropog<sup>0\*1</sup>**

Spikes digitate, umbelled or racemose, very r<sup>\*fl</sup> solitary or if so then lemmas obovate :—

Spikelets 1-flowered ; spikes always digitate

99. **Cynodon\***

Spikelets 2-several-flowered, sometimes only fertile :—

Fertile florets 1-3 with 1 or more imperfect above or below; spikes umbelled or racemose, rarely solitary ; lemmas awned or aristate . . . . . 100. **Chloris.**

Fertile florets 2-several, none imperfect :-\*

Spikes digitate or subdigitate or capitate, usually rigid ; glumes shorter than lemmas :- -

Spikes terminated by a spikelet; glumes aristate lemmas mucicous or obscurely mucronate

101. **Eleusine.**

Spikes terminating in a sharp point; upper glume and lemmas rigidly mucronate cuspidate . . . . . 102. **Dactyloctenium-**

Spikes racemose, slender, spreading or reflexed ; glumes much longer than the lemmas

Lemmas typically 5-many-nerved :— [103. *Dinebra.*

Lemmas broad, 4-9-lobed :—

Inflorescence a contracted panicle ; lemmas 9-nerved and -awned . . . . . 104 **Enneapogon.**

Inflorescence a simple spike ; lemmas spirally arranged in a cone, 4-nerved, and lobed, 1-5-awned

105. **Pommereuilla.**

Lemmas entire or 2-, rarely 3-lobed :—

Spikelets in compact, subcapitate or cylindric, often interrupted, spikes :—

Leaves flat, neither distichous nor pungent, usually long ; spikes cylindric, often interrupted

106. **Elytrophorus.**

Leaves convolute, distichous, rigid, pungent, 1-2 in. long ; spikes capitate. . . . . 107. **Aeluropus.**

Spikelets not compact, in spikes, racemes or panicles :—

Inflorescence paniced :—

Glumes absent, or minute or setaceous; fertile floret solitary :—

Lower florets represented by 2 scales or bristles ; glumes minute, scale-like or subulate

108. **Oryza.**

Lower florets suppressed ; glumes 0 or reduced to a rim :—

Glumes represented by an entire or 2-lobed rim ; lemmas awnless. . . . . 109. **Leersia.**

Glumes suppressed ; lemmas awned

110. **Hygrorhiza.**

Glumes, at least the upper, developed :—

Two lower lemmas 2-lobed, awned from below the sinus. . . . . 111. **Anthoxanthum.**

Lemmas entire :—

Leaves flat, lanceolate, with numerous transverse venules :—

Spikelets not compressed ; fertile floret 1, with several closely sheathing, cuspidate empty lemmas above. . . . . 112. **Lophatherum.**

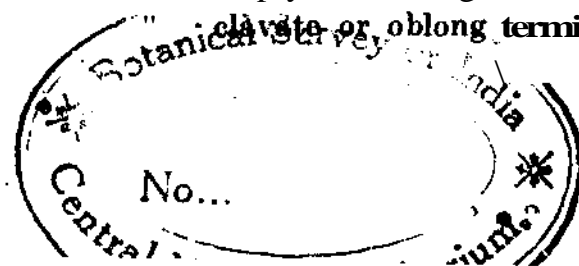
Spikelets compressed; fertile florets 1-3, empty lemmas 0-1-several, usually with erect or deflexed bulbous-based bristles; muticous. . . . . 113. **Centotheca.**

Leaves usually narrow, no transverse venules:—

Lower 1-3 lemmas bisexual, those above empty, enfolding each other to form a

clavate or oblong terminal body

I<sup>14</sup>. **Melica.**



**FLORA OF MADRAS.**

Upper lemmas not in a terminal sterile body :—

plumes and lemmas muticous ; spikelets laterally compressed :—

Panicles expanded ; glumes and lemmae subequal :—

Spikelets ovate or triangular ; pedicel capillary ; glumes and lemmas broadly ovate, obtuse, not keeled

115. **Bri2»\***

Spikelets oblong ; pedicels not capillary ; glumes and lemmas ovate-lanceolate, acute, keeled .. 116. **Po»«**

Panicles narrow ; spikelets elongate-oblong ; glumes much shorter than the strongly nerved lemmas .. 117 **Glyceria-**  
glumes and lemmas caudate, aristate or awned :—

Panicles contracted ; spikelets in dense clusters ; rhachilla short between the lemmas .. 118. **Dactylis.**

panicles more or less expanded ; spikelets not clustered ; rhachilla elongate between the lemmas :-


Lower glume much the shorter ; lemmas subulate, not keeled

119. **Vulpia.**

glumes subequal ; lemmas oblong or lanceolate :—

Lemmas rounded on the back or keeled only in the upper half, long.... 120. **Festuca.**

glumes sharply keeled throughout,

Inflorescence a simple spike or  8  
Leaves narrowed into a sharp point ; lemmas convolute, acutely 2-fid  
**Streptogyne.**

rhachis on the rachis :—

Rhachis not recessed ; spikelets nearly terminal distichous

123. **Brachypodium.**

- Rhachis flexuous, recessed; spikelets much compressed, distichous. . . . . 124. **Lolium.**
- Spikelets aggregated into a dense oblong head :—
- Spikelets solitary at the nodes, without involucre. . . . . 125. **Triticum.**
- Spikelets 3-nate at the nodes ; outer glumes of each cluster together forming a quasi involucre. . . . . 126. **Hordeum.**
- Blades of leaves usually transversely veined, articulate on their sheaths; large woody shrubs or trees with large culm-sheaths with an imperfect blade :—Bamboos.
- Paleas differing from the lemmas, 2-keeled, or if not keeled then the stamens monadelphous :—
- Staminal filaments free :—
- Stamens 3. . . . . 127. **Arundinaria.**
- Stamens 6 :—
- Spikelets in globose congested heads
128. **Dendrocalamus.**
- Spikelets not in globose congested heads :—
- Imperfect blade of culm-sheath broadly triangular, erect; paleas 5-7-nerved between the keels ; pericarp thin, adnate to the seed. . . . . 129. **Bambusa.**
- Imperfect blade linear-ensiform, recurved; paleas I-nerved between the keels; pericarp crustaceous, free from the seed. . . . . 130. **Teinostachyum.**
- Staminal filaments united into a tube ; stamens 6
131. **Oxytenanthera.**
- Paleas 0 or resembling the lemmas, not keeled ; stamens usually numerous ; filaments free or united. . . . . 132. **Ochlandra.**

### 1. *Zea*, Linn.

Tall, stout, annual herbs. *Leaves* large, flat. *Inflorescence* monoecious ; \$ spikelets in large terminal subdigitate or racemose panicles of spiciform racemes ; axes of \$ spikes fused into a spongy, subcylindric core in axillary sheaths. <J *spikelets* 2-nate; one pedicelled, the other sessile, 2-flowered. *Glumes* subequal, membranous. *Lemmas* similar, hyaline, their paleas similar. *Lodicules* 2, fleshy. *Stamens* 3. ? *spikelets* 2-nate in 4—11 longitudinal rows, slightly immersed in the axis ; florets 2, the lower reduced to an empty lemma. *Glumes* similar, very broad, fleshy below,

hyaline above. Lemmas like the glumes; paleas short broad, the lower sometimes wanting. Tip, exerted in sheath. Grain by the dried-up glumes, lemmas and paleas.

ZEA MAYS, Linn.; F. R. L. v. 11.

American plant grain and its fodder leaves. 1 many localities for its edible

Stems robust up 70" and 4 in wide inches long

Makka ehlm, Turak, Makkai jol-i, Mokka Jounalu; Tan, cholam; Kan.

2. Coix, Linn,

Annual or perennial, tall, erect or floating plants. Leaves flat. Inflorescence of axillary and terminal\* spiciform racemes. consisting usually of one spikelet completely enclosed in a globose sheath, through which the rachis grows out and beak times continues to a leafy blade, and polished, sometimes continuing to a leafy blade, a second bract above. ♂ spikelets imbricate in pairs or threes, one pericelled. Glumes subequal, herbaceous, the lower with 2 ~ 1 winged keels, the upper boat-shaped with 1 upper empty. Lemmas membranous, the upper shorter; paleas hyaline. Lodicules 2 cuneate, fleshy. Stamens 3. Glumes hyaline in the bract with 2 bare beaks.

with acute cartilaginous beak, the upper acutely keeled between 2 deep grooves. FLSs 2, the lower usually reduced to an empty lemma resembling the lower one, upper empty. Pericarpium rudimentary. Ovary 2-fid, exerted from the mouth of the beak; embryo as Ion.

Annuni; culms up to 5 ft. Leaves 5-2 in. wide, base cordate, long; 9 bracts in. long; ♂ glume 0.3-0.5 in. long; wings low. We . . 1. Lacryma-Johi.

Perennial; culms up to 15 ft. high ; leaves linear, 1-4 ft) long, -1--7 in. wide, base narrowed or slightly rounded, not cordate ; peduncles up to 7 in. long ; <\$ racemes -7-2-5 in. long ; spikelets usually 3-nate ; wings of lower glume -02--05 in. wide . . . . . 2. *gigantea*.

1. Coix LACRYMA-JOBI, Linn. ; F. B. I. vii. 100 ; S. I. G. fig. 126.

In all Districts except the hottest and driest localities ; from near sea-level to 7,000 ft. Job's tears.

Sometimes cultivated by hill tribes for the grain. The stony bracts are strung by the hillmen into necklaces and other ornaments. The leaves are readily eaten by cattle. Vern. *Hind.* Sankru ; *Tarn.* Kattu-kundamani.

2. Coix GIGANTEA, Roxb. *C. Lachryma-Jobi*, Linn. var. *gigantea*, Stapf ; F. B. I. vii. 100.

In the same localities as the last species.

### 3. Chionachne, R. Br.

Annual or perennial erect herbs. *Leaves* flat, narrow. *Inflorescence* of spiciform racemes ; racemes entirely <\$ or with 1 or more \$ spikelets at the base, at first enclosed in spathiform bracts ; rhachis articulate lit the base and above each \$ spikelet. <J *spikelet* 2-flowered, solitary or 2-nate and then one pedicelled. *Glumes* dissimilar, lower herbaceous, shallowly concave with a narrow membranous wing on each side, upper chartaceous or rarely herbaceous, ^ narrower. *Lemmas* similar, membranous, paleate, both staminate or the upper empty. *Lodicules* 2, cuneate. *Stamens* 3. ? *spikelets* oblong, dorsally compressed, 2-flowered. *Glumes* very dissimilar ; lower thickly coriaceous, embracing but not concealing the rhachis between ij^s inflexed margins, enclosing the upper glume and floret; upper membranous or chartaceous. *Lemmas* delicately hyaline ; the lower empty, paleate or not; the upper narrow, its palea wrapped round the pistil. *Lodicules* 0. *Styles* very long. *Gram* orbicular, compressed, ventrally channelled, free inside the hardened lower glume.

Culms up to 2 ft. high ; leaves up to 12 in. long, -1--25 in.- wide ; spathes always closed, 1-1 -5 in. long, muticous or mucronate ; racemes solitary ; 9 spikelets 2-5, -27--34 in. long ; \$ spikele^s usually many ; wings of lower glume glabrous, not ciliate . . . . . 1. *semi&eres*.



Culms up to 8c ft. high; leaves up to 3 ft. long, -22-(>5 in. wid<sup>o</sup> •  
 spathes chaffy, at first plicate, soon opening out, \*5-1 in. long \*<sup>ith</sup>  
 an arista -2--5 in. long; racemes umbelled; \$ spikelets solitary,  
 •19--3 in. long; <£ spikelets usually few; wings of lower glumes more  
 or less puberulous, ciliate. . . . . 2. Koem<J<sup>li</sup>,

1. CHIONACHNE SEMITERES, C. E. C. Fischer n. comb. *PolyW<sup>l</sup>  
 semiteres*, Benth. ex Hook. f. ; F. B. I. vii. 101.

S. Arcot District (Barber); Tinnevely District at Palamcottah (Wight).

2. CHIONACHNE KOENIGII, Thw. *Polytoca barbata*, Stapf <sup>cS</sup>  
 Hook. f. ; F. B. I. vii. 102 ; S. I. G. fig. 127.

Northern Districts as far S. as Bellary and Cuddapah ; Nilgi<sup>ri</sup>  
 N. Coimbatore and Travancore Hills ; 200-3,500 ft. Vern.  
*Kan.* Suku dabha.

#### 4. Spinifex, Linn.

Gregarious, much-branched, woody shrubs. *Leaves* rigid, thickly coriaceous, involute, spreading and recurved. *Inflorescence* dioecious, in large, terminal, globose, bracteate heads with radiating spiciform racemes. *Spikelets* articulate on the short pedicels; <J several? distichous in each raceme, 2-flowered; \$ solitary, 1-flowered. *Glumes* chartaceous, acute, subequal or the upper slightly longer. *Lemmas* subequal, paleate; in <J both staminate or the lower empty; in \$ the lower empty, the upper fertile. *Lodicules* 2, large, connate below, strongly nerved. *Stamens* 3. *Styles* 2, long, united below. *Staminodes* sometimes present in ? floret.- *Grain* clavate, tipped with rigid style-base, free within the hardened lemma and palea.

SPINIFEX LITTOREUS, Merr. *S. squarrosus*, Linn. ; F. B. I. vii. 63 ; S. I. G. figs. 105, 106.

Sea-shore sands in all coastal districts.

Whole plant pale grey or glaucous ; stems forming thickets ; leaves channelled, up to 13 in. long; <J heads up to 6 in. diam., bracts and rhachises pungent, spikelets -36—4 in. long ; \$ heads u<sup>4</sup> to 13 in. diam. ; bracts pungent up to 8 in. long, spikelets hidden at the base of the bracts, up to -52 in. long.

A useful sand-binder. Vern. *Ur.* Gudukanko ; *Tel* Ravani suruni misalu ; *Tarn.* Ravanan meesai.

## 5. Imperata, Cyrill.

Erect, perennial herbs; culms leafy, solid. *Leaves* narrow. *Inflorescence* a terminal, spiciform or thyrsiform panicle. *Spikelets* all alike, generally 2-nate, one short-, the other long-pedicelled, disarticulating from the pedicels; 2-flowered, the lower usually reduced to an empty lemma, rarely (J. *Glumes* subequal, membranous, enveloped in long silky hairs from the obscure callus and from the lower half of the glume. *Lemmas* hyaline, muticous; the lower usually much smaller than the glumes; the upper still smaller, with a broad palea. *Lodicules* 0. *Stamens* 1-2. *Styles* 2, connate below. *Grain* oblong; embryo half as long or longer.

IMPERATA CYLINDRICA, Beauv.

Var. *Koenigii*, Dur. et Schinz. / *arundinacea*, Cyr.; F. B. I. vii. 106 *in part*; S. I. G. fig. 128.

In all Districts, usually in wet situations; sea-level to 7,000 ft. Root-stock stoloniferous, often creeping; culms 1-4 ft. high; leaves 2-2-5 in. long, 1-6 in. wide; panicles 1-8-5 in. long, narrow, white-silky hairy. Cotton grass.

Eaten by cattle only when young and tender. Vern. *Hind.* Dabh.; *Tel.* Dharba, Modewa gaddi; *Tarn.* Tharpai pullu, Dharbai pul; *Kan.* Sanna dabbai hullu.

## 6. Miscanthus, Andcrss.

Tall,\* perennial herbs. *Leaves* flat, narrow, long. *Inflorescence* terminal, of numerous spiciform racemes crowded into a usually nodding, fan-shaped corymb; rhachis slender, not articulated. *Spikelets* in similar pairs at the nodes, one long- the other short-petioled, 1-flowered, the callus with long hairs forming a quasi involucre. *Glumes* chartaceous, subsimilar. *Lemmas* hyaline; the lower empty; the upper narrower, 2-toothed or 2-lobed, usually with an awn from the sinus; palea usually minute, containing a bisexual floret. *Lodicules* 2. *Stamens* 2-3. *Styles* 2, free. *Grain* oblong; embryo half as long.

MISCANTHUS NEPALENSIS, Hack.; F. B. I. vii. 107.

Nilgiris at Ootacamund; 7,500 ft. (Nar|yana and Raju, possibly introduced); without precise locality (Ramasyami).

Culms up to 6 ft. high ; leaves up to 18 in. long and 6 in. wide ; corymbs up to 9 in. long ; callus of spikelets very short, bearing numerous fine, brown hairs up to 34 in. long ; glumes broad 0.8—1.2 ; awns 1.4—4.2 in. long.

#### 7. *Cleistachne*, Bentham.

Annual or perennial erect herbs. *Leaves* flat, elongate. *Panicles* narrow. *Spikelets* solitary, all alike ; pedicels slender with thickened tips. *Glumes* subequal and similar, more or less coriaceous. *Lamina* hyaline ; the lower empty, without palea ; the upper shorter, entire or 2-toothed, with a stout geniculate awn ; palea short, containing a bisexual floret. *Lodicules* 2, cuneate, ciliate. *Stamens* 3. *Styles* 2, free. *Grain* oblong to obovoid-oblong, free ; embryo half as long.

CLEISTACHNE STOCKSH, Hook. f. ; F. B. 1. vii. 152.

Bababudan Hills (Law) ; Travaneore at Santhaparn, 4000 ft. (Meebold).

Culms up to 4 ft. high ; leaves 10-16 in. long, 2-3 in. wide, more or less soft-hairy, margins spinulose ; panicles 6-10 in. long, rhachis and pedicels slender, rufous-hairy ; glumes 1.8—2.1 in. long, dark-brown, rufous-hairy ; awns 0.5-1 in. long.

#### 8. *Saccharum*, Linn.

Erect, perennial, tall or very tall herbs ; culms usually solid. *Leaves* narrow, flat, sometimes rolled up when dry. *Inflorescence* of large terminal panicles of racemes, often very silky and showy ; rhachis articulate and fragile. *Spikelets* usually surrounded in long silky hairs from their bases, 2-nate, one pedicelled and falling from the pedicel, the other sessile and falling with the joints of the rhachis ; florets 2. *Glumes* 2, equal, often subcoriaceous or chartaceous below, membranous to hyaline upwards. *Lemmas* hyaline ; the lower empty ; the upper sometimes awned, containing a bisexual floret. *Lodicules* 2. *Stamens* 3. *Styles* 2, free or shortly connate. *Grain* oblong to subglobose ; embryo half as long or shorter.

Callus-hairs at least twice as long as the spikelets ; glumes glabrous on the back ; lemmas not cuspidate :—

Glumes uniform, whitish throughout, -12-15 in. long. Culms up to 20 ft. high ; leaves up to 5 ft. long and 2 in. wide ; panicles up to 3 ft. long, densely silvery. . . . . 1. *officinatum*.

Glumes coriaceous and brown below, subhyaline and white in the upper §, -14-17 in. long. Culms up to 15 ft. high ; leaves 1-4 ft. long, -2-5 in. wide ; panicles up to 2 ft. long, usually rather contracted, silvery. . . . . 2. *spontanum*.

Callus-hairs much shorter than the spikelets ; glumes uniformly membranous, pale or brown with darker tips, white- or yellowish-villous on the lower § of the back ; lemmas cuspidate :—

Leaves up to 6 ft. long, -8-2 in. wide. Culms up to 20 ft. high ; panicles effuse, white villous, up to 30 in. long ; joints of rhachis -18-2 in. long, pedicels shorter, both white-villous ; glumes -12 in. long, acute, white-villous except the glabrous upper one of the sessile spikelets. . . . . 3. *arundinaceum*.

Leaves up to 3\*5 ft. long, -1-25 in. wide. Culms up to 10 ft. high ; panicles rather contracted, yellowish-villous, up to 16 in. long ; joints of rhachis and pedicels -1-12 in. long, yellowish-villous ; glumes -15-19 in. long, acuminate, yellowish-villous. . . . 4. *ciliare*.

L SACCHARUM OFFICINARUM, Linn. ; F. B. I. vii. 118.

Cultivated in most Districts. The Sugar-cane.

The sap is extracted from the culms by crushing and boiled down to sugar. The residue after crushing can be utilized for paper making and for cordage. The leaves are used as fodder. Vern. *Hind.* Ukh ; *Ur.* Aku ; *Tel.* Cheruku ; *Taw.* Karumbu ; *Mai.* Karimbu ; *Kan.* Khabbu.

2. SACCHARUM SPONTANEUM, Linn. ; F. B. I. vii. 118 ; S. I. (J. h'g. 129.

In all Districts, usually near water ; sea-level to 5(XK) ft. A good fodder for buffaloes ; the leaves are used for thatching. Vern. *Hind.* Kans ; *Tel.* Rellu gaddi.

3. SACCHARUM ARUNDINACEUM, Retz. ; F. B. I. vii. 119.

Tinnevely District and Travancore.

The culms are used for hut walls and for screens- Vern. *Tarn.* Pi Karumbu ; *Kan.* Hodakai hullu.

4. SACCHARUM CILJARE, Anderss. 8. *arundinaceum* Retz. ; F. B. I. vii. 119 *in part*.

Canjam T)istrict.

9. Eriochrysis, Keauv.

Perennial herbs. Leaves mostly crowded at the base, very narrow. Inflorescence a contracted, hairy panicle of spiciform racemes; rhachis articulate, fragile. Spikelets 2-nate, one sessile, the other pedicelled, differing usually slightly in sex, the pedicell falling from its pedicel, the sessile falling with the contiguous nt of the rhachis and the Florets 2, the .ower reduced to an empty lemma, the upper bisexital of some- times in the pedicelled spikelet the stamens 0 or rudimentary. Glumes subequal, chartaceous or coriaceous. Lemmas hyaline, without paleas. Lodicules 2, minute. Stamens 3. Styles 2, free. Grain obovoid to ellipsoid-globose; embryo half as long.

ERIOCHRYSIS RANGACHARII, C. E. C. Fischer in Kew Bull. 1932, 246.

At Pykara, Nilgiri Hills; 6,000 ft (K. Ranga Achari).

Culms wiry, 5-12 in. high; leaves very narrow, plicate or more or less expanded above with 1 e marg basal up to 9 in. long and .2 wide, soft; racemes 3; spikelets narrowly lanceolate, 15-25 in. long, surrounded by long, dense, rufous hairs. Florets 2, minute; stamens 3; styles 2, free. Grain obovoid to ellipsoid-globose; embryo half as long.

Taii " 10, opoalo POGON, Trin.

Tall, usually perennial herbs, often petioled. Inflorescence of panicle 2-3-nate, spikelets usually one sessile and one pedicelled, the upper sometimes aristate. Lemmas subequal, membranous; lower plicate, paleate or not. Stamens 3; styles 2, free. Grain obovoid to ellipsoid-globose; embryo half as long.

LBIDUS, Benth.

; W. Coast and ... 108.

... District; up to 7,000 ft.

Culms tufted, much branched, straggling, up to 4 ft. high; leaves flaccid, acuminate, often aristate, 2-10 in. long, 4-1.4 in wide, base narrowed into a petiole 4-3.5 in. long; panicle

at first enclosed in a long spathaceous sheath ; rhachis and pedicels more or less densely silky-hairy ; glumes -22-27 in. long, sometimes aristate, more or less villous ; lemmas -16-24 in. long ; awns -5-8 in. long.

### 11. *Dimeria*, R. Br.

Slender, annular or perennial herbs. *Leaves* narrow. *Inflorescence* of terminal solitary, twin or fascicled slender spikes or, more usually, spiciform racemes ; rhachis inarticulate, terete, angular or flat. *Spikelets* solitary, secund, bifarious, laterally strongly compressed, articulate on the rhachis or on a very short, rarely long, pedicel, 2-flowered. *Glumes* 2, rigid, coriaceous, chartaceous or membranous, keeled, often divaricate in flower, subequal or the upper larger, with usually hyaline margins and the keel sometimes winged. *Lemmas* shorter, hyaline ; the lower empty and without palea ; the upper complicate, bifid with a slender long awn from the sinus, its palea small, containing a bisexual floret. *Lodicules* 0 or 2, minute, rarely well developed. *Stamens* 2 or 3. *Styles* 2, free. *Grain* linear, compressed, free within the lemmas.

Rhachis of raceme terete or angled ; leaves sparingly ciliate ; awns geniculate :—

Internodes of rhachis less than half as long as the upper glume ; glumes coriaceous, upper -2-3 in. long including an arista, winged all down the keel and ciliate. Culms 3-7 in. high ; leaves 1-2 in. long f racemes solitary ; callus -05 in. long . . . . . 1. *avenacea*.

Internodes more than half as long as the upper glume ; glumes chartaceous, not winged ; callus very short:—

Racemes 2, rarely 3 or 1, -9-1-6 in. long. Culms very slender, 5-8 in. high ; leaves 1 in. long ; glumes subequal, about -13 in. long ; upper lemma -11 in. long ; awn -28 in. long

2. *Hohenackeri*.

Racemes 3-5 or more, 3-5 in. long. Culms 2-3 ft. high ; leaves 2-6 in. long ; lower glume -14-26 in. long, acuminate, upper •15-28 in. long ; upper lemma -13-21 in. long ; awn -3-45 in. long . . . . . 3. *yrncilis*.

Rhachis of raceme flat, sometimes keeled on one face :—

Awns geniculate :—

Glumes not winged or upper sometimes narrowly so at apex only:—

Culms slender or very slender ; leaves and sheaths glabrous or sparingly hairy, not villous, -1 in. wide; glumes membranous.

Margins of rhachis ciliate. Culms 2-20 in. high; 1<sup>eaVe</sup>

1-2 in. long ; sparingly ciliate ; racemes solitary or **twin**

•7-2-5 in. long; glumes ciliate, lower -1—17 in. long, upj\***r**

•11--2 in. long, often narrowly winged at apex ; upper lem<sup>ma</sup>

•07--0a in. long ; awn -28-4 in. long . . . . . 4. *Thwaites*<sup>ll</sup>

Margins of rhachis glabrous or asperulous ; leaves more or less hairy; racemes 2- or 3-nate, -7-2 in. long ; glumes not ciliate or\*the upper at the apex only :—

Rhachis -03 in. wide. Culms 2-10 in. high ; leaves 1-3 in. long ; lower glume -08--1 in. long, upper -1--2 in. long; upper lemma -07-08 in. long ; awn -3--4 in. long

5. *ornithopod*-<sup>^</sup>

Rhachis very slender. Culms 4-14 in. high ; leaves 1-<sup>1</sup>•3

in. long; lower glume -06--07 in. long, upper -07--08 in.

long; upper lemma -05--066 in. long; awn -23--3<sup>in<</sup>

long . . . . . 6. *te?ier*(<sup>t</sup>

Culms comparatively robust, up to 2 ft. high ; leaves and sheaths usually densely villous, 3-6 in. long, -2 in. wide; racemes usually 2, 2-5-3 5 in. long ; rhachis 03-05 in. wide, its margins villous; glumes chartaceous, villous, lower •1S-'lk in. long, upper -18--2 in. long, apex sometimes narrowly winged ; upper lemma -1--14 in. long ; awn -3--4 in. long

7. *pubescent*.

Upper glume distinctly winged, wing corky :—

Racemes usually solitary, -7-1 -3 in. long. Culms 2-8 in. <sup>hiid</sup>1 :

leaves 1-2 in. long; margins of rhachis ciliate ; lower glu»i<sup>(1</sup>

•17 in. long, not winged, upper •18--22 in. long, keel narrowly

winged throughout and ciliate ; upper lemma -12--13 in. long ;

awn \3(i-\*4/5 in. long . . . . . 8. *Lairsom*-

Racemes 2- or 3-nate, -5-1-2 in. long. Culms 7-14 in. high :

leaves 2-3 in. long ; rhachis glabrous ; lower glume -12-1<◇ in-

long, its keel narrowly winged throughout, upper 13-\*17 in-

long, its keel broadly winged and ciliate ; upper lemma -1-'1<sup>2</sup>

in. long ; awn -35--42 in. long . . . . . 9. *bialatfl*.

Awns not geniculate, -3--33 in. long. Culms 10-18 in. high:

leaves 2-6\*5 in. long, glabrous or nearly so ; racemes 2- or 3-nate,

2-5 in. long ; lower glume -1--12 in. long, obtuse, upper 13-15 in.

long, ciliate, sometimes narrowly winged at apex ; upper lemma

•1-f 12in. long . . . . . 10 *ifimanni*.

- 14 DIMERIA AVENACEA, C. E. C. Fischer, n. comb. *D. pusilla*, Thw. ; F. B. I. vii. 103.  
Mahendragiri, Ganjam District (Fischer); Kambakkam, Nellore District (Bourne); Tranquebar (Koenig *fide* Retzius).
2. DIMERIA HOHENACKERI, Hochst.; F. B. I. vii. 103.  
Mangalore (Hohenacker).  
In rice fields.
3. DIMERIA GRACILIS, Nees ; F. B. I. vii. 105.  
S. Kanara District.
4. DIMERIA THWAITESII, Hack. *D. pusilla*, Thw. var. *pallida*, Thw. ; F. B. I. vii. 103.  
W. Coast; Madras ; Travancore ; sea-level to 3,000 ft,  
In rice fields.
5. DIMERIA ORNITHOPODA, Trin. ; F. B. I. vii. 104 *in part*.  
Mysore State, 2,000-3,000 ft. (Meebold); Malabar ; Travancore.
6. DIMERIA TENERA, Trin. *D. ornithopoda*, F. B. I. vii. 104 *in part*.  
Oodavari District at Bison Hill (Barber); S. Kanara and Malabar Districts ; Bababudan, Mysore, Nilgiri and Travancore Hills ; "from sea-level to 5,000 ft.
7. DIMERIA PUBESCENS, Hack. ; F. B. I. vii. 105.  
Mysore State, 3,000-3,500 ft. (Meebold).  
In wet localities.
- K. DIMERIA LAWSONI, C. E. C. Fischer n. comb. 1). *pusilla*, Thw. var. *Lawsoni*, Hook. f. ; F. B. I. vii. 103.  
Mysore (Meebold); Coorg (Lawrie) ; Wynaad (Lawson) : 2,000-3,000 ft.  
On granite rocks (Meebold).
- \*. DIMERIA BIALATA, C. E. C. Fischer in Kew Bull., 1033, 351.  
S. Kanara District at Siradi (Meebold).
10. DIMERIA LEHMANNI, Hack. ; F. B. I. vii. 104.  
Kainbakkam Hills (Bourne).

## 12. Pogonatherum, Beauv.

Slender annual or perennial erect herbs. *Culms* branching, leafy. *Leaves* flat, narrow, suberect. *Racemes* terminal, solitary ; rhachis fragile. *Spikelets* 2-nate, one sessile the other pedicelled,



1-2-flowered ; c  
 lower truncate,  
 2-fid with a long slender  
 lower usually absent  
 a slender awn from  
 floret. *Lodicules*  
 oblong, free embryo

W usually longer, keeled,  
 sinuate  
 Pedicels  
 P\*elet; upper 2-fid, inf\*  
 containing a bristly  
 Grain

POGONATHERUM PANICEUM, Hack.

P. B. F. vii. Uj.

• "x/toroideum, Beauv.,

District; Mysore State at 2,000 ft. (Meebold);  
and Gháts; up to 6,000 ft.

and flat pedicels  
 white, -1-18 in  
 long; long  
 this subtriangular, joints  
 long ciliate; hairs of callus  
 0.4-0.9 in

13. *Eulalia*, Kunth

Annual or more  
 Inflorescence of dense racemes ; rhachis readily disarticulate.  
 Leaves narrow-

*Spikelets* 2, subequal, nerved, flat or depressed with inflexed margins ; upper  
*Lodicules* 2, subequal, nerved, usually boat-shaped, 6 or empty, sometimes suppressed, usually much shorter, rare with a long awn from the  
*Pedicels* long-ciliate. *Stamens* usually 3. *Styles* 2, free.

*Glumes* 2, subequal, nerved, flat or depressed with inflexed margins ; upper  
 usually boat-shaped, 6 or empty, sometimes suppressed, usually much shorter, rare with a long awn from the  
 often deeply so, palea, enclosing

*Lodicules* 2, subequal, nerved, usually boat-shaped, 6 or empty, sometimes suppressed, usually much shorter, rare with a long awn from the  
 often deeply so, palea, enclosing

*Stamens* usually 3. *Styles* 2, free.

*Grain* oblong or oblong; embryo 1/2-2/3 as long.

Leaves flat, acute ; racemes 1-4 ft. high ; Culm 2-3 ft. high ;

SB, upper stem - C t r t - X i t r  
 1. *quadrinervis* var. ^, ^, ^, ^

W e, usually crumpled, fine  
 lower glume nerveless or 2-nerved  
 P to 16 in. long, ., -25 in.

Hairs of the racemes white. Culms 9-43 in. high, quite glabrous ; lower sheaths glabrous; racemes 2-17, rarely 1, 1-5-8 in. long; joints and pedicels 0.8-1.1 in. long; glumes 1-1.6 in. long upper lemma 0.6-1 in. long, hardly wider than its awn ; awn 0.38-0.54 in. long . . . . . 2. *tristachya*.

Hairs of the racemes usually reddish-brown, rarely greyish ; culms 10-52 in. high, densely white- or brown-silky for a short distance below the inflorescence ; lower sheaths usually red-brown tomentose at the base; racemes 2-11, 1-5-5 in. long; joints and pedicels 1-1.6 in. long ; upper lemma 1-1.7 in. long, decidedly wider than its awn ; awn 0.5-0.8 in. long . . . . . 3. *phaeothrix*.

1- EULALIA QUADRINERVIS, O. Ktz.

Var. *Wightii*, Hook, f. *Pollinia quadrinervis*, Hack. var. *Wightii*, Hook. f. ; F. B. I. vii. 110.

Rampa Hills at 4,500 ft. (Narayanswami); Pulney Hills ; 6,000-7,000 ft. (Wight, Bourne).

2. EULALIA TRISTACHYA, O. Ktz. *Pollinia argentea*, Trin. ; F. B. I. vii. 111.

W. Coast and Ghats; Kambakkam Hills; sea-level to 5,000 ft.

A good fodder when young.

3. EULALIA PHAEOTHRIX, O. Ktz. *Pollinia phaeothrix*, Hack. ; P. B. I. vii. 112.

Rampa Hills (Narayanswami); N. Coimbatore and Sirumalai Hills ; W. Ghats ; 3,000-8,800 ft.

Very common in open downs at high elevations.

#### 14. *Pseudopogonatherum*, A. Camus

Annual erect herbs. *Leaves* very narrow, often inrolled. *Inflorescence* of few to many spiciform racemes approximate on a common, persistent axis. *Spikelets* 2-nate, both pedicelled and falling from the pedicels or less often one of them sessile and falling with the pedicel of the other. *Glumes* chartaceous or membranous, lower rounded or flat on the back with inflexed margins, upper often aristate or mucronate. *Lemmas* hyaline, lower empty or sometimes suppressed, upper narrow, often bifid, with a long awn. *Lodicules* 2. *Stamens* usually 3. *Styles* free. *Grain* oblong or obovate-oblong ; embryo J-f as long.

PSEUDOPOGONATHERUM CONTORTUM, A. CamUS. *Pollinia articulata*, Tim. ; F. B. I. vii. 109.

Goomsur in Ganjam District (Gamble) ; Kodagundi Forest in Vizagapatam District (Jacob). **Reserved**

Culms up to 3-5 ft. high ; leaves 4-10 in. long, -05-07 in. racemes 4-13, 1-2-5 in. long, rhachis and pedicels white both spikelets pedicelled ; lower glume 08-09 in. long, upper with a capillary awn 12-17 in. long; awn of lemma geniculate, -7--8 in. long.

15. *Microstegium*, Nees

Annual or perennial, erect or decumbent herbs. *Leaves* flat, narrowed to the base and often petioled. *Inflorescence* of fascicled, spiciform racemes ; rhachis readily disarticulating; joints and pedicels usually long-ciliate. *Spikelets* 2-nate, one sessile, the other pedicelled, similar. *Glumes* membranous or chartaceous, the lower dorsally longitudinally channelled, with more or less keeled margins, upper boat-shaped, medially keeled. *Lemmas* hyaline. Lower  $\llcorner$  or empty, rarely paleate, sometimes absent, upper much shorter, 2-fid with a long awn from the sinus, usually with palea, *Lodiades* 2. *Stamen*\* 1, 2 or 3. *Styles* 2, free. *Grains* oblong or obovate-oblong.

Racemes 2-10, fascicled, 1-5-3 in. long; margins of joints and pedicels densely ciliate ; callus shortly bearded. Culms up to 4 ft. high; leaves sometimes shortly petioled, 1-4-5 in. long, 2-3 in. wide ; glumes of sessile spikelet 14-15 in. long ; awns very slender\* 2-4 in. long . . . . . 1. *ciliatum*\*

Racemes 3-6, somewhat distant, 1-4 in. long; joints and pedicels slender, glabrous or slightly ciliate at the base only ; callus bearded. Culms up to 5 ft. high ; leaves 1-2 in. long, 3-5 in. wide ; glumes of sessile spikelet 15-18 in. long; awns capillary 5-7 in. long . . . . . 2. *nudum*\*

1. MICROSTEGIUM CILTATUM, A. Camus. *PolUnia ciliata*, Trin. ; F. B. I. vii. 116.

Pulney and Travancore Hills ; (5,000 ft.

2. MICROSTEGIUM NUDUM, A. Camus. *PoUnia nuda*, Trin. ; F. B. I. vii. 117.

Pulney Hills ; 5,000-7,000 ft.

## 16. Pollinidium, Stapf ex Haines

densely tufted perennial herbs ; rootstock and basal sheaths woolly. *Leaves* convolute, wiry. *Inflorescence* of more or less Paniced, digitate or fascicled, spiciform racemes ; rhachis compressed, articulated, fragile. *Spikelets* 2-nate, one sessile, the other Pedicelled, similar ; callus densely clothed with long brown hairs. *Wumes* 2; lower flattened, 2-3-toothed, 5-7-nerved, margins inflexed, hairy on the back at the base; the upper cymbiform, cuspidate or aristate, 3-5-nerved. *Lemmas* hyaline ; lower elliptic, palea finely ciliate ; upper narrow, conduplicate, entire or 2-toothed, finely awned from the tip or the sinus, its palea broad, nearly as long, densely ciliate at the apex. Other characters as in *Ischaemum*.

POLLINIDIUM BINATUM, C. E. Hubbard. *Ischaernum angustifolium*, Hack. ; F. B. I. vii. 129.

Qanjam, Vizagapatam and Godavari Districts.

Culms 1-3 ft. high ; leaves up to 3 ft. long and 10 in. wide ; the old sheaths white-woolly at the base ; racemes 1-4, 1-2 in. long ; joints slender, 12-16 in. long, glabrous or with a line of hairs, densely rusty- or golden-villous at the base, pedicels similar, shorter; lower glumes chartaceous, 13-16 in. long; upper lemmas 13-15 in. long ; awns 16-28 in. long.

Used for paper-making and locally for fibre, cordage and mats. Eaten, by cattle when young. Vern. *Hind.* Bhabar, Sabai; Vr. Babuli.

## 17. Ischaemum, Linn.

Usually perennial. *Leaves* convolute when young, eventually flat, usually narrow, sometimes petioled. *Inflorescence* of twin, digitate, fascicled or corymbose spiciform racemes ; rhachis compressed, readily disarticulating ; joints and pedicels flattened or subconcave on the inner side, often stout, *Spikelets* 2-nate, one sessile or with a short pedicel and falling with the contiguous joint, the other long-pedicelled and falling from the pedicel, the pairs alike or differing only in sex or more or less heteromorphous ; florets 2, generally the lower sterile, the upper bisexual, rarely sterile or empty in the long pedicelled spikelet. *Glumes* subequal, lower

flattened or somewhat convex, rarely concave on the back, P<sup>o</sup>ad-  
 ceous below, chartaceous and sometimes strongly nerved tow<sup>ards</sup>  
 the apex, seldom chartaceous throughout, entire or 2-fid and cus-  
 pidate, with more or less keeled, inflexed margins; upper gl<sup>ume</sup>  
 boat-shaped, medially keeled at least towards the apex, some<sup>times</sup>  
 awned. Lemmas hyaline to rigidly membranous; lower mutico<sup>us</sup>;  
 upper of sessile spikelet usually 2-fid and geniculately awned tr<sup>om</sup>  
 the sinus, rarely mucronate or muticous; that of the long-pedice<sup>lled</sup>  
 spikelet sometimes similar but more often entire and awnle<sup>ss</sup>;  
 the paleas hyaline, subequal to the lemmas. Lodicules 2. Starne<sup>ns</sup>  
 3, sometimes small or rudimentary in the fertile florets. Sty<sup>W</sup> 2,  
 free. Grain oblong or lanceolate, dorsally compressed; embry<sup>o</sup>  
 about half as long.

Sessile spikelets, at least, awned:—

Margins of lower glume of sessile spikelets expanded below the  
 middle, incurved at the base, apex 2-toothed or -cuspidate; upp<sup>er</sup>  
 lemmas of both spikelets 2-lobed to about the middle with an a<sup>n</sup>  
 from the sinus:—

Racemes 2, rarely 3:—

Lower glume of sessile spikelet distinctly winged at ape<sup>\*s</sup>»  
 •15--18 in. long, upper glume and lower pedicelled spikelet<sup>at</sup>  
 1-keeled and winged at the apex. Culms often creeping  
 the base, 2-30 in. high; leaves rounded or narrowed at the  
 base, sessile, 1-5-9-5 in. long, -05--5 in. wide, sparsely t<sup>o</sup>  
 densely hairy; awns '3--5 in. long . . . . . 1. *aristatum*.  
 Lower glume of sessile spikelets not winged. Culms slender\*  
 up to 3 ft. high:—

Lower leaves, at least, acute at base, hairy, 1-3-2 in. long\*  
 •2-\*5 in. wide, often narrowed into a rather broad petiole  
 up to -75 in. long; racemes -8-2\*5 in. long; rhachis dis\*  
 tinctly undulate; lower glume of sessile spikelets -13--18 i<sup>n</sup>\*  
 long, ribbed at the apex, more or less hirsute, upper glume  
 minutely 2-lobed, mucronate or cuspidate, keeled upwards,  
 not winged; awns of sessile spikelets -28--54 in. long, oi  
 pedicelled shorter and finer . . . . . 2. *timorensi*.  
 Leaves rounded or attenuate at base, 2-4 in. long, •15-\*25  
 in. wide, glabrous or with a few ciliae, sometimes the lowest  
 tapering into a petiole up to 1 in. long; racemes 1-2 in. long;  
 rhachis nearly straight; lower glume of sessile spikelets  
 •14--26 in. long, strongly nerved at apex, bristly in the

middle or hirsute below the middle, upper glume keeled and narrowly winged upwards, with a tuft of hairs below the wing, apex minutely 2-toothed with an arista -1--28 in. long; awns of both spikelets -4-1 in. long . . . . 3. *Thomsonianum*. Racemes corymbose, 7-12, rarely as few as 3 or up to 16, 1-5-3-5 in. long, silvery hirsute. Culms robust, rooting below, up to 24 in. high; leaves sessile, usually narrowed at base, sometimes rounded, 2-5-9-5 in. long, -2-75 in. wide, softly hairy, rarely glabrous; lower glume of sessile spikelets not winged; awns of both spikelets -3--45 in. long . . . . . 4. *nilagiricum*. Margins of glumes narrowly inflexed, not expanded below; lower glume of pedicelled spikelets flat, 2-keeled :—

Lower glume, at least, of pedicelled spikelet, winged, its upper lemma entire, awnless; Racemes 2-3, rarely 1 :—

Lower glume of sessile spikelets -34--36 in. long with 3-4 nodules on each margin in the lower part, sometimes connected by rounded transverse ridges, keels narrowly winged. Whole plant glabrous; culms robust; leaves rounded or emarginate at the base, sessile, up to 15 in. long and 1-3 in. wide; racemes 3, up to 4-3 in. long; joints -1 in. wide; lower glume of pedicelled spikelets smooth, with a wide wing on one keel; lemmas brown, awn of sessile spikelets -36 in. long . . . . . 5. *Koenign*.

Lower glume of sessile spikelets -16--28 in. long; rhachis of racemes, at least, hairy :—

Pedicels usually more than  $\frac{1}{2}$  as long as the sessile spikelets, rarely only  $\frac{1}{2}$ . Culms slender, erect, 5-36 in. high; leaves rounded or emarginate at base and sessile or narrowed into a petiole up to 2 in. long, more or less hairy, -8-6 in. long, •12-7 in. wide; racemes 1-2-8 in. long; lower glume of sessile spikelets smooth or with 1-3 shallow marginal nodules usually joined by shallow curved, transverse ridges, keels narrowly winged above, glabrous, lower glume of pedicelled spikelets smooth, one keel widely winged, the other wingless or very narrowly winged at apex; awn <3--54 in. long . . . . . 6. *commutatum*.

Pedicels less than half as long as the sessile spikelet:—

Leaves, at least the lower, cordate or sagittate at base :—

Pedicels and joints plano-convex, ciliate to densely villous; lower glume of sessile spikelets with 3-6 marginal nodules below the middle, usually connected by transverse ridges, sometimes smooth^ keels usually narrowly winged at apex :—

Leaves, at least some, petioled, base deeply cordate, <sup>to</sup> acutely sagittate, -8-3-5 in. long, -2--5 in. <sup>wide.</sup>  
 Culms slender, often decumbent at base, up to <sup>20 in.</sup> high ; racemes 1-2 in. long ; lower glume of <sup>sessile</sup> spikelets narrowly lanceolate, transverse ridges usually irregular and shallow, rarely regular and deep; <sup>lower</sup> glume of pedicelled spikelets similar but more <sup>often</sup> smooth or the nodules and ridges more shallow <sup>and</sup> one keel broadly winged ; awn -42-\*9 in. long

*emisagittatum.*

Leaves all sessile, shallowly cordate, 2-6-5 in. <sup>long,</sup>  
 •15--4 in. wide. Culms rather stout, up to 36 in. <sup>in.</sup> high ; racemes 2-4-6 in long ; lower glume of <sup>sessile</sup> spikelets ovate- or lanceolate-oblong ; lower <sup>glume</sup> of pedicelled spikelets smooth or sometimes faintly <sup>noduled,</sup> one keel with a wide crescent-shaped wing <sup>»</sup> awn -4-76 in. long . . . . . 8. <sup>inolU,</sup>

Pedicels and joints acutely trigonous, outer angle long <sup>in.</sup> ciliate. Culms erect from a prostrate base, 10-16 in. <sup>or</sup> high ; leaves more or less cordate at base, sessile <sup>10</sup> petioled, -8-3-4 in. long, -12--4 in. wide, petioles up <sup>f</sup> 1 in. long ; racemes 1-2-8 in. long ; lower glume <sup>of</sup> sessile spikelets obliquely linear-lanceolate, margins <sup>in</sup> basal <sup>f</sup> with 2-5 horny, large, almost keeled nodules, quite smooth between the margins, in the apical <sup>J</sup> on <sup>e</sup> keel broadly, the other narrowly winged ; lower glume <sup>of</sup> pedicelled spikelets similar but smooth; upper lemma <sup>oi</sup> sessile spikelets usually 2-lobed to below the middle, <sup>i\*</sup> awn -4-68 in. long, that of the pedicelled spikelet tapered into a fine arista -1-15 in. long. . . 9. *Rangacharidnuvi-*

Leaves not cordate or sagittate :—

Lower glume of sessile spikelets with 5 horny, usually sharp, deep, regular, seldom irregular, transverse ridges in the lower part, the keels unequally winged in the upper part. Culms stout, 12-45 in. high ; leaves tapered to an acute base, 6-13 in. long, -15--4 in. wide ; racemes 1-3-2 in. long; joints and pedicels plano-convex, stout, outer margin hairy ; lower glumes of pedicelled spikelets smooth or more or less ridged, one keel with a wide crescent-shaped wing ; lemma of sessile spikelet 2-lobed to below the middle ; awn -5--8 in. long . . . . . 10. *rugosunu*

Lower glume of sessile spikelets with marginal nodules not extended across the glume or if meeting the ridges very shallow and irregular; lower glume of pedicelled spikelets with one broad and one narrow wing. Culms rather stout, up to 3 ft. high :—

Lower glume of sessile spikelets not or very narrowly winged at apex, below with 2-6 rounded marginal nodules sometimes joined by shallow irregular transverse ridges. Leaves 2-5-6 in. long, -4--65 in. wide, base rounded, sometimes with a short tomentose petiole ; racemes 2-5-4-5 in. long ; joints and pedicels obtusely trigonous, glabrous or sparsely hairy on the back ; lower glume of pedicelled spikelets oblong, smooth or rugulose ; awn up to -62 in. long, sometimes short or even absent . . . . . 11. *travancorensis*.

Lower glume of sessile spikelets oblique, the basal § with 2-5 marginal nodules, smooth between the margins, one keel broadly the other narrowly winged at apex. Leaves tapering to the base, 1-5-9-5 in. long, -1--25 in. wide; racemes 1-5-4 in. long; joints and pedicels acutely trigonous, up to -1 in. wide, one angle hairy; lower glume of pedicelled spikelets lanceolate, smooth ; awn -23--52in. long. .12. *mangaluricum*.

Glumes not winged. Rhizome stoloniferous; culms erect, up to 4 ft. high ; leaves 2-14 in. long, -15--33 in. wide ; racemes 3-6, rarely only 2, 3-8 in. long ; joints and pedicels subclavate, compressed, yellow- or brownish-pilose; lower glumes of both spikelets narrowly lanceolate ; awn slender, -3 in. long ; upper lemma of pedicelled spikelets shortly 2-lobed, with a slender arista -1—2 in. long . . . . . 13. *pilosum*.

Both spikelets awnless. Rhizome creeping, stout; culms erect, slender, 7-20 in. high ; leaves 1-5-4 in. long, -15--5 in. wide, base rounded or shallowly cordate, sometimes very shortly petioled; racemes 2, -9-1-5 in. long ; joints and pedicels stout, sharply trigonous, more or less ciliate ; lower glumes of both spikelets smooth, shining, •25 in. long, narrowly winged at apex ; lemma of sessile spikelet shortly 2-lobed, usually with a mucro . . . . . 14. *muticum*.

1. LSCHAEMUM ARISTATUM, Linn. / . *ciliare*, Retz. ; F. B. I. vii. 133 ; S. I. G. figs. 135, 136.

Common in all Districts ; sea-level to 8,000 ft.

Vern. *Tel.* Erruthota gaddi; *Kan.* Mobbu gar?jalu garikai hullu.



Var. *Barberi*, C. E. C. Fischer n. var. More robust, glabrous, more coriaceous; lower glume of sessile spikelet wide ear-shaped wings at apex; upper lemma of pedicelled spikelet with a slender arista. 1—2 in. long.

Mangalore (Barber No. 4803).

2. ISCHAKMUM TIMORENSE, Kunth; F. B. I. vii. 132.

W. slopes of Nilgiris; N. Coimbatore Hills; Malabar and Travancore; up to 3,000 ft.

Vern. *Kan.* Xilamunga hullu.

Var. *villosum*, C. E. C. Fischer n. var. Joints of pedicels and lower glume of sessile spikelets densely villous.

3. ISCHAEMUM THOMSONIANUM, Stapf MS., n. nom. *L. murinum*, Hook. f. non Forst.; F. B. I. vii. 135.

Mysore; Cochin; Travancore; up to 3,000 ft.

4. ISCHAEMUM NILAGIRICUM, Hack. *I. hirtum*, Hook. f. Hack.; F. B. I. vii. 135 in part.

Kistna (Barber and Salem Districts; Nilgiri and Piling Hills; up to 6,500 ft.

5. ISCHAEMUM KOENIGII, Stapf MS. n. comb. *I. arvensis*, Hook. f. non Linn, subsp. *Koenigii*, Hook. f.; F. B. I. vii. 127.

Precise locality unknown (Koenig).

(j) ISCHAEMUM COMMUTATUM, Hack.; F. B. I. vii. 131.

W. Ghats; 2,000-7,000 ft.

7. ISCHAEMUM SEMISAGITTATUM, Koxb.; F. B. I. vii. 130. *I. conjugatum*, Roxb.; F. B. I. vii. 131.

W. Coast and Ghats; up to 4,000 ft.

8. ISCHAEMUM MOLLE, Hook. f.; F. B. I. vii. 128.

Mysore State. 2,000-3,500 ft. (Meebold); W. Coast, near sea-level.

(k) ISCHAEMUM HANOACHANUM, C. E. C. Fischer in Kew Bull., 1933, 352; *I. aristatum*, Ranga Aeharim and Tadu Hingnin Linn.; S. I. (i. fig. 130.

Malabar and Travancore; at low elevations.

10/ ISCHAEMUM RUGOSUM, Salisb.; F. B. I. vii. 127; S. I. G. fig. 132.

In all Districts; up to 5,000 ft.

Eaten when young by horses and cattle; grain occasionally eaten by the poor. Vern. *Tarn.* Kadukken pillu.

H<sub>4</sub> ISCHAEMUM TRAVANCORENSE, Stapf ex C. E- C. Fischer in Kew Bull., 1933, 353.

Wynaad and Travancore.

12. ISCHAEMUM MANGALURICUM, Stapf M.S. n. comb. / . *aristatum*^ Hook. f. non Linn. var. *mangaluricum*., Hack. ; F. B. I. vn. 127 ; S. I. G. fig. 131.

