

FLORA OF
GOA, DIU, DAMAN,
DADRA & NAGARHAVELI
VOLUME II

ROJLA SESHAGIRI NAO



BOTANICAL SURVEY
OF INDIA

**FLORA OF
GOA DIU DAMAN DADRA &
NAGARHAVELI**

FLORA OF INDIA

Series 2

FLORA OF GOA DIU DAMAN DADRA & NAGARHAVELI

Volume 2

Rolla Seshagiri Rao



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RUBIACEAE

1. Erect, prostrate or climbing herb
 2. Flowers solitary, axillary sessile or shortly pedicelled
 3. Herbs succulent *Hydrophylax*
 3. Herbs not succulent
 4. Flowers terminal ; fruits smooth *Geophila*
 4. Flower axillary ; fruits densely and coarsely hairy *Dentella*
 2. Flowers in axillary and terminal corymbs, umbels, cymes or panicles
 5. Scabrid, climbing herbs *Rubia*
 5. Erect herbs
 6. Flowers purple or pink coloured
 7. Prostrate or ascending herbs with flaccid hairs *Neanotis*
 7. Erect herbs, softly hairy *Knoxia*
 6. Flowers white
 8. Seed one in each cell *Borreria*
 8. Seeds numerous in each cell
 9. Flowers in umbels or cymes *Argostemma*
 9. Flowers in dichotomous, axillary or terminal panicles, rarely solitary
 10. Calyx teeth 5 *Ophiorrhiza*
 10. Calyx teeth 4 *Hedyotis*
 1. Shrubs or trees
 11. Flowers collected in dense, globose or ovoid heads
 12. Calyx lobes fused into a fleshy mass *Nauclea*
 12. Calyx tube not fused into a fleshy mass
 13. Corolla lobes imbricate *Neonauclea*
 13. Corolla lobes valvate
 14. Flowers white ; stipules connate ; fruit a syncarpium, globose *Morinda*
 14. Flowers yellow ; stipules free ; fruit capsular :
 15. Sepals distinct *Adina*
 15. Sepals absent *Mitragyna*
 11. Flowers not collected in dense heads
 16. One calyx lobe expanded into a white or coloured leaf *Mussaenda*

16. Calyx lobe neither coloured nor expanded
17. Flowers in large, terminal or axillary corymbs
18. Leaves thin, lower sheathing ; bracts membranous ; style entire, long exerted *Pavetta*
18. Leaves thick, not sheathing ; bracts coriaceous ; style 2-branched, slightly exerted *Ixora*
17. Flowers in axillary or leaf-opposed cymes or fascicles
19. Branches armed
20. Ovary 3 to 5-celled *Meyna*
20. Ovary 2-celled
21. Fruit a capsule *Xeromphis*
21. Fruit a drupe, didymous *Canthium*
19. Branches unarmed
22. Corolla tube short, straight *Psychotria*
22. Corolla tube long, curved *Chassalia*
17. Flowers in terminal or axillary thyrsoid spikes or paniced cymes
23. Fruit a capsule
24. Leaves opposite ; flowers in thyrsiform panicles with 2 foliaceous bracts *Hymenodictyon*
24. Leaves in whorls of 3, flowers in small panicles *Wendlandia*
23. Fruit a fleshy berry
25. Inflorescence terminal
26. Ovary 2-celled *Tarenna*
26. Ovary 1-celled *Gardenia*
25. Inflorescence axillary *Tricalystia*

ADINA Salisb.

Adina cordifolia (Roxb.) Hook. f. ex Brandis, For. Fl. 263, f. 33, 1874 & in FBI 3 : 24, 1880 ; DG. 93 ; C. 2 : 7 ; T. 2 : 85 ; G. 2 : 412 ; S. 101 ; Dangs. 12 ; Saur. 258. *Nauclea cordifolia* Roxb. Pl. Cor. 1 : 40, t. 63, 1795.

Fl. : June July. *Fr.* : November - May. *Ill.* : T. f. 334.

Vern. : Heddi (Mar.) ; Yettagal (Kan.) ; Hed (Konk.) ; Aldavana Hedde (Port.).

Loc. : GOA : *Bicholim* ; *Usgao*. *Salcete* ; Chinchinum lake, Vernem. *Canacona* : Butpal, Kanpal hill top ; Ordofond-Gotkawal ; Ordofond,

near nursery ; Butpal. NAGARHAVELI : Saily forest ; Dolara forest ; Nana Randha ; Carchond forest ; Markhal ; Umberkoi Dongar pada forest.

Common in open forest areas.

ARGOSTEMMA Wall.

Argostemma courtallense Arn. in Ann. Nat. Hist. 3 : 22, 1839 ; FBI 3 : 42 ; C. 2 : 12 ; G. 2 : 417.

Fl. & Fr. : September. *Ill.* : Wt. Ic. t. 1160.

Loc. : GOA : *Satari* : Dinarai forests.

Rare, on moist rock crevices along stream.

BORRERIA G. F. W. Meyer *nom. cons.*

1. Stem erect ; flowers white ; seeds polished
2. Stem scabrid
 3. Leaves linear or lanceolate *pusilla*
 3. Leaves ovate or obovate *ocymoides*
2. Stem glabrous leaves oblong or oblanceolate *verticellata*
1. Stem procumbent, hispid ; leaves elliptic oblong ; flowers pale blue or violet ; seeds finely granular *articularis*

The genus *Borreria* G. F. W. Mey. (1818) is now considered by a few recent workers, as synonymous to the earlier genus *Spermacoce* Linn. Sp. Pl. 102, 1753 as the characters for both the genera are identical in the broader aspect with a wide range of material.

Borreria articularis (Linn. f.) F. N. Will. in Bull. Herb. Boiss. II, 5 : 956, 1905 ; Saur. 261 ; Pav. 117. *Spermacoce articularis* Linn. f. Suppl. 119, 1781 (excl. syn. Rumph.). *S. hispida* Linn. Sp. Pl. 102, 1753 ; FBI 3 : 200 ; DG. 99 ; C. 2 : 53 ; *Borreria hispida* K. Sch. in Pfam. 4(4) : 144, 1894 ; G. 2 : 461 ; S. 108, non Spruce ex K. Schum. (1889).

Fl. : August - October. *Fr.* : October - December.

Vern. : Gedo (Konk.) ; Madhuri Jadi (Guj.).

Loc. : GOA : *Pernem* : Terekhol. *Satari* : Onda. *Illhas* : Panaji, coastal area ; Mercedes village Curva. *Salcete* : Goodier ; Raiyi village. *Marmugao* : Gongsua. *Ponda* : Curti village. *Sanguem* : Ugem village ; Bali ; Nandrona near Molem ; Bati ; Barazon. *Canacona* : Angidiv. NAGARHAVELI : Khanvel ; Saily. DAMAN : Marvor ; Cataria ; Dundorta ; Jampore. DIU : Nagoa ; Airport area ; Gagale.

Common in open situations along waste lands, fields etc., sometimes along margins of roadside ditches.

Borreria ocymoides (Burm. f.) DC. Prodr. 4 : 544, 1830 ; G. 2 : 461. *Spermacoce ocymoides* Burm. f. Fl. Ind. 34, t. 13, f. 1, 1768 ; FBI 3 : 200.

Fl. & Fr. : November.

Loc. : GOA : *Bardez* : Porvorim roadside. *Satari* : Nana Che Dongar. *Sanguem* : Ghalto (Netravali) ; Barazon.

Rare, along roadside shady areas.

B. pusilla (Wall.) DC. Prodr. 4 : 543, 1830. *Spermacoce pusilla* Wall. in Roxb. Fl. Ind. 1 : 379, 1820. *Borreria stricta* (Linn. f.) Schum. in Pfam. 4(4) : 143, 1891 ; G. 2 : 461 ; S. 108. Dangs, 13 ; Saur. 262 ; Pav. 118. *Spermacoce stricta* Linn. f. Suppl. 120, 1781 ; FBI 3 : 200 ; C. 2 : 52.

Fl. & Fr. : August November.

Loc. : GOA : *Pernem* : Chopora, Kaisura fort ; Corgoa. *Bicholim* : Narora. *Satari* : Onda ; Caranzol ; Sanverdem Volpoi road. *Bardez* : Porvorim rocky plateau. *Ilhas* : Santacruz village. *Marmugao* : Nuvem hills. *Ponda* : Curti village. *Sanguem* : Bali ; Sanguem rest house area ; Alduna (Netravali). *Canacona* : Ordofond. NAGARHAVELI : Saily ; Dolara ; Morkhal. DAMAN : Fort area.

Common on open, rocky plateau and hill slopes and often along open situations in wastelands.

B. verticellata (Linn.) G.F.W. Mey. Prim. Fl. Esseq. 83, 1818. *Spermacoce verticellata* Linn. Sp. Pl. 102, 1753.

Fl. & Fr. : August. November.

Loc. : GOA : *Sanguem* ; Barazon.

Rare.

CANTHIUM Lamk.

Branches armed with spines ; leaves ovate-cordate to lanceolate ; flowers in axillary fascicles or cymes

angustifolium

Branches unarmed leaves oblong-lanceolate ; flowers in axillary, peduncled umbels

dicoccum

Canthium angustifolium Roxb. Fl. Ind. 2 : 169, 1824 ; FBI 3 : 135. *Canthium rheedei* DC. Prodr. 4 : 474, 1830 ; FBI 3 : 134 ; DG. 97 ; T 2 : 108. *Plectronia rheedei* var. *angustifolia* Gamble, Fl. Pres. Madras 625, 1921 ; FBI 3 : 135.

Fl. & Fr. : April. May. *Ill.* : Wt. Ic. t. 826.

Vern. : Chapyel (Mar.) ; Ambgani (Kan.) ; Bidani gheli (Konk.) ; Espinho salado (Port.).

Loc. : GOA : *Satari* : Caranzol, Vangiri forest. *Canacona* : Nadquem ; Yed forest towards Nadquem.

Occasional, inside the forest.

Canthium dicoccum (Gaertn.) Teysm. & Binn. var. *umbellatum* (Gamble) Sant. & Merch. in Bull. Bot. Surv. India. 3 : 107, 1961. *Plectronia didyma* var. *umbellata* Gamble in Fl. Pres. Madras, 624, 1921. *Canthium umbellatum* Wt. Ic. t. 1034. 1845 ; FBI 3 : 132. *Plectronia wightii* Cooke, Fl. Pres. Bombay 1 : 606, 1903.

Fl. & Fr. : November - May. *Ill.* : Wt. Ic. t. 1034.

Vern. : Tupa, Arsul (Mar.) ; Yellal (Kan.) ; Ursul (Konk.).

Loc. : GOA : *Satari* : Caranzol old railway station. *Canacona* : Mehdan forest, near Nadquem.

Occasional, inside the forest

CHASSALIA Commers. ex Poir.

Chassalia ophioxylodes (Wall.) Craib. in Gard. Bull. Straits Settl. 6 : 474, 1930. *Psychotria ophioxylodes* Wall. in Roxb. Fl. Ind. 2 : 168, 1824. *Chassalia curviflora* (Wall.) Thw. Enum. 150. 1849 p.p. ; FBI 3 : 176 ; C. 2 : 47 ; T. 2 : 130 ; G. 2 : 453.

Fl. : August. *Fr.* : September. *Ill.* : T. 2 : f. 362.

Vern. : Kanmullige gidda (Kan.).

Loc. : GOA : *Satari* : Dinarai forest. *Canacona* : Poinguinim.

Rare along forest edges.

Though the characters separating *Chassalia* and *Psychotria* are not quite distinct, there is considerable diversity of opinion regarding merging of *Chassalia* with *Psychotria* Linn. However, in this work *Chassalia* is treated as distinct. The correct spelling is *Chassalia* and not *Chasalia* as given in Floras.

DENTELLA J. R. & G. Forst.

Dentella repens (Linn.) Forst. Charact. 26, t. 13, 1776 ; FBI 3 : 42 ; DG. 94 ; C. 2 : 12 ; G. 2 : 416 ; S. 103 Dangs. 13 ; Saur. 260. *Oldenlandia repens* Linn. Mant. 1 : 40, 1767, non Burm.

Fl. & Fr. : Almost throughout the year. *Ill.* : Subramanyam & Sharma in Bull. Bot. Surv. India 10 (3 & 4) : 387, f. 1-6, 1968.

Vern. : Jata (Konk.).

Loc. : GOA : *Satari* : Masarde village. NAGARHAVELI : Silvassa ; Atal forest ; Chispana area. DAMAN : Regunvara ; Dabel.

Occasional, in moist situations often forming dense mats on the ground.

GARDENIA Ellis *nom. cons.*

Leaves petiolate ; calyx lobes 5, long-subulate, erect *resinifera*
 Leaves sessile ; calyx lobes 5-9, lanceolate, recurved *latifolia*

Gardenia latifolia Ait. Hort. Kew 1 : 294, 1789 ; FBI 3 : 116 ; DG. 96 ; C. 1 : 30 ; T. 2 : 103 ; G. 2 : 436.

Fl. : March *May. Ill.* : Wt. Ic. t. 759 ; T. f. 343 & 344.

Vern. : Pandru (Mar.) ; Gogavli (Konk.).

Rare, along ghat slopes (Dalgado).

G. resinifera Roth. Nov. Sp. 150, 1821. *G. lucida* Roxb. [Hort. Beng. 15, 1814 (*nom. nud.*) &] Fl. Ind. 1 : 707, 1820 ; FBI 3 : 115 ; DG. 96 ; C. 2 : 30 ; T. 2 : 101 ; G. 2 : 436.

Fl. : March *June. Ill.* : Wt. Ic. t. 575.

Vern. : Dikemali (Mar.) ; Dikmali (Konk.).

Occasional in forest areas and sometimes cultivated for 'Dikamali' resin used as a veterinary ointment.

Cult. species :

G. jasminoides Ellis in Phil. Trans. 51 : 935, 1761 ; C. 2 : 31 ; G. 2 : 437. *G. florida* Linn. Sp. Pl. ed. 2 : 305, 1762 ; DG. 96.

Fl. : July *September.*

Vern. : Gandroya (Mar.) ; Nanamt (Konk.) ; Jasmin do cabo de Boa Esperanca (Port.).

A native of China, cultivated in gardens for beautiful white, fragrant flowers.

GEOPHILA D. Don *nom. cons.*

Geophila repens (Linn.) I.M. Johnston in Sargentia 8 : 281, 1949. *Rondeletia repens* Linn. Syst. ed. 10, 928, 1758-59. *Geophila reniformis* D. Don Prodr. Fl. Nepal, 136, 1825 ; FBI 3 : 178 ; DG. 99 ; C. 2 : 49 ; G. 2 : 454.

Ill. : Wt. Ic. t. 54.

Vern. : Karli (Konk.).

Though recorded from Vengurla only (Cooke & Dalgado), it is quite possible to locate from Goa also.

HEDYOTIS Linn.

Critical morphological studies of the various taxa treated under the genera *Hedyotis* Linn., *Oldenlandia* Linn., *Houstonia* Linn. ex Benth. et Hook. f., *Kohautia* Cham. & Schlecht. and *Exallage* Bremek. by the recent workers covering a wide range of pantropical material, clearly prove that the major characteristic of several species exhibit continuous ranges and the various generic realignments made by Bremekamp (*Verh. Akad. Wet. Amst.* 48 : 1-297, 1952) and a few others would not stand at all. As such *Oldenlandia* Linn., based on numerous minute angled seeds with fleshy endosperm in wholly inferior capsules and monomorphic flowers with very short corolla, *Kohautia* Cham. & Schlecht., based on elongate corolla tube and *Exallage* Bremek., created on the basis of indehiscent fruit, do not stand as distinct genera. The author in his study of the genus *Hedyotis* Linn. in Maharashtra State (1973) followed the present understanding of the genus and the same approach is presented here. [For details *vide* : Rolla S. Rao and K. Hemadri in *Ind. For.* 99(6) : 372-1973].

HEDYOTIS Linn.

- | | |
|--|--------------------|
| 1. Capsules indehiscent | <i>auricularia</i> |
| 1. Capsules dehiscent at least at the top | |
| 2. Capsules protruded at apex | |
| 3. Plants unbranched or 2.3-branched ; persistent calyx lobes for exceeding the protruded apex, of ten leaf-like | <i>maheshwarii</i> |
| 3. Plants more or less profusely branched ; calyx lobes shorter or equalling the protruded apex | <i>herbacea</i> |
| 2. Capsules not protruded at apex | |
| 4. Capsules broader than long, very truncate and flat on the top | <i>diffusa</i> |
| 4. Capsules more or less as long as broad, globose | |
| 5. Leaves opposite, very linear ; flowers with long, capillary peduncles and pedicels ; capsules 1.5-2 mm in diam | <i>affinis</i> |
| 5. Leaves whorled and opposite, never less than 1 mm broad ; flowers with short peduncles and pedicels ; capsules about 2.5 mm in diam | <i>corymbosa</i> |

Hedyotis affinis R. & S. Syst. Veg. 3 : 194, 1818. *Oldenlandia affinis* (R. & S.) DC. Prod. 4 : 428, 1830. *Oldenlandia dichotoma* (Koen. ex Roth.) Hook. f. FBI 3 : 67, 1880, *non* Spreng. 1850 ; G. 2 : 424.

Fl. & Fr. : August. November.

Loc. : GOA : *Satari* : Nanacha dongar (Codal).

Common in open areas.

Hedyotis auricularia Linn. Sp. Pl. 101, 1753 ; FBI 3 : 58 ; DG. 94 ; C. 2 : 13. *Oldenlandia auricularia* K. Schum. in Pflanzenf. 4 (4) : 25, 1891 ; G. 2 : 421. *Exallage auricularia* (Linn.) Bremek. in Verh. Kon. Ned. Acad. Wet. II, 48 (2) : 142, 1952.

Fl. : September - November. *Ill.* : Wt. Ic. t. 1028.

Vern : Ghaymari (Konk.).

Loc. : GOA : *Satari* : Masarde ; Caranzol ; Onda Mole ; Tanam ; Nanacha Dongar. *Ilhas* : Chimbhel water reservoir. *Salcete* : Goodier. *Ponda* : Near Curti village. *Quepem* : Budsari Goundugarha. *Sanguem* : Wolancha Dongar ; Chansuia ghat ; Bati ; Babanbanda (Molem Belgaum road) ; Nandrena near Molem. *Canacona* : Butpal ; Codal village ; rdofond forest, on way to Tudal ; Ordofond.

Common in the fields and open forest areas.

H. corymbosa (Linn.) Lamk. Tab. Encl. 1 : 272, 1791. *Oldenlandia corymbosa* Linn. Sp. pl. 119, 1753 ; FBI 3 : 64 ; DG. 94 ; C. 2 : 15 ; G. 2 : 423 ; S. 103.

Fl. & Fr. : August November.

Vern : Papti (Mar.) ; Poripat (Konk.) ; Papalo (Port.).

Loc. : GOA : *Bicholim* : Sanquilim. *Satari* : Nandore, bank of Mahadevi river ; Nanachedongar, Codal. *Bardez* : Porvorim road side. *Ilhas* : Rice fields, near Santacruz village. *Marmugao* : Marmugoa fort. *Sanguem* : Balli ; Sanguem. *Canacona* : Butpal ; Angidiv.

Common in open situations, on moist sandy soil and along roadsides.

H. diffusa Willd. Sp. Pl. 1 : 566, 1797-98. *Oldenlandia diffusa* Roxb. [Hort. Beng. 11, 1814 (*nom. nud.*) &] Fl. Ind. 1 : 423, 1832 ; FBI 3 : 65 ; C. 2 : 16 ; G. 2 : 423.

Fl. & Fr. : May.

Loc. : GOA : *Satari* : Masarde, near Valpoi, Nandore bank of Mahadevi river ; Codal - Nanora road, 10 km point.

Occasional, in open situations on moist sandy soil.

H. herbacea Linn. Sp. Pl. 102, 1753 ; Backer & Bakhuizen, Fl. Java 2: 286. 1965. *Oldenlandia herbacea* (Linn.) Roxb. [Hort Beng. 11, 1814 (*nom. nud.*) &] Fl. Ind. 1 : 424, 1831 ; C. 2 : 16 ; G. 2 : 424. *Oldenlandia heynii* R. Br. : FBI 3 : 65.

Fl. : March - April. *Fr.* : October - November.

Loc : GOA : *Bardez*. Betim ; Porvorim rocky plateau ; Bastora. *Ihas* : Miramar, Panaji. *Salcete* ; Goodier ; Gonsua. *Sanguem* : Sidh forest area ; Surla. *Quepem* : Budsari Goundugarha. *Canacona* : Ordofond.

Common.

Hedyotis maheshwarii (Sant. et Merch.) Rolla Rao et Hemadri in Ind. For. 99 (6) : 376, 1973. *Oldenlandia maheshwarii* Sant. et Merch. Journ. Ind. Bot. Soc. 42A : 213-215, ff. 1-6, 1964.

Fl. & Fr. : August-April.

Loc : GOA : *Sanguem* : Surla

HYDROPHYLAX Linn. f.

Hydrophylax maritima Linn. f. Suppl. 126, 1781 ; FBI 3 : 199, C. 2 : 51 ; Saur. 260.

Fl. & Fr. : September.

Loc. DIU : Diu, Sandy sea shore near Jalandhar.

Rare, on sandy saline soil. The roots are usually deep penetrating.

HYMENODICTYON Wall.

- | | |
|---|-----------------|
| 1. Flowers pedicelled, in fascicles or umbellules on a thyrsoid panicle ; capsules on recurved pedicels | <i>orixense</i> |
| 1. Flowers sessile, in elongate spikes ; capsules erect | <i>obovatum</i> |

Hymenodictyon obovatum Wall. in Roxb. Fl. Ind. 2 : 153, 1824 ; FBI 3 : 36 ; DG. 93 ; C. 2 : 10 ; T. 1 : 91 ; G. 2 : 416 ; S. 101.

Fl. : July-September. *Fr.* : September. *Ill.* : Wt. Ic. t. 1159.

Vern. : Kadva-Sirid (Mar.) ; Bogi (Kan.) ; Sirid (Konk.).

Though recorded from Ramghat of Ratnagiri district (Cooke and Dalgado), it would be possible to collect it in Goa also.

H. orixense (Roxb.) Mabblerly in Taxon 31 : 66, 1982. *Cinchona orixensis* Roxb., Bot. Descr. Swietenia 21, 1793 & in Mad. Facts. Obs. 6 : 152, 1795. *Hymenodictyon excelsum* (Roxb.) Wall. in Roxb. Fl. Ind. 2 : 149, 1824 ; FBI 3 : 35 ; DG. 93 ; C. 2 : 9 ; T. 2 : 91 ; G. 2 : 416 ; S. 101 ; Saur. 267. *Cinchona excelsa* Roxb. Pl. Cor. 2, t. 106, 1798.

Fl. : June-July. *Fr.* : October. *Ill.* : Wt. Ic. t. 80.

Vern. : Bhorsal (Mar.) ; Damdeli (Konk.).

Loc. : NAGARHAVELI : Barpam forest ; Dolara forest.

Rare, along ghats (Dalgado) and in deciduous forests.

IXORA Linn.

- | | |
|---|--------------------|
| 1. Flowers scarlet | <i>coccinia</i> |
| 1. Flowers white or pink | |
| 2. Calyx lobes longer than the tube ; lobes linear - lanceolate | <i>lanceolaria</i> |
| 2. Calyx lobes shorter than the tube or absent | |
| 3. Shrubs ; leaves and inflorescence turning black on drying ; leaves elliptic - lanceolate, acute or shortly acuminate at apex | <i>nigricans</i> |
| 3. Small trees ; leaves oblong or elliptic - oblong, obtuse at apex ; leaves and inflorescence not turning black on drying | |
| 4. Flower buds globose, corolla tube less than 0.8 cm long ; leaves thinly coriaceous, elliptic oblong, narrowed at base | <i>brachiata</i> |
| 4. Flower buds ellipsoid, corolla tube more than 0.8 cm long ; leaves thickly coriaceous, obovate, rounded or cordate at base | <i>arborea</i> |

Ixora arborea Roxb. in Rees Cycl. 19 : 5, 1811 ; S. 106. *I. parviflora* Vahl, Symb. 3 : 11, t. 52, 1794 (*non* Lamk.) ; FBI 3 : 142 ; DG. 97 ; T. 1 : 114 ; C. 2 : 39 ; G. 2 : 445.

Fl. : January - April. *Fr.* : May - June. *Ill.* : T. f. 350 ; Bedd. Fl. Sylv. t. 222.

Vern. : Kurat (Mar.) ; Henu (Kan.) ; Kurati (Konk.).

Fairly common along ghats (Dalgado).

I. brachiata Roxb. [Hort. Beng. 10, 1814 (*nom. nud.*) &] Fl. Ind. 1 : 391, 1820 ; FBI 3 : 142 ; C. 2 : 39 ; T. 2 : 112 ; G. 2 : 445 ; S. 106 ; Dangs. 13 ; Saur. 269.

Fl. & Fr. : February - May. *Ill.* : Wt. Ic. t. 710 ; T. f. 349.

Vern. : Gorbale (Kan.).

Loc. : GOA : *Satari* : Nandore forests ; Caranzol old railway station area ; Matachi Rai, near Palem ; Satre river bank, Codal - Ambechagol ; south of Codal, 3 km. *Sanguem* : Patiem forest ; Kargal Jungle. *Canacona* : Ordofond - Tudal ; Hathipawal, Butpal Ordofond ; Nadquem, Quer hills ; Badsare forests. DAMAN : Coileque area.

Common inside the forest along rivers and streams.

I. coccinia Linn. Sp. Pl. 110, 1753 ; FBI 3 : 145 ; DG. 98 ; C. 2 : 40 ; T. 2 : 115 ; G. 2 : 445 ; Saur. 268.

Fl. : October - November. *Ill.* : T. f. 351 ; Wt. Ic. tt. 149 & 153.

Vern. : Pendgul (Mar.) ; Gudde dasal (Kan.) ; Podkali (Konk.) ;
Ixora (Port.).

Loc. : GOA : *Pernem* : Tamboxim Pernem. *Satari* : Nagram, near
Valpoi ; Mavacha gunda, Valpoi Caranzol ; Valpoi ; Tanem ;
Golauhi ; Caranzol. *Ilhas* : Santacruz area ; Goodier ; Chimbel reservoir
Brahmapuri temple. *Marmugao* : Nuvem Dongri. *Sanguem* :
Molem Belgaum Road, 62 km ; Periche Tem (Cumbari) ; Bavanbanda
(Molem Belgaum Road) ; Orgoni (Netravali) ; near Anvelven (Molem) ;
Bati. *Canacona* : Canacona Balli ; Ordofond ; Polem ; Angidiv. DAMAN :
Dabel.

Common along river banks and also on the ghats and near sea
coast. Also grown in gardens for using flowers in prayers.

Ixora lanceolaria Colebr. in Roxb. Fl. Ind. 1 : 397, 1820 ; FBI 3 :
138 ; C. 2 : 37 ; T. 2 : 111 ; G. 2 : 444.

Fl. : November. *Ill.* : Wt. Ic. t. 827.

Loc. : GOA : *Canacona* : Ordofond Butpal.

The species which is recorded for North Kanara only is now collected
in Goa also.

I. nigricans R. Br. ex Wt. & Arn. Prodr. 428, 1834 ; FBI 3 :
148 ; C. 2 : 38 ; T. 2 : 117 ; 117 ; G. 2 : 445 ; S. 107.

Fl. : March May. *Fr.* : August November. *Ill.* : T. f. 352 ; Wt. Ic.
t. 318.

Vern. : Lokhandi (Mar.) ; Adalaya (Kan.).

Loc. : GOA : *Satari* : Sakad forest, Maloli ; Poshiyen forest, near
Pengeral ; Dinarai forest, near Pali, Matachi Rai, near Palem ; Vadachi
Dhat, near Vangiri forest from Nandore ; Codal Nanora road, 5 km,
Ambeachagol (alt. 700m) ; Satrem. *Sanguem* : Moduka bungla jungle ;
Darbandora nala, near forest Chowk. *Canacona* : Nadquem hills ; Yed
forest, Nadquem area ; Mehdan forest, near Nadquem ; Butpal.

Common, inside the forest along hill slopes.

KNOXIA Linn.

Knoxia sumatrensis (Retz.) DC. Prodr. 4 : 560, 1830. *Spermacoce*
sumatrensis Retz. Obs. 4 : 23, 1786, *Knoxia corymbosa* auct. non Willd. ;
FBI 3 : 128 ; C. 2 : 33 ; G. 2 : 439.

Fl. : October. *Ill.* : Wt. Ill. t. 128.

Loc. : GOA : *Salcete* : Margao ghat.

Rare, on exposed rocky areas.

MEYNA Roxb. ex Link

Meyna laxiflora Robyns in Bull. Jard. Bot. Bruxelles 11 : 228, 1928 ; S. 105 ; Dangs. 13 ; Saur. 265. *Vangueria spinosa* Hook. f. in FBI 3 : 136, 1882 ; DG. 97 ; C. 2 : 36 ; T. 2 : 109 ; G. 2 : 442, *omnes partim*.

Fl. : January - April. *Fr.* : April - May. *Ill.* : T. f. 348.

Vern. : Alu (Mar.) ; Gund kare (Kan.) ; Helu (Konk.)

Loc. : GOA : *Satari* : Jamad forest Nandore hill ; Codal Nauora road, 10 km. *Canacona* : Ordofond Mukadamol ; Butpal forest ; Nadquem, Angidiv. NAGARHAVELI : Saily forest ; Berpam forest ; Chispana area ; Dudeni ; Sindhoni forest.

Fairly common in ghat areas in semi evergreen forests near jungle clearings and towards margins of forests. The fruits when ripe are eaten by villagers but not palatable. Dalgado records that *Vangueria madagascariensis* J. F. Gmel. Syst. 367, 1791 (= *Vangueria edulis* Vahl) a native of Madagaskar, was cultivated in Goa for its fruits.

MITRAGYNA Korth. *nom. cons.*

Mitragyna parvifolia (Roxb.) Korth. Obs. Naocl. Ind. 19, 1839 ; C. 2 : 8 ; G. 2 : 413 ; S. 101 ; Dangs. 14 ; Saur. 259 ; Pav. 118. *Nauclea parvifolia* Roxb. Pl. Cor. 1 : 40, t. 52, 1795. *Stephegyne parvifolia* Korth. Verh. Nat. Ges. Bot. 161, 1840 ; FBI 3 : 25 ; DG. 93, T. 2 : 86.

Fl. : April - July. *Fr.* : August - November. *Ill.* : T. f. 335.

Vern. : Kadam (Mar.) ; Kanu (Kan.) ; Kalam (Konk.) ; Kalame, Kadamb (Guj.).

Loc. : GOA : *Satari* : Caranzol old railway station. *Canacona* : Ordofond area ; Canacona area ; Butpal ; Nadquem. NAGARHAVELI : Saily forest ; Umberkoi Dongarpada forests ; Morkhal ; Jamunpada forest.

Common in cleared forest area and along roadside.

MORINDA Linn.

- | | |
|---|------------------|
| 1. Climbing shrubs | <i>umbellata</i> |
| 1. Trees or shrubs | |
| 2. Leaves glabrous, shining ; seeds winged | <i>ctrifolia</i> |
| 2. Leaves pubescent or tomentoes, dull ; seeds not winged | <i>tomentosa</i> |

Morinda citrifolia Linn. Sp. Pl. 176, 1753 ; FBI 3 ; 155 ; DG. 99 ; C. 2 : 42 ; T. 2 : 121 ; G. 2 : 459.

Fl. : May June. *Ill.* : Bedd. Fl. Sylv. t. 220.

Vern. : Bartondi (Mar.) ; Ainshi (Kan.) ; Bartondi (Konk.).

The species though mostly cultivated, is also found as an escape in Concan (Vengurla) and Goa (Marmagoa) (Cooke and Dalgado). The species being subjected to considerable cultivation, the two varieties *bracteata* Hook. f. and *elliptica* Hook. f. though recognised by Hooker f. in FBI and followed by Cooke, are not quite clear and a more detailed work between the wild and cultivated forms, based on collections from different parts of India, is essential.

M. tomentosa Heyne ex Roth, Nov. Pl. Sp. 147, 1821 ; Saur. 253 ; Pav. 119. *M. tinctoria* Roxb. var. *tomentosa* Hook. f. in FBI 3 : 156, 1880 ; DG. 99 ; C. 2 : 43 ; T. 2 : 123 ; G. 2 : 459 ; Dangs 50.

Fl. : May July. *Fr.* : September.

Vern. : Aseti (Mar.) ; Mulgal (Kan.) ; Aseti (Konk.) ; Al. (Guj.).

Loc. : GOA : *Bardez* : Chopora, Kaisura fort. NAGARHAVELI : Dongarpada Umberkoi ; Carchand forests (Velgaon).

Common in deciduous forest.

M. umbellata Linn. Sp. Pl. 176, 1753 ; FBI 3 : 157 ; DG. 99 ; G. 2 : 460.

Fl. & Fr. : May - September.

Vern. : Ran-makad-phal (Konk.). Fructo dos macacos (Port.).

Mostly cultivated (Dalgado).

MUSSAENDA Linn.

Branchlets glabrous except the nodes ; leaves glabrous above, minutely pubescent below ; fruit glabrous

glabrata

Branchlets and leaves softly hairy ; fruit sparsely hirsute

laxa

Mussaenda glabrata (Hook. f.) Hutchin. ex Gamble, Fl. Pres. Madras 610, 1921 ; S. 104. *Mussaenda frondosa* var. *glabrata* Hook. f. in FBI. 3 : 90. *M. frondosa* Linn. Sp. Pl. 177, p.p. ; DG. 95 ; C. 2 : 24 ; T. 2 : 94.

Fl. : March. *Fr.* : August November. *Ill.* : T. f. 339.

Vern. : Bhutkes, Sherwod (Mar.) ; Pathri (Kan.) ; Sarvadi (Konk.).