Mysore State (Meebold) ; S. Kanara and Malabar Districts ; up to 2,000 ft.

13. ISCHAEMUM PILOSUM, Hack. ; F. B. I. vii. 130 ; S. I. C figs. 133, 134.

-DecosiTi.

A moderate fodder. Vern. *Tel.* Kundara gaddi, Urranki.

14. ISCHAEMUM MUTICUM, Linn. ; F. B. I. vii. 132.

S. Kanara and Travancore.

Usually growing in water ; also among coastal sands.

### 18. Sehima, Forsk.

Annual or perennial erect, tufted herbs. *Uuv*\*\* convolute when young, later expanded. *Racemes* solitary, often much curved ; rhachis jointed, fragile ; joints and pedicels plano-convex. *Spikelets* compressed, 2-nate, one sessile, the other pedicelled ; 2-flowered ; lower floret <J, upper bisexual in the sessile spikelet, \$ or neuter in the pedicelled. *Glumes* subequal, usually chartaceous ; lower of sessile spikelets usually deeply grooved, rarely flat, 2-toothed or -cuspidate, keeled upwards and often winged on the keels ; upper boat-shaped, often aristate. *Lemma*\* hyaline ; the lower entire and muticous ; the upper 2-fid with a geniculate awn from the sinus ; *Lodicules* 2. *Stamens* 3. *Grain* oblong, obtusely trigonous ; embryo half as long.

Joints and pedicels -14-18 in. long, ciliate on both edges ; lower glume of sessile spikelets -25-28 in. long, strongly 4-nerved, the 2 median branched, diverging and converging again with a deep depression between ; callus -04-05 in. long ; upper glume -21-20 in. long, entire, keel narrowly winged at the apex, with a setaceous arista -43-0 in. long ; awns 1-2-1-6 in. long. Culms up to 4 ft. high ; leaves 3-20 in.

long, -1--3 in. wide . . . . . 1- *nervosum*.

Joints and pedicels -18-26 in. long, ciliate on one margin only ; lower glume of sessile spikelets -28-34 in. long, strongly 4-nerved. *tfio* 2

median straight, close together with a groove between; callus <sup>05-</sup>  
 •08 in. long; upper glume -23-27 in. long, 2-cuspidate, not wing <sup>ed,</sup>  
 with a setaceous arista \*36 in. long; awns 1-1 \*8 in. long. Culms w <sup>ak,</sup>  
 up to 2 ft. high; leaves 3-5-6 in. long, -1-2 in. wide—2. *sulcatu* <sup>m.</sup>

1. SEHIMA NERVOSUM, Stapf. *Ischaemum laxum*, R. Br.; F.  
 vii. 136; S. I. G. fig. 137.

In all Districts except the W. Coast; sea-level to 6,000 ft. <sup>n.</sup>

A good fodder. Vern. *Hind.* Chota shadai ghans; *J<sup>ar</sup>*

Kura itti; *Kan.* Sinna shadai hullu, Nalai hullu. <sup>s.</sup>

2. SEHIMA SULCATUM, A. Camus. *Ischaemum sulcatum*, Hac  
 F. B. I. vii. 137.

Nellore and Kistna Districts (Bourne).

### 19. Lophopogon, HackH

Small, perennial, densely tufted herbs. *Leaves* very narrow <sup>w.</sup>  
*Inflorescence* of terminal, solitary, binate or fascicled, spicifor <sup>m</sup>  
 racemes; rhachis articulate, more or less fragile; joints often  
 cupular at the tip. *Spikelets* 1-2-flowered, 2-nate, one sessile  
 the other pedicelled. *Sessile spikelet* with a short callus, dorsally  
 compressed. *Glumes* chartaceous; the lower truncate, irregularly  
 toothed; the upper longer, acute, apiculate or narrowed into ft  
 straight awn. *Lemmas* hyaline; the lower with a linear palea and <sup>d</sup>  
 empty or <J with 1-2 stamens; upper often 2-fid with setifom <sup>1</sup>  
 lobes, often aristate from the sinus, its palea quadrate, containing  
 a bisexual or <J floret with 2 anthers. *Lodirules* 0. *Pedicelled*  
*spikelet* laterally compressed or nearly terete, 2-flo\vcpl. the lower  
 floret often (J, the upper \$.

- LOPHOPOGON TRIDENTATUS, Hack.; F. B. I. vii. 149; S. I. \*<sup>i</sup>  
 fig. 141.

Cuddapah, Nellore, Chittoor and Chingleput Districts; Mysore  
 State; sea-level to 2,000 ft.; usually in dry localities.

Culms very slender, capillary at apex, often densely white-silky  
 at the base, 3-20 in. high; leaves 1-6 in. long; racemes  
 usually 2, -3-9 in. long; lower glumes narrowly obcuneate,  
 3-toothed or mucronate and lobulate, with a tuft of rufous  
 hairs in the middle, -17-19 in. long; upper glume narrowly  
 boat-shaped, -18-22 in. long, narrowed to a fine arista -25-4 in-  
 long, margins with long rufous hairs; awns -6-9 in. long.

## 20. Apocopis, Nees

Annual or perennial herbs. *Leaves* flat. *Racemes* terminal, solitary or 2-3-nate ; rhachis not readily disarticulating. *Spikelets* secund, closely imbricate, compressed, solitary, sessile, often accompanied by a pedicel without spikelet. *Glumes* 2, chartaceous or membranous; lower broadly cuneiform, nearly flat, truncate, rounded or emarginate; upper narrower, usually laterally 2-keeled with broadly inflexed margins. *Lemmas* hyaline ; lower oblong, its palea nearly as long, enclosing a <J floret or empty ; upper very narrow, entire or shortly 2-lobed with a long geniculate awn, its Palea much shorter, wrapped round a \$ or bisexual floret. *Lodicules* 0. *Stamens* 2 or 3. *Styles* 2, free. *Grain* linear or fusiform ; embryo half as long.

APOCOPIS WTGHTII, Nees ; F. B. I. vii. 142 ; S. I. G. figs. 139, 140.

In all Districts, except in the driest localities ; sea-level to 3,000 ft.

Culms often densely tufted, 2-5-24 in. high ; leaves densely imbricate or distant, -5-5 in. long, -05-25 in. wide, more or less hairy from bulbous bases ; racemes usually 2, -5-1-7 in. long, rhachis and pedicels rufous-hairy ; lower glume obcordate or obovate truncate, yellow with a red-brown tip or dark-brown with a yellowish tip, glabrous to densely rufous- or fuscous-hairy, -14--2 in. long ; awn geniculate, -75 in. long.

## 21. Eremochloa, Buese

Perennial herbs. *Leaves* more or less equitant, rigid, flat. *Inflorescence* a terminal, solitary, spiciform raceme; rhachis articulated, fragile. *Spikelets* secund, solitary owing to the pedicelled spikelets being reduced to a rudimentary pedicel, sessile, imbricating, dorsally compressed, 2-flowered. *Glumes* chartaceous or coriaceous ; lower nearly flat, oblong to subcircular, 2-keeled, the margins pectinate with long spinules or rigid hairs, often winged at the apex ; upper elliptic or oblong-lanceolate, 3-5-nerved. *Lemmas* hyaline, muticous, paleate ; lower <\$ ; upper smaller \$ or bisexual. *Lodicules* 2. *Stamens* 3. *Grain* elliptic or ovoid, flattened on one side ; embryo half as long.

EREMOCHLOA MURICATA, Hack.; F. B. I. vii Un • s: T. U- fig. 138.

Chingleput and S. Arcot Districts.

Culms 5-24 in. high ; leaves densely tufted below,  $\frac{1}{2}$  to  $\frac{3}{4}$  wide, exactly linear, sometimes with a few ciliae near the rounded base ; raceme 2-5-4-5 in. long ; lower glume thick coriaceous, broadly ovate, acute, the upcurved marginal spinules up to  $\frac{1}{7}$  in. long, apex with a broad triangular or fan-shaped wing on both sides, wider across than the width of the rest of the glume.

## 22. Arthraxon, Beauv.

Annual or perennial, sometimes decumbent herbs. Leaves linear-lanceolate to ovate, base usually cordate or amplexicaul margins more or less ciliate from bulbous bases. Inflorescence, twin, digitate, fascicled or subpanicled simple or branched raceme or spikes ; rhachis articulated, fragile. Spikelets laterally compressed, 2-nate, one sessile, the other pedicelled, similar or differing in sex mainly owing to reduction, or else solitary and sessile with or without an often very rudimentary pedicel. Glumes chartaceous to coriaceous, rarely membranous ; lower 2-keeled rounded on the back and sides and not keeled, sometimes bearing rows of tubercles or spines on the margins ; upper thinner, much compressed, keeled upwards, in all our species complicate-boat-shaped. Lemmas hyaline ; lower empty, usually without palea upper subtire with a dorsal or basal, more or less well-developed awn, rarely awnless, enclosing a bisexual floret, palea minute or  $\infty$  Lodicules 2. Stamens 2-3. Grain narrowly linear or fusiform • embryo half as long. Pedicelled spikelet, when present, usually  $J$  and awnless.

Lower glume of sessile spikelets 2-keeled. margins indented, nearly flat:—

Glumes glabrous or nearly so ; keels not winged :—

Keels of lower glume of sessile spikelets tubercled or toothed : pedicelled spikelets more or less developed :—

Lower glume of sessile spikelets  $\frac{1}{2}$  in. or less long with pinnately toothed keels ; joints of rhachis  $\frac{1}{2}$ - $\frac{1}{2}$  in. long, ciliate :—

Lower glume of sessile spikelets lanceolate  $\frac{1}{8}$ - $\frac{1}{2}$  in. long, back smooth. Rootstock and lowest 1 or 2 sheaths tomentose: culm\* comparatively robust, up to 30 in. high : leaves

lanceolate to linear-lanceolate, -8-3 in. long, -12-65 in. wide, glabrous ; awns -26-42 in. long . . . . . 1. *lanceolatus*.

Lower glume of sessile spikelets linear or narrowly lanceolate, •2 in. long, nerves on back echinulate, rarely in the lowest spikelets smooth. Rootstock and sheaths not tomentose^ culms up to 12 in. high ; leaves linear, -8-2-3 in. long, -17 •5 in. wide, usually pubescent, rarely quite glabrous ; awns

. . . . . 2. *echinatus*.  
 •3—4 in. long . . . . . 1

Lower glume of sessile spikelets -28 in. or more long, narrow y linear-lanceolate, keels with a double row of tubercles, gradually converted to spinules at the apex. Culms 4-10 in. high; leaves ovate to ovate-lanceolate, -8-2-3 in. long, -25-6 in. wide, sparsely hairy; joints -18 in. long, long-ciliate ; awns -8 in.

. . . . . 3. *Meeboldu*.  
 long . . . . .

Lower glume of sessile spikelets linear-lanceolate, subconaceous, •2-26 in. long, keels spinulose-hispid. Culms comparatively robust; leaves rigid, ovate to oblong-lanceolate, cuspidate, 2-3-5 in. long, -5-1 in. wide, glabrous ; joints -16-19 in. long, compressed, densely ciliate; pedicelled spikelet reduced to a pedicel; awn -42-48 in. long . . . . . 4- *depressus*.

Lower glume of sessile spikelets lanceolate, -22 in. long, back densely villous, keels with narrow, densely ciliate wings. Culms 12 in. or more long; leaves linear-lanceolate, 1-2-2 in. long, -3 in. wide, hairy; joints -14 in. long, long white-ciliate^ pedicelled spikelet fully developed ; awn -48 in. long . . . . . 5- "Wo««\*.

Lower glume of sessile spikelets compressed-convex, not keeled, margin^ not inflexed :—

Lower glume entire or minutely 2-toothed ; no pedicelled spikelet:—

Paleas about half as long as the upper lemmas, ovate-lanceolate. Culms up to 2 ft. high; leaves linear-lanceolate, acuminate, 1-5-4 in. long, -15-6 in. wide, margins and midrib below ciliate : pedicels -09 in. long, hairy on the back, devoid of spikelets : glumes of sessile spikelets minutely muriculate, lower -2--24 in. long, 5-7-nerved, nerves armed with spinescent tubercles in the upper half, upper longer, keeled, keel spinulose near apex——6. *rudis*.

Paleas 0 : —

Joints subterete, very slender, -07-1 in. long, finely ciliate on one side only ; pedicels 0. Culms very slender, 2-18 in. high ; leaves linear to elliptic-lanceolate, -4-2-3 in. long, -07—55 in. wide ; lower glume -1-15 in. long, nerves minutely scaberulous ; upper glume minutely puberulous, not ciliat^ ; awns -23-4 in. long . . . . . 7 *QMrtiftnm\**

Joints plano-convex, slender, 12-18 in. long, glabrous; pedicels 0.6-1.4 in. long, linear, flat. Culms 10-20 in. high; leaves lanceolate to ovate, 7-23 in. long, 2-7 in. wide; lower glume 1.5 in. long, nerves hispid; upper glume hispid at apex, its margins ciliate; awns 3-5 m. long. Lower glume of sessile spikelets lanceolate, 1-1.3 in. long; minipuberulous, 2-cuspidate. Culms very slender, straggling. Culms 5-7 in. long; leaves linear-lanceolate to ovate, 15-47 in. wide, puberulous and often also sparsely hairy; very slender, subterete, 0.3-0.8 in. long, densely long-ciliate; pedicels 0.3-0.4 in. long flat, long-ciliate, spikelets fully developed; upper glume of sessile spikelets 0.8-0.9 in. long, with awn 0.0 in. long; awns 2-4 in. long. 9. *Ut»(Kj<sup>o</sup>Uus,*

1. ARTHRAXON LANCEOLATUS, Hochst. ; F. B. I. vii. 143.  
Bellary District at Raman Drug ; Nilgiri and Pulney Hills ;  
2,500-6,500 ft.  
Vern. *Tel.* Rai gaddi.
2. ARTHRAXON ECHINATUS, Hochst. *A. spathaceus*, Hook. & Grev.  
F. B. I. vii. 145.  
Cuddapah District (Wight, Gamble); Mysore State (Meebold);  
about 2,000 ft.
3. ARTHRAXON MEEBOLDII, Stapf.  
Mangalore (Meebold).
4. ARTHRAXON DEPRESSUS, Stapf ex O. E. C. Fischer in Kew Bull. 1933, 350.  
Mysore State at Agalatti (Meebold) ; 3,500 ft.
5. ARTHRAXON VILLOSUS, C. E. C. Fischer in Kew Bull. 1933. 350.  
Bababudan Hills (Bourne).
6. ARTHRAXON RUDIS, Hochst. ; F. B. T. vii. 144.  
Mysore State (Meebold) ; 3,500 ft.
7. ARTHRAXON QUARTINIANUS, Nash. *A. ciliaris*, Beauv. a -  
F. B. I. vii. 146.  
W. Ghats from Coorg to the Pulney Hills ; 3,000-7,000 ft. :  
Mysore State; Calicut; Bolampatti Valley at 1,700 ft. (Fischer)  
Vern. *Kan.* Nela bidaru hullu.
8. ARTHRAXON HISPIDUS, Makino. *A. ciliaris*, Beauv. b ; F. B. I. vii. 146.  
Mysore State at 2,000 ft. (Meebold); Malabar (Barber);  
Travancore (Mayuranathan).

& ARTHRAXON LANCIFOLIUS, Hochst. *A. micmphyllus*, Hochst. ;  
F. B. I. vii. 147.

Rampa Hills at 4,500 ft. (Narayanaswami) ; Bellary District  
at Raman Drug ; Mysore State (Meebold); W. Coast.

23. *Capillipedium*, Stapf.

Annual or perennial herbs. *Leaves* flat. *Inflorescence* a rather  
<lc>licate, usually much divided panicle ; main rhachis and branches  
capillary ; racemes 1-4, rarely up to 8-jointed ; joints and pedicels  
slender, longitudinally grooved and translucent in the groove.  
*Hpikelets* 2-nate, one sessile, the other pedicelled, similar in shape,  
differing in sex. *Sessile spikelet*: *Glumes* subequal, thinly char-  
taceous to membranous; lower 2-keeled with narrow, inflexed  
margins, keels usually bristle-ciliate ; upper boat-shaped, more or  
less grooved on each side of the keel. *Lemmas* dissimilar ; lower  
hyaline empty ; upper reduced to the linear, hyaline base of a  
geniculate awn, containing a bisexual floret; palea absent. *Lodi-  
cules* 2. *Stamens* 3. *Grain* oblong, slightly dorsally compressed ;  
embryo more than half as long. *Pedicelled spikelet* sometimes with  
only one 2-keeled glume, the second, if present, shorter or much  
reduced ; one or both lemmas sometimes present, hyaline, awnless,  
sometimes containing a £ floret.

Culms stiff, erect, not or hardly decumbent below :—

Culms usually copiously branched, up to 6 ft. high, or even taller,  
almost woody ; nodes glabrous or short-hairy ; panicles usually  
large, lax ; callus of sessile spikelets shortly bearded ; lower glume  
•08- -1 in. long, glabrous or minutely puberulous ; awns -30--5 in.  
long ; lower glume of pedicelled spikelets •1--16 in. long

1. *glaucops* 2s.

Culms simple or sparingly branched, up to 4 ft. high, usually slender ;  
nodes usually densely, often long bearded ; panicles contracted,  
rarely somewhat lax; callus of sessile spikelets densely villous ;  
lower glume .1...14 in. long, usually villous all over or only below  
the middle ; sometimes only puberulous or quite glabrous, awns  
•4-9 in. long; lower glume of pedicelled spikelets -14-17 in. long

2. *Huegelii*.

Culms decumbent and often interlaced, copiously geniculately  
branched, weak, up to 3 ft. long; nodes shortly > hairy ; panicles  
1-2 in. long, branches few ; callus of sessile spikelets 4ensely vifyus;



lower glume -08-12 in. long, glabrous or sparsely hairy below the middle ; awns -38-62 in. long ; lower glume of both spikelets <\*> 3.filiculm'\*

- 1. CAPILLIPEDIUM CLAUCOPSIS, Stapf. Andropogon amim^' Steud.; F. B. I. vii. 179.

Ganjam (Gamble) and Godavari Districts; Coorg, Wyna\*» and Travancore ; 300-2,(KK) ft.

- 2. CAPILOPEDIUMHUEOELII, Stapf. Andropogon Huegelii, Hack- F. B. I. vii. 180.

W. Ghats from the Bababudan Hills to Travancore; S-Kanara District; sea-level to 7,000 ft. Often aromatic

- i- OAPILLIPEDIUM FILICULMIS, Stapf. Andropogon filiculmis, Hook. f.; F. B. I. vii. 181.

Mysore State at Agalatti (Meebold); S. Kanara and S. Malabar Districts.

24. Amphilophis, Nash

IVr,,mial herbs. W f , mm,m% usua,ly flat lufortarain o( panicle d di v h K itat<1> S1)icifor,,, sh»r\*ly peduncled racemes, usually with a short primary axis, rarely with secondary branches ; rhachiB of pecS r i r fi ny,i O ill t e d t t U s articulilti^ horizontally ; joints and groove. Spik 2, one SeSSile, the oth - P««celled, similar in shape or whe pedicelled reduced, (differing in sex except the l s beq 1 T f COmpreSse<1, Ca»»s «'«». "-ally bearded. 6lun.es sube ,< ,ohartaceous or .membranous ; lower 2-keeJed with in- d^ ilar T IS; I d l n d r boatsh r M>ed, acutely keeled. UrnM\* stipe of a minute. obtuse \*lu\*,H rttow^W l : eny>M 2 l e e G r a i n o b l o n g, Ped <J ; floret, | I I I " : " u e l l > m i l l n < f t T M 1 w s T M t c o n t a i n i n g •'

Primary axis of the inflorescence short, much overtopped racemes, branches undivided ; Lea long "»«• ».<!«.. Cnlrn, often oro,pi ng at the b l w e, up to 30 in.

*Ampylophis.*

## GRAMINEAE.

Ipng; racemes 1-10, 1-2-5 in. long; lower glumes usually with a median pit, rarely 2, on the back above the middle, but sometimes quite smooth, -11-14 in. long; awns -36-85 in. long.... 1. *pertusa*.  
Leaves mostly cauline, elongate:—

Lower glumes devoid of pits:—

Culms stout, up to 5 ft. high, nodes hairy; leaves 3-24 in. long, -15-3 in. wide; racemes up to 6, 1-4 in. long; lower glume of sessile spikelets more or less long-hairy on the back below the middle, -16-2 in. long; awns -65-1 in. long

2. *pseudoischaemum*.

Culms comparatively slender, up to 3 ft. high, nodes usually glabrous; leaves often involute, 4-14 in. long, 1.5-1 in. wide; racemes few to many, 1-4 in. long; lower glume of sessile spikelets glabrous, often dorsally longitudinally depressed, 14-17 in. long; awns -5-85 in. long..... 3. *Foulke*

Lower glumes usually pitted, at least in most of the spikelets:

Lower glume of pedicelled spikelets 2-4-pitted, -16-2 in. long; that of sessile spikelets 1-pitted. Culms up to 3 ft. high; leaves (5-25 in. long, -12-3 in. wide; racemes 1-14, 1-3-0 in. long; awns -46-85 in. long..... 4. \*»\*»\*»\*\*•

Both lower glumes with 1 dorsal pit, seldom unpitted, -14-19 in. long. Culms often robust, up to 7 ft. high; leaves 4-24 in. long, -12-4 in. wide; racemes 8-20, sometimes more, flexuous, silky, 1-5-3 in. long; awns -12-2 in. long..... 5. *Kuntzeana*.

Primary axis up to 10 in. long, much longer than the racemes, stronger branches again branched. Culms 2-6 ft. high; leaves often setose at the base, 4-20 in. long, -2-42 in. wide; racemes numerous, up to 2-5 in. long; lower glume of sessile spikelet with or without a dorsal pit, -12-1 in. long, glabrous or somewhat hairy on the back below the middle, that of pedicelled spikelets unpitted: awns -4-75 in. long..... (1) *gahril*

1. AMPHILOPHIS PERTUSA, Stapf. *Andropogon vertuosus*, VVinkl.; P. B. I. vii. 173; S. I. G. figs. 152, 153.

In all Districts except the wettest localities; sea-level to 4,000 ft. Often in saline soils. A good fodder and hay. Vern. *Ur Basana*; *Tel Janu gaddi*, *Turn gaddi*; *Tarn Chinna-karai pullu*.

2. AMPHILOPHIS PSEUDOISCHAEMUM, V, E. C. Fischer n. comb. *Andropogon pseudoischaemum*; Nees; F. B. T. J. vii. 172.

Deccan and Coromandel; 1,000-2,000 ft.

3. AMPHILOPHIS FOULKESII, C. E. C. Fischer n. como. *Andropogon Foulkesii*, Hook. f. ; F. B. I. vii. 174. Nilgiri, Pulney and Tinnevelly HiUs ; 6,000-8,000 ft.
4. AMPHILOPHIS INSCULPTA, Stapf. *Andropogon pertusus*, var. *insculptus*, Hack. ; F. B. I. vii. 174. W. Gháts from the Bababudan to the Pulney Hills ; 3,67,000 ft. Vern. Kan. Henu ganjalu garikai hullu.
5. AMPHILOPHIS KUNTZEANA, Haines. *Andropogon Kuntzea* Hack.; F. B. I. vii. 175. Deccan ; Carnatic ; N. Coimbatore and Xiliriri Distric sea-level to 2,000 ft. Uncommon.
6. AMPHILOPHIS GLABRA, Stapf. *Andropogon inter medius*, R- F. B. I. vii. 175. *A. montanus*, Roxb.; F. B. I. vii. 176<sup>a</sup>. N. Circars from Ganjam and the Rampa Hills to the Nal<sup>a</sup> mallais ; up to 3,500 ft. Vern. Vr. (Jnnd;i bma.

## 25. Vetiveria, Thouars

Coarse, jierennial herbs with stout rhizomes ; culms more or less compressed below. *Leaves* narrow, conduplicate in <sup>^u d</sup> ultimately flat; lower leaf-sheaths much coir pressed. *Panic<sup>les</sup>* erect, composed of many-rayed whorls of <sup>^lender</sup> simple, rare<sup>ly</sup> compound racemes ; rhachis 3-many-jointed, fragile ; joints an<sup>d</sup> pedicels slender. *Spikelets* 2-nate, one sessile and one pedicelleo\* the pairs subsimilar but differing in sex. *Sessile spikelets* slightly laterally compressed. *Glumes* equal, coriaceous or chaitacepus ; lower rounded on the back, usually muticous, margins subinnexed ; upper boat-shaped, keeled towards apex, mucronate or aristulate-*Lemmas* hyaline ; lower 2-nerved, entire, empty ; upper minutely 2-toothed, muticous, mucronate or Ovith a more or less developed geniculate awn from the sinus, palea minute, enclosing a bisexual floret. *Lodicules* 2. *Stamens* 3. *Styles* 2. *Grain* oblong, slightly oblique at the apex. *Pedicelhd spikelets* dorsally compressed, with much thinner glumes than those of the sessile spikelets, like the lemmas usually awnless, usually containing a \$ floret.

Rootstock with spongy aromatic roots; culms tuftod, stout, up <sup>(t)</sup> 0 ft. high or more ; leaves distichous at the base, coriaceous, conduplicate at least below, 12~3(> in. long, -15--4 in. wide, usually glabrous ; panicle G-15 in. long ; joints and pedicels glabrous ; sessik<sup>1</sup>

spikelets with glabrous callus, lower glume muriculate, upper muriculate on the keel; upper lemma entire, mucicous or mucromilate

1. *zizanoïdes*.

Rootstock horizontal, roots not spongy nor aromatic; culms comparatively slender, 1-5-5 ft. high; leaves chiefly subradical, rigidly herbaceous, 3-9 in. long, rarely up to 15 in., 0.6-1.5 in. wide, glabrous or more often sparsely, shortly hairy and distantly ciliolate; panicles 4-8 in. long, narrow; joints and pedicels with a basal tuft of hairs; sessile spikelets with a bearded callus; lower glume narrowly ensiform with a row of marginal tubercles enlarging upwards and becoming spinulose at the tip, upper shorter, 2-fid with a slender arista 0.3-0.5 in. long; upper lemma with a slender awn 0.8 in. long . . . . . 2. *Lawsoni*

1. VETIVERIA ZIZANOIDES, Nash. *Andropogon squarrosus* Hack, non Linn. f.; F. B. I. vii. 186; S. I. G. fig. 154.

In all Districts except on the W. Coast; sea-level to 3,000 ft.

The Khas-khas or Cus-cus grass.

A good fodder when young. The aromatic roots are used for making the well-known khas-khas mats for cooling dwellings and for fans. An aromatic and medicinal oil is extracted from the roots. Vern. *Hind.* Khas-khas; *1 el.* Vatti-veru; *Tarn.* Vettiver, Virkel, Viyal; *Mai.* Vettiver; *Kan.* Kadu karai, Dhappa sajjai hullu.

2. VETIVERIA LAWSONI, Blatter et McCann. *Andropogon Lawsoni*, Hook. f.; F. B. I. vii. 187.

Mysore State; Coimbatore and Nilgiri Districts; 1,400-3,000 ft.

Cattle are said to eat the leaves and reject the flowering culms. Vern. *Kan.* Karai hullu; Thoddu karai hullu.

## 26. Pseudosorghum, A. Camus

Annual herbs, decumbent below. Panicles contracted, dense; primary branchlets nearly always solitary, alternate, erect, branching from the base, lower secondary branchlets sometimes verticillate; racemes spiciform, dense, sessile or nearly so; rachis fragile; joints and pedicels slender, hairy. *Spikelets* 2-nate, one sessile, the other pedicelled, differing only in sex. *Sessile spikelets* much imbricated: *Callus* short, bearded. *Glumes* subequal, chartaceous; lower 2-keeled; upper boat-shaped, 1-keeled. *Lemmas* hyaline; lower nearly as long as the glumes, sometimes

paleate, empty ; upper narrow, shorter, cleft for half its long<sup>11</sup> into 2 narrow, lobes with a geniculate awn from the sinus, enclosing a bisexual floret. *Lodiculu* 2. *Stamens* 3. *Styles* 2, free. ?& *celled spikelets* narrower than the sessile, often much reduced, sometimes only 1 glume left. *Glumes* membranous narrow; lower 2-keeled; upper similar or boatshaped and 1-keeled. *Lemmas*, when present, hyaline: Inw.r t|>.- lwer. empty or containing a <J floret.

P8KCDO8OBOHUII FASCICULARK, A. Camus. *Amlr»p<XJOH fa\*\* culans*, Roxb. ; F. B. I. vii.TK

"anjam (Gamble), Oodavari (Barber) and Coimbatore (Fischer) District!!; Palghat Hills (Beddome); Cochin State (Meebold); sea-level to 4,000 ft.

Culms up to 5 ft. high ; leaves sometimes very short but usually long, up to 20 in. long and 3 in. wide ; panicles up to 10 in. long ; racemes few or many and dense, 1-5-2 in. long ; awns 4-6 in. long.

Vern. *Tel.* Konda-jeri.

## 27. Sorghum, *Yi-s.scn.su* A. (,,,,,,).

Annual or perennial, tall, sometimes woody. *Isar*,\* at *Hr*\* convolute, eventually flat. *Panicle*\* often large, with verticillate or scattered branches, usually lax in the wild species, frequently contracted or compacted in the cultivated ones; rachis fragile or tough; divisions 1-fen-jointed ; joints and pedicels slender with einate edges. *Spikelets* 2-nate on the lateral nodes, one sessile, the other pedicelled or reduced to a pedicel, differing in shape and sex & *Mwf*c *spikdet*\* more or less dorsally compressed or subglobose or ovate or elliptic : *Glumes* subequal, often coriaceous : lower 2-keeled at apex with narrowly inflexed margins, involute at base, apex erose or 3-toothed ; upper shorter, convex, 1-keeled-*uemma*, hyaline ; lower as long as the glumes or nearly so, empty ; upper oblong, 2-toothed or 2-fid, rarely entire, mucicous or mucronate or awned from the sinus, paleas sometimes present, including a bisexual floret. *Lodicoles* 2, rather large. *Stamen*, 3, very rare. *Style*, 2, free. *Grain* obovate or linear-oblong in wild species, *S* *ped* *its* more or less reduced, *lem* ... sent ♂ or empty.

of racemes fragile; sessile spikelets falling together with the peltate joint and pedicel; spontaneous perennial plants:—

Primary branches of the panicle undivided, up to 4 in. long:—

Culms solitary, stout, 3-8 ft. high; nodes white-silky; leaves 8-21 in. long, 1-5 in. wide; panicle ultimately effuse, 4-10 in. long; racemes whorled; peduncles very slender; joints, pedicels and spikelets purplish- or reddish-villous; lower glume of sessile spikelets black and polished when ripe; upper lemma acuminate, truncate or 2-fid for up to 1/2 its length, imbricate, aristate or with an awn up to 1/2 in. long. . . . . 1. nitidum.

Culms tufted, comparatively thin, 0-24 in. high; nodes glabrous; leaves 2-4 in. long, 1-5 in. wide; panicles narrow, up to 5 in. long; racemes few, alternate; peduncles rather stout; joints and pedicels densely creamy-villous; glumes of sessile spikelets very coriaceous, tomentose on the back; awns 1/2 in. long

2. Stapfii.

Primary branches of the panicle branched, up to 10 in. long, panicles usually effuse, 9-17 in. long. Culms solitary, stout, often woody, 3-10 ft. high; nodes glabrous or nearly so; leaves 5-33 in. long, 1-5 m. wide; glumes of sessile spikelets more or less hairy on the back; upper lemma cleft for 1/2 to 1/3 its length, with an awn 1/2 in. long, entire and mucous. . . . . 3. halepense.

Panicles of racemes tenaceous; sessile spikelets persistent; usually annual, cultivated plants. . . . . Cultivated species.

1. SORGHUM NITIDUM, Vrs. Andropogon nitidum, Thunb.; F. B. I. vii. 185.

\* In all Districts from Coorg to Travancore; 1-7 ft. Vern. Kan. (Chikka narala hullu.

2. SORGHUM STAPFII, C. E. C. Fischer n. nov. Andropogon Stapfii, Hook. f.; F. B. I. vii. 184.

Palamkotta (Wight).

3. SORGHUM HALEPENSE, Pers. Andropogon halepense, Brot.; F. B. I. vii. 182.

In all Districts, except on the W. Coast; sea-level to 7000 ft. A good fodder and hay grass when mature; when young it is said to have sometimes had injurious and even fatal effects on animals eating it. Vern. Tain. Kadu-cholam; Kan. Kadu-kambu hullu.

CULTIVATED SPECIES: Various species and races of Sorghum are cultivated in all Districts. Hitherto these have been clubbed

under the name *Andropogon Sorghum*, Brot. ; F. B. I-<sup>vll<</sup> 183.  
The Great Millet.

The cultivated Sorghums are under revision by Mr. J. D. Snow<sup>do</sup> and until the result of his work is published it would be inadvis<sup>able</sup> to attempt a classification. As far as is known at presen<sup>t</sup> the following five species with varieties and races are grown in in<sup>...</sup> 8. *Roxburghii*, Stapf, 8. *bicolor*, Moench, 8. *Durra*, Stapf, "8. *cer-*  
*nuum*, Host, *S. svhglabrescens*, Schweinf. et Aschers. The<sup>ver-</sup> naeular names, which cannot at present be correlated with<sup>the</sup> different species, are : *Hind.* Juari, Bajra; *Ur.* Jonna; *Tel.* Jonna, Jonnalu; *Tarn*, and *Mai.* Cholam; *Kan.* Jola; <sup>with</sup> racial names qualifying each.

The plants are of great economic importance as coniesti<sup>ble</sup> grains and as a fodder, hay and thatch grasses.

## 28. Chrysopogon, Trin.

Usually perennial, erect herbs. *Leaves* narrow, flat or comp<sup>cate.</sup> *Panicles* terminal, usually lax, branches whorled, rarely 2-nate<sup>or</sup> solitary, simple or divided at the base. *Spikelets* in threes at<sup>the</sup> ends of the branches, one sessile and 2 pedicelled, falling togeth<sup>er</sup> from the thickened, oblique, rarely glabrous tips of the peduncle<sup>s</sup> rarely 2-nate in 2-jointed racemes and then 1 sessile and 1 P<sup>^i-</sup> pedicelled, the sessile falling with the contiguous joint and pedice<sup>l</sup> pedicels (and joints when present) filiform. *Sessile spi kelets* usually laterally compressed: *Glumes* subequal, coriaceous<sup>or</sup> chartaceous; lower complicate or involute, backs rounded or more<sup>r</sup> less 1-keeled; upper boat-shaped, more or less 1-keeled. *Lemmas* hyaline; lower empty; upper entire or 2-toothed, with a more<sup>r</sup> less perfect geniculate awn; palea small or 0, enclosing a bisexu<sup>\*1</sup> floret. *Lodicules* 2. *Stamens* 3. *Grain* linear, laterally coff<sup>l</sup> pressed; embryo half as long. *Pedicelled spikelets* dorsally com<sup>\*</sup> pressed: *Glumes* subequal, thin, sometimes awned. *Lemma*<sup>3</sup> hyaline, muticous, usually enclosing a \$ floret.

Pedicels half as long as the sessile spikelets or longer :—

Pedicels glabrous. Rootstock woody, creeping; culms 5-20<sup>i11.</sup> high; leaver mostly basal, -8-6 in. long, -1--25 in. wide, glabrous  
<sup>^</sup>panicles 1-5-3-5 in. long, narrow, branches ascending sharply<sup>f</sup>

glumes of sessile spikelets -14-17 in. long, upper mucronate: awiiR .10-24 in. long: glumes of pedicelled spikelets -14-24 in. long, muticous . . . . . \. *acicvM\*\**.

Pedicels rufous-hairy ; leaves usually puberulous :—

Lower glume, at least, of pedicelled spikelets aristate :—

Leaves conspicuously distichous, sheaths below much compressed and acutely keeled, often beset with bristles from bulbous bases, 3\_2Un. long, -1-45 in. wide, often complicate, base semi-amplexicaul. Culms stout, 20-52 in., high ; panicles 5!) in. long, narrow, branches ascending; glumes of sessile spikelets -2-22 in. long, awn of upper -5-85 in. long ; awn of lemma 1-7-2-8 in. long; glumes of pedicelled spikelets -33-ffi> in. long, lower with one awn -33-5 in. long, upper muticous

. . . . 2. *nsper*.  
or with an arista -22 m. long . . . . .

Leaves not conspicuously distichous, not bristly, not semi-amplexicaul:—

Culms robust, up to 6 ft. high, lower nodes often leard.d : leaves 14-20 in. long, -4-65 in. wide; sparsely pilose at haw. finely acuminate, sheaths not keeled ; panicles i-tJ in. long, pyramidal, branches ultimately horizontal; sessile spikelet with a callus -04-07 in. long, glumes -21-28 in. long, upper with an awn -32-46 in. long; awn of lemma 1-3-1-7 in: long; glumes of pedicelled spikelets -34-42 in. long, lower with an awn -24-42 in. long, upper muticous

3. *vertictllatus*.

Culms comparatively slender, up to 3 ft. high, nodes glabrous ; leaves 1-7-9-5 in. long, -1-3 in. wide, usually abruptly acute, pubescent, rarely glabrous, lower sheaths somewhat compressed and keeled ; panicles 5-7 in. long, branches ascending ; sessile spikelets with a callus -09-2 in. long, glumes •18-23 in. long, awn of upper -36-66 in. long, awn of lemma 1-5-2-4 in. long; glumes of pedicelled spikelets -26-36 in. long, awn of lower -25-63 in. long, upper finely acuminate,

7. \* . . . 4. *orientalis*.

muticous or mucronate . . . . .

Glumes of pedicelled spikelets -37-53 in. long, acuminate or caudate-acuminate, not aristate or awned. Culms 7-36 in. high ; leaves 8-14 in. long, -15-6 in. wide, complicate, rather stiff, often densely imbricate at the base; panicles 3-6 in. long, branches erect or spreading; sessile spikelets with a callus •04-06 in. long, glumes -23-26 in. long, upper mucronulate or with an arista up to -26 in. long, awn of lemma \-25-1-45 in. long

5. *zeylanicu*8.  
AAAAAA



Pedicels less than half as long as the sessile spikelets :—

Leaves glabrous:—

Leaves not distichous :—

Upper glume of sessile spikelets more or less ciliate, usually rufous-hairy on the keel; glumes of pedicelled spikelets usually pubescent or hispid, lower aristate. Rootstock often creeping; culms 9-38 in. high; leaves 1-8-8 in. long, .05-.1 in. wide, usually rigid, sometimes ciliate from bulbous bases; Panicles 1-5-3 in. long, branches usually spreading; glumes of sessile spikelets .12-.22 in. long, upper with an arista .26-.33 in. long, awns of lemmas .9-1.1 in. long; glumes of pedicelled spikelets .13-.22 in. long, lower with an arista .14-.22 in. long (in variety *robusta* all parts larger). . . . . 6. *montana* (Willd.) H. B. K.

Upper glume of sessile spikelets glabrous; glumes of pedicelled spikelets muticous, glabrous. Culms 6 ft. or more high; leaves 6-36 in. long, 2-3 in. wide, sheaths silky at base, margins often silky-ciliate; panicles 4-6 in. long, branches spreading; glumes of sessile spikelets .17-.22 in. long, upper with arista .12-.3 in. long, awn of lemmas .7-1.2 in. long; glumes of pedicelled spikelets .17\*18 in. long . . . . 7. *Hacked*

Leaves conspicuously distichous, 4-5-8-2 in. long, .15-.2 in. wide. Rootstock woody, creeping; culms up to 3 ft. high; panicles 3-6 in. long, branches ascending; hairs of pedicels and callus pale straw-coloured, latter slender, glabrous in upper half; glumes of sessile spikelets .22-.24 in. long, upper mucronate; awn of lemma .47-.56 in. long; glumes of pedicelled spikelets .22 in. long, muticous. . . . . 8. *polyphylla* (Willd.) H. B. K.

Leaf-sheaths and blades puberulous, blades 5-9 in. long, .1-1.42 in. wide. Culms 1-2 ft. high; panicles 2-3 in. long, branches spreading with sparsely, shortly, white-ciliate apices; glumes of sessile spikelets .21-.25 in. long, pale, upper more or less rufous-hairy, with an arista .16-.28 in. long; awn of lemmas 1-2 in. long; glumes of pedicelled spikelets .15-.2 in. long, muticous, lower rufous-hispid in lower half. . . . . 9. *velutinus*.

1. CHRYSOPOGON ACICULATUS, Trin., *Andropogon aciculatus*, Retz.; F. B. I. vii. 188.

In all Districts; sea-level to 2,000 ft. The Love-grass. Eaten by cattle before flowering. Vern. Tel. Putthi gaddi.

2. CHRYSOPOGON ASPER, Heyne ex Hook f. *Andropogon asper*, Heyne ex Hook. f.; F. B. I. vii. 189; S. I. G. figs. 155, 150.

Cuddapah District; Horsleykonda; Kambakkam Hills; Nilgiri Hills at Naduvattam ; 1,000-6,000 ft.

Doubtfully distinct from *C. orientalis*, A. Camus.

3. CHRYSOPOGON VERTICILLATUS, Trin. *Andropogon verticillatus*, Koxb.; F. B. I. vii. 189.

Rampa Hills at 2,000-3,000 ft. (Narayanaswami) ; Godavari District (Bourne).

4. CHRYSOPOGON ORIENTALS, A. Camus. *Andropogon Witjhtim*, Steud. ; F. B. I. vii. 191 ; S. I. G. fig. 157.

In most Districts from Cuddapah southwards ; sea-level to 7,000 ft.

A conspicuous grass owing to the bright red or purple glumes of the pedicelled spikelets.

5. CHRYSOPOGON ZKYLANÆICUS, Thw. *Andropogon zeylanicum*, Nees; F. B. T. vii. 192.1

W. Ghats ; 4,000-8,000 ft.

The glumes of the pedicelled spikelets are purple and green.

Vern. *Kan.* Badi hullu.

6. CHRYSOPOGON MONTANUS, Trill. *Andropogon nimilicohl*, Schult. ; F. B. I. vii. 192; S. I. G. fig. 158.

In all Districts except the W. Coast; sea-level to 3,000 ft.

Often on laterite soil.

A good fodder grass. Vern. *Tel* Gurra batto kehi.

- Var. *robustu*\*, Hook. f. ; F. B. I. vii. 193.

Culms stouter and taller ; all parts larger.

Godavari, Kistna, (Juntur, Bellary and Coimbatore Districts.

Vern. *Kan.* (hello sail kanni.

7. CHRYSOPOGON HACKELI, C. E. C. Fischer n. comb. *Andropogon Hackelii*, Hook. f. ; F. B. I. vii. 194.

W. Ghats from Coorg to Travancore ; 2,000-5,000 ft.

8. CHRYSOPOGON POLYPHYLLUS, Blatter et McCann. *Andropogon polyphyllus*, Hack, ex Hook. f. ; F. B. I. vii. 194.

Godavari District: IVvypatna-m ((Jamble) and Kolar Gorge (Bourne).

9. CHRYSOPOGON VELUTINUS, Am. ex Hook. f. *Andropogon rehainus*, Hook. f. ; F. B. I. vii. 194.

Cuddapah District (Wight).

29. *Dichanthium*, Willemet

Perennial, seldom annual, tufted herbs. *Leaves* narrow. *In*, *florescence* of subdigitate, rarely solitary, subpanicled or «\*»<sup>1</sup>, mosely arranged, short-peduncled, spiciform racemes ; joints \*\*& pedicels slender. *Spikelets* 2-nate, one sessile, the other I\*»<sup>1</sup> celled, similar in shape and size, differing in sex, the lowermost 1-2 pairs of the raceme usually homogamous and <\$ or empty\* *Sessile spikelets* dorsally compressed : *Glumes* equal, thinly cha<sup>f</sup>-taceous ; lower usually rounded at the apex, 2-keeled, at least in the upper half ; upper boat-shaped, acutely 1-keeled. *Le\*»<sup>nU</sup>* usually without palea, sometimes a minute upper one present ; lower hyaline empty ; upper reduced to a firm pale stipe hya<sup>6</sup> at base, passing into a geniculate awn, the stipe rarely vetf narrowly margined and finely 2-fid at apex ; its floret bisexual-*Lodicules* 2. *Stamens* 3. *Styles* 2, free. *Grain* oblong, obtuse, slightly compressed. *Pedicelled spikelets* awnless ; lower lemma present or not, if present sometimes empty, sometimes containing a c£ floret.

Culms leafy ; leaves glabrous or sparsely hairy ; glumes -18 in. <sup>or</sup> less long ; upper lemma of sessile spikelets reduced to an awn :—

Stem below inflorescence and peduncles of spikes glabrous :—

Culm nodes patently hairy, rarely glabrous ; culms up to 40 in. high ; leaves 2-11 in. long, -1-2 in. wide ; racemes 2-9, 1-3 \*<sup>n</sup> long ; glumes -1—15 in. long, lower of sessile spikelets elliptic apex rounded or narrowed and obtuse ; awns -6-1 in. long

*i. annuum* \*'-

Nodes usually glabrous, seldom somewhat hairy, rarely patently so ; racemes solitary or sometimes 2-nate ; lower glume of sessile spikelets obovate or obovate-oblong :—

Culms usually erect from a geniculate base, 10-36 in. high, occasionally dwarf and 3-4 in. high ; leaves 1-5-4-5 in. long, •05-17 in. wide ; racemes 1-4-2-2 in. long ; glumes -12-15 in. long, apex rounded or subacute ; awns -6-9 in. long

*ri* *2. caricosturn-*  
Culms creeping, apical 2-6 in. erect ; leaves -9-2 in. long, •00-1 in. wide ; racemes -8-1 in. long ; g<sub>l</sub>u<sub>m</sub>e<sub>s</sub> -16 in. long, apex rounded ; awns -75 in. long . . . . . *3. pallidum*

Stem below *the* inflorescence usually and peduncles always softly, patently há-ry ; culms 1-4 ft. high ; nodes usually patently hairy,

sometimes glabrous; leaves 3-12 in. long, 1-2 in. wide; racemes  
 2-3-5 in. long; glumes 13-18 in. long, lower of sessile  
 spikelets elliptic-oblong to broadly obovate, apex rounded or  
 narrowed and obtuse; awns 7-11 in. long . . . . . 4. *nodosum*.  
 Culms naked or with 1-2 reduced leaves, 20-40 in. high, slender;  
 leaves mostly basal, 7-10 in. long, 1 in. wide, the cauline up to 4-5  
 in. long, softly hairy on both sides, often involute; racemes usually  
 solitary, sometimes 2-3, 2-2-2 in. long; glumes 26-4 in. long, lower  
 of sessile spikelets narrowly elliptic-oblong to lanceolate, acute or  
 obtuse, up to 36 in. long; awns 9-12 in. long, their bases with a  
 narrow hyaline margin cleft for about 1/2 its length into 2 capillary  
 lobes. . . . . 5. *polytychum*,

- 1- DICHANTHIUM ANNULATUM, Stapf. *Andropogon annulatus*,  
 Forsk.; F. B. I. vii. 196; S. I. G. figs. 160, 161-  
 In all the Eastern and Central Districts; at low elevations.  
 A fair fodder.
- 2- DICHANTHIUM CARICOSUM, A. Camus. *Andropogon caricosus*,  
 Linn.; F. B. I. vii. 196; S. I. G. fig- 159.  
 In all Districts except the W. Coast; near sea-level to  
 3,000 ft.  
 A fair fodder. Vern. Kan. Urukun hullu.
- 3- DICHANTHIUM PALLIDUM, Stapf MS. n. comb. *Apocopis*  
*pallida*, Hook. f.; F. B. I. vii. 143.  
 Nilgiri Hills (Foulkes).  
 This may be an impoverished form of the last species.
- 4- DICHANTHIUM NODOSUM, Willem. *Andropogon caricosus*,  
 Linn. var. *mollicomus*, Hack.; F. B. I. vii. 196.  
 Mysore State; Godavari, Bellary, Salem and Coimbatore  
 Districts; 1,000-3,000 ft.
- 5- DICHANTHIUM POLYPTYCHUM, A. Camus. *Andropogon poly-*  
*tychus*, Steud.; F. B. I. vii. 198.  
 Nilgiri and Pulney Hills (Bourne); 6,000-7,000 ft.

### 30. Heteropogon, Pers.

Annual or perennial usually branched herbs; branches mostly  
 flowering and gathered into spatheate panicles. Leaves narrow,  
 flat- Racemes spiciform, usually solitary, terminating the culms

or their sometimes fascicled branches ; spikelets 2-nate, one sessile<sup>e</sup> the other pedicelled, the 1-several lower pairs alike, (J or empty<sup>f</sup> the upper pairs differing in sex and strikingly in shape ; rha<sup>^8</sup> many-jointed, not or tardily disarticulating between the hom<sup>0i</sup> gamous pairs of spikelets, fragile between the heterogamou<sup>st</sup> *Fertile sessile spikelets* terete or subterete. *Callus* often pungent densely bearded upwards. *Glumes* equal, coriaceous or chartaceous, obtuse. *Lemmas* hyaline; lower empty; upper very slender, cartilaginous at apex and passing into a usually stout, geniculate awn ; palea small or 0, enclosed floret \$ or bisexual-*Lodicules* 2, large to minute. *Stamens* 3, or rudimentary or 0-*Grain* sublinear, terete ; embryo slightly more than half as long-***Lower sessile and pedicelled spikelets dorsally compressed, often twisted, imbricate:*** *Glumes* dissimilar; lower 2-keeled, usually winged upwards on one or both keels. *Lemmas* hyaline, often more or less reduced or suppressed, with or without 3 stamens. Joints and pedicels glabrous ; lower glume of fertile spikelets tightly involute, brown-hispid :—

Culms usually tall, comparatively stout; leaves glabrous or m<sup>orC</sup> or less setose from tubercles at the base; upper glume of fc-til<sup>\*f</sup> spikelets deeply grooved on both sides of the midrib :—

Leaves basal or basal and cauline, not strikingly distichous, vcO<sup>o</sup> variable, 2-17 in. long, -1-4 in. wide. Culms (>4f) in. high? racemes 1-2-5 in. long; fertile spikelets with a callus 07.--H<sup>in></sup> long, densely rufous-hairy : glumes -I;! -22 in. long : «<sup>wnS</sup> 2-3-5 in. long; lower glume of other spikelets -23--31 in. long' glabrous or more or less densely setose from tubercles, upP<sup>or</sup> glume slightly longer, glabrous or with a few apical .setae fro»<sup>l</sup>

1. *contorts-*  
Leaves from the middle of the culm, strikingly distichous, rigid, complicate, usually curved, 1-3 in. long, -1-13 in. wide. Culm\* 13-18 in. high, sheathed below; glumes of fertile spikelets -24-27 in. long; awns -21-24 in. long; glumes of other spikelets 36-4 in. long, subequal, glabrous. . . . . *contort\*\** var. *disctic/><*

Culms slender, (i-9 in. high; leaves 1-2-5 in. long, -05 in. wicks glabrous or puberulous, ciliate at base; racemes -5-15 in. long; fertile spikelets with a callus -09-1 in. long, vilfoilH-hairy OH <or Hide, glumes -22-23 in. long, upper not channelled, awns Hi in. long: glumes^f other spikelets -28 in. long, |a1, mus

**Joints** and pedicels whitish hairy ; lower glume of fertile spikelets not tightly involute :—

Leaves flat, 5-2-6 in. long, 12-22 in. wide, hirsute, margins thickened. Culms slender, almost capillary, 2-12 in. high ; racemes sometimes 2-nate, 5-1-5 in. long ; lower glume of fertile spikelets 13-16 in. long, oblong, convex, pale silky-hairy at least below the middle, upper boat-shaped, hardly keeled, glabrous ; awns 1-1-6 in. long, glabrous in basal half ; glumes of other spikelets 14-18 in. long, lower elliptic-oblong, truncate or 3-lobulate, 2-keeled, keels narrowly winged at apex. . . . .<sup>3</sup>- *oliganthus*.

Leaves tightly involute, filiform, 3-8 in. long, glabrous. Culms wiry, 16 or more in. high ; racemes 2-2-5 in. long ; glumes of fertile spikelets 23-26 in. long, glabrous, lower narrowly linear-lanceolate, 2-toothed, 2-keeled at apex, with a deep median channel below the middle, glabrous, upper narrowly boat-shaped, not keeled, arista 13-15 in. long, slender, hairy below the middle ; glumes of other spikelets 31-34 in. long, narrowly lanceolate, acuminate, 2-keeled, glabrous. . . . . 4. *bellariensis*.

1- HETEROPOGON CONTORTUS, Beauv. ex Roem. et Schult. *Andropogon contortus*, Linn. ; F. B. I. vii. 199 ; S. I. G. figs. 162, 163.

In all Districts ; sea-level to 7,500 ft.

All the awns of a raceme often twisted about each other. A variable and very common, gregarious and very troublesome grass owing to the sharp, barbed callus and the hygroscopic awns which cause the fruit to adhere to and penetrate into the clothing of man and the hairs of animals. The Spear-grass.