Loc. : GOA : *Pernem* : Pernem Bicholim. *Satari* : Tanem ; *Caranzol. Bardez* : Porvorim forests. *Ilhas* : Chimbel reservoir - Brahmapuri temple.

Sanguem : Avelde jungle, Molem ; Potiem forests ; Suryagarh ; Patola ; Molem Belgaum Road, 71 km. *Canacona* : Ordofond - Butpal ; Ordofond forest, on way to Tudal ; Tudal, near nala ; Tudal ; Angidiv.

Common in the open forest edges.

Mussaenda laxa Hutchin. Herb. Kew ex Gamble, Fl. Pres. Madras, 610, 1921 ; *M. frondosa* var. *laxa* Hook. f. in FBI 3 : 89.

Fl. & Fr. : April - November.

Loc. : GOA : *Satari* : Masarde hill, near Valpoi. *Bardez* : Betim. *Sanguem* : Sanguem Barazan mine area ; Colem area. *Quepem* : Budsari-Goundugarha. *Canacona* : Mukadoma! Ordofond.

Common along roads and at the edges of forests.

NAUCLEA Linn.

Nauclea missionis Wall. ex Wt. & Arn. Prodr 392, 1834 ; FBI 3 : 27 ; DG. 93 ; G. 2 : 411. *Nauclea elliptica* Dalz. & Gibs. Bombay Fl. 118, 1861 (non Bedd.). *Sarcocephalus missionis* Haviland, in Jour. Linn. Soc. 33 : 32, 1897 ; C. 2 : 5 ; T. 2 : 84.

Fl. : April - May.

Vern. : Phuga (Kon.).

The species which is common in evergreen forests of North Kanara, is also recorded for Goa ghats by Dalgado.

NEANOTIS W.H. Lewis (= *Anotis* auct. non DC.)

Walter H. Lewis [Annals of Missouri Botanical Garden 53 (1) : 32, 1966], while revising the American and Asian species of *Anotis* and other allied genera like *Hedyotis*, *Oldenlandia* indicates that all the 14 species included originally by DeCandolle in the genus *Anotis* DC. are referable to the already known earlier valid genera like *Arcytophyllum* and *Hedyotis* and they are native to the American origin only. With this understanding, the Asian species described under the genus *Anotis* DC. by the various authors on Asian Floras (including India) are quite distinct from the American group and hence a new name *Neanotis* has been proposed by Lewis with *Neanotis indica* (DC.) Lewis (= *Putoria indica* DC.) as the type species. As such all the species described under *Anotis* sensu Hook. f. in Benth. and Hook. f. Gen. Pl. 2 : 52, 1873, excl. sect. *serpicula* Hook. f. and sect. *Pterospora* Hook. f. non DC. (Prodr. 4 : 31, 1830) are now transferred to *Neanotis* by Lewis, under new combinations. The distinct nature of the genus *Neanotis* is further supported by Palyhological characters. Lewis, however, admits that a more detailed monographic work on the genus is needed to present a comprehensive data on the genus is needed to present a comprehensive data on the Asian species of the genus and its allies.

Many combinations under *Anotis* ascribed to Hook. f. in Benth. & Hook. f. Gen. Pl. 2 : 59-60, 1873 in the Index Kewensis, were only listed under *Anotis* in *Genera Plantarum* and accordingly to Art. 33 of the International Code of Botanical Nomenclature such a combination is not considered to be validly published. Fortunately, however, many such invalid combinations were validated by Hooker f. himself in the *Flora of British India*, seven years later.

1. Flowers in lax cymes
 2. Capsule broader than long ; calyx teeth a little below the top of the capsule in fruit *lancifolia*
 2. Capsule globose ; calyx teeth about middle of the capsule in fruit *rheedei*
1. Flowers in 2 to 3-flowered, capitate cymes
 3. Capsule 4-lobed and 4-celled ; calyx-teeth minute *quadrilocularis*
 3. Capsule 2-lobed and 2-celled *foetida*

Neanotis foetida (Hook. f.) W.H. Lewis in Ann. Missouri Bot. Gard. 53 : 38, 1966. *Anotis foetida* Hook. f. FBI 3 : 74, 1880 ; C. 2 : 22 ; G. 2 : 426 ; S. 104. *Hedyotis foetida* Dalz. in Hook. Journ. Bot. 2 : 134, 1850 *non* (Forst.) J.E. Smith (Rees Cyclop. 17, 1811).

Fl. & Fr. : August.

Loc. : GOA : *Bicholim* : Usgao Onda ; *Narora*. *Satari* : Castle rock on way to Anmode ; Dudhsagar along rail line ; Wagheri (Tanem). *Bardez* : Chopora. *Salcete* : Raiyi village hills. *Marmugao* : Vasco, Naval office plateau. *Sanguem* : Bati forest. *Canacona* : Angidiv.

Common on open rocky, gravelly soil of plateau areas but nowhere abundant.

N. lancifolia (Hook. f.) W. H. Lewis, *l.c.* 39, 1966. *Anotis lancifolia* Hook. f. FBI 3 : 73, 1880 ; C. 2 : 20 ; G. 2 : 426 ; S. 104. *Hedyotis lancifolia* Dalz. in Hook. Journ. Bot. 2 : 135, 1850, *non* Schum. in Schum. & Thonn. Beskr. Guin. Pl. 1 : 92, 1827.

Fl. & Fr. : September November.

Loc. : GOA : *Bicholim* : Usgao Onda. *Satari* : Nagargao. *Bardez* : Paliem, Bastara. *Salcete* : Margao hill top, around the fort. *Marmugao* : Vasco, Cortallum. *Sanguem* : Viliyan forest ; Sangum. *Canacona* : Ordofond-Tudal ; Butpal Nadquem ; Angidiv.

Common along rocky crevices and gravelly soil, especially during the first half of monsoon.

N. quadrilocularis (Thw.) W.H. Lewis, *l.c.* 39, 1966. *Hedyotis quadrilocularis* Thw. Enum. 144, 1858. *Anotis quadrilocularis* Hook. f. in FBI 3 : 74 ; C. 2 : 22 ; G. 2 : 427.

Fl. & Fr. : September - December. *Ill.* : Bedd. Ic. t. 28.

Loc. : GOA : *Satari* : Ivorem Burzuruco.

Though considerably rare as indicated by Cooke (*l.c.*), the species can be located in Goa in the rocky crevices along the hilly slopes.

Neanotis rheedel (Wall. ex Wt. & Arn.) W. H. Lewis *l.c.* 40, 1966. *Hedyotis rheedel* Wall. (Cat. no. 1294, 1829, *nom. nud.*) ex Wt. & Arn. Prodr. 409, 1834. *Hedyotis latifolia* Dalz. Hook. Jour. Bot. 2 : 133, 1850 *Anotis rheedel* (Wall. ex Wt. & Arn.) Hook. f. FBI 3 : 73, 1880 ; C. 1 : 21.

Fl. & Fr. : September - November.

Loc. : GOA : *Pernem* : Corgao. *Salcete* : Margoa hill top, around the fort ; *Vernem*. *Sanguem* : Castle rock on way to Anmoda ; *Molem-Belgaum* Road 67 km ; *Nanecha Dongar* (Codal) ; *Bati Sidh*.

Common as undergrowth in open forest.

NEONAUCLEA Merr.

Neonauclea purpurea Merr. in Interp. Rumph. Herb. Amb. 483, 1917; G. 2 : 412. *Nauclea purpurea* Roxb. Cor. Pl. 1 : 41, t. 54, 1795 ; FBI 3 : 26 ; DG. 93 ; C. 2 : 7 ; T. 2 : 89. *Nauclea elliptica* Bedd. Ic. Pl. Ind. Or. t. 19 (*non* Dalz. & Gibs.).

Fl. : February - March. *Fr.* : May - June. *Ill.* Bedd. Ic. t. 19.

Vern. : Dev-Phanas (Mar.) ; Ahnan (Kan.) ; Dhavo panas (Konk.) ; *Jaca falsa* (Port.).

The species which is treated under *Neonauclea* by Merrill, is common in the North Kanara ghats and is also recorded for Goa (Dalgado).

OPHIORRHIZA Linn.

Ophiorrhiza prostrata D. Don, Prodr. Fl. Nepal. 136, 1825. *O. harrisi* Heyne ex Hook. f. in FBI 3 : 78, 1880 ; C. 2 : 23 ; G. 2 : 428.

Fl. : September.

Loc. : GOA : *Satari* : Dinarai forest, Satrem. *Panda* : Usgaon.

Rare, inside the forest.

PAVETTA Linn.

Leaves obovate

Leaves elliptic

crassicaulis

tomentosa

Pavetta crassicaulis Bremek. in Fedde Repert. 37 : 112, 1934 & 47 : 25, 1939.

Fl. : April. May. *Fr.* : October November.

Loc. : GOA : *Satari* : Hariali forest, near Nandore ; Nagargao ; Koparde. *Bardez* : Succoor forests, near Porvorim. *Sanguem* : Colamba. *Canacona* : Nadquem ; Tudal, Angidiv.

Common in ghat areas at the edges of forests and in open situations.

P. tomentosa Roxb. ex Sm. in Rees, Cycl. 26 : no. 2, 1819. *Pavetta indica* Linn. var. *tomentosa* Hook. f. in FBI 3 : 150, 1880 ; C. 2 : 41.

Fl. : March May. *Fr.* : August November. *Ill.* : Wt. Ic. t. 1065.

Loc. : GOA : *Satari* : Tanem ; Ambeachagol ; Wadicha Dongar (Caranzol) ; Pale. *Sanguem* : Viliyan forest ; Durgan forests ; Ramde (Netravali). *Quepem* : Budsari Goundugarha. *Canacona* : Ordofond forest, on way to Tudal.

Common at the edge of the forests.

PSYCHOTRIA Linn. *nom. cons.*

Psychotria dalzellii Hook. f. in FBI 3 : 163, 1880 ; C. 2 : 45 ; T. 2 : 125 ; G. 2 : 451.

Fl. : May July. *Fr.* : August November. *Ill.* : T. f. 358.

Vern. : Shivan yallaki (Kan.).

Loc. : GOA : *Satari* : Dinarai forest, near Palli ; Codal ; Codal - Satrem road, 5 km ; Nanecha Dongar ; Satrem ; Castle rock on way to Anmode ; Ambeachgol. *Ponda* : Vernem. *Sanguem* : Sanguem Barazan mine area ; Pashia forest, near Pongeral ; Potiem forest ; Talauli ; Madka Banglow (Molem Belgaum Road). *Canacona* : Butpal ; Nadquem, Quer hills ; Butpal Nadquem ; Butpal.

Common inside the forest and occasionally along the forest edges.

RUBIA Linn.

Rubia cordifolia Linn. Mant. 197, 1767 ; FBI 3 : 202 ; DG. 100 ; C. 2 : 54 ; G. 2 : 462.

Fl. : October - January. *Ill.* : Wt. Ic. t. 187.

Vern. : Manjishth (Mar.) ; Itari (Konk.) ; Ruiva dos tirtureiros da India (Port.).

Loc. : GOA : *Sanguem* : Surla.

Fairly common along ghats (Dalgado).

TARENNA Gaertn.

Tarenna asiatica (Linn.) Alston in Trimen Handb. Fl. Ceyl. 6, Suppl. : 150, 1931. *Rondeletia asiatica* Linn. Sp. Pl. 172, 1753. *Tarenna zeylanica* Gaertn. Fruct. 1 : 139, t. 28, 1788 ; C. 2 : 25. *Webera corymbosa* Willd. Sp. Pl. 1 : 1224, 1797 ; FBI 3 : 102 ; DG. 95 ; T. 2 : 96. *Stylocoryne webera* A Rich. Mem. Fam. Rubiac. 168, 1829 & in Mem. Soc. Hist. Nat. Par. 5 : 248, 1834.

Fl. : April June. *Ill.* : Gaertn. Fruct. t. 28.

Vern. : Kare (Mar.) ; Kupa (Konk.).

TRICALYSIA A. Rich. ex DC.

Stamens with long filaments, exerted ; fruit sessile, ellipsoid, with a conical beak

apiocarpa

Stamens sessile ; fruits pedicelled, globose, without a conical beak

sphaerocarpa

Tricalysia apiocarpa Gamble, Fl. Pres. Madras, 620, 1921. *Diplospora apiocarpa* Hook. f. in FBI 3 : 123, 1880 ; DG. 97 ; C. 2 : 32 ; T. 2 : 105.

Fl. : July September. *Ill.* : Bedd. Ic. t. 40.

Vern. : Panigar (Konk.).

Rare along ghats (Dalgado).

T. sphaerocarpa Gamble, Fl. Pres. Madras, 320, 1921. *Diplospora sphaerocarpa* Hook. f. in FBI 3 : 123, 1880 ; DG. 97 ; C. 2 : 32 ; T. 2 : 106.

Fl. : October. *Fr.* : May. *Ill.* : T. f. 346.

Vern. : Wild coffee (Eng.).

Rare along ghats (Dalgado).

WENDLANDIA Bart. ex DC. *nom. cons.*

Wendlandia thyrsoides (R. & S.) Steud. Nom. (ed. 2) 2 : 786, 1841 ; S. 102. *Canthium thyrsoldeum* R. & S. Syst. 6 : 207, 1820. *Wendlandia notoniana* Wall. ex Wt. & Arn. Prodr. 403, 1834 ; FBI 3 : 40 ; DG. 94 ; C. 2 : 11 ; T. 2 : 93 ; G. 2 : 415.

Fl. : March May. *Ill.* : Wt. Ic. t. 1033 ; T. f. 338.

Vern. : Showla (Mar.) ; Taligi (Kan.).

Loc. : GOA : *Satari* : Near Nandore hills ; Kawaliyan forest. *Sanguem* : Bhati Sanguem. *Canacona* : Nadquem hills ; Nadquem - Quer hills.

Occasional in open situations on the hills, along streams.

XEROMPHIS Rafin

Spines short, in 1 to 2 pairs at the ends of arrested branches ;
leaves obovate, obtuse

uliginosa

Spines axillary, opposite or alternate ; leaves obovate - elliptic
hispidly hairy on the nerves beneath

spinosa

Xeromphis spinosa (Thunb.) Keay, Bull. Jard. Bot. Etat. Brux. 28 : 37, 1958. *Gardenia spinosa* Thunb. Diss Gard. No. 7, 1780. *Randia dumetorum* (Thunb.) Poir. in Lamk. Encycl. Suppl. 2 : 829, 1812 ; FBI 3 : 110 ; DG. 95 ; C. 2 : 27 ; T. 2 : 98 ; G. 2 : 434. *Randia brandisii* Gamble, Fl. Pres. Madras, 616, 1921 : S. 104.

Fl. : March May. *Fr.* : August November. *Ill.* : Wt. Ic. t. 580 ; T. 2 : f. 341.

Vern. : Ghola (Mar.) ; Kari gidda (Kan.) ; Mindhal (Guj.).

Loc. : GOA : *Bicholim* : Pelernum village ; Nanore forest. *Satari* : Nandore forest ; Caranzol hills ; Caranzol old railway station area ; Nagram ; Golauli, Wolancha Dongar (Caranzol) ; Tanem ; Wadicha Dongar. *Ilhas* : Lake near Chinchinum ; Kanpal hill top ; Plateau on way to Military Camp, Chimbél reservoir. *Sanguem* : Bati ; foot hill, near Patim ; Molem Ponda ; Moduka bungla jungle, near Molem ; Sidh forests, near Bati ; Periche Tem (Cumbari) ; Cumbari ; Vidugune (Netravéli) ; Chausunaghat (Netravéli) ; Nondrena near Molem ; Molem-Belgaum Road, 71 km. *Salcete* : Verna lake outskirts. *Canacona* : Ordofond ; Butpal Ordofond, road side ; Ordofond Butpal forest ; Mehdan forest, near Nadquem ; Angidiv. NAGARHAVELI : Chispana forest area ; Carchond forest ; Morkhal ; Velugaon.

Very common in deciduous forest, usually in open situations on hill tops.

X. uliginosa (Retz.) Maheshwari in Bull. Bot. Surv. India 3 (1) : 92, 1961. *Gardenia uliginosa* Retz. Obs. 2 : 13, 1781. *Randia uliginosa* DC. Prodr. 4 : 386, 1830 ; FBI 3 : 110 ; DG. 95 ; C. 2 : 27 ; T. 2 : 97 ; G. 2 : 434 ; S. 266.

Fl. : May June. *Fr.* : August September. *Ill.* : Wt. Ic. t. 397 ; T. f. 340.

Vern. : Pandri (Mar.) ; Banbugi (Kan.) ; Pemdari (Konk.) Gangeda (Guj.).

Loc. : GOA. : *Satari* : Coda forest area, *Sanguem* : near Anvaldem.
NAGARHAVELI : Atal forest, near Silvassa.

Rare on ghat forests.

Cult species :

Anthocephalus chinensis (Lamk.) Rich. ex Walp. in Rep. 2 : 491, 1843. *Anthocephalus indicus* A. Rich. in Mem. Soc. His. Nat. Par. 5 : 238, 1834 ; C. 2 : 6 ; G. 2 : 411. *A. cadamba* Miq. Fl. Ind. Bat. 2 : 135, 1856 ; FBI 3 : 23 ; DG. 92 ; T. 2 : 88.

Fl. : November February. *Ill.* : Bedd. Fl. Sylv. t. 35.

Vern : Kadam (Mar.) ; Kadwal (Kan.) ; Niv. (Konk.) ; Wild cinchona (Eng.).

This species is mostly found in cultivation near villages and temples (Dalgado).

Coffea arabica Linn. Sp. Pl. 172, 1753 ; FBI 3 : 153 ; DG. 98 ; C. 2 : 55 ; T. 2 : 120 ; G. 2 : 449.

Fl. : January April. *Ill.* : Wt. Ic. t. 53.

Vern. : Kaphe (Mar.) ; Cafezeiro (Port.).

The species, a native of Abyssinia was introduced and cultivated in Goa (Satari, Tamboli etc.) (Dalgado), possibly on experimental basis.

C. liberica Bull ex Hiern, in Trans. Linn. soc. ser. II, 1, 171, t. 24, 1876 ; DG. 98.

Vern. : Cafeeiro libenico (Port.). *Ill.* : Fl. W.T.A. 2 : 155, f. 231.

The Liberian coffee was introduced from Liberia and Angola into Goa by Col. G. R. C. Westropp (Dalgado) possibly for experimental purposes.

Ixora barbata Roxb. Fl. Ind. 1 : 384, 1820 ; DG. 98.

Vern. : Dhavi padkali.

Mostly cultivated in gardens.

ASTERACEAE

(= COMPOSITAE)

1. All florets ligulate

2. Achenes columnar, truncate at both ends

Lauanaea

2. Achenes compressed, beaked or not

3. Achenes beaked

Lactuaca

3. Achenes not beaked

Sonchus

1. Florets all tubular or the outer only ligulate, at any rate not all florets ligulate
 4. All florets tubular
 5. Flowers orange or yellow
 6. Flowers orange *Gynura*
 6. Flowers yellow
 7. Pappus present
 8. Pappus uniseriate, slender
 9. Aromatic herbs ; heads solitary or fascicled or paniced ; achenes angled or terete
 10. Anthers tailed *Blumea*
 10. Anthers not tailed *Laggera*
 9. Herbs not aromatic ; heads corymbose or paniced ; achenes compressed *Conyza*
 8. Pappus tubular with fimbriate mouth *Grangea*
 7. Pappus absent
 11. Anther bases obtuse, entire ; achenes ellipsoid, oblong or subovoid *Artemisia*
 11. Anther bases truncate ; achenes compressed *Dichrocephala*
 5. Flowers blue, purple, pink or white
 12. Leaf margins and (or) involucrel bracts spinose or spinescent
 13. Heads one flowered ; achenes smooth *Tricholepis*
 13. Heads many flowered ; achenes villous *Echinops*
 12. Leaf margins or involucrel bracts not spinescent
 14. Heads 1 or few- flowered, crowded into dense clusters resembling simple heads
 15. Leaves alternate mostly radical ; involucrel bracts ; scarious corolla violet *Elephantopus*
 15. Leaves opposite or the upper only alternate ; involucrel bracts silky hairy ; corolla white *Lagascea*
 14. Heads many-flowered, terminal or leaf-opposed, sub-corymboseely paniculate
 16. Leaves with dense, white, woolly tomentum beneath
 17. Achenes 8 to 10-ribbed *Centratherum*
 17. Achenes not ribbed *Lamprachaentum*

16. Leaves without white tomentum beneath
18. Pappus absent
19. Leaves toothed, decurrent on the stem; heads numerous, sessile crowded on a large receptacle into a globose terminal head *Sphaeranthus*
19. Leaves pinnatisect, not decurrent on the stem; heads in small panicles *Cyathocline*
18. Pappus present
20. Pappus usually of 3-5 paleaceous scales or glandular setae
21. Involucral bracts very acute, ribbed on the back, ciliolate and with scarious margins *Ageratum*
21. Involucral bracts obtuse or subacute, glabrous, glandular or scabrid, margins not scarious *Adenostemma*
20. Pappus long, copious
22. Leaves entire or toothed *Vernonia*
22. Lower leaves lyrate or obovate, upper amplexicaule and auricled *Emilia*
4. Inner florets tubular and outer rayed
23. Receptacle naked, pitted or fimbriate
24. Leaves glabrous, decurrent on the stem; florets purple *Epaltes*
24. Leaves glabrous or white or grey cottony tomentose beneath, not decurrent on the stem; florets yellow *Senecio*
23. Receptacle paleaceous
25. Pales of the receptacle flat, not folded around the achenes

26. Involucral bracts free, the outer herbaceous, the inner merging into the palae of the receptacle ; leaves simple
27. Achenes of ray florets compressed, pectinate winged, of disc florets triquetrous *Synedrella*
27. Achenes almost all alike, angled
28. Erect, tall glabrous herb ; pappus absent *Guizotia*
28. Procumbent, hispid herb ; pappus of spreading, plumose bristles *Tridax*
26. Inner involucral bracts connate at base, outer few usually smaller ; leaves divided *Bidens*
25. Palae of the receptacle concave or folded around the achenes
29. Heads in the forks of dichotomous branches ; inner involucral bracts embracing the fertile ray achenes ; achenes spinous *Acanthospermum*
29. Heads axillary or terminal ; inner involucral bracts not embracing the ray achenes
30. Ligulate florets absent *Splianthes*
30. Ligulate florets present
31. Pappus forming a cup or annulus with or without bristles
32. Leaves with short petiole ; ligules conspicuous, yellow ; capitula long peduncled ; achenes tuberculate with caducous aristae *Wedelia*
32. Leaves with slender petiole ; ligules small, white ; capitula sessile or shortly pedunculate ; achenes minutely rugose with persistent, barbellate aristae *Blainvillea*
31. Pappus not united into a cup or annulus
33. Leaves petiolate ; flower heads fairly large, yellow ; scales of the receptacle numerous *Melanthera*
33. Leaves sessile ; flower heads small, white ; scales of the receptacle few *Eclipta*

**Caesulia*, *Vicoa*, *Pulicaria* and *Xanthium* are later additions and hence not included in the Key.

ACANTHOSPERMUM Schrank

Acanthospermum hispidum DC. Prodr. 5 : 522, 1836 ; G. 2 : 495 ; S. 123 ; Pav. 132.

Fl. & Fr. : September November. *Ill.* : Tadulingam & Venkatanarayana, Handb. Some South Indian weeds, t. 91, f. 1-7, 1955.

Loc. : GOA : *Ilhas* : Panaji along coastal area. *Sanguem* : Netraveli. NAGARHAVELI : Nala between Kowcha and Jamunpada. DAMAN : Cataria. DIU : Diu town near Rest House ; Gogale.

Common, along roadsides, river beds, wastelands, fallow fields etc. especially during monsoon.

ADENOSTEMMA Forst.

Adenostemma lavenia (Linn.) O. Kuntze, Rev. Gen. Pl. 1 : 304, 1891 ; G. 2 : 476. *Verbesina lavenia* Linn. Sp. Pl. 902, 1753. *Adenostemma viscosum* Forst. Charact. Gen. 90, 1776 ; FBI 3 : 242 ; DG. 101 ; C. 2 : 69.

Fl. & Fr. : September February. *Ill.* : Wt. Ic. t. 1087 & 1088.

Vern. : Ghanerem (Konk.).

Loc. : GOA : *Sanguem* : Netraveli.

The species is found to be common in moist situations (Dalgado). The leaves vary very much depending on the soil and the habitat.

AGERATUM Linn.

Ageratum conyzoides Linn. Sp. Pl. 839, 1753 ; FBI 3 : 243 ; DG. 101 ; C. 2 : 70 ; G. 2 : 476 ; S. 110 ; Dang. 15 ; Pav. 123.

Fl. & Fr. : Throughout the year. *Ill.* : Wt. Ic. t. 1098.

Vern. : Sahadevi, Osadi (Mar.) ; Nayitulasi (Kan.) ; Vosadi (Konk.) ; Herva de S. Joao ou Mentrasto (Port.) ; Ajgantha (Guj.).

Loc. : GOA : *Pernem* : Cargo. *Satari* : Onda village ; Valpoi. Nanacha Dongar (Codal) ; Satrem ; Kulacheamal (Savorem) ; Wadicha Dongar (Caranzol) ; Dudhsagar. *Bardez* : Porvorim ; Nuvem ; Cargao. *Salcete* : Goodier. *Marmugao* : Marmugao harbour area. *Ponda* : Borim, near bride. *Sanguem* : Along Goa road, Anomode Molem ; Nandrona near Molem ; Molem Belgaum Road, 73 km ; Barazon ; Bati. *Canacona* : Barsare nala, near Tudal ; Angidiv. NAGARHAVELI : Sindhoni forest ; Nana Randha ; Bank of Damanganga river on way to Kawcha ; Dudeni ; Kuntly forest. DADRA. DAMAN : Fort area.

Common in moist, shady places.

ARTEMISIA Linn.

Artemisia nilagirica (Clarke) Pamp. in Nuov. Giorn. Bot. Ital. 33 : 452, 1926 ; S. 119. *A. vulgaris* Linn. var. *nilagirica* Clarke, Comp. Ind. 162. *A. vulgaris* auct. non Linn. FBI 3 : 325 ; DG. 105 ; C. 2 : 105 ; G. 2 : 502.

Fl. & Fr. : September - January. *Ill.* : Wt. Ic. t. 1112.

Vern. : Dhordavana (Mar.) ; Surpin (Konk.) ; *Artemisia verdadeira* (Port.).

The plant which is common in the ghat area is sometimes cultivated in gardens also (Dalgado).

Following the work of Pampanini (*l.c.*) it is now evident that the Indian species *Artemisia* common along the Western ghats is a distinct species, quite unconnected with the European *A. vulgaris* Linn., commonly recorded as such in the Indian Floras.

BIDENS Linn.

- | | |
|--|------------------|
| 1. Leaves 3-fid or 3-sect, segments broadly or narrowly ovate or lanceolate serrate | <i>bitermata</i> |
| 1. Leaves bipinnatifidly compound, segments ovate lanceolate or linear entire lobed or toothed | <i>bipinnata</i> |

Bidens bipinnata Linn. Sp. Pl. 832 ; 1753 ; Roxb. Fl. Ind. 3 : 411. *B. pillosa* Linn. var. *bipinnata* Hook. f. FBI 3 : 309, 1882 ; C. 2 : 101 ; G. 2 : 499. *B. Wallichii* DG. Prod. 5 : 598, 1836 ; Dalz. & Gibs. Bomb. Fl. 129.

Loc. : GOA : *Sanguem* : Verlem.

B. bitermata (Lour.) Merr. & Sherff in Bot. Gaz. 88 : 293, 1829 ; S. 118 ; Dangs. 15. Pav. 125. *Coreopsis bitermata* Lour. Fl. Cochinch. 508, 1790. *Bidens pillosa* auct. non Linn. (1753) : FBI 3 : 309 ; C. 2 : 101 ; G. 2 : 499.

Fl. & Fr. : September - December.

Loc. : GOA : *Ihas* : Santacruz area. DAMAN : Coileque area. DIU : Sandstone ditch, castle area.

Frequent in wasteland and near sea shore, usually in moist situations.

BLAINVILLEA Cass.

Blainvillea acmella (Linn. f.) Philipson in Blumea 6 : 350, 1950. Pav. 125. *Verbesina acmella* Linn. f. Suppl. 378, 1781. *Blainvillea latifolia*

(Linn. f.) DC. ex Wight, Contrib. 17, 1834 ; FBI 3 : 305. *B. rhomboidea* Cass. in Dict. Sc. Nat. 29 : 494, 1823 ; C. 2 : 97 ; G. 2 : 496.

Fl. & Fr. : August September.

Loc. : GOA : *Bardez* : Bastara : *Salcete* : Raiyi village. NAGARHAVELI : Phlipson Velugaon ; Dolara. DAMAN : Fort area. DIU : Nagoa ; Jhoola.

Common in open situations in wastelands, fallow fields etc.

BLUMEA DC. *nom. cons.*

- | | |
|--|--------------------|
| 1. Heads few in axillary and terminal corymbs or solitary, peduncled at the ends of the branches | |
| 2. Heads few in axillary and terminal corymbs | |
| 3. Erect herbs | |
| 4. Leaves membranous ; achenes angled | <i>eriantha</i> |
| 4. Leaves leathery ; achenes flattened, hairy | <i>malcolmii</i> |
| 3. Prostrate herbs | <i>oxyodonta</i> |
| 2. Heads solitary, peduncled at the ends of the branches | <i>obliqua</i> |
| 1. Heads many | |
| 5. Heads sessile in interruptedly spicate glomerules | <i>fistulosa</i> |
| 5. Heads in peduncled clusters or in spreading corymbs and panicles | |
| 6. Heads in peduncled clusters | <i>lacera</i> |
| 6. Heads in spreading corymbs and panicles | |
| 7. Stem and branches glabrous ; leaves lyrate, runcinate | <i>virens</i> |
| 7. Stem and branches pubescent ; leaves obovate or oblanceolate | <i>membranacea</i> |

Blumea eriantha DC. in Wight, Contrib. 15, 1834 ; FBI 3 : 266 ; DG. 102 ; C. 2 : 78 ; G. 2 : 482 ; S. 114 ; Pav. 129.

Fl. : September.

Vern. : Nimurdi (Mar.) ; Nimdi (Konk.).

Loc. : NAGARHAVELI : Chispana area ; Silvassa along Daman ganga river bank ; Nana Randha ; Jamunpada forest.

Common and indigenous to Concan (Dalgado). A variable and polymorphous herb.

It would be of considerable interest to record that a very sweet scented essential oil has been extracted from this species at the National Chemical Laboratory, Poona at the initiation of the present author and further work is still in progress.

Blumea fistulosa (Roxb.) Kurz, Journ. As. Soc. Beng. 46 (2) : 187, 1877. *Conyza fistulosa* Roxb. Fl. Ind. 3 : 429, 1832. *Blumea glomerata* DC. in Wt. Contrib. Bot. Ind. 15, 1834 ; FBI 3 : 262 ; DG. 102 ; C. 2 : 76 ; G. 2 : 483.

Fl. & Fr. : September - October.

Vern. : Bhambhurda (Mar.) ; Bambrudo (Konk.).

The species considered to be rather rare along Concan by Cooke, has been indicated, however, as common in Goa by Dalgado. Such general indication needs further scrutiny.

B. lacera (Burm. f.) DC. in Wight Contrib. 14, 1834 ; FBI 3 : 263 ; DG. 102 ; C. 2 : 76 ; G. 2 : 483 ; S. 113. *Conyza lacera* Burm. f. Fl. Ind. 180, 1768.

Fl. & Fr. : October.

Vern. : Burando (Mar.) ; Bamburdi (Konk.).

Loc. : GOA : Canacona : Nagargao.

Rare, usually in open situations.

B. malcolmii (Cl.) Hk. f. FBI 3 : 266, 1881 ; C. 2 : 78 ; G. 2 : 482. *Pluchea malcolmii* C. B. Clarke, Comp. Ind. 95, 1876.

Fl. : November - February.

Loc. : NAGARHAVELI : Dongarpad Umberkoi.

B. membranacea DC. Prodr. 5 : 440, 1836 ; FBI 3 : 265 ; C. 2 : 77 ; G. 2 : 483 ; S. 114 ; Pav. 130.

Fl. & Fr. : March - November.

Loc. : GOA : Ilhas : Santacruz area. *Sanguem* : Talem forest, towards Patiem. *Canacona* : Ordofond forest ; Ordofond, near the river. DAMAN : Fort area.

Common in the shady undergrowth of the forests. Closely allied to *Blumea virens* DC. and often regarded as a glandular - pubescent form of *B. virens*.

B. obliqua (Linn.) Druce in Rep. Exch. Club. Brit. Isles 4 : 609, 1917. *Erigeron obliquus* Linn. Mant. 573, *Blumea amplectens* DC. in Wt. Contrib. 13, 1834 ; FBI 3 : 260 ; C. 2 : 75.

Fl. & Fr. : August.

Loc. : DIU : Nagoa.

Rare, on rocky areas.

B. oxyodonta DC. in Wight Contrib. 15, 1834 ; FBI 3 : 266 ; C. 2 : 77 ; G. 2 : 482 ; S. 114.

Fl. & Fr. : March - May.

Loc. : *Satari* : Near Nandore. *Salcete* : Raiyi village. *Canacona* : Rutpal village. DADRA.

Common in open areas and waste places, usually among grasses.

Blumea virens DC. in Wight, Contrib. 14, 1834 ; FBI 3 : 264 ; C. 2 : 77 ; G. 2 : 483 ; S. 113.

Fl. & Fr. : April May.

Loc. : GOA : *Sanguem* : Colem, along railway line. *Canacona* : Barsare village, near Tudal.

Occasional along forest covered hill slopes. A distinct species of the genus by its entire glabrous nature.

*CAESULIA Roxb.

Caesulia axillaris Roxb. Pl. Cor. 1 : 64, t. 93, 1775 ; FBI 3 : 291 ; C. 2 : 62 ; S. 117 ; Dangs. 15 ; Pav. 123.

Fl. & Fr. : September - November. *Ill. Wt. Ic.* t. 1102.

Loc. : NAGARHAVELI : Dudeni, Dolara ; Khanvel. DADRA.

Fairly common in moist situations throughout the area, often gregarious covering large areas. Very common especially in cultivated fields and marshy region during the monsoon season.

CENTRATHERUM Cass.

- | | |
|--|----------------------|
| 1. Pappus yellowish ; outer involucre of bracts with coarse moniliform hairs, usually obtuse | <i>courtallensis</i> |
| 1. Pappus reddish | |
| 2. Variably branched herb (not dichotomously) ; outer involucre bracts 1- α ; linear or lanceolate ; achenes deeply 10-ribbed | <i>phyllolaenum</i> |
| 2. Dichotomously branched herb ; outer involucre bracts 1 or 2 linear oblong ; achenes faintly 10-ribbed | <i>tenuis</i> |

Centratherum courtallense (Wt.) Benth. in Gen. Pl. 2 : 225, 1862, non. C.B. Cl. ; FBI 3 : 227 ; G. 2 : 469. *Decaneuron courtallense* Wt. Ic. t. 1081, 1846.

Loc. : GOA : *Sanguem* : Bati Sidh.

C. phyllolaenum (DC.) Benth. ex C. B. Clarke, Comp. Ind. 4, 1876; FBI 3 : 228 ; C. 2 : 62 ; G. 2 : 469 ; S. 108. *Decaneurum phyllolaenum* DC. Prodr. 7 : 264, 1838.

Fl. & Fr. : September November.

*Later addition and hence not included in the generic Key.

Loc. : GOA : *Bicholim* : Bicholim - Ponda. *Bardez* : Bastara. *Satari* : Codal ; Onda. *Ilhas* : Brahmapuri temple, near old Goa. *Sanguem* : Molem, Avelde jungle ; Dudal ; Bali ; Molem ; Netravali ; Barazon. *Canacona* : Butpal Kanpal hill top ; Ordofond Butpal ; Ordofond. NAGARHAVELI : Sindhoni forest ; Khuntly forest ; Dolara. DAMAN : Dundorta.

Common in open areas along forest edges, not gregarious ; usually very variable in size.

Centratherum tenue (Wight) C. B. Clarke, *Comp. Ind.* 4, 1876 ; FBI 3 : 228 ; C. 2 : 63 ; S. 108. *C. molle* Benth. var. *tenue* Wight ex C. B. Clarke, *Comp. Ind.* 4, 1876.

Fl. & Fr. : October.

Loc. : GOA : *Satari* : Onda.

Rare, in open situations. The plant is elegant and attractive especially when in flowers.

CONYZA Less *nom. cons.*

Conyza leucantha (D. Don) Ludlow & Raven in *Kew Bull.* 17 : 71-72, 1963. *Erigeron leucanthum* D. Don *Prodr. Fl. Nep.* 171, 1825. *Conyza viscidula* Wall. (Cat. 3006, 1831 *nom. nud.*) ex DC. *Prodr.* 5 : 388, 1836 ; FBI 3 : 258 ; G. 2 : 480.

Fl. & Fr. : March.

Loc. : GOA : *Canacona* : Choram hill top, Nadquem.

Rare, in ghat areas in open situations.

CYATHOCLINE Cass.

Cyathocline purpurea (Don) Kuntze, *Rev. Gen. Pl.* 338, 1891 ; S. 110. *Tanacetum purpureum* Don *Prodr.* 181, 1825. *Cyathocline lyrata* Cass. in *Ann. Soc. Sci. Nat. (ser. 1)* 17 ; 420, 1829 ; FBI 3 : 246 ; C. 2 : 71 ; G. 2 : 478.

Fl. & Fr. : November -April. *Ill.* : Wt. Ic. t. 1098.

Loc. GOA : *Satari* : Maarde village, near Valpoi ; Codal area. *Sanguem* : Talem, on way to Patiem. *Quepem* : Budsari Coundugarha. *Canacona* : Ordofond, near the river. NAGARHAVELI : Silvassa, along Damanganga river bank ; Morkhal ; Bank of Damanganga river on way to Kawcha ; on way to Sindhoni from Khanvel.

Common throughout the area in moist situations ; also as a roadside weed. The plant flowers profusely in cold season.

DICHROCEPHALA DC.

Dichrocephala latifolia DC. in Wight, Contrib. 11, 1834 ; FBI 3 : 245 ; C. 2 : 70 ; G. 2 : 477.

Fl. : August - October.

Loc. : GOA : *Sanguem* : Surla.

ECHINOPS Linn.

Echinops echinatus Roxb. [Hort. Beng. 62, 1814 (*nom. nud.*) &] Fl. Ind. 3 : 447, 1832 ; FBI 3 : 358 ; C. 2 : 112 ; Dangs. 15 ; Pav. 123.

Fl. & Fr. : September. *Ill.* : Wealth of India 3 : f. 75.

Vern. : Utkanto (Guj.).

Loc. : DAMAN : Between Bimpur & Janivancore. DIU : Jalandhar ; Castle area.

Occasional on gravelly, sandy soil near sea shore. Often the name is attributed to De Candolle (Wt. Contr. Ind. Bot. 24, 1834) but since Roxburgh's publication is two years earlier, the citation should be credited to Roxburgh only.

ECLIPTA Linn.

Eclipta alba (Linn.) Hassk. Pl. Jav. Rar. 528, 1848 ; FBI 3 : 304 ; DG. 103 ; G. 2 : 496. *Verbesina alba* Linn. Sp. Pl. 902, 1753. *Eclipta prostrata* (Linn.) Linn. Mant. 2 : 286, 1771 ; S. 118 ; Pav. 124. *E. erecta* Linn. Mant. 2 : 286, 1771 ; C. 2 : 95.

Fl. & Fr. : August - December. *Ill.* : Wealth of India, 3 : f. 76 ; Tadulingam & Venkatanarayana in Handb. Some South Indian weeds, t. 92, f. 1-11, 1955.

Vern. : Bhingurja (Mar.) ; Caragadasoppu (Kan.) ; Mako (Konk). Dodhak (Guj.).

Loc. : GOA : *Satari* : Masarde village, near Valpoi ; Onda ; Gaulauli ; Pale (Tanem). *Bardez* : Chopora, Kaisuya fort. *Salcete* : Margao fields. *Ponda* : Palerum village ; Curti village. *Sanguem* : Bali ; Patrem. *Quepem* : Rivona. NAGARHAVELI : Sindhoni forest ; Silvassa along Daman Ganga river bank ; Dhapsa ; Morkhal. DADRA. DAMAN : Coileque area ; Marvor : Fort area. DIU : Castle area ; Gogale.

Common in moist situations, often along cultivated fields, and near salt pans.

The author who first unites the taxa, is to be followed (Int. Code Bot. nomen. art. 57, 48-49, 1978).

ELEPHANTOPUS Linn.

Elephantopus scaber Linn. Sp. Pl. 814, 1753 ; FBI 3 : 242 ; DC. 101 ; C. 2 : 68 ; G. 2 : 476 ; S. 110 ; Dangs. 16.

Fl. & Fr. : September - November. *Ill.* : Wt. Ic. t. 1086.

Vern. : Pathari (Mar.) ; Bhopathari (Guj.) ; Hakkarike (Kan.) ; Bhopathari (Guj.).

Loc. : GOA : *Satari* : Codal village ; Nanecha Dongar (Codal) ; Caranzol Saverdem. *Bardez* : Sukur village. *Ilhas* : Chimbel reservoir area, near Panaji. *Salcete* : Goodier. *Marmugao* : Marmugao hill top, around the fort. *Sanguem* : Bali ; Madka Banglow (Molem Belgaum Road) ; Molem Belgaum Road, 71km ; Chansuria ghats (Netravali). *Quepem* : Budsari Goundugarha. *Canacona* : Nagargao. NAGARHAVELI : Silvassa ; Khanvel ; Nala near Dudhari near bus stop ; Umberkoi Dongar pade forests.

Common in waste places along roadside, usually in the shady under growth of trees.

EMILIA Cass.

Emilia sonchifolia (Linn.) DC. in Wight Contrib. 24, 1834 & in DC. Prodr. 6 : 302, 1837 ; FBI 3 : 336 ; DG. 105 ; C. 2 : 107 ; G. 2 : 503 ; S. 120 ; Dangs. 16 ; Pav. 128. *Cachalia sonchifolia* Linn. Sp. Pl. 835, 1753.

Fl. & Fr. : August - September. *Ill.* : Fl. Barbados, Gooding *et al* 437, f. 27, 1965.

Vern. : Undrachim Panam (Konk.) ; Harva do figado (Port.).

Loc. : GOA : *Satari* : Nanecha Dongar ; Wadicha Dongar. Dudhu-sagar. *Bardez* : Porvorim village field ; Chopora, Kaisura fort. *Marmugao* : Cortallim. *Sanguem* : Nondrena near Molem 1000 ; Surla ; Madka Bunglow (Molem Belgaum Road). NAGARHAVELI : Sindhoni forest ; Khuntly forest area. DAMAN : Dolar.

Common on rocky hill slopes, in shady moist situations.

EPALTES Cass.

Epaltes divaricata Cass. in Bull. Soc. Philom. 139, 1818 ; FBI 3 : 274 ; C. 2 : 83 ; G. 2 : 486 ; S. 116.

Fl. & Fr. : October - November.

Loc. : GOA : *Pernem* : Ambrem, near Pernem. *Satari* : Nagram, Nanecha Dangar (Codal). Caranzol; Pale. *Bardez* : Betim. *Salcete* : Cortallim Madgao, plateau area. *Canacona* : Butpal; Tudal.

Frequent, in rice fields.

GRANGEA Adans.

Grangea maderaspatana (Linn.) Poir. *Encycl. Suppl.* 2 : 825, 1811 ; *FBI* 3 : 243 ; *DG.* 101 ; *C.* 2 : 72 ; *G.* 2 : 478 ; *S.* 112 ; *Dangs.* 17 ; *Pav.* 131. *Artemisia maderaspatana* Linn. *Sp. Pl.* 849, 1753.

Ill. : *Wt. Ic. t.* 1097.

Vern. : Mashipatri (Mar.) ; Devana (Kan.) ; Modagoru (Konk.) ; Khinkimundi ; Mundi (Guj.).

Loc. : NAGARHAVELI : Along Dapada, Chispana. DAMAN : Regunvara ; Dabel.

Common in moist areas.

GUIZOTIA Cass. *nom. cons.*

Guizotia abyssinica Cass. in *Dict. Sc. Nat.* 59 : 248, 1829 ; *FBI* 3 : 308 ; *DG.* 103 ; *C.* 2 : 125 ; *G.* 2 : 498 ; *S.* 123 ; *Dangs.* 17.

Fl. & Fr. : October - November. *Ill.* : *Wealth of India*, 4 : f. 136.

Vern. : Khurasni (Mar.) ; Ourellu (Kan.) ; Rantil (Konk.) ; *Verbesina da India* (Port.) ; Kalatel (Guj.).

Loc. : GOA : *Bicholim* : Usgao. *Satari* : Golauli. *Canacona* : Canacona-Balli. Angidiv. NAGARHAVELI : Jamunpada forests ; Nana Randha. DADRA : Tingra village.

Though cultivated as an oil crop, the plant is seen as an escape and attractive when in flowers.

GYNURA Cass.

Gynura cusimbua (D. Don) S. Moore in *Journ. Bot.* 50 : 212, 1912. *Cacalia cusimbua* D. Don, *Prodr. Fl. Nep.* 179, 1825. *Gynura angulosa* DC. *Prodr.* 6 : 298, 1838 ; *FBI* 3 : 334 ; *C.* 2 : 106 ; *S.* 119.

Fl. & Fr. : March - April.

Loc. : GOA : *Satari* : Nandore village fields ; Satre river bank, Codal Ambechagol ; Golauli ; Caranzol ; Castle rock on way to Anmod ;

Nanecha Dongar (Codal). *Sanguem* : Valkeri ; Molem Belgaum Road 17 km ; Nondrona near Molem-10001.

Occasional in sandy soil and river banks with orange red flowers.

LACTUCA Linn.

Stout herbs 0.60 m-1.50 m high ; leaves sometimes 30.48 cm long

runcinata

Slender herbs 20-46 cm ; leaves rarely exceeding 10 cm long

remotiflora

Lactuca remotiflora DC. in Wight Contrib. 26, 1834 ; FBI 3 : 403 ; DG. 107 ; C. 2 : 118.

Fl. & Fr. : September.

Vern. : Undirachakan (Mar.) ; Taraxco (Port.).

Loc. : DAMAN : Airport area.

Rare on gravelly soil in Goa area (Dalgado)

L. runcinata DC. in Wt. Contrib. Bot. Ind. 26, 1834 : C. 2 : 118. *Lactuca heyneana* DC. Prodr. 7 : 140, 1838 ; FBI 3 : 403, 1881.

Fl. & Fr. : August. *Ill.* : Wt. Ic. t. 1146 ; Tadulingam & Venkatanarayana, Hanb. Some South Indian Weeds, t. 99, f. 1-7.

Loc. : DIU : Castle area.

Rare, near sand stone ditch.

Cult. species :

L. scariola Linn. Sp. Pl. ed. 2 : 1119, 1763 ; FBI 3 : 404 ; DG. 107 ; C. 2 : 119.

Vern. : Alfas (Konk.) ; Oarden lettuce (Eng.) ; Alface (Port.).

The species is cultivated for Salad.

LAGASCEA Cav. *nom. cons.*

Lagascea mollis Cav. in Anal. Cienc. Nat. 6 : 322, t. 44, 1803 ; FBI 3 : 302 ; C. 2 : 93 ; G. 2 : 494 ; S. 118.

Fl. & Fr. : August January. *Ill.* : Tadulingam & Venkatanarayana, Handb. Some South Indian weeds, t. 90, f. 1-8, 1955.

Loc. : GOA : *Salcete* : Marmugao hillock.

Occasionally in open situations.

LAGGERA Sch. Bep. ex Oliver

Laggera alata (D. Don) Schultz Bip. ex Oliver in Trans. Linn. Soc. 29 : 94, 1875. ; FBI 3 : 271 ; DG. 102 ; C. 2 : 80 ; G. 2 : 485. *Erigeron alatum* Don, Prodr. 171, 1825.

Fl. & Fr. : December February. *Ill.* : Wt. Ic. t. 1101 (as *Blumea alata* DC.).

Vern. : Ran muli (Konk.).

Occasional along Western ghats and Dalgado also records for Goa.

LAMPRACHAENIUM Benth.

Lamprachaenium microcephalum (Dalz.) Benth. & Hook. f. Gen. Pl. 2 : 226, 1873 ; FBI 3 : 299 ; DG. 100 ; C. 2. 64. *Decaneurm microcephalum* Dalz. in Kew Journ. Bot. 3 : 231, 1851.

Fl. : August.

Loc. : GOA : *Canacona* : Ordofond, near the bridge.

Rare, on gravelly hillock.

LAUNAEA Cass.

Launaea fallax (Jaub. & Spach.) Kuntze, Rev. Gen. Pl. 351, 1891. *Microhynchus fallax* Jaub. & Spach. Pl. Or. t. 276, 1849. *Launaea nudicaulis* (Linn.) Hook. f. in FBI 3 : 416, 1881 ; C. 2 : 122 ; G. 2 : 515 ; S. 122.

Fl. : April. *Ill.* : Wealth of India, 6 : f. 21.

Loc. : GOA : *Ilhas* : Panaji, along sea coast ; Panaji roadside. *Salcete* : Cavallosim. *Canacona* : Angidiv. NAGARHAYBLI : Saily. DAMAN : Marvor ; Airport area ; Dundorta. DIU : Nagoa ; Castle area ; Jalandhar.

Common in open situations.

MELANTHERA Rohr.

The genera *Melanthera* Rohr, *Blainvillea* Cass., *Wedelia* Jacq. and *Aspilia* Thouars. are closely allied and it is often difficult to assign the various species to one or the other genera. *Melanthera* is readily distinguished by the pappus of free caducous bristles or scales whereas in the other genera the pappus of bristles are united at the base or cupshaped with or without free bristles.

Melanthera biflora (Linn.) H. Wild. in *Kirkia* 5 (1) : 4, 1965.
Verbesina biflora Linn. Sp. Pl. ed. 2 : 1272, 1763. *Wedelia biflora* (Linn.)
 DC. in Wight Contrib. 18, 1834 ; FBI 3 : 306 ; DG. 103 ; C. 2 : 99 ; G.
 2 : 497.

Fl. : December. *Ill.* : Wt. Ic. t. 1108.

Vern. : Sonki (Mar.) ; Ambi (Konk.).

Climbing shrub, essentially a coastal plant, distributed also in Japan,
 Africa and Australia.

**PULICARIA* Gaertn.

Pulicaria wightiana (DC.) Benth. ex C. B. Cl. Comp. Ind. 128, 1876 ;
 FBI 3 : 298 ; Pav. 132. *Callistephus wightianus* DC. Prodr. 5 : 275,
 1836.

Fl. & Fr. : September. *Ill.* : Wt. Ic. t. 1089.

Loc. : DIU : Nagoa ; Castle area ; Gogale.

Occasional, on sandy rock soil along sea shore.

SENECIO Linn.

1. Heads ebracteolate

2. Pappus hairs slender, not paleaceous ; achenes glabrous

gibsoni

2. Pappus absent ; achenes hairy

belgaumensis

1. Heads bracteolate

3. Pappus hairs slender

4. Erect undershrub ; leaves rhomboid or ovate

edgeworthii

4. Herb ; leaves linear - oblong

dalzellii

3. Pappus paleaceous

grahami

Senecio belgaumensis C. B. Clarke, Comp. Ind. 200, 1879 ; FBI 3
 348 ; C. 2 : 111.

Fl. & Fr. : August September. *Ill.* : Wt. Ic. t. 1152.

Loc. : GOA : *Bardez* : Sukur village hill. *Salcete* : Raiyi village.
Ponda : Ponda Darbandara. *Sanguem* : Molem Belgaum Road, 63 km
 & 67 km ; Castle rock on way to Anmod. *Canacona* : Ordofond forest.

Occasional on gravelly hill slopes and on bunds of rice fields.

S. dalzellii C. B. Clarke Comp. Ind. 201, 1876 ; FBI 3 : 346 ;
 C. 2 : 110 ; G. 2 : 508 ; S. 120.

Fl. : November.

* Later addition and hence not included in the generic Key.

Loc. : GOA : *Quepem* : Budsari Goundugarha.
Rare, in open situations.

Senecio edgeworthii Hook. f. in FBI 3 : 346, 1881 ; C. 2 : 109 ; G. 2 : 508.

Loc. : GOA : *Sanguem* : Cumbari ; Verlem (Butabaicha Dongar) ; Surla ; Bati Sidh ; Chansuria ghats (Netraveli).

S. gibsoni Hook. f. in FBI 3 : 347, 1881 ; C. 2 : 111.

Loc. : GOA : Dudh sagar.

S. grabami Hook. f. in FBI 3 : 347, 1881 ; C. 2 : 110 ; S. 121.
S. reticulatus C.B. Clarke, Comp. Ind. 199, 1876, non DC. (1838).

Fl. & Fr. : September. *Ill.* : Wt. Ic. t. 1151B.

Loc. : GOA : *Bicholim* : Bicholim Ponda. *Canacona* : Tudal.

Rare, in rice fields along margins.

SONCHUS Linn.

Sonchus oleraceus Linn. Sp. Pl. 794, 1753 ; FBI 3 : 414 ; C. 2 : 119 ; S. 122.

Fl. : September October. *Ill.* : Wt. Ic. t. 1141 ; Tadulingam & Venkatanarayana, Handb. Some South Indian Weeds, t. 100, f. 1-9, 1955.

Loc. : NAGARHAVELI : Silvassa, along Damanganga river bank.
DAMAN : Dundorta ; Fort area.

Occasional, in open, damp situations.

SPHAERANTHUS Linn.

Wings of the stem entire ; flowers white ; achenes glandular *africanus*

Wings of the stem toothed ; flowers mauve ; achenes sub-
glabrous *indicus*

Sphaeranthus africanus Linn. Sp. Pl. (ed. 2) 2 : 1314, 1763 ; FBI 3 : 275 ; C. 2 : 84 ; G. 2 : 486.

Fl. & Fr. : November.

Loc. : GOA : *Pernem* : Kolvelle ferry crossing area. *Bardez* : Borim Margao. *Ilhas* : Santaacruz village rice fields, near Panaji.

Occasional, mostly found growing in rice fields.

S. indicus Linn. Sp. Pl. 927, 1753 ; FBI 3 : 275 ; C. 2 : 84 ; G. 2 : 487 ; S. 116 ; Dangs. 17 ; Pav. 126.

Fl. & Fr. : October - March. *Ill.* : Wt. Ic. t. 1094.

Vern. : Gorakhamundi (Mar.) ; Bodiokalara Gorukh (Guj.).

Loc. : GOA : *Satari* : Dhawe village, near the river ; Nandore village.

Quepem : Budsari Goundugarha. *Canacona* : Tudal village fields ; Ordofond, near the river. NAGARHAVELI : Dapada ; Morkhal ; Velugaon ; Bank of Damanganga river on way to Kawcha ; Dhapsa ; Umberkoi.

Occasional, in waste places along water courses and in rice fields.

SPILANTHES Jacq.

Spilanthes paniculata Wall. ex DC. Prodr. 5 : 625, 1836. *Spilanthes acmella* auct. plur. [*non* (Linn.) Murr. 1774] ; FBI 3 : 307 ; DG. 103 ; C. 2 : 99 ; G. 2 : 490. *S. pseudo acmella* auct. [*non* (Linn.) Murray].

Fl. & Fr. : November - December. *Ill.* : Wt. Ic. t. 1110.

Vern. : Akalkara (Mar., Konk.) ; Jambu (Port.).

Loc. : GOA : *Bardez* : Bastra.

Dalgado indicates that this plant is supposed to have been introduced into India by the Portuguese (possibly from Tropical America.)

Spilanthes paniculata is often referred to in the Floras as *S. acmella* (Linn.) Murray or *S. pseudo acmella* (Linn.) Murray. The specific epithets "*acmella* and *pseudo acmella*" are from *Verbesina acmella* Linn. and *V. pseudo acmella* Linn., the type specimens of which are available in Hermann's Herbarium. Koster & Philipson [Blumea 6 (2) : 349-54, 1950] remark that a critical examination of these specimens reveals that *Verbesina pseudo-acmella* is *Eclipta prostrata* (Linn.) Linn. and *V. acmella* as *Blainvillea latifolia* (Linn.) DC. As such the specific epithets "*acmella* or *pseudo-acmella*" cannot be retained under *Spilanthes*. The next available valid name is only *S. paniculata* Wall. ex DC.

SYNEDRELLA Gaertn.

Synedrella nodiflora (Linn.) Gaertn. Fruct. 2 456, t. 171 f. 7, 1791 ; FBI 3 : 308 ; G. 2 : 498. *Vernonia nodiflora* Linn. Amoen. Acad. 4 : 290, 1759.

Fl. & Fr. : November.

Loc. : GOA : *Bardez* : Porvorim, rocky plateau.

Rare.

TRICHOLEPIS DC.

Tricholepis glaberrima DC. Prodr. 6 : 564, 1837 ; FBI 3 : 381 ; DG. 106 ; C. 2 : 114 ; G. 2 : 511 ; S. 121.

Fl. : October - November.

Vern. : Brahmandandi (Kan. & Mar.) ; Serralha Indiana (Port.).

Loc. : GOA : *Ilhas* : Raj Bhavan forest area Panaji. *Salcete* : Goodier. *Sanguem* : Foot of the hill, near patiem ; Aldana (Netraveli). *Canacona* : Tudal. NAGARHAVELI : Nala between Kawcha and Somanpada ; Dongarpada Umberkoi ; Sindhoni forests.

Occasional, near streams, rice fields and on hillocks. The plant is showy and attractive when in flowers.

TRIDAX Linn.

Tridax procumbens Linn. Sp. Pl. 900, 1753 ; FBI 3 : 311 ; C. 2 : 102 ; G. 2 : 500 ; S. 119 ; Dangs. 18 ; Pav. 130.

Fl. & Fr. : Throughout the year.

Loc. : GOA : *Satari* : Nanacha Dongar (Codal). *Ilhas* : Panaji. *Sanguem* : Baiunbunda (Molem Belgaum Road) ; Bati, Dudhsagar. DADRA. DAMAN : Fort area ; Dundorta. DIU : Jalandhar ; Castle area ; Gogale.

VERNONIA Schreb. *nom. cons.*

Achenes not ribbed ; pappus white

cinerea

Achenes ribbed ; pappus reddish

anthelmintica

Vernonia anthelmintica Willd. Sp. Pl. 3 : 1634, 1803 ; FBI : 3 : 237 ; DG. 100 ; C. 2 : 66. *Centratherum anthelminticum* O. Kuntze Rev. Gen. 1 : 320, 1891 ; G. 2 : 469.

Fl. : December - February.

Vern. : Kadu - jire (Mar.) ; Kalemjirem (Konk.).

Loc. : GOA : *Sanguem* : Patrem. NAGARHAVELI : On way to Bildhara from Dudhari.

The fruits are used in native medicine.

V. cinerea (Linn.) Less, in *Linnaea* 4 : 291, 1829 & 6 : 673, 1831 ; FBI 3 : 233 ; DG. 100 ; C. 2 : 65 ; G. 2 : 475 ; S. 109 ; Dangs. 18 ; Pav. 126. *Conyza cinerea* Linn. Sp. Pl. 862, 1753.

Fl. & Fr. : August - November. *Ill.* : Tadulingam & Venkat anarayana in *Handb. Some South Indian weeds*, t. 80, f. 1-5, 1955.

Vern. : Osari, Sahadevi (Mar.).

Loc. : GOA : *Bardez* : Calangute sea beach. *Ilhas* : Panaji, along coastal area. *Marmugao* : Marmugao harbour area. *Sanguem* : Nondrona near Molem ; Bavanbunda ; Nanacha Dongar (Codal) ; Barazon. *Canacona* : Maxem. NAGARHAVELI : Silvassa ; Khanvel ; Sindhoni forests ; Velgaon ; Jamunpada forests ; Dhapsa Nand Randha. DAMAN : Coileque area ; Fort area ; Cale area ; DIU : Nagoa ; Jalandhar ; Castle area ; Gogale.

Common. Extremely variable in its habit, size and leaf shape.

*VICOA Cass.

Vicoa indica (Willd.) DC. in Wight Contrib. 10, 1834 ; S. 117 ; Dangs. 19 ; Pav. 133. *Inula indica* Willd. Sp. Pl. 3 : 2092, 1804 ; *Vicoa auriculata* Cass. in Ann. Sc. Nat. (ser. 1), 17 : 418, 1829 ; FBI 3 : 297 ; C. 2 : 88.

Fl. : October November. *Fr.* : November January. *Ill.* : Wt. Ic. t. 1148 ; Tadulingam & Venkatanarayana *l.c.*, t. 88, f.1-7, 1955.

Vern. : Sona sali (Guj.).

Loc. : NAGARHAVELI : Dongarpad Umberkoi. DAMAN : Bimpur ; Dundorta. Rare, in the fields. The bright yellow flowers are showy and attractive.

WEDELIA Jacq. *nom. cons.*

Invol. - bracts much longer than the disk flowers ; leaves subsessile, lanceolate - oblong

chinensis

Invol. - bracts about equalling the disk-flowers ; leaves petioled, ovate

urticaefolia

Wedelia chinensis (Osbeck) Merr. in Philip. Journ. Sc. Bot. 12: 111, 1917. *Solidago chinensis* Osbeck, Dagbok Ostind. Resa 241, 1757. *Wedelia calandulacea* (Linn.) Less, Syn. Comp. 222, 1832 ; FBI 3 : 306 ; DG. 103 ; C. 2 : 98 ; G. 2 : 497 (*non Pers.*).

Fl. & *Fr.* : February May. *Ill.* : Wt. Ic. t. 1107.

Vern. : Pivala bhangra (Mar.) ; Biringarsi (Konk.).

This species, though recorded by Dalgado is not quite frequent in Concan ghats. In fact the other two species *Wedelia urticaefolia* DC. and *W. biflora* DC. are reported by Cooke (*l.c.*) from Marmugao area.

W. urticaefolia DC. in Wight Contrib. 18, 1834 ; C. 2 : 98.

Loc. : NAGARHAVELI : Dongarpad Umberkoi.

*Later addition and hence not included in the generic Key.

*XANTHIUM Linn.

Xanthium strumarium Linn. Sp. Pl. 987, 1753 ; FBI 3 : 303, C. 2 : 94 ; S. 118 ; Dangs. 19 ; Pav. 128.

Fl. : October - November. *Ill.* : Wt. Ic. t. 1104.

Vern. : Godriyum (Guj.).

Loc. : NAGARHAVELI : Silvassa along Damanganga river bank ; Khanvel ; Bank of Damanganga river on way to Kawcha ; Nana Randha ; DIU : Gogale.

Occasional, on wastelands and along roadside near the sea shore, A troublesome weed, indigenous in America and introduced into our country over 100 years ago.

Cult. species :

Achillea millefolium Linn. Sp. Pl. 899, 1753 ; DG. 104, C. 2 : 126.

Vern. : Rajmari (Konk.). Millefelio (Port.).

Cultivated in gardens.

Calendula officinalis Linn. Sp. Pl. 921, 1753 ; DG. 106 ; C. 2 : 126.

Vern. : Jemdu (Konk.) ; Maravilhas dos jardins (Port.).

Grown in gardens for cut flowers.

Carthamus tinctorius Linn. Sp. Pl. 830, 1753 ; FBI 3 : 386 ; DG. 106 ; C. 2 : 126.

Vern. : Kusumba (Mar.) ; Kusbo (Konk.) ; Carthamo (Port.).

Mostly cultivated for the red dye obtained from flowers and oil from seeds.

Chrysanthemum coronarium Linn. Sp. Pl. 889, 1753 ; DG. 104.

Vern. : Sivamti (Konk.) ; Malme queres (Port.).

Cultivated in gardens for cut flowers.

C. indicum Linn. Sp. Pl. 889, 1753 ; DG. 104 ; C. 2 : 126.

Fl. : Cold season.

Vern. : Gul dandi (Mar.) ; Sivamti (Konk.) ; Sivanti (Port.).

The species, a native of China and Japan, is mostly grown in gardens for its flowers.

Cichorium endivia Linn. Sp. Pl. 813, 1753 ; DG. 107 ; G. 2 : 127.

Vern. : Chicorea (Port.) ; Garden endine (Eng.).

Cultivated, used as salad.

Cosmos bipinnatus Cav. Icon. 1 : 10, t. 14. ; C. 2 : 125.

A native of Mexico, cultivated in gardens.

*Later addition and hence not included in the generic Key.

Cynara scolymus Linn. Sp. Pl. 827, 1753 ; DG. 106 ; C. 2 : 126.

Vern. : Artachok (Konk.) ; Alcachofra (Port.).

Grown in gardens as an ornamental plant.

Eupatorium triplinerve Vahl, Symb. 3 : 97, 1794 ; C. 2 : 123. *E. ayapana* DC. Prodr. 5 : 169, 1836. ; FBI 3 : 244.

Vern. : Ayapanam (Konk.) ; Ayapana ou Japana (Port.).

A native of tropical America, cultivated in the gardens as a hedge plant.

Helianthus annuus Linn. Sp. Pl. 904, 1753 ; DG. 104 ; C. 2 : 124.

Vern. : Suryaphul (Mar.) ; Surya kamal (Konk.) ; Girasal (Port.).

Grown in gardens ; a native of Western United States.

H. tuberosus Linn. Sp. Pl. 905, 1753 ; DG. 104 ; G. 2 : 124.

Vern. : Alcachofras de Jerusalem (Port.).

A native of North America, cultivated in gardens.

Tagetes erecta Linn. Sp. Pl. 887, 1753 ; DG. 105 ; C. 2 : 125 ; v. 65.

Fl. : November.

Vern. : African marigold.

A native of Mexico and introduced into India through Africa. Cultivated in gardens for its showy flowers and possibly as an escape growing wild and thus collected from Canacona area and Satari (Wadicha dongar).

T. patula Linn. Sp. Pl. 887, 1753 ; DG. 106 ; C. 2 : 125 ; v. 65.

Vern. : Raji (Konk.) ; Gravo de Tunis (Port.) ; French marigold (Guj.).

A native of Mexico, grown in gardens ; a smaller form than *Tagetes erecta* Linn.

GOODENIACEAE

SCAEVOLA Linn.

Scaevola taccada (Gaertn.) Roxb. [Hort. Beng. 15, 1814 (*nom. nud.*) &] ; Fl. Ind. 1 : 527, 1824. *Lobelia taccada* Gaertn. Fruct. 1 : 119, t. 25, 1788. *Scaevola koenigii* Vahl, Symb. Bot. 3 : 36, 1794 ; FBI 3 : 421 ; DG. 108 ; C. 2 : 128. *S. frutescens* auct. non Krause.

Fl. : June - December. *Ill.* : Wt. Ill. t. 137.

Vern. : Bhadrak (Mar.) ; Tarkoth (Konk.) ; Amierro (Port.).

This species common along west coast of India and also cultivated in gardens, is recorded by Dalgado. It can be located in the rocky parts of Goa coast. It is also now recorded from the rocky portions of east coast near Vishakhapatnam (Andhra Pradesh).

LOBELIACEAE

LOBELIA Linn.