A good fodder and suitable for hay-making, but when in fruit the latter should first be separated. Useful for thatching. Vern. *Hind*-. Kher ; *Ur*. Sinkolo ; *Tel* Eddi gaddi, Kaseri gaddi ; *Dubba* gasari gaddi, Yerragoyi ; *Tarn*. Oosi pullu, Karunsi pullu, Pani pullu ; *Kan*. Kari vunugada hullu, Sunkari hullu.

Var. *distichus*, C. E. C. Fischer n. var.

Anamallais at 3,500 ft. (Barber) ; Kodaikanal, 6,000-7,000 ft. (Bourne).

2. HETEROPOGON POLYSTACHYOS, Schult. *Andropogon polystachyos*, Roxb. ; F. B. I. vii. 202.

Without precise locality (Wight).

3. HETEROPOGON OLIGANTHUS, Blatter et McCann. *Andropogon oliganthus*, Hochst. ; F. B. I. vii. 201.  
W. Gháts from Kudrai Mukh to Travaneore; 3, X<sup>^\*</sup>  
8,000 ft.
4. HETEROPOGON BELLARIENSIS, C. E. C. Fischer n-<sup>o</sup>mb.  
*Andropogon bellariensis*, Hack. ; F. B. I. vii. 201.  
Anantapur District on Gooty Fort Hill (Campbell, Wigh <sup>t</sup>)

## 31. Themeda, Forsk.

Coarse annual or perennial herbs. *Leaves* narrow. *Inflorescence* terminating the culms and their upper branches in short solitary racemes subtended by spathes, crowded in paniculate, often glomerate fascicles ; rhachis terete, tough or tardily disarticulating and glabrous between the homogeneous pairs of spikelets, readily disarticulating above them. *Spikelets* 2-nate, the terminal glomerate 3-nate\*; 2 lowest pairs persistent, alike, (J or empty, sessile or sessile, closely approximate to form a quasi involucre, the folioles pairs differing in sex and conspicuously in shape, one sessile, other on a jointed pedicel, and falling with the upper part of pedicel. *Involucral and pedicelled spikelets* similar, the lower narrower, much dorsally compressed, awnless: *Glumes* usually 2; lower 2-keeled, one or both keels sometimes scariously winged; upper occasionally suppressed. *Lemmas* hyaline ; upper often suppressed, both or either with or without a <J florev. *Sesquipedal spikelets* above the involucral terete : *Callus* usually acute to pungent, so densely bearded as to conceal more or less the adjacent joint and pedicel bases. *Glumes* equal, coriaceous except the submembranous tips ; lower tightly involute, without keel, sometimes grooved down the middle ; upper with a deep longitudinal groove on each side, firm between the grooves, margins thin. *LernnM* dissimilar; lower hyaline, epaleate, empty; upper stipitiform\*<sup>1</sup> base hyaline, cartilaginous upwards and passing into a stout geniculate awn, or hyaline throughout and awnless or passing into a more or less reduced awn, paleate or not, containing a bisexual floret. *Lodicules* 2, rather large. *Stamens* 3. *Styles* 2. *Grain* lineal-obovate, subterete, grooved on the front; embryo about half as long.

Inv^lucral spikelets all on the same level; only one bisexual spikelet in the raceme :—

Branching strict; clusters of inflorescence very numerous in numerous fascicles :—

Perennial, erect; culms robust, up to 10 ft. high ; leaves 10-20 in. long, -1-55 in. wide ; clusters in globose or \*an-shapea, drooping fascicles ; lower glumes of involucral spikelets 16 \*£ in. long, glabrous or more or less setose from tubercles ; lower glume of bisexual spikelets -18-27 in. long, glabrous, pubescent or rarely densely silky, sometimes muriculate, apex usual y hispid ; awns -6-2-5 in. long . . . . .

Annual, erect or more often geniculately ascending and scrambling ; culms slender, up to 6 ft. long ; leaves up to 12 in. long and -25 in. wide; clusters usually narrow, erect or suberect, lower glumes of involucral spikelets -18-2 in. long, margins; in upper half beset with stiff bristles from large tubercles ; lower glumes of bisexual spikelets -16-17 in. long, puberulous; awns

i o i \* . i . . . . . 2. quadivalvis. 1-0-1-5 in. long . . . . .

Branching very effuse; clusters few in few, small, superposed fascicles on filiform branches; leaves on the main culms up to 14 in. long and -3 in. wide, tips filiform, upper leaves 3-4 in. long, filiform; lower "glumes of involucral spikelets -26-27 in. long, glabrous except for a very few bristles from tubercles near the apex , lower glumes of bisexual spikelets -18 in. long, glabrous and shining below, hispidulous at apex; awns 1-1-7 in. long . . . . .

Involucral spikelets in superposed pairs; often 2 bisexual spikelets in the raceme :—

Panicle racemiform; lower glumes of bisexual spikelets -1-2-14 in-long, back longitudinally channelled. Culms usually "tender. up to 4 ft. high, leafy, not clothed at base with leaf-sheaths; leave, 3-20 in. long, -1-55 in. wide; spathules usually finely ">\*>\*->\*«™ large tubercles; lower glumes of involucral spikelets -20-34 in. long; setose from minute tubercles ; awns -8-1-3 in .long tremula.

Panicle decomposed, thyriform ; lower glumes of bisexual spikelets •14-18 in. long, not channelled. Culms robust, up to 10 ft. high, clothed at the base with broad, coriaceous, equitant leaf-sheaths, leaves up to 4 ft. long and -33 in. wide ; spathules slender, glabrous ; lower glumes of involucral spikelets -17-24 in. long, glabrous, rarely setose from minute tubercles, apex hispidulous, awn8^--y in. long . . . . . 5. cym rida.



[Themeda.

1. THEMEDA TRIANDRA, Forsk. *Anthistiria imberws*, Retz. ;  
F. B. I. vii. 211.  
In all Districts ; sea-level to 7,000 ft.  
Very variable, especially in indumentum. Eaten <sup>b-y</sup> <sup>c<sup>ttic</sup></sup> <sup>Kan.</sup>  
only when young. Vern. Tarn. Erigai thattu pullu >  
Bettanchi hullu, Thodda anji hullu, Gondamanchi hullu-  
2. THEMEDA QUADRIVALVIS, O. Ktz. *Anthistiria ciliato*\* L<sup>n</sup>. f. ;  
F. B. I. vii. 213.  
Ganjam, Kurnool, Bellary, Coimbatore and i<sup>1</sup> <sup>llv</sup>  
Districts; Coorg, Mysore State. Ver. Kan. Guntu <sup>nalai</sup>  
hullu.  
3. THEMEDA LAXA, Stapf ex Huimes. *Anthistiria laxa*, Anderss. ;  
F. B. I. vii. 213.  
Rampa (Narayanaswami) and Vizagapatam Districts. (K.  
Ranga Achariyar), 2,500 ft.  
4. THEMEDA TREMULA, Hack. *Anthistiria trrmuin*. Sees ; r-  
vii. 214 ; S. I. G. fig. 165.  
Hills from Coorg to Travancore ; S. Kanara District; <sup>1H<tr</sup>  
sea-level to 7,000 ft.  
5. THEMEDA CYMBARIA, Hack. *Anthistiria cymbaria*, R<sup>ox</sup> b. ;  
F. B. I. vii. 215.  
W. Ghâts ; 1,000-7,000 ft. Vern. Tarn. Noshia palai l<sup>1111u</sup> ;  
Kan. Balai hullu.

## 32. Iseilema, Andersson

Annual or perennial ; culms compressed, at least at base. <sup>leaves</sup>  
narrow with compressed, keeled sheaths. *Panicles* with usual <sup>llv</sup>  
fascicled branches interspersed with spathe-like bracts. *Racemes* <sup>f-a-</sup>  
cicled, each in the axil of a complicate spathe with scarious margin <sup>8.</sup>  
*Spikelets* lanceolate, the four basal whorled to form a quasi involucre  
as in *Themeda*, but all pedicelled ; rhachis short, bearing one sessile  
and two pedicelled spikelets, or sometimes 2-jointed and then <sup>the</sup>  
lower with one sessile and one pedicelled spikelet, disarticulat<sup>Wf</sup>  
from the peduncle immediately below the involucrel spikelet \*.  
*Involucral and upper pedicelled spikelets* similar, the latter usually  
narrower and w'th longer pedicels, sometimes much reduced <<sup>^</sup>

^presented by the pedicel alone : *Glumes* membranous, subequal, more or less 2-keeled, usually strongly nerved. *Lemmas* hyaline, usually only the lower present, epaleate, containing a <J floret. <sup>s\*\*</sup>*sik spikelets* with a very short, more or less bearded callus : *Glumes* subequal, coriaceous or chartaceous; lower lanceolate, truncate, emarginate or 2-toothed ; upper more or less boat-shaped, <sup>ac</sup>ute. *Lemmas* dissimilar ; lower short, hyaline, epaleate, empty ; <sup>u</sup>pper a hyaline stipe passing into a geniculate awn, subtending a Asexual floret. *Lodicules* 2. *Stamens* 3. *Grain* oblong, dorsally compressed ; embryo half as long.

Pedicels of involucre spikelets longer than broad, glabrous ; glumes membranous; glumes of sessile spikelets lanceolate, glabrous on the <sup>ba</sup>ck ; <sup>u</sup>pper pedicels slender, .05-1 in. long, sparsely hairy, their <sup>s</sup>Pikelets like the involucre :—

Spathes very narrow, rarely without minute tubercles on the keel and margins; peduncles very slender, .28-5 in. long, often much exserted, hispidulous upwards, minutely tubercular at apex. Culms <sup>4</sup>~36 in. high; leaves 1-2-6 in. long, .05-1 in. wide; pedicelled spikelets .14 in. long ; glumes of sessile spikelets .11-12 in. long ; awns-.4 in. long..... *1. prostratum.*

Spathes comparatively broad, devoid of tubercles; peduncles .08-1 in. long, not exserted, devoid of tubercles. Culms 10-40 in. high ; leaves 2-8 in. long, .05-15 in. wide ; pedicelled spikelets .n-21 in. long; glumes of sessile spikelets .14-2 in. long; awns .^'15 in. long..... *Z.laxum.*

Pedicels of involucre spikelets as broad at apex as long, sides and base densely bearded ; glumes coriaceous, .23-27 in. long, longitudinally depressed on each side of midrib. Culms 3-30 in. high ; leaves <sup>1</sup> .4-5 in. long, .07—18 in. wide ; spathes usually glabrous, sometimes sparsely eiliate from rather large tubercles ; glumes of sessile spikelets beaked, the beak 2-keeled, lower .22-24 in. long, back more or less Pubescent, upper slightly shorter, more or less 1-keeled ; awns .54 <sup>in</sup>- long; <sup>u</sup>pper pedicels"-12-15 in. long, capillary, glabrous, bearing <sup>1</sup> or 2 much reduced glumes or none ..... *3. anthephoroides.*

1- ISKILEMA PROSTRATUM, Anderss. *1. Wiyhtii.* Anderss. ; F. B. I. vii. 218.

Northern and Eastern Districts; Nilgiri and Coimbatore Districts ; at low elevations in the drier party  
An excellent fodder.

2. *ISEILEMA LAXUM*, Hack. ; F. B. I. vii. 218 ; S. I. G. figs. 166-168.

In all Eastern and Central Districts from Ganjam to S. Arcot in Mysore State ; sea-level to 2,500 ft.

An excellent fodder. Often confused with the previous speck\* Vern. *Tel.* Erra chengali gaddi ; *Tarn.* Tenga nari pill"-

3. *ISEILEMA ANTHEPHOROIDES*, Hack. ; F. B. I. vii. 219 ; S. I. figs. 169, 170.

In the coastal Districts from Ganjam to Nellore ; I<sup>llar</sup> and Cuddapah Districts ; sea-level to 1,000 ft.

### 33. *Pseudanthistiria*, Hook. f.

Annual herbs. *Leaves* narrow. *Panicles* leafy; branches slender, each terminating in a subumbellate fascicle of racemes subtended by a spathe-like bract. *Racemes* subtended by a complicate, acuminate or caudate, keeled spathe, resembling those of *Fhemeda*, but lacking the involucrel spikelets, 2-jointed, the basal with one sessile and one pedicelled spikelet, the upper with one sessile and 2 pedicelled. *Sessile spikelets* with a short, short-bearded callus: *Glumes* subequal; lower chartaceous, slightly narrowed upwards, truncate, margins narrowly inflexed in upper part, broadly involute below ; upper membranous, lanceolate acute or obtuse. *Lemmas* dissimilar; lower small, quadrate, empty; upper stipitiform. hyaline below, hardening upwards into a fine geniculate awn, subtending a bisexual floret. *Lodicules* 2, rather large. *Stamens* 3-4, small. *Pedicelled spikelets* with slender pedicels as long as the *glumes* subequal, membranous. *Lemmas* 0, or sometimes one present. *Lodicules* and *stamens* as in the sessile spikelet.

Leaves tapering from base to apex, more or less hairy from tubercles on both sides ; primary nerves 3-4 on each side of the midrib distinct from the finer secondaries ; peduncles 0.4 in. long, pubescent; back of lower glume of sessile spikelets not sulcate; lower glume of pedicelled spikelets usually sparsely setose at apex :-

bracts 2.5-3 in. long, margins setose, usually from minute tubercles; lower glume of sessile spikelets nerveless or nerves 2 at base; *Culms* erect, up to 2 ft. high; leaves 6 in. long; lower glume of pedicelled spikelets 1-1.2 in. long; awns 0.6-1.5 in. long; base slightly narrowed; awns 0.6-1.5 in. long; lower glume of pedicelled spikelets 1-1.2 in. long

Upper half bristles -32-H in. long, margins only or most of the lower half bristles from rather large, sometimes blackish tubercles ; lower glumes of sessile spikelets 12-22 in. long, 7-nerved. Culms erect. Plants to 3 ft. high ; leaves 3-7-5 in. long, 1-3 in. wide, base rounded ; awns 1/2-1 in. long ; lower glume of pedicelled spikelets 14-22 in. long, widest near the middle, glabrous, primary and secondary panicles usually indistinguishable, 9-2-4 in. long, 1-3 in. wide. Culms decumbent, rooting bases, slender, up to 18 in. high ; panicles 5-12 in. long, hairy ; lower glume of sessile spikelets 7-12 in. long, 7-nerved, back slightly sulcate on each side of the midrib ; awns 7-1 in. long ; lower glume of pedicelled spikelets 14-24 in. long, not setose. . . . . 3. *urnbellata*.

1. <sup>PsE</sup>UDANTHISTIRIA HBTEROCLITA, Hook. f. ; F. B. I. vii. 210.  
 \$• Kanara and S. Malabar Districts ; near the coast.

2. <sup>P</sup>SEUDANTHISTIRIA HISPIDA, Hook. f. ; F. B. I. vii. 219.  
 Mysore State ; S. Kanara ; sea-level to 4,000 ft.

3. <sup>P</sup>SEUDANTHISTIRIA UMBELLATA, Hook. f. ; F. B. I. vii. 220.  
 Godavari District ; W. Coast and Ghâts, from Coorg southwards ; sea-level to 4,000 ft.

### 34. *Apluda*, Linn.

Annual or perennial, leafy herbs, often geniculate and rooting at the nodes. Leaves flat, sometimes petioled. Panicles compound ; branchlets clustered, clusters subtended by a spathe. Spikelets in threes at the tips of the branchlets, embraced by a boat-shaped 1 sessile and 2 pedicelled, all similar in shape, or the sessile awned, alike in sex or more often the pedicelled only ; the whole falling together with the bulbous basal joint, or else the pedicelled spikelet when fertile disarticulating separately ; the terminal spikelet small or almost suppressed, on a broad, flat, glume-like pedicel. Glumes equal ; lower convolute, margins not or very narrowly inflexed ; upper keeled. Lemmas hyaline, paleate ; lower entire muticous, usually containing a floret ; upper deeply 2-fid, and geniculately awned from the sinus or entire or nearly so and muticous, containing a bisexual floret, or in the pedicelled spikelets with a 3-fid floret. Lodicules 2. Stamens 3. Grain oblong, slightly laterally compressed.

Upper lemma of sessile spikelets 2-lobed for half its length or to  
 awn 26—66 in. long. Culms 1-10 ft. high; leaves 2-5-15-5 in.  
 •1-65 in. wide, narrowed at the base and often with a petiole up  
 1-5 in. long; bracts 16--34 in. long, aristate; basal joint small  
 hemispheric or up to 16 in. long and turbinate or cylindrical;  
 glume of sessile spikelet 12-31 in. long, margins narrowly  
 above the middle. . . . . 1. (triM<sup>o</sup> ta<sup>^</sup>)

Upper lemma of sessile spikelet entire or very shortly 2-lobed, a\*<sup>n</sup>  
 Otherwise as in the last species, but more slender, usually sin<sup>aller</sup>  
 in all its parts and more glabrous. . . . . 2. (M<sup>u</sup> Mutica<sup>^</sup>)

1. APLUDA ARISTATA, Linn. *A. varia*, Hack, subsp. *aristata*,  
 Hack. ; F. B. I. vii. 150 ; S. I. G. figs. 142, 143.

In all Districts ; sea-level to 7,000 ft.

Common, very variable in the dimensions of all its part\*<sup>and</sup>  
 in indumentum. Often scrambling over bushes.

A fairly good fodder, readily eaten by cattle when young-  
 Vern. *Hind*, (kirurna ; *Tarn*. Manda pillu, Mungil pi<sup>llu</sup>,  
 Sengamanri Jillu ; *Kan*. Sanna kari kachi hullu, Akku hu<sup>llu</sup>.

2. APLUDA MUTICA, Linn. *A. varia*, Hack, subsp. *vnttira*. H<sup>«</sup> (k<sup>v</sup> ;  
 F. B. I. vii. 150.

Pondicheri (IVrrottet).

### 35, Eremopogon, Ntapf

Perennial, rarely annual, erect herbs ; culms simple below, <sup>more</sup>  
 or less branched above, sometimes in fastigate bundles cat-<sup>h</sup>  
 supported by a bladeless sheath. *Racemes* spiciform, solitary  
 terminating each branchlet, spatheate; rhachis many-jointed  
 fragile, joints and pedicels filiform. *Spikelets* 2-nate, one sessil<sup>e</sup>  
 and one pedicelled, similar in shape, differing in sex, except in<sup>e</sup>  
 1-3 lowest pairs which are homogeneous and (J or empty, disartic<sup>l</sup>  
 lating horizontally. *Sessile spikelets* dorsally compressed : *Call<sup>is</sup>*  
 small, shortly bearded. *Glumes* equal, thinly chartaceous to mem-  
 branous ; lower 2-keeled with narrowly inflexed margins ; upp<sup>er</sup>  
 boat-shaped, acutely 1-keeled. *Lemmas* dissimilar; lower hyaline  
 upper reduced to a slender stipe, hyaline below, passing into <sup>{</sup>  
 geniculate awn, rarely with a very narrow hyaline margin short<sup>l</sup>  
 cleft at the apex, subtending a bisexual floret; paleas 0. *Lodiruk<sup>^</sup>*  
 2. *Stamens* 3, <sup>f</sup> *Styles* 2, free. *Pedicelled spikelets* similar to the

sessile, but awnless. Lemmas usually absent, sometimes one Saline, containing a <\$ floret.

EREMOPOGON FOVEOLATUS, Stapf. *Andropogon Joveolatus*, Del. ;  
<sup>F</sup>- B. I. vii. 168 ; S. I. G. figs. 148, 149.

In all the hotter parts ; Bababudan Hills (Meebold) ; sea-level  
 ^ 3,000 ft.

Culms tufted, 0-30 in. high;\* basal sheaths white- or cream-  
 tomentose ; leaves 1-3-6 in. long, almost filiform to -1 in. wide ;  
 racemes -6-1-5 in. long; glumes •12-14 in. long, lower ones  
 with a circular median pit above the middle of the back ;  
 awns -7...C) \u. jon<, A ^OO(l fodder.

### 36. Schizachyrium, Xees

Annual or perennial herbs. *Leaves* narrow. *Inflorescence* of  
<sup>tor</sup>terminal, solitary, spiciform racemes supported by or more or less  
<sup>onclo</sup>sed in narrow spathes, frequently collected into a false panicle ;  
<sup>rhachi</sup> « fragile, many-jointed ; joints often stout, thickened upwards  
<sup>with</sup> a scarious, cupuliform, more or less toothed terminal appendage.  
<sup>S</sup>*Spikelets* 2-nate, one sessile, the other pedicelled, differing in sex and  
<sup>oft</sup>en in size and shape, both falling together with the contiguous  
<sup>joint</sup>. *Sessile spikelets* dorsally compressed: *Glumes* subequal ;  
<sup>lower</sup> chartaceous or subcoriaceous. *Lemmas* hyaline; lower  
<sup>em</sup>pty; upper 2-toothed or 2-fid, rarely entire, awned from the  
<sup>a</sup>pex or sinus, containing a bisexual floret. *Lodicules* 2. *Stamens* 3,  
<sup>r</sup>arely 2. *Styles* 2, *free* Grain narrowly linear, subterete ; embryo  
<sup>sho</sup>rt. *Pedicelled spikelets* similar ; lower lemma empty ; upper if  
 Present containing a <\$ floret.

<sup>Cu</sup>lms solitary or 2-3 together, 2-30 in. high, divaricately branched  
<sup>from</sup> most of the nodes ; leaves suddenly narrowed to a sharp point,  
<sup>at</sup> least those on the main stems, base rounded and constricted,  
<sup>7-18</sup> in. long, -07-2 in. wide; spathes -4-75 in. long, usually as  
<sup>long</sup> as the raceme ; joints -08-11 in. long, glabrous, with a tuft of  
<sup>hair</sup>s at the base ; lower glume of sessile spikelets •1-12 in. long ;  
 Minutely puberulous ; callus with a tuft of hairs ; awns -28--36 in.  
 long . . . . . 1. *brevifolium*.

Culms tufted, usually densely so, 2-22 in. high, fastigiately branched ;  
<sup>le</sup>aves tapering from the not or slightly constricted base to the acumi-  
 nate tip, 1-4 in. i<sub>ong</sub>> .Q5--1 in. wide;" spathes -8-1-7V long, often

becoming bright red, racemes usually exserted: joints -17-<sup>12</sup> j<sup>h</sup> long, densely long white-hairy on the back; lower glume of «<sup>essl</sup> spikelets -2 -22 in. long, back long-white-hairy; awns 4-<sup>r></sup>» in-<sup>l o l</sup> \

2. ex<sup>re</sup>.

1. SCHIZACHYRIUM BREVIFOLIUM. Xoes. *Andropogon brevifolius*, Sw.; F. B. I. vii. 165.

Godavari District at Bison Hill (Barber); Xilgiri Hi<sup>^ a t</sup> Gudalur; Travancore State.

2. SCHIZACHYRIUM EXILE, Stapf. *Andropogon exilis*, Hochst.; F. B. I. vii. 100.

Xellore and Anantapur Districts; Travancore State

### 37. Andropogon, Linn.

Usually perennial, erect herbs. *Leaves* usually flat. *Inflorescen*\* of paired, rarely solitary, or corymbose, often digitate or subdigit<sup>ate</sup> spiciform racemes subtended by spathes, terminating the cul<sup>is</sup> or their branches, sometimes collected into false panicles; rha<sup>(hli)</sup> articulated, fragile; joints and pedicels very slender, usually plano-convex, thickened upwards, cupped and usually 2-3-tooth\*\* at the apex, more or less densely ciliate. *Spikelets* 2-nate, <sup>one</sup> sessile, the other pedicelled, differing in sex and usually more or less in shape and size, the lowest pair sometimes homogeneous ^ imperfect. *Sessile spikelets* dorsally or laterally compressed • *Glumes* equal or subequal, membranous to coriaceous; lower fl<sup>lti</sup> concave or channelled on the back, margins inflexed and sharp keeled at least in the apical half, keels sometimes winged; upP<sup>ef</sup> boat-shaped, 1-keeled upwards, sometimes aristulate. *Lemmas*<sup>8</sup> hyaline or the upper one firmer, with or without small paleas» lower empty; upper 2-toothed or -fid, awned from the siku<sup>s</sup> containing a bisexual floret. *Lodicules* 2. *Stamens* 3. *Gras*\*\* subulate to oblong, subterete or plano-convex; embryo half »<sup>s</sup> long. *Pedicelled spikelets* often very different from the sessile\* always more or less dorsally compressed, never concave or channelled on the back, sometimes reduced and small or entirely suppressed • *Glumes* membranous to chartaceous; upper often 2-keeled upwards, keels sometimes narrowly winged; lower muticous or aristulate. *Lemmas* if present, hyaline, ciliate, muticous; lower empty; upper containing a<sub>7</sub>; floret.

Leaves not or only slightly narrowed at the base :—

Lower glume of sessile spikelets linear-oblong, back deeply channelled, Wls not winged ; upper lemma of sessile spikelets shortly 2-fid:—

Culms 4-6 ft. high ; lower leaves 1-3 ft. long, upper 10-20 in. long, .2-25 in. wide; racemes 3-5, sometimes only 2, 1-2 in. long ; lower glume of sessile spikelets -17-18 in. long, upper -18--2 in. long with a fine arista -27-33 in. long ; awn of upper lemma \*<sup>6</sup>-1 in. long ; glumes and lower lemma of pedicelled spikelets aristate . . . . . *ascinodis*.

Culms 3-24 in. high; leaves 1-5-5 in. long, .05-2 in. wide; racemes 2, secund, -5-1 in. long ; glumes of sessile spikelets -18 in. long, upper mucronate ; awn of upper lemmas -5-6 in. long ; glumes and lemmas of pedicelled spikelets muticous. . . 2. *pumilus*.

Lower glume of sessile spikelets flat, -28-3 in. long, keels usually winged at the apex. Culms up to 40 in. high ; leaves 3-8 in. long, .1-2 in. wide, more or less hairy ; racemes 2, 1-6-3 in. long ; upper glume of sessile spikelets -26-3 in. long, with an arista -16-22 in. long ; upper lemma cleft to the middle with an awn -55-7 in. long ;

lower glume of pedicelled spikelets aristate . . . . . 3. *longipes*.

Leaves tufted at the base of culms 7-36 in. high, at least the lower tapering to a very narrow, often elongate, almost petioled base, .1-1.5 in. long, .08-16 in. wide ; racemes 1-3, 1-6-2 in. long ; glumes livid or purple, lemmas white or reddish-purple ; lower glume of sessile spikelets flat, usually with a shallow depression near the base, Wls often narrowly winged, apex 2-toothed or -mucronate, -25-34 in. long ; upper lemmas cleft to the middle, lobes very narrow, awn .5-8 in. long ; glumes and lemmas of pedicelled spikelets muticous, lower glume often narrowly winged at the apex. . . . . 4. *lividus*.

1- ANDROPOGON ASCINODIS, C. B. Clarke. *A. apricus*, Hook, f. non Trin. ; F. B. I. vii. 169.

Ganjam District at Aska (Gamble) ; Coorg.

2. ANDROPOGON PUMILUS, Roxb.; F. B. I. vii. 170; S. I. G. figs. 150, 151.

In all the drier tracts ; sea-level to 4,000 ft.

Often on black-cotton soil.

3. ANDROPOGON LONGIPES, Hack. ; F. B. I. vii. 170.

Nilgiri Hills.

4. ANDROPOGON LIVIDUS, Thw. ; F. B. I. vii. 209.

Nilgiri and Pulney Hills, at high elevations ; Anaimudi Peak in Travancore at 8,840 ft. (Barnes).

In open downs often burnt over.



38. *Cymbopogon*, Hack.

Perennial, densely tufted, often aromatic herbs. *Leaves* flat, often very coarse. *Inflorescence* of paired racemes, usually one of them sessile, the other peduncled, subtended by a spathe terminating the culms and their branches, collected into a frequent much-branched panicle; rhachis fragile, several-jointed; spikelets 2-nate, one sessile, the other pedicelled, lowest pair of one or both racemes homogamous (<} or empty), the rest differing in sex more or less in shape; joints and pedicels filiform, their tips more or less cupped or auricled, those of the lowest pair conspicuously swollen, oblong or barrel-shaped. *Sessile spikelets* (except the lowest one) dorsally, rarely laterally compressed: *Callus* very short, obtuse, shortly hairy. *Glumes* subequal, more or less chartaceous; lower flat, slightly depressed, narrowly grooved or broadly channelled on the back, 2-keeled at least from the middle upwards, keels usually narrowly winged; upper boat-shaped, 1-keeled, keel sometimes narrowly winged. *Lemmas* hyaline, lower entire empty; upper 2-fid or -lobed, awned from the summit or entire and mucous, rarely firmer and stipitiform below the awn; column of the awn smooth; paleas 0, usually containing a bisexual floret. *Lodicules* 2. *Stamens* 3. *Styles* 2, free. *Pedicelled spikelets* oblong, subterete or plano-convex; -embryo half as long as the pedicelled spikelets differing more or less in shape and size from the sessile, never depressed or grooved on the back: *Glumes* lower chartaceous; upper thinner. *Lemmas* (usually the lower only present) hyaline, containing a single floret, rarely both suppressed.

The following key is based on Dr. F. C. S. in 'Kew Bull.' 1906, 350, and that of Melle. A. Camus in 'Rev. Bot. Appliq.' 1921, i, 271.

Spikelets awnless:—

- Lower glume of fertile spikelets lanceolate, acute, back flat, 2-keeled, keels narrowly winged, 16—18 in. long. Culms up to 5 ft. high; panicles pyramidal or linear-oblong. . . . . 1. *Nardus*<sup>\*</sup>
- Lower glume of fertile spikelets linear or linear-lanceolate, acuminate, back distinctly concave in lower half, 18--2 in. long. V-shaped like the last species in other respects. . . . . 2. *Cymbopogon*<sup>\*</sup>

Fertile

Lowest spikelets bearing a slender, geniculate awn :—

Upper glume of fertile spikelets not channelled, at most slightly depressed or foveolate :—

Lowest pedicel not or hardly stouter than the rest; the longer

leaves usually much narrowed to the base :—

Panicle often greyish, lax, with slender, long, flexuous, often

drooping branches and comparatively inconspicuous spathes.

Culms 3-6 ft. high; leaves 8-60 in. long, 1-8 in. wide;

glumes 1-2 in. long, back of lower smooth or 1-2-foveolate

3. *flexuosus*.

Panicle erect, dense, often interrupted, with rather conspicuous,

frequently purplish-brown to blackish spathes. Otherwise

hardly distinguishable from the last species, slightly more

robust with rather shorter awns. . . . . 4. *confertiflorus*.

Lowest pedicel of at least the sessile racemes much swollen,

convex, coriaceous. Culms 1-4 ft. high; leaves 6-25 in.

long, 0.6-3.5 in. long, not narrowed to the base; panicles erect,

narrow, often interrupted, hairs of joints and pedicels white, often

conspicuously contrasting with the pale-brown spikelets; lower

glume of fertile spikelets 1.5-2 in. long, its back flat or slightly

depressed below the middle; awns 3-6 in. long. . . . . 5. *coloratus*.

Lower glume of fertile spikelets deeply channelled :—

Channel of glume in lower half, very narrow, corresponding to a rib on the inner side :—

Lowest pedicel of sessile racemes slightly swollen and connate to the base of the rhachis :—

Leaves linear-lanceolate, subcordate or amplexicaul, 3-18

in. long, 0.25-1 in. wide, finely caudate. Culms up to

6 ft. high; panicles 4-12 in. long, turning reddish (often

very bright) when mature; glumes 1.3-1.6 in. long; awns

0.45-0.55 in. long. . . . . 6. *Martini*.

Leaves narrowly linear, not caudate or amplexicaul, 3-12 in.

long, 0.15-0.3 in. wide. Culms up to 3 ft. high; panicles 4-8

in. long, glaucous or straw-coloured when mature; glumes

0.12-0.16 in. long; awns 0.3-0.7 in. long. . . . . 7. *caesius*.

Lowest pedicels not swollen, free from the rhachis. Culms

up to 2 ft. high; leaves subcordate, finely acuminate, 2-5-8 in.

long, 0.2-0.4 in. wide, often purplish near the base; panicles

narrow, stiff, spathes often with rudimentary blades, purplish-

brown with yellowish scarious margins; spikelets usually

green in the lower part and purple in the upper; glumes 1.8 in.

long; awns 0.4-0.5 in. long. . . . . 8. *polyneuros*.

Fertile glumes wedged between the rather stout joint and the pedicels, deeply channelled for most of its length and a little width between the keels, the channel ceasing abruptly above the base, which appears slightly humped, not winged; awns \*4\*5 in. long. Culms slender, 6-5 in. high, leaves 15-15 in. long, \*03-26 in. wide. . . . . ®' *Gidda*.

1. CYMBOPOGON NARDUS, Rendle. *Andropogon Nardus*, Linn.; F. B. I. vii. 205.  
Only known in cultivation. Grown for its aromatic oil. The Citronella grass.
2. CYMBOPOGON CITRATUS, Stapf.  
Occurring only as a cultivated plant grown for its oil. The Lemon grass. Vern. Tel. Vasana gaddi, gaddi, Nimma gaddi; Tarn. Vasana pillu, Karpura P<sup>1</sup> Mai. Vasana pullu.
3. CYMBOPOGON FLEXUOSUS, Wats. *Aii<lr<ij><>(</<>i<.\>">7ms* - Linn.  
var. *flexuosus*, Hack. ; F. B. I. vii. 207.  
In all Districts from Bellary and Chingleput except on the W. Coast; W. Ghâts. Also cultivated the extraction of Malabar lemon-grass oil. A white and a dark form are distinguished. The Ginger grass. Vern. Tarn. Chukkunari pillu, Sukkunari pillu ; Mai. Chukkun\* pullu ; Kan. Anthi balai.
4. CYMBOPOGON CONFERTIFLORUS, Stapf. *Andropogon* >>  
Linn. var. *nilagiricus*, Hack. ; F. B. I. vii, 20b\*.  
Rampa Hills (Narayanaswami); W. Coast and Ghâts; -6,000 ft. Vern. Toda Bamba.
5. CYMBOPOGON COLORATUS, Stapf. *Andropogon Nardus*, Linn.  
var. *coloratus*, Hook. f. ; F. B. I. vii. 206.  
In all Districts from Bellary and Nellore southwards except the W. coast; sea-level to 3,000 ft.  
Used for thatch. Frequently deformed by a fungus, &V *chloe* sp. Vern. Tel. Botha gaddi; Tarn. Manda pillu, Manakru pillu, Manjin pillu, vSengamani malai pillu, Seng<sup>a</sup> pillu ; Kan. Badhai hullu, Karat ha anjai hullu.
6. CYMBOPOGON MARTINI, Wats. *Andropogon Schoenanthus*, Linn. var. *Martini*, HOOK. f. ; F. B. I. vii. 204.

Eastern and Central Districts from Kistna and Bellary to Coimbatore and Salem ; Mysore, Nilgiri and Pulney Hills; sea-level to 5,000 ft. The Geranium grass.

The source of Rusa oil, of which there are two kinds, *Motia* and *~ufia*, which though differing chemically appear to be derived from separate, morphologically indistinguishable races of this species. Sometimes cultivated. Vern. *Hind.*

*Rusa* J *Tel-* Kachi gaddi; *Tarn.* Kavattan pillu, Kannam Pillu ; *Kan.* Kasi hullu, Kunthi hullu, Anchet hullu, Nanj hullu, Bili dodda kachi hullu.

7. **C** YMBOPOGON CAESIUS, Stapf. *Andropogon Schoenanthus*, Linn. var. *caesius*, Hack. ; F. B. I. vii. 205 ; S. I. G. fig. 164.

From Mysore State, Bellary and Kurnool Districts southwards, except on the W. coast; 500-5,000 ft.

Used for thatching ; eaten by cattle only when young. Vern. *Td* Kasi gaddi, Kamanchi gaddi; *Tarn.* Kamakshi pillu, Mandap pillu, Muchival pillu ; *Kan.* Kasi hullu, Kamancha hulhi, Anji hullu.

8. **C** WYBOPOGON POLYNEUROS, Stapf. *Andropogon Schoenanthus*, Linn. var. *versicolor*, Hack. ; F. B. I. vii. 205.

Nilgiri Hills ; 3,000-7,000 ft.

9. **C** YMBOPOGON GIDARBA, Hausskn. *Andropogon Gidarba*, Ham. ex Hook. f. ; F. B. I. vii. 208.

Mysore State; Vizagapatam, Cuddapah, Bellary, Nellore and Tinnevelly Districts. Vern. *Tel.* Seetha Kasi gaddi, Thigavomji gaddi.

### 39. Hackelochloa, O. Kuntze

**Annual**, erect, much-branched, usually low herbs. *Leaves* linear. *In* *w*escence of axillary and terminal, often fascicled, cylindric, *spicif*orm racemes ; rhachis fragile, joints hollowed, completely fused with the pedicels. *Spikelets* 2-nate, dissimilar, one sessile, the other with a pedicel fused to the joint. *Sessile spikelets* globose : *Callus* obcol\*ic. *Glumes* subequal; lower cartilaginous, subglobose; upper chartaceous, broadly ovate-oblong, lining the cavity of the joint. *Lemmas* hyaline ; lower epale^te and empty ; upper paleate, staining a bisexual floret. *Lodirules* 2, broadly cuneate. *Stamen*\* 3.

*Grain* suborbicular; embryo § as long. *Pedicelled* *spikelets* long as the sessile or longer : *Glumes* equal, ovate, green ; slightly asymmetrical ; upper boat-shaped, prominently *Lemmas* sometimes wanting, when present hyaline empty or upper containing a <J floret.

HACKELOCHLOA GRANULARIS, O. Ktz. *Manisuris grandis* Linn. f. ; F. B. I. vii. 159 ; Roxb. Cor. Pl. t. 118 ; S. I- 0- fig- ^

In all the central and eastern Districts and in the hills ; usual in the drier tracts ; sea-level to 4,000 ft.

Culms 1-5-30 in. high ; leaves 1-2-75 in. long, 1-5 in. hairy, base often cordate ; racemes 2-7 in. long ; glume of sessile spikelets .04-06 in. long, pitted.

A moderately good fodder. Vern. *Hind.* Trinpali ; *Tel* W jedanai gaddi, Guru singu gaddi ; *Kan.* Kadu sanna har hullu.

#### 40. Ophiuros, Gaertner f.

Erect, usually much-branched herbs. *Leaves* flat or convoluted *Racemes* spiciform, cylindrical, terminal on the usually fascicled branchlets ; rachis horizontally or slightly obliquely fragile, completely fused with the pedicels to form deeply hollowed, cylindrical recesses for the sessile spikelets. *Sessile spikelets* with a callus fused to the base of the joint : *Glumes* equal ; lower thin coriaceous, nearly flat ; upper thinly membranous, boat-shaped *Lemmas* hyaline, paleate ; lower containing a 3 floret or empty upper containing a bisexual floret. *Lodicules* 2. *Stamens* 3. *Globoles* oblong, slightly compressed ; embryo \. as long. *Pedicelled* *spikelets* entirely suppressed or rudimentary and minute.

OPHIUROS EXALTATUS, O. Ktz. *O. corymbosa*, Gaertn. F. B. I. vii. 160. *Rottboellia corymbosa*, Linn. f. ; Roxb. Cor. Pl. t. 181.

Mysore State and the Eastern Districts ; sea-level to 3,000 ft. Culms up to 7 ft. high, base tuberous ; leaves 4-12 in. long 1-3 in. wide ; racemes 1-4 in. long ; lower glumes oblong obtuse, 0.8-1.1 in. long, smooth or more or less pitted in rows Used for hatching. Vern. *Tel* Pedda panuku ; *Tarn.* Kinang pillu, Sothu alagu pillu.

## 41. Rottboellia, Linn. f.

Annual, sometimes Perennial, usually tall herbs, branched above, often with tilt from the lowest nodes. Leaves large, broadly linear, flat. Inflorescence of solitary, slender, cylindric or very jointed racemes; rhachis nearly horizontally to very obliquely fragile; joints fused with the usually shorter pedicels to form a deeply concave, thin-walled recess to receive the sessile spikelets. Sessile spikelet pale: Glumes subequal, coriaceous; lower glume slightly convex and closing the cavity; upper deeply boat-shaped. Lemmas hyaline, paleate, nearly as long as the glumes; lower lemma enclosing a floret; the upper a bisexual one. Lodicules 2. Stamens 3. Grain broadly oblong or ellipsoid, compressed; embryo nearly as long. Pedicelled spikelets usually shorter than the sessile: Glumes green, membranous or chartaceous. Lemmas hyaline, both or the upper only containing a floret or reduced and empty. Joints and spikelets in the upper part of the raceme more and more reduced and forming a tail-like appendage.

**ROTTBOELLIA EXALTATA**, Linn. f.; *b* B. I. vii. 156. Roxb. (or) *l* t. 157; 8. I. G. fig. 145.

In all Districts except in the driest localities; sometimes growing in water; sea-level to 7,000 ft.

Culms usually several feet, up to 12 ft., high, sometimes quite short; leaves up to 4 ft. long and 1-2 in. wide; racemes 2-6 in. long; joints 2-23 in. long; glumes 15-22 in. long, the lower of sessile spikelets often narrowly winged on both sides near the apex, upper glumes on the keel and the lower glume of pedicelled spikelets on one side. Vern. Hind. Barsali; Tel. Konda panuku.

## 42. Manisuris, Linn.

Annual or perennial low herbs. Culms usually tufted and branched. Leaves narrow, conduplicate, ultimately flat. Racemes solitary, terminal, compressed; rhachis fragile; joints fused with the pedicels to form a short, truncate, convex internode, hollowed on the inner face to receive the sessile spikelets, falling with the spikelets. Spikelets 2-nate, one sessile, the other only appearing by the fusion of its pedicel with the joint. Sessile spikelets

dorsally compressed : *Glumes* dissimilar ; lower coriaceous, <sup>^oo tu</sup> or more or less rugose, muricate or spinulose, its upper half 2-kee <sup>le d</sup> and winged, often 1-2-awned ; upper membranous or chartaceoU<sup>\*i</sup> more or less boat-shaped and 1-keeled. *Lemiruis* hyaline, us <sup>ually</sup> paleate ; lower empty or containing a <\$ floret; upper contain <sup>ning</sup> a bisexual floret. **Lodicules 2. Stamens 3. Grain oblong** ; e <sup>^ bryo</sup> as long. *Pedicelled spikelets* as long as the sessile : *Glumes* cofl<sup>></sup> ceous or chartaceous, smooth, often aristate ; lower 2-keeled <sup>>>></sup> usually winged on one keel; upper 1-keeled and variously wing<sup>\*^</sup> *Lemmas* hyaline or absent or more or less reduced, when V<sup>er</sup> <sup>fec</sup> sometimes the upper containing a <J floret.

Lower glume of sessile spikelets ovate, acute, not awned, <sup>margi</sup> <sup>^</sup> winged, wings rounded above, usually narrowed at the middle & <sup>\*i</sup> expanded at the base; .11-13 in. long, back smooth or shallow transversely grooved, puberulous ; glumes of the pedicelled <sup>iked</sup> "muticous. Culms wiry, 0-28 in. high ; racemes 1-3 in. long

Lower glumes of all spikelets terminated by flat, single or paired a <sup>nd</sup> <sup>urus.</sup> divaricate awns :—

Lower glume of sessile spikelets ovate, -13 in. long, tapering i <sup>lt0</sup> an acuminate awn up to -36 in. long, its margins winged above the middle, wings narrowly lunate, backs with 3-6 transverse, sometiJ<sup>es</sup> slightly warted ridges ; lower glume of pedicelled spikelets simil<sup>r</sup> but winged on one side only and the back smooth. Culms slender, 3-12 in. high ; leaves 1-3 in. long, very narrow ; racemes 1-2 <sup>>>></sup> <sup>g</sup> . . . . . 2. *acuminata*-

Lower glume of sessile spikelets lanceolate, acute, -1-12 in. \o<sup>\*&</sup> terminated by 2 divaricate, often unequal awns -22-27 in. lo<sup>\*i</sup> margins winged, wings acute below and tapering onto the base o<sup>f</sup> the awns, back below 4-6-grooved, with 5-9 marginal hooked spinules, the back smooth or with spinules or sometimes the spinul<sup>^</sup> fused into crenulate laminae ; lower glume of pedicelled spikelets with an awn -27-42 in. long, upper with an arista -1-ltf in- <sup>10llg</sup> Culms slender, 2-10 in. h.Vh ; racemes -S 2-4 in. long

### 3. *forficidata*-

1. MANISURIS MYURUS, Linn.; Roxb. Cor. PI. t. 117. *Bottboellia Myurus*, Benth. ; F. B. I. vii. 154 ; S. I. G. fig. 144-Carnatic ; Coimbatore, N. Arcot, Madura and Tinnevell.V District<sup>^</sup>; usually in dry localities; low elevations to 2,000 ft-Vern. 7eZ. Nalla panuku ; *Tarn*. Waritsira pillu.

2. M<sup>A</sup>NISURIS ACUMINATA, C. E. C. Fischer n. comb. *Bottboellia*  
«<\*minata<sub>9</sub> Hack. ; F. B. I. vii. 155.

% sore State at Talguppa, 2,000-3,000 ft. (Meebold). On  
# at rocks.

3  
• ^ANISURIS FORFICULATA, C. E. C. Fischer in Kew Bull. 1933,  
35 5. *Uottboellia divergent*, Lisboa non Hack. ; F. B. I. vii. 155.

Cochin State at Kavalay ; 3,000-4,000 ft. (Meebold).

V<sup>ar></sup>hir\*\*\*a, C. E. C. Fischer in Kew Bull. 1933, 357.

flumes smaller, densely hirsute, hardly aristate.

<sup>B</sup>ababudan Hills (Meebold).

43. Mnesithea, Kunth.

Perennial erect herbs. *Leaves* narrow. *Inflorescence* of solitary,  
terminal, spiciform, cylindrical racemes; **rhachis fragile; joints**  
fit H... ^... ^... P<sup>e</sup>dicels into a terete internode deeply hollowed to  
receiv<sub>g</sub> t<sub>he</sub> \*wo sessile opposite spikelets, separated by a hyaline,  
often eVaneSCent mcm brane. *Sessile spikelets* all alike : *Glumes*  
equal in SIZ6anc^sn^a P<sup>e</sup>\* lower coriaceous, convex, closing the cavity;  
upper rather rigidly hyaline. *Lemmas* hyaline ; lower resembling  
the u Pper glume, paleate or not, empty ; upper oblong, its palea  
sh<sup>Or</sup>t er, enclosing a bisexual floret. *Lodicules* 0. *Stamens* 3. *Grain*  
narrowl, °blong, compressed; embryo § as long. *Pedicelled*  
spikelet<sub>s</sub> represented by minute rounded or truncate single glumes,  
^rely by 2.

MNESITHEA LAEVIS, Kunth ; S. I. G. fig. 146. *Eottboellia*> *perforata*

Ro\*b. Cor. PL<sub>t</sub>. 182 ; F. B. I. vii. 158.

I<sub>n</sub> all the east coast Districts ; Mysore State ; Shevaroy Hills ;

\*\*> • Ghats from the Nilgiri to the Travancore Hills ; sea-level  
to 3,000 ft.

Culms 1-4 ft. high; leaves 1-20 in. long; -1-35 in. wide;  
racemes 2-8-5 in. long ; joints -14-18 in. long.

Eaten by cattle when young. Vern. *Tel.* Panuku, Kolupu  
^didiKan. Sunku dabbai hullu.

44. Hemarthria, K. Brown

Erect or decumbent, perennial herbs. *Leaves* narrow, flat.  
Rac<sub>znies</sub> s]ieiform, compressed, often curved, ti]§ more or less  
sub<sub>niato</sub> (>wing to the slender terminal spikelet, terminating the



culms and their fascicled branches, subtended by a spathe ; rha<sup>n</sup> ^  
 disarticulating tardily ; joints semicylindric owing to their fn<sup>n</sup> ^  
 with the pedicels, hollowed out to receive the sessile spita<sup>9</sup> \*  
*Sessile spikelets* closing the cavity in the rhachis : *Glumes* subequ<sup>1</sup> i  
 lower nearly flat; upper boat-shaped, 1-keeled, sometimes adhering  
 to the joint and pedicel. *Lemmas* hyaline, with or without pal<sup>\*\*\*</sup> ;  
 lower empty; upper containing a bisexual floret. *Lodie* <sup>le</sup> \* ''  
*Stamens* 3. *Grain* oblong, dorsally compressed. *Pedicel* *Ud spi* ^ f  
 very like the sessile : *Glumes* usually more elongate ; upper ii<sup>\*\*\*</sup> \*  
 mucronate, caudate or aristate.

HEMAKTHRU COMPRESSA, W t h . *Roltmllä, compress.* IJ<sup>n</sup> - f t ;  
 F- B. I. vii. 153, . Rox b a / r . P , t . 5 ( . ) .

Godavari, Nellore ami ('hinsreput Districts: usually i<sup>n</sup> «<sup>i</sup>  
 situations.

Culms 1-5 ft. high, .K-.umiH-nt and rooting below ; ^ > v ( ^  
 1-5 in. long, 1-2 in. wide ; racemes 2-5 in. long ; lower glu<sup>n</sup> \*  
 of sessile spikelets -18-23 in. long, 2-keeled, margined or vet  
 narrowly winged at apt<sup>x</sup> ; upper glume of pedicelled spii<sup>lot</sup> ?  
 sometimes narrowly winged on the keel near the apex. V < m  
*Tel.* Slrvu panukii.

#### 45. *Digitaria*, Haller

Annual or perennial, slender herbs. *Leaves* narrow, flat, oft<sup>1</sup>  
 naccid. *Inflorescence* of 2-many dictate or more or less distant-  
 alternate, opposite or whorled spikes or racemes, rarely pani.ultf •  
 rhachis triquetrous, flat or terete with or without green «<sup>i</sup> » S<sup>s</sup>-  
 ^ *pikelets* usually 2-3-nate, jointed on the pedicels and falling fro\*  
 them entire. *Glumes* dissimilar; lower a minute membranous  
 scale or delicate, evanescent, hyaline membrane or sometime<sup>3</sup>  
 absent; upper membranous, sometimes very thin, rarely absent-  
*Lemmas* 2 ; lower 5-7-nerved, empty or with a minute palea w<sup>d</sup>  
 l<sup>n</sup> dicules; „pper chartaceous with hyaline margins, faintly 3<sup>n</sup>  
 nerved ; palea as long fts and embraced by the lemma, fin<sup>1</sup> ?  
 ^ nerved, containing a bisexual floret. *Lndirhs* 2. Stow<sup>n</sup> \* <sup>3</sup> >  
*Myles* 2, free. *Orain* tightly enclose,! by the slightly harden<sup>1</sup>  
 lemma and ?Alea, oblong, 1,lano.,,nvex with rounded angles \*  
 section.

racemes not paniculate panicle with the lower opposite or  
whorled:—

Spikelets .09 in. or more long. Culms tufted from a geniculate,  
often rooting base .—

— not clavate-tipped.—

Rhachis flat, up to .04 in. wide, margins winged. Culms up  
to 2.5 ft. high; leaves up to 10 in. long; racemes 2-14, sub-  
digitate or 2-3-nate on a short common axis, up to 7 in. long,  
appressed, acutely acuminate; .1-14 in. long; lower glume  
very small or 0; barren lemma similar to the upper glume and  
like it with lines of fine appressed, ultimately spreading hairs  
between the nerves; grain oblong, whitish. . . . . 1. *marginata*.

Rhachis trigonous, not winged. Culms up to 3 ft. high;  
racemes 5-13, alternate or opposite, sometimes more or less  
branched and subverticillate; spikelets 2-nate; upper glumes  
and barren lemmas more or less silky-hairy. Otherwise as in  
the latter species. . . . . 2. *Griffithii*.

Hairs of upper glume and barren lemma clavate-tipped. Culms  
2-4 in. high, rarely branched; leaves up to 9 in. long; racemes  
2-7 » subdigitate on a short common axis, up to 5 in. long; rhachis  
flat » narrowly winged; pedicels 2-3-nate, hispidulous, the hairs  
forming a tuft at the tips; spikelets elliptic-oblong, obtuse,  
.09-1.1 in. long, appressed, subimbricate; lower glume 0; upper  
shorter than the lemmas, 3-nerved with 4 lines of clavate-tipped  
brownish hairs; barren lemma similar, somewhat shaggy with  
clavate-tipped hairs. I upper lemma soon becoming dark brown  
to black. J grain ellipsoid, white. . . . . 3. *ternata*.

Spikelets .08 in. or less long :-

Hairs not clavate-tipped :-

Rhachis straight, flat, margins winged :-

Fruiting lemmas pale. Culms rising singly or in fascicles  
from a long creeping and rooting base, slender, 3-14 in. high;  
leaves .5-2.5 in. long; racemes 2 or 3, digitate, slender,  
.8-2.5 in. long; pedicels 2-3-nate, flexuous, tips discoid;  
spikelets elliptic-oblong, .05-.07 in. long, appressed, sub-  
imbricate; lower glume 0 or rudimentary, upper delicate,  
nearly as long as the spikelet, finely pubescent; barren  
lemma 7-nerved, appressed-pubescent between nerves;  
grain ellipsoid, whitish. . . . . 4. *longiflora*.