Small herbs with small flowers ; seeds trigonous *alsinoides*

Tall, erect herb with large flowers ; seeds ellipsoid, compressed *nicotianaefolia*

Lobelia alsinoides Lamk. Encycl. 3 : 588, 1792 ; S. 124. *Lobelia trigona* Roxb. [Hort. Beng. 85, 1814 (nom. nud.) &] ; Fl. Ind. 1 : 506, 1832 ; FBI 3 : 423 ; DG. 108 ; C. 2 : 130 ; G. 2 : 518.

Fl. & Fr. : October. *Ill.* : Wt. Ic. t. 1170.

Loc. : GOA : *Satari* : Ivorem, Bazuruco. *Sanguem* : Molem Belgaum Road 71 km. ; Netraveli. *Quepem* : Budsari Goundugarha. *Canacona* : Nadquem village ; Butpal. NAGARHAVELI : Dhopsa ; Uंबरkoi ; Velugaon

Common along grassy hill slopes.

L. nicotianaefolia Heyne in Roth, Nov. Pl. Sp. 143, 1821 ; FBI 3 : 327 ; DG. 108 ; C. 2 : 131 ; G. 2 : 518 ; S. 124.

Fl. & Fr. : October March. *Ill.* : Wt. Ill. t. 135.

Vern. : Dhaval (Mar.) ; Baknal (Konk.) ; Lobelia das folhas de tabaco (Port.).

This species, frequently collected along the Western ghats, is recorded as most common on Goa ghats by Dalgado.

SPHENOCLEACEAE

SPHENOCLEA Gaertn.

Sphenoclea zeylanica Gaertn. Fruct. 1 : 113, t. 24, 1788 ; FBI 3 : 438 ; C. 2 : 134 ; G. 2 : 520.

Fl. & Fr. : August October. *Ill.* : Wt. Ill. t. 138.

Loc. : GOA : *Satari* : Pilegao. *Bardez* : Mapuca.

Rare, in damp or marshy situations.

PLUMBAGINACEAE

Styles 5, free from base or nearly so

Statice

Styles connate throughout their entire length

Plumbago

PLUMBAGO Linn.

Plumbago zeylanica Linn. Sp. Pl. 151, 1753; FBI 3 : 480 : C. 2 : 136 ; G. 2 : 524 ; S. 124 ; Dangs. 19 ; Pav. 134.

Fl. & Fr. : October. *Ill.* : Wt. *Ill.* t. 179.

Vern. : Chitraka (Mar.) ; Chitramulika (Kanl.) ; Kalochitrak (Guj.).

Loc. : GOA : *Sanguem* ; Verlem. NAGARHAVELI : Silvassa. DIU : sand stone ditch, Castle area.

Rare in open fields. Sometimes grown in gardens also.

STATICE Linn.

Statice stocksii Boiss. in DC. Prodr. 12 : 664, 1848 ; FBI 3 : 480 ; C. 2 : 136.

Fl. & Fr. : August September. *Ill.* : Wt. *Ill.* t. 178 ; Hook. Ic. Pl. t. 837.

Loc. : DIU : Rocky creek, Nagoa ; Podamo ; Nagoa, near Air port.

Occasional along the sea shore, confined to drier tracts of Gujarat and Sind only.

Cult. species :

Plumbago indica Linn. in Stickm. Herb. Amb. 24, 1754. *P. rosea* Linn. Sp. Pl. ed. 2, 215, 1762 ; FBI 3 : 481 ; DG. 109 ; C. 2 : 137 ; G. 2 : 524.

Ill. : Fl. Males. ser. 1, 4 (2) : 111, f. 2, 1949.

Vern. : Lalchitrak (Mar.) ; Tambdi chitrak (Konk.).

A native of South East Asia, mostly cultivated in gardens both as ornamental and medicinal plant. Can be used as a substitute for *Rauwolfia serpentina* Benth. ex Kurz.

P. auriculata Lamk. Encycl. 2 : 270, 1876. *Plumbago capensis* Thunb. Prodr. Fl. Cap. 33, 1794 ; C. 2 : 137 ; G. 2 : 524.

Fls. : May December.

Vern. : Kala-chitrak (Mar.).

Native of Africa with pale blue flowers, cultivated as an ornamental plant.

MYRSINACEAE

1. Scandent shrubs or climbers

Embelia

1. Erect shrubs or small trees

2. Calyx not thickened, free ; fruit 1-seeded

3. Leaves ovate or lanceolate, base decurrent on the petiole; flowers pedicelled, rose coloured; fruits globose Ardisia
3. Leaves ovate, obtuse, base cuneate; flowers sessile, white; fruits cylindrical, curved falcately Aegiceras
2. Calyx thickened, adnate to the ovary; fruit many seeded Maesa

AEGICERAS Gaertn.

Aegiceras corniculatum (Linn.) Blanco, Fl. Filip. ed. 1, 79, 1837; G. 2 : 532. *Rhizophora corniculata* Linn. Sp. Pl. 635, 1753. *Aegiceras majus* Gaertn. Fruct. 1 : 216, t. 46, 1788; FBI 3 : 533; DG. 110; C. 2 : 147; T. 2 : 150.

Fl. & Fr. : February - March. *Ill.* : T. f. 369; *Wt.* III. t. 146.

Vern. : Kanjala (Mar.) : Kamdlam (Konk.) : Salgueira (Port.).

Loc. : GOA : *Bicholim* : Tirla. *Ponda* : Borim, Zueri river. *Marmugao* : Near Sancoale. DAMAN : Coileque area; Cale area.

Common in marshy, saline areas along with *Acanthus ilicifolius* Linn. Dalgado also records this species as common along the banks of Agua and Salgada.

ARDISIA Swartz *nom. cons.*

Ardisia solanacea (Poir.) Roxb. Pl. Cor. 1 : 27, 1795; C. 2 : 146; G. 2 : 531. *Anguillaria solanacea* Poir. Encycl. 7 : 688, 1806. *Ardisia humilis* A. DC. in Trans. Linn. Soc. 17 : 118, 1837; FBI 3 : 529; DG. 109; T. 2 : 149 *non* Vahl (1794).

Fl. & Fr. : September - October. *Ill.* : *Wt.* Ic. t. 1212.

Vern. : Dinka (Mar.) ; Havalad (Kan.) ; Nilbedsi (Konk.) ; Fruct gibique preta (Port.).

Loc. : GOA : *Satari* : Dinarai forest, Satrem-Kutachemal (Ivorem). Codal-Nanora road, 5 km. *Cinacona* : Butpal Nadquem ; Polem ; Tudal village ; Valchem.

Rare, inside the forest along hill slopes and near water streams.

EMBELIA Burm. f. *nom. cons.*

Scandent shrubs, leaves oblong-lanceolate; inflorescence terminal or in the upper axils

ribes

Erect shrubs, leaves broadly elliptic; inflorescence axillary

tsjarlam-cotta m

Embelia ribes Burm. f. Fl. Ind. 62, t. 23, 1768 ; FBI 3 : 513 ; DG. 109 ; C. 2 : 144 ; T. 2 : 146 ; G. 2 : 529.

Fl. : February. *Ill.* : Wt. Ic. t. 1207.

Vern. : Vaivarang (Mar.) ; Vayvaramg (Konk.).

The species which is fairly common along Western India is recorded for Goa ghats by Dalgado.

E. tsjariam-cottam (Roem. & Schultz.) A. DC. in Trans. Linn. Soc. 17 : 131, 1834 & in DC. Prodr. 8 : 87, 1844 ; G. 2 : 529 ; S. 125. *Ardisia tsjariam-cottam* Roem. & Schultz. Syst. 4 : 518, 1819. *Embelia robusta* C. B. Clarke in FBI 3 : 515, 1882 ; DG. 109 ; C. 2 : 144 ; T. 2 : 147 (*non*. Roxb., 1832).

Fl. & Fr. : August November. *Ill.* : Wt. Ic. t. 1209.

Vern. : Ambati (Mar.) ; Amti (Kan.) ; Ambti (Konk.) ; Ramisoli (Port.).

Loc. : GOA : *Bicholim* : Nanora. *Sanguem* : Barazan mine area ; Potiem forest ; Dudal ; Barazon. *Canacona* : Ordofond-Tudal ; Ordofond-Butpal.

MAESA Forsk.

Maesa indica Wall. in Roxb. Fl. Ind. 2 : 230, 1824 (*in nota*) ; FBI 3 : 509 ; DG. 109 ; C. 2 : 141 ; S. 125.

Fl. : November January.

Vern. : Atki (Mar.).

This common species of the Western ghats is also reported for Goa ghats by Dalgado.

SAPOTACEAE

1. Calyx lobes 1-seriate

2. Leaf nerves close and parallel ; staminodes nil

Chrysophyllum

2. Leaf nerves distant ; staminodes present

Xantolis

1. Calyx lobes 2 - seriate

3. Calyx lobes 4 to 5

Madhuca

3. Calyx lobes 6 to 8

4. Staminodes present

- | | |
|---|------------------|
| 5. Leaves elliptic, shortly acuminate; flowers tetramerous; staminodes lanceolate, acuminate, hairy | <i>Mimusops</i> |
| 5. Leaves obovate or oblong, emarginate; flowers trimerous; staminodes denticulate, glabrous | <i>Manilkara</i> |
| 4. Staminodes absent | <i>Palaquium</i> |

CHRYSOPHYLLUM Linn.

Chrysophyllum roxburghii G. Don, Gen. Syst. 4 : 33, 1837; FBI 3 : 535; DG. 110; C. 2 : 149; G. 2 : 533.

Fl. : April - May. *Ill.* : Bedd. Fl. f. 236.

Vern. : Tarsi (Mar.); Dömngri mayphal (Konk.); Estrella (Port.).

A species of the evergreen forests, found to be growing in areas adjoining Goa ghats, recorded by Dalgado also and hence included here.

The fruits are edible though not tasty.

MADHUCA J. F. Gmel.

Maduca longifolia (Koen.) MacBride var. *latifolia* (Roxb.) Chevalier, Rev. Bot. Appl. 23 : 149, 1943. *Bassia latifolia* Roxb. Pl. Cor. 1 : 20, t. 19, 1795 & in Fl. Ind. 2 : 526, 1832; FBI 3 : 544; C. 2 : 152; T. 2 : 156. *Maduca indica* Gmel. Syst. Nat. 2 : 799, 1791; S. 126.

Fr. : March. *Ill.* : Wt. Ill. t. 147; T. f. 372.

Vern. : Mohwa (Mar.); Movaro (Kan.); Mahudo, Mauha (Guj.).

Loc. : GOA : *Canacona* : Ordofond; Jalem, near Nadquem. NAGARHAVELI: Velugaon; Bank of Damanganga river on way to Kawcha; Nana Randha.

Rare, along river beds as isolated trees.

MANILKARA Adans. *nom. cons.*

Manilkara hexandra (Roxb.) Dub. in Ann. Mus. Col. Mars. (ser. 3) 3 : 9, 1915. *Mimusops hexandra* Roxb. Pl. Cor. 1 : 16, t. 15, 1795; FBI 3 : 549; C. 2 : 155; T. 2 : 163; G. 2 : 538.

Fl. : November. *Ill.* : Wt. Ic. t. 1587.

Vern. : Kirni, Ranjana (Mar.); Bakula (Kan.); Rayan, Khirni (Guj.).

Loc. : GOA : *Bardez* : Porvorim-Betim plateau area. DAMAN.

Rare, in deciduous forests.

MIMUSOPS Linn.

Mimusops elengi Linn. Sp. Pl. 349, 1753 ; FBI 3 : 548 ; DG. 111 ; C. 2 : 155 ; T. 2 : 161 ; G. 2 : 538 ; S. 126.

Fr. : October - November. *Ill.* : Wt. Icon. t. 1586 ; Bedd. Fl. Sylv. t. 40 ; T. f. 375.

Vern. : Wavoli (Mar.) ; Ranjal (Kan.) ; Omval (Konk.) ; Vanvoleiro (Port.) ; Borsali (Guj.).

Loc. : GOA : *Richolim* : Usgao. *Bardez* : Betim hill slope. *Sanguem* : Bati Sanguem ; Molem.

Rare, along forest edges and on the hill slopes. The flowers are fragrant, perfume is distilled from them.

PALAQUIUM Blanco

Palaquium ellipticum (Dalz.) Baillon, Traite Bot. Med. Phan. 1500, 1884. *Bassia elliptica* Dalz. in Hook. Journ. Bot. & Kew Misc. 3 : 36, 1851. *Palaquium ellipticum* (Dalz.) Engl. Bot. Jahrb. 12 : 511, 1890 ; C. 2 : 154 ; G. 2 : 537. *Dichopsis elliptica* Benth. & Hook. f. Gen. Pl. 2 : 658, 1876 ; FBI 3 : 542 ; DG. 110 ; T. 2 : 160.

Fl. : February. *Ill.* : Bedd. Fl. t. 43.

Vern. : Panchoti-palla (Mar.) ; Gutta percha indiana (Port.).

A fairly common species along the Western ghats and also recorded by Dalgado for Goa ghats.

XANTOLIS Raf.

Xantolis tomentosa (Roxb.) Raf. Sylv. Tell. 36, 1838 ; S. 290 (in appendix). *Sideroxylon tomentosum* Roxb. Pl. Cor. 1 : 28, t. 28, 1795 & in Fl. Ind. 1 : 602, 1832 ; FBI 3 : 538 ; DG. 110 ; C. 2 : 150 ; T. 2 : 154 ; G. 2 : 534.

Fl. & Fr. : November. *Ill.* : Wt. Ic. t. 1218 ; T. 2 : f. 371.

Vern. : Kumbul (Mar.) ; Sumahale (Kan.).

Loc. : GOA : *Sanguem* : Moduka bungla jungle ; Bati Sidh ; Periche Tem (Cumbari) ; Ambeachagd. *Canacona* : Nadquem hills ; Nadquem, Quer hills, Mahden forest, near Nadquem ; Nadquem. NAGARHAVELI : Velugaon.

Occasional on hill slopes.

Cult. species :

Manilkara achras (Mill.) Fosberg in *Taxon* 13 : 255, 1964. *Achras sapota* Linn. Sp. Pl. ed. 2, 469, 1762 ; FBI 3 : 534 ; DG. 110 ; C. 2 : 156 ; G. 2 : 533.

Vern. : Chiku (Mar.) ; Sapotilha (Port.).

This species was introduced from America and is cultivated in Goa and other parts for its fruits.

Mimusops kauki Linn. Sp. Pl. 349, 1753 ; FBI 3 : 549 ; DG. 111 ; C. 2 : 156 ; G. 2 : 539.

Vern. : Manilphal (Konk.) ; Fructo de Adao (Port.).

A native of Malaya and Tropical Australia introduced into Goa where it is now grown in gardens for its fruits.

EBENACEAE

Flowers 3 - merous ; ovary 3 or 6 - celled

Maba

Flowers 4 - merous ; ovary 4 to 8 - celled

Diospyros

DIOSPYROS Linn.

- | | |
|---|--------------------|
| 1. Female flowers in short, few flowered cymes | <i>candolleana</i> |
| 1. Female flowers solitary or in pairs | |
| 2. Fruits clothed with stinging hairs | <i>pruriens</i> |
| 2. Fruits not clothed with stinging hairs | |
| 3. Male flowers in panicles | <i>paniculata</i> |
| 3. Male flowers in short cymes | |
| 4. Calyx dissimilar in the 2 sexes, larger in the female | |
| 5. Leaves often subopposite | <i>melanoxylon</i> |
| 5. Leaves all alternate | <i>crumenata</i> |
| 4. Calyx almost similar in both the sexes | |
| 6. A spinous tree ; corolla campanulate or urceolate ; stamens 16 | <i>montana</i> |
| 6. Unarmed tree ; corolla ovoid oblong or tubular ; stamens 24 - 40 | |
| 7. Corolla ovoid or oblong ; stamens 40 or more | <i>malabarica</i> |
| 7. Corolla tubular ; stamens 24 - 32 | <i>ebenum</i> |

Diospyros candolleana Wt. Icon. 4 (1) : 9, tt. 1221 1222, 1848; FBI 3 : 566 ; C. 2 : 161 ; T. 2 : 177 ; G. 2 : 543 ; S. 127.

Fl. & Fr. : March June. *Ill.* : Wt. Ic. tt. 1221 22.

Vern. : Kalwan (Mar.) ; Kari gidda (Kan.).

Loc. : GOA : *Satari* : Vadachi Dhat near Vangiri, Nandore. *Sanguem* : Colem near Sonavadi nadi. *Canacona* : Butpal forest ; *Nadquem* Butpal road, 5 km ; Butpal.

Occasional, inside the forest.

D. crumenata Thw. Enum. Ceyl. Pl. 179, 1860 ; FBI 3 : 567 ; C. 2. 161.

Loc. : GOA : *Sanguem* : Mattan Donger (Netravali).

This species which is considered to be confined to evergreen forests & Karnataka and southwards as far as Sri Lanka is now recorded in Goa area.

D. ebenum Koenig in Phys. Salsk. Hendl. 1 : 176, 1776 ; FBI 3 : 558 ; DG. 112 ; C. 2 : 164 ; G. 2 : 545. *Diospyros assimilis* Bedd. in Madras For. Rep. 20, t. 1, 1866-67.

Fl. : February March. *Ill.* : Wt. Ic. t. 188.

Vern. : Abnus (Mar.) ; Karemara (Konk.).

The species is common in evergreen forests of South India, and rather quite rare in Goa but it is also quite possible to locate it in Goa forests. It has, however, been grown in Goa for its quality wood.

The approach of the earlier workers treating *Diospyros ebenum* Koenig of Malesia and *D. assimilis* Bedd. as conspecific needs further scrutiny. It is quite possible that a single taxonomic species growing in such distinct climatic zones like South India and Malesia, may produce the well known ebony wood of two different qualities as is seen in Teak of Central India and Burma.

D. malabarica (Desr.) Kostel, Allg. Med. Pharm. Fl. 3 : 1099, 1833. Backer & Bakh. f. in Fl. Java 2 : 188, 1965. *Garcinia malabarica* Desr. in Lamk. Encycl. 3 : 701, 1792. *Diospyros embryopteris* Pers. Syn. 2 : 624, 1807 ; FBI 3 : 556 ; DG. 112 ; C. 2 : 167 ; T. 2 : 171.

Fl. : March April. *Fr.* ? December. *Ill.* : Wt. Ic. tt. 843 & 844 ; T. f. 378.

Vern. : Temburi (Mar.) ; Kusharta (Konk.).

The species fairly common in the adjoining regions on either side of Goa, is also recorded for Goa (Dalgado).

D. melanoxylon Roxb. Cor. Pl. 1 : 36, t. 46, 1795 ; C. 2 : 159 ; T. 2 : 174 ; G. 2 : 543. Dangs. 20 ; Pav. 135. *D. tuperu* Buch.-Ham. in Trans. Linn. Soc. 15 : 111, 1827 ; FBI 3 : 563, DG. 112.

Fl. : April May. *Fr.* : November - December. *Ill.* : Wt. Ic. t. 1223 ; Wealth of India, f, 44 ; Bedd. Fl. Sylv. tt. 66, 67.

Vern. : Tendu (Mar.) ; Balai (Kan.) ; Tembiri (Konk.) ; Tamrug, Timbru (Guj.).

Loc. : GOA : *Satari* : Sirunguli near Caranzol. NAGARHAVELI : Jamupada forest ; Carchond forest ; Nana Randha ; Silvassa, towards Atal forest ; Khuntly area. DAMAN : Between Bimpur & Janivancore.

Occasional in the deciduous forest.

Diospyros montana Roxb. Cor. Pl. 1 : 37, t. 48, 1795 ; FBI 3 : 555, p. p. ; DG. 112 ; C. 2 : 165 ; T. 2 : 169 ; G. 2 : 545 ; S. 187.

Fl. : March April. *Fr.* : April December. *Ill.* : Wt. Ic. t. 1215 ; T. f. 377.

Vern. : Goindu (Mar.) ; Tendu (Konk.).

Loc. : GOA : *Sanguem* : Chansuria ghats (Netraveli).

The species which is fairly common along the Western ghats, is recorded for Goa ghats by Dalgado.

D. paniculata Dalz. in Kew Journ. Bot. 4 : 109, 1852 ; FBI 3 : 570 ; DG. 112 ; C. 2 : 163 ; T. 2 : 178 ; G. 2 : 544.

Fl. : November - December. *Fr.* : April June. *Ill.* : Bedd. Ic. t. 125 ; T. f. 381.

Vern. : Kurikoomar (Kan.).

Loc. : GOA : *Canacona* : Nadquem village.

Rare, inside the forest.

D. pruriens Dalz. in Kew Journ. Bot. 4 : 110, 1852 ; FBI 3 : 543 ; C. 2 : 162 ; T. 2 : 166 ; G. 2 : 544.

Fl. : November - February. *Fr.* : March. *Ill.* : Bedd. Ic. Pl. Ind. Or. t. 129.

Loc. : GOA : *Satari* : Matachirai, near Palem.

Rare.

MABA FORST.

Maba nigrescens Dalz. in Dalz. & Gibs. Fl. 142, 1861 ; FBI 3 : 551 ; DG. 111 ; C. 2 : 157 ; T. 2 : 164 ; G. 2 : 540.

Fl. : March.

Vern. : Rakta - rora (Mar.) ; Hole Kuncha (Kan.).

Loc. : GOA : *Satari* : Satre river, Codal Ambechagol ; Codal-Satrem road, 5 km. *Sanguem* : Molem Belgaum road, 71 km ; Madka Bunglow (Molem Belgaum Road).

Occasional.

STYRACACEAE

SYMPLOCOS Linn.

- | | |
|--|------------------------|
| 1. Fruit globose, urceolate, bluish-black ; bracteoles 3, minute | <i>cochinchinensis</i> |
| 1. Fruit ovoid - oblong, yellow ; bracteoles 2, ovate | <i>racemosa</i> |

Symplocos cochinchinensis (Lour.) S. Moore in Jour. Bot. 52 : 148, 1914 ; Noteboom, Rev. Symp. 141, 1975. *Dicalix cochinchinensis* Lour. Fl. Cochin. 1 : 663, 1790. *S. spicata* Roxb. (Hort. Beng. 40, 1814, *nom. nud.* &) Fl. Ind. 2 : 541, 1832 ; DG. 113 ; C. 2 : 169 ; T. 2 : 180 ; G. 2 : 549. *S. spicata* var. *laurina* C.B.Cl. in FBI 3 : 573, 1882. *S. laurina* Wall. ex Rehd. & Wills. in Sargent Pl. Wills. 2 : 594, 1916.

S. racemosa Roxb. (Hort. Beng. 40, 1814, *nom. nud.* &) Fl. Ind. 2 : 539, 1832 ; FBI 576 ; Noteboom *l.c.* 271. *S. beddomei* C. B. Cl. in FBI 3 : 582, 1882 ; DG. 113 ; C. 2 : 169 ; T. 2 : 181 ; G. 2 : 551.

Fl. : November - January. *Ill.* : T. f. 382.

Vern. : Lenda (Mar.) ; Manithristi (Konk.) ; Lodar (Kan.) ; China nova (Port.).

The species is fairly common along the Western ghats in Concan and North Kanara and it is quite possible to locate it in Goa ghats also.

OLEACEAE

- | | |
|--|-------------------|
| 1. Scandent or climbing shrubs | <i>Jasminum</i> |
| 1. Large shrubs or small trees | |
| 2. Flowers in terminal panicles | <i>Ligustrum</i> |
| 2. Flowers in axillary or terminal pedunculate beads | <i>Nyctanthes</i> |
| 3. Leaves elliptic - lanceolate, acute or acuminate, distantly and sharply serrate, waved ; petals small, united into a tube or absent | <i>Olea</i> |
| 3. Leaves elliptic - oblong, obtuse or bluntly acuminate, margins entire more or less resolute ; petals rather long, free or united in pairs | <i>Linosyris</i> |

JASMINUM Linn.

- | | |
|---|--------------------|
| 1. Leaves glabrous ; bracts linear | <i>malabaricum</i> |
| 1. Leaves pubescent or villous ; bracts ovate or lanceolate | |
| 2. Leaves elliptic - lanceolate ; bracts white | <i>rotterianum</i> |
| 2. Leaves ovate - acute ; bracts green | <i>multiflorum</i> |

Jasminum malabaricum Wt. Icon. 4 (1) : 13, t. 1250, 1850 ; FBI 3 : 594 ; C. 2 : 172 ; T. 2 : 186 ; G. 2 : 554 ; S. 127.

Fl. : March May. *Fr.* : May June. *Ill.* : Wt. Icon. t. 1250 ; T. f. 384.

Vern. : Kusar (Mar.) ; Tirgal (Kan.) ; Mogra (Guj.).

Loc. : GOA : *Satari* : Maloli Valpoi road. *Salcete* : Raiya village. *Sanguem* : Sidh forest, near Bati ; Bati Sanguem. *Canacona* : Ordofond ; Moira forest ; Angidiv.

Occasional in the outskirts of forest, often climbing on shrubs and small trees.

J. multiflorum (Burm. f.) Andr. Bot. Rep. t. 496, 1801, *nom.* Roth, 1821 ; S. 128. *Nyctanthes multiflora* Burm. f. Fl. Ind. 5, t. 3, f. 1, 1768. *Jasminum pubescens* Willd. Sp. Pl. 1 : 37, 1797 ; FBI 3 : 592 ; DG. 114 ; C. 2 : 188 ; G. 2 : 554.

Fl. : December February. *Ill.* : Wt. Ic. t. 702 & 1248.

Vern. : Ran mongara (Mar.) ; Ran mogri (Konk.).

Generally cultivated but also run wild.

J. rotterianum Wall. ex DC. Prodr. 8 : 305, 1844 ; FBI 3 : 593 ; DG. 114 ; C. 2 : 174 ; T. 2 : 189 ; G. 2 : 554.

Fl. : March May. *Ill.* : Wt. Ic. t. 1249.

Vern. : Varamallige (Kan.) ; Vismogri (Konk.) ; Mogrim de serra (Port.).

Loc. : GOA : *Satari* : Kedgi forest, near Nandore, Vangiri forest.

Occasionally noted growing in forests.

Cult. species :

J. auriculatum Vahl, Symb. Bot. 3 : 1, 1794 ; FBI 3 : 600 ; DG. 114 ; C. 2 : 174 ; T. 2 : 190 ; G. 2 : 555.

Fl. : July October. *Ill.* : Wt. Ic. t. 700.

Vern. : Jai (Mar.) ; Juy (Konk.).

Cultivated in gardens.

Jasminum officinale Linn. Sp. Pl. 3, 1753 ; FBI 3 : 603, DG. 114 ; C. 2 : 175.

Vern. : Jati Jai (Mar.) ; Jayli (Konk.) ; Jasmine (Port.).

Mostly cultivated for its flowers from which the oil of Jasmine is extracted.

J. officinale var. *grandiflorum* (Linn.) Kobuski in Journ. Arn. Arb. 13 : 161, 1932. *Jasminum grandiflorum* Linn. Sp. Pl. ed. 2 : 9, 1762 ; FBI 3 : 603 ; DG. 114 ; C. 2 : 176 ; G. 2 : 556 ; V. 68.

Fl. : October.

Vern. : Chameli (Mar.) ; Sanjuy (Konk.) ; Jasmineire (Port.).

This species is mostly cultivated for its perfume.

J. sambac Ait. Hort. Kew 1 : 8, 1789 ; FBI 3 : 591 ; DG. 113 ; C. 2 : 172 ; T. 2 : 186 ; G. 2 : 554 ; V. 68.

Fl. : April July. *Ill.* : Wt. Ic. t. 704.

Vern. : Batmogra (Mar.) ; Vismogri (Konk.) ; Mogorim (Port.).

Widely cultivated for its fragrant flowers.

LIGUSTRUM Linn.

Ligustrum perrottetii A. DC. in DC. Prodr. 8 : 294, 1844 ; FBI 3 : 615 ; G. 2 : 560. *Ligustrum neilgherrense* Wt. Ic. t. 1243, 1848 *non* Decne ; FBI 3 : 615 ; DG. 116 ; C. 2 : 181 ; T. 2 : 198.

Fl. : August November. *Ill.* : Wt. Ic. t. 1243 & 1244 ; T. f. 391.

Vern. : Kungin (Mar.).

Loc. : GOA : *Sanguem* : Surla.

A very common species in moist forests of the Ghats, and also recorded from Goa forests by Dalgado.

LINOCIERA Swartz

Linociera malabarica Wall. ex Don, Syst. 4 : 53, 1838 ; FBI 3 : 607 ; C. 2 : 178 ; T. 2 : 195 ; G. 2 : 558 ; S. 128.

Fl. : November. *Fr.* : March. *Ill.* : Wt. Ic. t. 1246 ; T. f. 389.

Vern. : Manikimara (Kan.).

Loc. : GOA : *Canacona* : Ordofond - Butpal ; Devasthan, Nadquem ; Nadquem, Butpal.

Rare, along stream edges.

NYCTANTHES Linn.

Nyctanthes arbor-tristis Linn. Sp. Pl. 6, 1753; FBI 3 : 603 ; DG. 115 ; C. 2 : 176 ; T. 2 : 192 ; G. 2 : 556 ; S. 128.

Fl. : October November. *Ill.* : Bedd, Fl. Sylv. t. 240 ; T. f. 387.

Vern. : Parijat (Mar.) ; Hursing (Kan.) ; Pardik (Monk.) ; Arvore triste (Port.).

Loc. : GOA : *Satari* : Palle village ; Palle.

OLEA Linn.

Olea dioica Roxb. [Hort. Beng. 3, 1814 (nom. nud.) &] Fl. Ind. 1 : 106, 1832 ; FBI 3 : 612 ; DG. 115 ; C. 2 : 179 ; T. 2 : 196 ; G. 2 : 559 ; S. 128.

Fl. & Fr. : January April. *Ill.* : Wt. Ill. t. 151 ; T. f. 390.

Vern. : Kauki (Mar.) ; Akki (Kan.) ; Peddhaliki (Konk.) ; Querillas (Port.).

Loc. : GOA : *Satari* : Satre river, Codal Ambechagol ; Caranzol. *Canacona* : Nadquem ; Nadquem, Quer hills.

Rare, along river banks.

SALVADORACEAE

SALVADORA Linn.

Salvadora persica Linn. Sp. Pl. 122, 1753 ; FBI 3 : 619 ; C. 2 : 182 ; T. 2 : 200.

Fl. : November. *Ill.* : T. f. 392.

Vern. : Khanjal (Guj.).

Loc. : DAMAN : Varacunda.

Rare, along the river bank.

APOCYNACEAE

1. Climbing shrubs

2. Anthers included, free from the stigma, rounded at the base ; seeds not comose, but winged at both ends

Ellertionia

2. Anthers included or exerted, conniving in a cone round and adhering to the stigma ; seeds comose

- | | |
|---|---------------------|
| 3. Anthers exerted | <i>Parsonia</i> |
| 3. Anthers included | |
| 4. Corolla very large, exceeding 2 cm across | |
| 5. Corolla campanulate or infundibuliform; disc deeply 5-lobed | <i>Beaumontia</i> |
| 5. Corolla hypocrateriform; disc thick, annular or cupular | <i>Chonemorpha</i> |
| 4. Corolla small, under 1 cm across | |
| 6. Follicles stout, tapering; corolla lobes with the tips not deflected | <i>Anodendron</i> |
| 6. Follicles slender, cylindric; corollalobes with the tips deflexed | <i>Ichnocarpus</i> |
| 1. Non-scandent or climbing; herbs to trees | |
| 7. Plants armed with spines | <i>Carissa</i> |
| 7. Plants unarmed | |
| 8. Leaves alternate | <i>Cerbera</i> |
| 8. Leaves opposite or whorled | |
| 9. Flowers solitary or geminate | <i>Catharanthus</i> |
| 9. Flowers in cymes | |
| 10. Corona present, fimbriate | <i>Wrightia</i> |
| 10. Corona absent | |
| 11. Seeds arillate or with coma | |
| 12. Seeds with aril red or orange | <i>Ervatamia</i> |
| 12. Seeds with silky coma | |
| 13. Seeds ciliate at both ends | <i>Alstonia</i> |
| 13. Seeds ciliate at top only | <i>Holarrhena</i> |
| 11. Seeds without aril or coma | <i>Rauvolfia</i> |

ALSTONIA R. Br. *nom. cons.*

Alstonia scholaris (Linn.) R. Br. in Mem. Wern. Soc. 1: 76, 1811; FBI 3; 642; DG. 118; C. 2: 194; T. 2: 215; G. 2: 569; S. 131. *Echites scholaris* Linn. Mant. 1: 53, 1767.

Fl.: December - February. *Fr.*: February April. *Ill.*: Wt. Ic. t. 422.

Vern.: Satwin (Mar.); Mudhol (Kan.); Samtvin (Konk.).

Loc.: GOA: *Satari*: Vada chi Dhat, near Nandore; Codal - Satrem road, 5 km point. *Salcete*: Margoa, behind Agriculture office; *Dargin*.

Rare; sometimes cultivated for its medicinal bark known as "Dita bark".

ANODENDRON A. DC.

Anodendron paniculatum A. DC. Prodr. 8 : 444, 1844 ; FBI 3 : 668 ; DG. 120 ; C. 2 : 204 ; T. 2 : 228 ; G. 2 : 576.

Fl. : November - March. *Ill.* : Wt. Ic. tt. 396 (*non* Poir) & 1309.

Vern. : Lamtani (Mar.) ; Kiti (Konk.).

A common species of the ghat area recorded by Dalgado.

BEAUMONTIA Wall.

Beaumontia jerdoniana Wt. Ic. Pl. Ind. Or. tt. 1314 & 1315, 1850 ; FBI 3 : 661 ; DG. 120 ; C. 2 : 201 ; T. 2 : 225 ; G. 2 : 575.

Fl. : November - December. *Ill.* : Wt. Ic. (*l.c.*).

A common Western India species, recorded from Goa and also Sawantwadi of Ratnagiri district by Dalgado.