Fruiting lemmas dark brown or black. Culms tufted, base  
not creeping, 2-20 in. high; leaves 1-4 in. long; racemes

2-5, up to 4 in. long, digitate or when more than 2 or 3 from a lower level; spikelets .06-.08 in. long. Other\* as in the last species.

Rhachis flexuous, trigonous, capillary. Culms tufted, slender, 3-26 in. high; leaves finely acuminate, up to 1.5 in. long; racemes 3-10, alternate, spreading, sometimes branched to 4 in. long; pedicels 2-5-nate, some longer than the spikelets; spikelets elliptic-oblong, acute, .05-.06 in. long, not imbricate; lower glume 0, upper thinly membranous, pubescent; lemma elliptic, dark brown, shining. . . . . 6. *pedicellaris*.

Hairs on upper glumes and barren lemmas short, clavate. Culms tufted, 6-24 in. high; leaves up to 6 in. long; racemes 3-15, erect, subdigitate or alternate, up to 4 in. long; rhachis trigonous, slender; pedicels sometimes as long as the spikelets, setulose at least at the apex; spikelets secund, broadly elliptic, .04-.05 in. long; lower glume 0, upper sometimes reduced to tuft of hairs or } the length of the barren lemma; fruiting Black, longitudinally striolate. . . . . 7. *Roylean*.

Racemes in a pyramidal panicle, the lower opposite or whorled. Culms creeping below, 3-30 in. high; panicles 1-5-5 in. long, cominate; axis slender, subterete; racemes many, up to 3-5 in. long, divaricate; rhachis capillary, usually naked for a short distance at the base; spikelets narrowly lanceolate, acuminate; upper glume and slightly shorter barren lemma several-ribbed, white appressed-hairy between the ribs. . . . . 8. *Wittiv*.

1. DIGITARIA MARGINATA, Link. *D. sanguinulis*, Scop. var. *extensum*, Rang, et Tad., S. I. G. figs. 74, 75. *Paspalum sanguinale*, Lamk. var. *commutatum*, Hook. f.; F. B. A. vii. 15; ditto var. *extensum*, Hook. f.; F. B. I. vii. 15; var. *Rottleri*, Hook. f.; F. B. I. vii. 16.

In all Districts; sea-level to 7,000 ft.

A good fodder. Vern. *Hind.* Takri takra: *Tarn.* Arisi pill Akki pillu; *Kan.* Henu akkibu hullu.

Var. *fimbriata*, Stapf. *D. sanguinalis*, Scop. var. *aliaris*, et Tad., S. I. G. figs. 71, 72. *Paspalum sanguinale*, Lamk. var. *ciliare*, Hook. f.; F. B. I. vii. 15. With the hairs of the mature spikelet spread out horizontally forming a rigid fringe on both sides, often mixed with thick-walled bristles from tubercle bases.

Distribution and vernacular names of the species.

- DIGITARIA** GRIFFITHU, Stapf. *IA sanguinalit*, Scop. var. *Griffithii* Rang, et Tad. S. I. G. fig. 73. *Paspalum mnguinale*, Lamk. var. *Griffithii*, Hook. f. ; F. B. I. vii. 15.  
W, Gh^ts ; 2,000-3,000 ft.
3. **DIGITARIA** TERNATA, Stapf. *Paspalum ternatum*, Hook. f. ;  
\* B. I. vii. 17.  
Bababudan, Nilgiri and Mysore Hills; Ramandrug ;  
3>000~8,000 ft. Vern. Kan. Bili akkabu hullu.
4. **DIGITARIA** LONOIFLORA, Pers. ; 8. I. G. figs. 76, 77. *P*ci*\*-  
pa<sup>l</sup>n tongiflorum*, Hetz. ; F. B. I. vii. 17 in part.  
In all districts; sea-level to 6,000 ft. Vern. Tel. Pakuru
5. **D**f<sup>ddi</sup>; *Kan* - Tapari hullu.  
toiTARu CHINENSIS, Honiain. *Paspalum longiflorum*, Hook,  
f. non Retz.; F. B.I. vii. 17 in part.  
Ganjam, Godavari and Chittoor Districts ; Mysore State ;  
Nilgiri, Anai»ialai and Pulney Hills ; 400-6,000 ft.
6. **DIGITARIA** PKDICELLARIS, Prniu. *Paspalum pedicellarc*. Trin. :  
\* K. 1- vii. 1\$).  
In all Districts, except in the driest and wettest parts ;  
2»000(5000) ft.
7. **DI**°ITARIA ROYLEANA, Prain. *Paspalum Boyleanum*, Nees ;  
F, B. I. vii. 18.  
%8ore State at Shimoga (Meebold); Ramandrug ; 2,000-  
^ 3,000 ft. Vern. Kan. Bili akkabu hullu.
- ^ **D**JGITARIA WALLICHIANA, Stapf. *Paspalum Pcrrottetii*, Hook.  
ft) » F. B. I. vii. 20.  
Bababudan, Nilgiri and Pulney Hills ; 4,000-7,000 ft.

## 46. Alloteropsis, Presl.

Ann Ual Or perennial, erect herbs. Leaves usually flat. Racemes  
kpiciform> d\*%ott&te or whorled, often compound. Spikelets solitary,  
tw' in or &as cycled, more or less compressed dorsally, articulated on  
and falling entire from the pedicels. Glumes thinly membranous  
chartaceous I the lower the shorter ; the upper nearly as long  
as f, - one 8^kel^\* an(^ densely ciliate. Lemmas dissimilar ; the lower  
as long as or longer than the upper, its palea short, 2-fid or 2-  
partite, enclosing a \$ floret; the upper narrowed into a short  
or an arista, its palea 2-ne\*rvd and 2-ke^ed with basal

auricled flaps, containing a bisexual floret. *Lodicules* 2. *Stamens* 3. *Styles* 2, free. *Grain* elliptic-oblong to suborbicular, dorsally compressed, free within the hardened lemma and palea.

ALLOTEROPSIS CIMICINA, Stapf. *Axonopis cimicinus*, Beauv.; F. B. I. vii. 64 ; S. I. G. figs. 107, 108.

In all Districts ; sea-level to 4,000 ft.

Culms up to 3 ft. high; leaves lanceolate, base cordate, .5-4.25 in. long, .15-7 in. wide, glabrous or more or less hairy from tubercles ; racemes few to many, 2-9 in. long ; spikelets .12-15 in. long; upper lemma mucronate or with an arista up to .13 in. long. Vern. *Kan.* Niru sajjai hullu-

#### 47. *Pseudechinolaena*, Stapf

Annual herbs. *Culms* slender, erect from a prostrate rooting base. *Leaves* flaccid. *Panicle* simple; racemes few, spikelets pedicelled, 2-nate or more often solitary with or with an accompanying reduced one, secund. *Glumes* herbaceous, the lower equal or the lower shorter ; lower nearly flat, 3-nerved, smooth or nearly so ; upper boat-shaped, gibbous below, 7-nerved with rows of transparent spots between, naked or with short or long hooked hairs or bristles from the spots. *Lemmas* chartaceous : lower membranous at the margins and hyaline at a point at the base, oblong-lanceolate, laterally compressed, rounded on the back, as long as the spikelet, its palea more or less convolute, 2-nerved, empty or containing a small floret; upper shorter, broadly lanceolate to oblong, back very convex, faintly 5-nerved, its palea similar tightly clasped by the lemma when mature, containing a bisexual floret. *Lodicules* 2. *Stamens* 3. *Styles* 2, free. *Grain* oblong, plano-convex, gibbous on the back at the apex.

PSEUDECHINOLAENA POLYSTACHYA, Stapf. *Panicum uncinatum*, Raddi; F. B. I. vii. 58.

W. Ghats from Mysore to Travancore ; 2,000-6,000 ft.

Culms 3-24 in. high; leaves ovate to linear-lanceolate, acuminate, 1-3 in. long, .17-6.5 in. wide, more or less hairy or pubescent; panicles up to 7 in. long ; racemes up to 2 in. long ; spikelets obliquely ovoid, .14-1.9 in. long; bristles when present up to .07 in. long.



similar and almost as long, 2-keeled, containing a bisexual floret  
*Lodtules* 2. *Stamens* 3. *Styles* 2, free. *Grain* broadly oblong <\*  
 elliptic, more or less flattened, tightly enclosed in the more or le\*  
 hardened lemma and palea.

Spikelets imbricate or approximate :—

Rhachis flat, margins scaberulous, often setulose; sP<sup>ikelet</sup>  
 secund :—

Culms 3-30 in. high, slender, nodes glabrous, rarely puberuloi" •  
 leaves -6-0.5 in. long, -15-4 in. wide ; racemes 2-0, simple :~-

Peduncle below the inflorescence more or less hairy ; spi<sup>icle</sup>  
 ellipticobovate. acute or subacute, -1-12 in. long. Cul<sup>8</sup>  
 prostrate or straggling, 2-20 in. high ; leaves -6-2-7 in. ton\*  
 •15-3 m. wide ; racemes 2-4, -9-1-7 in. long . . . . 1. *distachy*\*-

Peduncle glabrous, rarely puberulous; spikelets elliptic or  
 elliptic-oblongate, acute, usually apiculate, -14-10 in. l<sup>ong</sup>  
 Culms U8Ua,,y ercct> ,2\_30 .n hjgh\_ 3 ( ) 5 . n ,ong.

l>>-4 in. wide ; racemes 4-0, 1-2-0 in. lone . . . 2. *miHifon*"l\*-

Culms 3-8 ft. high, robust, nodes villous; leaves 5-12 in. l<\*  
 •> -/ in. wide; racemes numerous, 1-3-5 in. long, the lowest >t  
 least usually branched ; spikelets lanceolate, acute, -12-13 i>-  
 long; pedicels usually setose; lower glume -05 in. long, "PP<sup>er</sup>  
 •11 -12 in. long . . . . . 3 . *mutica*-

Rhachis trigonous or terete : -

Spikes erect, appressed to the rhachis, G-II, -2-8 in. I""\*;  
 Leaves softly pilose from bulbous bases, -0-3-5 in. long, .07-<sup>22</sup>  
 "j- w,do base rounded ; spikelets secund. elliptic to broadly  
 oblong, .0,-09 in. long; lower glume -02 in. long, glabrous  
 upper '00 ,,,, l<sub>ong</sub>> pi<sub>loge</sub>) rare,y glabrous . . . . . t. *ernci/or*"\*"-

Spikes erecto-patent or horizontal .—

Leaves lanceolate, base subcordate, clasping the elm, M-"  
 'n. long, '15-7 in. wide, glabrous or pubescent, spikes up to  
 \* in. long; spikelets not secund, broadly elliptic, acute or  
 apiculate, '1-13 in. long ; lower glume -04-07 in. long, upp"  
 Droadly oblong, apiculate, -09-1 in. long, puberulous.. 5. *ramosa*-  
 Reaves ovate, base rounded, not clasping, -5-1-8 in. long-  
 18" So in. wide, softly villous, margins markedly cartilaginous,  
 often crisped ; spikes -4-75 in. long ; spikelets .secund, elliptic-  
 obovate, -08-095 in. l<sub>ong</sub>; lower glume c ,)2g-.o4 in. l<sub>oig</sub>,  
 obtuse, upper obovate, obtuse, gibbous, .06-08 in. long,  
 glabrous or puberulous ; lower lemma longer than the glumes

6. *semiundulata*-

Upper glume elliptic-oblong, glabrous :—  
 leaves narrow, rounded base, finely acuminate,  
 lower spikes numerous, up to 3-5 in. long,  
 upper glume .05-.08 in. long, lower glume .05-.08 in. long,  
 upper lemma usually rugulose

7. *semiverticillata*.

Upper lemma sessile. Culms decumbent, 1-2 ft. high;

Leaves narrowly linear, glabrous, slightly puberulous at the base; spikes usually numerous, up to 4 in. long; spikelets elliptic; lower glumes .05-.08 in. long, upper .08 in. long. . . . . 8. *remata*.

Leaves linear to lanceolate, base rounded or subcordate, sparsely bristly from bulbous bases, 2 in. long, .5 in. wide, margins usually ciliate from bulbous bases, at the base, sheaths ciliate: spikes usually few. Other . . . . . 9. *Kurzii*.

1. BRACHIARIA DISTACHYA, Stapf. *Panicum distachyum*, Linn.; F. B. I. vii. 37; S. I. (L figs. 97, OS).  
 Districts; sea-level to 3,000 ft. W. Tel. Koranna gaddi; Kan. Hanibu harka hulhi.
2. BRACHIARIA MILIIFOKMIS, (Linn.) Hasck *Panicum distachyum*, Linn.; F. B. I. vii. 37 iwycir/.  
 Anara and N. Coimbatore Districts: Trancoro. Vern. Kuru; Kada samai hullu.  
 Very similar to the last species and often conspecific with it.
3. BRACHIARIA MUTICA, Stapf. *Panicum muticum*, Forsk.; F. B. I. vii. 34.  
 Shevaroy Hills (Perrottet); Tinnevely District at Mundanthurai (Barber) and Courtallam (Venkoba Rao).  
 A native of America and W. Africa, introduced and run wild here and there. An excellent fodder.
4. BRACHIARIA ERUCIFORMIS, Griseb. *Panicum Isachne*, Roth; F. B. I. vii. 28; S. I. G. figs. 80, 81.  
 In all Districts; sea-level to 6,000 ft.  
 A moderate fodder. Vern. Tel. Domakalu gaddi.



- ▷. BRACHIARIA RAMOSA, Stapf. *Panicum ramosum*, Linn.;  
 F. B. I. vii. 36 ; S. I. G. figs. 95, 96.  
 In all Districts ; sea-level to 6,000 ft. Vern. Tel-  
 gaddi; Kan. Kadu baragu hullu. **Eduri**
6. BRACHIARIA SEMIUNDULATA, Stapf. *Panicum viundulatum*,  
 Lamk. ; F. B. I. vii. 34.  
 W. Ghâts ; 5,000-7,000 ft.
7. BRACHIARIA SEMIVERTICILLATA, Alston. *Panicum semiverticillatum*,  
 Rottl. ; F. B. I. vii. 38.  
 Nilgiri, N. Coimbatore, Anamallai, Pulney and Hills ; 1,500-6,000 ft. Vern. Kan. Manju hullu, Thap-  
 rakai hullu. **Tinnevely**
8. BRACHIARIA REMOTA, Haines. *Panicum remotum*, Retz.;  
 F. B. I. vii. 38.  
 Ganjam District at Chatrapur (Fischer) ; Salem to Travancore Hills ; sea-level to 3,000 ft.
9. BRACHIARIA KURZII, A. Camus. *Panicum Kurzii*, Hooker;  
 F. B. I. vii. 38.  
 Rampa Hills (Narayansawami). **f.;**

50. *Paspalum*, Linn.

Perennial, sometimes annual herbs. Leaves narrow, more or less inrolled. Inflorescence of solitary, digitate or more spikes; rhachis flat and winged or trigonous, secund, 2-seriate, solitary or paired, sessile or nearly so, orbiculate or oblong or ovate. Lower glume usually absent, rarely represented by a small scale ; upper membranous, about equalling the lower, rarely shorter or absent, 3-nerved. Lemmas dissimilar, lower similar to the upper glume, empty ; upper chartaceous crustaceous, faintly nerved, its palea subequal, similar and embraced by it, containing a bisexual floret. Lodicules 2. Stamens 3. Styles 2, free. Grain more or less biconvex, tightly enclosed by the hardened lemma and palea.

Spikelets 0.9 in. or more long :—

Glume and lemmas glabrous ; spikelets normally 2-ranked :—

Spikelets suborbicular or nearly so, obtuse, 0.9-1.3 in. long,

Rhizome short; culms 1-3 ft. high, leaves glabrous, up to

18 m. long, -15-4 in. wide; racemes 2-5, rarely solitary, -8-5-8 in. long; rhachis broad, winged, with a median keel, produced at the apex into 2 short rounded or acute lobes; upper lemma and glume crustaceous, latter with wide membranous auricles at the base. . . . . i. scrobiculatum.

Spikelets oblong to oblong-lanceolate, acute or subacute. Culms single and rooting below:—

Spikelets oblong, subacute, -1-13 in. long; upper lemma nearly as long as the spikelet. Culms up to 3 ft. high; leaves flat up to 8-5 in. long, -15-25 in. wide, glabrous or more or less densely hairy; racemes 2-3, -8-3-5 in. long. 2. orbiculare.

Spikelets oblong-lanceolate, acute, -12-14 in. long; upper lemma shorter than the spikelet, Culms up to 13 in. high; leaves flat or involute, -9-4-3 in. long, -07-1 in. wide, glabrous; racemes 2, very rarely 3, -5-2 in. long

3. vaginatum.

Glume and barren lemma puberulous or hairy: spikelets normally 4-ranked:—

Racemes usually 7-9, 1-2-3 in. long; spikelets suborbicular, acute, -08-1 in. long. Culms erect, up to 4 ft. high; leaves up to 10 in. long, -15-3 in. wide; rhachis glabrous or nearly so, with setulose margins; glume and barren lemma minutely puberulous. . . . . 4. longifolium.

Racemes usually 3-5, 2-4 in. long; spikelets broadly ovate, acute, -10-10 in. long. Culms erect, up to 5 ft. high; leaves up to 10 in. long, -4-5 in. wide; rhachis hairy at the base, with minutely scabrid margins; glume and barren lemma sparsely silky, long white-ciliate. . . . . 5. \*7. Kf. TM.

Spikelets -06-07 in. long:—

Racemes paired, rarely 3, 1-3-5 in. long; rhachis flat, margins cartilaginous and smooth or scabrous; spikelets compressed plano-convex, subobtusely apiculate or shortly acute; glume ciliate with rather long white hairs, barren lemma glabrous. Culms erect from often very long rooting runners, up to 3 ft. high; leaves up to 8 in. long, -35-6 in. wide, glabrous. . . . . 6. conjugatum.

Racemes 6-20, alternate, -15-1 in. long; rhachis subtriquetrous, margins more or less bristly from tubercles; spikelets turbidly plano-convex, obtuse; glumes more or less ciliate with rigid hairs from tubercles; barren lemma more or less bristly. Culms 2-12 in. high; leaves -7-3 in. long, -2-65 in. wide; sparsely hairy on the ribs. . . . . 7. compactum.

1. PASPALUM SCROBICULATUM, Linn. ; F. B. I. vii. 69; 70. *spatum.*  
 In all Districts ; sea-level to 7,000 ft. Wild or *rited.*  
 The wild form, which is generally smaller and more *Jader,*  
 is the var. *Commersonii*, Stapf.  
 The grain is used for food, but requires careful *preparation*  
 as it is liable to act as a narcotic poison. The *stiv m ^ es*  
 good cattle-fodder. Vern. *Hind.* Kodo; *Ur.* *Khoddi,*  
*Tel.* Arugu, Nita ari gaddi, Arikelu. *Trn.* *^: < I < ^*  
 Karu varagu ; *Kan.* Haraku hullu, Arikel.
2. PASPALUM ORBICULARE, Forst. *P. scrobiculatim* > *Linn.*  
 F. B. I. vii. 11 *in part.*  
 Ganjam, Nellore, Arcot and Coimbatore Districts ; *\*Ci a- te y (1*  
 to 2,000 ft. *F. ^ . |.*
3. PASPALUM VAGINATUM, Sw. *P. dittichum*, Linn. ;  
 vii. 12.  
 In sea-shore and river sand ; near sea-level.
4. PASPALUM LONGIFOLIUM, Roxb. *P. scrobiculatim* > *Linn. ;*  
 F. B. I. vii. 11 *in part.*  
 Travancore.
5. PASPALUM DILATATUM, Poir. *na j y*  
 A S. American fodder-grass ; introduced and *occisi* <  
 run wild.
6. PASPALUM CONJUGATUM, Berg. ; F. B. I. vii. 1L  
 Mysore ; Wynaad ; Travancore ; 500-4,000 ft.
7. PASPALUM COMPACTUM, Roth. ; F. B. I. vii. 12. *4 000-*  
 Bababudan, Coorg, Nilgiri and Travancore Hills ; >  
 6,000 ft.

## 51. Stenotaphrum, Trin.

Perennial or annual, erect herbs, often creeping or prostrate *te at*  
 the base. Leaves flat, with compressed sheaths. Panicles *spici-*  
 form, terminal or sometimes also from the upper axils ; *ri a chis*  
 flat, continuous or jointed, bearing 1-8 spikelets sunk in hollows  
 or chambers in its anterior face. Spikelets lanceolate to ova *te-*  
 oblong, falling entire from rudimentary pedicels. Glumes *2,*  
 dissimilar ; the lower smaller, sometimes scale-like ; the upper  
 nearly or quite as long as the spikelet, 5-11-nerved. *Lenin as*

similar, elliptical, coriaceous to coriaceous; the lower paleate or not, containing a \$ floret; the upper with a 2-keeled palea containing a bisexual floret. Lodicules 2. Styles 3. Grain broadly elliptic-plano-convex, closely embraced by, but free within the lemma and Palea; embryo half as long.

TE VII. TAPHRUM UIMIDIATUM, Brogn. \*V. glabrum, Trin. ; h\ B. I.

TYa

Culmancore State at Ambalapuzha (Ranga Achariyar). Rare. Culms erect from the root or from a slender rhizome, 5-13 in. Leaves exactly linear, apex rounded, 1-3-3 in. long; narrow in. wide; panicle 1-3-6 in. long; rachis alternately broadly and broadly winged on one side and the other, the broader wing usually with an apical tooth and forming the lower glume to receive the spikelet, spikelets 15-19 in. long; lower glume unfused, .05 in. long.

52. Paspalidium, »Stapf

Perennial terrestrial or semi-aquatic herbs; culms often spongy. Leaves flat or involute. Inflorescence of few to many spikelets sessile or subsessile racemes secund on a common quadrangular axis. Spikelets ovoid to ovate-lanceolate, turgid or more or less compressed. Glumes dissimilar and unequal; the lower smaller, turned away from the axis. Lemmas dissimilar; lower similar to, but usually longer than the upper. Florets 2, the upper infllexed, with or without a palea, containing a \$ floret. The upper elliptic, crustaceous with firm, involute margins, a 2-keeled, of the same texture, almost as long, containing a bisexual floret. Lodicules 2. Stamens 3. Styles 2, free. Grain enclosed in the more or less hardened lemma and palea.

Spikelets ovate or subglobose, hardly compressed, obtuse or acute, lower glume broadly ovate or suborbicular, rounded, upper glume acute, .07-.1 in. long; lemmas .08-.12 in. long. Leaves ciliate near the base, 1-13 in. long, wide; racemes usually, the lowest always, shorter than the spikelets distant .3-1.3 in. long. 1. flavidum. Spikelets ovate to ovate-lanceolate, acute or apiculate, distinctly narrower; lower glume broader than long, thinly membranous

truncate, retuse or undulate, .03 in. long; racemes mostly as long as or longer than the internodes, the lowest sometimes shorter, imbricate,

•3-1-6 in. long. Culms often spongy below :—

Upper glume broadly oblong, obtuse, .07 in. long; lower lemma<sup>m</sup> acute or apiculate, .09-11 in. long; upper lemma .09 in.<sup>to n></sup> distinctly punctate. Leaves 2-2-9 in. long, .1--3 in. wide

2. *punctate*

Upper glume broadly ovate, apiculate, .07-08 in. long; lemma<sup>low ^ r</sup> apiculate, .08-09 in. long; upper lemma smooth. *Leaves* 7-12 in. long, .2-3 in. wide . . . . . 3. *geminatum*.

1. PASPALIDIUM FLAVIDUM, A. Camus. *Panicum flavidum*, B<sup>etz\*</sup> F. B. I. vii. 28; S. I. G. figs. 82, 83.

In all Districts; sea-level to 4,000 ft.

The spikes are sometimes reduced to 1-3 spikelets.

A good fodder. Vern. *Hind.* Sanka; *Tel Uda & M<sup>U</sup>* *Tarn.* Arisi pillu.

2. PASPALIDIUM PUNCTATUM, Stapf. *Panicum punctatum*, Burin» F. B. I. vii. 29.

In all the eastern Districts; sea-level to 600 ft. Often & water.

3. PASPALIDIUM GEMINATUM, Stapf. *Panicum paspaloides*, Pers.; F. B. I. vii. 30. *P. fluitans*, Retz.; S. I. G. figs. 84, &

In all Districts; sea-level to 3,500 ft. Often in water. Vern. *Kan.* Gaddai vadavina hullu.

53. *Urochloa*, Beam.

Annual or perennial herbs. *Leaves* linear-lanceolate to ovate flat. *Inflorescence* of several racemes sessile or subsessile on » common, more or less triquetrous, rarely strap-shaped axis with » straight or zig-zag keel on the anterior\* face; pedicels solitary <sup>oT</sup> twin, 2-several seriate. *Spikelets* broadly ovate to lanceolate, more or less flattened or depressed, the convex side turned towards the axis, falling entire from the disc-tipped pedicels. *Glumes* membranous, usually very unequal; the lower the shorter, turned away from the axis; the upper either glabrous or more or less <sup>s</sup> densely felted-pubescent. *Lemmas* dissimilar; the lower closely resembling the upper glume in all respects, empty or holding » <sup>o</sup>

in the Upper crustaceous or subcoriaceous with narrow  
 acute margins, elliptic-oblong, concave, obtuse and usually  
 with a scabrid or barbellate mucro or cusp, containing a bisexual  
 endosperm. *Stamens* 3. *Style* 2, free. Grain tightly  
 enclosed in the more or less hardened lemma and palea.

**Species 1:** Paniclelets -13-16 in. long; upper lemma distinctly cuspidate:—  
 Paniclelets ovate to elliptic-oblong, acute. Culms up to 3 ft. high;  
 leaf sheaths cordate, clasping the stem, hairy or rarely nearly glabrous,  
 with tubercles, 1-2-6.7 in. long, -2-7 in. wide; lower glume  
 broadly ovate, clasping the base of the spikelet, acute or obtuse,  
 4-6 in. long; upper glume and lower lemma about the size  
 and shape of the spikelet; upper lemma with a cusp -0.3 in. long  
 1. *panicoides*.

Leaflets lanceolate, acuminate. Leaves glabrous, 1-2-4 in. long,  
 0.5-1 in. wide. Other characters as in the last species  
 2. *setigera*.

Species 2: Paniclelets ovate to elliptic, acute or apiculate, -0.7-0.9 in. long. Culms  
 prostrate or creeping, rather slender, up to 20 in. long; leaves rounded  
 at the apex, spreading the stem or not, glabrous or minutely pubescent,  
 1-5 in. long, .12-6 in. wide; lower glume suborbicular, -0.2-0.3 in.  
 long; upper glume and lower lemma elliptic-ovate, acute; upper  
 lemma broadly oblong, apiculate or mucronate, -0.6 in. long  
 3. *reptans*.

**Species 1:** UROCHLOA PANICOIDES, Beauv. *Panicum javanicum*, Hook.  
 f. non Poir.; F. B. I. vii. 35; S. I. G. figs. 1, 3, 4, 7, 93, 94.  
 In all Districts except the wettest; sea-level to 3,000 ft.  
 The grain is eaten by the poor. A good fodder. Vern.  
 Tel. Salla wudu; Kan. Kadu billi samai hullu.

**Species 2:** UROCHLOA SETIGERA, Stapf. *Panicum setigerum*, Retz.:  
 F. B. I. vii. 36.  
 Eastern and Central Districts from Kistna to Tinnevely;  
 sea-level to 2,000 ft.  
 An excellent fodder.

**Species 3:** UROCHLOA REPTANS, Stapf. *Panicum prostratum*, Lamk.;  
 F. B. I. vii. 33; S. I. G. figs. 91, 92.  
 In all Districts except the wettest; sea-level to 6,000 ft.  
 The grain is eaten by the poor in times of scarcity. A good  
 fodder much liked by cattle. Vern. Tarn. Shani pillu.

54. *Echinochloa*, Beam.

Annual or perennial, often tall herbs. *Leaves* narrow. *Inflorescence* of crowded panicles of loosely arranged, secund, spiculate branches bearing spikelets from the base or near it; *triangular*. *Spikelets* ovate to elliptic- or lanceolate-oblong. 2-nate or clustered, articulated on and falling entire from pedicels. *Glumes* membranous, unequal; the lower much shorter, mucronate, cuspidate or awned; the upper coincident in outline with the spikelet, acute, cuspidate or shortly *lemmas* dissimilar; the lower equalling the upper glume (excluding cusp or awn), its palea 2-keeled, empty or containing a *S* the upper subcoriaceous or crustaceous, ovate to elliptic-oblong-obtuse or apiculate, polished, very convex on the back, its *P* as long, with rounded sides and flaps, containing a bisexual *Lodicules* 2. *Stamens* 3. *Styles* 2, free. *Grain* broadly elliptic-plano-convex.

Racemes simple, rather distant, -3-1-25 in. long; lower glume a upper lemma about equal; obtuse, acute or cuspidate. Annual, to 2 ft. high; leaves 2-8 in. long, -15-45 in. wide, ligule 0; lower glume -04-05 in. long, upper 09-11 in. long; lemmas -08-1 in. long, lower with a floret. Racemes usually more or less branched, -8-2 in. long; lower glume and upper lemma cuspidate or awned, the latter the longer; lemma often awned :\_

Annual, up to 3 ft. high; leaves 3-21 in. long, -2-5 in. long, junction of blade and sheath glabrous, usually marked by a brown zone; spikelets -15-18 in. long; lower glume -07-12 in. long, upper -15-n in. long; lower lemma empty, -14-17 in. long; upper -12-15 in. long; awn of lower lemma up to 2 in. long

Usually perennial, up to 6 ft. high; culms rooting and often branching from the base; leaves 3-18 in. long, -18 in. long, leaf; sometimes absent on the upper part of the culm or with a ♂ floret. Otherwise as in the last species.

- 1. *ECHINOCHLOA COLONA*, Link. *Paniawl* " *colonum*, Linn.; figs. 89, 90.
  - 2. *crui-go*
  - 3. *stagnina*
- ... except in the wetted localities; sea-level

An excellent fodder. The grain is eaten by the poorer classes. Vern. Hind. Sawank; Tel Otha gaddi, Kaproda gaddi; Tarn. Sawu, Sauri, Varsanum pillu, Karum pul.

galli, Linn. var. <sup>Umentacea</sup> <sup>c</sup> - E. C. Fischer n. comb. *Panicum Crus-*  
taller and more robust plant with dense, sometimes corymbose

nicles <sup>Qv</sup> <sup>na</sup> <sup>v</sup> cultivated for its grain in most Districts. The straw is  
able fodd er. Vern. Hind. Shamula, Sanwa; Ur. Samu ;  
valli <sup>b</sup> <sup>onta</sup> <sup>Shama</sup> <sup>Pa</sup> <sup>Ia</sup> <sup>ood</sup> alu, Sawa, Chamalu ; Tarn. Kudrai-  
2 .]g<sup>llu</sup> <sup>Rai</sup> 1 Pillu ; Kan. Samai, Savai.

CHINOCHLOA CRUS-GALLI, Beauv. *Panicum Crus-galli*, Linn. ;  
F. B. I. vii. 31 ; S. I. G. figs. 6, 86, 87.

n most Districts; in rice-fields and other wet places ;  
sea-level to 6,000 ft.

Th  
ne grain is eaten by the poor. A good cattle-fodder and  
sometimes cultivated for that purpose. Vern. Hind.  
3 Sar\* wak ; Tel. Pedda-wundu ; Kan. Kadu dabhai hullu.

CHINOCHLOA STAGNINA, Beauv. ; S. I. G. fig. 88. *Panicum*  
*Crus-galli*, Linn. ; F. B. I. vii. 31 in part.

n all Districts, in wet places, often partly submerged ;  
sea-level to 3,000 ft.

Often confused with the last species. Vern. Tel Bontha  
Kan. Kadu dabhai hullu.

55. Oplismenus, Beauv.

Ann  
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ual or perennial herbs, usually decumbent and rooting at  
base. Leaves thin, flat, ovate to lanceolate, often rather  
Metrical. Inflorescence of simple or paniced spiciform  
Pikelets solitary or fascicled, secund. Glumes subequal,  
s or membranous, more or less keeled upwards, both or  
lower awned. Lemmas dissimilar ; the lower similar to  
nger than the glumes, muticous, mucronate or aristate, its  
perfect, reduced or absent, containing a <J floret or empty ;  
pper chartaceous to subcoriaceous, nearly as long as the lower,  
fcous, its palea as long as and embraced by the lemma, con-  
sexual floret. Lodicules 2, broadly cuneate, often very  
te. Stamens 3. Styles 2, free. Grain oblong, tightly  
hiced by th(^ hardened lemma and |n||vi).



Perennial; culms slender to rather robust, up to 3 ft. high;  $l^{ef*v\wedge}$   
 •8-6-5 in. long, -25-1 in. wide; panicles up to 1 ft. long;  $racel\wedge_f$   
 distant, few to many, sometimes reduced to sessile clusters.  
 spikelets, up to 3 in. long; spikelets -12-18 in. long, awns need<sup>le</sup>,  
 like, smooth, up to '43 in. long. . . . . 1.  $comV^{os\%}tus$ ,  
 Annual; culms slender, up to 18 in. high; leaves -7-2-2 in.  $l<^{**}$   
 •2-55 in. wide; panicles up to 4 in. long; racemes distant or clos<sup>e</sup>\*  
 few, up to -7 in. long; spikelets -09-1 in. long, awns cap $H\wedge'$   
 minutely scaberulous, up to -41 in. long. . . . . 2. *Burmann\** •

1. OPLISMENUS COMPOSITUS, Beauv. ; F. B. I. vii. 66,  $O$   
*undulatifolius*, Hook. f. non Beauv. ; F. B. I. vii. *M-*  
 In all Districts; sea-level to 7,000 ft. Common.  $\wedge^{ern<}$   
*Tel.* Kodi juttu gaddi, Konda anthrika gaddi.
2. OPLISMENUS BURMANNII, Beauv. ; F. B. I. vii. 68.  
 In all Districts ; sea-level to 3,000 ft.  
 Much liked by cattle. A good hay-making grass. Vern-  
*Tarn.* Mungil pillu.

### 56. Ottochloa, Dandy

Perennial herbs, creeping and rooting below, geniculate  $^{**d}$   
 scrambling above. *Leaves* narrow, flat, firmly papery.  $/>\langle\rangle^{***}$   
 elongate, widely open or contracted; racemes more or less distant,  
 short; rachis and pedicels filiform. *Spikelets* usually in small\*  
 approximate or distant clusters, narrowly oblong, acute, dorsad  
 compressed. *Glumes* 2, similar and subequal, firmly membranous,  
 much shorter than the spikelet. *Lemmas* subequal; the  $^{*>^{**}}$   
 membranous, the size and shape of the spikelet, empty; the upi $^{*r}$   
 subconaceous, margins very narrowly hyaline, its palea simile  
 embraced by it all along, containing a bisexual floret. *Lodicules* %  
*Stamens* 3. *Styles* 2, free. *Grain* elliptic, almost flat.

OTTOCHLOA NODOSA, Dandy. *Panicum nodosum*, Kuntb;  
 $^{*}$  B. I. vii. 43.

Travancore State; at low elevations and up to 6,000 ft.  
 (Meebold).

Culms up to 6 ft. high; leaves narrowed and almost petioled  
 or rounded or subcordate, 1-8-5 in. long, -32-5 in. wide;  
 panicles up to 8 in. long, branches up to 5 in. long; spikelets  
 •10—15 in. long.

## 57. Holcolemma, Stapf et Hubbard

Annual or perennial herbs. *Leaves* linear, flat. *Panicles* narrow, <sup>sP</sup>«iform. *Spikelets* fascicled or solitary on a slender, simple <sup>rha</sup>chis, together with setae at the lower nodes or replaced by <sup>\*\*•</sup>» oblong to lanceolate, back flat and deeply channelled. <sup>^s</sup>hyaline or thinly membranous; the lower i-J as long as <sup>he</sup>spikelet; the upper slightly longer. *Lemmas* dissimilar; the <sup>LOW(\*</sup> as long as the spikelet > base slightly saccate, membranous <sup>\*lth</sup> a longitudinal median channel of thinner tissue, its palea as <sup>lon</sup>g. 2-keeled, concave and hyaline between the keels, empty or posing a <j floret; the upper as long as or slightly shorter than <sup>the</sup> lower, becoming crustaceous, finely granulate and transversely <sup>y°\*\*</sup>, enclosing its similar palea except at the tip, containing a <sup>J<sup>e</sup>XUal</sup> floret. *Lodicules* 2. *Stamens* 3. *Styles* 2, free. *Gram* <sup>Ptic</sup>-oblong, dorsally compressed.

HOLCOLEMMMA CANAUCULATUM, Stapf et Hubb. *Panicum carniculatum*, Nees; F. B. I. vii. 43.

Precise locality unknown (Wight).

Culms slender, weak, up to 4 ft. high; leaves flaccid, 3-b in. <sup>lo</sup>ng, -1-15 in. wide > finely acuminate; panicles 1-5-4 in. <sup>lot</sup>»g; spikelets 12-14 in. long.

## 58. Panicum, Linn.

~~DO. Panicum~~

. Annuia or perennial, erect or procumbent, sometimes woody <sup>herl\*</sup>. *Leaves* very diverse. *Inflorescence* of usually open panicles, <sup>W</sup>nerally <sup>m u c h</sup> divided. *Spikelets* lanceolate to oblong, elliptic or <sup>orbi</sup>◊ular, rarely somewhat oblique, falling entire or nearly so. <sup>^wn\*</sup> herbaceous; the lower rarely absent, sometimes hyaline, <sup>Usu</sup>ally considerably shorter than the upper, seldom as long; the <sup>U</sup>pper <sup>PPW</sup> rounded on the back. *Lemmas* dissimilar; the lower <sup>PPW</sup> rounded on the back. *Lemmas* dissimilar; the lower <sup>Sln</sup>»lar and subequal to the upper glume, with or without a palea, <sup>m</sup>Pty or enclosing a <} floret; the upper coriaceous or crustaceous, <sup>''Jt</sup>^e or acute, muticous, margins usually involute, its palea <sup>Si</sup>»»lar, containing a bisexual floret. *Lodicules* 2. *Stamens* 3. <sup>%fe</sup>« 2, free. (*J<sub>m</sub>m* tightly enclosed in the hardened lemma <sup>illl</sup> palea.

Lc 7g, T e diStinCt> at least i as lo »e as the spikelet :  
-Leaves linear :—

Leaves not markedly distichous, flat, not rigid or glaucous:—

Glumes equal, -07-11 in. long, obtuse. Culms 1-3 ft. bf>  
leaves 2-3-2 in. long, -2-4 in. wide, closely ribbed; spiH<sup>et\*</sup>  
•08-12 in. long, upper lemma -06 in. long. . . . . 1- ore<sup>ades</sup>.

Lower glume shorter than the upper :—

Spikelets -06-08 in. long. Culms 1-12 in. high; leaves  
16 m. long, very narrow; lower lemma distinctly shorter  
than the upper gl<sub>ume</sub>, not much longer than the upper  
lemma . . . . . 2. humile.

Spikelets -085 in. or more long! :—

Spikelets -2-26 in. long. Culms 1-4 ft. high, soft<sup>v</sup>  
hirsute below the nodes ; leaves tapering from a broad  
base, 4-14 in. long, -25-8 in. wide, sheaths with long  
spreading hairs from conspicuous tubercles ; upper lem\*\*  
ovate, -13-15 in. long, brown, shining, usually with 5 V<sup>le</sup>  
brown nerves. . . . . 3. miliace<sup>^n</sup>,

Spikelets -16 or less long :—

Upper lemma smooth :—

Annuals ; nodes of culms glabrous :—

Spikelets not gaping ; keel of glumes not scaberu-  
lous ; upper lemma acute or subacute :—

Panicles contracted, branches and pedicels  
moderately slender. Culms 1-2 ft. long ; leaves  
tapering from a broad base, 3-12 in. long, ^"  
•5 in. wide (in cultivated forms sometimes much  
larger, stout, up to 3 ft. high ; leaves up to 2 ft-  
long and 1 in. wide); spikelets .13-17 in. long!  
lower glume -04-09 in. long; upper leW\*  
•08-12 in. long, dark brown at maturity, often  
with 5 paler veins. . . . . 4. mM<sup>are</sup>,

Panicles effuse ; branches and pedicels capillary-  
Culms slender, 0-22 in. high ; leaves not tapering\*  
.2-8 in. long, -25-35 in. wide ; spikelets •1-12 in-  
long; lower glume-03-05 in. long; upper lcni\*  
0< -08 in. long, pale brown or whitish

5. psilopodii<sup>l</sup>-

•Spikelets gaping, -11-15 in. long; upper lcnn<sup>l</sup>  
obtuse, .07-11 in. long, yellow. Culms 6-3<i i"-  
high ; leaves usually basal only, not tapering, 1 ^  
l:\* »'• long, -12-4 in. long, copiously hairy fro">

tubercles, rarely glabrous; panicles often large; lower glume .05-.1 in. long, cuspidate, keel acaberulous

Perennials :— [6- *trypheron*.

Lower glume broader than long, obtuse, *i* as long as the spikelets or less. Culms stout, 2-3 ft. high, base creeping or floating and rooting at the lower nodes, nodes glabrous; leaves tapering, 4-11 *m*. long, .25-.4 in. wide, sheaths inflated; pedicels scabrid, usually much enlarged at the apex; spikelets lanceolate, .12-16 in. long. 7. *paludosum*. Lower glumes ovate, acuminate, J-J as long as the spikelets. Culms solid, terete, woody below, up to (> ft. high, nodes thickened, puberulous; leaves very finely acuminate, 6-24 in. long, .25-8 in. wide, sheaths not inflated; panicles large, pedicels slender, not enlarged at the apex; spikelets ovoid, acute, .12-13 in. long . . . . . 8. *antidotale*.

Upper lemma transversely rugulose, .08-1 in. long. Culms usually stout, up to 10 ft. high; nodes hirsute; leaves tapering from a broad, rounded or cordate base, <)24 in. long, .35-8 in. wide, margins spinulose; lowest node of the panicle villous; spikelets .11-16 in. long; lower glume suborbicular, .04-.06 in. long. 9. *maximum*.

Leaves distichous, involute, seldom expanded, rigid, glabrous, <sup>2\*</sup>5~13 in. long, .15-3 in. wide. Culms creeping at the base, stoloniferous, often nodular, 1-5 ft. high, sterile shoots closely <sup>leaf</sup>y; spikelets .1-13 in. long; lower glume suborbicular, .04-05 in long . . . . . <sup>10</sup>- *repens*.

**L**<sub>aves</sub> ovate to lanceolate :—

<sup>S</sup>Pikelet8 .13 in. or less long:—

Leaves ovate, acute, base cordate, amplexicaul, 1-3-2 in. long, .5-1-2 in. wide. Culms decumbent and rooting below, up to 3 ft. long; spikelets .07-09 in. long; glumes glabrous, puberulous or sometimes pilose from tubercles, upper gibbous, .06-.08 in. long, very slightly longer than the lower; lower lemma about as long, upper very little shorter than the lower glume

#### 11. *brevifolium*.

Leaves lanceolate, acuminate, base broad, deeply cordate, 3-5-8-5 in. long, .4-1-2 in. wide. Culms erect, up to 6 ft. high, base shortly woody; spikelets .1-13 in. long; upper glume not gibbous, subequal to the lower lemma, a little longer than the lower glume and upper lemha . . . . . 12. *montanum*.

Spikelet\* 10-22 in. long. Culms slender, up to 5 ft. W\*;  
 loaves ovate-lanceolate, acuminate, base rounded or *cor*<\*^  
 2-7 in. long, .35-1 in. wide : upper glume and lower lemma  
 equal, larger than the lower glume and upper lemma . . 13. *Uard*\*<sup>i</sup>  
 Glumes minute or one or both absent. Culms slender, up to j ft.  
 high; leaves 2-5-8 in. long, .15-53 in. wide; panicles large, e\*»<sup>c</sup>  
 branches and pedicels capillary; spikelets -1 in. long; lower le\*\*<sup>a</sup>  
 5-7-nerved, glabrous or silky between the nerves, enfolding wh<sup>e</sup>  
 slightly shorter upper. . . . . \* . . . . . 14. *aiibegl*\*<sup>6</sup>

1. PANICUM OREADES, Domin *P. aequiglumv*, Hook, f non  
 Hack, et Arechav. ; F. B. I. vñ7M7

Nilgiri Hills at 5,000 ft. (Lawson, Bourne).

2. PANICUM HUMILE, Nees ; F. B. I. vii. 48.

Vizagapatam and S. Kanara Districts ; Travancore State-  
 Considered a good fodder in N. India.

3. PANICUM MILIACEUM, Linn. ; F. B. I. vii. 45.

Cultivated for its edible grain. The common Millet.

The straw is a useful fodder. Vern. *Hind.* Chena; <sup>lr</sup>  
 Rala ; *Tel.* Varagalu, Wuragi, Warigalu, Barigalu ; <sup>?am</sup>  
 Samai, Kadai-kanni; *Kan.* Baragu.

4. PANICUM MILIARE, Lamk. ; F. B. I. vii. 46.

Much cultivated in all Districts for its edible grain and run  
 wild; sea-level to 7,000 ft. The little Millet.

The straw is a good fodder. Vern. *Hind.* Savan; <sup>t/r\*</sup>  
 Suniva ; *Tel.* Chamalu, Ganga samalu, Sani, Savai; *T\**»\  
 Samai, Shamai, Peru samai; *Kan.* Shamai, Bili san^  
 hullu ; *Mai.* Shama.

5. PANICUM PSILOPODIUM, Trin.; p. B. I. vii. 46.

In all Districts ; sea-level to 6,000 ft.

Not easily distinguished from the last species, of which it \*  
 probably the truly wild form. In salt swamps the whole  
 plant becomes rather stiff, with narrow erect leaves. *Vem-*  
*Tarn.* Kadaikanai, Piva pillu, Samai, Uragadam, P»<sup>ttU</sup>  
 pillu, Kalam pillu.

The spikelets are very commonly inhabited by a larva and  
 then they become much hypertrophied, up to -3 in. *long-*  
*in* normal spikelets occasionally a coriaceous linear ensifo^1  
 appendage J-f as long as the upper lemma is found attached  
 to the rhachilla between the two lemmas.

6. PANICUM TRYPPERON, Schult.; F. B. I. vii. 47; 8. I. G. % 101.  
In all Districts; sea-level to 6,000 ft. Vern. *Tel* Adavi s<sup>t</sup>ha gaddi; *Tarn*. Samai-karunai; *Kan*. Kadu karai samai hullu.
7. PANICUM PALUDOSUM, Roxb. *P. proliferum*, Hook. f. non Umk.; F. B. I. vii. 50.  
|\*anjam, Cuddapah and Coimbatore Districts; Mysore State; Lower Pulney Hills; Courtallam; sea-level to 3,000 ft.
8. PANICUM ANTIDOTALE, Retz.; F. B. I. vii. 52.  
**Bangalore**; Carnatic; Nilgiri and Shevaroy Hills,  
**Grazed** by cattle only when young. Used medicinally for ulcers (*vide* Koenig), and in throat affections; the smoke <sup>h</sup> is burnt is said to be a disinfectant. Vern. *Tarn*. Nassiam pillu, Pinisu pillu.
9. PANICUM MAXIMUM, Jacq.; F. B. I. vii. 49.  
**A** topical African grass cultivated for its valuable fodder and occasionally found as an escape. The Guinea grass. vern. *Hind*. Gini ghans; *Tarn*. Ginio pillu; *Kan*. Gini hullu.
10. PANICUM REPENS, Linn.; F. B. I. vii. 49; S. I. G. figs. 102, 103.  
In all Districts; in sandy soil or in standing, including brackish, water; sea-level to 7,000 ft. The Ginger grass. Much liked by cattle and alleged to stimulate the yield of milk. Vern. *Ur*. Reda; *Tel*. Ladda gaddi, Kari gaddi; *Tam*. Tinei pillu, Inji pillu; *Mai*. Inchi kanu pullu; *Kan*. Sonti hullu.
11. PANICUM BREVIFOLIUM, Linn. *P. ovalifolium*, Poir.; F. B. I. vii. 44.  
In all Districts; sea-level to 3,500 ft.
12. PANICUM MONTANUM, Roxb.; F. B. I. vii. 53.  
In all Districts; sea-level to 4,000 ft.
13. PANICUM GARDNERI, Thw. *Isachne Gardneri*, Benth.; F. B. I. vii. 26.  
W. Ghats; 5,000-7,500 ft.
14. PANICUM SUBEGLUME, Trin.; F. B. I. vii. 51.  
In all the Eastern Districts from the Rampa Hills to Tinnevely; sea-level to 2,000 ft. ;

## 59. Hymenachne, Beauv.

Stout, erect herbs. *Leaves* broadly linear. *Inflorescence* ^ thyrsoid panicle with erect, appressed branches; branchlets spiciform. *Spikelets* very numerous, secund, narrowly ~~lanceolate~~ \*te, acuminate, articulated on minute pedicels; rhachilla produced between the glumes and between the upper glume and the lower lemma. *Glumes* membranous; the lower shorter, cuspid\*tc, keeled; the upper sheathing the rhachilla, prominently ^neX^e cuspidate or awned. *Lemmas* longer than the upper glumes; lower membranous, lanceolate, tapering into an arista, 5-nerve d^ onispy; the upper shorter, oblong, membranous in flower, hardened^, in fruit, faintly 2-nerved, embracing its palea except at the W' containing a bisexual floret. *Lodicules* 2. *Stamens* 3. ®^J^e^ free. *Grain* very small, oblong, tip contracted; embryo lar- orbicular. , n 14. In

HYMENACHNE PSEUDO-INTERRUPTA, C. Muell. *Panimm Myur* H.S.  
H. B. K. ; F. B. I. vii. 39.

Xear the coast line; not common.

Root stock creeping or floating; culms erect, 2-6 ft. \*>&^ rooting at the lower nodes, spongy below; leaves 3-5-18 i^ long, -3-75 in. wide, base rounded or cordate; panicle 4-5- in. k>ng; spikelets -1(-)2 in. long; glumes and lower lemi"fl scaberulous on the ribs; upper glume strongly 3-ribbe"U acuminate-caudate, -15 in. long; lower lemma -18"2 in, long, tapering into an arista £ as long; upper lemma -12-13 in. long.

## 60. Cyrtococcum, Stapf

Perennial, usually weak herbs. *Leaves* usually narrow, sometimes ovate, flat. *Panicles* effuse or contracted. *Spikelets* long- or short-pedicelled, distant or approximate, obliquely obovate to semi-obovate, much laterally compressed. *Glumes* thinly membranous, unequal or subequal. *Lemmas* dissimilar; the lower similar to the upper glume, its palea, if present, narrow, 2-nerved, empty; the upper narrowly boat-shaped, papery to subcrustaceous with firm, narrowly involute margins, as long as the lower or

nearly so, its palea > su^e(Jual t() ifc» narrowly'convex on the back, with keels and thin flap containing a bisexual floret. Lodicules with Stamens 3. %/es 2, free, tdraw small, obovoid, free m the hardened lemma and palea.

Ped. ICols short, rarely as long as the spikelets : leaves 1-7 in. long, -1-4 in. wide. Culms slender, creeping

Leaves few; spikelets few, hispid, -0-07 in. long. 1. trigonum.

fr OH 2-7-5 in. long, -2--65 in. wide. Culms rather stout, erect

panicle 2-5-8-5 in. long, many; spikelets numerous, glabrous, rarely softly

panicle 2-5-8-5 in. long. 2. oxyphyllum. palea long, usually longer than the spikelets :—

upper lemma semi-ovate, with a linear or oblong apical pale callus, palea usually with a small round apical callus ; glumes more or

less keeled :—

Lower lemma obtuse ; glumes usually puberulous or hispidulous ;

Panicles effuse, simply branched :— "

spikelets -09--1 in. long; upper lemma semi-ovate. Culms slender, erect from a creeping, rooting base, 5-12 in. long ; leaves linear to linear-lanceolate, 1-4 in. long, -2--35 in. wide

3. patens.

s spikelets -06—08 in. long ; upper lemma broadly semi-ovate.

Culms up to 18 in. high ; leaves ovate to lanceolate, 1-3 in. long, \*2--65 in. wide. Other characters as in the last species

4. radicans.

Lower lemma and glabrous glumes acute or cuspidate. Culms

rather robust, up to 3 ft. high from a decumbent base; leaves

3-5 in. long, <25--6 in. wide ; panicles up to 1 ft. long, fastigiately

branched ; spikelets -08--09 in. long, less compressed than in any

of the previous species. . . . . 5. longipes.

Upper lemma semi-lanceolate, acute, without apical callus, its

palea without callus ; glumes not keeled. Culms very slender, up

to 10 in. high ; leaves 1-2-7 in. long, up to -3 in. wide; panicles

laxly effuse, branches and pedicels capillary; spikelets distant, -05—07 in 1

1. in. long . . . . . 6. sparsicomum.

^YRTOCOCCUM TRIGONUM, A. Camus. Panicum trigonum, ftetz.; F. B. I. vii. 56.

In all Districts ; up to 3,000 ft. Usually in shade. Vern. Kan. Abbu karkai.



2. CYRTOCOCCUM OXYPHYLLUM, Stapf. *Panicum pilvipes*, Nees et Arn. ; F. B. I. vii. 57.  
In all Districts ; sea-level to 6,000 ft. In open grass la<sup>n</sup> d<sup>s</sup> and woods and in evergreen forest.
3. CYRTOCOCCUM PATENS, A. Camus. *Panicum patens*, Li<sup>1111</sup> ; F. B. I. vii. 57 in part.  
Nilgiri, Pulney and High Wavy Mountains ; 4,000-6,000 ft.
4. CYRTOCOCCUM RADICANS, Stapf. *Panicum patens*, <sup>^</sup>inll< ; F. B. I. vii. 57 in part.  
Mysore State ; W. Coast and Ghats ; N. Coimbutore H<sup>»</sup> ; sea-level to 6,000 ft.  
Grazed by cattle. Vern. Kan. Akki hullu.
5. CYRTOCOCCUM LONGIPES, A. Camus. *Panicum longipes*\* W<sup>r</sup>•e<sup>t</sup> A. ; F. B. I. vii. 58.  
Godavari District at Bison Hill (Barber); Mysore <sup>^</sup>llte ; W. Coast and Ghâts ; 2,000-5,000 ft.
6. CYRTOCOCCUM SPARSICOMUM, A. Camus. *Panicum sp*<sup>r</sup>><sup>i</sup>romnm, Nees ; F. B. I. vii. 58.  
Kodaikanal Ghât, about 20<X) ft. (Bourne).

## 61. Saccolepis, Nash

Perennial, or sometimes annual herbs. *Leaves* linear, flat or convolute and filiform. *Panicles* effuse or contracted and spicif<sup>o</sup>rm, *Spikelets* often small, ovate oblong to conico-lanceolate, subterete or compressed, sometimes more or less oblique, usually somewhat turgid ; pedicels filiform. *Glumes* unequal; the lower minute or up to half as long as the spikelet; the upper always very convex, often with a saccate base, 5-13-ribbed. *Lemmas* dissimilar ; <sup>t</sup>be lower about half as long as the upper, with a straight back, i<sup>t</sup>s palea hyaline, finely 2-keeled, sometimes reduced or rudimentary\* empty or containing a <J floret; the upper very convex, chartaceous, becoming crustaceous, margins narrowly involute, obscurely 5-nerved, its palea of the same texture and almost as long, tightly embraced by it, hardly keeled, containing a bisexual floret. *Lod\**' *cules* 2. *Stamens* 3. *Styles* 2, free. *Grain* tightly enclosed i<sup>n</sup> the hardened lemma and palea, elliptic, dorsally compressed, almost plano-convex in section'; embryo about half as long.

**Panicles** *eyrindc* > 8 *jjic; ifor* : pedicels short : ...  
**Lower glume** less than ; a h long as the spikelet. Culms usually  
 robust and spongy below, up to 6 ft. high ; leaves 6-15 in. long,  
 2-5 in. wide ; Pseudo spikes 5-13 in. long (in impoverished indi-  
 viduals) ; spikelets usually in interrupted, crowded  
 fascicles, narrowly ovoid, 14-19 in. long, glabrous.. 1. *interrupta*.  
**Lower glume** *Umona\*\* as \*ong a8 m?* «pikelet ; pseudo spikes continuous,  
 rarely interrupted :—  
**Spikelets** ovoid, usually curved, 8-13 in. long, glabrous or  
 more or less densely hispid. Culms slender, 4-24 in. high ; leaves  
 1-2 m. long, 1/2-2 in. wide ; pseudo spikes 3-5 in. long  
 2. *indica*.  
**Spikelets** *ots Subglol> 08e, \*00*—8 in. long, glabrous. Culms slender,  
 1-2 m. high ; leaves 4-14 in. long, 1/2-2 in. wide ; pseudo  
 spikes 4-10 in. long. . . . . 3. *myosuroides*.\*  
**Panicles** broader, up to 4 in. long ; pedicels capillary, often longer  
 than the spikelets. Culms slender, 6-20 in. high ; leaves 1-5-4 in.  
 long, 1/2-2 m. wide ; spikelets gibbously ovoid, 9-11 in. long,  
 flabrous . . . . . 4. *curvata*.

1. **S**ACCOLEPIS INTERRUPTA, Stapf. *Panicum interruptum*, Willd. ;  
 \*<sup>B</sup>- I. vii. 40 ; S. I. G. figs. 99, 100.  
 Xn all Districts ; sea-level to 6,000 ft. In swampy places.  
 Grazed by cattle. Vern. *Tel.* Wolam ; *Tarn.* **Tandan pillu** ;  
 K «n. Hodikai hullu.
- 2 **S**ACCOLEPIS INDICA, Chase. *Panicum indicum*, Linn. ; F. B. I.  
 vii. 41.  
 In all Districts ; sea-level to 6,500 ft. Vern. *Kan.* Kari  
 korla hullu.
3. **S**ACCOLEPIS MYOSUROIDES, A. Camus. *Panicum myosuroides*,  
 R. B. I. ; F. B. I. vii. 42.  
 Ganjam District ; Mysore State ; Carnatic ; sea-level to  
 3,000 ft.  
 Doubtfully separable from the last species.
4. **S**ACCOLEPIS CURVATA, Chase. *Panicum curvatum*, Linn. ;  
 P. B. I. vii. 42.  
 Chingleput and Tirmevelly Districts ; Travancore ; up to  
 6,000 ft.  
 In marshes and in hedges. A good fodder.

## 62. Set aria, Beam.

Annual or perennial herbs. *Leaves* narrow, flat. *Panicles* terminal, contracted and cylindric with solitary or clustered spikelets on stunted branchlets which are more or less produced into bristles or divided into a one-sided involucre of bristles, or more or less open panicles with elongated branches and distant spikelets; the bristles present or not. *Spikelets* oblong to ovate, very compressed on the back, falling entire, subtended by 1-many bristles, the membranous; the lower usually ovate from a clasping base; the upper similar but longer. *Lemmas* dissimilar; the lower corresponding in size and shape with the spikelet, its palea elliptic, oblong, acute, sharply keeled or the keels marginate and narrowly winged, sometimes much reduced, empty or enclosing a floret; the upper subequal to the lower, very convex on the back, boat-shaped, crustaceous, often transversely rugose or finely pitted its margins involute and embracing all along the similar palea up to its more or less prominent keels, containing a bisexual flower. *Lodicules* 2. *Stamens* 3. *Styles* 2, free. *Grain* oblong or elliptic, tightly enclosed in the hardened lemma and palea.

Leaves plicate, 4-24 in. long, 1-3 in. wide. Perennial; culms erect from a woody rootstock, up to 8 ft. high; panicles usually 1-2 ft. long, contracted or expanded, up to 2 ft. long, sometimes reduced and subspiciform; branchlets usually ending in a bristle; spikelets ovate-lanceolate, acute or acuminate, .1-1.5 in. long; upper lemma faintly transversely striate. . . . . 1. *pdhnifoli*\*

Leaves flat, not plicate. Annuals: \_\_\_

Bristles barbellate with erect teeth: \_\_\_

Upper lemma smooth or faintly transversely striate. Culms up to 5 ft. high; leaves tapering to a long fine point, 6-18 in. long, 1-4 in. wide; panicles dense, forming a cylindric, sometimes lobed, continuous pseudo spike up to 12 in. long; branches spiral or more or less whorled; bristles 2-6; spikelets subsistent, broadly oblong or elliptic, .8-1.1 in. long. . . . . 2. *italic*\*

Upper lemma distinctly transversely rugose: \_\_\_

Panicles continuous, cylindric, .3-6.5 in. long; bristles about 8. Culms up to 40 in. high; leaves 2-5-13 in. long, .15-.4 in. wide; spikelets deciduous, ovate to elliptic-oblong; .9-1.2 in. long. . . . . 3. *pallidi/usca*

Panicles narrow, interrupted, lax, flexuous, 1-5-8 in. long

branches ending in a bristle, lower up to 1 in. long ; involucrel  
bristles 3-4. Culms slender, up to 3 ft. high ; leaves flaccid,  
2-12 in. long, 1/2-7 in. wide ; spikelets broadly ovate, 1/2-1 in. long . . . . . 4. *intermedia*.

<sup>Bri</sup>»tles barbellate with descending teeth. Culms up to 4 ft. high ;  
<sup>lCavo</sup>« 3-5-14-5 in. long, 1/2-1 in. wide ; panicles straight or curved,  
<sup>^</sup>ntinuous, cylindric, 5-8 in. long ; branches ending in a bristle ;  
<sup>inv</sup>ohicral bristles 1-4 ; spikelets oblong-ellipsoid, 1/2-1 in. long  
5. *verticillata*.

\* SETARIA PALMIFOLIA, Stapf. *Panicum plicatum*, Lamk. ;  
P- ». I. vii. 55.

In all Districts, especially in the hills ; near sea-level to  
6,000 ft.

2- SETARIA ITALICA, Beauv. ; F. B. I. vii. 78.

Widely cultivated and occasionally found as an escape.  
The Italian Millet. Probably the cultivated form of 8.  
*intermedia*, R. et S. Vern. *Hind.* Kangu ; *Ur.* Kangu ;  
*Tel* Kora, Koralu ; *Tarn.* Tenai ; *Mai* Tena ; *Kan.* Kari  
biragu, Navanai.

3- SETARIA PALLIDIFUSCA, Stapf et Hubbard. *S. ghuca*,  
Beauv. ; F. B. I. vii. 78 *in part.* ; S. I. G. fig. 109.

In most Districts ; sea-level to 7,000 ft.  
Panicles pale-yellow to reddish-brown. A fair fodder.  
Vern. *Hind.* Bandra ; *Tel.* Nakka kora, Kuradakori gaddi,  
Nakka-toka gaddi.

\* SETARIA INTERMEDIA, Roem. et Sch. ; F. B. I. vii. 79 ;  
S. I. G. fig. 110.

In all Districts ; 2,000-6,000 ft. Vern. *Tel* Arranki gaddi ;  
*Kan.* Dodda anta purlai hullu, Kari ottai hullu.

5- SETARIA VERTICILLATA, Beauv. ; F. B. I. vii. 80 ; S. I. G.  
<sup>fi</sup>gs. 111, 112.

In all Districts ; up to 6,000 ft.  
The grain is eaten by the poor ; eaten by cattle before the  
spikes appear. Vern. *Tel* Chik lenta ; *Kan.* Sanna anta  
purlai hullu.

### 63. Pseudoraphis, Griffith

Floating or marsh herbs, usually elongate, much branched and  
<sup>roo</sup>ting at the lower, geniculate nodes. *Leaves* narrow, flat.

*Panicles* terminal, contracted or effuse, the branchlets produce beyond the uppermost spikelet. *Spikelets* narrow, obscurely articulated on the short pedicels, persistent, *Glumes* very unequal, the lower very small, thinly membranous; the upper as long as the spikelet or nearly so. *Lemmas* smaller and rather firmer than the upper glume; the lower containing a 3 floret; the upper bisexual or a ♀; paleas hyaline, cuneiform. *Lodicules* 2, sometimes only 1 in ♀ florets. *Stamens* 3, rudimentary in ♀ florets. *Styles* 2, shortly united at the base. *Grain* linear-oblong, compressed, free within the subcoriaceous lower and the hyaline upper lemmas.

**PSEUDORAPHIS ASPERA, Pilger.** *Chamaeraphis spinescens*, F. B. I. vii. 62; S. I. G. fig. 104.

Kistna, Cuddapah, Coimbatore and Chingleput Districts; Mysore State; near sea-level to 4,000 ft. (Horsleykonda)- Growing in tanks and marshes.

Culms up to 3 ft. long; leaves 1-2-3 in. long, .1-22 in. wide, scaberulous; panicles contracted, ultimately effuse, up to 4-5 in. long, branches flattened, undulate, scabrid, the prolongation usually overtopping the uppermost spikelet; spikelets distant, subulate, acuminate, 2-3-31 in. upper glume caudate.

#### 64. Rhynchelytrum, Nees.

Annual or perennial herbs. *Leaves* linear or filiform, flat. *Panicles* compound or decompound, open or contracted, branches and pedicels capillary, the latter discoid and usually hairy or pubescent at the tips. *Spikelets* linear- to ovate-oblong, laterally compressed, often more or less gaping, usually clothed with soft, shining, often brightly coloured hair. *Glumes* usually separated; the lower minute or small, rarely as long as the spikelet; the upper as long as the spikelet or nearly so, emarginate or 2-lobed, rarely entire, mucronate, mucronate or aristate from the sinus. *Lemmas* dissimilar; the lower resembling the upper glume, usually aristate, its palea 2-keeled, usually containing a 2 floret; the upper much smaller and not aristate, containing a bisexual floret. *Lodicules* 2. *Stamens* 3, free. *Styles* 2, free. *Grain* oblong-ellipsoid, closely embraced by the lemma and palea,

ftHYNcHELYTRUM villosum, Chiov. *Trichoktena Wighlii*, Nees  
 ct Am.; F. B. I. vii. 65.

Kurnool (Bourne) and Bellary Districts ; Bangalore (" weed  
 in a garden," Sedgwick); 1,000-3,000 ft.

Culms up to 2 ft. high ; leaves 1-6 in. long, -1-25 in. wide ;  
 Panicles up to 6 in. long ; spikelets -19-24 in. long, excluding  
 aristas; lower lemma 2-lobed, its arista -07-14 in. long with  
 very long whitish or pinkish-purple hairs on the back.

65. *Pennisetum*, L. C. Rich.

Annual or perennial, erect, often tall, simple or branched herbs.  
 Leaves narrow, flat or convolute. Panicles spiciform, usually  
 dense, branches numerous, short and simple with a solitary spikelet  
 axillary and the spikelets in clusters of 2-5, the single  
 leaves or clusters subtended by and deciduous with an involucre of  
 awns to many, free, usually unequal, scabrid or plumose, simple,  
 rarely branched bristles. Glumes usually small and hyaline ; the  
 lower sometimes suppressed ; the upper rarely more than half as  
 long as the spikelet. Lemmas similar and subequal or dissimilar and  
 the upper smaller, membranous to chartaceous ; the lower empty  
 or enclosing a floret; the upper containing a bisexual floret;  
 paleas subequal and similar to the lemmas, the lower sometimes  
 oppressed. Lodicules 2, small or 0. Stamens 3 ; anthers some-  
 times penicillate at the tip. Styles 2, free or more or less connate.  
 Perianth narrowly oblong to orbicular, enclosed in the slightly hardened  
 lemma and palea ; embryo -1-f as long.

Sometimes the spikelets are much reduced (especially in culti-  
 vated forms), even to an upper floret with only minute traces of a  
 lower lemma.

leaves expanded :—

Panicles cylindric, stout, 1-8-9 in. long; rhachis thick, villous;  
 Peduncles villous, -05-09 in. long ; involucre densely packed all  
 round the rhachis, often purplish, bristles sometimes ciliate, up to  
 2 in. long. Culms stout, up to 6 ft. high ; leaves 4-24 in. long,  
 1-15 in. wide; spikelets 2, rarely 3, to an involucre, pedicelled,  
 13-17 in. long; lower glume usually 0, upper very short or 0;  
 lemmas subequal, lower sometimes suppressed, 12-14 in. long;  
 anther-tips penicillate . . . . .

rpennise<sup>m.</sup>  
^

Panicles linear, slender, 1-8 in. long; rhachis slender, flexuous, glabrous or puberulous; involucre sessile, arranged at short intervals; spikelets usually solitary, an involucre. Culms stout, up to 3 ft. high; leaves 3-15 m-  
•2-6 in. wide; anthers not penicillate:—

Inner bristles densely villous, longest up to .65 in. long; P up to .07 in. long; lower glume .05-.07 in. long, more villous, upper .15-.17 in. long, acute, puberulous; like the upper glume, 3-toothed at apex, upper chart .09-11 in. long, its apex and that of its palea fimbriate

2. pedicellatum.

Inner bristles laxly ciliate, longest up to .5 in. long; sessile; lower glume minute or suppressed. Other characters as in the last species. . . . . 3. polyantha.

Leaves convolute, 3-30 in. long, very narrow; panicles spikelets solitary, sessile; anthers not penicillate. Culms up to 3 ft. high:—

Panicles 3-7 in. long; involucre subsessile, bristles plumose, up to .74 in. long, often purplish; spikelets long; lower glume orbicular .04 in. long, upper ovate, long; lower lemma .24-.29 in. long. . . . . 4. Hohenackia.

Panicles 1-4.5 in. long; peduncles up to .05 in. long; plumose, up to 2.5 in. long, sometimes purplish; spikelets long; lower glume oblate, .02-.04 in. long, upper lanceolate to oblong, .14-.2 in. long; lemmas .3-.4 in. long; .5. villosa.

1- PENNISETUM TYPHOIDES, Stapf et Hubbard. *P. typhoideum* Rich.; R B. I. vii. 82.

Cultivated in all Districts for its edible grain and for fodder; here and there found as an escape; near sea-level to 7,000 ft.—The Bull-rush Millet, Pearl Millet or Spiked Millet. Vern-Hind. Bajra; Ur. Gantiya; Tel. Sajja, Sajjalu, Gantelu; Tarn. Kambu; Mai. Kampam; Kan. Sajjai.

2. PENNISETUM PEDICELLATUM, Trin.; F. B. I. vii. 86. Godavari District (Barber).

3. PENNISETUM POLYSTACHYON, Schult. *P. setosum*, Rich.; F. B. I. vii. 87. Godavari District (Barber).

4. PENNISETUM HOHENACKIUM, Hochst. ex Steud.; *P. ahpecuros*, Steud.; V. f. vii. R.%; S. T. O. figs. 113, 114.

ysore State; Bellary, N. Arcot, Salem, Madura and Malabar Districts ; Nilc-iri and N. Coimbatore Hills ; 1,000-600 ft. Vern. Tarn. Munja pillu; Kan. Nosai hullu, Manai geddai.

5. PENNISETUM VUXOSUM, R. Br.

produced and run wild along road-sides at Ootacamund. Pennisetum ckmdeminum, Hochst., the Kikiyu grass, an excellent tropical African fodder grass, is being cultivated in certain areas to improve the grazing. It is reported to be a good lawn grass and is likely to spread.

66. Cenchrus, Linn.

Annual or perennial herbs. Leaves flat and Haccoid or convolute, and rigid. Inflorescence of simple spikes or panicles. Spikes narrow, solitary or 2-3, rarely 4, enclosed in an involucre of bristles or spines thickened and united at the base into a cup and falling with it. Glumes unequal; the lower small; the upper hardly shorter than the spikelet. Lemmas, when both present, dissimilar; the lower empty, containing a floret or entirely suppressed; the upper more rigid, containing a bisexual floret. Lodicles 0 or 2, minute. Stamens 3. Styles 2, often shortly connate. Grain oblong, rather hard, enclosed but free within the lemma and palea.

Involucral bristles not spinose, 3-5 in. long, the inner plumose, even if thickened below the tips always filiform. Culms up to 18 in. high; leaves 1-12 in. long, 1-2 in. wide; spikes 1-3 in. long; lower glume ... 1. ciliaris.

Involucral bristles spinose, tips not filiform:— ciliate, hairy  
Base of involucre rounded, bristles all erect, not 4-5 in.  
thin, up to 16 in. long. Culms up to 12 in. high; leaves long;  
K, 15 in. wide; spikes 0.5-3 in. long; spikelets 13-16  
Lower glume 0.6-0.7 in. long, upper slightly longer; lemmas ... tigerus.

iri - long .....  
Base of involucre turbinate, bristles stout, the outer spreading  
<> recurved, ciliate, up to 33 in. long. Culms 2-18 m. high;  
leaves 1-6 in. long, 2 in. wide; spikes 1-6 in. long; spikelets  
22-26 in. long; lower glume usually suppressed, upper 14-2 in.  
long; lemmas 1.5-2.3 in. long ... barbatus.



1. CENCHRUS CILIARIS, Linn. *Pennisetum cenchroides*, Rich.;  
F. B. I. vii. 88; S. I. G. fig. 115.  
Mysore State; Anantapur, Bellary, Chingleput, Salem,  
Coimbatore and Madura Districts; up to 3,000 ft.  
Spikes often purple. An excellent fodder. Attempts are  
being made to extend it over wider areas. Vern. Tam.  
Kolukkattai pullu.
- Var. *echinoides*, Hook. f. *Pennisetum cenchroides*, Rich. var.  
*echinoides*, Hook, f.; F. B. I. vii. 88; S. I. G. fig. 116. With rat  
stouter bristles united higher up into a more definite cup. her ^
2. CENCHRUS SETIGERUS, Vahl. *C. biflorus*, Roxb.; F- #  
vii. 89; S. I. G. fig. 117.  
Coromandel. Not common.  
Spikes sometimes purple.
3. CENCHRUS BARBATUS, Schum. *C. catharticus*, Del.; F- #  
vji. 90; S. I. G. fig. 118. -r.  
Northern Circars; Bellary District.  
Grazed by cattle before flowering.

## 67. Isachne, R. Br.

Perennial herbs. *Leaves* flat. *Inflorescence* loosely panicle<sup>d</sup>,  
*Spikelets* small or minute, subglobose or obovoid, not or obscurely  
articulated on the pedicels. *Glumes* subequal, convex, herbaceous\*  
often falling separately. *Lemmas* subequal or the lower 1<sup>o n ^</sup>  
and flatter, coriaceous paleate; the lower containing a J or some-  
times a bisexual floret; the upper articulated and often stipi\*\*te  
on the rhachilla and falling separately, containing a bisexual o<sup>r</sup>  
sometimes a \$, rarely a <} floret. *Lodicules* 2, very minificen  
*Stamens* 3, rarely 4-6. *Styles* 2, free. *Grain* free within the  
hardened lemma and palea.

*Glumes*, at least the lower, longer than the lemmas, cuspidate or  
caudate :—

*Lemmas* subequal:—

Blanches of the panicles glabrous or pubescent; margins of  
leaves thickened and cartilaginous; glumes lanceolate, sparsely  
setose at apex :—

Leaves ovate to ovate-lanceolate, -6-3-5 in. long, '2-15 in.  
wide (much wider in var. *latifolia*), base rounded and clasp<sup>n1\*</sup>  
tho stem, sheaths more or less densely long-hairy and cili<sup>te></sup>

Culms 3-12 in. high ; glumes -1-11 in. long ; lemmas -06-09  
<sup>ill</sup>« long, upper more or less puberulous. . . . . 1 • *Kunthiana*.

Leaves linear to linear-lanceolate, rarely a few narrowly ovate,  
<sup>>6</sup>-2-6 in. long, -15-4 in. wide, base narrowed, not clasping  
the stem, sheaths glabrous, rarely shortly puberulous. Culms  
<sup>3</sup>-40 in. high ; glumes -12-15 in. long. Other characters as  
in the last species. . . . . 2. *Bourneorum*.

Ranches of the panicles setose ; glumes ovate-orbicular, -09-11  
;<sup>n</sup>- long ; setose all over the back. Culms 1-5 in. high ; leaves  
<sup>la</sup>nceolate, -7-2 in. long, -2-4 in. wide, base clasping the stem,  
<sup>ma</sup>rgins neither thickened nor cartilaginous, sheaths long-hairy  
<sup>or</sup> nearly glabrous, long-ciliate ; lemmas hemispheric, -06 in.  
<sup>lo\*</sup>g, glabrous. . . . . *S.Lrsboae*.

<sup>lo\*</sup>er lemma elliptic, -08-09 in. long, glabrous, upper broadly  
<sup>^</sup>e , -04-06 in. long, rather densely pubescent. Culms slender,  
<sup>^5</sup> in. high ; leaves ovate to ovate-lanceolate, -4-1-2 in. long,  
<sup><15</sup>-4 in. wide, sheaths lax, patently hairy from tubercles ; glumes  
<sup>o</sup> <sup>vat</sup>e, caudate-acuminate, 7-nerved, setose from large <sup>^ b TM</sup>  
<sup>o</sup> <sup>o</sup> ~12 in. long, lower usually the longer. . . . . *setosa*.

<sup>Cl</sup>  
\* <sup>^</sup> <sup>mes</sup> as <sup>l</sup> <sup>ong</sup> as or shorter than the lemmas :—

pikelets -12 in. or less long :—

Leaves 6-5 in. or less long :—

Stems erect or prostrate, 25 in. or less high :—

Spikelets -07-12 in. long ; ligules represented by a line of  
stiff hairs :—

Lemmas subequal and similar, ovate to elliptic-ovate,  
rather deeply concave, subcoriaceous, puberulous, -0b -u  
in. long. Culms decumbent, rooting below, up to 24 in.  
high ; leaves asperulous, sometimes softly hairy, 2-5-0 in.  
long, -2-25 in. wide, usually more or less erect ; glumes  
subequal, broadly ovate to orbicular, glabrous or asperulous,  
and setose upward, -07-11 in. long. . . . . <sup>5</sup>- *eW<sup>ans</sup>*:-

Lemmas markedly unequal and dissimilar, lower elliptic  
to oblong, shallowly concave, glabrous, membranous :

Culms prostrate, slender, up to 12 in. long ; leaves  
1-2-2-3 in. long, -15-3 in. wide ; glumes suborbicular  
or broader than long, -05-09 in. long, upper much more  
deeply concave, glabrous, sometimes asperulous and  
setulose at the apex ; lower lemma as long, upper  
broadly ovate to suborbicular, semicircular in section,  
chartaceous, puberulous at least on the margins, -04-0'  
in. long . . . . .

[*Isachne*.

Culms erect from a decumbent, rooting  $h^{*se} >$   $*' \& / \wedge_e$ ;  
 to 12 in. long; leaves 1-2-5 in. long, -15--4  $in' \>$   $6 \cdot 1$  in.  
 glumes as in the last species; lower lemma  $*' \>$   $b \text{ " } u_j \text{ ott } 6$   
 long, upper crustaceous, hard, usually white, pu  $\text{ @ } \text{ r}$ .  
 at least on the margins, -05—08 in. long  $\dots \dots \dots 7\# \text{ @ } \text{ r}$ .  
 Spikelets -04 in. long; ligules 0. Culms 1-5-7 in.  $h' \text{ g } b$ ,  $ve y$   
 slender; leaves ovate, -35-1-5 in. long, -2--5  $in'$   $wic' e$ ,  
 flaccid; glumes delicately membranous, elliptic to e  $*' F \wedge$ ,  
 ovate, sparsely setose, -03-04 in. long  $\dots \dots \dots 8' \wedge$   $vcs$   
 Culms straggling, bamboo-like, 4 ft. or more long;  $l \text{ a } c \wedge$   
 2-6 in. long, -12-25 in. wide, ciliate at base; g  $lume s \text{ br}$  L in  
 elliptic-ovate, -08-1 in. long; lemmas boat-shaped, -07-"  $vc$   $\dots$   
 long  $\dots \dots \dots 9. \text{ Angl} *' \>$   $61'$

Leaves 7-14 in. long, -2-4 in. wide, continuous with the she  $\gg \wedge$   
 beset with stiff short or long hairs, margins thickened and  $c \wedge$   
 Jaginous. Culms erect, rigid, up to 3 ft. high; spikelets glo  $bc \rightarrow$   
 glumes suborbicular, sparsely setose at apex, -08--1  $*' n' 10$   $ng$ ;  
 lemmas orbicular, -06-07 in. long  $\dots \dots \dots 10. M^{eeb0}$   $lat' \text{ r}$ .

Spikelets -14 in. or more long. Culms often stout, 1-5 ft-  $W \wedge$   
 leaves 2-11-5 in. long, -2-1 in. wide; glumes subequal,  $< > ? * * *$   
 ovate-lanceolate, -14-2 in. long, glabrous or setulosc;  $1 * * \text{ mas}$   
 subequal, boat-shaped, -12-15 in. long, coriaceous.. .. H-  $Wal \text{ ker} \text{ r}$ .

1. ISACHNE KUNTHIANA, W. et A. ; F. B. I. vii. 21.  $v.$   
 W. Gháts; High Wavy Mountains (Blatter and HaH  $berg$ ),  
 5,000-8,000 ft.

Var. *latifolia*, Hook f. ; F. B. I. vii. 22. Leaves up to 1 in-  $\wedge \text{ d} \cdot$   
 with 2-4 nerves on either side of the midrib prominent below-  
 W. Gháts; 5,000-8,000 ft.

Var. *nana*, C. E. C. Fischer n. var.  
 Culms only 1-2 in. high; leaves -1-25 in. long, -05-1 in-  $\text{ wide,}$   
 margins not cartilaginous; glumes longer than, equal to or  $\text{ rarely}$   
 shorter than the lower lemma.

Travancore on Anaimudi Peak at 8,840 ft. (Barnes).

2. ISACHNE BOURNEORUM, C. E. C. Fischer in Kew Bull  $1932,$   
 324.

Bababudan, Nilgiri and Pulney Hills; 5,000-8,000  $ft. ;$   
 Travancore on Anaimudi Peak at 8,840 ft. (Barnes).

3. ISACHNE LISBOAE, Hook. f. ; F. B. I. vii. 22.  
 Bababudan Hills (Taibot, Meebold); 6,000 ft.

- † • ISACHNE SETOSA, C. E. C. Fischer in Kew Bull. 1032, 247.  
y . Cochin and Travancore States (Meebold); 3,000-6,000 ft.  
\* ISACHNE ELEGANS, Dalz. ; F. B. I. vii. 23.  
% sore, Nilgiri and Pulney Hills ; 5,000-7,000 ft. Vern.  
Kan. Kadu sanna samai hullu.  
K ISACHNE MILIACEA, Roth ; F. B. I. vii. 25.  
Godavari District; W. (bast; at low elevations ; usually  
7 in wet places.  
' MACHINE DISPAR, Trin. ; F. B. I. vii. 26. /. *australis*, Hook. f.  
n°n R. Br.; F. B. I. vii. 24.  
In all Districts ; sea-level to 6,000 ft. ; often in wet situations.  
Readily eaten by horses and cattle. A troublesome weed in  
V rice-fields.  
N<sup>ar</sup>- *Villon*, C. E. C. Fischer n. var.  
<sup>1Qde</sup>8 setose ; leaves villous.  
8 High Wavy Mountains (Blatter and Hallberg).  
' ISACHNE GRACILIS, C. E. Hubbard in Kew Bull. 1927, 77.  
- Bababudan Hills at Santaveri (Meebold); 4,000 ft.  
9- ISACHNE ANGLADEI, C. E. C. Fischer in Kew Bull. 1932, 323.  
1 Pulney and High Wavy Mountains ; 4,000-6,000 ft.  
0> ISACHNE MEEBOLDII, C. E. C. Fischer in Kew Bull. 1932, 323.  
1- Mysore State (Meebold); 2,000-3,000 ft.  
\* ISACHNE WALKERI, W. et A. ; F. B. I. vii. 26.  
W. Ghats ; 2,500-7,000 ft.

68. *Thysanolaena*, Nees

<sup>7</sup>A\*U, reed-like shrubs with solid, terete culms. *Leaves* distichous,  
<sup>or</sup>oad, flat. *Panicles* compound, large, effuse. *Spikelets* very  
<sup>n</sup>erous, linear-oblong, obscurely articulated on their pedicels.  
<sup>G</sup>membranous, much shorter than the lemmas, the lower  
<sup>sh</sup>orter than the upper. *Lemmas* similar ; the lower without palea,  
<sup>empt</sup>y J the upper paleate, containing a bisexual floret. *Lodicules*  
<sup>2.</sup> *Stamens* 2-3. *Styles* 2, free. *Grain* minute, enclosed in the  
<sup>ha</sup>\*lemna and palea.

- \*YSANOLAENA MAXIMA, O. Kt. T. *Agrostis*, Nees; F. B. I. vii. 61.  
Ganjam, Vizagapatam and Rampa Districts ; 1,500-4,800 ft.  
culms up to 12 ft. high ; leaves subcoriaceous, finely acuminate,  
cordate, up to 2 ft. long and 3 in. wide ; panicle up to 3 ft. long  
\*nd 2 ft. across; spikelets '07-i-09 in. long; lower glume

•02-03 in. long, upper .04-in. long; lemmas lanceolate, <sup>b.o.at.</sup> shaped; acuminate, -06-07 in. long, the upper the sh<sup>or ter,</sup> oiliate with long spreading hairs.

## 69. Arundinella, Kaddi

Annual or perennial, erect herbs. *Leaves* usually narrow. *P<sup>\*mic</sup>les* usually branched, rarely congested. *Spikelets* 1-2-, rarely <sup>3-</sup> flowered, not or imperfectly jointed at the base; rhachiHa <sup>TV</sup>, produced beyond the uppermost floret, disarticulating above <sup>^</sup> glumes. *Glumes* membranous, chartaceous or thinly coriaceous<sup>1\*</sup> > more or less convex; the lower usually much the shorter, 3-<sup>t</sup> rarely 7-nerved. *Lemmas* dissimilar; ' the lower usually bo<sup>» ^</sup> shaped, 3-7-nerved, its palea linear or oblong, 2-keeled, empty <sup>o.</sup>, enclosing a <} or a bisexual floret; the upper much shorter, usual. chartaceous or crustaceous, articulated at the base and more or <sup>^</sup> separately caducous, involute, entire or 2-toothed, sonietu<sup>^</sup> provided with two apical setae, usually long awned from the ap<sup>^</sup> or sinus, the awn sometimes very short or absent, genicul<sup>\* e</sup> f and hygroskopically contorting below the middle, the p<sup>»<sup>lea</sup> o</sup> / similar texture, enclosed in the lemma, 2-keeled with wide infle<sup>\*\*.n</sup> flaps (palea sometimes lacking in either or both lemmas), contain<sup>\*\*</sup> usually a bisexual, seldom a \$ floret. *Lodicules* 2. *Stamens* \*- *Styles* 2, free or very shortly united. *Grain* oblong or ellipsoid, &<sup>\*</sup> within the lemma and palea; embryo large; albumen rather hard- Upper lemma awned, hairy at the base; glumes narrow :-'-

Upper lemma bearing 2 apical setae :—

Inflorescence congested into a crowded ovoid or oblong h<sup>e\*</sup> <sup>d</sup> <sup>to</sup>  
 •4-1-7 in. long. A weak annual 1-12 in. high; leaves linear  
 lanceolate, cordate, 1-2 in. long; lower glumes -16--22 in. I<sup>\*\*\*</sup>  
 setose; upper lemmas -16-22 in. long, pilose, awns -3-'35 <sup>in<</sup>  
 long, portion below the knee flat.....1. *avenac\*\*'*  
 Panicle of distant spikes or effuse; leaves linear; upper *le&V\**  
 acaberulous :—

Spikelets mostly sessile or very shortly pedicelled, bifariously imbricate in spikes -2-1-5 in. long. Culms slender, 10-24 in. high; leaves 1-4-5-5 in. long, -05-32 in. wide; panicles up <sup>t0</sup> 5 in. long; glumes bristly from tubercles; upper lemm<sup>ftS</sup>  
 •07—15 in. long, awns -2—35 in. long . . . . . 2. *mesophy<sup>lla,</sup>*  
 Spikelets slenderly pedicelled, not bifarious or imbricate-

(iu>ms slender to rather stout, 13 ft. high: leaves 3-11 in. long< -1-3 in. wide ; panicles 3-12 in. long ; glumes glabrous or setose, ribs often scabrid ; upper lemma -08-12 in. long, awns -25-.37 in. long ; setae 0ft-14 in. long . . . . . 3. \*eto\*<t.

Upper lemma: ia devoid of setae :---

Spikelets small; upper lemma less than 1/4 in. long :—

Both glumes -07 in. or less long, smooth, glabrous or rarely with a few hairs. A slender annual 4-15 in. high; leaves 4-8 in. long, -15-82 in. wide ; panicles effuse, feathery, 5-8 in. long; upper lemmas -03-04 in. long, scaberulous, awns -08-11 in. long, very slender . . . . . 4. PUMila.

Glumes usually, upper always, more than -07 in. long, ribs of lower glume scabrid :.. .

Panicles compact, ovoid or oblong, rarely somewhat effuse, 1-6-8 in. long, branches -3-1-5 in. long, spikelets crowded. Culms 1-12 in. high ; leaves 1-5-7 in. long, -12-42 in. wide ; lower glumes -07-13 in. long; upper lemma -04--06 in. long, scaberulous, awns -13-15 in. long . . . . . 5. holcoide\*.

Panicles open, branches slender, spikelets not crowded :—

Culms very slender, 3-15 in. high ; leaves aggregated near the base, distant above, with a naked peduncle to the Panicle; leaves -5-1-3 in. long, -03-1 in. wide; rachis, the 3-6 branches up to 1 in. long and the pedicels capillary ; glumes more or less setose, lower -06-08 in. long, upper -1-12 in. long ; upper lemmas -04 in. long, puberulous ; awns very slender, -1-12 in. long . . . . . «• pygmaea.

Culms more robust; leaves mostly more than 2 in. long and -07 or more in. wide :—

Glumes glabrous, lower -06-1 in. long, upper 1-U m. long. Culms 3-20 in. high; leaves 1-12 in. long, -12-45 in. wide; panicles 2-20 in. long; upper lemmas -04-06 in. long, papillose, awns -1-11 in. long

7. Metzii.

Glumes usually more or less setose, lower -08-11 in. long, upper -13-15 in. long. Culms 1-4 ft. high; leaves 2-5-13 in. long, -07-2 in. wide; panicles compound, 7-20 in. long, branches slender, up to 6 in. long; upper lemmas -05-6 in. long, awns -16--2 in. long . . . . .

pikelets larger; upper lemma -07 in. or more long, scaberulous ;

Perennials :—

Panicles narrow, 2-7 in. long, branches spieiform, 5-1 in. long, rarely longer, distant or approximate, spikelets crowded, subsessile, rhachis and branches densely villous. 28 in. high ; leaves mostly radical, flat, channelled or stiff; more or less densely villous, rarely glabrous; villous, lower -25 in. long, upper -28 in. long; upper lemma 13 in. long ; awns -18 in. long . . . . .

Panicles effuse, branches long, spikelets pedicel! glabrous :—

Branches of panicles distant; spikelets in distant panicles; Hoots not tuberous, not woolly; culms 15-30 in. long; leaves 6-18 in. long; -32-45 in. wide; panicles long, branches numerous, slender, up to 6 in. long, 5-6 times again branched ; spikelets numerous, imbricate; lower glumes -12-15 in. long, ribs upper -15-18 in. long; upper lemma -07-1 in. long; awns -11-12 in. long . . . . . 10.

Roots tuberous, densely woolly ; culms slender, 6-10 in. high ; leaves 4-8 in. long, -1-2 in. wide ; panicles spreading, 4-9 in. long, branches few, distant, very undivided, up to 5 in. long, pedicels long, capillary, spikelets few, distant; lower glumes -1-13 in. long, glabrous or scabrid on the ribs, upper -15-17 in. long; upper lemmas -07-1 in. long; awns -2-23 in. long; capillary. . . . . 11.

Branches of panicles close, spikelets crowded, rarely rather open with fewer and distant spikelets, 25-6 in. long. 3-24 in. high; leaves 2-3-9-5 in. long, -15-6 in. long; lower glumes -12-16 in. long, upper -16-21 in. long; lemmas -07-09 in. long ; awns -15-18 in. long.. 12.

Upper lemma unawned, devoid of setae, without hairs at the base, perennials :—

Rootstock hairy; culms comparatively slender, 1-4 ft. high; leaves 3-5-15 in. long, -15-6 in. wide; panicles 3-13 in. long; branches 1-2-5 in. long; lower glumes -07-09 in. long, upper lemma 1-11 in. long; upper lemmas -05—06 in. long, papillose . . . . . 13.

Rootstock glabrous; culms rather stout, 20-30 in. high; leaves rigid, 5-11-5 in. long, -3-6 in. wide ; panicles 7-19 in. long, branches up to 6 in. long; lower glumes -08-12 in. long, upper lemma 11-15 in. long ; upper lemma -07-09 in. long, asperous. . . . . 14.

- 1 \ ARUNDINELLA AVENACEA, Munro ; F. B. I. vii. 69.  
W. Gháts ; 2,000-7,500 ft.
- ARUNDINELLA MESOPHYLLA, Nees ; F. B. I. vii. 69.  
W. Gháts ; 1,000-7,500 ft.
- 3 \* ARUNDINELLA SETOSA, Trin. ; F. B. I. vii. 70. *A. nervosa*,  
Nees ; F. B. I. vii. 70.  
I\* all Districts ; sea-level to 7,000 ft. Vern. *Tel.* Pathi  
00 Pagaddi ; *Kan.* Hakki varji hullu, Maraga thattu hullu.  
V<sup>ar</sup> - *hnifera*, C. E. C. Fischer n. var.  
R<sup>o</sup>ot<sup>s</sup> woolly and the setae of the upper lemmas only .02-.025 in.  
long.
- Cuddapa District at Mogilikuppa (Gamble no. 21307), 3,000 ft.
- 1 ARUNDINELLA PUMILA, Steud. *A. tenella*, Nees ; F. B. I.  
vii. 71.  
W. Coast and Ghats ; Mysore State (Meebold) ; sea-level to  
6,000 ft.
- 0 ARUNDINELLA HOLCOIDES, Trin. *A. agrostoides*, Trin. ; F. B. I.  
vii. 71.  
Godavari District at Bison Hill (Barber); Cuddapah Hills  
(Beddome); Mysore State (Meebold); W. Gháts ; 2,000-  
6,000 ft. Vern. *Mai.* Molam pullu.
- 6 ARUNDINELLA PYGMAEA, Hook. f.; F. B. I. vii. 72.  
S. Kanara at Pulicode.
- 7< ARUNDINELLA METZII, Hochst.; F. B. I. vii. 72.  
% 3ore State ; S. Kanara and N. Malabar Districts ; sea-  
level to 3,000 ft.
- 8 ARUNDINELLA LAWII, Hook. f.  
Mysore at Sagar (Meebold); 2,000 ft.
- 9 ARUNDINELLA VILLOSA, Am. ; F. B. I. vii. 72.  
Bababudan, Pulney and Tinnevelly Hills ; Attapadi Valley  
(Fischer); 2,000-7,000 ft.
- 10 ARUNDINELLA NEPALENSIS, Trin. ; *A. brasiliensis*, Hook. f.  
non Raddi; F. B. I. vii. 73.  
Mysore, Pulney and Travancore Hills ; 3,500-7,000 ft.
- 11 • ARUNDINELLA MUTICA, Nees. *A. capillaris*, Hook. f. ; F. B. I.  
vii. 74.  
Cuddapah and Nellore Districts ; 300 to 3,000 ft.



12. ARUNDINELLA FUSCATA, Nees; F. B. I. vii. 74.  
Mysore, Nilgiri, Anamallais and Pulney Hills ; 3,000-7,000 ft.  
An excellent fodder.
13. ARUNDINELLA LEPTOCHLOA, Hook. f ; F. B. I. vii. 70.  
W. Coast from N. Malabar District southwards ; Tinned  
Districts ; at low elevations.
14. ARUNDINELLA LAWSONI, Hook. f ; F. B. J. vii. 7(5.  
Nilgiri Hills ; 3,000 to 6,000 ft. In swamps.

## 70. Avenastrum, Jessen

Erect, usually perennial herbs. *Leaves* usually *exp*<sup>n</sup>ded.  
*Panicles* effuse. *Spikelets* erect, all alike, 2-8-flowcrd, not J<sup>oid</sup>ted  
on the pedicels ; rhachilla articulated at the base and between th<sup>e</sup>  
lemmas. *Glumes* subequal or the upper longer, dorsally roun<sup>d</sup>  
or keeled ; the lower 1-3-nerved ; the upper 3-5-nerved. *Ley*<sup>m</sup>  
all alike, lanceolate or ovate, usually deeply 2-cleft, s<sup>O</sup>inetin<sup>n</sup>  
2-toothed or entire, bearing a geniculate awn with a twisted bas<sup>e</sup>  
from about the middle of the back ; the lowest always long-a<sup>WIC</sup>  
the upper ones with shorter awns or awnless ; paleas nar<sup>ro</sup>  
2-keeled, keels ciliate, containing a bisexual floret. *Lod*<sup>ule</sup>  
*Stamens* 3. *Styles* 2, free. *Grain* long, glabrous or hairy »  
the middle, free within the lemma and palea or adhering to the<sup>the</sup>  
latter.

AVENASTRUM ASPERUM, C. E. C. Fischer n. comb. *Avena aspera*,  
Munro ; F. B. I. vii. 277.

Nilgiri and Pulney Hills ; 6,000-7,500 ft.

Culms up to 4 ft. high ; leaves 1-18 in. long, 1-22 in. wide,  
glabrous or more or less pilose ; panicles 3-12 in. long ; <sup>nes</sup>  
•26—42 in. long, the lower 3-nerved ; lowest lemma -37-42 in.  
long, cleft to the middle ; awns -5-6 in. long.

Var. *Schmidii*, C. E. C. Fischer n. comb. *Avena aspera*, M<sup>unr</sup>  
var. *Schmidii*, Hook. f. ; F. B. I. vii. 277.

Smaller and more slender ; leaves mostly radical and more hairy ;  
panicles smaller and more contracted with shorter branches ; <sup>glumes</sup>  
•17-27 in. long, lower 1-nerved ; lowest lemma, -26-3 in.  
entire ; awns -32—42 in. long.

Nilgiri and Pulney Hills ; 7,000-8,000 ft.

*Ho* <sup>^</sup> *Polyneum* > C<sub>1</sub> E<sub>-</sub> c<sub>-</sub> Fischer n. comb. *Avena polyneura*,  
 ' > \*• B. I. vii. 277.  
 s < malle tha \* < e \* y P \* ca 1 species in culms and leaves ; panicles  
 Ver v e u s G W I ^ ^ on 8 spreading lower branches ; glumes strongly  
 ne r v e H 32 ~ o \* n . \* On ^ 1 o w e r 3-nerved ; lowest lemma 4 in. long,  
 o k f f ~ o r a b o u t I - its length, awns -7 in. long.  
 0 (\* dabetta in the Nilgiri Hills (Gamble); 8,000 ft.

71. Avena, Linn.

Annual (T%) t herbs. *Leaves* usually expanded. *Panicles* effuse,  
 o n t e d or spiciform. *Spikelets* all alike, 2-4-flowered, not  
 j o i n t e d on the J > edicels; rhachilla articulated at the base and  
 S o m e t i m e H b e t w e e n the lemmas. *Glumes* subequal or unequal, the  
 low \* c r U 8 U a ^ y t f c shorter, dorsally rounded or weakly keeled,  
 b r o a d l ^ 0 V a ^ e or ovate-lanceolate, acute, 5-11-nerved. *Lemmas*  
 a l l a i k C j o v a t e or lanceolate, 2-toothed or deeply 2-cleft, awned  
 h r . a u t o b a c k below the cleft or awnless, sometimes only the lowest  
 a w n e d \* a w n geniculate with a twisted base; paleas narrow,  
 2 - k e e l e d >> keels scabrid or ciliate, containing a bisexual floret.  
 ^ . C u e s u s u a l l y 2. *Stamens* 3. *Styles* 2, free, t f r a t n long,  
 g l a r o u s or n a i r y at the apex, free within the lemma and palea or  
 a d h e r i n g to the latter.

in s p e c i e s o \* t i f \* s genus—the Oats—occur only as cultivated crops  
 i n t h e N i l g i r i Hills and an occasional escape is met with. The  
 f o l l o w i n g two species have been recorded :

- 1. *sativa*.  
 n . h i l l a h a i r y J lemmas hairy on the back below the middle ; all  
 t b ^ e l e m m a s a w n e d . . . . . 2. *sterilis*.

1. AVENA SATIVA, Linn. ; F. B. I. vii. 275.

2. AVENA STERILIS, Linn.

A more slender plant than the first.

72. Coelachne, R. Br.

S m a U, erect or trailing marshland herbs. *Leaves* short, flat,  
 c o n v o l u t e or involute. *Inflorescence* of open, contracted or spici-  
 f o r m i n g panicles or a single spiciform raceme. *Spikelets* all alike,

sessile or pedicelled, not articulated, 2-flowered, both florets <sup>per</sup> <sup>fect</sup> <sup>^</sup>  
 or one or both unisexual, if both unisexual the upper ? • <sup>Gl</sup> <sup>^</sup> <sup>i</sup> <sup>f</sup> <sup>j</sup>  
 subequal, membranous, orbicular or elongate. *Rhachilla* articu<sup>a</sup> <sup>te</sup> <sup>two</sup>  
 above the persistent glumes, more or less elongate between the <sup>the</sup> <sup>^</sup>  
 lemmas, not produced above the upper. *Lemmas* dissimilar; <sup>U</sup> <sup>P</sup> <sup>f</sup> <sup>J</sup>  
 lower glabrous or nearly so, considerably longer than the <sup>U</sup> <sup>P</sup> <sup>f</sup> <sup>J</sup>  
 containing a bisexual or a <J floret; the upper coriaceous, more <sup>Lodi-</sup>  
 less hairy, containing a bisexual or a ? floret; both paleate. <sup>an</sup> <sup>o-</sup>  
*culcs* 2. *Stamens* 2-3. *Grain* fusiform or oblong, terete or pl<sup>an</sup> <sup>o-</sup>  
 convex, free within the lemma and its palea.

Rhachis, pedicels and rhachilla terete. Nodes of culms pubescen<sup>t</sup> »  
 spikelets numerous ; grain subterete, -03—04 in. long :—

Panicles interrupted, spiciform, -4-3-5 in. long, branches <sup>a</sup> <sup>P</sup> <sup>ressed</sup>  
 and congested or spreading and scattered, up to -35 in- <sup>lon</sup> <sup>^</sup>  
 usually shorter, bearing up to 9 ovoid spikelets. Culms erect <sup>t</sup>  
 decumbent, 2-5-15 in. high; leaves usually flat, -4--17 i<sup>n</sup>; <sup>1</sup> <sup>ong</sup> <sup>TM</sup>  
 filiform to -13 in. wide; glumes -04-06 in. long, suborbicua <sup>></sup>  
 lower lemmas -06-09 in. long, upper -04-06 in. long, P<sup>llberulo</sup> <sup>US</sup> <sup>/fl.</sup>

1. *pulchella* var. *simpU* <sup>^</sup> <sup>^</sup>

Panicles open, 1-2 in. long, branches spreading, distant, up to <sup>'</sup> <sup>-</sup> <sup>l</sup> <sup>'</sup>  
 long, bearing 1-4 lanceolate spikelets. Culms erect, 4-6 in. hig<sup>h</sup> <sup>^</sup>  
 leaves flat, -5-1-1 in. long, up to -06 in. wide; glumes -05--08 <sup>^</sup> <sup>\*</sup>  
 long, ovate-oblong; lower lemma -1—11 in. long, upper • <sup>07</sup> <sup>09</sup> <sup>1</sup> <sup>\*</sup>  
 long, puberulous. . . . . 2. *perpu* <sup>sill</sup> <sup>d</sup>

Rhachis, pedicels and rhachillas flat. Culms very slender, flacci<sup>'</sup>  
 trailing, up to 18 in. long, nodes glabrous, flowering culms 2-4 <sup>in</sup> <sup>d</sup>  
 high, unbranched ; spikelets in pairs, one sessile and one pf<sup>dicelfc</sup> |  
 glumes -11-14 in. long, the lower ensiform, the upper oblong, concave <sup>></sup>  
 lower lemma -16-17 in. long, upper -08-09 in. long, broadly oblong<sup>'</sup>  
 margins shaggily hairy; grain -06 in. long, plano-convex <sup>..</sup>

3. *Meeboldv-*

1. COELACHNE PULCHELLA, R. Br. ; F. B. I. vii. 271.

**Var. *simpliuscula*, Hook. f.**

Mysore, Nilgiri, Pulney and Travancore Hills ; 2,000-6,000 ft-  
 Vern. *Kan.* Sanna purlai hullu.

2. COELACHNE PERPUSILLA, Thw. *C. pulchella*, R. Br. <sup>var</sup> <sup>></sup>  
*graeillima*, Hook. f. ; F. B. I. vii. 271.

Nilgiri Hills (Schmid).

3. COELACHNE MEEBOLDII, C. E. C. Fischer in Kew Bull. 1934, <sup>169</sup>  
 Cochin State at Chalakndi (Meebold). In tanks.

73. *Zenkeria*, Triii.

Perennial herbs. *Leaves* narrow, flat, convolute or involute. *Panicles* effuse or contracted; branches capillary. *Spikelets* all alike <sup>2</sup>-flowered, laterally compressed, not articulate on the pedicels; Achilla very short, bearded, disarticulating above the glumes, not or very shortly produced beyond the upper lemma. *Glumes* Subequal or the upper longer, 1-nerved, keeled, persistent. *Lemmas* j<sup>^</sup>al and similar, chartaceous, longer than the glumes, usually hairy p<sup>^</sup>w the middle, several-veined; paleas shorter, broad, 2-keeled, long-ciliate, enclosing a bisexual floret. *Lodicules* 2, ovate, denticulate. *Stamens* 3. *Styles* 2, free. *Grain* narrowly oblong.