Cult. species :

Beaumontia grandiflora (Roxb.) Wall. Fl. Nepal t. 7, 1824 ; FBI 3 : 660 ; C. 2 : 139 ; G. 2 : 575. *Echites grandiflora* Roxb. Fl. Ind. 2 : 14, 1832 (*excl. fruct.*).

Cultivated for its white, showy, bell shaped flowers.

CARISSA Linn. *nom. cons.*

Spines straight, often forked at tip

congesta

Spines curved, not forked

inermis

Carissa congesta Wt. Ic. Pl. Ind. Or. 4(2) : 1, t. 1289, 1850 ; S. 129 ; Dangs. 21 ; Pav. 136. *Carissa carandas* Graham, Cat. Bomb. Pl. 116, 1839 ; FBI 3 : 630 (*p.p.*) ; DG. 116 ; C. 2 : 186 ; T. 2 : 206 ; G. 2 : 565 *non* Linn. (1767).

Fl. : December - March. *Fr.* : March June. *Ill.* : Wt. Ic. t. 1289 ; T. f. 393.

Vern. : Karvanda (Mar.) ; Kawli balli (Konk.) ; Karawanda (Guj.).

Loc. : GOA : *Bardez* : Palernum village. *Canacona* : Canacona Balli ; Ordofond - Jhari Jardal ; Angidiv. NAGARHAVELI : Carchond forest, Jamunpada forest ; Nana Randha ; Saily ; Dapara - chispana area. DADRA. DAMAN : Coileque area ; Cale area.

Common in forest undergrowth.

Carissa inermis Vahl, Symb. 3 : 45, 1794 ; C. 2 : 187 ; G. 2 : 565 ;
C. macrophylla Wall. Cat. 1679, 1828 ; FBI 3 : 631 ; DG. 116 ; T. 2 : 207.

Fl. : January - February. *Fr.* : May - June.

Vern. : Kantam (Kan.).

Loc. : GOA : Madka Banglow (Molem - Belgaum Road).

Scandent shrub with white flowers and edible purple fruits. The species is common from North Kanara onwards in the Peninsular India.

CATHARANTHUS G. Don

Catharanthus pusillus (Murr.) G. Don, Gen. Syst. 4 : 95, 1837.
Vinca pusilla Murr. in Comm. Gotting 3 : 66, t. 2, f. 1, 1773 ; FBI 3 : 640 ; DG. 117. *Lochnera pusilla* K. Schum. in Engl. & Prantl, Pflanzenf. 4(2) : 145, 1895 ; C. 2 : 191 ; G. 2 : 568.

Fl. : July - September. *Ill.* : Tadulingam & Venkatanarayana, Handb. Some South Indian Weeds, t. 102, f. 1 - 7, 1955.

Vern. : Sankaphi (Mar.) ; (Konk.).

The species is fairly common along the moist ghats of Western India.

The appropriately separated genus *Lochnera* from the genus *Vinca* Linn. by Reichenbach (1828) was unfortunately not accompanied by a description and though validated later by Endlicher in 1838, it is preoccupied by the validly described G. Don's (1837) genus *Catharanthus*.

CERBERA Linn.

Cerbera manghas Linn. Sp. Pl. 208, 1753 ; G. 2 : 566. *C. odallam* Gaertn. Fruct. 2 : 193, 1791 ; FBI 3 : 638 ; DG. 117 ; C. 2 : 190 ; T. 2 : 211 ; V. 69.

Fl. & Fr. : September. *Ill.* : Wt. Ic. t. 441.

Vern. : Sukanu (Mar.) ; Kande (Kan.) ; Kharo uro (Konk.).

Loc. : GOA : *Salcete* : Gonsue - Cavollosum.

CHONEMORPHA G. Don

Chonemorpha fragrans (Moon) Alston in Ann. Perad. 11 : 203, 1929. *Echites fragrans* Moon, Cat. 20. 1821. *Chonemorpha macrophylla* G. Don, Gen. Syst. 4 : 76, 1837 ; FBI 3 : 661 ; DG. 120 ; C. 2 : 202 ; T. 2 : 226 ; G. 2 : 575.

Fl. : April - September. *Fr.* : November - December. *Ill.* : Wt. Ic. t. 432 ; T. f. 401.

This species, common throughout the moist forests of Concan and North Kanara can be located from Goa forests also.

ELLERTONIA Wt.

Ellertonia rheedii Wt. Ic. Pl. Ind. Or. t. 1295, 1850; FBI 3 : 641 ; DG. 118 ; C. 2 : 193 ; T. 2 : 213 ; G. 2 : 570.

Fl. : November - January. *Ill.* : Wt. Ic. t. 1295.

Vern. : Orovel (Konk.).

Though a rare species, its collection from Sawantwadi (Ratnagiri district) and also North Kanara forests indicates the possibility of its occurrence in Goa area also.

ERVATAMIA Stapf

Ervatamia heyneana (Wall.) Cooke, Fl. Bomb. Pres. 2 : 134, 1904 ; G. 2 : 572. *Tabernaemontana heyneana* Wall. Cat. 1573, 1829 ; FBI 3 : 646 ; DG. 118 ; T. 2 : 218.

Fl. : March - April. *Fr.* : April - August. *Ill.* : T. f. 399.

Vern. : Nagkuda (Mar.) ; Bilikodsalu (Kan.).

Loc. : GOA : *Satari* : Valpoi-Nagram ; Nandore forest, near Mahadevi stream ; Maloli Valpoi ; Maloli forests ; Dinachi rai, near Palle ; Vangiri forests ; Tanem ; Waghore ; Onda. *Salcete* : Lake, near Chinchinum. *Sanguem* : Potiem forest ; Sidh forest, near Bati ; Castle rock on way to Anmond ; Madka Bungalow (Molem Belgaumpad) ; Nandrona near Molem ; Tautemol ; Alduna (Netravali) ; Mattar Donger (Netravali). *Quepem* : Colomba. *Canacona* : Nadquem, Ordofond Butpal ; Butpal ; Poinguinam, Angidiv.

Common, inside open forest areas.

Cult. species :

E. divaricata (Linn.) Burkill, in Rec. Bot. Surv. Ind. 10 : 320, 1925. *Nerium divaricatum* Linn. Sp. Pl. 209, 1753 (*quoad syn.* Fl. Zeyl. *excl. syn.* Hermann). *Tabernaemontana coronaria* Willd. Enum. Hort. Berol. 275, 1809 ; FBI 3 : 646 ; DG. 119. *Ervatamia coronaria* Stapf in Fl. Trop. Afr. 4 : 127, 1902 ; C. 2 : 197 ; T. 2 : 220 ; G. 2 : 571. *Tabernaemontana divaricata* (Linn.) R. Br. in R. & S. Syst. 4 : 427, 1819 ; S. 131.

Fl. : November. *Ill.* : Wt. Ic. t. 477.

Vern. : Tagar, Anant (Mar.) ; Kottuhale (Kan.) ; Nomdit (Konk.) ; Flor do Santo Antonio (Port.)-

Loc. : GOA : *Sanguem* : Molem Colem.

Cultivated in gardens.

HOLARRHENA R. Br.

Holarrhena antidysenterica (Roth) A. DC. Prodr. 8 : 413, 1844. FBI 3 : 644 ; DC. 118. C. 2 : 195 ; T. 2 : 217 ; G. 2 : 570 ; S. 131 ; Dangs. 21 ; Pav. 137. *Echites antidysenterica* Heyne ex Roth, Nov. Pl. Sp. 138, 1821.

Fl. : April May. *Fr.* : August November. *Ill.* : Wt. Ic. tt. 439 & 1297 ; T. f. 398.

Vern. : Kuda (Mar.) ; Koodsaloo (Kan.) ; Kudo (Konk.) ; Herva do Malabar (Port.).

Loc. : GOA : *Satari* : Hariali forest, near Nandore ; Maloli forest ; Wadicha Dongar (Caranzol) ; Koparde ; Codal. *Ponda* : Nuvem hills. *Sanguem* : Bati Sanguem ; Sanguem-Dudal ; Nandrona near Molem ; Bavanbunda (Molem Belgaum Road). *Quepem* : Budasari Coundugarha. *Canacona* : Ordofond ; Ordofond - Tudal. NAGARHAVELI : Carchond forest ; Jamunpada forest ; Sindhoni forest ; Velugaon ; Nana Randha ; Saily forest ; Berpam forest near Mandoni ; Dolara forest ; Khuntly forest ; Dapara Chispana area.

Common on hill tops along deciduous forests in association with *Butea*, *xylia* etc.

ICHNOCARPUS R. Br. *nom. cons.*

Ichnocarpus frutescens (Linn.) R. Br. in Mem. Wern. Soc. 1 : 62 ; 1809 ; FBI 3 : 669 ; DG. 120 ; C. 2 : 205 ; T. 2 : 229 ; G. 2 : 577 ; *Apocynum frutescens* Linn. Sp. Pl. 213 ; 1753.

Fl. : October - November. *Ill.* : Wt. Ic. t. 420.

Vern. : Krishnasarwa (Mar.) ; Gowri balli (Kan.).

Loc. : GOA : *Bicholim* : Mahim forest. *Satari* : Valpoi - Nagram ; Onda ; Tanem ; Wolancha Dongar (Caranzol). *Bardez* ; Porvorim forest. *Ithas* : Plateau, on way to Chimbil. *Salcete* : Lake, near Chinchinum. *Marmugoa* : Cortallam - Madgoa plateau area. *Ponda* : Verem. *Sanguem* ; Dargiri ; Orgoni ; Alduna (Netravali) ; Sanguem Dual ; Bati. *Canacona* : Butpal Nadquem ; Nadquem.

Frequent along forest edges, climbing on *Microcos*, *Bridelia*, *Glochidion*, *Terminalia*, *Careya* etc.

PARSONSIA R. Br. *nom. cons.*

Parsonsia helicandra Hook. & Arn. Bot. Beech. Voy. 197, 1837.
P. spiralis Wall. (Cat. 1631, 1829) ex G. Don, Gen. Syst. 4 : 80, 1837 ;
 FBI 3 : 650 ; C. 2 : 198 ; T. 2 : 220 ; G. 2 : 572.

Fl. & Fr. : April - May. *Ill.* : Wt. Ic. t. 1303.

Loc. : GOA : *Satari* : Colem Caranzol, old railway station.
Canacona : Nadquem.

Rare, inside the forest near streams.

RAUVOLFIA Linn.

Rauvolfia serpentina (Linn.) Benth. ex Kurz, For. Fl. Burm. 2 :
 171, 1877 ; FBI 3 : 632 ; DG. 116 ; C. 2 : 188 ; T. 2 : 208 ; G. 2 : 567 ;
 S. 130. *Ophioxylon serpentinum* Linn. Sp. Pl. 1043, 1753.

Fl. : April. *Fr.* : August - November. *Ill.* : Wt. Ic. t. 849.

Vern. : Harki (Mar.) ; Sutranabhi (Kan.) ; Atki (Konk.) ; Talona
 (Port.).

Loc. : GOA : *Bicholim* : Usgao. *Satari* : Valpoi Nagram ; Tanem ;
 Wadicha Dongar (Caranzol) ; Caranzol ; Wadicha Dongar. *Bardez* :
 Sukur village near Porvorim ; Bastra. *Salcete* : Verna village ; Margao ghat.
Marmugao : Marmugao harbour plateau. *Sanguem* : Sidh forest ;
 Cumbari ; Bati ; Rumde ; Molem. *Quepem* : Budsari Goundugarha.
Canacona : Amdiga near Butpal ; Butpal forests ; Ordofond Butpal, 4th
 mile point ; Butpal ; Ordofond ; Maxem ghat.

Common as forest undergrowth, on the slopes. Medicinally important
 and hence often cultivated on a large scale.

WRIGHTIA R. Br.

Leaves glabrous or puberulous beneath ; corona scales fimbriate ;
 follicles smooth, cohering at the apex only

tinctoria

Leaves tomentose on both sides ; corona scales entire or lobed ;
 follicles tubercled, connate throughout

tomentosa

Wrightia tinctoria R. Br. in Mem. Wern. Soc. 1 : 47, 1811 ; FBI 3 :
 653 ; DG. 119 ; C. 2 : 200 ; T. 2 : 222 ; G. 2 : 573, S. 132. Dangs. 22 ;
 Pav. 137.

Fl. : March - June. *Fr.* : April - November. *Ill.* : Wt. Ic. t. 444 ;
 Bedd. Fl. Sylv. t. 241 ; T. f. 400.

Vern. : Kalakudi (Mar.) ; Kodmuki (Kan.) ; Kalakudo (Konk.) ; Cali Cari, Runchallo Dudhlo (Guj).

Loc. : GOA : *Sanguem* : Barazon. *Canacona* : River bank opposite Ordofond village ; Tudal Badsare ; Badare village ; Ordofond Tudal. NAGARHAVELI : Nana Randha ; on way to Bildhara from Dudhri ; Dongarpad Umberkoi ; Velugaon ; on way to Sindhoni from Khanvel ; Jamunpada forest ; Carchond forest ; Atola forest ; Dolara forest.

Common, in the forest undergrowth along streams.

Wrightia tomentosa Roem. & Schult. Syst. 4 : 414, 1819 ; FBI 3 653 ; DG. 119 ; C. 2 : 119 ; T. 2 : 222 ; G. 2 : 573.

Fl. : April - June. *Ill.* : Wt. Ic. t. 1296.

Vern. : Tambadakuda (Mar.) ; Atgo - kudo (Konk.).

This species is common in the moist forests of Concan and North Kanara along the ghat areas hence, it is included in this work.

Cult. species :

Allamanda cathartica Linn. Mant. 2 : 214, 1771 ; DG. 116 ; C. 2 : 207 ; G. 2 : 577 ; S. 133 ; V. 69.

Fl. : August - November. *Ill.* : Bor. & Raiz. Beaut. Ind. Climbers and shrubs f. 117.

Vern. : Arasinhu (Kan.) ; Bothi (Konk.) ; Allamanda (Port.).

Loc. : GOA : *Satari* : Codal forest. *Sanguem* : Darbandora area ; Netravali ; near Anvaldem (Molem). *Canacona* : Canacona village.

The species, a native of Brazil, was introduced by the Portuguese and is grown in gardens and also seen as an escape along margins of fields and roadsides. The specimens are referable to var. *nobilis* Bailey (Stand. Hort. 1 : 246, 1914).

Nerium indicum Mill. Gard. Dict. ed. 8 (2) : 1786 ; S. 133. *N. odorum* Ait. Hort. Kew 1 : 297, 1789 ; FBI 3 : 655 ; DG. 119 ; C. 2 : 206 ; G. 2 : 577.

Fl. : Throughout the year.

Vern. : Kanher (Mar.) ; Dhavi Kaneri (Konk.) ; Loendro (Port.).

Cultivated in the gardens especially near the temples.

Plumeria rubra Linn. forma *acutifolia* (Poir.) Woodson. *P. acutifolia* Poir. Encycl. Method. 2 : 667, 1811 ; FBI 3 : 641 ; DG. 117 ; C. 2 : 205 ; T. 2 : 213 ; G. 2 : 577.

Vern. : Kherachapha (Mar.) ; Khair - champo (Konk.) ; Flor de Santo (Port.).

This species is a native of tropical America, cultivated in the gardens. The flowers are white with yellow centre and are used for garlands for the temples. The tree is bare of leaves when in full bloom.

ASCLEPIADACEAE

1. Erect plants
2. Erect herbs with underground tubers ; corolla lobes connate at tips *Ceropegia*
2. Erect herbs without underground tubers ; corolla lobes not connate at tips
3. Stem and leaves glabrous ; flowers orang - red *Asclepias*
3. Stem and leaves cottony pubescent ; flowers purple *Calotropis*
1. Twining or climbing plants
4. Herbs with watery juice and underground tubers ; corolla segments with connate tips ; corona double, staminal ; pollen masses waxy *Ceropegia*
4. Not all characters concomitant ; pollen masses always granular
5. Flowers purple
6. Anthers with membranous appendages
7. Stem and leaves sub - hispidly hairy *Pergularia*
7. Stem and leaves glabrous or nearly so
8. Leaves linear, under 1 cm broad *Oxystelma*
8. Leaves broadly ovate, cordate, 6 - 15 cm broad *Holostemma*
6. Anthers without membranous appendages, incumbent on style apex *Leptadenia*
5. Flowers white, creamy - yellow or greenish - yellow
9. Corolla lobes valvate
10. Leaves thick and fleshy ; root climber, often epiphytic *Hoya*
10. Leaves subcoriaceous ; twining under - shrubs *Heterostemma*
9. Corolla lobes overlapping
11. Inflorescence solitary at each node *Tylophora*
11. Inflorescence 2 or more at each node
12. Corona thin
13. Corona petaloid, simple *Gymnema*
13. Corona scale - like, bifid at apex *Cosmostigma*
12. Corona fleshy *Dregea*

Cynanchum is added later and hence not included in the generic Key.

ASCLEPIAS Linn.

Asclepias curassavica Linn. Sp. Pl. 215, 1753 ; FBI 4 : 18 ; DG. 122 ; C. 2 : 245 ; G. 2 : 585 ; S. 140.

Fl. & Fr. : During dry months of the year, occasionally during rains. *Ill.* : Bot. Reg. t. 81.

Vern. : Kurki (Konk.) ; Ipecacuanha bastarda (Port.).

Loc. : GOA : *Satari* : Nandore village fields ; Codal Nanora road, 5 km. *Sanguem* : Netravali.

Infrequent, seen along fields and other moist areas. This plant is occasionally cultivated for its showy flowers.

CALOTROPIS R. Br.

Corona - lobes narrow, shorter than the staminal - column, with 2 obtuse auricles just below the entire apex

gigantea

Corona - lobes broad, equalling or longer than the staminal - column, without auricles below the bifid apex

procera

Calotropis gigantea (Linn.) R. Br. in Ait. Hort. Kew. (ed. 2), 2 : 78, 1811 ; FBI 4 : 17 ; DG. 121 ; C. 2 : 214 ; T. 2 : 241 ; G. 2 : 585 ; S. 134 ; Dangs. 22 ; Pav. 139. *Asclepias gigantea* Linn. Sp. Pl. 214, 1753.

Fl. & Fr. : Throughout the year. *Ill.* : Wt. Ill. tt. 155 & 156 A. T. f. 408 & 409.

Vern. : Madar (Mar.) ; Dhavi rui (Konk.) ; Ekke (Kan.).

Loc. : GOA : *Bardez* : Kolvelly ferry crossing. *Ilhas* : Panaji, coastal area. *Marmugao* : Marmugao. *Sanguem* : Barazon mine area ; Netravali ; Chichegal. *Quepem* : Budsari - Goundugarha. *Canacona* : Ordofond - Tudal road, 4th mile ; Near Badsare village ; Angidiv. NAGARHAVELI : Dongarpad Umberkoi ; on way to Bildhora from Dudhuri. DAMAN : Fort area. DIU : Diu town, near Rest house.

Common on wastelands and along roadsides.

C. procera (Ait.) R. Br. in Ait. Hort. Kew. (ed. 2), 2 : 78, 1811 ; FBI 4 : 18 ; C. 2 : 215 ; Dangs. 22 ; Pav. 139. *Asclepias procera* Ait. Hort. Kew. (ed. 1), 1 : 305, 1789.

Fl. : Almost throughout the year. *Ill.* : Wt. Ic. t. 1278.

Loc. : DIU : Jalandhar - Diu road.

Rare, along roadside.

CEROPEGIA Linn.

- | | |
|---|-------------------|
| 1. An erect plant | <i>attenuata</i> |
| 1. Climbing or twining plant | |
| 2. Calyx segment much longer than the corolla | <i>fantastica</i> |
| 2. Calyx segment shorter than corolla | <i>bulbosa</i> |

Ceropegia attenuata Hook. Icon. Pl. 9 : t. 867, 1852 ; FBI 4 : 67, C. 2 : 239 ; S. 138.

Fl. : July - October. *Fr.* : September - October. *Ill.* : Uni. Bombay Bot. Mem. 4, Pl. 2.

Vern. : Tilor (Mar.).

Loc. : GOA : *Marmugao* : Verna village plateau.

Rare and scattered in distribution.

C. bulbosa Roxb. Pl. Cor. 1 : 11, t. 7, 1795 ; FBI 4 : 67 ; DG. 124 ; C. 2 : 240 ; G. 2 : 602.

Fl. : August. *Ill.* : Wt. Ic. t. 845.

Vern. : Khapar karu (Mar.). Reported from Goa by Dalgado.

Tubers edible and much relished.

C. fantastica Sedgwick in J. Ind. Bot. 2 : 124, 1921.

Fl. : August. *Ill.* : Kanodia & Reddi in Bull. Bot. Surv. India 6 (2-4) : 311, t. 1, f. 1-5, 1965.

Loc. : GOA : *Canacona* : Ordofond forest on way to Tudal.

Rare. This rare plant was first collected from North Kanara (Mysore State) in August 1918 by T.R.D. Bell and there is no record of its subsequent collection. The plant was rediscovered in Goa in 1963 and is at once recognizable in the field due to its conspicuous much elongated calyx segments.

COSMOSTIGMA Wt.

Cosmostigma racemosum (Roxb.) Wt. Contrib. 42, 1834 ; FBI 4 : 46 ; DG. 123 ; C. 2 : 232 ; T. 2 : 251 ; G. 2 : 595. *Asclepias racemosa* Roxb. Fl. Ind. 2 : 32, 1832.

Fl. : June - August. *Ill.* : Wt. Ic. t. 591.

Vern. : Jati (Mar.) ; Gharphuli (Konk.) ; Torique (Port.).

Dalgado mentions it for Goa and further this species is also common in Concan and Kanara, hence included here.

***CYNANCHUM** Linn.

Cynanchum callialata Ham. in Wight Contrib. : 56 : 1834 ; FBI 4 : 24 ; Wt. Ic. t. 1279 ; G. 2 : 588 ; C. 2 : 221.

Fl. : October January.

Loc. : GOA : *Satari* : Kuta Chemal (Ivoren).

DREGEA E. Meyer *nom. cons.*

Dregea volubilis (Linn. f.) Benth. ex Hook. f. in FBI 4 : 46, 1883 ; DG. 123 ; T. 2 : 254. *Aselepias volubilis* Linn. f. Suppl. 170, 1781 ; *Marsdenia volubilis* Cooke, Fl. Pres. Bombay 2: 166, 1904 ; G. 2. 595.

Fl. : July August. *Ill.* : Wt. Ic. t. 586.

Vern. : Ambri (Mar.).

Loc. : GOA : *Bardez* : Bastra.

The genus was merged by N. E. Brown (Fl. Trop. Afr. 4 : 417) in *Marsdenia* but Bullock (Kew Bull. 512, 1956) has shown that it can be distinguished from the latter genus by the umbellate cymes, rotate corolla and stellately spreading, fleshy corona lobes as against the lax panicles, campanulate or salver shaped corolla and flattened, erect corona lobes found in *Marsdenia*.

GYMNEMA R. Br.

Gymnema sylvestre (Retz.) Schultes in Roem. & Schult. Syst. veg. 6 : 57, 1819 ; FBI 4 : 29 ; DG. 122 ; C. 2 : 224 ; T. 2 : 249 ; G. 2 : 590 ; S. 135.

Fl. : April June. *Fr.* : October February. *Ill.* : Wt. Ic. t. 349 ; T. f. 416.

Vern. : Kawali (Mar.) ; Kawli (Konk.) ; Sannagera (Kan.).

Loc. : GOA : *Marmugao* : Nuvem hills ; Angidiv.

Rare, on the hill slope climbing on *Anacardium* along with *Abrus* and *Smilax*. Chewing of the leaves of this species destroys the taste for sugar, for which reason said to be efficaceous in controlling diabetes.

HETEROSTEMMA Wt. & Arn.

Heterostemma dalzellii Hook. f. in FBI 4 : 48, 1883 ; C. 2 : 232 ; T. 2 : 256.

Fl. : August September.

*Added later and hence not included in the generic Key.

Loc. : GOA : *Bardez* : Porvorim forest area. *Canacona* : Ordofond Butpal forests.

Rare, inside the forest in the undergrowth.

HOLOSTEMMA R. Br.

Holostemma annulare (Roxb.) K. Schum. in Pflanzenfam. 4 (2) : 250 & 247, t. 71, J K, 1895 ; G. 2 : 586 ; S. 135. *Asclepias annularia* Roxb. [Hort. Beng. 20, 1814 (*nom. nud.*) &] Fl. Ind. 2 : 37, 1832. *Holostemma rheedei* Wall. Cat. 4469, 1828 ; FBI 4 : 21 ; DG. 122 ; T. 2 : 245. *H. rheedianum* C. 2 : 220 (*non* Spreng.).

Ill. : Wt. Ic. t, 697 ; Uni. Bomb. Bot. Mem. 4, Pl. 8.

Vern. : Shidori (Mar.) ; Karabphul (Konk.).

Loc. : GOA : *Sanguem* : Natraveli ; Molem Belgaum Road ; Dudhsagar, Castle rock. NAGARHAVELI : Khanvel ; on way Sindhori from Khanvel.

This species was recorded by Dalgado also as common in Goa. The plant is found in Concan also and used in indigenous medicines.

HOYA R. Br.

Hoya wightii Hook. f. in FBI 4 : 59, 1883 ; C. 2 : 234 ; T. 2 : 258 ; G. 2 : 597. *H. pendula* Wt. & Arn. in Wt. Contrib. 36, 1834 *p.p. excl. syn., non* Wt. Ic. t. 474 ; DG. 124 ; S. 138.

Fl. : June - August. *Fr.* : August - November.

Loc. : *Satari* : South of Codal, 3 km. *Canacona* : Tudal village near a stream.

Hoya pendula Wt. & Arn. is a mixture of two species one indicated by the description and the other by Wt. Ic. t. 474. Bullock (Kew Bull. 19 : 146, 1964) has indicated that the figure in Wt. Ic. 474 is referable to *H. alexicaca* (V.J. Jacq.) Mon. under article 69 of the Code (1961), *Hoya pendula* is illegitimate, hence the next available epithet *H. wightii*.

LEPTADENIA R. Br.

Leafy, twining herb

reticulata

Leafless, erect shrub

pyrotechnica

Leptadenia pyrotechnica (Forsk.) Decne. in Ann. Sci. Nat. (ser. 2) 9 : 269, 1838. *Cynanchum pyrotechnicum* Forsk. Fl. Aegypt. Arab. 53,

1775. *Leptadenia spartium* Wt. & Arn. in Wight Contrib. 48, 1834; FBI 4 : 64; C. 2 : 237; T. 2 : 261.

Fl. : September.

Loc. : Diu : Banxiwara Diu road.

Rare, climbing on hedges along roadside.

Leptadenia reticulata (Retz.) Wt. & Arn. in Wight, Contrib. 47, 1834; FBI 4 : 63; DG. 124; C. 2 : 237; T. 2 : 260; G. 2 : 598; Pav. 140.
Cynanchum reticulatum Retz. Obs. 2 : 15, 1781.

Fl. : April July. *Ill.* : Wt. Ic. t. 350.

Vern. : Kharkhoda (Mar.); Dhudh vel (Konk.); Nani Dodi (Guj.).

Loc. : Diu : Jhoola.

This species is common along the coastal belt of Concan and North Kanara areas. Though not collected from Goa there is possibility of locating it in the area, hence included in this works.

OXYSTELMA R. Br.

Oxystelma secamone (Linn.) Karst. Dent. Fl. 1031, 1880 - 83.
Periploca secamone Linn. Mant. 2 : 213, 1771. *Oxystelma esculentum* (Linn. f.) R. Br. in Mem. Wern. Soc. 1 : 40, 1811; FBI 4 : 17; DG. 121; C. 2 : 216; G. 2 : 586.

Fl. : September October.

Vern. : Dhudhani (Mar.); Dugdhike (Kan.).

Loc. : NAGARHAVELI : Silvassa along Damanganga river bank.
DAMAN : Dabel.

Rare, in open field areas. Dalgado records it for Goa.

PERGULARIA Linn. *non alior auct.*

Pergularia daemia (Forsk.) Choiv. Result. Sc. Miss. Stefan Paoli Somal. Ital. 1 : 115, 1916; Pav. 140. *Asclepias daemia* Forsk. Al. Aeg. - Arab. 51, 1775. *Pergularia extensa* N.E. Brown in Dyer, Fl. Cap. 4 : 758, 1908; G. 2 : 588. *Daemia extensa* R. Br. in Mem. Wern. Soc. 1 : 50, 1811; FBI 4 : 20; DG. 122; C. 2 : 219.

Fl. : August - January. *Ill.* : Wt. Ic. t. 596.

Vern. : Utarn (Mar.).

Loc. : Diu : Jalandhar Diu road.

This species is widely distributed in the Concan area, often climbing on the hedges and is also recorded by Dalgado.

TELOSMA Coville

Telosma pallida (Roxb.) Craib, in Kew Bull. 418, 1911; Pav. 141. *Asclepias pallida* Roxb. Hort. Beng. 20, 1814 (*nom. nud.*) & Fl. Ind. 2 : 48, 1832. *Pergularia pallida* Wt. & Arn. in Wt. & Arn. in Wt. Contrib. 42, 1834; FBI 4 : 38; C. 2 : 229.

Fl. : June - July. *Ill.* : Wt. Ic. t. 585.

Loc. DAMAN : Bimpur.

Rare.

TYLOPHORA R. Br.

- | | |
|--|--------------------|
| 1. Stem erect or suberect | <i>fasciculata</i> |
| 1. Stem twinning or climbing | |
| 2. Calyx eglandular inside; corolla small; corona adnate to the staminal column, without free points above | <i>dalzellii</i> |
| 2. Calyx glandular inside; corolla twice as large; corona free, cuspidate at the apex | <i>indica</i> |

Tylophora dalzellii Hook. f. in FBI 4 : 43, 1883; C. 2 : 227; T. 2 : 253; S. 137.

Fl. : September - November. *Fr.* : March. *Ill.* : Sant. & Irani, Univ. Bomb. Bot. Mem. 4 : t. 11, 1962.

Loc. : GOA : *Pernem* : Tirla. *Satari* : Codal forest area; Nagargao. *Bardez* : Betim hili slopes. *Salcete* : Cavallosim, 2 km. *Sanguem* : Talem Potiem; Ghalto (Netravali); Barazon; Molem; Chorandem; Moira forest. *Canacona* : Pollem.

Occasional along forest edges on *Syzygium* sp. and *Careya arborea* etc. apparently endemic in the Western ghats.

T. fasciculata Ham. in Wt. Contrib. 50, 1834; FBI 4 : 40; DG. 123; C. 2 : 226; T. 2 : 252; G. 2 : 592; S. 136.

Fl. : June - September. *Fr.* : September - December. *Ill.* : Wt. Ic. t. 848.

Vern. : Bhindodi (Mar.); Bhumy dori (Kan.).

Loc. GOA : *Bicholim* : Usgao Onda.

Rare, on open rocky plateau.

Tylophora indica (Burm. f.) Merrill, in Phil. Journ. Sci. 19 : 373, 1921 ; S. 137. *Cynanchum indicum* Burm. f. Fl. Ind. 70, 1768 ; *Tylophora asthmatica* Wt. & Arn. in Wt. Contrib. 51, 1834 ; FBI 4 : 44 ; DG. 123 ; C. 2 : 228 ; T. 2 : 253 ; G. 2 : 593.

Fl. : September. *Ill.* : Wt. Ic. t. 1277.

Vern. : Antamul (Mar.) ; Nepala (Kan.) ; Pitvel (Konk.).

Loc. : GOA. : Bardez : Porvorim forest area. *Sanguem* ; Valcham.

Rare. Fresh leaves of this species are reported to be used in the treatment of Asthma.

PERIPLOCACEAE

Leaves with numerous lateral nerves united in an intramarginal one ; stem green ; flowers yellowish

Cryptolepis

Leaves with few lateral - nerves, not united intramarginally ; stem purplish ; flowers greenish or Ochre

Hemidesmus

CRYPTOLEPIS R. Br.

Cryptolepis huchanani Roem. & Schult. Syst. 4 : 409, 1819 ; FBI 4 : 5 ; DG. 121 ; C. 2 : 210 ; T. 236 ; G. 2 : 580 ; S. 134.

Fl. : March. August. *Fr.* : May January. *Ill.* : Wt. Ic. t. 494 ; T. f. 406 407.

Vern. : Karnata (Mar.) ; Kurbuntun balli (Kan.).

Loc. : GOA : *Satari* : Near Maloli village. *Ithas* : Raj Bhavan forest area, Panaji. *Canacona* : Ordofond, Tudal village. NAGARHAVELI : Carchond forest.

Scandent shrub, infrequent. The milky sap is said to cause blisters on contact with skin.

HEMIDESMUS R. Br.

Hemidesmus indicus (Linn.) Schult. in Roem. & Schult. Syst. Veg. 6 : 125, 1819 ; FBI 4 : 5 ; DG. 120 ; C. 2 : 210 ; T. 2 : 232 ; G. 2 : 580 ; S. 134 ; Dangs. 22. *Periploca indica* Linn. Sp. Pl. 211, 1753.

Fl. : September - December. *Fr.* : January May. *Ill.* : Wt. Ic. t. 594 ; T. f. 403.

Vern. : Anant vel (Mar.); Sugankha palada gidda (Kan.)
Uparsal (Konk).; Salsaparitha Indiana (Port.).

Loc. GOA : *Satari* : Codal village; Wolancha Dongar; Caranzol.
Maloli Valpoi road forest; Onda; Arvolam. *Bardez* : Betim forest.
Sanguem : Ravanacha Dongar Verlem; Molem. *Quepem* : Budsari
Goundugarha; Colamba. *Canacona* : Ordofond Tudal. NAGARHAVELI :
Morkhal; stream between Kawcha & Jamunpada; Dongarpad Umber-
koi; Saily; Khuntly forest; Dapara. DADRA. DAMAN : Regunwava.

Common in the open forest areas, often along edges of the forests.