*Stem* 11-28 in. high; leaves flat or convolute, 2-5-28 in. long, 1-3 in. wide, narrowed into a long stiff channelled quasi petiole; *Panicles* 3-10 in. long, usually effuse; glumes .07-1 in. long; lemmas acuminate or caudate-acuminate, .14-2 in. long . . . . . 1. *Regans.*  
*Culms* 6-10 in. high; leaves rigid, erect, flat with involute margins, 4-12 in. long, .25-3 in. wide, not narrowed into a quasi petiole; *Panicles* 2-5-5 in. long, contracted; glumes .1-13 in. long; lemmas acute, .16-.17 in. long . . . . . 2. *Stapfii.*

<sup>1</sup>> ZENKERIA ELEGANS, Trin. ; F. B. I. vii. 270.

N. Arcot, Salem, Coimbatore and Tinnevely Districts  
 Nilgiri and Pulney Hills ; 1,500-7,000 ft.

<sup>2</sup>- ZENKERIA STAPFII, Henr.

Nilgiri Hills (Perrottet).

74. *Arundo*, Linn.

Tall, stout, perennial shrubs, often woody below. *Leaves* broad, flat. *Panicles* large, decomposed; branches fascicled. *Spikelets* laterally compressed, not jointed on the pedicels, 2-8-flowered; Achilla articulated at the base and between the lemmas. *Glumes* <sup>2</sup>> Persistent, subequal, narrow, acute or acuminate, keeled, 3-nerved. *Annias* lanceolate, entire and acuminate or 2-fid with an arista from the sinus, 3-nerved, long-silky-hairy on the back below the Middle; paleas hyaline, 2-nerved, each containing a bisexual floret. *Lodicules* 2, obovate. *Stamens* 3. *Styles* 2, free. *Grain* oblong.

ARUNDO DONAX, Linn. ; F. B. I. vii. 302.

In most Districts except the W.<sup>^</sup>Coast, usually near water; up to 2,000 ft.

Rhizome creeping ; culms fistular, reed-like, up to 10 ft. <sup>high</sup>  
 leaves ensiform, amplexicaul, 8-24 in. long, .5-2 in. <sup>wide</sup>  
 panicles 9-24 in. long ; glumes .25-45 in. long ; lemmas <sup>2</sup>  
 the uppermost empty when more than 3, lowest .42-<sup>46</sup>  
 long, silky pilose.

Not a good fodder though cattle will eat the young <sup>leaves</sup> &  
 The stems are used in thatch-roofing.

75. *Neyraudia*, Hook. f.

Tall, perennial, leafy herbs or shrubs. *Leaves* flat or <sup>someti</sup>  
 convolute. *Panicles* effuse, decomposed, often nodding. <sup>8P%k\*</sup>  
 laterally compressed, 4-8-flowered; rhachilla shortly bear <sup>ded</sup>  
 jointed at the base or above the first lemma, in which case the <sup>latter</sup>  
 is entire and empty, and between the lemmas. *Glumes* A <sup>^</sup>  
 branous, subequal or the upper slightly the longer, keeled, 1-ner<sup>e</sup> <sup>^</sup>  
*Lemmas* elongate-subulate, often recurved, acuminate, entire <sup>the</sup>  
 shortly 2-fid, with 2 setae and an often recurved arista <sup>from</sup>  
 tip or the sinus, strongly 3-nerved, sides long silky-hairy; <sup>leas</sup>  
 short, oblong, 2-keeled, keels scaberulous, all containing a bisex<sup>\*1</sup>  
 floret or the lowest empty and glabrous. *Lodicules* 2. *Starrier* <sup>3.</sup>  
*Styles* 2. *Grain* linear-subulate, base acute, loose in the lemma-  
 NEYRAUDIA ARUNDINACEA, Henr. *N. madagascariensis*. Hook-  
 F. B. I. vii. 305.

Travancore at Devicolam (Meebold) ; 6,000 ft.

Culms solid, sometimes woody below, 2-8 ft. or more <sup>high</sup>  
 leaves 8-24 in. long, .2-1 in. wide ; panicles up to 3 ft. <sup>h</sup>  
 glumes .08-13 in. long ; lemmas .14-2 in. long.

76. *Phragmites*, Adans.

Tall, stout, perennial shrubs ; rhizomes creeping, often <sup>\*e ry</sup>  
 long ; culms hollow, woody below, leafy nearly to the apex. <sup>^^</sup>  
 flat. *Panicles* lax, usually large, decomposed. *Spikelets* 3-  
 flowered, linear, terete, slightly laterally compressed, not joint <sup>ed</sup>  
 on the pedicels ; rhachilla long silky hairy above the lowest lem<sup>f</sup>  
 jointed between the lemmas, sometimes shortly prolonged <sup>beyon</sup>  
 the uppermost. *Glumes* 2, persistent, membranous, <sup>unequal,</sup>  
 oblong-lanceolate, 3-nerved. <sup>^</sup>*Lemmas* much longer, the <sup>lowest</sup>  
 linear-lanceolate, empty or containing a \$ floret, the rest <sup>hyaline,</sup>

usually subulate-lanceolate, caudate-acuminate, 3-nerved ; callus  
 densely long-silky-hairy ; paleas much shorter, 2-keeled, each  
 containing a bisexual floret, the uppermost sometimes imperfect.  
 Stamens 1-3. Styles 2, free, oblong, terete.

PHRAQMITES KARKA, Trin., F. B. I. vii. 304.

In all Districts except the W. Coast; usually near water and  
 often gregarious in large colonies ; up to 3,000 ft.

Culms robust, sometimes up to 20 ft. high ; leaves stiff, semi-  
 erect, up to 25 in. long, 3-5 in. wide; panicles up to 25 in.  
 long; lower glumes 12-16 in. long, upper 22-24 in. long;  
 lemmas 3-5 in. long.

The stems are made into pipes ; split stems are plaited into  
 mats. The culms and leaves are used for thatching.

#### 77. Polypogon, Desf.

Slender, annual or perennial herbs. Leaves flat. Panicles spici-  
 form or lobed, dense ; rhachis fragile. Spikelets minute, uniform,  
 crowded, laterally compressed, 1-flowered, articulate on the pedicels  
 but persistent. Glumes 2, subequal, concave, keeled, entire or  
 notched, with a slender arista from the sinus or from the back.  
 Lower glumes much shorter, hyaline, broadly oblong, truncate, toothed,  
 mucous or aristate ; palea small, 2-nerved, enclosing a bisexual  
 floret. Lodicules 2. Stamens 1-3. Styles 2, free. Grain obovoid,  
 thinner than the lemma and palea.

POLYPOGON MONSPELIENSIS, Desf.; F. B. I. vii. 245.

Bababudan Hills (Talbot).

Culms tufted, up to 2 ft. high; leaves 1-1 in. long, 1-1 in.  
 wide ; panicles cylindrical or oblong, 5-2 in. long ; glumes  
 6-8 in. long, scaberulous, aristas 2-3 times as long; lemmas  
 4-5 in. long.

#### 78. Aristida, Linn.

Annual or perennial, usually slender, tufted herbs. Leaves flat or  
 often convolute, very narrow. Panicles branched, contracted  
 or effuse. Spikelets all alike, 1-flowered, slender, not articulated  
 on the short or long pedicels; rhachilla very short, disarticulating  
 above the upper glume. Glumes narrow, keeled, 3-nerved,  
 lower usually considerably shorter, but sometimes subequal

or even longer, frequently aristate, sometimes 2-toothed. <sup>^</sup>ute, with a more or less bearded, usually pungent callus, narrow, inv <sup>^</sup> more or less cylindric, often attenuate at the apex, terminated } <sup>^</sup> awn usually consisting of 3 slender, hispidulous, usually <sup>9ube^jjy</sup> setae sessile on the lemma or supported by a short or long, <sup>u s U ^</sup> twisted column, sometimes the 2 lateral setae shorter than ~~the~~ median or entirely suppressed, the median sometimes <sup>P<sup>lumose</sup></sup> lemma sometimes jointed at the middle or near the apex or <sup>J^</sup> above the apex of the stamens ; palea very narrow, short, enibra <sup>^</sup> by the lemma, sometimes absent, the contained floret <sup>bise, X</sup> ~~dr~~ <sup>c</sup>

**Lodicules 2-3. Stamen\* 3. Styles 2, free. Grain narrowly cyl<sup>n</sup>**  
or elongate-ellipsoid ; embryo short or long.

Awn sessile ; setae always 3, subequal :— <sup>., ^0</sup>

Glumes muticous. Culms slender, up to 2 ft. high ; leaves <sup>I\*''</sup> in. long; lower glume -14-23 in. long, upper -24-35 in. <sup>1^</sup> callus -02-03 in. long; lemma -23-44 in. long, keeled; <sup>se</sup> <sup>44-84 in. long</sup> . . . . . 1. *depress<sup>^</sup>*

Glumes, at least one, aristate; callus -05--08 in. long; <sup>g<sup>llinxCV</sup></sup> <sup>4--7 in. long (including the aristas):-</sup> . . . . .

Panicles contracted, 3-15 in. long; branches erect, straight, <sup>ht</sup> main axis terete, axils glabrous. Culms erect, 4-48 in. <sup>h<sup>1</sup> | h<sup>^</sup></sup> leaves up to 20 in. long; lemma -38-5 in. long ; setae <sup>slen < W ' 1-1-5 in. long</sup> . . . . . 2. *^tace<sup>d</sup>*

Panicles effuse, 3-9 in. long, branches spreading, flexuous, main axis angled, axils hairy or prominently tumid. Culms usually straggling and curved, up to 2 ft. high ; leaves up to 10 in. <sup>long</sup> lemma -32--35 in. long ; setae rigid, rather wide at the base, 1-1-8 in. long . . . . . 3. *Hystrix*

Awn supported by a column :—

Setae always 3, subequal :—

Lemma -17-23 in. long, elongate-fusiform, attenuate **upwards**, continuous with the -1-12 in. long column. Culms up to <sup>U ^</sup> high; leaves 1-5-3 in. long, glabrous; panicles usually contracted' 2-4-5 in. long ; glumes shortly aristate, -2-32 in. long ; ca<sup>W<sup>s</sup></sup> <sup>02-03 in. long ; setae -55-8 in. long</sup> . . . . . 4. *mutab<sup>H<sup>is</sup></sup>*

Lemma -08-17 in. long, cylindric, truncate, articulated with the <sup>6-1-4 in. long, scabrid</sup> Column. Culms up to 2 ft. high ; lea<sup>veS</sup> 2-5-5 in. long, flat or convolute, glabrous or puberulous above, thinly pilose near the base ; panicles narrow, lax, 1-5-7 in. long J glumes aristate, -7-9 in. long; callus -08 in. long; setae <sup>l<sup>s</sup>''</sup> 2-4 in. long . . . . . 5. *funiculata*

**Setae** often reduced to 1 > '8-1-2 in. long, the lateral when present  
 finer > 3-4 in. long. Culms tufted, 6-24 in. high; leaves  
 3-4 in. long; panicle lax, often expanded, 3-12 in. long; glumes  
 2-4 in. long, the upper often suppressed; callus  
 1-2 in. long; lemma 3-5 in. long, continuous and not per-  
 articulated with the 3-5 in. long column. . . . 6. *redacta*.

1. ARISTIDA DEPRESSA, Retz. *A. adscencionis*, Linn.; F. B. I. vii. 224 *in part*; S. I. G. figs. 171, 172.  
 In all but the wettest localities; up to 3,000 ft. Vern. *Tel.* Nari balana gaddi; *Tarn.* Kodai balla pullu, Oosi pullu, Nigam pullu, Todapa puvada pullu; *Kan.* Kari sanna hanchi hullu.
2. ARISTIDA SETACEA, Retz.; F. B. I. vii. 225; S. T. G. fig. 173.  
 In all Districts; up to 3,000 ft.  
**Used** for making brooms. Rejected by cattle. Vern. *Kan.* Kodda hanchi hullu, Nai anchi katti.
3. ARISTIDA HYSTRIX, Linn. f.; F. B. I. vii. 225; S. I. G. fig. 174.  
 In all Districts; up to 3,000 ft.  
 Said to be liked by cattle. Vern. *Kan.* Bili vunugada hullu.
4. ARISTIDA MUTABILIS, Trin. et Rupr.; F. B. I. vii. 226; S. I. G. figs. 175, 176.  
 In Uddapah, Nellore, Anantapur, Coimbatore and Tinnevely Districts; up to 1,400 ft.
5. ARISTIDA FUNICULATA, Trin. et Rupr.; F. B. I. vii. 226; S. I. G. fig. 177.  
 In all the Eastern Districts south of the Kistna River; up to 2,000 ft. Vern. *Tel.* Kundeti gaddi.
6. ARISTIDA REDACTA, Stapf.; F. B. I. vii. 227.  
 Bababudan Hills; Mysore State; Bellary and Kurnool Districts.

### 79. *Agrostis*, Linn.

**Erect**, usually perennial herbs. *Leaves* narrow, flat or slightly convolute. *Panicles* contracted or effuse, branches capillary, whorled. *Spikelets* all alike, 1-flowered, not jointed on the pedicels; rachis disarticulating above the glumes, not produced beyond the lemma. *Glumes* 2, equal or unequal, lanceolate, acuminate, veined, muticous, 1-, rarely 3-nerved. *Lemma* shorter, hyaline, truncate, crenate or cleft, often awigged on the back; callus short,



glabrous or bearded with hairs less than half as long; palea usually much shorter, often minute or 0; the contained bisexual. *Lodicules* 2. *Stamens* 3. *Grain* free within the lemma

Lemmas glabrous; callus glabrous or very shortly hairy; Glumes 0.8-1 in. long, keel scaberulous; lemma 0.6-0.8 in. 3-toothed or -lobulate, awnless, palea 0-0.5 in. long. Culms 3 ft. high; leaves 1-2.5-5 in. long, 0.8-1.3 in. wide; Panicles 12 in. long, effuse (contracted in var. *prorepens*). Glumes 1.1-1.4 in. long; keels spinulose-ciliolate, at least in half; lemma 0.6-1 in. long, rounded or truncate and 2-toothed, bearing a geniculate awn 1.4-1.6 in. long on the close to the base, palea 0.6-1 in. long. Culms 10-18 in. leaves 1-2.7 in. long, 0.5-1.7 in. wide; panicles effuse, 5-12 m-

2. *peninsularis*

Lemmas hairy; callus long hairy; palea 0; keels of glumes spinulose-ciliolate;—

Rootstock slender; culms 4-26 in. high; leaves 1-8 in. wide, base not narrowed; panicles effuse, 2-5-7 in. glumes 0.9-1.3 in. long; lemma 0.7-0.9 in. long, truncate, lobed or minutely denticulate, awn 0.9-1.6 in. long.

Rootstock stout, covered with the old sheaths; culms 8 in. cauline leaves few, 1-1.5 in. long, very slender, base not narrowed radical leaves up to 4 in. long and 1.5 in. wide, narrowed into rigid quasi petiole; panicles 1.5 in. long; glumes 1.3 in. lemma 0.9 in. long, truncate, 2-4-dentate, awn 1.8 in. long.

4. *Schmidii*\*

1. AGROSTIS STOLONIFERA, Linn. *A. alba*, Linn.; F. B. L. vii-254 Nilgiri and Pulney Hills; 6,000-7,000 ft.

**Var. *prorepens*, Koch.**

Rather smaller in all its parts; bearing stolons up to 1 ft. panicles contracted.

Nilgiri Hills; 7,000 ft.

2. AGROSTIS PENINSULARIS, Hook. f.; F. B. I. vii. 255.

Nilgiri and Pulney Hills; 6,000-7,000 ft.

3. AGROSTIS PILOSULA, Trin. *Calamagrostis pilosula*, Hook, f. F. B. I. vii. 263.

Nilgiri and Pulney Hills; 3,000-8,000 ft.

4. AGROSTIS SCHMIDII, C. E. C. Fischer n. comb. *Calamagrostis Schmidii*, Hook. f.; F. B. I. vii. 264.

Xikriri Hills (Schmid).

80. Garnotia, Brogn.

Er<\*t, perennial, rarely annual herbs. Leaves flat or convolute. Snicks terminal, branches slender. Spikelets solitary or twin, plated on the pedicels, very small, narrowly lanceolate, terete, J-floored; rhachilla not produced beyond the lemma. Glumes \*• subequal, lanceolate, acute, acuminate, cuspidate or awnea. ^m narrowly lanceolate, entire or notched, awned, sometimes ^ned, rarely muticous; awns straight or with a twisted base, betimes geniculate or recurved, palea narrower, often aur.clea ?^the base; containing a bisexual floret. Lodicules 2. Stamens 3. ^ 2, free. Grain linear or oblong, free within the lemma and Pale &; embryo about § as long.

Culms tufted, nodes glabrous; leaves mostly basal, not articulated on the sheaths, margins of sheaths often woolly :—

^aves complicate, glabrous, basal sheaths flattened, equitant; Panicles contracted, usually very narrow, lemmas gemculately a\*ned:—

Leaves flexuous, not stiff, 9-18 in. long, -1 \*« TMj°\m1? \*TM smooth. Culms slender, 6-20 in. high; panicles 2-5-10 in. long, glumes -19-22 in. long, with cusps -03-05 in. long; Lemma 16 in. long, awn -4 in. long.

Leaves straight, rigid, often trigonous in section, 15, 26 j'' j'' 8, •1-15 in. wide, margins scabrid. Culms stout up to 3 ft. Big parses 8-36 in. long; glumes -16-22 in. long, lower cuspidate upper muticous; lemma -1-15 in. long, awn -22-28 in. W g ^ 2. scop

Leaves flat, pubescent below, narrowed into a long «''\*\*\*\* Petiole, up to 34 in. long, -3-6 in. wide, sheaths not flattened or equitant, bristly. Culms stout, up to 3 ft. high; panicles up to 20 in. long, effuse; glumes muticous or very shortly «w££ -16-2 in. long; lemmas .13-16 in. long, awnless. . . . \*• teaor •.

Culms not tufted, nodes usually more or less hairy; leaves scattered, "at, articulate on the sheaths :—

Panicles contracted; branches subercct:—

Leaves narrowed to the base, 1-8 in. long, 1-4 in. wide, glabrous or pubescent. Culms often geniculate and rooting below, up to 3 ft. high; panicles 2-5-9 in. high; glumes -08-15 in. long; lower usually muticous, upper usually cuspidate; lemma 07i^>. in. long, awn -26-35 in. long.

Leaves broad at the base, rounded or subcordate, 3-10 in. wide, often short-hairy below. Culms up to 3 ft. panicles 5-12 in. long; glumes 1-12 in. long, both lemma 0.9-1.2 in. long, awn 0.2-0.46 in. long . . . . . 5. *arundinacea*  
 Panicles lax, 2-5-5-5 in. long; branches in distant fascicles length spreading. Culms slender, 3-20 in. high; leaves long, 1-3 in. narrowed to the base pubescent; glumes 1-14 in. long, muticous, sometimes apiculate; lemma 0.9-1.1 in. long, awn 0.14-0.43 in. long . . . . . 6. *courtallensis*

1. GARNOTIA SCHMIDH, Hook. f. ; F. B. I. vii. 242.  
 Nilgiri Hills (Schmid, Lawson); 4,500 ft.
2. GARNOTIA SCOPARIA, Stapf ex Hook. f. ; F. B. T. vii. «\*"  
*G. tenuiglumis*, Stapf. ex Hook. f. ; F. B. I. vii. 242.  
 In most localities except the wettest; up to 7,000 ft.
3. GARNOTIA TECTORUM, Hook. f. ; F. B. I. vii. 242.  
 Anamallai Hills (Beddome) ; Travancore State at Devicem (Meebold); 6,000 ft.
4. GARNOTIA STRICTA, Brogn. ; F. B. I. vii. 243.  
 Mysore State, W. Coast and Ghats : sea-level to 4,000 ft.  
 Sometimes epiphytic,
5. GARNOTIA ARUNDINACEA, Hook. f. ; F. B. I. vii. 243.  
 W. Ghats ; up to 6,000 ft. Vern. *Kan.* Dobrai hullu-
6. GARNOTIA COURTALLENSIS, Thw. ; F. B. I. vii. 244.  
 Nilgiri, Pulney and Travancore Hills ; 6,000-7,000 ft.

#### 81. Trachys, Pers.

Annual, diffuse or erect herbs. *Leaves* flat. *Inflorescence* of » solitary spiciform raceme or more usually 2-3 radiating from the apex of a long peduncle ; rhachis rigid, flat, broad, jointed, bearing on the underside of each joint shortly peduncled clusters of 1" sessile spikelets mixed with small, scale-like, rigid, flowerless glumes. *Spikelets* subglobose. *Glumes* dissimilar ; the lower small, coriaceous ; the upper elongate, membranous, 3-5-nerved. *Lemmas* dissimilar; the lower broadly ovate to ovate-oblong, rigidly coriaceous, 9- or more-nerved, its palea minute, empty ; the upper smaller, chartaceous, ovate-lanceolate to linear-oblong, its palea as long, containing a bisexual floret. *Lodicules* 2, very minute or 0. *Stamens* 3. *Styles* 2, free. *Grain* oblong, compressed, within the lemma and palea.

**T**<sub>R</sub>ACHYS MURICATA, Steud. *T. mucronata*, Pers. ; F. B. I. vii. <sup>ŷ</sup> <sup>Λ</sup> ; S. I. G. fig. 121. *Panicum squarrosum*, Retz. ; Roxb. <sup>o</sup> <sup>o</sup> <sup>r</sup> - PL t. 206.

**I**<sub>n</sub> all but the wettest localities, often in sea-shore sand.

**^**lilms diffuse and rooting below or erect and up to 2 ft. high ;

**le**<sub>a</sub><sup>v</sup><sub>e</sub><sup>s</sup> 1-6-5 in. long, 1—5 in. wide, more or less softly-villous ;

racemes -5-2-5 in. long, rhachis .12-17 in. wide, its midrib

stout; lower glume -07-11 in. long, upper -13-14 in. long;

**l**<sup>o</sup>**^**er lemma -21-24 in. long, 9-13-nerved, upper .15-16 in. long.

### 82. *Tragus*, Haller

**A**<sub>n</sub> nual or perennial, small, rigid, decumbent or erect herbs. **Lea**<sub>v</sub><sup>e</sup><sub>s</sub> <sup>\*\*</sup> short, flat. *Raceme* spiciform, solitary, terminal. *Spikelets* sessile in deciduous clusters usually of 2 facing each other, seldom 3 and Very rarely 4 or 5, not or obscurely articulated on a short peduncle, 1-flowered. *Glumes* 2 or the lower suppressed; the lower when present minute, hyaline ; the upper narrowly lanceolate, concave, acuminate, 5-ribbed, ribs armed with hooked spinules. **Lem**<sup>711(1)</sup> solitary, thinly chartaceous, lanceolate, its palea as long, Closing a bisexual floret. *Lodicules* 2. *Stamens* 3. *Styles* 2, free. (*xrain* linear-oblong, free within the lemma and palea.

**^**RAGUS BIPLORUS, Schult. *T. racemosus*, Hook. f. non All. ;

F. B. I. vii. 97 ; S. I. G. figs. 122, 123.

**I**<sub>r</sub><sup>\*</sup> all but the wettest tracts; often in sandy localities ; sea-level to 3,000 ft.

**^**ulms 2-8 in. high; leaves rigid, glaucous, glabrous, margins stiffly ciliate, -4-2 in. long, .1-15 in. wide ; racemes -7-2-8 in.

**J**<sup>o</sup>ng ; upper glume .16—18 in. long, sometimes purple, white and semi-transparent between the ribs, lemma -1—11 in. long, puberulous.

### 83. *Lopholepis*, Dene.

**T**<sub>u</sub>fted, erect herbs. *Leaves* small, flat. *Racemes* spiciform, simple, terminal. *Spikelets* minute, 1-flowered, shaped somewhat like the head of a bird, jointed but persistent on the short pedicels. *Glumes* coriaceous ; the lower incumbent on the upper, consisting of a globose base and a cymbiform limb, keel with a narrow cartilaginous wing, pectinately ciliate with spinules hooked at the **t**<sup>\*</sup>**P** ; the upper lanceolate, acute, similarly keeled. *Lemma* hyaline,

L.P., lep.

minute, broadly oblong, its palea broad, hyaline <sup>con ai</sup> bisexual floret, *Lodicules* 0. *Stamens* 3. *Styles* 2, fr<sup>ee</sup>; <sup>h.h</sup> subulate, concave in front, base gibbously incurved, free with rigid glumes.

LOPHOLEPIS OKXITHOCEPIALA, Steud. ; F. B. I. vil- ^  
Xilgiri (F. Foulkes) and Madura Hills; Madura and Tinne-  
velly Districts and Travancore near the coast.  
Glabrous except the inflorescence; culms slender, <sup>3</sup> 1 in.  
high ; leaves imbricate at the base, distant upwards, <sup>4</sup> .g in.  
long, .05-25 in. wide, margins scabrid ; racemes 2-6 in. long ;  
pedicels puberulous and with a fringe of stiff hairs on <sup>opposite</sup>  
sides; spikelets .07-09 in. long; glumes muricate, re<sup>u</sup>  
»rown at maturity, lower as long as the spikelets, <sup>upper</sup>  
shorter ; lemma .03-04 in. long, curved.

## 84. Perotis, Aiton

Tufted, wiry herbs, usually geniculate at the base. <sup>Leaves flat.</sup>  
*Racemes* spiciform, simple, terminal. *Spikelets* minute, <sup>subulate,</sup>  
1-flowered, articulated on short or rudimentary pedicels, <sup>falling</sup>  
entire. *Glumes* subequal, narrow, tapering into a long, <sup>cap\*</sup> awn.  
*Lemma* hyaline, much shorter than the glumes, its <sup>P</sup> narrower,  
containing a bisexual floret. *Lodicules* 2. *Stamens* <sup>ns</sup> 2.  
*Styles* 2, shortly connate. *Grain* linear, terete, nearly as long  
the glumes and free within them ; embryo J as long.

PEROTIS INDICA, O. Ktz. *P. tetifolia*, Ait. ; F. B. L <sup>vii></sup> 98 ;  
S. I. G. figs. 124, 125.

Common in all Districts ; <sup>on sea-shore sands and elsewhere</sup>  
to 5,000 ft.; usually in dry soils. Vern. *Tel* Nakka pee<sup>llu</sup> ;  
*Nakka toka*; *Tarn*. Narival, Kudrai-val pillu, Thopparai pi  
*Kan*. Nari misai hullu, Jabburu korlai hullu. .jj,  
Culms 2-18 in. high ; leaves closely imbricate below, <sup>ribs</sup>  
pungently acute, .3-2-2 in. long, .15-4 in. wide, <sup>niags</sup>  
spinulose-ciliate ; racemes slender, 1-2-7-5 in. long, <sup>fe a</sup>  
owing to the long awns ; spikelets .06-08 in. long; <sup>glu</sup>  
hispid ; awns .3-65 in. long, usually purplish.

## 85. Zoysia, Willd.

Small, rigid herbs. *Leaves* very narrow, convolute, rigid. <sup>Racemes</sup>  
spiciform, solitary, simple, terminal; rhachis inarticulate, <sup>notched.</sup>

^Pikelets ovoid, laterally compressed, 1-flowered, articulated on  
 Ve<sup>ty</sup> short, rather stout pedicels appressed to the rhachis.  
 (l<sup>ume</sup> single, coriaceous. Lemma smaller than and completely  
 enclosed in the glume, hyaline; palea linear-oblong, containing a  
 Asexual floret. Lodicles 0. Stamens 3. Styles 2, very long,  
 innate below. Grain oblong, free within the lemma and glume.

ZOYSIA MATRICKIA, Merr. *Z. pungens*, Willd. ; F. B. I. vii. 99.

In sea-shore sand on both coasts.

Rootstock wiry, creeping, up to 3 ft. long; culms 1-10 in.  
 high; leaves many, 5-2 in. long; racemes 3-14 in. long;  
 glumes 1-14 in. long.

#### 86. SporobolUS, K. Brown

Perennial, rarely annual, erect, prostrate or creeping herbs.  
 L<sup>aves</sup> narrow, flat or convolute. Particles effuse or spiciform,  
 often pyramidal. Spikelets small or minute, all alike, 1-, rarely  
 2-flowered, jointed on the pedicels or rarely on the rhachis; rha-  
 chilla very short, jointed at the base, not produced beyond the  
 upper or the only lemma. Glumes membranous, muticous, nerve-  
 less or 1-3-nerved, unequal, the lower smaller, sometimes minute,  
 Persistent or falling singly. Lemmas muticous, ovate or oblong;  
 Paleas as long, sometimes emarginate, closely 2-nerved and often  
 splitting between the nerves as the grain matures, enclosing a  
 bisexual floret. Lodicles 2, very minute or 0. Stamens 2-3.  
 %fc» 2, free. Grain oblong, obovoid or pyriform, free within the  
 lemma and palea; pericarp thin, hyaline, loose; embryo large.

Lower glume distinctly shorter than the lemma :—

Upper glume distinctly shorter than the lemma; leaves glabrous,  
 flat, complicate or convolute mixed :—

Panicles effuse :—

Lemma 6 in. or more long :—

Lemma 6 in. long. Culms up to 30 in. high; leaves 4-12  
 in. long, 5-15 in. wide; panicles 4-18 in. long; lower  
 glumes 1-2 in. long, upper 2-4 in. long..1. *diander*.

Lemma 7-8 in. long. Culms up to 3 ft. high; leaves  
 3-24 in. long, 15-23 in. wide; panicles 6-18 in. long; lower  
 glumes 2-3 in. long, upper 4-6 in. long .. 2. *Walchn*.

Lemma 4 in. or less long. Culms up to 15 in. high; leaves  
 5-11 in. long, 1-2 in. wide; panicles 12-20 in. long; lower  
 glumes 1 in. or less long, upper 2 in. long .. 3. *minutiflorus*.

Panicles spiciform or narrow, rarely slightly expanded :—

Leave\* flaccid, usually flat, not pungent, up to 16 in<sup>h</sup> long  
•1-22 in. wide. Not stoloniferous ; culms up to 3 ft<sup>h</sup> S,  
rather robust; panicles 4-14 in. long, sometimes shg<sup>h</sup> X  
expanded ; lower glumes -02-03 in. long, upper 1.4~1.0  
long ; lemma -06-08 in. long . . . . . 4. <sup>itla</sup> <sup>icu<sup>s</sup></sup>

Leaves rigid, usually convolute, pungent. Stoloniferous |  
Panicles subspiciform, sometimes interrupted and flex<sup>u</sup>g  
•3-4-5 in. long. Culms 7-17 in. high; leaves 1.33~2.1<sup>n</sup>  
long, -07-14 in. wide ; spikelets shortly pedicelled ; 10  
glume -04-05 in. long, lanceolate, acute, upper -06--W in<sup>\*</sup>  
long; lemma -06-1 in. long . . . . . 5. <sup>tret</sup>\*\*\*<sup>8</sup>

Panicles strictly spiciform, -7-2-5 in. long. Culms 3-9 \*  
high; leaves -7-2-7 in. long; spikelets sessile, orowde<sup>^</sup>  
lower glumes -02-03 in. long, quadrate, truncate, \*W  
•05-06 in. long ; l e m m a .07 in. long . . . . . 6. <sup>sp</sup>\*\*\*<sup>8</sup>

Upper glume as long as or longer than the lemma :—

Stoloniferous ; leaves glabrous, margins minutely serrulate, con  
volute, rigid, pungent, -7-6 in. long. Culms 2-5-14 in. h<sup>n</sup>  
panicles spiciform or narrowly pyramidal, 1-4 in. long; \* < \*  
glumes -03-04 in. long, upper -06-1 in. long; lemma \* & - < \*  
long . . . . . 7. <sup>orienta</sup> <sup>trS</sup>

Not stoloniferous ; leaves pilose or bristly, rarely nearly glabrous

Panicles contracted, subspiciform, 1-3 in. long. Culms tufted  
1-12 in. high ; leaves flat or convolute, sparsely softly I<sup>80</sup>  
margins serrulate, sometimes ciliate from minute tubercles,  
•6-5-5 in. long, -05-1 in. wide ; lower glumes -04-06 in. long'  
upper -06-08 in. long; lemma -07 in. long . . . . . 8. <sup>pWf</sup>''''<sup>8</sup>

Panicles effuse; leaves flat, base rounded or subcode,  
margins cartilaginous, serrulate and ciliate from tubercles ;-\*

Panicles 1-5-5-2 in. long; rhachis and branches smooth  
Culms tufted, spreading, 2-20 in. high ; leaves glabrous or  
sparsely hairy from minute tubercles, -4-6-5 in. long, \*<sup>15</sup>  
•22 in. wide; glumes glabrous, lower -01-02 in. long, upP<sup>ef</sup>  
•05-07 in. long ; lemma -05-06 in. long.. 9. <sup>coromandelian</sup> <sup>^</sup>

Panicles 3-8 in. long, rhachis and branches scaberulou\*  
Culms tufted, 4-20 in. high ; leaves bristly from tubercle\*  
l-5-5 in. long, -18-45 in. wide ; glumes more or less keeled  
scaberulous on the back and keel, lower -04-05 in. long'  
upper -06-09 in. l<sub>ong</sub> ; l<sub>omma</sub> > .06 in. ,ong

10. *scabrifolius*.

W<sub>e</sub>r g<sub>l</sub>u<sub>m</sub>e a<sub>s</sub> l<sub>o</sub>n<sub>g</sub> a<sub>s</sub> o<sub>r</sub> i<sub>l</sub>o<sub>n</sub>g<sub>e</sub>r t<sub>h</sub>a<sub>n</sub> t<sub>h</sub>e l<sub>e</sub>m<sub>m</sub>a. Culms decumbent below, erect portion 7-10 in. high ; leaves convolute, rarely flat, rigid, pungent, margins smooth, -7-4 in. long, -1 in. wide ; panicles narrow, 1-3 m. long ; glumes and lemma subequal -08--1 in. long

11. *virginicus*.

1. SPOROBOLUS DIANDER, Beauv. ; F. B. I. vii. 247 ; S. I. G. fig. 178.

In all Districts except the W. Coast; up to 3,500 ft.

Readily eaten by cattle. Vern. *Kan.* Navalu dondi hullu, Thoddu karai kandaka hullu.

2. SPOROBOLUS WALLICHII, Munro ex Hook. f. ; F. B. I. vii. 248.

In the central and eastern Districts from Cuddapah southwards ; up to 3,000 ft.

3. SPOROBOLUS MINUTIFLORUS, Link ; F. B. I. vii. 248. S. Kanara and Chittoor Districts.

4. SPOROBOLUS INDICUS, R. Br. ; F. B. I. vii. 247.

Kistna, Nilgiri, N. Coimbatore, Madura and Tinnevelly Districts ; sea-level to 7,000 ft.

A good pasture grass. Hardly distinguishable from some forms of *S. diander*, Beauv. ; both may have 2 or 3 stamens.

5. SPOROBOLUS TREMULUS, Kunth. ; F. B. I. vii. 250 ; S. I. G. figs. 179, 180.

In all Districts except the W. Coast and Gháts; up to 2,500 ft. Vern. *Tarn.* Uppurutnam pillu.

6. SPOROBOLUS SPICATUS, Kunth ; F. B. I. vii. 250.

Deccan, Coimbatore and Tinnevelly Districts; up to 1,000 ft.

7. SPOROBOLUS ORIENTALIS, Kunth ; F. B. I. vii. 251.

Godavari, Kistna, Guntur, Chingleput and Tinnevelly Districts ; usually in saline soils.

8. SPOROBOLUS PILIFERUS, Kunth ; F. B. I. vii. 251.

W. Coast and Gháts ; up to 7,000 ft.

9. SPOROBOLUS COROMANDELIANUS, Kunth; F. B. I. vii. 252 ; S. I. G. figs. 181, 182. *S. commutatus*, Kunth; S. I. G. figs. 183, 184.

In all central and eastern Districts ; sea-level to 3,000 ft.

A poor fodder. Vern. *Kan.* Nari balada hennu hullu.



10. SPOROBOLUS SCABRIFOLIUS, Bhide ; S. I. G. figs-<sup>185, 186</sup> in Coimbatore and Tinnevelly (Wight) Districts; usual black cotton soil.
11. SPOROBOLUS VIRGINICUS, Kunth ; F. B. 1. vii. 249. Coastal sands ; not very common.

## 87. Myriostachya, Hook. f.

Tall, stout, perennial marsh herbs; rootstock thick, <sup>\* 1 K) 1</sup> Leaves narrow, long, flat, equitant. <sup>el on £ \* tfl</sup> Panicles narrow, branches racemed, filiform; pedicels jointed on the branch <sup>q</sup> Spikelets very many, strongly laterally compressed, distichous <sup>^</sup> racemed, 4-20-flowered, not jointed on the pedicels ; <sup>r h a C ? ^</sup> very stout, ultimately fragile at the base and between the <sup>n ^</sup> distant lemmas, not prolonged beyond the uppermost <sup>lellinl . j o</sup> Glumes 2, coriaceous, persistent, subequal, lanceolate, tapering <sup>\* n ^</sup> a rigid awn, 1-nerved. Lemmas coriaceous, ovate-lanceolate <sup>kee</sup> narrowed into a very short, stout, scabrid awn, 3-nerved, smooth; paleas as long, chartaceous, acuminate, <sup>2-towthed,</sup> 2-keeled, keels ciliate, containing each a bisexual floret. <sup>J lodicules</sup> Lodicules 2, very minute. Stamens 3 ; anthers very small. Styles 2, <sup>f ree</sup> Grain obliquely ovoid, subterete ; embryo large.

MYRIOSTACHYA WIGHTIANA, Hook. f. ; F. B. I. vii. 327.

Godavari District at Coringa.

Culms densely tufted, up to 10 ft. high ; rootstock sheath <sup>d</sup>, sometimes floating ; leaves several feet long, up to <sup>-65 ^</sup> wide ; panicles 1-2 ft. long ; spikelets 4-8-flowered ; <sup>g lulXIC</sup> •17—21 in. long.

## 88. Desmostachya, Stapf

Perennial herbs, branched at the base ; branches covered <sup>ftitj</sup> leathery sheaths at or just above the base. Leaves coarse, tufted. Panicles terminal, long, spiciform, often interrupted below ; <sup>>> \* is</sup> stiff ; branches more or less spreading. Spikelets linear, strongly <sup>^</sup> laterally compressed, often very many-flowered, sessile or sub <sup>\*</sup> closely packed and more or less 2-ranked on the lower side of and often at right angles to the rhachis, straw-coloured or tinged with brown or purple, falling entire. Glumes 1-nerved, 1-toothed. Lemmas rigidly membranous, ovate, acute or subacute, <sup>muticous,</sup>

Con/ved, acutol, V \*'ke elod ; paleas slightly shorter, 2-keeled, each  
fining a bisexual floret. *Lodicules* 2. *Stamens* 3. *Styles* 2,  
in ti rQH °k^fucly ovoid, obtusely trigonous, loosely enclosed  
lemma and palea ; embryo about J as long.

Des. MOST ACHY A BIPINNATA, Stapf. *Eragrostis cynosuroides*,  
Beauv. ; P. B. £. yii .324 ., g L G fig 22( . ),

Viz. agapatam, Kistna, Nellore, Chingleput and Bellary Dis-  
tricts ; usually in sandy soil, often in wet places ; at low  
elevations.

Culms stout or slender, 7-36 in. high ; stolons stout, covered  
with shining sheaths ; leaves rigid, tips setaceous, 2-18 in.  
long, .05-3 in. wide ; panicles 2-5-13 in. long ; glumes .04-06  
in. long ; lemmas .06-08 in. long.

89. Leptochloa, Beauv.

Annual, usually slender herbs. Leaves flat or involute. *Panicles*  
branches slender, spiciform. *Spikelets* small, sessile or  
shortly pedicelled, 1-many-flowered, alternate and unilaterally  
2-seriate, not jointed at the base ; rhachilla jointed at the base,  
produced between the lemmas. *Glumes* membranous,  
long or lanceolate, 1-keeled, 1-nerved, the upper the longer.  
*Lemmas* ovate, obtuse or subacute, sometimes cuspidate, 1-keeled,  
3-nerved, the lateral nerves close to the margins, often pubescent ;  
*paleas* shorter, 2-keeled, each containing a bisexual floret or the  
unilateral imperfect. *Lodicules* 2. *Stamens* 3. *Styles* 2, free,  
rain subglobose, oblong-obovoid, compressed or trigonous, closely  
embraced by the lemma and palea, free or cohering to the latter.

Leaves lanceolate, flat, .9-3.5 in. long, .2-.4 in. wide. Culms up to  
4 in. high ; panicles up to 13 in. long ; racemes usually distant,  
1-5 in. long ; spikelets 1-flowered ; glumes linear-lanceolate, acumi-  
nate or caudate, .09-1 in. long ; grain fusiform, obtusely trigonous,  
rarely slightly compressed, grooved on one side, .05 in. long

1. *uniflora*.

Leaves narrowly linear, flat or involute :—

*Spikelets* 1-flowered. Culms 12-30 in. high ; leaves 3-7 in. long,  
1-1.2 in. wide ; panicles 6-13 in. long ; racemes close, .6-2.3 in.  
long ; glumes lanceolate, obtuse or apiculate, .05-.06 in. long ;  
grain ovoid, .03-.04 in. long . . . . . 2. *polystachya*.

Spikelets 2-7-flowered :—

Glumes lanceolate, acute, acuminate or caudate, <sup>not</sup> <sup>nfi</sup> in. <sup>\* 1/2</sup> <sup>^</sup>;

lemmas pubescent or hairy :— <sup>.i--16</sup>

Culms slender, 3-12 in. high ; leaves flat, 1-5-5-4 in. long <sup>></sup> <sup>^</sup> <sup>g#g</sup> in. wide; panicles 2-5 in. long; racemes very slender, <sup>^</sup> <sup>^</sup> in. long ; florets usually 2, sometimes 3 ; grain <sup>subglo</sup> <sup>b</sup> <sup>o</sup> <sup>L</sup> <sup>^</sup> - side gibbous, the other convex, <sup>3'</sup> <sup>/f</sup> <sup>or</sup> <sup>in</sup> .025 in. long . . . . .

Culms comparatively stout, 1-4 ft. high; leaves <sup>.fla</sup> <sup>^</sup> , volute, 2-5-11 in. long, <sup>-1—25</sup> in. wide ; panicles 6-14 <sup>m</sup> <sup>^</sup> <sup>^</sup> racemes 2-4-2 in. long; florets usually 3-6, sometime 7 ; grain ellipsoid to oblong, biconvex or compressed. <sup>4. chine</sup> <sup>^</sup>

Glumes ovate, rounded or retuse, <sup>-06--08</sup> in. long. Culms <sup>up to</sup> <sup>niel</sup> 8 ft. high; leaves flat, 7-17 in. long, <sup>-1--2</sup> in. wide; <sup>P></sup> <sup>^</sup> 4-6 in. long ; racemes <sup>2-3-5</sup> in. long ; lemmas <sup>glabrous</sup> <sup>wit</sup> <sup>the</sup> ; keel <sup>chil</sup> ; grain oblong or obovate-oblong, rounded, <sup>conv</sup> <sup>^</sup> convex, <sup>-05</sup> in. long . . . . . <sup>5- obtUSIJ</sup>

1. LEPTOCHLOA UNIFLORA, Hochst.; F. B. I. vii. 297.  
Chingleput, S. Coimbatore, S. Malabar, Madura and <sup>Tinne</sup> velly Districts ; Travancore ; sea-level to 4,000 ft.
2. LEPTOCHLOA POLYSTACHYA, Benth. ; F. B. I. vii. 298.  
In the eastern Districts from Godavari to <sup>Tinne</sup> velly ; sometimes in marshes ; up to 1,000 ft.
3. LEPTOCHLOA FILIFORMIS, Roem. et Sch. ; F. B. I. vii- 298-  
Vizagapatam, Godavari, Chingleput and Tanjore Distnc <sup>ts, ^</sup>
4. LEPTOCHLOA CHINENSIS, Nees ; F. B. I. vii. 299 ; <sup>S</sup> <sup>l</sup> fig. 212.  
In most Districts ; often in wet places; sea-level to <sup><< 400 ft</sup> <sup>^</sup> <sup>Kan.</sup>  
A moderate fodder. Vern. *Tel.* Cheepura gaddi;  
Kadu sanna kari sajjai hullu.  
Some forms of this species are hardly distinguishable <sup>from</sup> the previous one.
5. LEPTOCHLOA OBTUSIFLORA, Hochst. ; F. B. I. vii. 299.  
Nilgiri and Coimbatore Districts; Cochin State; <sup>\* 1,000-</sup> 2,000 ft.

90. *Eragrostis*, Beauv.

Annual or perennial, usually erect and slender herbs. <sup>Leaves</sup> narrow, flat, complicate or convolute. <sup>terminal</sup> *Inflorescence* of <sup>Spikelets</sup> open or contracted panicles, rarely of simple spikes.

<sup>Sm</sup>W, many-, rarely 1-2-flowered, usually strongly laterally com-  
<sup>Pres</sup>^d, not articulated at the base; rhachilla continuous or  
<sup>art</sup>i: culate between the lemmas, not prolonged beyond the upper-  
<sup>m</sup>ost. *Glumes* 2, usually separately deciduous, broad, obtuse,  
<sup>a</sup>o<sup>u</sup>t<sup>e</sup> or mucronate, never awned, back rounded, 1-keeled, 1-nerved  
<sup>o</sup>\* ^e upper sometimes 3-nerved. *Lemmas* imbricate, longer than  
<sup>the</sup> glumes which they resemble, sometimes acuminate or emar-  
<sup>gina</sup>t<sup>e</sup>, 3-nerved, ultimately deciduous; paleas deciduous with  
<sup>the</sup>ir lemmas or persistent, broad, 2-keeled, keels smooth, scabrid  
<sup>Or</sup> ciliate, each containing a bisexual floret or the uppermost and  
<sup>r</sup>arely the lowermost imperfect. *Lodicules* 2, very minute or 0.  
<sup>Ar</sup>nens 1-3. *Styles* 2, free. *Grain* minute, globose, oblong-ovoid  
<sup>bo</sup> void, free within the lemma and palea.

^Pikelets paniced :—

Rhachilla more or less jointed, breaking up from the apex down-  
Wards :—

Lemmas ciliate :— (1-21)

Lemmas acuminate, mucronate or cuspidate :—

Panicles clavate, dense, sometimes shortly interrupted at  
the base, rather shining, -8-4 in. long ; glumes -06--1 in.  
long, obtuse; lemmas -1-11 in. long; keels of paleas  
narrowly winged, long-ciliate. Culms 4-30 in. high ; leaves  
1-2-5-5 in. long, -1-25 in. wide, usually flat.....1. *spicata*.  
Panicles cylindrical, compact, -8-3 in. long ; glumes -04--06 in.  
long, acute ; lemmas -08 in. long ; keels of paleas not winged,  
lo'ng-ciliate. Culms 8-36 in. high ; leaves 2-5-9 in. long,  
•1-3 in. wide.....<sup>2</sup>- *ciliata*"

Lemmas obtuse, -04--08 in. long ; keels of paleas short to long-  
ciliate. Culms wiry, 4-30 in. high ; leaves 1-5 in. long, -15 in.  
wide ; panicles subspiciform, often lobed, dense or somewhat  
lax, 1-3-5 in. long.....<sup>3</sup>- *coarctata*.

Lemmas not ciliate :—

Panicles spiciform :—

Annuals ; culms slender, 5-10 in. high ; leaves flat or con-  
volute, usually ascending, 2-3-5 in. long, -1-15 in. wide;  
panicles 1-5-2-5 in. long; lemmas -06-08 in. long, their  
lateral nerves very close to the margins; paleas -05--06 in.  
long, ciliae of keels soft, distinctly longer than the width of  
the expanded palea.....<sup>4</sup>- *ciliaris*.

Perennials; culms wiry, 5-20 in. high, leaves often at

[*Eragrostis*.

right angles to the culm ; panicles -5-2-2 in. long ; glumes  
•04--065 in. long, their lateral nerves near the middle of the  
sides; paleas -04—05 in. long, ciliae of keels stiff  
than the width of the expanded palea . . . . .

Panicles more or less effuse :—

Panicles thyriform, 10-24 in. long; branches capillary, scaberulous, pedicles longer than the  
Culms 8-26 in. high ; leaves 8-18 in. long, \*2-\*4 in. glumes -04—05 in. long, obtuse ; lemmas -06 in.  
or emarginate ; grain subglobose, -02 in. long. . . . .

Panicles oblong or linear, not thyriform :—

Grain ovoid, '015—02 in. long ; stamens 3 :—  
Culms 2-18 in. high, more or less viscid panicle ; leaves -7-4-5 in. long, -1-\*2 in.  
convolute ; panicles cylindric or oblong, 1~7 in. long ;  
lower part of rhachis more or less viscid, branches and  
pedicels with minute glands, scented when fresh ;  
glumes -03—05 in. long, obtuse ; lemmas -04  
long . . . . .

Culms 4-18 in. high, no part of plant viscid or glandular ;  
leaves 3-7-5 in. long, -1--25 in. wide ; panicles linear, contracted to oblong and effuse, 1'5-9 m-  
glumes -03-05 in. long, obtuse or subacute ; lemmas  
•04—06 in. long, obtuse or acute . . . . .

Grain obovoid, -01 in. long ; stamens 2 ; panicles more or less interrupted :—

Branches of panicles more or less whorled ; 2-7-, sometimes up to 9-flowered. Culm 6-17 in. long,  
leaves flat or complicate, 4-10 in. long, -12-2 m- panicles 6-13 in. long ; glumes -016--04 m-  
lemmas -035--05 in. long . . . . .

Branches of panicles mostly solitary ; spikelets seldom 6-or 7-flowered. Culms 12-24 in. high ;  
as in the previous species, up to 16 in. long, '25 in. panicles up to 24 in. long ; glumes and lemmas as in  
previous species . . . . .

Rhachilla tough, persistent, lemmas falling off from the upwards :—

Spikelets ovate or ovate-oblong, much compressed, long, -12-18 in. wide, up to 80-flowered, pale or purple.  
o-25 in. high ; leaves 1-7 in. long, -1-2 in wide ; panicles o

or ovoid, -8-10 in. long ; branches usually spreading ; glumes  
 •\*<sup>0</sup>6-1 in. long, acute ; lemmas usually slightly shorter, broad,  
 mucronate, their lateral nerves prominent; paleas not or very  
 narrowly winged, falling with the lemmas ; grain ellipsoid, or  
 obovoid, -025-035 in. long . . . . .<sup>11</sup>- *unioloides*.

Spikelets linear or linear-oblong, slightly compressed, lateral  
 nerves of lemmas weak, or if spikelets flattened and lateral  
 nerves prominent, then the paleas persistent:—

Spikelets more or less fascicled, close, pointing forwards :—

Leaves glaucous, 1-3-12 in. long, -13 in. wide. Culms 5-  
 56 in. high, often stout; panicles narrow, 2-12 in. long ;  
 lemmas -08-1 in. long ; grain oblong or oblong-fusiform,  
 •03-04 in. long . . . . .<sup>12</sup>- *gangeiica*.

Leaves not glaucous, 2-5 in. long, -05--12 in. wide. Culms  
 3-36 in. high ; panicles contracted or oval and more or less  
 effuse, 3-10 in. long ; lemmas -05 in. long ; grain globose or  
 subglobose, -016-025 in. long . . . . .<sup>13</sup>- *nutans*.

Spikelets scattered, spreading or pendulous :—

Upper glume 3-nerved, -08 in. long, lower shorter. Culms  
 10-40 in. high ; leaves 7-14 in. long, -18-32 in. wide, flat,  
 margins usually glandular; panicle oblong, usually open,  
 4-13 in. long, lateral pedicels -04-12 in. long; spikelets  
 linear-oblong, flattish, -24-75 in. long, -08-12 in. wide;  
 lemmas 19-50, lateral nerves strong . . . . .<sup>14</sup>. *cilianensis*.

Both glumes 1-nerved :—

Spikelets -4-1-5 in. long, -08-09 in. wide; glumes -06-  
 •08 in. long, acute ; lemmas 10-70, -07-08 in. long. Culms  
 6-32 in. high ; leaves 3-5-7-5 in. long, -1 in. wide ; panicles  
 ovate, diffuse, 4-12 in. long . . . . .<sup>15</sup>- *tremula*.

Spikelets up to -8 in. long ; lemmas 6-15 :—

Panicles rather stiff ; lateral pedicels usually less than  
 •12 in. long :—

Glumes subequal or the upper only slightly the longer.

Leaves 1-5-7 in. long, -08-18 in. wide, margins  
 often glandular, mouths of sheaths bearded.  
 Culms 3-22 in. high, tufted ; panicles oblong, open,  
 3-7 in. long ; spikelets pale green to dark purplish  
 or olive-grey, -13-3 in. long, -08 in. wide ; glumes  
 •04-•07 in. long ; lemmas -07-08 in. long ; grain  
 globose or ellipsoid-globose, -025-035 in. long

16. *poaeoides*.

*Eragrostis.*

Leaves 17 in. long, -1 in. wide, <sup>margin</sup> glandular, mouths of sheaths naked. Culms <sup>1</sup> in. high ; panicles oblong, 1-5-6 in. long, 2 in. long, .04—05 in. wide; glumes long; lemmas .05 in. long; grain .025 in. long.