Cult. species :

Cryptostegia grandiflora R. Br. in Bot. Reg. t. 435, 1819; FBI 4 :
6; DG. 121; C. 2 : 245; T. 2 : 234; G. 2 : 606.

Fl. : June - September.

Vern. : Vilayati Vakundi (Mar.).

A native of Tropical Africa, introduced, but now quite naturalised.
There are indications that chewing of the leaves is lethal even to human
beings and at present the plants are being chemically analysed at the
National Chemical Laboratory, Poona.

LOGANIACEAE

1. Herbs

2. Flowers sessile, in 2 to 3 - chotomous cymes; corolla 5 - lobes *Cynoctonum*

2. Flowers pedicelled, solitary or clustered; corolla 4 - lobed *Mitrasacme*

1. Shrubs or trees

Strychnos

CYNOCTONUM J.F. Gmel.

Cynoctonum mitreola (Linn.) Britton in Mem. Torrey Bot. Club 5 :
258, 1894. *Ophiorrhiza mitreola* Linn. Sp. Pl. 150, 1753. *Mitreola oldenlan-*
dioides Wall. ex DC. Prodr. 9 : 9, 1845; FBI 4 : 79; C. 2 : 246; G. 2 :
607; S. 141.

Capsule with 2 horn - like projections at the apex.

Fl. & Fr. : September - October.

Loc. : GOA : *Bicholim* : Usgao. *Salcete* : Margao. *Sanguem* :
Bati Sider. *Canacona* : Poinguinam. NAGARHAVELI : Silvassa near Atal
forest; Dolara; Dapara, near Chispana forest.

Occasional on exposed rocky areas and as forest undergrowth. The
figure t. 1600 in Wt. Ic. is inaccurate in habit and details.

MITRASACME Labill.

Mitrasacme alsinoides R. Br. Prodr. 453, 1810; FBI 4 : 80; C. 2 : 247; G. 2 : 607.

Fl. & Fr. : August. *Ill.* : Wt. Ic. t. 1601 (1).

Loc. : GOA : *Salcete* : Margao, fields near Rest house.

Rare, in rice fields.

STRYCHNOS Linn.

Climbing shrub ; berry 1 - 2 seeded

colubrina

Erect trees - berry many seeded

nux - vomica

Strychnos colubrina Linn. Sp. Pl. 189, 1753, descr. emend. A. Hill in Kew Bull. 1917 : 157; FBI 4 : 87; DG. 124; C. 2 : 249; T. 2 : 264; G. 2 : 610.

Fl. : October - January.

Vern. : Kanal (Mar.); Dhavo kajro (Konk.); Pau de cobra (Port.).

Common along ghat areas. It is used in indigenous medicines. This species is common in the forests adjoining Goa and Dalgado also records it.

S. nux vomica Linn. Sp. Pl. 189, 1753; FBI 4 : 90; DG. 124; C. 2 : 250; G. 2 : 610.

Fl. : March - April. *Fr.* August - November. *Ill.* : Bedd. Fl. Sylv. t. 243; T. f. 421.

Vern. : Kar (Mar.); Kasarkana mara (Kan.); Kajro (Konk.); Voz vomica (Port.).

Loc. GOA : *Satari* : Valpoi Nagarm; Deosali (Caranzol); near Pale village; Codal; Codal Nanora road, 10 km. *Bardez* : Porvorim. *Ilhas* : Moreg Santana road, Panaji. *Salcete* : Vernem. *Sanguem* : Sidh forests near Bati; Molem. *Canacona* : Butpal; Ordofond Jhani Jawal; Ordofond Tudal.

Common along forest edges.

GENTIANACEAE

1. Aquatic herbs ; leaves alternate

Nymphoides

1. Terrestrial herbs ; leaves opposite

2. Flowers irregular ; corolla tube longer than the lobes

3. Flowers yellow

Hoppea

- | | |
|--|-------------------|
| 3. Flowers pink or white | <i>Canscora</i> |
| 2. Flowers regular ; corolla tube shorter than the lobes | |
| 4. Flowers blue or purple ; ovary 2 - celled ; stigma entire | <i>Exacum</i> |
| 4. Flowers white pink or mauve ; ovary 1 - celled ; stigma 2 - lobed | |
| 5. Flowers white in sessile, axillary clusters | <i>Enicostema</i> |
| 5. Flowers pink or mauve in dichotomous cymes | <i>Centaurium</i> |

CANSOCORA Lamk.

- | | |
|---------------------------------------|-------------------|
| 1. Calyx strongly 4 - winged | <i>perfoliata</i> |
| 1. Calyx not winged | |
| 2. Stem 4 - angled, not winged | <i>diffusa</i> |
| 2. Stem strongly 4 - winged | |
| 3. Lower leaves exceeding 2.5 cm long | <i>decurrens</i> |
| 3. Lower leaves less than 2.5 cm long | <i>pauciflora</i> |

Canscora decurrens Dalz. in Kew Journ. Bot. 2 : 136, 1850 ; FBI 4 : 103 ; C. 2 : 257 ; G. 2 : 617 ; S. 143 ; Pav. 144.

Fl. : October May. *Fr.* : January May.

Vern. : Titavi (Mar.).

Loc. : GOA : *Pernem* : Tamboxim. *Bicholim* : Usgao. *Satari* : Codal village. *Bardez* : Porvorim rocky plateau. *Quepem* : Budsari Goundugarha. *Sanguem* : Molem area : Netravali. *Canacona* : Butpal ; Choram hill top, Nadquem ; Poinguinam. NAGARHAVELI : Silvassa, near Atal forest. DADRA. DAMAN : Fort area.

Common on moist, grassy slopes, often in association with *Canscora diffusa* which it resembles closely.

C. diffusa R. Br. Prodr. 451 in Obs. 1810 ; FBI 4 : 103 ; C. 2. 257 ; G. 2 : 617 ; S. 143 ; Dangs. 23 ; Pav. 144. *C. lawii* Wt. Ic. t. 1327, 1848 (non Clarke).

Fl. & Fr. : March - November. *Ill.* : Wt. Ic. t. 1327.

Loc. : GOA : *Satari* : Nandore forest, near Mahadevi nadi ; Nanecha Dongar ; Dudhsagar. *Salcete* : Goodier, on way to Quepem. *Sanguem* : Surla. *Canacona* : Butpal forest ; Butpal Ordofond ; on way to Kadriyan from Nadquem. NAGARHAVELI : Dhapsa ; on way to Sindhori from Khanvel ; Umberkoi Dongarpada forest ; Jamunpada forest ; Morkhal. DADRA. DAMAN : Regunvara ; Fort area.

Common in moist, sandy shady areas. An elegant and conspicuous plant especially when it is in full bloom.

Canscora pauciflora Dalz. in Kew Journ. Bot. 2 : 136, 1850 ; FBI 4 : 103 ; C. 2 : 258 ; G. 2 : 617 ; S. 143.

Fl. & Fr. : November.

Loc. : GOA : *Ihas* : On plateau between Mercedes Military camp and Chimbhel reservoir.

Rare.

C. perfoliata Lamk. Encycl. Method. 1 : 601, 1785 ; FBI 4 : 104 ; DC. 125 ; C. 2 : 258, G. 2 : 618.

Fl. : March. *Ill.* : Wt. Ic. t. 1326.

Loc. : GOA : *Canacona* : Choram hill top, Nadquem.

Rare.

CENTAURIUM Hill.

Centaurium centauroides (Roxb.) Rolla Rao et Hemadri in J. Bomb. Nat. Hist. Soc. 67 (2) : 357, 1970. *Chironia centauroides* Roxb. [(Hort. Beng. 16, 1814, *nom nud.* 'centauroides' &)] Fl. Ind. 1 : 584, 1832, "centaureoides". *Centaurium roxburghii* (Don) Druce in Rep. Bot. Exch. Club Brit. Isles 4 : 614, 1916 ; S. 143. *Erythraea roxburghii* D. Don, Syst. 4 : 206, 1837 ; FBI 4 : 102 ; DG. 125 ; C. 2 : 255 ; G. 2 : 615.

Fl. : September October. *Ill.* : Wt. Ic. t. 1325.

Vern. : Lantak (Mar.).

Loc. : NAGARHAVELI : Dapara.

Rare, in cultivated fields.

ENICOSTEMA Blume *nom. cons.*

Enicostema hyssopifolium (Willd.) I.C. Verdoorn in Bothalia 7 : 462 463, 1961. *Exacum hyssopifolium* Willd. Sp. Pl. 1 : 640, 1798. *Gentiana verticillata* Linn. Syst. 952, 1759. *Enicostema littorale* Blume Bijdr. 848, 1826 ; FBI 4 : 101 ; C. 2 : 255 ; Dangs. 23. *Enicostema verticillatum auct. non Engl.* : Pav. 143.

Fl. : September.

Vern. : Mamejavo (Guj.).

Loc. : DADRA. DAMAN : Marvor ; Airport area. Diu : Castle area.

Occasional, found in small patches here and there especially in grassy meadows, in cultivated fields and along stream beds.

EXACUM Linn.

- | | |
|--|------------------|
| 1. Corolla large, lobes 2.5 cm or more long | <i>bicolor</i> |
| 1. Corolla small, lobes less than 1 cm long | |
| 2. Leaves petioled, ovate, acute, usually 5 - ribbed | <i>petiolare</i> |
| 2. Leaves sessile, lanceolate sub - obtuse, 3 - ribbed | <i>pumilum</i> |

Exacum bicolor Roxb. [Hort. Beng. 83, 1814 (*nom. nud.*) &] Fl. Ind. 1 : 413, 1820 ; FBI 4 : 96 ; DG. 125 ; C. 2 : 252 ; G. 2 : 613 ; S. 141 ; Dangs. 24 ; Pav. 143.

Fl. & Fr. : September - November. *Ill.* : Wt. Ic. t. 1321.

Loc. : GOA : *Bicholim* : Colguirem. *Satari* : Kutachemal Ivorem. *Sanguem* ; Molem - Colem ; Choraundem ; Ravana cha Dongar ; Chichegal, NAGARHAVELI : Chaura village. DADRA. DAMAN : Bamoti.

Common in moist areas. An elegant and attractive plant.

E. petiolare Griseb. in DC. Prodr. 9 : 46, 1845 ; FBI 4 : 98 ; C. 2 : 614 ; S. 142 ; Pav. 143. *Exacum pedunculatum* var. *petiolare* Trim. Hand. Fl. Ceyl. 3 : 182, 1893 ; C. 2 : 253.

Fl. & Fr. : September - October. *Ill.* : Wt. Ic. t. 1324 (2).

Loc. : GOA : *Satari* : Ivorem ; Wagheri ; Ivorem, Bruzuruco ; Wadicha Dongar. *Sanguem* : Choraundem ; Chausuriaghats (Netravali). *Canacona* : Butpal. NAGARHAVELI : Chura village.

Occasional in moist areas in the undergrowth of trees and shrubs.

E. pumilum Griseb. in DC. Prodr. 9 : 46, 1845 ; FBI 4 : 68 ; C. 2 : 254 ; S. 142.

Fl. & Fr. : August - September. *Ill.* : Wt. Ic. t. 1324.

Loc. : GOA : *Pernem* : Pernem *Bicholim*. *Bicholim* : 5 miles beyond Dodamar. *Satari* : Ambechagol ; Ivorem ; Castle rock on way to Anmode ; Dudhsagar and along railway line *Bardez* : Porvorim rocky plateau. *Ponda* : Near Curti village on Ponda Darbandora road. *Sanguem* : Potiem forests ; Bati ; near to Arvaldem (Molem) ; Siwai (Surla) ; Valkeri ; Verlem *Quepem* : Quepem - Sanguem, 10 km. *Canacona* : Ordofond Tudal. DADRA.

Occasional on open grassy, gravelly plateau.

HOPPEA Willd.

Hoppea fastigiata C.B. Cl. in Hook. f. Fl. Ind. 4 : 100, 1883 ; G. 2 : 616.

Fl. & Fr. : August.

Loc. : GOA : *Satari* : Caranzol. *Ponda* : Bicholim *Ponda. Sanguem* : Potiem forests ; Near Anwaldem ; Babanbanda (Molem Belgaum road).

Rare, in open grassy fields.

NYMPHOIDES Seguiet.

This genus normally goes under the name of *Limnanthemum* Gmel. (1770) in the Indian floras, but *Nymphoides* is earlier.

Corolla lobes entire, with a longitudinal fold down the middle,
white ; seeds few, large, with slightly glochidiate tubercles *cristatum*

Corolla lobes fimbriate, not folded down the middle, white with
yellow centre ; seeds many, small, smooth or minutely tubercled *indicum*

Nymphoides cristatum (Roxb.) O. Kuntze, Rev. Gen. Pl. 429, 1891.
Menyanthes cristata Roxb. Pl. Cor. 2 : 3, t. 105, 1798. *Limnanthemum cristatum* Griseb. Gen. & Spec. Gent. 342, 1839 & in DC. Prodr. 9 : 139, 1845 ; FBI 4 : 131 ; DG. 126 ; C. 2 : 261 ; G. 2 : 620 ; S. 145.

Fl. & Fr. : October. *Ill.* : CSIR Bot. Mon. 3 : f. 16, 1962.

Loc. : GOA : *Salcete* : Gonsua ; Cuncolim.

Rare, in shallow water ponds.

N. indicum (Linn.) O. Kuntze, Rev. Gen. Pl. 429, 1891.
Menyanthes indica Linn. Sp. Pl. 145, 1753. *Limnanthemum indicum* (Linn.) Griseb. emend. Thw. Enum. Pl. Zeyl. 205, 1860 ; FBI 4 : 131 ; DG. 126 ; C. 2 : 261 ; G. 2 : 621 ; S. 144.

Fl. & Fr. : November. *Ill.* : CSIR Bot. Mon. 3 : f. 17, 1962.

Loc. : GOA : *Salcete* : Lake near Chinchinum.

Rare, floating in the tanks.

HYDROPHYLLACEAE

HYDROLEA Linn.

Hydrolea zeylanica (Linn.) Vahl, Symb. Bot. 2 : 46, 1791 ; FBI. 4 : 133 ; DG. 126 ; C. 2 : 263 ; G. 2 : 621 ; S. 145. *Nama zeylanica* Linn. Sp. Pl. 226, 1753.

Fl. & Fr. : November - March. *Ill.* : Wt. Ic. t. 601.

Vern. : Keriti (Konk.).

Loc. : GOA : *Quepem* : Budsari Goundugarha ; Bali. *Canacona* : Nadquem. NAGARHAVELI : Bank of Damanganga river on way to Kawcha.

Occasional, in moist situations in rice fields, especially after harvest, sometimes also along the margins of tanks, ditches and such other moist situations.

BORAGINACEAE (incl. EHRETIACEAE)

Ehretia Linn. & *Cordia* Linn. are treated by some botanists under a separate family Ehretiaceae but in this work they are included under Boraginaceae only.

1. Ovary entire or slightly 4 - lobed ; style terminal
 2. Trees or shrubs
 3. Style once forked *Ehretia*
 3. Style twice forked *Cordia*
 2. Herbs or undershrubs
 4. Prostrate herbs *Coldenia*
 4. Erect herbs or undershrubs
 5. Flowers at the apices of short lateral branchlets *Rotula*
 5. Flowers in terminal, dichotomous cymes, the branches in scorpioid racemes *Heliotropium*
1. Ovary deeply 4 - lobed
 6. Anthers connivent into a cone, subexserted ; connectives much produced *Trichodesma*
 6. Anthers not connivent into a cone, included ; connectives not much produced
 7. Nutlets attached to a convex or conical carpophore, often prominently margined
 8. Bases of the nutlets produced downwards *Cynoglossum*
 8. Bases of the nutlets hardly produced downwards *Adelocaryum*
 7. Nutlets on a flat or nearly flat receptacle, not prominently margined *Sericostoma*

ADELOCARYUM Brand.

Adelocaryum coelestinum (Lindl.) Brand. in Fedde, Repert. 13 : 549, 1915 & in Pflanzenr. 78, f. 8, 1957 ; S. 148. *Cynoglossum coelestinum*

Lindl. in Bot. Reg. 25 : t. 36, 1839. *Paracaryum coelestinum* Benth. & Hook. f. in Gen. Pl. 2 : 850, 1876 ; FBI. 4 : 160 ; C. 2 : 285 ; G. 2 : 633.

Fl. & Fr. : August November. *Ill.* : Wt. Ic. t. 1394 ; pflanzenr. l.c. f. 8.

Loc. : GOA : *Bicholim* : Bicholim Ponda, 23rd mile. *Satari* : Codal ; Waghare (Tanem) ; Castle rock on way to Anmod. *Ponda* : Ponda Darbandora, *Sanguem* : Organi (Netravali) ; Ghatto (Netravali) ; Netravali. *Canacona* : Butpal.

Occasional, in the undergrowth of forests especially towards the margins. The plant is attractive and showy when in bloom.

COLDENIA Linn.

Coldenia procumbens Linn. Sp. Pl. 125, 1753 ; FBI. 4 : 144 ; DG. 127 ; C. 2 : 271 ; G. 2 : 627 ; S. 146 ; Pav. 148.

Fl. & Fr. : April May.

Vern. : Tripunkhi (Mar.) ; *Coldenia rosteira* (Port.).

Loc. : GOA : *Satari* : Nandore village ; Kuntal, near Caranzol. *Sanguem* : Sanguem. *Canacona* : Tudal village fields. DADRA. DAMAN : Regunvara ; Dabel ; Bimpur ; Dundorta.

Common, on drying mud near ponds or cultivated fields.

CORDIA Linn.

- | | |
|---|------------------|
| 1. Leaves 3 to 5 basal nerved, broadly ovate or orbicular and more or less as broad as long | |
| 2. Leaves not tomentose beneath ; flowers in lax cymes ; fruiting calyx not ribbed | <i>dichotoma</i> |
| 2. Leaves densely tomentose beneath ; flowers in short, terminal or axillary corymbs | |
| 3. Calyx ribbed | <i>macleodii</i> |
| 3. Calyx not ribbed | <i>wallichii</i> |
| 1. Leaves feather nerved, oblong, oblanceolate - obovate | |
| 4. Leaves toothed in the upper half ; pedicels short and thick | <i>crenata</i> |
| 4. Leaves entire ; pedicels long and fragile | <i>rothii</i> |

Cordia crenata Del. Fl. Egypte. 195, t. 20, 1813 14 ; Duthie Fl. Upper Gang. Plains 1 : 528 (ed. 1960). *Cordia lowriana* Brand. Ind. Trees 479, 1906.

Fl. & Fr. : August September. *Ill.* : K. Hemadri in Ind. For. 94 (11) : 809, f. 1, 1968.

Loc. : DIU : Nagoa.

Indigenous to Egypt & Sudan and in India it has been recorded from the drier tracts of Rajasthan, Kutch and Saurashtra. It is possible that this species has reached Diu through trade ships during the Portuguese regime. Closely allied to *Cordia gharaf* (Forsk.) Ehrenb. et Asch. in gross appearance but in the latter species, the leaves are opposite, entire and chartaceous, inflorescence much laxer and fruits are subtended by slender stalks. In *C. crenata* the leaves are alternate, irregularly toothed and thick, inflorescence is compact and fruits are subtended by thick stalks.

Cordia dichotoma Forst. f. Prodr. 18, 1786 ; S. 145 ; Dangs 24 ; Pav. 145. *C. obliqua auct. non* Willd. Phytogr. 4, t. 4, 1794 ; FBI 4 : 137 excl. vars. ; G. 2 : 623. *C. myxa auct. plur. non* Linn. (1753) ; DG. 126 ; C. 2 : 265 ; T. 2 : 270.

Fl. : March - April. *Ill.* : T. f. 422.

Vern. : Shelu, Chokri (Mar.) ; Chikkachalle (Kan.) ; Bhakhran (Konk.) ; Sebasteira (Port.) ; Bargund, Vad gundo (Guj.).

Loc. : NAGARHAVELI : Dapra Chispana area. DAMAN : Cafe area.

Rare, in deciduous forest.

The species is often cultivated and the fruits are pickled. Bark and the viscid pulp of the fruits are used in indigenous medicine.

The species is normally known as *Cordia myxa* Linn. in the Floras, but the Linnean plant is altogether different from the present species. It is also referred as *C. obliqua* Willd. but the latter species is identical to *C. bantamensis* Bl.

C. macleodii Hook. f. & Thoms. in Journ. Linn. Soc. 2 : 128, 1858 ; FBI. 2 : 139 ; C. 2 : 266 ; T. 2 : 272.

Fl. : March - April. *Ill.* : T. f. 423 ; Brandis, For. Fl. t. 41.

Loc. : NAGARHAVELI : Mandoni, Berpam forest ; Dolara forest. Occasional, in deciduous forest.

C. rothii Roem. & Schult. Syst. 4 : 798, 1819 ; FBI 4 : 138 ; DG. 127 ; C. 2 : 268 ; T. 2 : 274 ; G. 2 : 624.

Fl. : November. *Fr.* : December - January. *Ill.* : Wt. Ic. t. 1379.

Vern. : Gundi (Mar.) ; Lahan selti (Konk.).

Loc. : GOA : Satari ; Caranzol. DIU : Banxiwara Diu road.

This species is found wild in the drier parts and is also cultivated. The fruits are edible and the bark is valued in indigenous medicine.

Cordia wallichii G. Don. Gen. Syst. 4 : 379, 1837 ; C. 2 : 266 ; T. 2 : 271 ; G. 2 : 624. *C. obliqua* var. *wallichii* C.B. Cl. in FBI. 4 : 137, 1883 ;

Fl. : December January. *Fr.* : April May. *Ill.* : Bedd. Fl. Sylv. t. 245 ; Wt. Ic. t. 1378.

Vern. : Doddachalle (Kan.).

Loc. : GOA : *Satari* : Caranzol village.

Rare, in deciduous forest.

CYNOGLOSSUM Linn.

Cynoglossum wallichii G. Don. Gen. Syst. 4 : 354, 1838 ; FBI. 4 : 157. *C. glochidiatum* Wall. ex Lindl. in Bot. Reg. 27 : t. 15, 1841 ; FBI. 4 : 156. *C. denticulatum* DC. FBI 4 : 156.

Fl. & Fr. : June November.

Loc. : GOA : *Sanguem* : Molem Belgaum road, 71st Km. ; Madka bungalow, Molem Belgaum road.

EHRETIA Linn.

Ehretia laevis Roxb. Pl. Cor. 4 : 42, t. 56, 1795 ; FBI. 4 : 141 ; DG. 127 ; C. 2 : 269 ; T. 2 : 275 ; G. 2 : 626.

Fl. & Fr. : November.

Vern. : Datrang (Mar.) ; Adak, Bagari (Kan.) ; Kalo gamdo (Konk.).

Loc. : GOA : *Bardez* : Betim forest. *Sanguem* : Talauli.

Rare, along hillocks in open forests, sometimes grown in the gardens.

HELIOTROPIUM Linn.

Leaves ovate, obtuse, narrowed or cordate at base, unequal-sided, usually decurrent on the long petiole ; petiole upto 3.5 cm long

indicum

Leaves obovate - spatulate, [obtuse, base tapering ; petiole upto 1.3 cm long

ovalifolium

Heliotropium indicum Linn. Sp. Pl. 130, 1753 ; FBI. 4 : 152 ; DG. 127 ; C. 2 : 273 ; G. 2 : 630 ; S. 146.

Fl. & Fr. : April September. *Ill.* : Wt. Ill. t. 171.

Vern. : Bhurundi (Mar.) ; Ajeru (Konk.) ; *Heliotropio indiano* (Port.) ; *Hasti sandha* (Guj.).

Loc. : GOA : *Satori* : Nandore village ; Codal Nanora road, 10 km. *Bardez* : Bastra. *Canacona* : Nadquem village. NAGARHAVELI : Silvassa, along Daman ganga river bank ; Chispana forest ; Atal forest area and surroundings.

Frequent in moist places.

Heliotropium ovalifolium Forsk. Fl. Aegypt. Arab. 38, 1775 ; FBI. 4 : 150 ; C. 2 : 278 ; G. 2 : 629 ; S. 147 ; Dangs. 25 ; Pav. 147.

Fl. : March. *Ill.* : Wt. Ic. t. 1388.

Vern. : Velala Hathi Shundhan (Guj.).

Loc. : GOA : *Sanguem* : On way to Sanguem. NAGARHAVELI : Silvassa, along Daman ganga river bank ; Chispana forest. DADRA, DAMAN : Regunvara ; Bimpur, Dundorta.

Frequent in open, dry, grassy areas, occasionally in moist cultivated fields also.

Cult. species :

H. peruvianum Linn. Sp. Pl. ed. 2, 187, 1762 ; DG. 127 ; C. 2 : 280 ; G. 2 : 631.

Vern. : *Hiliotopio* (Port.).

This beautiful species is grown in gardens as an ornamental plant. Dalgado mentions it for Goa.

ROTULA Lour.

Rotula aquatica Lour. Fl. Coch. 121, 1790 ; G. 2 : 627 ; S. 146 ; Dangs. 25. *Rhabdia lycioides* Mart. Nov. Gen. & Sp. 2 : 137, t. 195, 1826 ; FBI. 4 : 145 ; C. 2 : 272 ; T. 2 : 278.

Fl. : September March. *Ill.* : Wt. Ic. t. 1385 ; T. f. 426.

Loc. : GOA : *Canacona* : River near Ordofond village ; Walgaon river. NAGARHAVELI : Nala near Dudhuri near bus stop ; Silvassa, along Daman ganga river bank ; Atal forest.

Common in the river beds, among rocks.

SERICOSTOMA Stocks.

Sericostoma pauciflorum Stocks in Wt. Ic. 4 (2) : 15, t. 1377, 1850 ; FBI. 4 : 175 ; C. 2 : 288.

Fl. : September. *Ill.* : Wt. Ic. t. 1377.

Loc. : DAMAN : Jampore ; Cataria. DIU : Gogale.

Rare, on sandy soil, confined to dry tracts of Gujarat, Rajputana and Sind.

TRICHODESMA R. Br.

1. Calyx lobes cordate or hastate

2. Calyx lobes hastate at base ; Corolla with 10 glandular spots, 2 to each lobe ; stamen tips spirally twisted into hair like points

indicum

2. Calyx lobes cordate or slightly hastate ; corolla with glandular spots to 2 lobes only ; stamen tips pointed, not spirally twisted,

sedgwickianum

1. Calyx lobes rounded at base

zeylanica

Trichodesma indicum R. Br. Prodr. 496, 1810 ; FBI. 4 : 153 ; C. 2 : 281 ; Dangs. 25.

Fl. & Fr. : September. *Ill.* : Wt. Ill. t. 172.

Vern. : Undhanphuli (Guj.).

Loc. : DAMAN : Cale area. DIU : Castle area ; Nagoa.

T. indicum R. Br. var. *amplexicaule* Cooke, Fl. Pres. Bomb. 2 : 215, 1904 ; DG. 128. *T. amplexicaule* Roth, Nov. Pl. Sp. 104, 1821 ; FBI. 4 : 153 ; S. 147.

Fl. : August October.

Vern. : Chhotaphulya (Mar.) ; Jimgi (Konk.).

Loc. : NAGARHAVELI : Bank of Damanganga river on way to Kawcha.

Occasional, in grasslands.

T. sedgwickianum Banerjee in Bull. Bot. Soc. Bengal, 16 (1 & 2) : 10-11, 1962 (Apr. 1964) ; *Trichodesma amplexicaule* DC. Prodr. 10 : 172, 1846 (*non* Roth, 1821) ; *T. amplexicaule* C. B. Cl. in FBI 4 : 154, 1883 (*p.p.*) ; G. 2 : 631 (*p.p.*) ; *T. indicum* R. Br. var. *amplexicaule* Cooke in Fl. Bomb. Pres. 2 : 215, 1904 (*p.p.*).

Fl. & Fr. : August October.

Vern. : Undhaphuli (Guj.).

Loc. : NAGARHAVELI : Saily ; Dolara. DAMAN : Marvor ; Fort area.

Roth (Nov. Sp. Pl. 104, 1821) described *Trichodesma amplexicaule* which was confused with *Trichodesma amplexicaule* DC. and it was controversial as to whether both were identical or not. Sedgwick (Rec. Bot. Surv. India 6 : 347, 1913) was the first to point out that Roth's species was distinct from that of De-Candolle. On the basis of mainly androecium and corolla features, he treated Roth's species as a variety under *T. indicum* R. Br. naming it as *T. indicum* R. Br. var. *amplexicaule* Cooke, while retaining the name *T. amplexicaule* for De Candolle's species. However, as *T. amplexicaule* DC. (1846) is preoccupied by *T. amplexicaule* Roth (1821), Banerjee (*l.c.*) has proposed the name *T. sedgwickianum* for De-Candolle's species. Common in wastelands during monsoon.

Trichodesma zeylanicum R. Br. Prodr. 496, 1810 ; FBI. 4 : 154 ; DG. 128 ; C. 2 : 282 ; G. 2 : 632.

Fl. : January.

I have included this species here because it is common in the Concan and Ambehat area and should be located in Goa also.

CONVOLVULACEAE

- | | |
|---|--|
| 1. Parasitic, leafless twining herb | <i>Cuscuta</i> |
| 1. Non parasitic, leafy, climbing or erect plants | |
| 2. Style absent | <i>Erycibe</i> |
| 2. Styles 2 | |
| 3. Flowers axillary, solitary, blue in colour | <i>Evolvulus</i> |
| 3. Flowers in small clusters in axils of upper leaves, pink in colour | <i>Cressa</i> |
| 2. Style 1 | |
| 4. Fruit indehiscent | |
| 5. Flowers white | <i>Rivea</i> |
| 5. Flowers pink or purple | <i>Argyreia</i> |
| 4. Fruit dehiscent | |
| 6. Stigma globose | |
| 7. Outer sepals not larger than inner, not decurrent | |
| 8. 5 bands of the corolla rarely clearly defined from the intervening spaces, pollens usually with longitudinal folds | |
| 9. Stem not winged ; capsule 4 - valved | <i>Merremia</i> |
| 9. Stem winged ; capsule operculately dehiscent | <i>Operculina</i>
(<i>Merremia</i>) |

- | | |
|---|---------------------|
| 8. 5 bands of the corolla clearly defined by 2 prominent lines ; pollens echinate | <i>Ipomoea</i> |
| 7. Outer sepals larger than inner and decurrent on the peduncle | <i>Aniseia</i> |
| 6. Stigma with ovate or elongate lobes | |
| 10. Prostrate, trailing herbs | <i>Convolvulus</i> |
| 10. Climbing herbs | <i>Jacquemontia</i> |

ANISEIA Choisy

Aniseia martinicensis (Jacq.) Choisy in Mem. Soc. Phys. Genev. 8 (1) : 66, 1838. *Convolvulus martinicensis* Jacq. Sel. Strip. Amer. 26, t. 17, 1763. *Ipomoea uniflora* Roem. & Sch. Syst. 4 : 247, 1819 (non Blume) FBI 4 : 201 ; DG. 130. *Aniseia uniflora* (Burm. f.) Choisy in Mem. Soc. Phys. Genev. 6 : 483, t. 2, f. 9, 1834 ; C. 2 : 300 ; G. 2 : 649.

Ill. : Wt. Ic. t. 850 ; van Oostst. in Fl. Males. ser. 1, 4 (4) : 436, f. 21, 1953.

The species is rare in the North Kanara and Concan area along the back waters and margins of tanks. There is possibility of its occurrence in the Goa area also.

ARGYREIA Lour.

- | | |
|--|--------------------|
| 1. Leaves glabrous above | |
| 2. Stamens exerted | |
| 3. Leaves broadly ovate, cordate white tomentose beneath | <i>nervosa</i> |
| 3. Leaves ovate - elongate with rounded base, sparsely hairy beneath | <i>involucrata</i> |
| 2. Stamens included | <i>elliptica</i> |
| 1. Leaves strigose or sparsely hairy above | |
| 4. Leaves sparsely hairy on both surfaces | <i>strigosa</i> |
| 4. Leaves strigose above | |
| 5. Leaves tomentose beneath | <i>hirsuta</i> |
| 5. Leaves densely silky and silvery white beneath | <i>sericea</i> |

Argyreia elliptica Choisy, in Mem. Soc. Phys. Hist. Nat. Genev, 6 : 417, 1833 ; S. 153. *Lettsomia elliptica* Wt. Ic. 4 (2) : 12, 1850 ; FBI 4 : 192 ; DG. 129, C. 2 : 329 ; G. 2 : 640.

Fl. : September - October. *Fr.* : October - January.

Vern. : Bondvel (Mar.); Kedari (Konk.). *Ill.* : Talb. f. 429.

Loc. : GOA : *Sanguem* : Verlem.

Common along the ghat areas adjoining Goa, hence included here.

Argyreia hirsuta Wight & Arn. in Nov. Act. Nat. Cur. 18 : 356, 1836 ; G. 2 : 638.

Loc. : GOA : *Sanguem* : Surla

Occasional in the forest.

A. involucrata C.B. Cl. in Hook. f. FBI 4 : 187, 1883 ; C. 2 : 325 ; T. 2 : 286 ; G. 2 : 637.

Fl. : October - November.

Loc. : GOA : *Satari* : Nagargao ; Caranzol ; Ambeachagol ; Satrem : Kutachemal Ivorem. *Bardez* : Betim hills. *Sanguem* : Molem-colem; Molem-Tinem on Belgaum road, 71st km ; Chorandem ; Bavanbunda (Molem - Belgaum road) ; Talauli ; Netravali ; Patrem ; Dudhsagar, towards castle - rock side. *Canacona* : Butpal ; Butpal-Nadquem ; Ordofond-Butpal, 10 km point.

Occasional in the forest.

A. nervosa (Burm. f.) Boj. Hort. Maurit. 224, 1837 ; S. 153. *Convolvulus nervosus* Burm. f. Fl. Ind. 48, t. 20, f. 1, 1768. *Argyreia speciosa* Sweet, Hort. Brit. 289, 1827 ; FBI 4 : 185 ; DG. 129 ; C. 2 : 324 ; T. 2 : 284 ; G. 2 : 637.