Lower glume .02-.025 in. long, upper glume .05 in. long; culms very slender, 2-18 in. high; leaves rigid, 4-4-8 in. long, .04-1 in. wide, 3-5 times glandular; panicles oblong, open, 1-1.5 in. long; spikelets 3-6 in. long, .05 in. wide; grain .06-07 in. long ; grain oblong, truncate at dorsally flattened and grooved. .02--03 in. long.

Panicles lax, branches slender, flexuous or lateral pedicels .12-36 in. long; lateral nerv lemmas faint :—

Leaves 2-13-5 in. long, -1-12 in. wide, sheaths naked. Culms 4-36 in. high ; oblong to lanceolate, 2-6-5 in. long, branches or 2-nate; spikelets 3—8 in. long, .06--08 in. long; glumes hyaline, lower .02-025 in. long, obtuse, slightly longer, truncate ; lemmas obtuse, .07, .08 long; grain oblong, dorsally grooved, .06-07 in. long.

Mouth of sheaths bearded; grain .03-.04 in. long; branches of panicles often whorled :—

Spikelets 16-3 in. long, .04 in. wide, 2-24 in. high ; leaves 2-9 in. long, 1-1.2 in. long; panicles oblong or pyramidal, open or 4-13 in. long; lower glume .025-.03 in. long; upper .05-.06 in. long; lemmas .08 in. long; grain ellipsoid, base laterally apiculate, .04 in. long.

Spikelets 16-24 in. long, .08 in. wide, 7-30 in. high ; leaves 3-5-17 in. long, .08—1 in. long, upper slightly the longer; grain .01 in. long; grain subquadrate, .03 in. long.

21. *mtF*

Spikelets secund on a simple spike with a slender rachis alveolate  
 ^ hispidulous on the side on which the spikelets are inserted ; keels

°\* paleas in all either winged or not:—

Leaves convolute or complicate, very slender, finely acuminate,  
 Puberulous above, 1-7-5 in. long. Culms 6-24 in. high; spikes  
 4-11 in. long; spikelets slightly to much compressed, linear to  
 ovate-oblong, .25-8 in. long, .08-18 in. wide; glumes .07-14 in.  
 long, lower usually acuminate ; lemmas 13-53, orbicular or broader  
 than long, convex, keeled, obtuse or apiculate, keels of paleas often  
 distinctly winged ; grain broadly ellipsoid or subglobose, often

\*vw i . . . . . 22. *bifaria*.  
 obtusely trigonous, .025 in. long . . . . .

Leaves glabrous above ; spikes 3-8-5 in. long ; keels of paleas nor  
 or very narrowly winged :—

Leaves flat or complicate, rather rigid, apex rounded, .0-4 in. lon^,  
 .08-12 in. wide. Culms 4-18 in. high; spikelets nearly terete,  
 .24-75 in. long, .0(>)-1 in. wide ; glumes .05-06 in. long, obtuse  
 or Hubacute; lemmas 9-42, very broadly ovate, obtuse .08 in.  
 long; grain subglobose-ovoid, .026 in. long . . . . 23. *brathyphy*Ua.

Leaves convolute or complicate, 7-12-5 in. long, .08-1 in. wide.  
 Culms 10-15 in. high ; spikelets ovate-lanceolate, much com-  
 pressed, .28-3 in. long, .1-12 in. wide; glumes .06, 1 in. long,  
 acute or acuminate; lemmas 12-30, .1-11 in. long obtuse oi  
 subacute ; grain ellipsoid-oblong, .04 in. long . . . . 24. *Waikeiu*

1. ERAGROSTIS SPICATA, Jedwabn. *E. phleoides*, Stapf ; F. B. I. vii. 313.

Ganjam, Godavari and Salem Districts ; Bangalore ; up to  
 3\*500 ft. Vern. *Kan.* Kadu nawanai hullu.

2. ERAGROSTIS CILIATA, Nees ; F. B. I. vii. 313.

Ganjam, Vizagapatam, Rampa and Godavari Districts.

- 3- ERAGROSTIS COARCTATA, Stapf.; F. B. I. vii. 313.

East Coast Districts ; Mysore State ; up to 2,000 ft.

4. ERAGROSTIS CILIARIS, Link ; F. B. I. vii. 314.

Chittoor and S. Arcot Districts.

5. ERAGROSTIS RIPARIA, Nees. *E. tenella*, Roem., et Sen. var. *riparia*, Stapf ; F. B. I. vii. 315.

In most Districts ; sea-level to 3,000 ft.

A good fodder. Vern. *Kan.* Kadu kambu hullu. . . . .

- ◇ ERAGROSTIS ASPERA, Nees ; F. B. 1. vn. <514.

Kurnool, Salem, Coimbatore, Nilgiri, S. Arcot, Iriohmopoh  
 and Madura Districts ; sea-level to 2,000 ft.



\* <ch var>  
/ . KKA(JHOSTIS VISCOSA, Trin. *E. tenella*, Koenig. ct -1J<  
*a'tcosa*, Stapf; F. B. I. vii. 315.

In all Districts; sea-level to 2,500 ft. l by

Usually very sticky and scented. Said to »\* di-sllke(  
cattle. Vern. Tel. Bankasigarantha. ^

8. ERAGROSTIS PLUMOSA, Link. *E. tenella*, Rocz. et Sch- vt  
• *plinnosa*, Stapf; F. B. I. vii. 315.

In all Districts; sea-level to 4,000 ft. na y>

A good fodder liked by horses and cattle. Makes good ligW ll"

Vern. Tel. Chinna garikai gaddi; Kan. Sanna purlai hu^ ^

9. ERAGROSTIS JAPONICA, Trin. *E. interrupta*, Beauv.  
*tenuissimi*, Stapf; F. B. I. vii. 316. j

Godavari, Nilgiri and Tinnevely Districts; Mysore »»  
Travancore States; up to 3,000 ft. tf§

10. ERAGROSTIS DIARRHENA, Steud. *E. interrupta*, Beauv. v  
*diarrhena*, Stapf; F. B. I. vii. 316. to

In the Northern and Eastern Districts; Travancore; up  
1,000 ft.

Var. *Koenigii*, C. E. C. Fischer n. comb. *E. interrupta*, Beauv.  
var. *Koenigii*, Stapf; F. B. I. vii. 316; S. I. G. fig. 217.

Panicles with short dense branchlets.

In most Districts; sea-level to 3,000 ft.

Readily eaten by cattle. The culms are used for making  
brooms. Vern. Tarn. Kanjara pullu; Kan. Kadu g asagasai  
hullu, Pini hullu.

11. ERAGROSTIS UNIOLOIDES, Nees. *E. amabilis*, W. et A.;  
F. B. I. vii. 317; S. I. G. fig. 218.

In all Districts; often in wet places; up to 7,000 ft.

The glumes are often purple or pink. Vern. Tel. Udara ga ddi.

12. ERAGROSTIS GANGETICA, Steud. *E. elegantula*, Steud.; F. B. I.  
vii. 318.

In all Districts except on the W. Coast; up to 7,500 ft.

Readily eaten by cattle.

13. ERAGROSTIS NUTANS, Nees. *E. stenophylla*, Hochst.; F. B. I.  
vii. 318.

In all Districts; up to 2,000 ft.

Headily eaten by cattle in the absence of a better grass. Vern.

r- Looha bena; Tel N.kurmaral, Urenkai, Pedda garikai.

- M- EUAOROSTIS cILIANENSIS, Link. *K. wijor*, Host- ; F. B. I. vii. 320 ; S. I. G. figs. 221, 222.  
In all Districts except on the W. Coast; up to 4,000 ft.  
Said to be liked by cattle. Vern. *Kan.* Bettada akabu hullu.
15. ERAGROSTIS TREMULA, Hochst.; F. B. I. vii. 320 ; S. I. G. figs. 219, 220.  
Godavari, Kistna, Anantapur, S. Kanara and Tinnevelly Districts.  
Said to be a good fodder, but the foliage is too scanty to yield much substance. The slender pedicels allow the spikelets to stir with the slightest movement of the air and in that respect it resembles the European Quaker-grass. The seeds are sometimes eaten by the poor.
16. ERAGROSTIS POAEOIDES, Beauv. *E. minor*, Host.; F. B. I. vii. 321.  
In the Northern, Central and Eastern Districts; up to 7,000 ft. Vern. *Tel.* Goob-bai gaddi; *Kan.* Dodda purla hullu.
17. ERAGROSTIS ROTTLKRI, Stapf; F. B. I. vii. 321.  
Tranquebar (Rottler).
18. ERAGROSTIS WILLDENOVIANA, Nees ; F. B. I. vii. 322 ; S. I. G. figs. 223, 224.  
In the Central and Eastern Districts from Kistna southwards. Vern. *Kan.* Kari jontu hullu.
19. ERAGROSTIS TENUIFOLIA, Hochst.; F. B. I. vii. 322.  
Mysore State ; Bellary, N. Coimbatore, Salem, Madura and Tinnevelly Districts; Nilgiri, Pulney and High Way Mountains ; up to 7,000 ft. Vern. *Kan.* Thodda karaka hullu
20. ERAGROSTIS PILOSA, Beauv. ; F. B. I. vii. 323 ; S. I. G. fig. 225.  
In all Districts except on the W. Coast; up to 7,000 ft.  
In some localities said to be much liked by cattle, elsewhere reported to be rejected. Vern. *Kan.* Kadu sanna samai hullu.
21. ERAGROSTIS NIGRA, Nees ; F. B. I. vii. 324.  
N. Coimbatore, Nilgiri, Pulney and Tinnevelly Hills ; 2,000-7,000 ft.

22. KKA(KO)STIS HIFARIA, Wight ex Steud. ; F. B. I. <sup>vii</sup>; <sup>^</sup> S. I. O. fig. 227. *E. coromandeliana*, Trin. ; F. B. L. VH-  
In all Districts ; up to 4,000 ft. <sup>^</sup>  
Reported to yield good fodder. Vern. *Tel.* Gubbikal <sup>gNasai</sup>  
Nooli gaddi, Wooda tallum ; *Kan.* Kodi mara hullu,  
hullu.
23. ERAGROSTIS BRACHYPHYLLA, Stapf; F. B. I. vii. 327. <sup>^</sup>  
In the Central and Eastern Districts, from Vizagapa<sup>tam</sup>  
Coimbatore.
24. ERAGROSTIS WALKERI, Stapf.  
Kurnool District on Cum bum Hill (Bourne).

91. *Halopyrum*, stapf

Tall, stout, perennial herbs; rootstock creeping, branches <sup>id.</sup> sheathed; roots vermiform. *Leaves* convolute, narrow, rigid. <sup>t.</sup> *Panicle* ovoid, elongate; branches alternate, spiciform, short. <sup>»</sup> pedicels not jointed on the branchlets. *Spikelets* large, <sup>»</sup> branched, <sup>»</sup> flowered, strongly laterally compressed, sessile or shortly peduncled. <sup>he</sup> not jointed on the pedicels; rachilla very short between the <sup>d</sup> lemmas, jointed at the base and between the lemmas, not producing beyond the uppermost one, silky hairy. *Glumes* coriaceous subequal, ovate-lanceolate, acuminate or apiculate, lower <sup>3.</sup> 1-nerved, upper 5-nerved. *Lemmas* coriaceous, distichously imbricate, ovate-oblong, cymbiform, 3-nerved; paleas as long, subacute, 2-keeled, each enclosing a bisexual floret. *Lodicules* 2. *Stamens* <sup>3.</sup> 3. *Styles* 2, free. *Grain* oblong or ellipsoid, compressed, more or less deeply hollowed or concavo-convex, free within the lemma and palea; embryo large.

HALOPYRUM MUCRONATUM, Stapf; F. B. I. vii. 328.

Coast of Tinnevely District and on Krusadai Island.

Culms 5-24 in. high; leaves 4-12 in. long; panicles 6-10 in. long; spikelets 5-9 in. long, 10-17-flowered; glumes 3-35<sup>in.</sup> long. Vern. *Tarn.* Uppukarai pullu.

92. *Diplachne*, Beauv.

Tufted herbs. *Leaves* narrow, flat or convolute. *Panicles* 1\*\*, erect, simple or nearly so, branches slender, simple. *Spiked*

Orally compressed, sessile or subsessile, few- to many-flowered, not articulated at the base; rhachilla articulated between the lemmas, not prolonged beyond the terminal. *Glumes* membranous, the upper the longer, persistent, oblong-lanceolate, keeled, 1- $\bar{d}$ -nerved. *Lemmas* rather longer, thin, elliptic-oblong, tip <sup>ATM</sup>»\*\* 1-3-nerved, mucronate or awned, keeled; paleas oblong, 2-keeled, staining each a bisexual floret. *Lodicules* 2. *SUzmem* 3. *Styles* 1, free. *Grain* ovoid-oblong, subtrigonal, free within the lemma and Palea.

DIPLACHNE FUSCA, Beauv. ; F. B. I. vii. 329.

Kistna, Anantapur, Malabar and Tinnevely Districts; Travancore State; at low elevations.

Culms up to 5 ft. high; leaves 4-18 in. long, rarely flat; panicles 3-5-13 in. long; spikelets 4-13-flowered, 2-4-5 in. long; glumes .08-11 in. long; lemmas 12-14 in. long, margins and margins of paleas hairy.

Buffaloes are said to eat it readily. Vern. *Tarn. Mand. pillu.*

### 93. Dichaetaria, Nees ex Steud.

Slender perennial herbs. *Leaves* narrow, flat. *Panicles* of a few racemes on a long simple axis. *Spikelets* few, distant, 1-flowered; narrow, terete, pedicelled, not jointed at the base; rhachilla jointed at the base, produced beyond the lemma into a filiform arista bearing a minute empty glume below the middle. *Glumes* 2, equal or unequal, lanceolate, acuminate, 3-nerved, the upper subanstate, separately deciduous. *Lemma* much longer, very narrow, apex bifid with a long recurved awn from the sinus, 3-nerved; callus elongate, bearded; palea as long, finely acuminate, entire or minutely 2-toothed, 2-nerved, containing a bisexual floret. *Lodicules* 2, fleshy. *Stamen* 3. *Styles* 2, free. <\*>» very narrow.

DICHAETARIA WIGHTII, Nees ex Steud. ; F. B. I. vii. 300.

Tranquebar (Rottler); rare.

Culms 1-2 ft. high; leaves nearly as long, 1-3 in. wide, mostly basal; panicles 8-18 in. long; racemes slender, up to 4 in. long; glumes 3-4 in. long; lemmas 6-7 m. long; awns 9-1 in. long.

94. Oropetium, Xrin.

Dwarf, densely tufted, annual or perennial herb, setaceous. Spikes solitary, terminal, slender, 2-ranked; solitary, sessile, more or less sunk in the alternating hollows in the rhachis, 1-4 flowered; rhachilla slender, alternating above the glumes and between the lemmas, when one. Glumes 2, subequal and persistent in the upper if more than one, otherwise the lower glume very small or narrow, rigid, sometimes closing the hollow of the rhachis, overlapping the florets, lemmas hyaline, ovate to oblong, 1-3 paleas as long, 2-keeled, containing a bisexual floret or, than one, the uppermost rudimentary. Lodicules 2, thin Stamens 3. Styles 2, free within the lemma and palea.

OROPETIUM THOMAM M, i rm. ; F. H. 1. vii. 366 ; Rottboellia Thomaea, Koen.; Roxb. O^r. PL t. 132, lower ng-

In all the drier localities ; sea-level to 4,000 ft. Whole plant not exceeding 4 in. high, forming hard tussocks; leaves 2-5-1 in. long, often curved, more or less hairy ; 4-1-5 in. long; rhachis compressed, undulating; glumes 0.8-1.2 in. long ; lemmas semicircular, 0.5 in-

95. Microchloa, R. Br.

Slender, usually perennial, tufted herbs. Leaves filiform, volute, subsetaceous, pungent, the lower curved. Spikes solitary, terminal, very slender, often curved. Spikelets all alike, very 1-flowered, alternate and secund in two closely approximate erect, not articulated at the base ; rhachilla disarticulating the glumes, not prolonged beyond the lemma. Glumes 2, subequ

acuminate. Lemmas much smaller, 2, as long, 2-keeled, containing a bisexual floret. Lodicules 2, free. Stamens 3. Styles 2, free. Grain oblong, within the lemma and palea ; embryo as long.

MICROCHLOA INDICA, Beauv. M. setacea, R. Br.; 283.

Rottboellia setacea, Roxb. Cor.. PL t. 132, upper fig-

Uodavuri and Bellary Districts; Mysore State ; Nilgm and l'ulney Hills ; sea-level to 6,500 ft. ; often growing on walls. Culms very slender, 1-18 in. high ; leaves -4-3-0 in. long, spikes 1-7 in. long, purplish ; rhachis rounded on the back, channelled in front, with the sessile spikelets inserted on either margin; glumes .1 in. long. Vern. *Tel.* Nagavamu gadd.; *Kan.* Navalu bannada hullu.

96. *Melanocenchris*, Xees

«»>nll. tufted, annual or perennial herbs. *Leaves* rigid, flat or involute. *Inflorescence* of sessile or shortly peduncled clusters oi 4-5 spikelets secund on a flattened, terminal, solitary axis. *t>p\*e- \*\* sessile, not articulated at the base, 2-flowered ; rhaehilla jointed at ^c base and between the lemmas, prolonged beyond the upper »nd sometimes bearing 1-2 empty scales (abortive lemma and palea of a third floret). Glumes 2, coriaceous, narrow, persistent, attenuated '»to a scabrous arista, the upper broader, with hyaline margins. <\* %\* thinly membranous, cymbiform or broadly ovate, acute, entire and cuspidate or 3-cuspidate, keeled or nearly flat; paleas narrow, 2-cuspidate, 2-keeled, the lower containing a bisexual floret, ^e upper a <J. Lodicules 2, minute. Stamens 3. Styles 2, free. Grain oblong, free within the lemma and palea.*

"erennial; culms 6-17 in. high ; leaves flat, linear or ensiform, mostly aggregated at the base, in elongated culms, narrower cauhne ones also Present, -7-4 in. long, -05-17 in. wide; rhachis 1-5-3-6 in. long; ^umes (including aristas) -23-31 in. long, edges densely cihate; Achilla puberulous; lemmas -16-18 in. long, entire or <sup>TM n u t e J</sup> 2-toothed, cuspidate; paleas 2-toothed, back between ^ \*\*\* J ^ » channelled ; grain linear-oblong. . . . . <sup>mc a.</sup>

Annual; culms 2-7 in. high ; leaves convolute, very narrow' 4-1-7 in- long, not aggregated at base; rhaehis -7-1-3 in. long; rhach.lla 8>abrous; lemmas -18-21 in. long, shortly 3-aristate; paleas 2- °<<pidate, back between the keels flat; grain elliptic, »>»«»i<sup>c ^ "</sup> Pressed plano-convex ; glumes as in *monoica*. . . . . <sup>2- R V ea</sup>

- 1- MELANOCENCHRIS MONOICA, C. B. C. Fischer n. comb. non O. Ktz. *Gracilea mutans*, Koen.; F. B. I. vii. 283; S. I. G. fig. 187. In dry localities from the Kistna River to S. Arcot; N.lgir. District (Perrottet); up to 2,000 ft.

2. MELANOCENCHRIS ROYLEANA\*, Nees. *Gracilea Royleana*, Hook.  
f.; F. B. I. vii. 284 ; S. I. G. fig. 188.

Mysore State ; Guntur, Bellary, Cuddapah, Chingl<sup>e</sup>P<sup>u</sup><sup>t</sup> ^  
Kollegal Districts ; in dry localities ; up to 2,000 ft.

## 97. Tripogon, Roth

Slender, often densely tufted herbs. *Leaves* mostly basal, very narrow, usually convolute. *Spikes* terminal, solitary, slender. *Spikelets* uniform, sessile, unilaterally 2-seriate, few-many-flowered, not articulated on the rachis ; rachilla produced between lemmas, not prolonged beyond the terminal, jointed at the base. *Glumes* membranous, 1-nerved ; the lower usually lodged in furrow of the rachis, 1-toothed or -lobed on one side ; the upper longer, entire or notched at the tip, mucronate or aristate, inserted distinctly higher on the rachilla. *Lemmas* ovate, dorsally convex, 2-fid and awned from the sinus or 4-fid with the outer lobes awned the inner lobes membranous and rarely awned, rarely truncate and mucicous, 3-nerved ; paleas broad or narrow, complicated, usually truncate, keels ciliate, each containing a bisexual floret except the 1 or 2 terminal which are imperfect. *Lodicules* 2. *Stamens* 3. *Styles* 2, free. *Grain* very narrow, free within the lemma and palea. Culms simple, slender, not thickened by the old sheaths ; leaves not equitant, rigid or pungent:—

Lemmas 2-fid or entire :—

Lemmas 2-fid, awned or aristate from the sinus :—

Lemmas distinctly shorter than their awns :—

Awns finely capillary, flexuous, .8-1 in. long ; lowest lemma .8-1 in. long, 2-fid, lobes acute ; paleas not winged.

Culms very slender, 1-5-7 in. high ; leaves 1-5-10 in. long ; spikes 6-14 in. long ; spikelets remote, few-flowered ; glumes cuspidate or aristate. . . . . 1- capillary

Awns geniculate or straight, not flexuous, .3--6 in. long

Lobes of lemma with aristas -16—22 in. long ;

puberulous, -11-14 in. long ; awns geniculate, .42-6 in. long ;

paleas not winged. Culms slender, .5-3 in. long ;

leaves 1-2 in. long ; spikes .3-2-5 in. long ; spikelets separated, few-flowered ;

glumes acuminate, .13—2 in. long . . . . . 2. p & K perculus.

Lobes of lemma triangular, acute, lemma .2--25 in. long

awn not geniculate, curved, -3-36 in. long; paleas broadly winged. Culms 4-12 in. high; leaves 3-7-5 in. long; spikes 3-9 in. long; spikelets approximate, many-flowered, -5-1-5 in. long; glumes often 2-toothed and -mucronulate, upper -22--3 in. long. . . . . 3. *Wightii*.

Lemma longer than its arista, -13-16 in. long, lobes obtuse, arista -08—12 in. long; paleas narrowly winged. Culms 7-15 in. high; leaves 2-7-5 in. long; spikes 2-9 in. long; spikelets -3-9 in. long, many-flowered; glumes acute, upper •13-16 in. long. . . . . 4- *Jacquemontii*.

Lemmas rounded or truncate and minutely 3-toothed, -1 in. long, Wuticous or with 1 short arista; paleas not winged. Culms 1-4 in. high; leaves -5-3 in. long; spikes 1-3-5 in. long; spikelets 1-2-flowered; glumes coriaceous, obtuse, upper -13 in. long

5. *Roxburghianus*.

Lemmas 4-fid, -08—15 in. long, 2 inner lobes short, acute, with an arista from the sinus -08-13 in. long, 2 outer short, bearing aristas '°7-1 in. long; paleas not winged. Culms 4-24 in. high; leaves 3~15 in. long, glabrous to densely hairy; spikes 2-11 in. long; 8Pikelets usually close, several-flowered; glumes notched or 2-fid, uPper -16-23 in. long. . . . . G- *bromoides*.

Culms branched, thickened below by the imbricate, old leaf-sheaths. Rer and exserted above, 1-8 in. long; leaves -4-2 in. long, equitant, rid, pungent, minutely hispidulous above; spikes 1-5-2-5 in. long; pikelets approximate, 7-9-flowered; glumes membranous, -12-16 in. u"ng; lowest lemma -1 in. long, 2-fid, its arista -03-04 in. long; pa<\*as not ringed . . . . . 1, *Puvigens*.

L TRIPOGON CAPILLATUS, Jaub. et Spach.; F. B. I. vii. 285.

Mysore and Cochin States (Meebold); Wynaad (Boddome); 3,000r4,00() ft. ; often epiphytic.

2- TRIPOGON PAUPERCULUS, Stapf; F. B. I. vii. 285.

Bababudan Hills and Mysore State (Meebold); Travancore at Peermade (Venkoba Rao); 2,000-6,000 ft.

({rowing on trees and rocks.

3- TRIPOGON WIGHTII, Hook. f.; F. B. I. vii. 286.

Horsleykonda; Bellary District; Nilgiri Hills; Cochin and Travancore States; 1,000-6,000 ft.

4- TRIPOGON JACQUEMONTII, Stapf; F. B. I. vii. 286.

Xilgiri Hills; Coimbatore District; Travancore; up to 8,800 ft.



5. *TRIPOGON ROXBURGHIANUS*, Bhide. *Lepturus Roxburg* Steud. ; F. B. I. vii. 365.

Guntur, Cuddapah, Anantapur and Bellary Districts.

In dry places among rocks.

6. *TRIGOPON BROMOIDES*, Roth; F. B. I. vii. 287. W. Gh'ats; Mysore State; Bellary, Cuddapa and Districts; Travancore ; 1,000-7,500 ft.

Often on rocks.

7. *TRIPOGON PUNGENS*, C. E. C. Fischer in *Kew Bull.* S. Coimbatore District at Punachi in the Ananiallais Pulney Hills at Neutral Saddle (Bourne); 3,000-4,

#### 98. *Enteropogon*, Nees

Erect, sometimes tufted, perennial herbs. Leaves narrow flat, the upper sometimes involute. Spikes slender, sometimes twin ; rhachis flat or trigonous. Spikelets sessile, not jointed at the base, 1-3-flowered ; rhachilla the base, continuous between the lemmas and prolongs the uppermost. Glumes persistent, hyaline, acuminate, keeled, the upper much the longer. Lemmas diminishing upwards, the lowest rather longer than the upper glume, taceous, 3-nerved, more or less keeled, entire or shortly awned from the sinus in continuation of the keel; paleas lanceolate, obtuse or 2-toothed, 2-keeled, keels scabrid, each containing a bisexual floret. Lodicules 2, minute. Stamens 3, 2, free. Grain narrow, free within the hardened lemma and

*ENTEROPOGON MONOSTACHYOS*, K. Schum. *E. melicoides*,

F.B.I, vii. 284 ; S. I. G. fig. 189.

In all Districts from Mysore State and Cuddapah south\* except on the W. Coast; sea-level to 2,000 ft.

Culms up to 3 ft. high, densely tufted ; leaves 2-5-21 m-14 long ; •1-25 in. wide ; spikes 4-8 in. long ; lower glume -09-long ; long, upper -22-27 in. long ; lowest lemma -27-31 in- awns -24-3 in. long. Vern. *Tarn*. Kannai pillu.

#### 99. *Cynodon*, Pers.

Perennial creeping grasses with erect culms. Leaves narrow, flat or complicate. Inflorescence of 2-8 fascicled or umbellate »V

rhachis slender. *Spikelets* all alike, sessile, laterally compressed, alternately 2-seriate, imbricate, not jointed at the base, 1-flowered ; rachilla disarticulating at the base, rarely produced beyond the lemma. *Glumes* 2, thin, keeled, acute or mucronate, persistent or separately deciduous. *Lemmas* broader than the glumes, firmly membranous, boat-shaped, 3-nerved, keel ciliate, awnless; paleas keeled, containing a bisexual floret. *Lodicules* 2, minute. *Stamens* 3. *Styles* 2, free. *Grain* oblong, free within the lemma and palea.

**Lemmas** longer than the upper glumes, broadly boat-shaped, .08-1 in. long:—

**Erect** culms 2-18 in. high ; lower leaves usually flat, the upper often complicate, .4-4-7 in. long, .03--11 in. wide; spikes 3-7, .6-2-5 in. long, usually more or less erect; lower glume .05-08 in. long. . . . . 1. *dactylon*.

**Erect** culms 7-40 in. high ; leaves narrowly ensiform, flat, 1-4-5 in. long, \*18-27 in. wide ; spikes 3-6, usually spreading and curved, 2-4 in. long ; lower glumes .04 in. long, upper .05-06 in. long

var. *intermedius*.

**Lemmas** shorter than or equalling the upper glume, narrowly boat-shaped, .08 in. long, the ciliae on the keel often minutely knobbed.

**Erect** culms 4-9 in. high ; leaves flat, .6-2-5 in. long, .1-2 in. wide ; spikes 3-5, .6-2-2 in. long; lower glume .04-08 in. long, upper .08-1 in. long . . . . . 2. *Barberi*.

!• CYNCDON DACTYLON, Pers. ; F. B. T. vii. 288 ; S. I. G. figs. 190, 191.

In all Districts except on the W. Coast; sea-level to 7,000 ft. Underground stems often very long. Hariali grass. A highly nutritious fodder, especially for horses. Vern. *Hind.* Dub; *Ur.* Dubbula ghanso ; *Tel.* Gericha gaddi, Gurka hariali; *Tarn.* Arugam pillu ; *Kan.* Kudi garikai, Karkeri hullu.

Var. *intermedius*, C. E. C. Fischer n. comb. *C. intermedia\**, Ran\*;. († Tad.; S. I. G. figs. 192, 193.

Usually without underground stem.

In the same localities as the typical species but less common ; up to 3,000 ft. The extreme forms are easily recognized, but the intermediate are not readily distinguishable.

Chloris\*

2. CYNODON BARBERI, Rang, et Tad.; S. I. G. figs- 194, 195  
In the same region as the former species, mi\* loss con\*no?   
not reported from Travancore.

100. Chloris, Sw.

Perennial, rarely annual, erect or decumbent herb. <sup>b</sup> <sup>s.</sup> <sup>Leaves</sup>  
usually flat, sometimes complicate or convolute. <sup>l</sup> <sup>\*«</sup> <sup>Inflorescence</sup>  
of solitary, umbelled or racemosely arranged spikes or <sup>r</sup> <sup>spiciform</sup>  
racemes, erect or stellately spreading. *Spikelets* sessile or <sup>rh</sup> <sup>ac</sup> <sup>^</sup> <sup>ry</sup>  
shortly pedicelled, unilateral, 2-seriate, not jointed on the <sup>ill</sup> <sup>\*</sup> <sup>rtic</sup> <sup>^</sup>  
with 1-4 perfect florets and 1-3 imperfect above ; rhaclu <sup>fect</sup> <sup>\*floret</sup>  
lated above the glumes, prolonged beyond the upper per <sup>branou</sup> <sup>^</sup>  
and bearing 1-3 empty lemmas above. *Glumes* 2, mem <sup>te</sup> <sup>or</sup> <sup>^</sup>  
unequal, persistent, narrow, 1-nerved, keeled, mucrona <sup>btuse</sup> <sup>^</sup>  
upper more or less aristate. *Lemmas* 3-nerved, acute, o <sup>^</sup> <sup>^</sup>  
2-fid, usually awned; paleas 2-nerved, 2-keeled, containi <sup>^</sup> <sup>^</sup>  
bisexual floret. *Lodicules* 2, minute. *Stamens* 3. *Sty* <sup>\*8</sup> <sup>2</sup> <sup>></sup> <sup>^</sup>  
*Grain* linear-oblong or ellipsoid, compressed or subtrigon <sup>ous.</sup>  
within the lemma and palea ; often with a loose pericarp-  
Spikes solitary, very rarely 2, -8-2-5 in. long, erect. <sup>t</sup> <sup>Hilm</sup> <sup>s</sup> <sup>>></sup> <sup>lander,</sup> <sup>orets</sup>  
5-18 in. high ; leaves 2-10 in. long ; . 1-15 in. wide ; perfec <sup>^</sup> <sup>^</sup>  
4, lowest lemma -2 in. long, broadly obovate, truncate with <sup>an</sup> <sup>c</sup> <sup>in</sup> <sup>pt.</sup> <sup>y</sup>  
•12--14 in. long, that of next longer, of the 4th very short or 0 ; <sup>e</sup> <sup>^</sup>  
lemmas 2, muticous . . . . . <sup>l.</sup> <sup>tene</sup> <sup>^</sup>

Spikes 3-many ; perfect florets 1-2 :—

Spikes umbelled :—

Perfect floret 1 :—

Empty lemma above the floret solitary, \vell-develop <sup>e</sup> <sup>a</sup> <sup>pi</sup>  
rudimentary :—

**Empty lemma represented by a fine arista** .18--5 in. <sup>lo</sup> <sup>llg</sup>  
hardly widened at the base. Culms procumbent or <sup>at,</sup> <sup>^</sup>  
1-5 ft. high ; peduncles long ; leaves 2-22 in. long, <sup><</sup> <sup>0</sup> <sup>4</sup> <sup>i</sup> <sup>^</sup>  
wide ; spikes 3-10, 2-10-5 in. long ; upper glumes -2-1-38 <sup>0.</sup>  
long ; lemma oblong-lanceolate, glabrous, -17- 28 m- <sup>long ;</sup>  
awn -12-6 in. long . . . . . <sup>2.</sup> <sup>incomp</sup> <sup>eta.</sup>

Empty lemma oblanceolate, truncate, its arista <sup>ft</sup> <sup>i</sup> <sup>^</sup>  
long. Culms decumbent, 3-18 in. high; leaves <sup>l</sup> <sup>a</sup> <sup>^</sup>  
long, 07-11 in. wide^ spikes 4-7, -8-2-5 in. long; <sup>r</sup> <sup>ute</sup> <sup>^</sup>  
hairy ; upper glumes -08--1fi in. long ; lemma obovate, »<sup>c</sup>

•1-12 in. long, apical margin long-ciliate ; awn -15-26 in. long . . . . . •••<sup>3</sup> - *virgata*,

Empty lemmas above the floret 2 or 3 :—

Culms glabrous, 1-3 ft. high ; leaves 2-12 in. long, -1-2 in. wide ; spikes 4-20, 2-4 in. long, rhachis scaberulous ; upper glumes -1-13 in. long; lemma -08-1 in. long, obovate, obtuse, back sparsely hairy, margins densely ciliate above the lower *i*, its arista -16 in. long ; empty lemmas 2, lower obovate, upper subglobose, their aristas \*12-18 in. long  
<sup>^</sup> <sub>6</sub> 4.  *barbata*.

Culms puberulous or hairy for at least a short distance below the spikes :—

Culms 3-30 in. high, hairy for a short distance below the spikes ; leaves 1-10 in. long ; -02-1 in. wide, glabrous ; spikes 3-13, -6-2-8 in. long, rhachis glabrous; upper glumes -08-13 in. long ; lemma obovate to oblanceolate, keel glabrous, back sparingly hairy at the sides, margins long-ciliate, -08-1 in. long ; awn -16-34 in. long ; empty lemmas 2-3, lower obovate, truncate, upper subglobose, their aristas -1—3 in. long . . . . ."

Culms 3-8 in. long, usually puberulous throughout, sometimes hairy above ; leaves -7-1-5 in. long, -05-1 in. wide, densely short-hairy; spikes 3-4, -5-1 in. long, rhachis densely hairy; upper glumes -08-1 in. long; lemma obovate, obtuse, emarginate or 2-toothed, back asperulous, keels and margins long-ciliate, -1 in. long; awn -2-3 in. long ; empty lemmas 3, obovate, apiculate, puberulous, their awns -2-3 in. long . . . . .6. *Wightiana*.

IVifoct florets 2. Culms 1-3 ft. high, minutely puberulous just below the spikes ; leaves 1-10 in. long, -05-2 in. wide, glabrous ; spikes 3-9, 1-4-4 in. long ; upper glume -07-1 in. long ; lowest lemma obovate, back scaberulous, keel and margins long-ciliate, .09-16 in. long, awn -16-23 in. long; second lemma broader, shorter with a shorter awn ; empty lemmas 2, subglobose, their aristas -08-18 in. long . . . . .<sup>7</sup> - *Bournei*,

•Spikes racemously arranged, 14-30, 1-5-2-5 in. long. Culms 18-30 in. high ; leaves 2-6-5 in. long, -1-15 in. wide ; upper glume •6 in. long ; perfect lemma solitary, -06-09 in. long, narrowly lanceolate, acute, 2-toothed, sparsely ciliate on the keel and margins above the middle, its awn -33-44 in. long; empty lemmas 2, minute, their awns -25-4 in. long . . . . . «• *poly«tach*, a.

1. CHLORISTENKII, Roxb. ; F. B. I- vii- 290; »^ 1- Bellary District. Reputed a good fodder.
2. CHLORIS INCOMPLETA, Roth ; F. B. 1. vii. 2\*30 ; s - 1 ; # 100- cages and Jn all Districts except on the W. Coast; often in » scrambling among bushes ; sea-level to 2,000 t ; K. vithari Eaten by cattle before flowering. Vern. I e < - gaddi; Kan. Melamalai hullu.
3. CHLORIS VIROATA, Sw. ; F. B. I. vii. 21)1 ; »S 1- < 3 ^ ft, Bellary and Salem Districts ; Mysore State ; 2,000- » Wrn. Tel Uppu giwidi. filyg j09,
4. CHLORIS HARIUTV. Sw. : F. B. I vii. 292; S. 1- ( " " " 200,201. t 2>000ft. In all Districts except on the W. Coast ; sea-level- Odai pillu A good fodder before flowering. Vern. Tarn- Iv llu Sevarugu pullu ; Kan. Henu manchada kalu hu - U. ^ rg .
5. CHLORIS MONTAW, Roxb. ; F. B. T. vii. 292; & A. 204,20,"). to Cape In the central and eastern Districts and southward^ . avara Comorin ; sea-level to 2,000 ft. Vern. Kan . Komlpi J hullu.
6. CHLORIS WIGHTIANA, Nees ; F. li. 1. vii. 293. S. India, without precise locality (Wight).
7. CHLORIS BOURNEI, Rang, et Tad. ; S. I. 0. %« ^ o2, ^ jore Godavari, Bellary, S. Arcot. (V)imbatore and Districts; up to 2,500 ft.
8. CHLORIS POLYSTACHYA, Roxb. ; F. B. 1. vii. 292. nnevelly Bellary District ; Xilgiri, Coimbatore, Pulney and Ti Hills; (1)ape Comorin ; up to 2,500 ft.

## 101. Eleusine, Gaertner

Annual or perennial herbs. *Leaves* flat or complicate. n flores-  
*cence* of capitate, digitate, whorled or scattered spikes. # kelets  
*sema*U, sessile, 2-3-seriate, secund, imbricate, pointing for Wft rds # ft  
 an acute angle to the rhachis, with a terminal spikelet or « ollielt,, he  
 only an abortive lemma ; laterally compressed, not jointed to t  
 rhachis ; rhachilla continuous between the 2-12 lemmas. W nes  
 persistent, subequal, keeled, acute or cuspidate ; lower 1-nerved ,

"Pper often broader, 1-7-nerved. Lemmas resembling the glumes ;  
 r1\* lowest usually the longest, 3-nerved ; paleas complicate,  
 Wrongly 2-keeled, each containing a bisexual floret or the terminal  
 :1 c? or empty. Lodicules 2. Stamens 3. Styles 2, free. Grain  
 8l nall, free within the lemma and palea ; pericarp loose, hyaline.  
 Erect; leaves 3 in. or more long ; spikes umbelled or scattered ;  
 lemmas and paleas glabrous :—

Spikes in one whorl, occasionally 1-2 solitary spikes below the  
 umbel; glumes entire :—

Rhachis of spike slender, glabrous. Culms not very stout,  
 6-30 in. high ; leaves 3-20 in. long, -1-25 in. wide ; spikes 2-9,  
 •9-5-5 in. long; lowest lemma -12-14 in. long; paleas not  
 winged ; grain oblong, narrowed at the ends, laterally compressed.

1. *indica*.

Rhachis broad, margins scabrid. Culms usually stout, 1-3 ft.  
 high ; leaves 10-24 in. long, -2-5 in. wide ; spikes 4-many,  
 1-4 in. long ; lowest lemma -15-17 in. long ; paleas winged on

„ , . . . . . i u . . . . . 2. *coracana*.  
 the keels ; grain globose . . . . .

Spikes 4-30 in 1-several whorls with scattered solitary or twin  
 spikes intermixed, 1-5-5 in. long; rhachis slender. Culms 1-4 ft.  
 high ; leaves 3-10 in. long, -1-5 in. wide ; glumes usually with  
 notched tips ; lowest lemma 11-14 in. long, truncate or 2-toothed  
 caudate; paleas with ciliolate, wingless keels; grain oblong-  
 subglobose, grooved down one side, rugose and muriculate

3. *verticillata*.

Prostrate or creeping, spreading and rooting from the nodes ; culms  
 1-9 in. high ; leaves -5-1-2 in. long, -05-15 in. wide ; spikes numerous,  
 crowded into a globose head, -3-5 in. across ; lowest lemma -15-17 in.  
 long, cuspidate, densely hairy on the keel and on the 2 lateral nerves  
 below the middle ; paleas densely hairy on the keels ; grain ovate to  
 nearly orbicular, concavo-convex, transversely rugose. 4. *lagopoides*.

1. ELEUSINE INDICA, Gaertn. ; F. B. I. vii. 293 ; S. I. G. fig. 206.

In all Districts ; up to 0,500 ft.

A fair fodder. Vern. *Tarn*. Thippa ragi.

2. ELEUSINE CORACANA, Gaertn.; F. B. I. vii. 299.

Cultivated in the dry and hilly parts of most Districts ; up  
 to 5,000 ft. Believed to be the cultivated form of the  
 previous species.

The grain is an important article of food for the poorer  
 classes. The culms and leaves are a good cattle-fodder

Vern. *Ur.* Mandiya ; *Tel.* Kagi, Ragulu, Thamidalu ; *Chodalu* ;  
*Tarn.* Ragi, Kalvaragu, Kapai ; *Kan.* Ragi.

3. ELEUSINE VERTICILLATA, Roxb. ; F. B. I. vii. 295.

In all the eastern Districts ; Mysore State ; Nilgiri and  
 Coimbatore Districts ; up to 3,000 ft.

A good fodder. Vern. *Tarn.* Kadu kapai.

4. ELEUSINE LAGOPOIDES, Merr. ; *E. brevifolia* ; R. Br. ; \*.  
 vii. 294 ; S. I. G. fig. 207.

Along the E. coast and inland as far as Coimbatore ; usu-  
 gually  
 in sandy tracts and salt soils ; up to 1,500 ft.

102. *Daaiyloctenium*, VWilld.

Annual or perennial, usually erect herbs. *Leaves* flat.  
 in one terminal umbel, rarely reduced to a solitary spike. &P  
 sessile, laterally compressed, densely imbricate in 2 rows,  
 at right angles to the rachis, which is produced in a rigid p  
 beyond them ; rhachilla disarticulating above the lower gl  
 continuous between the lemmas. *Glumes* deciduous, slightly u  
 equal, 1-keeled, 1-nerved ; lower ovate to oblong, acute or obtu  
 persistent ; upper oblong, obtuse, mucronate or cuspidate. L  
 3-5, firmly membranous, ovate, 1-keeled, 3-nerved,  
 mucronate or cuspidate ; paleas 2-keeled, each containing a bisex  
 floret or the uppermost more or less imperfect. *Lod*  
*Stamens* 3. *Styles* 2, free. *Grains* oblong to globose ; pericarp

DACTYLOCTENIUM AEOYPTIUM, Btuuiv. *Eleusine aegy*  
 Desf. ; F. B. I. vii. 205 ; S. I. G. figs. 5, 208, 209.

In all Districts ; up to 3,000 ft.

Erect or creeping in poor soils ; culms 1-5-30 in. high ;  
 1-10 in. long, '08-35 in. wide, glabrous or more or less pilo  
 spikes 1-7, digitately radiating, '3-1-5 in. long ; lemmas bn  
 subfalcate, strongly cuspidate, lowest 12-14 in. long-

103. *Dinebra*, Jacq.

Annual herbs ; culms leafy. *Leaves* fiat. *Inflorescence* of «  
 spreading or deflexed spikes collected in narrow, pyramidal racers,  
 sometimes paniced. *Spikelets* crowded, secund, 2-seriate, scssJ  
 --sJ-ttowed, not jointed at the base ; rhaohilla slender, join  
 at the base, produced beyond th» uppermost floret and bearing &

imperfect lemma. *Glumes* 2, persistent, subequal or the upper longer, lanceolate, 1-nerved, 1-keeled, awned or cuspidate. *Lemmas* much shorter, hyaline, broadly ovate, subacute or obtuse, 1-nerved; *Meas* as long, hyaline, 2-keeled. *Lodicules* 2, minute. *Stamens* 3. *Styles* 2, free. *Grain* oblong or ovoid, trigonous, free within the lemma and palea; embryo  $\frac{1}{2}$  as long.

**DINEBRA** RETROFLEXA, Panz. *D. arabica*, Jacq.; F. B. I. vii. 297; S. I. G. figs. 17, 210, 211.

In the central and eastern Districts from Godavary to Coimbatore; up to 3,000 ft.

Culms 2-36 in. high; leaves 2-10 in. long, 1-3 in. wide; inflorescence 3-16 in. long; spikes 3-2-5 in. long; glumes rigid, 18-21 in. long; lemmas .08-1 in. long; grains .05 in. long, acute.

Headily eaten by cattle before flowering. Vern. *Tel.* Wadata toka gaddi; *Kan.* Nari balada gandu hullu.

#### 104. Enneapogon, Desv.

Initial herbs. *Leaves* narrow, flat or convolute. *Panicles* contracted or spiciform. *Spikelets* distichous, 1-3-flowered, not jointed on the pedicels; rachilla disarticulating at the base. *Glumes* 2, persistent, keeled, 3-9-nerved. *Lemmas* 4-5, shorter, concave, 9-nerved, 9-awned; awns subulate, equal or alternately shorter and longer, plumose, ciliate or scaberulous; paleas 2-toothed, 2-keeled, the lowest containing a bisexual floret, the rest gradually shorter and with a floret or empty, the uppermost rudimentary or reduced to a tuft of hairs. *Lodicules* 2, fleshy. *Stamens* 3. *Styles* 2, free. *Grain* ovoid or oblong,

**ENNEAPOGON** ELEGANS, Stapf. *Pappophorum elegans*, Nees; \*MU. vii. 301; S. I. G. figs. 215, 216.

In all central and eastern Districts from Kurnool southwards; Coimbatore and Nilgiri Districts; up to 3,000 ft.

Culms slender, wiry, 2-20 in. high, erect from a woody, often thickened base; leaves flat or convolute 9-5 in. long, .05-1 in. wide; panicles 2-3\*5 in. long; glumes 16-22 in. long; lowest lemma .08 in. long, its awns 13-14 in. long, the uppermost minute, usually reduced to 3 short aristas.



## 105. Pommereulla, Linn. f.

IVminial creeping herbs ; rootstock stoloniferous. *I* <sup>aves line<sup>vr</sup>, simpl<sup>e</sup></sup>  
 flat or complicate ; basal sheaths equitant. *Spike* term<sup>inal</sup> \* <sup>geg</sup>sile,  
 or forked ; rhachis flattened. *Spikelets* distant or <sup>cl<sup>c</sup> \* V</sup> <sup>h. rt</sup> con-  
 2-3-flowered ; rhachilla articulated at the base, very <sup>d</sup> the  
 tinuous between the lemmas, shortly producea *J* <sup>Glumes</sup>  
 uppermost floret, with or without a rudimentary lemma-<sup>the</sup> <sup>er</sup>  
 membranous, persistent, amplexicaul at the base ; <sup>5-</sup> <sup>^</sup>  
 1-nerved ; the upper broader and longer, 3-nerved.  
 spirally arranged to form an inverted cone ; the lowest <sup>h</sup> <sup>pungent</sup>  
 callus ; the 2 lowest epaleate and empty, flabelliform, en<sup>libra</sup> <sup>^</sup> <sup>^</sup>  
 the upper, 4-lobed, lobes acute, acuminate, mucronate, <sup>4-n</sup> <sup>CUS</sup> <sup>spidate</sup> lemma  
 or shortly aristate, the 2 inner narrow, the 2 outer broad, <sup>t</sup> <sup>ie</sup> <sup>lemmas</sup>  
 bearing a slender awn on the middle of the back ; the upper <sup>d</sup> <sup>^</sup> <sup>th</sup>  
 gradually smaller, similar but concave at the base, 3-lobed <sup>e</sup> <sup>r</sup> <sup>third</sup>  
 the middle lobe entire or 2-cuspidate, the third and fourth <sup>to</sup> <sup>de</sup>  
 to fifth lemmas paleate ; paleas ovate, flat, 2-keeled with <sup>m</sup> <sup>^</sup>  
 flaps, containing each a bisexual floret ; the uppermost <sup>2</sup> <sup>e</sup> <sup>free</sup>.  
 epaleate and empty. *Ijodicules* 2. *Stamens* 2-3. *Style* <sup>sem</sup> <sup>ina</sup> <sup>and</sup>  
*Grain* oblong, biconvex or plano-convex, loose within the  
 palea ; pericarp loose ; embryo orbicular, small.

POMMEREULLA CORNUCOPIAE, Linn. f. ; F. B. I. vii <sup>3(0)</sup> ; Roxb.  
 Cor. Pl. t. 131 ; S. I. G. figs. 213, 214.

Vizagapatam (Narayanswami), Kistna (Barber) and <sup>hinge</sup> <sup>^</sup>  
 put Districts.

Stolons several inches long ; culms solitary or tufted, <sup>1-3</sup> <sup>if</sup>  
 in. high ; leaves -5-1 in. long, .05-15 in. wide, apex <sup>de</sup> <sup>^</sup> <sup>^</sup>  
 spikes partly enclosed in the upper spathiform leaf-sheath <sup>th</sup> <sup>or</sup>  
 long exserted, -8-3 in. long ; glumes -3-5 in. long ; <sup>likily</sup>  
 .08-1 in. long, villous ; lowest lemma -25-33 in. long, & <sup>long</sup>  
 villous on the nerves, its awn -2-3 in. long ; grain .06 m-

## 106. Elytrophorus, Beauv.

Erect, annual herbs. *Leaves* very narrow, flat. *Inflorescence* <sup>of</sup>  
 densely-packed globose clusters of spikelets continuous in a <sup>dric</sup>  
 cymose, <sup>or</sup> interrupted, <sup>oiua</sup> simple terminal axis. *Spikelets*

Usually small, laterally compressed, sessile, not articulated at the base, 6-many-flowered, subtended by many empty glumes; rachilla very short, smooth, jointed at the base and between the lemmas. *Glume*\* subequal, persistent, membranous, lanceolate, mucronate or instate, 1-keeled, 1-nerved. *Lemmas* 3-7, rather larger, ovate, instate, 3-nerved; paleas complicate, truncately 3-lobed, 2-keeled, one or both keels winged, the uppermost empty, the rest containing each a bisexual floret. *Lodicules* 2. *Stamens* 1-3; anthers minute. *Styles* 2, free. *Grain* minute, narrowly oblong or fusiform, impressed; pericarp loose at both ends.

ELYTROPHORUS SPICATUS, A. Camus. *E. articulatus*, Beauv.; F. B. I. vii. 306.

Oanjam, Chingleput, Arcot, Tanjore and Malabar Districts; Mysore State; sea-level to 3,000 ft.

Culms .05-12 in. high; leaves 1-12 in. long, .05-2 in. wide; inflorescence 1.5-9 in. long; glumes and lemmas .06-08 in. long, their aristas .05-09 in. long. Vern. Tarn. Vayal tenai; Kan. Nela antabu hullu.

#### 107. Aeluropus, Trin.

Low, much-branched, rigid, perennial, leafy herbs. *Leaves* distichous, coriaceous, usually convolute, pungent. *Inflorescence* of terminal crowded heads. *Spikelets* minute, sessile, laterally compressed, 6-many-flowered, not articulate at the base; rachilla obscurely articulate at the base and between the lemmas, not produced beyond them. *Glumes* membranous, persistent, rounded on the back, apiculate, mucronate or cuspidate; lower 1-3-nerved; upper much larger, 5-7-nerved. *Lemmas* membranous, longer than the glumes, 7-9-nerved; paleas as large, broadly cuneate, 3-lobed, lobes erose, 2-keeled, flaps broad, keels nearly smooth or oiliate, each enclosing a bisexual floret. *Lodicules* 2. *Stamens* 3. *Styles* 2, free. *Grain* oblong or obovoid, free within the lemma and palea.

AELUKOXUS LAGOPOIDES, Trin. ex Thw. *A. villosus*, Trin.; F. B. I. vii. 334.

(Coastal sands and alkaline soils on both coasts; often in marshy places.)

[*Aeluropus*.

Roots long, wiry ; culms tufted, 1-14 in. high ; <sup>leav</sup> <sup>v</sup> <sup>^</sup> <sup>j</sup> <sup>long</sup> or times flat, .15-2 in. long, up to .15 in. wide ; heads <sup>o</sup> <sup>v</sup> <sup>^</sup> <sup>^</sup> globose, -3-8 in. long ; glumes and lemmas more or less the former .06-08 in. long, the latter .1-11 in. long-

108. *Oryza*, Linn.

Tall, annual or perennial herbs. *Leaves* narrow, flat or <sup>co</sup> <sup>ll</sup> <sup>y</sup> <sup>dilat</sup> <sup>^</sup> *Inflorescence* spicate or paniced. *Spikelets* strongly latera <sup>t</sup> <sup>dilat</sup> <sup>^</sup> pressed, 1-flowered, appearing to be articulated on a shor <sup>Glum</sup> <sup>^</sup> pedicel but actually articulated above 2 abortive glumes. <sup>Lem</sup> <sup>^</sup> above the articulation 2, minute, subulate or <sup>absent</sup> chartaceous or coriaceous, the size and shape of the spike <sup>e</sup> <sup>t</sup> <sup>of</sup> <sup>cn</sup> strongly nerved or ribbed, obtuse, acute or awned, its <sup>P</sup> <sup>alca</sup> <sup>\*</sup> <sup>Obc</sup> <sup>d</sup> .similar, containing a bisexual floret. *Lodicule*\* 2, entire or <sup>"</sup> <sup>"</sup> <sup>"</sup> <sup>"</sup> *Stamen*\* 6. *Styles* 2, free. *Grain* narrowly oblong, free \* the lemma and palea.