Fl. : August - September. *Ill.* : Wt. Ic. t. 851.

Vern. : Samudra soka (Mar.) ; Samudra balli (Kan.) ; Samudra somk (Konk.).

Loc. : GOA : *Bicholim* : Usgao. *Quepem* : Quepem *Sanguem*, 10 km point. *Canacona* : Ordofond.

Occasional, along forest edges. Sometimes observed under cultivation in gardens.

Argyreia sericea Dalz. in Dalz. & Gibs. Bomb. Fl. 169, 1861 ; FBI 4 : 188 ; C. 2 : 326 ; T. 2 : 286 ; S. 153.

Fl. : September.

Loc. : NAGARHAVELI : Saily ; Dolara. DADRA : Tingra village.

Occasional in open fields. The plant is very showy with large flowers and silvery leaves.

A. strigosa (Roth.) Sant. & Patel, in Trans. Bose Res. Inst. Calc. 22 : 41, 1958. *Ipomoea strigosa* Roth, Nov. Pl. Sp. 113, 1821. *Lettsomia setosa*

Roxb. [(Hort. Beng. 13, 1814 (*nom. nud.*) &)] Fl. Ind. 1 : 490, 1832 ; FBI 4 : 194 ; C. 2 : 330 ; T. 2. 291 ; G. 2 : 640.

Fl. : November. *Ill.* : Wt. Ic. t. 1360 ; T. f. 430.

Loc. : GOA : *Bardez* : *Betim Ponda*. *Ilhas* : *Chimbel* reservoir *Brahmapuri* temple ; *Morkhal*.

Rare, in open situations.

CONVOLVULUS Linn.

Prostrate herbs or undershrubs not twining

microphyllus

A twining herb ; stems often twisted together

arvensis

Convolvulus arvensis Linn. Sp. Pl. 153, 1753 ; FBI 4 : 219 ; C. 2 : 303 ; G. 2 : 650 ; S. 150.

Fl. : December February.

Vern. : *Chandvel* (Mar.).

Weed with pink or white flowers, occasional in waste places, cultivated fields and along roadsides.

C. microphyllus Sieb. ex Spreng. Syst. Veg. 1 : 611, 1824 ; FBI 4 : 218 ; G. 2 : 301 ; Pav. 155. *Convolvulus pluricaulis* Choisy, Mem. Soc. Phys. Geneve 6 : 477, 1833 & in DC. Prodr. 9 : 403, 1845.

Fl. & Fr. : October - January. *Ill.* : Wt. Ic. t. 1367.

Loc. : DIU : *Nagoa* ; *Jalandhar*.

A common plant in wastelands and fields. Both *Convolvulus pluricaulis* & *C. microphyllus* refer to the same species and according to the rules of priority, the valid name should be *C. microphyllus* only.

CRESSA Linn.

Cressa cretica Linn. Sp. Pl. 223, 1753 ; FBI 4 : 225 ; DG. 133 ; C. 2 : 296 ; G. 2 : 647.

Fl. : November January. *Ill.* : Wt. Ill. t. 168 B.

Vern. : *Lona* (Mar.) ; *Chavel* (Konk.).

Common in fallow fields and moist situations.

CUSCUTA Tourn. f. ex Linn.

Cuscuta reflexa Roxb. Cor. Pl. 2 : 3, t. 104, 1798 ; FBI 4 : 225 ; DG, 133 ; C. 2 : 292 ; G. 2 : 654 ; S. 149.

Fl. : January February.

Vern. : Amervel (Mar.); Amorvel (Konk.); Ousegao do matto (Port.).

Loc. : DAMAN. DIU : Airport area.

Often this genus is regarded as representing a distinct family Cuscutaceae. Parasitic on bushes and trees, used in native medicine. Common along Western ghats and Goa.

ERYCIBE Roxb.

Erycibe paniculata Roxb. Pl. Cor. 2 : 31, t. 159, 1802 ; FBI 4 : 180 ; C. 2 : 293 ; G. 2 : 653 ; *E. wightiana* Grab. Cat. 137, no. 1024, 1839 ; G. 2 : 653 ; S. 149. *E. paniculata* Roxb. var. *wightiana* C.B. Cl. in FBI 4 : 181, 1883 ; C. 2 : 294.

Fl. : October - November. *Fr.* : March. *Ill.* : Wt. Ill. t. 180.

Vern. : Ankole (Kan.); Dhaviparvati (Konk.); Raiz de solteira (Port.).

Loc. : GOA : *Satari* : Caranzol. *Sanguem* : Moduka bungla jungle. *Canacona* : Nadquem.

Rare.

EVOLVULUS Linn.

Evolvulus alsinoides Linn. Sp. Pl. (ed. 2) 392, 1762 ; FBI 4 : 220 ; DG. 133 ; C. 2 : 297 ; G. 2 : 648 ; S. 149. Dangs, 26 ; Pav. 154.

Fl. & Fr. : September - November. *Ill.* : Wt. Ill. t. 168 bis.

Vern. : Vishnukranta (Mar.); Vishnykranti (Kan.).

Loc. : GOA : *Bardez* : Porvorim, rocky plateau. *Salcete* : Cavallasum sea shore. *Sanguem* : Alduna (Netravali). *Canacona* : Ordofond. DAMAN : Coileque area ; Fort area ; Dundorta ; Jampore.

Occasional on gravelly soil, creeping on the forest floor. A very variable plant with regard to its size and shape of the leaves. Used in native medicine.

IPOMOEA Linn.

1. Aquatic plants

aquatica

1. Terrestrial plants

2. Corolla tubular or salvar - shaped

- 3. Stem muricate ; flowers white or purple
 - 4. Corolla white, about 10 cm long *tuba*
 - 4. Corolla pale purple, 5 cm long *muricata*
- 3. Stem not muricate ; flowers red
 - 5. Leaves ovate, cordate *hederifolia*
 - 5. Leaves with many filiform segments *quamoclit (Cult.)*
- 2. Corolla campanulate or funnel - shaped :
 - 6. Leaves entire
 - 7. Flowers in sessile or nearly sessile heads ; capsules hairy *eriocarpa*
 - 7. Flowers in pedunculate cymes or panicles ; capsules glabrous
 - 8. Stout climber or straggling shrub ; seeds with long silky hair *illustris*
 - 8. Slender climber ; seeds velvety or nearly glabrous
 - 9. Flowers purplish *maxima*
 - 9. Flowers white or yellowish-white
 - 10. Seeds dark brown ; sepals acute *obscura*
 - 10. Seeds yellow ; sepals aristate *alba*
 - 6. Leaves lobed
 - 11. Leaves deeply 2-lobed *pes-caprae*
 - 11. Leaves 3-9 lobed
 - 12. Sepals 2.5 cm long or more *ntl*
 - 12. Sepals less than 2.5 cm long
 - 13. Sepals hairy *pes-tigridis*
 - 13. Sepals glabrous.
 - 14. Seeds with long, cottony hairs *digitata*
 - 14. Seeds with short, silky hairs *diversifolia*

Ipomoea abla Linn. Sp. Pl. 161, 1753. *I. bona-nox* Linn. Sp. Pl. ed. 2, 228, 1762 ; DG. 129. *I. bona-nox* var. *grandiflora* C. B. Cl. in Hook. f. FBI 4 : 197. *Calonyction speciosum* Choisy in Mem. Soc. Phys. Geneve. 6 : 441, 1834 ; C. 2 : 322. *C. bona-nox* Boj. Hort. Maur. 227, 1837 ; G. 2 : 646.

Fl. : October - November. *Ill.* : Wl. Males. 4 : 480, f. 53.

Vern. : Gulchandni (Mar.) ; Chamdrimphul (Konk.) ; Flor da lua (Port.).

This species is common at Sawantwadi and should occur at Goa also. It is doubtful whether this species is found in the wild state. The flowers open in the evening.

Ipomoea aquatica Forsk. Fl. Aeg. Arab. 44, 1775 ; FBI 4 : 210 ; DG. 131 ; C. 2 : 315. Pav. 153. *Ipomoea reptans* Poir. in Lamk. Encycl. Meth. Suppl. 3 : 460, 1814 ; G. 2 : 643. *Convolvulus reptans* Vahl, Symb. Bot. 1 : 17, 1790 (*non* Linn.).

Fl. : September - October. *Ill.* : Wealth of India, 5 : f. 131 ; van Oostst. in Fl. Males. ser. 1, 4(4) : f. 47, 47a, 48, 1953.

Vern. : Nadishaka (Mar.) ; Takasi vel (Konk.).

Loc. : DAMAN : Regunwara.

Occasional in the tanks, and moist and marshy areas of the field forming dense masses. Dalgado records it for Goa and it is common along Western ghats.

I. digitata Linn. Syst. (ed. 10) 924, 1759 ; FBI 4 : 202 ; DG. 130 ; C. 2 : 318 ; T. 2 : 293. *Ipomoea paniculata* R. Br. Prodr. 496, 1810 ; G. 2 : 644.

Fl. & Fr. : August - October. *Ill.* : Fl. Males. 4 : 483, f. 55.

Vern. : Bhinikobola (Mar.) ; Bhumichekri godde (Kan.) ; Bhumikumvali (Konk.).

Loc. : GOA : *Ilhas* : Sukur village hill. *Salcete* : Raiyi village, 4th mile from Margao ; Margao ghat. *Ponda* : Fields near Curti village (Ponda Darbandora).

Common on the hill slopes on outskirts of the forest. Sometimes cultivated for ornamental purposes.

I. diversifolia R. Br. Prodr. 487, 1810 ; DG. 152. *Ipomoea laciniata* C.B. Cl. in FBI 4 : 200, 1883 ; C. 2 : 319. G. 2 : 645.

Fl. & Fr. : October.

Loc. : GOA : *Canacona* : Polem.

Rare.

I. eriocarpa R. Br. Prodr. 484, 1810 ; FBI 4 : 204 ; DG. 131 ; C. 2 : 312. *Ipomoea hispida* (Vahl) R. & S. 4 : 238, 1819 (*non* Zuccagni). G. 2 : 643.

Fl. : September - January. *Fr.* : October - April. *Ill.* : Wt. Ic. t. 169.

Loc. : NAGARHAVELI : On way to Sindhoni from Khanvel ; Dhapsa ; Nana Randha.

Common along the ghat areas adjoining Goa.

I. hederifolia Linn. Syst. Nat. ed. 10, 925, 1759. *I. angulata* Lamk. Talb. Encycl. 1 : 464, 1793 ; S. 151. *Quamoclit phoenicea* Choisy in Mem. Soc. Phys. Hist. Nat. Geneve 6 : 433, 1833 ; G. 2 : 645.

I. coccinea C.B. Clarke in FBI 4 : 199, 1883. *Quamoelit coccinea* Cooke, Fl. Pres. Bomb. 2 : 261, 1904 (*non* Moench.).

Fl. : November. *Ill.* : Fl. Males. 4 : 482, f. 54, 1953.

Loc. : GOA : Bardez : Porvorim-Betim ; Betim forests, NAGARHAVELI : Morkhal.

Rare in waste place, often grown for ornamental purposes in gardens.

Ipomoea illustris (Clarke) Prain, Beng. Pl. 735, 1903 ; S. 152. *I. campanulata* Linn. var. *illustris* Clarke in Hook. f. FBI 4 : 211, 1883. *I. campanulata* Choisy. in Mem. Soc. Phys. Hist. Nat. Geneve 6 : 151, 1833 ; FBI 4 : 211 ; DG. 132 ; C. 2 : 316 ; G. 2 : 643 (*non* Linn.).

Fl. : October March. *Ill.* : Wt. Ic. t. 1375 ; T. f. 431.

Vern. : Tugelmi (Mar.) ; Pomgyavel (Konk.).

Dalgado recorded the species from Goa.

Fairly common along the ghat areas on either side of Goa (Cooke, *l.c.*).

I. mauritiana Jacq. Coll. 4 : 216, 1791 & in Hort. Caes. Schoenbr. 2 : 39, t. 200, 1797. *I. digitata* auct. *non* Linn. ; FBI 4 : 202 ; C. 2 : 318 ; T. 2 : 293.

Fl. & Fr. : August October. *Ill.* : J. Hutch. & J.M. Dalziel in Fl. W. Trop. Afr. (ed. 2), 2 : 351, f. 284, 1963.

Loc. : NAGARHAVELI : Dapada.

Rare, on hill slopes. By most of the authors, this plant is referred to as "*I. digitata* Linn." According to Verdcourt (Fl. Trop. E. Afr. 135, 1963), *I. digitata* Linn. is a rare plant endemic to Haitian and is distinct from the present species.

I. maxima (Linn. f.) Don ex Sweet, Hort. Brit. (ed. 2), 372, 1830. *Convolvulus maximus* Linn. f. Suppl. 137, 1781. *Ipomoea sepiaria* Koenig ex Roxb. Fl. Ind. 2 : 90, 1824. FBI 4 : 209 ; DG. 131 ; C. 2 : 315 ; T. 2 : 293 ; G. 2 : 643.

Fl. : September. *Ill.* : Wt. Ic. t. 838 ; van Oostst. in Fl. Males. ser. 1, 4(4) : 472, f. 45, 1953.

Vern. : Amti vel (Mar. & Konk.).

Loc. : GOA : Salcete. Covolossim. NAGARHAVELI : Silvassa. DAMAN : Regunvara. DIU : Airport, Nagoa ; Nagoa.

Occasional, near the sea coast.

I. muricata (Linn.) Jacq. Hort. Schoenbr. 3 : 40, t. 323, 1798 ; FBI 4 : 197 ; DG. 129 ; S. 151, *non* Cav. (1799). *Convolvulus muricatus* Linn.

Mant. 44, 1767. *Calonyction muricatum* G. Don, Gen. Syst. 4 : 264, 1837 ; C. 2 : 322 ; G. 2 : 646.

Fl. : September - November.

Vern. : Barik bhomvri (Konk.) ; Kantalo garayo (Guj.)

Loc. : GOA : *Sanguem* : Patole (Netravali). *Canacona* : Canacona. NAGARHAVELI : Nana Randha ; Dolara. DIU : Nagoa.

Rare. The flowers open after dark and fade away next morning.

Ipomoea nil (Linn.) Roth, Cat. Bot. 1 : 36, 1797 ; S. 151 ; Dangs. 27 ; Pav. 152. *Convolvulus nil* Linn. Sp. Pl. 219, 1762. *Ipomoea hederacea* C.B. Cl. in FBI 4 : 199 ; DG. 130 ; C. 2 : 321 ; G. 2 : 644 (*et al plur. non Jacq.*).

Fl. : September. *Ill.* : Wealth of Ind. 5 : f. 135.

Vern. : Nilpushpi (Mar.) ; Ganribija (Kan.) ; Kaladana (Guj.)

Loc. : GOA : *Satari* : Nanechadongar (Codal) ; *Sanguem* : Verlem ; Netravali. Dudhsagar along railway line. NAGARHAVELI : Dudhani to Bildhari forest. DAMAN : Fort area. DIU : Nagoa.

Rare. Closely allied to the American species *Ipomoea hederacea* (Linn.) Jacq. and mistakenly regarded conspecific to it. However, these two species can be readily differentiated by calyx features.

The seeds are said to be purgative.

I. obscura (Linn.) Ker Gawl. in Bot. Reg. t. 239. t. 1817 ; FBI 4 : 207 ; DG. 131 ; C. 2 : 317 ; G. 2 : 643 ; Pav. 152. *Convolvulus obscurus* Linn. Sp. Pl. 220, 1762.

Fl. & Fr. : August - October. *Ill.* : Fl. Maley. 4 : 472, f. 44.

Vern. : Pilibonvari (Mar.) ; Gumbadvel (Guj.)

Loc. : GOA : *Satari* : Pale. *Salcete* : Margoa. *Canacona* : Maxem ; Angidiv. NAGARHAVELI : Dhapsa. DADRA. DAMAN : Bamoti. DIU : Nagoa ; Sand stone ditch, Castle area ; Jalandhar.

Rare, often climbing on hedges, occasionally on sandy soil near the sea.

I. pes-caprae (Linn.) Sweet, Hort. Sub. Lond. 35, 1818 ; G. 2 : 644. *Convolvulus pes-caprae* Linn. Sp. Pl. 159, 1753 ; *Ipomoea biloba* Forsk. Fl. Aeg. Arab. 44, 1775 ; FBI 4 : 212 ; DG. 132 ; C. 2 : 317 ; T. 2 : 296 ; V. 76.

Fl. : September. *Ill.* : Fl. Males. 4 : 476, f. 49.

Vern. : Maryadvel (Mar.) ; Adumbaballi (Kan.) ; Bamgdavel (Konk.) ; Marjadavela (Guj.)

Loc. : GOA : *Pernem* : Wet paddy fields, Verem Pelernem ; Terekhol. DAMAN : Jampore.

Rare, on sandy soil, serving as sand binder. The leaves are used externally in rheumatism. The seeds are said to be a good remedy for abdominal complaints.

Ipomoea pes-tigridis Linn. Sp. Pl. 162, 1753; FBI 4 : 204; DG. 130; C. 2 : 320; G. 2 : 644; S. 152; Dangs. 28; Pav. 152.

Fl. : September - November. *Fr.* : November - December. *Ill.* : Wt. Ic. t. 836; van Oostst. in Fl. Males. ser. 1, 4(4) : 467, f. 40, 1953.

Vern. : Arti (Konk.).

Loc. : GOA : *Ilhas* : Chimbhel reservoir Brahmapuri temple. NAGARHAVELI : Nana Randha; Saily; Silvassa. DAMAN : Cataria. DIU : Jalandhar; Castle area; Gogale.

Common on sandy soil, during the rainy season.

I. tuba (Schl.) G. Don, Gen. Syst. 4 : 271, 1838. *Convolvulus tuba* Schl. in Linnaea 6 : 735, 1831.

Fl. & Fr. : October - November.

Vern. : Coast Moon flower (Eng.).

Loc. : GOA : *Satari* : Codal. *Bardez* : Kolvelly Ferry crossing : Borim Ponda. *Sanguem* : Verlem; Netraveli.

Rare, near streams and along sea coast.

Cult. species :

I. batatas (Linn.) Lamk. Tabl. Encycl. 1 : 465, 1791; FBI 4 : 202; DG. 130; C. 2 : 320; G. 2 : 645; S. 152. Dangs. 26. *Convolvulus batatas* Linn. Sp. Pl. 154, 1753.

Vern. : Ratalu (Mar. & Guj.); Kanangi (Konk.); Bateteira (Port.).

A native of Tropical America seen under cultivation. The tubers are edible.

I. fistulosa Mart. ex Choisy in DC. Prodr. 9 : 349, 1845. *I. carnea* auct. non Jacq. : C. 2 : 321; Dangs. 27.

Fl. : June.

Loc. : NAGARHAVELI : Silvassa.

An American plant, introduced into gardens. It is usually known under the name *I. carnea* Jacq. which is a different plant.

Rare, along roadsides of villages, probably planted.

I. quamoclit Linn. Sp. Pl. 159, 1753; FBI 4 : 199; DG. 129; S. 151. *Quamoclit vulgaris* Choisy in Mem. Soc. Phys. Hist. Nat. Geneve, 6 : 434; C. 2 : 331.

Fl. : September. *Ill.* : Wealth of Ind. 5 : f. 137.

Vern. : Vishnukranti (Mar.) ; Kamalate (Kan.) ; Juvamchivel (Konk.) ; Trepadeira des (Port.).

Rare. A native of Tropical America, commonly grown in gardens for beautiful foliage and flowers. Dalgado records it for Goa.

JACQUEMONTIA Choisy

Jacquemontia paniculata (Burm. f.) Hall. f. in Engler, Bot. Jahrb. 16 : 541, 1893 & 18 : 95, 1894 ; FBI 4 : 220 ; C. 2 : 303 ; G. 2 : 650.
Ipomoea paniculata Burm. f. Fl. Ind. 50, t. 21, f. 3, 1768.

Fl. & Fr. : October November. *Ill.* : van Oostst. in Fl. Males. ser. 1, 4(4) : 433, f. 19.

Loc. : GOA : Bardez : Betim hills.

Rare, on *Syzygium*.

MERREMIA Dennst. ex Hall. f.

- | | |
|--|--|
| 1. Leaves 5 to 7-lobed | |
| 2. Peduncles glandular in the upper part, the glands sometimes mixed with patent bristly hairs | <i>quinquefolia</i> |
| 2. Peduncles glabrous or hairy, not glandular | <i>vitifolia</i> |
| 1. Leaves entire | |
| 3. Leaves reniform, broader than long | <i>emarginata</i> |
| 3. Leaves not reniform, longer than broad | |
| 4. Seeds pubescent or hairy | <i>umbellata</i> |
| 4. Seeds glabrous | |
| 5. Leaves 3-lobed or 3-toothed at the apex | <i>tridentata</i> |
| 5. Leaves not 3-toothed at the apex ; base auriculate dentate | <i>tridentata</i> ssp.
<i>hastata</i> |

Merremia emarginata (Burm. f.) Hall. f. in Engl. Bot. Jahrb. 16 : 552, 1893 ; C. 2 : 305 ; G. 2 : 652 ; Dangs. 28 ; Pav. 157. *Evolvulus emarginatus* Burm. f. Fl. Ind. 77, t. 30, f. 1, 1768. *Ipomoea reniformis* Choisy, in Mem. Soc. Phys. Genev. 6 : 446, 1833 ; FBI 4 : 206 ; DG. 131.

Fl. : September.

Vern. : Umdrakani (Konk.) ; Umderkani (Guj.).

Loc. NAGARHAVELI ; Dhapasa, DADRA.

Rare, in water-logged fields. Though not collected from Goa it can be located in the area since it is common in Concan region. It superficially

ally resembles and sometimes confused with *Centella asiatica* Urb. especially in vegetative condition.

Merremia quinquefolia (Linn.) Hall. f. in Engl. Bot. Jahrb. 16 : 552, 1893 ; Rao & Safui in Proc. Ind. Acad. Sc. 58 (6) : 362, 1963 ; Pav. 127. *Ipomoea quinquefolia* Linn. Sp. pl. 162, 1753.

Fl. : November. *Ill.* : Santapau & Patel in Jour. Bomb. Nat. Hist. Soc. 53 : 215, f. 2, 1955 ; van Oostst. in Fl. Males. ser. 1, 4 (4) : 446, f. 28, 1953.

Loc. : DIU : Island area (T. A. Rao 1990)

This plant was first recorded for Western India by Santapau & Patel (1955). I have included it here on the authority of T. A. Rao, who records it from Diu.

M. tridentata (Linn.) Hall. f. in Engl. Bot. Jahrb. 16 : 552, 1893 ; C. 2 : 306 ; G. 2 : 652. *Convolvulus tridentatus* Linn. Sp. Pl. 157, 1753. *Ipomoea tridentata* Roth in Roem. et Schult. Arch. Bot. 1 (3) : 38, 1798 ; FBI 4 : 205 ; DG. 131.

Fl. : November. *Ill.* : van Oostst. in Fl. Males. 4 (4) : 445, f. 27, 1953.

Vern. : Semdar kalaudi (Konk.).

Loc. : GOA : *Bicholim* : Sanguilim. *Bardez* : Porvorim rocky plateau. *Salcete* : Goodier, 1 mile beyond Margoa ; *Gonsua*. *Quepem* : Bali - Sanguem.

Rare, on lateritic gravelly soil near the coast.

M. tridentata (Linn.) Hall. f. ssp. *hastata* (Hall. f.) Oostst. in Fl. Males., ser 1, 4 (4) : 445, 1953. *Merremia hastata* (Desr.) Hall. ff. in Engl. Bot. Jahrb. 16 : 552, 1893 ; C. 2 : 306 ; G. 2 : 652. *Convolvulus hastatus* Desr. in Lamk. Encycl. Method. 3 : 542, 1789. *Ipomoea angustifolia* C.B. Cl. in Hook. f. FBI 4 : 205 (not of Jacq.) ; DG. 131.

Fl. : August - December.

Vern. : Kalivel (Konk.).

M. umbellata (Linn.) Hall. f. in Engl. Bot. Jahrb. 16 : 552, 1893 ; C. 2 : 305 ; G. 2 : 651 ; S. 150. *Convolvulus umbellatus* Linn. Sp. Pl. 155, 1753. *Ipomoea cymosa* Roem. & Schult. Syst. 4 : 241 ; 1819 ; FBI 4 : 211 ; DG. 132 ; T. 2 : 295.

Fl. & Fr. : March - April.

Loc. : GOA : *Sanguem* : Talem forest on way to Patiem. *Canacona* : Tudal - Ordofond, 6 miles ; *Choram* hill top, *Nadquem* ; *Budsare* - *Tudal*.

Occasional in open areas, often climbing on small shrubs. A very variable plant in its habit and shape of the leaves.

Merremia vitifolia (Burm. f.) Hall. f. in Engl. Bot. Jahrb. 16 : 552, 1893 ; C. 2 : 307 ; G. 2 : 651 ; S. 150. *Convolvulus vitifolius* Burm. f. Fl. Ind. 45, t. 18, f. 1, 1768. *Ipomoea vitifolia* Bl. Bijdr. 709, 1826 ; FBI 4 : 213 ; DG. 132.

Fl. & Fr. : November - March.

Loc. : GOA : *Sanguem* : Molem Colem. *Rolla* 85054. *Canacon a*: Butpal Kampal hill top ; Choram hill top, Nadquem.

Occasional, on cleared hill tops.

OPERCULINA Silva Manso

**Operculina turpethum* (Linn.) Silva Manso, Enum. Subst. Braz. 16 & 49, 1836 ; C. 2 : 309 ; G. 2 : 653. *Convolvulus turpethum* Linn. Sp. Pl. 362, 1753. *Ipomoea turpethum* R. Br. Prodr. 485, 1810 ; FBI 4 : 212 ; DG. 132.

Fl. : October - January. *Ill.* : van Oostst. in Fl. Males. 4 (4) : 455, f. 32a b, 1953.

Vern. : Nisottar (Mar.) ; Turbit (Port.).

The species has not been collected by me but as it is found in the Concan area I have included it in this work. The roots are used in medicine. Sometimes also found in cultivation.

RIVEA Choisy

Rivea hypocrateriformis Choisy in Mem. Soc. Physc. Geneve 6 : 408, 1833 ; FBI 4 : 184 ; DG. 128 ; C. 2 : 323 ; G. 2 : 635 ; Dangs. 150.

Fl. : September. *Ill.* : T. f. 427.

Loc. : GOA : *Bardez* : Naoa, *DADRA, DIU* : Banxiwara Diu Road ; Diu - Nagarhaveli road.

Rare, in open situations.

SOLANACEAE

- | | |
|--|-----------------|
| 1. Calyx strongly accrescent, entirely enclosing the fruit | |
| 2. Flowers pedicelled and solitary | <i>Physalis</i> |
| 2. Flowers sessile or subsessile, clustered | <i>Withania</i> |
| 1. Calyx scarcely or slightly enlarged, not enclosing the fruit | |
| 3. Flowers 15-20 cm long ; fruit a 4-valved or irregularly dehiscent capsule | <i>Datura</i> |
| 3. Flowers under 8 cm long, fruit a berry | |

**Merremia turpethum* (Linn.) Shah & Bhat in Journ. Bomb. nat. Hist. Soc. 74 : 567, 1977.

4. Corolla tubular ; anthers longitudinally dehiscent *Cestrum*
4. Corolla rotate ; anthers dehiscent by a terminal pore
5. Flowers in fascicles ; calyx cup-shaped, truncate, upper margin entire or dentate just below rim, calyx teeth 5-11, linear-filiform ; anthers ellipsoid, apical pores face inwards and often oblique *Lycianthes*
5. Flowers in cymes ; calyx not as above, not truncate, but deeply dentate-divided, teeth 5, deltoid ; anthers elongated, apical pores [facing upwards or outwards *Solanum*

CESTRUM Linn.

Cestrum nocturnum Linn. Sp. Pl. 191, 1753 ; S. 157.

Fl. : March. *Ill.* : Bor & Raizada in Journ. Bomb. Nat. Hist. Soc. 43 : 8, f. 4 & t. opp. p. 8, 1942.

Loc. : GOA : *Canacona* : Tudal village.

Cultivated for its fragrant flowers.

DATURA Linn.

Glabrous or subglabrous plants ; corolla 5-toothed ; fruits tuberculate or armed with short spines *metel*

Pubescent plants ; corolla 10-toothed ; fruit armed with long, weak spines *inoxia*

Datura inoxia Mill Gard. Dict. (ed. 8) 5, 1768 ; S. 155. *D. metel* Sims. in Curtis Bot. Mag. t. 1440, 1812 ; FBI 4 : 243 ; C. 2 : 344, *et al* recent. auct. *non* Linn. (1753).

Fl. & Fr. : September.

Loc. : NAGARHAVELI : Chispana forest. DIU : Diu town near Rest house.

A native of Mexico but quite rare along roadsides and in wastelands in open situations. As remarked by Fosberg (Taxon 8 : 55. 1959) the correct spelling of the specific epithet should be *inoxia*. This species is often confused with *Datura metel* Linn.

D. metel Linn. Sp. Pl. 179, 1753 ; S. 155 ; Dangs. 29. Pav. 169. *Datura fastuosa* Linn. Syst. Nat. 2 : 932, 1759 ; FBI 4 : 242 ; DG. 136 ; C. 2 : 343 ; G. 2 : 660.

Fl. : September. *Ill.* : Wt. Ic. t. 1396.

Vern. : Kaladhotra (Mar.); Kanaka (Kan.) ; Dhavo dhutro (Konk.) ; Trombetoes roxos (Port.).

Loc. : DADRA.

Rare, in wastelands.

LYCIANTHES Hassler

Lycianthes bigeminata (Nees) Bitl. Abh. Naturw. ver. Bremen. 24 : 480, 1920. *Solanum bigeminatum* Nees, in Trans. Linn. Soc. 18 : 42, 1837 ; FBI 4 : 231 ; C. 2 : 334 ; G. 2 : 657.

Fl. : September - October.

Loc. : GOA : *Satari* : Dinarai forest ; *Satrem*. *Canacona* : Butpal-Nadquem.

The differences between *Lycianthes* and *Solanum* are not always quite clear and hence some botanists prefer to treat the various species of *Lycianthus* under *Solanum* only.

PHYSALIS Linn.

Physalis minima Linn. Sp. Pl. 183, 1753 ; FBI 4 : 238 ; DG. 135 ; C. 2 : 340 ; G. 2 : 659 ; S. 155.

Fl. & Fr. : August - November. *Ill.* : Wt. Ill t. 166b, f. 6 : Tadulingam & Venkatanarayana in Handb. some South Indian weeds, t. 116, f. 1-9, 1955.

Vern. : Chirboti (Mar.) ; Chirputi (Konk.).

Loc. : GOA : *Pernem* : Cargao. *Satari* : Valpoi, administrator's Office campus ; Onda ; Wadicha Dongar (Codal) ; Nanacha Dongar (Codal). *Bardez* : Kolvelle, ferry Coconut plantation. *Ilhas* : Panjim sea shore. *Salcete* : Harbour hillocks, Margao. *Sanguem* : Samvedam railway station ; Barazon ; Bati Sidh ; Near Anvaldem (Molem). *Canacona* : Nadquem ; Angidiv.

Common in wastelands, along roadsides, often also on bunds in cultivated fields.

SOLANUM Linn.

1. Plants unarmed
2. Shrubs or undershrubs
2. Annual herbs
1. Plants armed with prickles

denticulatum
nigrum

- | | |
|---|-------------------|
| 3. Prostrate or ascending densely armed herbs ; leaves deeply lobed | <i>surattense</i> |
| 3. Erect shrubs or undershrubs, less densely armed ; leaves shallowly lobed | |
| 4. Flowers dark purple ; lobes not incised | <i>indicum</i> |
| 4. Flowers white ; lobes deeply incised | <i>arundo</i> |

Solanum arundo Mattei in Boll. Ort. Bot. Palermo 7 : 188, 1908 ; Rao & Safui in Proc. Ind. Acad. Sc. 58 : 365, 1963.

Fl. : October.

Loc. : DIU : Island area (T.A. Rao 1949)

The species is a native of Tropical East Africa recorded here on the authority of T.A. Rao *l.c.*

**S. denticulatum* Blume, Bijdr. 697, 1826 ; FBI 4 : 231 ; C. 2 : 334 ; G. 2 : 657.

Fl. & Fr. : November. *Ill.* : Wt. Ic. t. 1397.

Loc. : GOA : Canacona : Butpal.

Rare.

**S. hovei* Dunal, in DC. Prodr. 13 (1) : 311, 1852 ; Sen Gupta in Bull. Bot. Soc. Bengal 17 (1&2) : 3, 1964 ; Sahni *et al* in Ind. For. 101 (10) : 580, 1975. *S. intermedium* Dunal MS. in herb. Banks, 1819, non Sendtn.

Fl. & Fr. : September - November. *Ill.* : Bull. Bot. Soc. Bengal 17 (1&2) : 4, 1964.

Fl. & Fr. : August - December. *Ill.* : Bull. Bot. Soc. Bengal 17 (1 & 2) : 4 (facing Pl.)

Vern. : Mothirigani (Mar.)

Loc. : GOA : Satari ; Volpoi. *Sanguem* : Along Goa border ; Colem Dudhsagar.

As indicated by Sen Gupta (1964), the species was collected from Gujarat, Maharashtra and near Goa boundary. Though considerably rare, it can be located in other parts of Western India provided its identity is fully established from *S. indicum* Linn. and *S. torvum* Sw. with which it is normally confused both in the field and in the Herbaria. Sahni *et al* (1975) possibly unaware of Sen Gupta's record of the species from Western India, has reported his collection of the species from Londa (Karnataka), Goa and Poona as new records from Western India. Though suggested as endemic to the Western India (Sen Gupta 1964), it can still be located in other parts of India including the Eastern Ghats, following its correct identity properly.