Lemma, excluding its awn, -35 in. or less long, punctate <sup>ov</sup> <sup>gr</sup> <sup>m</sup> not winged on the back :— <sup><im</sup> <sup>></sup> <sup>us</sup>

Panicles compound, 2-5-12 in. long, spikelets numerous; <sup>lan</sup> <sup>^</sup> <sup>ft</sup>  $\langle$  12  $\rangle$  14 in. long, often much shorter in cultivated <sup>p</sup> <sup>^</sup> lemma -25-3 in. long, regularly punctate, hispidulous, <sup>H</sup> <sup>^</sup> slender barbellate awn 14-5 in. long in wild plants, <sup>ft</sup> <sup>W</sup> <sup>"</sup> <sup>les</sup> <sup>in</sup> cultivated ones. Culms up to 4 ft. high; leaves 4-22 m- <sup>1</sup> <sup>3f</sup> <sup>in</sup> <sup>wide</sup> . . . . . 1- <sup>sat</sup> <sup>ira</sup>

Panicles simple, 1-5 4 in. long, spikelets few; lower glu- <sup>110</sup> <sup>(</sup> <sup>^</sup> <sup>y</sup> <sup>den</sup> <sup>j</sup> <sup>ft</sup>  $\langle$  40  $\rangle$  in. long; lemma -22-24 in. long- <sup>ir</sup> <sup>reg</sup> <sup>ular</sup> <sup>ly</sup> <sup>gran</sup> <sup>ulate</sup>, glabrous. Culms rather slender, up <sup>t</sup> <sup>(</sup> <sup>^</sup> <sup>a</sup> high ; leaves 3-10-5 in. long, -3-9 in. wide . . . . . 2. <sup>M</sup> <sup>\*</sup> <sup>t</sup> <sup>\*</sup> <sup>r</sup> <sup>l</sup> <sup><</sup> <sup>'</sup>

Lemmas -45-5 in. long, excluding a stiff, glabrous arista <sup>13</sup> <sup>\*</sup> <sup>!</sup> <sup>"</sup> <sup>^</sup> long, keel broadly winged above the middle, smooth, glabrous. <sup><</sup> <sup>></sup> <sup>lm</sup> <sup>»P</sup> <sup>to</sup> <sup>r</sup> <sup>></sup> ft. high; leaves <sup><</sup> <sup>></sup> 20 in. long, .25-5 in. wide; <sup>\*\*\*</sup> <sup>h</sup> <sup>s</sup> tessellate; panicles spiciform, 4 8 in. long; glumes finely subtil\* <sup>e</sup> <sup>•</sup> <sup>Hi</sup> -21 in. long . . . . . 3. <sup>c</sup> <sup>oarc</sup> <sup>U</sup> <sup>\*</sup> <sup>t</sup> <sup><</sup> <sup>'</sup>

- 1. ORYZA SATIVA, Linn. ; F. B. I. vii. 92. <sup>h</sup> In all Districts; <sup>i</sup> <sup>n</sup> marshes; sea-level to 2<MK) ft. <sup>\*Uu</sup> <sup>C</sup> <sup>!</sup> cultivated in all Districts in wet field\* <sup>f</sup> <sup>r</sup> its edible grain and its straw. The Paddy or  $\sqrt{\text{vv}}$  plants,

Hygrorrhiza.]

GRAMINEAE.

There are numerous races of the cultivated form. Vern. Hind. Dhan ; Ur. Dhanno ; Tel. Vadlu ; Tam. and Mal.

Nellu; Kan. Batta.

- 2. OKYZA MEYERIANA, Brill- *O. granulata*, \* - et Arn. , P. B. I. vii. 93.

In most Districts ; up to 4,000 ft.

- 3. ORYZA COARCTATA, Roxb. ; F. B. 1. vii. Godavari District at Tallurevu (Barber).

109. Leersia, Sw.

Slender, perennial herbs. Leaves narrow, flat, usually flaccid. Spikelets imbricate, branched or reduced to an obscure, hyaline, 2-lobed rim. Ligule coriaceous or chartaceous, oblong, 1-keeled; palea similar in texture and shape, nearly narrower, 1-keeled, containing a bisexual floret. Styles usually 0, sometimes 3 or fewer. Obovate, compressed, free within the lemma and palea.

P. V. I. vii. 94; S. I. G. fig. 119-

In all

!...! 7 - \* . " , " ^ ; ' r L T \* , » ~ \* " u \* • \* « •  
 in - vide in panicles of ^ J - ^ bristle-ciliate.  
 Much liked by cattle of Vern. Hind. Jun. gli dhan ; Mal. Nir  
 valli pullu ; Km. KaHu bili sajjabu hullu-

110. Hygrorrhiza, Nees.

amorous floating herbs ; roots at the nodes. Panicles short, broad, lanceolate, 1-flowered, articulate on their pedicels, deciduous. Obovate, thin, an awn; palea similar but narrower, gibbous. Styles 2, free. Grain narrowly oblong, within the lemma and palea.

HYGORRHIZA ARISTATA, Nees ; F. B. I. vii. 120, fig. 120, <sup>#</sup> 0000-  
 Along both coasts; Mysore State at Kumsi (Meebold) at in high ;  
 Floating culms a foot or more long, erect branches 2- base  
 leaves subcoriaceous, ovate to narrowly ovate-oblong long ;  
 subcordate, 1-3-1 in. long, -2-7 in. wide ; panicles 1-2 in-eolate,  
 spikelets few, long-pedicelled; lemma narrowly lance long,  
 •23—3 in. vitr «, n, rlv "»-««'rv«'d • nwn -25-55 in-  
 scabrid.

The grain is eaten by the poor. Keadily eaten by cattle.  
 Vern. Tarn. Valli pullu.

### 111. Anthoxanthum, Linn.

Perennial, erect, usually sweet-scented herbs. *Leaves* flat.\*  
*Panicles* spiciform or more or less branched and somewna t  
*Spikelets* pedicelled, slightly laterally compressed, 3\* flo. red.  
 rhachilla disarticulating above the glumes. *Glumes* 2, persi^  
 membranous, sometimes chaffy and shining, complicate, s harply  
 keeled ; the upper the longer and with a strong rib on eac h \* ide  
 close to the keel. *Lemmas* 3 ; the 2 lower similar and subeq ual,  
 laterally compressed, 1-keeled, hairy, 2-lobed or -fid, soinetn, ^  
 the upper to near the base, the lowest bearing an arista from \* ^  
 way below the tip, usually slightly overtopping it, but so metll,  
 shorter, the second with a geniculate awn from the back ; the upper-  
 most lemma shorter, usually complicate and 1-keeled, g labro U or  
*Paleas* of the 2 lower lemmas, if present, narrow, 2-keeled, enl P ty J efl  
 containing a <J, usually 3-stamened floret; the uppermost p » ^  
 complicate, 1-keeled, enclosing a bisexual floret, usually wil ^  
 stamens. *Lodicules* 0. *Styles* 2. *Grain* elliptic-ovoid, shg h y  
 laterally compressed ; embryo £ as long.

ANTHOXANTHUM HOOKERI, Rendle. *Hiororhi*<sup>TM</sup> *Ilookeri*, C. B.  
 Clarke ex Hook. f. ; F. B. I. vii. 223.

Pulney Hills in the vicinity of Kodaikanai ; 0,000-7,000 ft.  
 Possibly an escape from gardens, but I have seen no specif  
 from a garden.

Rootstock creeping; culms 20-40 in. high; leaves 4-11 in.\*  
 long, 2-4 in. wide, closely ribbed as are also the sheathe g  
 panicles lax ; upper glume, -23-27 in. long ; 2 lower Kanna

•18--22 in. long, brown-hairy; awn 28—4 in. long; uppermost lemma 1—12 in. long, rarely emarginate with a short arista.

*Anthoxanthum odoratum*, Linn. ; F. B. I. vii. 222. The sweet v\*ernal grass is cultivated in gardens in the hills. It differs from the above species through its smaller size ; leaves mostly basal; panicles s<sup>p</sup>iciform, short and close ; 2 lower lemmas 12-15 in. long, devoid of paleas and empty ; uppermost lemma 6—8 in. long.

### 112. *Lophatherum*, Brogn.

Perennial, leafy herbs. *Leaves* petioled, flat, narrowly lanceolate, tessellate with transverse nerves. *Panicles* subsimple, lax, narrow ; branches alternate. *Spikelets* solitary, secund, narrowly lanceolate, terete, 1-flowered, jointed at the base; rhachilla not jointed, produced beyond the floret and bearing several closely-sheathing, cuspidate, empty lemmas. *Glumes* 2, membranous, the upper the longer, rounded on the back or the lower 1-keeled, 5-7-nerved, acute or obtuse, margins often hyaline. Lowest *lemma* longer, 7-9-nerved, mucronate or cuspidate; *palea* narrow, 2-keeled, keels narrowly winged, containing a bisexual floret. *Lodicules* 2-3. *Stamens* 3. *Styles* 2, connate at the base. *Grain* oblong and compressed or fusiform and terete, free within the lemma and palea ; embryo long.

LOPHATHERUM GRACILE, Brogn. ; F. B. I. vii. 331.

Travancore without specific locality (Venkoba Rao).

Culms 2-5 ft. high; leaves 4-10 in. long, 1-1.5 in. wide; panicles 6-18 in. long, branches few ; spikelets 3—5 in. long, terminated by the erect or spreading cusps of the empty lemmas.

### 113. *Cen<sup>e</sup>totheca*, Desv.

Perennial, leafy herbs. *Leaves* rather broad, with transverse veins. *Panicles* subsimple, lax ; branches long, slender, spiciform ; pedicels capillary. *Spikelets* secund, alternate, laterally compressed, all perfect or the 1-several upper empty, perfect ones 1-3-flowered, not articulated at the base ; rhachilla very slender, articulated at the base and between the lemmas, rarely produced

above the uppermost. *Glumes* 2, persistent unequal, distant at the insertions, ovate-oblong, 3- or 5-nerved. *Lemmas* ovate to oblong, obtuse or acute, rounded on the back, 5- or 7-nerved, the upper one usually bearing soft, erect, ultimately deflexed, tubercles at the base of the bristles; paleas narrow, 2-keeled, keels ciliolate, containing a bisexual floret. *Lodicules* 0. *Stamens* 2-3, *Styles* 2, free-ovoid, acute, terete, free within the lemma and palea.

CENTOTHKCA LAPPACEA, Desv. ; F. B. I. vii. 332.

In most Districts, more abundant in wet localities; 3,000 ft.

Culms stout, 1-5 ft. high; leaves narrowly lanceolate to ovate, 2-10 in. long, .45-1.4 in. wide; panicles 3-5-14 in. long; glumes .09-1.4 in. long, the upper the longer; lowest lemma .16-.2 in. long.

#### 114. *Melica*, Linn.

Perennial, erect herbs. *Leaves* narrow, flat or concave, secund. *Panicles* open, spiciform or reduced almost to a raceme, secund. *Spikelets* few to many, laterally compressed or subterete, 1-5-flowered, jointed on the pedicels or not; rhachilla disarticulating tardily at the base, readily between the flowering glumes. *Glumes* 2, membranous, scarious or hyaline, persistent or separate, equal or unequal, 3- or 5-nerved or the upper 7-nerved. *Lemma*\* firmly membranous, the margins and tips often hyaline, 5-9-nerved; paleas 2-keeled, the lower 1-3, rarely 4-5, each a bisexual floret, the several above smaller, empty, each other to form a clavate or oblong terminal body. *Lodicules* 2, connate. *Stamens* 3. *Styles* 2, free. *Grain* oblong or cylindrical, terete or semi-terete; embryo small.

MKUCA SCABERRIMA, Hook. f. ; F. B. I. vii. 330.

Introduced and escaped from gardens around Ootacamund (Gamble); 7,000ft.

Culms 13 ft. high; leaves 2-3-5 in. long, .1-1.3 in. wide; panicles often effuse and large; perfect florets usually 2 or 3, sometimes up to 5; glumes ovate-lanceolate or the upper elongate-lanceolate, lower .18-2 in. long, 1-nerved, the lower .21-2.5 in. long, 3-nerved; lemmas .21-2.8 in. long, scaberulous.

115. *Briza*, Linn.

Annual or perennial, erect herbs. *Leaves* flat or involute, *articles* effuse, sometimes reduced to a raceme; branches and Pedicels capillary. *Spikelets* pendulous, laterally compressed, few-many-flowered; rhachilla disarticulating above the glumes and between the lemmas. Glume, 2, scarious or firmly « ^ b TM ' boat-shaped and keeled or saccate and rounded on the back, per-fetent, subequal, 3-9-nerved. *lemmas* firmly membranous with scarious margins, shaped more or less like the glumes, obtuse, acute or subaristate, 7-9-nerved, the outer 3 or all the lateral nerves palmately spreading; paleas much shorter, broad, 2 keeled, keels often winged, each containing a bisexual floret or the upper reduced *Lodicuhs* 2. *Stamens* 3. *Stytes* 2, free. *Grain* ovoid, concavo- or plano-convex, usually dorsally compressed; embryo small.

«pikelets ovate, few, sometimes only 1 or 2, -4-9 in. long, straw-coloured to brown or purplish, 7-20-flowered. Culms 5-26 in. high; leaves 2-8 in. long, -2-3 in. wide; glumes very broadly ovate, -2-3 in. long; lemmas very broadly ovate-cordate, -3 in. long, \*<sup>h</sup> ^ JK £ j £  
least silky-hairy . . . . .<sup>ia</sup>

.Spikelets numerous, triangular to ovate, often wider than long, .12-15 in. long, green, rarely purplish, 4-9-flowered. Culms 2-15 m' high; leaves 15-5 in. long, .12-32 in. wide; pancks broadly obovate, lax, 1-5-3-5 in. long; glumes -08-1 in. long, homontal^y ^reading; lemmas broadly ovate-cordate, very gibbous below, the scarious Margins very broad, -08-1 in. long, glabrous. . . . . 2. *tmnor*.

1. BRIZA MAXIMA, Linn.; F. B. I. vii. 336. -----

Introduced and run wild about the Nilgiri and Pulney Hill Stations and in Travancore; 7,000-8,000 ft. The Large Quaker- or Quaking-grass.

2. BRIZA MINOR, Linn.; F. B. I. vii. 336. . . .

Introduced and run wild around Ootacamund and Kodai-kanal; 6,000-7,000 ft. The Small Quaker- or Quaking-grass.

116. *Poa*, Linn.

Annual or perennial, usually small herbs. *Leaves* flat oi' con-volute. *Panicles* lax or contracted, rarely ^ TM J ^ laterally compressed, 2-«-flowered, not jomted at the base,

HHHHHH



rhachilla jointed at the base and between the lemmas. <sup>glumes 2»</sup>  
 thinly membranous, subequal, acute or obtuse, <sup>I-keeled</sup> 1-keeled, <sup>t/)</sup> palea <sup>8</sup>  
 nerved. *Lemmas* membranous, acute or obtuse, 5-7-ner <sup>ved</sup> <sup>f</sup>  
 shorter, 2-keeled, each containing a bisexual floret or <sup>th</sup> upper-  
 most reduced. *Lodicules* 2. *Stamens* 3. *Styles* 2, <sup>ire</sup> <sup>Grat</sup> <sup>^</sup>  
 ovoid, oblong or linear, often grooved, free within the <sup>l</sup> lemma <sup>^</sup>  
 palea or adhering to the latter; embryo small.

Lemmas connected by long, often copious silky wool <sup>I. 12-16 in.</sup> <sup>ave</sup> <sup>s</sup>  
 long; rhachilla long-silky-woolly. Culms 1-2 ft. high <sup>h</sup> <sup>»</sup> <sup>acute,</sup>  
 2-5-8 in. long, very narrow, panicles 2-2-5 in. long; <sup>glumes</sup> <sup>es</sup>  
 lower 0.8-1.1 in. long, upper 1-1.5 in. long. . . . . <sup>1, trivialis.</sup>

Lemmas not connected by wool, \*12 in. long; rhachilla <sup>H\*</sup> <sup>g</sup> <sup>labrous.</sup>  
 Culms tufted, 2-12 in. high; leaves 1-4-5 in. long, <sup>i</sup> <sup>19 in.</sup> <sup>^</sup> <sup>U</sup>  
 panicles 1-2-5 in. long; glumes obtuse, lower 0.6 in. <sup>l\*</sup> <sup>^</sup> <sup>pp</sup> <sup>er</sup>  
 0.8 in. long. . . . . <sup>2\*</sup> <sup>•</sup>

1. POA TRIVIALIS, Linn.

Introduced and escaped around Ootacamund <sup>in</sup> <sup>^e.</sup>  
 Pulney Hills; 5,000-7,000 ft. The <sup>Rou</sup> <sup>h</sup> <sup>Meadow-gr</sup> <sup>»\*</sup> <sup>•</sup>

2. POA ANNUA, Linn.; F. B. I. vii. 345.

Probably introduced and escaped around the Hill <sup>Stati</sup> <sup>0HS</sup> <sup>^</sup>  
 of the Nilgiri and Pulney Hills; 4,000-7,200 ft. The Ann  
 Meadow-grass.

117. Glyceria, K. Kruwn

Perennial, rarely annual herbs. *Leaves* flat or convolute, <sup>-</sup>  
 effuse or contracted. *Spikelets* laterally compressed, few- to <sup>many-</sup>  
 flowered, not jointed at the base; rhachilla jointed between <sup>the</sup>  
 lemmas. *Glumes* 2, thin, unequal, persistent, 1-5-nerved. <sup>^e</sup> <sup>mmas</sup>  
 membranous with a broadly hyaline tip, broadly oblong, obovate <sup>te</sup> <sup>QT</sup>  
 fan-shaped, rounded or truncate, rarely subacute, back rounded, <sup>nded,</sup>  
 3-9-nerved; paleas 2-keeled, all but the empty uppermost enclosing <sup>l</sup> <sup>sing</sup>  
 a bisexual floret. *Lodicules* 2. *Stamens* 3. *Styles* 2, free. <sup>Grat</sup> <sup>^</sup>  
 terete or compressed, free between the lemma and palea or <sup>su</sup>  
 adherent to the latter.

GLYCERIA FLUITANS, R. Br.; F. B. I. vii. 347.

Introduced and escaped about Ootacamund; 7,000-7,500 <sup>ft.</sup> <sup>;</sup>  
 usually in wet situations. The Floating Meadow-grass.

Culms 1-3 ft. high, lax ; leaves flaccid, 2-5-11 in. long, 15-35 in. wide ; panicles narrow, 4-12 in. long, branches rather distant; perfect florets 7-12 ; glumes broadly oblong, lower 8-9 in. long, upper 13-14 in. long; lemmas broadly oblong, the lowest 18-22 in. long ; paleas 2-toothed, keels narrowly winged upwards.

### 118. *Dactylis*, Linn.

Stiff, erect, perennial herbs. *Leaves* flat. *PanicUs* terminal, unilateral, composed of short, crowded, unilateral spikes. *Spikelets* subdistichous, compressed, not jointed at the base, 3-10-flowered ; rhachillas continuous. *Glumes* scarious, persistent, unequal, lanceolate, acuminate, mucronate or caudate ; lower 1-nerved ; upper 3-nerved. *Lemmas* rather longer, rigid, subaristate, keel scabnd, 5-nerved; paleas 2-fid, 2-keeled, keels ciliolate, each enclosing a bisexual floret, or the uppermost reduced or empty. *Lodicules* 2, fleshy, 2-lobed. *Stamens* 3. *Styles* 2, free. *Grain* oblong, acute, trigonous, dorsally subcompressed, ventrally channelled.

DACTYLIS GLOMERATA, Linn.; F. B. I. vii. 335.

Introduced and run wild in and about Ootacamund ; 7,000-8,000 ft. The Cock's-foot grass.

Culms 1-3 ft. high, erect from a short, creeping rootstock ; leaves 3-18 in. long, 1-3 in. wide ; panicles 1-5-5 in. long ; lower, glume 15-2 in. long, upper 25 in. long ; lemmas 3-4, lowest 26-3 in. long.

### 119. *Vulpia*, Gmelin

Annual, slender, erect herbs. *Leaves* very narrow, involute or convolute. *Panicles* contracted, narrow, usually more or less secund-, pedicels clavate. *Spikelets* laterally compressed after flowering 1-7-flowered ; rhachilla slender, disarticulating at the base and between the fertile lemmas. *Glumes* very unequal; the lower minute or obsolete or like the upper subulate to subulate-lanceolate but much shorter, 1-nerved ; the upper usually 3-nerved. *Lemmas* subulate-lanceolate, tapering into a straight awn, back rounded, faintly 5-nerved; paleas entire or minutely 2-toothed 2-keeled 1-several lower containing, a bisexual floret, the . or.

2 uppermost reduced, *Isxiicles* 2, hyaline. *Stamens* 13, 2, free. Grain linear, back strongly compressed, concave enclosed within the lemma and palea, adhering to the both; embryo small.

VULPIA MYUROS, (Jine.l. *Festuca Myunts*, Linn.; Introduced and escaped about Ootacamund and 6,500-8,000 ft. The Mouse-tail fescue-grass. Culms 6-18 in. high; leaves setaceous, at least 1-10 in. long; panicles narrow, spiciform, erect 2-10 in. long; lower glume .02-07 in. long, upper long, acuminate; lemmas 3-5 perfect, 1-2 reduced. 23-34 in. long, its awn 4-6-7 in. long.

120. *Festuca*, Linn.

Perennial, tufted herbs. Leaves flat, folded or setaceous; sheaths more or less open, seldom closed. Spikelets laterally compressed (at least after flowering), flowered; rachilla disarticulating at the base and bearing lemmas. Glumes subequal, rarely conspicuously unequal, less keeled, 1-3-nerved, the upper rarely 5-nerved. lanceolate, mucronate or awned from the tip near it, back rounded or keeled towards the apex, paleas more or less 2-toothed, 2-keeled, containing each a floret, the uppermost usually reduced. *Isxiicles* 3. *Stamens* 3. *Styles* 2, free. Grain oblong, back convex, concave in front, tightly enclosed in the slightly hardened lemma and palea, free or more or less adhering to the palea or embryo small.

FESTUCA OVINA, Linn.

Introduced and escaped about Ootacamund; 7,000-8,000 ft. Sheep's fescue-grass. Culms wiry, 6-15 in. high; leaves convolute and more setaceous, 1-3-3 in. long (much longer in the viviparous panicles open, 1-3 in. long; glumes 1-18 in. long, about 1/2 longer than the lower; lemmas lanceolate, long, 4-7 with perfect florets.

121. *Bromus*, Liliu.

Annual or perennial herbs. *Leaves*\* narrow, flat. *Panicles* contracted and often dense or open and sometimes effuse or reduced to a raceme. *Spikelets* laterally compressed (at least after flowering), rather large, erect or pendulous, not jointed at the base, usually many-flowered; rachilla disarticulating at the base and between the lemmas. *Glumes* usually unequal, persistent, acute to acuminate; the lower 1-7-nerved; the upper 3-9-nerved. *Lemmas* lanceolate to broadly oblong, back rounded or keeled, 5-13-nerved, usually awned, sometimes 3-awned, median or only awn erect or recurved, sometimes twisted at the base, not keeled; paleas entire or 2-fid, keels 2, scabrid or ciliate, enclosing each a bisexual floret, the uppermost reduced. *Lodicules* 2. *Stamens* 3, rarely 2. *Ovary* obvoid with a villous 2- or 3-lobed appendage. *Styles* 2, lateral on the appendage. *Grain* linear to linear-oblong, usually concavo-convex, enclosed in and usually adhering to the lemma and palea or at least to the latter; embryo small.

Perennial; culms up to 3 ft. high; leaves 4-18 in. long, 1/2--5 in. wide, glabrous or more or less hairy; panicles up to 1 ft. long; lower glume 1-nerved, 1/2-3/4 in. long, upper 3-nerved, 1/8--4/3 in. long; lemmas 3-9, 2/8-5 in. long, 5-7-nerved, aristate, scaberulous, keeled below the tip. . . . . 1. *asper*.

Annual; culms up to 28 in. high; leaves 5-15 in. long, 1/2--3 in. wide, glabrous; panicles narrow, usually nodding, 3-16 in. long; spikelets strongly compressed; glumes keeled, lower 5-7-nerved, 1/4-1/8 in. long, upper 7-9-nerved, 1/4-1/7 in. long; lemmas 4-10, 1/5-1/7 in. long, 9-13-nerved, cuspidate, keeled. . . . . 2. *catharticus*.

1. *BROMUS ASPER*, Murray; F. B. I. vii. 358.

Nilgiri and Pulney Hills; 5,500-8,000 ft.

Doubtfully indigenous.

2. *BROMUS CATHARTICUS*, Vahl. *B. unioloides*, H. B. K.; F. B. I. vii. 357.

Nilgiri Hills; 5,500-8,000 ft.

An introduced American grass escaped about Ootacamund and Kotagiri; sometimes grown for fodder.

Flowers cleistogamous.

122. *Streptogyna*, Beauv.

Tall, erect, perennial herbs. *Leaves* petioled, flat, with obscure transverse venules. *Spikes* erect, unilateral. *Spikelets* long, narrow, subterete, imbricate, 1-6-flowered, not jointed at the base, rhachilla very long, slender, articulated at the base and between the lemmas. *Glumes* chartaceous, persistent; the lower oblong, tip truncate and erose, 3-7-nerved to the tip; the upper longer, acuminate, tip entire or 2-toothed, awned. *Lemmas* chartaceous, very narrow, convolute, tip acutely 2-fid and awned from the sinus, 3-nerved; paleas as long, keels 2, close, smooth enclosing a bisexual floret. *Lodicules* 3, elongate. *Stamens* 2-3. *Style* single, long, twisted, with 2-3 long, tortuous stigmas, linear, free but closely embraced by the lemma and palea.

STREPTOGYNA GERONTOGAEA. Hook. f. *S. crinata*, Thw. non Beauv.; F. B. I. vii. 333.

*S.* Travancore; in moist forest.

Culms 2-6 ft. high; leaves 6-12 in. long, 4-1 in. wide; lower glumes 4-16 in. long; lower glumes 3-14 in. long, upper longer; lowest lemma a little longer than the upper glume, awn -6-1 in. long.

123. *Brachypodium*, Beauv.

Annual or perennial herbs. *Leaves* flat or setaceously convolute. *Racemes* terminal, simple, spiciform; joints of axis more or less hollowed, at least the lower, opposite the spikelets. *Spikelets* often few, rarely solitary, at first cylindrical, later laterally compressed, erect and appressed to the rhachis or spreading, 5-many-flowered. *Rhachilla* disarticulating above the glumes and between the lemmas. *Glumes* 2, persistent, firm, more or less unequal, 3-nerved. *Lemmas* oblong to oblong-lanceolate, usually narrowed in the middle, mucro or a straight arista, back rounded, 7-9-nerved, awned, imbricate, then spreading; paleas rather broad, obtuse or truncate, 2 keeled, keels rigidly ciliate, each enclosing a bisexual floret, the uppermost more or less reduced. *Miculous* 2, ciliate. *Stamens* 2 or 3. *Ovary* crowned with a villous appendage. *Styles* 2, lateral. *Grain* linear or linear-oblong, concavo-convex, enclosed in the lemma and palea, more or less adherent to the latter; embryo small-

KRACHYPODIUM SYLVATICUM, Beauv. ; F. B. I. vii. 362.

About the hill-stations in the Nilgiris and around Kodaikanal; 5,000-7,000 ft. Probably introduced and escaped.

Culms up to 4 ft. high ; leaves 3-8 in. long, 1—3 in. wide, flat and flaccid or convolute ; racemes 2-8 in long ; lower glume 16-18 in. long, 3-nerved, upper 26-27 in. long, 5-7-nerved ; lemmas 8-14, 29—36 in. long, 7-9-nerved, mucro or arista 4-32 in. long.

#### 124. Lolium, Linn.

Annual or perennial, erect herbs. *Leaves* flat or convolute. *Spikes* terminal, simple, solitary; rhachis alternately and distichously hollowed opposite the spikelets. *Spikelets* solitary, 2-ranked, usually more or less compressed, the lowest lemma appressed to the rhachis, 3-11-, sometimes more-flowered. *Glumes* 2 in the terminal spikelet, equal and similar, in all the other spikelets the lower glume suppressed ; upper linear to oblong, persistent, rigid, many-nerved. *Lemmas* shorter, oblong, obtuse, acute or awned, back rounded, 5-many-nerved ; paleas as long, 2-keeled, keels sometimes narrowly winged, each containing a bisexual floret or the uppermost reduced. *Lodicules* 2. *Stamens* 3. *Styles* 2, free. *Grain* elliptic- to linear-oblong, tightly enclosed by and adhering to the lemma and palea ; embryo short.

LOLIUM PERENNE, Linn. ; F. B. I. vii. 365.

Introduced and escaped around Ootacamund and in the Pulney Hills. The Rye grass.

Perennial; culms up to 18 in. high ; leaves 3-12 in. long, 5—15 in. wide, flat or convolute ; spikes 3-9 in. long ; glumes 34—4 in. long ; lemmas 3-11, 24—28 in. long.

#### 125. Triticum, Linn.

Annual or biennial herbs. *Leaves* flat. *Spikes* terminal, solitary; rhachis excavated opposite the spikelets, articulate or inarticulate. *Spikelets* solitary, distichous, tumid, few-flowered. *Glumes* 2, persistent, rigid, often unequal-sided, obtuse or shortly awned. *Lemmas* oblong or ventricose, back rounded or keeled upwards, mucicous or 1-3-awned, 5-9-nerved; paleas as long, 2-keeled, keels ciliate, the lower each containing a bisexual floret, the upper

enclosing a <} floret or empty. *Lodicules* 2. *Stamens* 3. <sup>by</sup> *Grain* oblong, ventrally grooved, often hairy, free within the <sup>lemma</sup> and palea or adhering to the latter.

TRITICUM DICOCCUM, Schrank. *T. vulgare*, Vill.; F. B. I. <sup>vii#</sup> 367.  
Cultivated here and there for its grain, but not <sup>e%tenBi</sup> <sup>ly</sup>  
The Wheat or Corn plant. Vern. *Tel.* Godumalu; <sup>la</sup>  
Godumai ; *Mai.* Kotampam ; *Kan.* Godi.

### 126. *Hordeum*, Linn.

Annual or perennial herbs. *Leaves* flat. *Spikes* <sup>terminal</sup> solitary, simple, cylindric ; rhachis excavate or jointed. <sup>lets</sup> *Spikes* 2-3-nate in the hollows or at the nodes of the rhachis, 1-flowered or the lateral imperfect; rhachilla jointed below the lemma <sup>and</sup> produced above it as a bristle, sometimes bearing an abortive lemma. *Glumes* 2, persistent, rigid, narrow, the outer ones of each cluster together often resembling an involucre. *Lemmas* lanceolate, tapering into a long straight or recurved awn, back rounded, 5-nerved ; paleas about as long, 2-keeled, deeply folded between the keels, containing a bisexual floret, or in the lateral spikelets a c? floret or empty and much reduced. *Lodicules* 2. *Stamens* 3. *Styles* 2. *Grain* ovoid- or narrow-oblong, grooved in front, usually villous, tightly enclosed in the lemma and palea and adhering to the latter or to both ; embryo small.

HORDEUM HEXASTICHON, Linn. *H. vulgare*, Linn. var. *I\*\*\*I*  
*stichon*, Aitchis. ; F. B. I. vii. 371.

Occasionally cultivated in the hills. The Barley plant. <sup>Vern></sup>  
*Tarn.* Ganji, Dorai ganji.

### 127. *Arundinaria*, Michaux

Erect or climbing woody shrubs. *Culms* slender ; nodes usually prominent. *Culm-sheaths* thin, papery, straw-coloured ; impenetrable blades narrow, subulate. *Leaves* usually small. *Inflorescence* various, paniculate or racemose. *Spikelets* often long, compressed, often enclosed in bracteate sheaths, 1-many-flowered. *Glumes* membranous, unequal. *Lemmas* longer, concave, many-nerved, obtuse, acute or mucronate ; paleas usually shorter, prominently 2-keeled, usually compressed, all containing a bisexual floret, except

*l><i«h<milamn.\*.|\*

(HiAMIXEAE.

sometimes the reduced terminal. *Lodicuhs* 3, ovate or lanceolate<sup>7</sup> eiliate. *Stamens* 3, rarely up to 6, usually exerted, anthers usually blunt, *Ovary* globular above, often hairy. *Style* short; stigmas 2-3. *Grain* ovate or narrowly oblong, smooth, furrowed on the back, enclosed in the persistent lemma and palea.

Large shrub\* : culm-leaves over 4 in. long, distinctly, shortly petioled ; spikelet\* many in large terminal panicles 3-5-flowered :—

Leaves thick with thickened cartilaginous margins, ^ J ^ ' J truncate. 5-11 in. long. 1-1 1/2 in. wide. . . . . 1. . . . . arti.

Loaves thin, margins neither thickened nor conspicuously cartilaginous. Insc usually shortly narrowed, -i-7 in. long, 2. 1^ n ^ . ^ .

•Small shrubs up to 3 ft. high ; leaves <densly imbricate, thick, rigid, pungent, margins thickened, cartilaginous, sessile or nearlj<sup>80</sup>, •8-15 in. leg. -17-3 in. wide; spike.ets in racemes onleafy branches. 3. densifolia. 1-flowered . . . . .

1. ARUNDINARIA WALKERIANA, Munro; F. B. 1. vn. . . . .  
Gamble Ann. Calc. vii. t. 1.

Pulney Hills (Beddome).

2. ARUNDINARIA WIOHTIANA, Nees ; F. B. I. vii. 377 ; Gamble Ann. Calc. vii. t. 2.

Nilgiri, Palghat, Pulney and High Wavy Mountains (Blatter and Hallberg) ; 3,000-8,000 ft,

Common underwood in the Nilgiri Sholas. Flowering annually ; densely gregarious.

Var. *uispida*, Gamble ; F. B. I. vii. 377.

Leaf-sheaths and stems thickly covered with golden hairs from tubercles ; internodes more flattened on one side.

Xilgiri Hills ; 7,000-7,500 ft,

3. ARUNDINARIA DENSIFOLIA, Munfo ; F. B. 1. vii. 379 ; Gamble Ann. Calc. vii. t. 7.

Anaimudi in Travanoore at 8,500 ft. (Beddome).

Densely gregarious.

## 128. Dendrocalamus, Nees

Trees, sometimes large, always unarmed. *Olms* usually erect from . denselv branched rootstoek, sometimes neariy sohd^ J ^ - \*\*,,/\*- often very large, usually elongate, variably aunclcd..



imperfect blades narrowly triangular. *Leaves* sometimes very broad, without transverse veins but frequently with pellucid glands instead. *Panicles* large, compound; the spikelets usually in globose congested heads in long spikes. *Spikelets* ovate, few, rarely more than 6, usually bisexual. *Glumes* 2-3, ovate, acute or mucronate, many-nerved. *Lemmas* similar; paleas ovate, truncate, emarginate or 2-cleft, the lower 2-keeled and ciliate, the uppermost usually rounded on the back and eciliate. *Loas* usually 0. *Stamens* 6; filaments free; anthers mucronate or tufted hairs. *Ovary* ovoid or subglobose, often depressed, hairy above. *Style* long, usually hairy; stigma usually simple-small; pericarp crustaceous or hardened.

DENDROCALAMUS STRICTUS, Nees; F. B. I. vii. 404; Bedd. Sylv. t. 325; Gamble Ann. Calc. vii. tt. 68, 69. *Bambos strict* Roxb. Cor. Pl. t. 80.

Gregarious in all the drier hill-tracts; 300-4,800 ft.; absent from the W. Coast. The Male Bamboo.

Variable in size according to climate; culms 20-50 ft. 1-3 in. diam., sometimes solid; leaves in very dry localities 1-2 in. long, in moist ones up to 10 in. long, 2-1-2 in. spikelets in dense globose heads 3-1-3 in. diam., spinescent; usually hairy, the fertile intermixed with smaller barren lemmas ending in a short, sharp spine surrounded by tufts of hairs.

The culms are much used for poles, rafters, lance-shafts, matting, baskets, etc. Vern. *Hind.* Bans; (*Jr.* Salia bhanso; Salimbo bhanso; *Tel.* Sadanapa veduru, Pen veduru, Kanka, *Taw.* and *Mai.* Kal mungil.

### 129. Bambusa, Schreber

Shrubs or trees, rarely climbing, often very large, sometimes thorny. *Culms* from a thick rhizome, sometimes stoloniferous. *Culm-sheaths* usually broad, as also the triangular imperfect blades. *Leaves* small to moderately large, their sheaths variously auriculate. *Inflorescence* usually a large, leafless, compound panicle with the spikelets in heads on spicate branchlets, but sometimes in leafy panicles or paniculate spikes. *Spikelets* 1-many-flowered. *Glumes*

1-3. *Lemmas* ovate-lanceolate, usually mucronate ; paleas 2-keeled containing a bisexual floret. *Lodicules* 3, membranous, generally obtuse, ciliate. *Stamens* 6 ; filaments free, often exerted ; anthers narrow, tip obtuse, apiculate or panicillate. *Ovary* oblong or obovate, hairy at the apex. *Style* short or long ; stigmas 1-3. *Grain* oblong or linear-oblong, furrowed on one side ; pericarp thin,<sup>1</sup> adhering; embryo conspicuous.

Thornless ; culms 20-70 ft. high, 2-4 in. diam. ; blade of culm-sheath sparingly hairy within ; leaves 6-10 in. long, -7-1-5 in. wide ; spikelets 1-3 in. long ; lemmas -5-1 in. long ; ovary hairy. . . . . 1. *Tulda*. Branches armed at the nodes with 2-3 recurved spines; culms 80-100 ft. high, 4-7 in. diam. ; blade of culm-sheath densely felted with black or dark-purplish hairs within ; leaves up to 8 in. long and 1 in. wide; spikelets -5-1 in. long; lemmas -2--35 in. long; ovary glabrous. . . . . 2. *arundinacea*.

1. BAMBUSA TULDA, Roxb. ; F. B. I. vii. 387; Gamble Ann. ('ale. vii. t. 29.

Vizagapatam District (Gamble); 1,500-2,000 ft. ; Nundydroog (Rottler—perhaps cultivated).

Used for building, scaffolding and the making of mats and baskets. Vern. *Hind.* Peka ; *Beng.* Tulda, Talda bans.

2. BAMBUSA ARUNDINACEA, Willd.; F. B. I. vii. 395; Roxb. Cor. PL t. 79 ; Bedd. FI. Sylv. t. 321 ; Gamble Ann. Calc. vii. t. 48.

Tn all Districts ; 100-4,000 ft. The Thorny Bamboo.

Used for buildings, scaffolding and for many domestic purposes; for floating heavy timber; the split culms are woven into mats, baskets, fans, etc. The grain when available is eaten by the poor. Vern. *Ur.* Konta bhanso; *Tel.* Veduru, Mulla veduru, Bongudu; *Tarn.* Mungil, Periya mungil, Peru varai mungil; *Mai.* Mulla, Illi; *Kan.* Dongi, Bidungalu, Hebbidru.

### 130. Teinostachyum, Munro

Shrubs or trees. *Culms* rather slender, drooping above. *Culm-sheaths* usually thin ; imperfect blades recurved. *Leaves* usually lanceolate, acuminate. *Inflorescence* of spicate panicles on ~~leafy~~

branches; the spikelets in bracteate verticels. *Spikelets* long, narrow, few-many-flowered, the upper and lower florets imperfect, the others bisexual. *Glumes* 1 or 2, ovate, mucronate. *Lemmas* similar with longer mucros; paleas convolute, 2-keeled, keels ciliate. *Lodicules* 3, conspicuous, 3-9-nerved, persistent. *Stamen*\* 6; filaments free; anthers exserted, obtuse or obtusely apiculate. *Ovary* ovate or depressed-globose, produced into a long beak enclosing the style; stigmas 2-3. *Grain* ovoid, acuminate, beaked; pericarp crustaceous, not adnate to the seed.

TEINOSTACHYUM BKDDOMEI, C. E. C. Fischer n. nom. *T. Wighh* Bedd.; F. B. I. vii. 410; Bedd. Fl. Sylv. t. 323; Gamble Ann. Calc. vii. t. 87.

Nilgiri and Travancore Hills; 3,000-5,000 ft.

Culms semi-scandent, 10-20 ft. high, 1-1.5 in. diam.; ends of branches pendulous; culm-sheaths papery, 10-12 in. long; leaves oblong-lanceolate, 6-15 in. long, 1-2 in. wide; panicles large, terminal, drooping, branches spiciform; spikelets 5-1 in. long; glume solitary; lemmas 3-4, 2-3 fertile, the others incomplete.

Flowers at long intervals and dies down.

Used by the jungle tribes for mats, baskets and fencing. Vern. *Tarn*. Nanyura, Mai ita, Chittu.

### 131. Oxytenanthera, Munro

Scandent or small or medium-sized, unarmed, erect trees. *Culm*\* from a thick rhizome, usually creeping underground and stoloniferous. *Culm-sheaths* and imperfect blades usually narrow. *Leaves* usually small. *Inflorescence* a large panicle of spicate heads of few-many spikelets. *Spikelets* elongate, conical, 1-2-3-flowered, the uppermost usually fertile. *Glumes* 1-3. *Lemmas* elongate-ovate, mucronate; lower paleas 2-keeled, the uppermost convolute, only slightly or not at all keeled. *Lodicules* 0. *Stamens* 6; filaments united into a tube, thick at first, later membranous, exserted; anthers narrow, acute or apiculate. *Ovary* ovoid. *Style* fine; stigmas 1-3. *Grain* elongate, grooved, beaked by the persistent style\* embryo conspicuous.

flumes densely, often dark-ciliate, 1—\*16 in. long. Leaf-sheaths truncate and rigidly ciliate at the mouth. Spikelets -44-\*48 in. long ; lemmas usually 4, densely ciliate above the middle ; -28-\*46 in. long ; grain \*25--35 in. long . . . . . 1. *nigrociliata* var. *Hohenackeri*.

Glumes not or sparingly pale-ciliate :—

Branches climbing, whip-like ; culms hollow ; culm- and sometimes leaf-sheaths with a separable, coriaceous, bristly ring at *the* mouth ; spikelets -35--5 in. long, 1-flowered ; glumes and lemmas usually sparingly pale-ciliate on the margins ; style hairy . . 2. *monadelpha*.

Branches not whip-like even though straggling ; culm- and leaf-sheaths without bristly ring ; spikelets \*6-1 in. long ; glumes and lemmas eciliate :—

Culms solid or nearly so, densely velvety-tomentose ; culm-sheaths thin, papery at the edges ; leaf-sheaths without apical calluses ; spikelets slender, long, spinose-apiculate, 1-flowered ; style glabrous . . . . . 3. *monostigma*.

Culms hollow, glabrous ; leaf-sheaths with 2 apical calluses ; spikelets robust, 3-flowered ; style hairy . . . . . 4. *Bourdilloni*.

1. OXYTENANTHERA NIGROCILIATA, MunXO ; F. B. I. vii. 401.

Var. *Hohenackeri*, C. E. C. Fischer n. var.

Coorg near Mercara (Hohenacker) ; S. Kanara (Rhodes Morgan, G. F. F. Foulkes).

2. OXYTENANTHERA MONADELPHA, Alston. *O. Thwaitesii*, Munro ; F. B. I. vii. 402 ; Bedd. Fl. Sylv. t. 322 ; Gamble Ann. Calc. vii. t. 64.

W. Gháts from the Bababudan to the Travancore Hills ; 3,500-6,000 ft.

Gregarious, subscandent, reed-like, 10-12 ft. high. Vern. Wattai (Anamallais—*Kadir* ?).

3. OXYTENANTHERA MONOSTIGMA, Bedd. ; F. B. I. vii. 462 ; Gamble Ann. Calc. vii. t. 65.

Coorg and Anamallai Hills.

Erect ; culms up to 15 ft. high. Apparently rare.

4. OXYTENANTHERA BOURDILLONI, Gamble ; F. B. I. vii. 403 ; Gamble Ann. Calc. vii. t. 67.

Travancore, near the Cochin boundary ; among precipitous rocks ; 3,000-5,000 ft. (Bourdillon).

Straggling, forming open clumps ; 20-30 ft. high. Vern. *Tom*. Kambti ; *Kan*. Arawba.

## 132. Ochlandra, Thwaites

Reed-like woody shrubs or small trees. *Culms* erect, internodes rather long, thin-walled. *Culm-sheaths* thin, persistent. *Inflorescence* of spikes or spicate panicles terminating leafy branches; spikelets verticillate, some fertile, some sterile. *Spikelets* 1-flowered, often very large. *Glumes* 2-5, variable, usually mucronate similar to the uppermost glume, mucronate; *paleas* membranous, not keeled. *Lodicules* 1-several, conspicuous, variable, usually appressed to the filaments. *Stamens* 6-120; filaments free or united into a tube, exerted; anthers long, usually mucronulate. *Ovary* narrow. *Style* long; stigmas 4-6. *Grain* large or very large, ovoid, long-beaked, supported by the persistent glumes, pericarp very thick, fleshy.

Ligules short:—

Culm leaves 1-7 in. or less wide; inflorescence, when known, short terminal spikes or spicate panicles on leafy branches; spikelets 1-2 in. or less long; filaments free:—

Culm-sheaths truncate with 2 falcate, long-ovate auricles, imperfect blades long-ensiform; spikelets 1-2 in. long, or with a few setae near the apex of glumes and lemmas. Culms erect, up to 16 ft. high and 1 in. diam.; leaves 4-10 in. long, 1/4-1 in. wide; glumes 2-6 in. long; lemmas 1/2-1 in. long.

1. *scriptoria*.

Culm-sheaths, when known, attenuate into a needle-like blade; spikelets, when known, hirsute:—

Culms and culm-sheaths unknown. Leaves 8-12 in. long, 1-1.5 in. wide, mouth of sheaths with a rounded bristly auricle decurrent on either side; spikelets 1-1.5 in. long, covered with scattered, stiff, bulbous-based, spreading, brown hairs; glumes up to 1.5 in. long; lemmas up to 1-3 in. long.

Culms erect or straggling, up to 20 ft. high, 1-1.5 in. diam.; culm-sheaths persistent, thin, papery, gradually narrowed to a narrow apex, their imperfect blades needle-like, 1-1.5 in. long; leaves 4-9 in. long, 1/2-1 in. wide. Inflorescence unknown

3. *tetigera*.

Culm-leaves 6-18 in. long, 2-4.5 in. wide, mouth of their sheaths bearing stiff bristles; inflorescence a subverticillate spicate panicle

Culms erect, 6-20 ft. high, 1-2 in. diam. ; spikelets 2-2-5 in. long; glumes up to 2 in. long, mucronate ; lemmas<sup>#</sup>2-2-2 in. long, usually muticous ; filaments united . . . . . 4. *travancorica*.  
 Ugules membranous, 1-1-8 in. long. Culms and culm-sheaths unknown; leaves 10-25 in. long, 1-5-4-5 in. wide, their sheaths rarely with a few deciduous bristles at the mouth ; inflorescence a terminal verticillate spike with a thick rhachis ; spikelets 1-1\*7 in. long ; glumes 1-2 in. long with a cusp 1-25 in. long; lemmas 1-4-1 «6 in. long, mucronate . . . . . 5. *Wightii*.

1. OCHLANDRA SCRIPTORIA, C. E. C. Fischer n. comb. *O. Iiheedii*, Gamble ; F. B. I. vii. 418 ; Gamble Ann. Calc. vii. t. 107.

Malabar (Wight); Cochin (Johnston); Travancore ; at low elevations. Growing in thick clumps on river banks.

Flowers sporadically every year and does not die down.

Used for mat and basket-making. Vern. *Mai*. Ammei, Ottal, Kolanji.

- Var. *sivagiriana*, Gamble ; F. B. I. vii. 419; Gamble Ann. Calc. vii. t. 108.

Leaves and spikelets much larger ; stamens more numerous, up to 60.

Pulney (Beddome) and Sivagiri Hills.

2. OCHLANDRA BEDDOMEI, Gamble ; F. B. I. vii. 419 ; Gamble Ann. Calc. vii. t. 110.

Wynaad (Beddome).

3. OCHLANDRA SETIGERA, Gamble ; F. B. I. vii. 420 ; Gamble Anjj. Calc. vii. t. 115.

Nilgiri Hills at Gudalur at 3,000 ft. (Gamble).

4. OCHLANDRA TRAVANCORICA, Gamble; F. B. I. vii. 419; Gamble Ann. Calc. vii. t. 111. *Beesha travancorica*, Bedd. Fl. Sylv. t. 324.

Anamallai, Tinnevelly and Travancore Hills ; sea-level to 5,000 ft.

Gregarious in evergreen forest, covering large areas with a dense growth. Flowers at long intervals and dies down.

In great demand locally for mat- and basket-making.

A coarse paper is made from it. The leaves are much eaten by elephants and can be fed to horses if grass is scarce.

Vern. *Tarn*. Eeral, Eera-katti, Nanal, Odai; *Mai*. Eetta, Kar-eetta, Vei.

Var. *hirsuta*, Gamble ; F. to. I. vii. 420; Gamble Ann- ( )  
vii. t. 112.

Leaves thicker, margin\* more cartilaginous, their <sup>s. hcrths</sup>  
with appressed hairs from bulbous bases; spikelets <sup>ckly</sup> tm  
clothed with light-brown velvety pubescence.

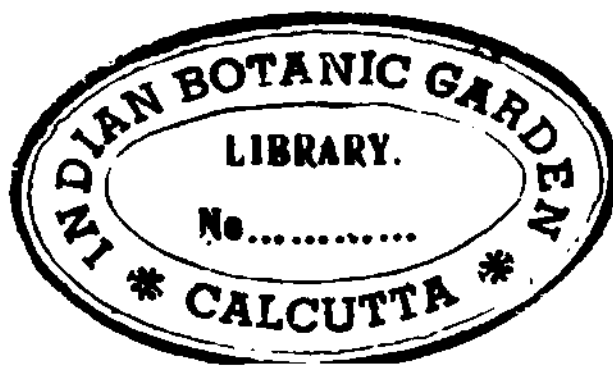
Travancore Hills (Hisldoie). . . . .

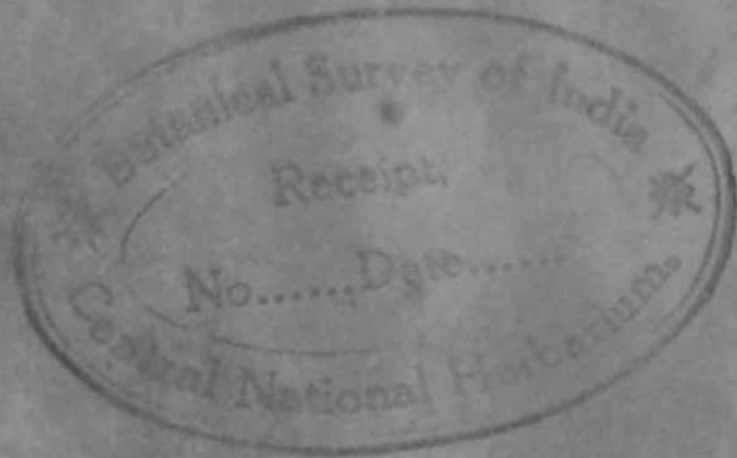
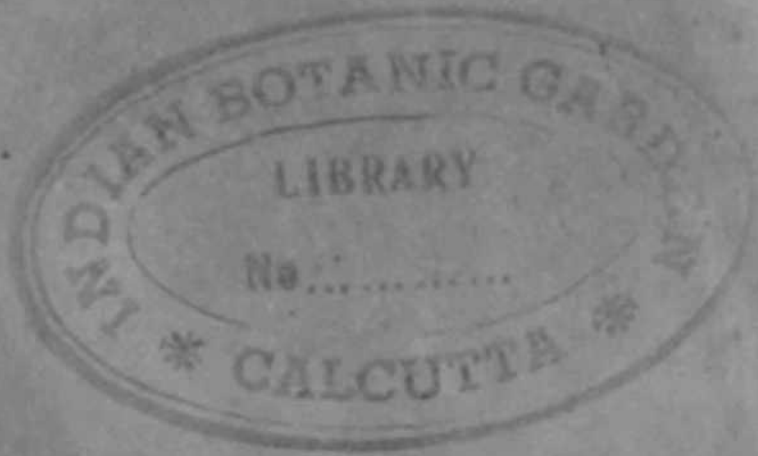
5. OCHLANDRA WIGHTII, C. E. C. Fischer n. comb. *O. Brandt'*  
Gamble ; F. B. I. vii. 420 ; Gamble Ann. Calc. vii. t. I<sup>13</sup>.

Travancore ; at low elevations and up to 3,500 ft.

Much resembling the previous s] > eies.

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