*Added later and hence not included in the Key.

**Lycianthes bigeminata* (New) Bitt. subsp. *Kaitisis* (Dun.) Bitt. in Abhandl. Naturw. ver Bremen 24 : 481, 1920.

**Solanum indicum* auct. non Linn. Sp. Pl. 187, 1753 ; FBI 4 : 234 ; DG. 134 ; C. 2 : 336 ; G. 2 : 658 ; S. 154 ; Dangs. 30.

Fl. & Fr. : August - November. *Ill.* : Wt. Ic. t. 346.

Vern. : Darli (Mar.) ; Badane (Kan.) ; Dorli (Konk.). Motaring in (Guj.).

Loc. : GOA : *Satari* : Codal ; Wadicha Dongar (Caranzol) ; Waghore ; Satrem. *Bardez* : Sukur village. *Sanguem* : Barazan mine area ; Madhka Bunglow (Molem-Belgaum Road) ; Verlem ; Surla ; Castle rock on way to Anmod. *Quepem* : Colomba reserve forest. *Canacona* : Nadquem. NAGARHAVELI : Dhapsa ; Dongarpad, Umberkoi ; Sindhoni forest ; Morkhel ; Dapara Chispana area.

Common in open situations, along outskirts of forests.

S. nigrum Linn. Sp. Pl. 186, 1753 ; FBI 4 : 229 ; DG. 133 ; C. 2 : 332 ; G. 2 : 657 ; S. 154.

Fl. : September - January. *Ill.* : Wt. Ic. t. 344.

Vern. : Kangani (Mar.) ; Kamchi (Konk.) ; Herva moira (Port.).

Loc. : GOA : *Satari* : Nanacha Dongar (Codal).

The species is mostly found growing in cultivated lands.

Fruits edible and medicinal.

S. surattense Burm. f. Fl. Ind. 57, 1768, (*excl. Syn. Pluk et Raj*) ; S. 154 ; Pav. 158. *S. xanthocarpum* Schrad. & Wendl. Sert. Hanov. 1 : 8, t. 2, 1795 ; FBI 4 : 236 ; DG. 134 ; C. 2 : 335 ; G. 2 : 658.

Fl. : September. *Ill.* : Wt. Ic. t. 1401.

Vern. : Bhonyaringani (Mar.) ; Kante (Kan.) ; Kamte ringini (Konk.).

Loc. : NAGARHAVELI : Silvassa along Daman ganga river. Atal forest ; Chispana area. DADRA. DAMAN : Marvor.

Common in the open areas along roadsides and in waste places.

WITHANIA Pauq.

Withania somnifera (Linn.) Dunal in DC. Prodr. 13 (1) : 453, 1852 ; FBI 4 : 239 ; DG. 136 ; C. 2 : 341 ; G. 2 : 660. *Physalis somnifera* Linn. Sp. Pl. 182, 1753.

Fl. : September. *Ill.* : Wt. Ic. t. 853.

**S. violaceum* Ortega, Hort. Matr. Dec. 56, 1800.

Vern. : Askand (Mar.) ; Domdalki (Konk.) ; Satilhas (Port.).

It is used in medicine.

Cult. species :

Capsicum frutescens Linn. Sp. Pl. 1 : 189, 1753 ; DG. 135 ; C. 2 : 348 ; G. 2 : 661. *C. minima* Mill. Gard. Dict. ed. 6, no. 10, 1752 ; FBI 4 : 239.

Vern. : Lovungi mirchi (Mar.) ; Mirsamg (Konk.) ; Pimentao (Port.).
Pimentao (Port.).

Cultivated, often found as an escape. [Wadicha Dongar (Caranzol), Satari, GOA.]

C. annum var. **grossum** (Willd.) Sendt. in Mart. Fl. Bras. 10 : 147, 1846-56 ; C. 2 : 347. *C. grossum* Linn. Mantiss. 47, 1767 ; FBI 4 : 239 ; DG. 136.

Vern. : Bipala mirchi (Mar.) ; Pimemtam (Konk.) ; Pimentao (Port.).

The dry chilli of commerce and cultivated.

Lycopersicum esculentum Mill. in Gard. Dict. ed. 8, no. 2, 1768 ; Clarke in FBI 4 : 237 ; DG. 134 ; C. 2 : 345 ; G. 2 : 661. *Lycopersicon lycopersicum* (Linn.) Karten, Deutsch. Fl. 966, 1880-1885. *Solanum lycopersicum* Linn. Sp. Pl. 185, 1753. *Lycopersicon esculentum* Mill. Gard. Dict. ed. 8, n. 2, 1768 ; S. 156.

Vern. : Tomati (Konk.) ; Tomateiro (Port.).

Often cultivated, occasionally found wild.

Nicotiana tabacum Linn. Sp. Pl. 180, 1753 ; FBI 4 : 245 ; DG. 136 ; C. 2 : 346 ; G. 2 : 661 ; S. 157.

Vern. : Pan (Konk.) ; Herva do tabaco (Port.) ; Tamaker (Guj.).

A native of South America and the tobacco of commerce.

Physalis peruviana Linn. Sp. Pl. 1670, 1753 ; FBI 4 : 238 ; DG. 135 ; C. 2 : 340 ; G. 2 : 659 ; S. 155.

Vern. : Popati (Mar.) ; Chirputi (Konk.) ; Grosiha peruviana (Port.).

Cultivated in gardens. The fruits are eaten and made into jams and tarts.

Solanum melongena Linn. Sp. Pl. 186, 1753 ; FBI 4 : 235 ; DG. 134 ; C. 2 : 339 ; G. 2 : 659 ; S. 154.

Vern. : Vangi (Mar.) ; Vaymgini (Konk.) ; Beringeleira (Port.).

Cultivated for vegetable.

S. tuberosum Linn. Sp. Pl. 185, 1753 ; FBI 4 : 229 ; DG. 133 ; C. 2 : 339 ; G. 2 : 659 ; S. 154.

Vern. : Batata (Mar.) ; Kamchi (Kan.) ; Solano (Port.) ; Batata (Guj.).

This species is extensively cultivated for the edible tubers.

SCROPHULARIACEAE

1. Corolla 2-lipped
 2. Flowers white or yellow
 3. Leaves not reduced to scales
 4. Leaves broadly ovate, coarsely crenate, serrate *Lindenbergia*
 4. Leaves lower lobbed, triangular hastate, the upper usually lanceolate-sagittate *Kickxia*
 3. Leaves small, reduced to scales *Striga*
 2. Flowers blue, pink or, purple or violet
 5. Marshy plants
 6. Leaves whorled, variously incised *Limnophila*
 6. Leaves opposite, not incised *Duputtium*
 5. Plants of comparatively dry situations
 7. Herbs not aromatic *Lindernia*
 7. Aromatic herbs *Stemodia*
1. Corolla not 2-lipped
 8. Capsules loculicidal ; flowers axillary, solitary *Bacopa*
 8. Capsules septicidal ; flowers terminal or axillary, umbellate or in racemes or spikes
 9. Calyx prominently keeled on the ribs *Torenia*
 9. Calyx not keeled
 10. Leaves entire or toothed
 11. Scabrid herbs *Centranthera*
 11. Glabrous under shrubs *Scoparia*
 10. Leaves pinnatisect with filiform segments
 12. Anthers 1-celled ; corolla tube curved *Rhamphicarpa*
 12. Anthers 2-celled ; corolla tube straight *Sopubia*

BACOPA Aubl. *nom. cons.*

1. Creeping herbs, rooting at nodes ; leaves obovate-oblong *monnieri*
1. Erect herbs ; leaves linear-lanceolate
 2. Flowers solitary, axillary, sessile *hamiltoniana*
 2. Flowers 1 to 3 together in the axils. pedicelled *floribunda*

Bacopa floribunda (R. Br.) Wettst. in Engl. & Prantl. Pflanzenf. 4 (3b) : 77, 1895. *Herpestis floribunda* R. Br. Prodr. 442, 1810 ; FBI 4 : 273. *Moniera floribunda* Cooke, Fl. Pres. Bomb. 2 : 286, 1904 ; G. 2 : 669.

Fl. & Fr. : November.

Loc. : GOA : Bicholim ; Condola area.

Rare, in paddy fields.

Bacopa hamiltoniana (Benth.) Wettst. in Engl. & Prantl. Pflanzen. f. 4 (3b) : 77, 1895. *Herpestis hamiltoniana* Benth. in Wall. Cat. 3898, 1831 (*nom. nud.*) ; FBI 4 : 272. *Moniera hamiltoniana* Cooke, Fl. Pres. Bomb. 2 : 286, 1904 ; G. 2 : 669.

Fl. & Fr. : September.

Loc. GOA : *Canacona* : Butpal Nadquem. NAGARHAVELI : Umberkoi.

Rare, on rocky slopes.

B. monnieri (Linn.) Pennell in Proc. Acad. Nat. Sci. Philad. 98 : 94, 1946 ; S. 158 ; Dangs. 30 ; Pav. 166. *Lysimachia monnieri* Linn. Cent. Pl. 2 : 9, 1756. *Moniera cuneifolia* Mich. Fl. Bor. Amer. 2 : 22, 1803 ; C. 2 : 356 ; G. 2 : 669. *Herpestis moniera* Benth. Scoph. Ind. 30, 1835 ; FBI 4 : 272 ; DG. 137.

Fl. : September.

Vern. : Nirbrahmi (Mar.) ; Nirubrahmi (Kan.) ; Brahmi (Konk.) ; Bam, Jalanevari (Guj.)

Loc. : GOA : *Bardez* ; Borim. *Canacona* : Angidiv. NAGARHAVELI : Silvassa, along Daman ganga river bank. DAMAN : Regunvara.

Rare, in moist areas.

CENTRANTHERA R. Br.

Centranthera indica (Linn.) Gamble, Fl. Pres. Madras 971, 1924 ; S. ed. 3, 184. *Rhinanthus indica* Linn. Sp. Pl. 603, 1753. *Centranthera hispida* R. Br. Prodr. 438, 1810 ; FBI 4 : 301, 1884 ; C. 2 : 381 ; G. 2 : 683. *Centranthera nepalensis* D. Don, Prodr. Fl. Nep. 88, 1825.

Fl. & Fr. : August - October.

Loc. : GOA : *Pernem* : Tirla. *Satari* : Valpoi ; Ambeachagol ; Satrem ; Deosali (Caranzol). *Sanguem* : Durgin hills, Darbandara ; Molem Belgaum Rd. 73 km ; Bati ; Sanguem Rest House ; Choraundem ; Patrem ; Periche Tem (Cumbari). NAGARHAVELI : Saily ; Khanvel, near Khuntly forest. DADRA.

Common in damp grassy situations and parasitic on grasses.

DOPATRIUM Buch. Ham. ex Benth.

Dopatrium junceum (Roxb.) Buch. Ham. ex Benth. Scroph. Ind. 31, 1835 ; FBI 4 : 274 ; C. 2 : 363 ; S. 159. *Gratiola juncea* Roxb. Pl. Cor. 2 : 16, t. 129, 1798.

Fl. : August September.

Loc. : GOA : *Sanguem* : Butabarcha dongar, Verlem. DAMAN : Dabel.

Rare, in moist areas.

KICKXIA Dumort.

Kickxia ramosissima (Wall.) Janchen in Oesterr. Bot. Zeitschr. 82 : 152, 1933 ; Pav. 164. *Linaria ramosissima* Wall. Pl. As. Rar. 2 : 43, t. 153, 1831 ; FBI 4 : 251 ; C. 2 : 353.

Fl. & Fr. : September.

Loc. : DIU : Jalandhar ; Castle area ; Nagoa.

Rare, in rocky crevices along sea shore.

LIMNOPHILA R. Br. *nom. cons.*

Limnophila indica (Linn.) Druce in Rep. Bot. Exch. Club. Brit. Isl. 3 : 420, 1914 ; S. 158 ; Dangs. 31. *Hottonia indica* Linn. Syst. Nat. ed. 10, 919, 1759. *Limnophila gratioloides* R. Br. Prodr. 442, 1810 ; FBI 4 : 271 ; DG. 137 ; C. 2 : 362 ; G. 2 : 668.

Fl. : October - November.

Vern. : Ambuli (Mar.). *Ill.* : Roxb. Pl. Cor. t. 189 ; Wt. Ic. t. 861. (under *L. racemosa* Benth.).

Loc. : GOA : *Canacona* : River bank, Ordofond village. NAGARHAVELI : Silvassa along Daman ganga river.

Occasional, in marshy and swampy situations. Extremely variable in its habit and size, depending on the water level.

LINDENBERGIA Lehm.

Lindenbergia muraria (Roxb.) P. Bruchl in Jour. Dept. Sci. Calc. Univ. 2 : 27, 1920. *Stemodia muraria* Roxb. ex Don, Prodr. Fl. Nep. 89, 1825. *Lindenbergia urticaefolia* Lehm. in Link & Otto, Sem. Hort. Hamb. 1829 : 5, 1830 ; FBI 4 : 262 ; DG. 137 ; C. 2 : 379 ; G. 2 : 665. *Lindenbergia polyantha* Royle ex Benth. Scroph. Ind. 22, 1835 ; FBI 4 : 262 ; C. 2 : 380. *Lindenbergia indica* (Linn.) Kuntze, Rev. Gen. Pl. 462, 1891.

Fl. : October - November.

Vern. : Dhol (Mar.).

Loc. : GOA : *Marmugao* : Marmugao hill top forest. DAMAN : Fort area. DIU : Nagoa ; Castle area ; Rocky creek in sea, Nagoa.

Rare.

LINDERNIA Allioni

1. Capsule about equalling the calyx
2. Pubescent herbs ; hairs spreading
2. Glabrous or sparsely hairy herbs

viscosa

- 3. Flowering calyx cleft to the middle or less *crustacea*
- 3. Flowering calyx cleft to the base or nearly so
 - 4. Flowers 3 - 4 mm long *multiflora*
 - 4. Flowers 8 - 12 mm long *Airta*
- 1. Capsule twice as long as the calyx
 - 5. Flowers white or red *ciliata*
 - 5. Flowers blue or violet
 - 6. Leaves distantly and shallowly toothed, oblong *oppositifolia*
 - 6. Leaves entire
 - 7. Leaves broadly elliptic to ovate - oblong *anagallis*
 - 7. Leaves linear *tenuifolia*

Lindernia anagallis (Burm. f.) Pennell in Journ. Arn. Arb. 24: 252, 1943. *Ruellia anagallis* Burm. f. Fl. Ind. 135, 1768. *Bonnaya veronicaefolia* Spr. Syst. Veg. 1: 41, 1825; FBI 4: 285; C. 2: 369. *Illysanthes veronicaefolia* Urban Berl. Deutsch. Bot. Ges. 2: 436, 1884; G. 2: 675.

Fl. & Fr. : September - May.

Loc. : GOA : *Satari* : Masarde village. *Quepem* : Budsari - Goundugarha. *Canacona* : Poinguinam ; Angidiy. NAGARHAVELI : Dhapsa. DAMAN : Marvor.

Common in moist, shady areas.

L. ciliata (Colsm.) Pennell in Brittonia 2: 182, 1936; S. 160; Pav. 166. *Gratiola ciliata* Colsm. Prodr. Desc. Grat. 14, 1793. *Bonnaya brachiata* Link & Otto, Icon Pl. Select. 25, t. 11, 1820; FBI 4: 284; C. 2: 369. *Illysanthes serrata* (Roxb.) Urban in Berl. Deutsch. Bot. Ges. 2: 436, 1884; G. 2: 675.

Fl. & Fr. : August - October.

Loc. : GOA : *Satari* : Valpoi ; Satrem ; Wadicha Dongar (Caranzol) ; Nanecha Dongar (Codal). *Salcete* : Raiyi village. *Sanguem* : Sanguem - Darbandara ; Molem - Belgaum Road 63 km ; near Anveldem (Molem) ; Patrem. NAGARHAVELI : Silvassa ; Khanvel. DAMAN : Marvor.

Common in moist, slushy, sandy or gravelly, shady areas and open cultivated fields.

L. crustacea (Linn.) F. Mueller, Cens. Austr. Pl. 97, 1882; S. 159; Dangs. 31. *Capraria crustacea* Linn. Mant. 87, 1767. *Vandellia crustacea* Benth. Scroph. Ind. 35, 1835; FBI 4: 279; C. 2: 366; G. 2: 673.

Fl. & Fr. : August. - November. *Ill.* : Wt. Ic. t. 863.

Loc. : GOA : *Bicholim* : 5 miles beyond Dodamarg ; Sanguilim. *Satari* : Codal ; Masarde village ; Caranzol - Wadicha Dongar ; Nanecha Dongar. *Bardez* : Betim ; Coconut plantation, near Kolvelly ferry crossing.

Ihas : Rice fields near Santacruz village. *Salcete* : Raiyi village. *Sanguem* : Patole (Netravali) ; Molem Belgaum Road, 73 km ; near Anwaldem ; Castle rock on way to Anmod. *Canacona* : Ordofond Butpal, 8 km ; Poinguinam. NAGARHAVELI : Bank of Damanganga river on way to Kaweha ; Sindhoni forest ; Nana Randha ; Saily ; Dapara-Chispana area. DADRA, DAMAN : Marvor.

Common in open moist gravelly areas along streams and in fields.

Lindernia hirta (Chamb. & Schl.) Mukerjee in Journ. Ind. Bot. Soc. 24 (3) : 131, 1945. *Torenia hirta* Chamb. & Schl. in Linnaea 2 : 571, 1827. *Vandellia scabra* Benth. Scroph. Ind. 36, 1835 ; FBI 4 : 281 ; G. 2 : 673.

Fl. & Fr. : September.

Loc. : GOA : *Satari* : Codal forest area.

Rare, in the cultivated fields.

L. multiflora (Roxb.) Mukerjee in Journ. Ind. Bot. Soc. 24 (3) : 131, 1945. *Torenia multiflora* Roxb. Fl. Ind. 3 : 96, 1832. *Vandellia multiflora* G. Don, Gen. Syst. 4 : 549, 1837 ; FBI 4 : 280.

Fl. & Fr. : August.

Loc. : GOA : *Salcete* : Borda village near Marmugao. *Marmugao* : Marmugao port.

Rare.

L. oppositifolia (Retz.) Mukerjee in Journ. Ind. Bot. Soc. 24 (3) : 134, 1945. *Gratiola oppositifolia* Retz. Obs. 4 : 8, 1786, (*non* Linn. *utscribit* Mukerjee). *Bonnaya oppositifolia* Spreng. Syst. 1 : 41, 1825 ; FBI 4 : 286 ; C. 2 : 370. *Ilysanthes oppositifolia* Urban in Berl. Deutsch. Bot. Ges. 2 : 435, 1884 ; G. 2 : 676.

Fl. & Fr. : August - September.

Loc. : GOA : *Pernem* : Chopodent near Agarvado. *Satari* : Codal forest area. *Salcete* : Raiyi village.

Occasional, in moist areas of cultivated fields.

**L. parviflora* (Roxb.) Haines, Bot. Bih. & Or. 635, 1922 ; S. (ed 3.) : 180. *Gratiola parviflora* Roxb. Pl. Cor. 3 : 3, t. 203, 1819. *Ilysanthes parviflora* Benth. : FBI 4 : 283 ; C. 2 : 296 ; G. 2 : 675.

Fl. & Fr. : August - November. Ill. Wt. Ic. t. 857 (*Bonnaya hyssopoides* Wt. *non* Benth.)

Loc. : NAGARHAVELI : Dhapsa ; Nana Randha ; Velugaon, Nana Randha ; Bank of Damanganga river on way to Kawcha.

L. tenuifolia (Vahl) Alston in Trim. Fl. Ceyl. 6, Suppl. 214, 1931. *Gratiola tenuifolia* Vahl, Enum. 1 : 95, 1804. *Bonnaya tenuifolia* Spreng.

*Added later, hence not included in the Key.

Syst. 1 : 42, 1824 ; FBI 4 : 286. *Ilysanthes tenuifolia* Haines, Bot. Bihar & Orissa, 634, 1922 ; G. 2 : 676.

Fl. : May.

Loc. GOA : *Satari* : Masarde village near Valpoi.

Rare, in rock crevices.

Lindernia viscosa (Hornem.) Boldingh, Zakfl. Landb. Java 165, 1916. *Gratiola viscosa* Hornem. Enum. Pl. Hort. Hafn. 19, 1807. *Vandellia hirsuta* Buch. Ham. ex Benth. Scroph. Ind. 36, 1835 ; FBI 4 : 280 ; C. 2 : 367 ; G. 2 : 673.

Fl. & Fr. : September.

Loc. : GOA : *Satari* : Pali village. *Sanguem* : Choraumdem. *Canacona* : Poinguinam.

Rare.

RHAMPHICARPA Benth.

Rhamphicarpa longiflora (Arn.) Benth. in Hook. Camp. Bot. Mag. 1 : 368, 1836 ; FBI 4 : 300 ; C. 2 : 377 ; G. 2 : 681 ; S. 164. Dangs. 32 ; Pav. 168. *Buchnera longiflora* Arnott in Nov. Act. Nat. Cur. 18 : 356, 1836.

Fl. & Fr. : August - September. *Ill.* : Wt. Ic. t. 1415.

Loc. : GOA : *Pernem* : Amberem. *Bicholim* : Bicholim-Ponda. *Satari* : Curchinum ; Caranzol ; Tonem. *Ithas* : Panjim. *Salcete* : Verna village. *Marmugao* : Vasco navy office plateau. *Sanguem* : Verlem. *Quepem* : Bali. *Canacona* : Tudal forest ; Castle rock on way to Anmod. DADRA.

Occasional, in open grassy meadows.

SCOPARIA Linn.

Scoparia dulcis Linn. Sp. Pl. 116, 1753 ; FBI 4 : 289 ; C. 2 : 383 ; G. 2 : 678 ; S. 165.

Fl. : August - November. *Fr.* : December - May.

Loc. : GOA : *Pernem* : Amberem. *Satari* : Masarde village ; Valpoi Administrator's office campus ; Nandore village along the rice fields ; *Satrem* ; Wadicha Dongar ; Kutachemal, Ivorem ; Nanecha Dongar (Codal). *Bardez* : Bastra. *Salcete* : Margao fields near rest house. *Sanguem* : Colem along railway line ; Curti village ; Molem - Belgaum Road 71 km ; Barazon ; Nondrena near Molem ; Bavanbunda, Molem - Belgaum Road. *Quepem* : Rivona - Colomba ; Castle rock on way to Anmod.

Common in moist shady areas, in rice fields and along railway line.

SOPUBIA Buch. Ham.

Sopubia delphinifolia (Roxb.) G. Don, Gen. Syst. 4 : 560, 1837 : FBI 4 : 302 ; C. 2 : 378 ; G. 2 : 682 ; S. 164. *Gerardia delphinifolia* Roxb. Pl. Cor. 1 : t. 90, 1795.

Fl. : August - November. *Fr.* : September - November.

Loc. : GOA : *Bardez* : Porvorim ; Porvorim rocky plateau. NAGARHAVELI : Morkhal ; Sindhoni forest ; Atal forest. DADRA. DAMAN : Marvor ; Bamoti.

Common, on gravelly plateau and in grasslands.

STEMODIA Linn. *nom. cons.*

Stemodia viscosa Roxb. Pl. Cor. 2 : 33, t. 163, 1798 & in Fl. Ind. 3 : 94, 1832 ; FBI 4 : 265 ; C. 2 : 359 ; S. 158 ; Dangs. 32 ; Pav. 165.

Fl. & Fr. : September. *Ill.* : Wt. Ic. t. 1408.

Vern. : Nukachuni (Guj.).

Loc. : NAGARHAVELI : Silvassa, along Damanganga river bank ; Chispara forest. DAMAN : Bimpur ; Dabel.

Occasional in wet places and cultivated fields.

STRIGA Lour.

- | | |
|---|---------------------|
| 1. Calyx 4 to 5 ribbed | |
| 2. Whole plant reddish-brown ; flowers pink | <i>gesnerioides</i> |
| 1. Calyx 10 to 15 ribbed | |
| 2. Whole plant green ; flowers white | <i>densiflora</i> |
| 3. Calyx 15 ribbed | <i>angustifolia</i> |
| 3. Calyx 10 ribbed | <i>lutea</i> |

Striga angustifolia (Don) Saldanha in Bull. bot. Surv. Ind. 5 : 70, 1963 ; Pav. 167. *Buchnera angustifolia* Don, Prodr. Fl. Nep. 91, 1825. *B. euphrasioides* Benth. Scroph. Ind. 41, 1835 (*non* Vahl, 1794.). *Striga euphrasioides* (Benth.) Benth. in Hook. Comp. Bot. Mag. 1 : 364, 1836 ; FBI 4 : 299 ; C. 2 : 376 ; S. 164 ; Dangs. 32.

Fl. : September. *Ill.* : Wt. Ic. t. 855.

Vern. : Dholo Aagiyo (Guj.).

Loc. : NAGARHAVELI : Khanvel. DADRA. DIU : Nagoa ; Gogale.

Occasional in grasslands and open meadows. The plant usually turns black on drying.

Striga densiflora (Benth.) Benth. in Hook. Comp. Bot. Mag. 1 : 363, 1836 ; FBI 4 : 299 ; C. 2 : 375 ; S. 163. *Buchnera densiflora* Benth. Scroph. Ind. 41, 1835.

Fl. & Fr. : September.

Loc. : DIU : Podamo.

Parasite on grasses. Usually in open grassy meadows.

S. gesnerioides (Willd.) Vatke in Oest. Bot. Zeitschr. 25 : 11, 1875 ; S. 152 ; Saldanha in Bull. bot. Surv. Ind. 5 : 68 ; Pav. 168. *Buchnera gesnerioides* Willd. Sp. Pl. 3 : 338, 1800. *Striga orobanchioides* (R. Br. ex Endl.) Benth. in Hook. Comp. Bot. Mag. 1 : 361, t. 19, 1836 ; FBI 4 : 299 ; C. 2 : 374.

Fl. & Fr. : September.

Loc. : DIU : Jalandhar ; Jalandhar-Diu road ; Castle area ; Nagoa.

The specimens are referable to var. *minor* Sant. (Kew Bull. 1948 : 491, 1949) which has a reduced stem under 8.5 cm tall and small flowers hardly 2.5-3.5 mm across. Parasite on *Lepidagathis* and *Hygrophila*, very often only a small portion of the stem is observed above the ground. Because of its tiny size, the plant often escapes the notice of the plant collectors.

S. lutea var. *lutea* Lour. Fl. Cochinch. 22, 1790 ; FBI 4 : 299 ; C. 2 : 375 ; G. 2 : 680 ; Saldanha in Bull. bot. Surv. Ind. 5 : 69. *Buchnera asiatica* Linn. Sp. Pl. 630, 1753, *p.p.* (*nom. rej.*). *Striga asiatica* Merr. Trans. Amer. Phil. Soc. 24 : 353, 1935, *non* O. Kuntze (1891).

Fl. & Fr. : August- November.

Vern. : Loghykurandika (Mar.) ; Dholo Agiyo, Agiya (Guj).

Loc. : GOA : *Bicholim* : Sangulim ; Amona ferry crossing. *Satari* : Pale ; Wagheri (Tanem) ; Ambechagol ; Walancha dongar (Caranzol) ; Kutachamal, Ivorem. *Bardez* : Agoada ; Porvorim ; Parvorim, rocky plateau ; Bastara. *Marmugao* : Nuvem hills. *Sanguem* : Dudal ; Talauli ; Surla ; Alduna (Netravali) ; Patrem ; Bati ; Nondrona, near Molem. *Canacona* : Butpal-Nadquem ; Chopedem ; Angidiv. NAGARHAVELI : Silvassa near Atal forest. DAMAN : Dundorta.

Plants with yellow flowers, common on hill slopes, rock crevices and grasslands.

S. lutea var. *albiflora* O. Kuntze, Rev. Gen. Pl. 2 : 466, 1891 ; Saldanha, *l.c.*, 5 : 69. *S. lutea* Hook. f. in FBI 4 : 299, 1884 ; C. 2 : 375 ; G. 2 : 680 all *p.p.* *S. asiatica* var. *albiflora* Sant. in Journ. Bomb. nat.

Hist. Soc. 49 : 44, 1950 & in Rec. bot. Surv. Ind. 16 (1) (ed. 2) : 163, 1960.

Fl. & Fr. : October.

Loc. : GOA : *Bicholim* : Usgao.

Plants with white flowers, rare in rice fields.

TORENIA Linn.

Stem erect or sub-erect ; calyx winged *indica*

Stem creeping ; calyx ribbed but not winged *bicolor*

Torenia bicolor Dalz. in Kew Journ. Bot. 3 : 38, 1851 ; FBI 4 : 278 ; C. 2 : 364 ; G. 2 : 672 ; S. 159.

Fl. & Fr. : September October.

Loc. : GOA : *Satari* : Codal forest ; Nanecha Dongar (Codal) Codal. *Ilhas* : Sukur village. *Canacona* : Ordofond - Butpal.

Occasional, in wet places.

T. indica Saldanha in Bull. bot. Surv. Ind. 8 : 126, f. 1, 1966. *T. cordifolia* auct. non Roxb. (Pl. Cor. 2 : 32, t. 161, 1802) : FBI 4 : 276 ; C. 2 : 364 ; G. 2 : 671 ; S. 159.

Fl. & Fr. : August October.

Loc. : GOA : *Satari* : Codal ; Satem ; Nanecha Dongar (Codal). *Ilhas* : Sukur village. *Marmugao* : Cortallam-Vasco. *Sanguem* : Potiem forests ; Evak (Patole-Netravali) ; Choraundem ; Bavanbunda, Molem-Belgaum Road. *Canacona* : Ordofond ; Butpal ; Poinguinam. NAGARHAVELI : Khanvel, near Khuntley forest.

*VERBASCUM Linn.

Verbascum chinense (Linn.) Santapau in Fl. Pur. 90, 1958 and in Rec. Bot. Surv. Ind. 16 (1) ed. 2 : 157, 1960 ; Pav. 163. *Scrophularia chinensis* Linn. Mant. 2 : 250, 1771. *Celsia coromandeliana* Vahl, Symb. Bot. 3 : 79, 1794 ; FBI 4 : 251 ; C. 2 : 352 ; Dangs. 32.

Fl. & Fr. : September. *Ill.* : Ic. t. 1406.

Vern. : Kalhar (Guj.)

Loc. : NAGARHAVELI : Dapara Chispana area Silvassa, along Damanganga river bank.

Rare in moist situations and in cultivated fields.

*Added later, hence not included in the Key.

Cult. species :

Digitalis purpurea Linn. Sp. Pl. 621, 1753 ; DG. 138.

This species, indigenous to Europe, was introduced and cultivated in Goa (Dalgado).

Torenia asiatica Linn. Sp. Pl. 619, 1753 ; FBI 4 : 277 ; DG. 137 ; C. 2 : 365.

Vern. : Kavlyacho dolo (Konk.).

Torenia asiatica Linn. is actually a native of China. The Linnaean reference to Rheede's Hort. Malab. 9 : 103, t. 53, 1698 and the Malayalam name "Kakapu" was interpreted to mean that this species is a native of Western India. Gamble in the Fl. Madras Presidency doubted its occurrence in the wild state and split up. *T. asiatica* Hook. f (FBI 4 : 277, 1844) into two distinct species, which is supported by Saldanha also (Bull. bot. Surv. Ind. 8 : 126, 1966). *Torenia asiatica* Linn. never grows in India and is only cultivated.

T. fournieri Linden ex Fourn. in Illustr. Hort. 23 : 129, t. 249, 1876 ; C. 2 : 365.

A native of Cochin China, often grown in gardens and found as an escape (Molem ; Sanguem, GOA).

OROBANCHACEAE

AEGINETIA Linn.

Aeginetia indica Linn. Sp. Pl. 632, 1753 ; FBI. 4 : 320 ; DG. 138 : C. 2 : 384 ; C. 2 : 685 ; S. 166 ; Dangs. 33.

Fl. : August October. *Fr.* : September October. *Ill.* : Wt. Ic. t. 895.

Vern. : Herva toira indiana (Port.).

Loc. : Goa : *Bicholim* : Colguirem. *Satari* : Maloli forests. *Bardez* : Porvorim forest. *Marmugao* : Vasco Cortallim. *Ponda* : Sanguem : Dudal-Sanguem. *Canacona* : 6 miles before Canacona ; Castle rock on way to Anmod ; Dudhsagar. NAGARHAVELI : Khuntly forest.

Common root parasite on *Terminalia*, grasses, *Adiantum*, *Leea*, *Syzygium* etc.

LENTIBULARIACEAE

UTRICULARIA Linn.

1. Aquatic, submerged plants ; flowers on long pedicels
1. Terrestrial plants

aurea

- | | |
|--|---------------------|
| 2. Leaves orbicular ; sepals very unequal ; seeds glochidiate ;
scape not twining | <i>striatula</i> |
| 2. Leaves linear ; sepals equal ; seeds reticulate ; scape
twining or erect | |
| 3. Scales and bracts of the scape attached by their base | |
| 4. Scapes erect | |
| 5. Pedicels recurved in fruit | <i>arcuata</i> |
| 5. Pedicels not recurved in fruit | |
| 6. Sepals acute ; lower lip of corolla
orbicular, entire | <i>uliginosa</i> |
| 6. Sepals acuminate ; lower lip of corolla
broadly ovate, reticulate | <i>graminifolia</i> |
| 4. Scapes twining | <i>reticulata</i> |
| 3. Scales and bracts of the scape attached by their middle | <i>caerulea</i> |

Utricularia arcuata Wight, in Hook. Kew Journ. 1 : 372, 1849 and Icon. t. 1571, f. 1, 1850 ; FBI 4 : 330 ; C. 2 : 391 ; G. 2 : 689. S. 188 (3rd edn.).

Fl. : August October. *Fr.* : September November. *Ill.* : Wt. Ic. 1571, f. 1.

Loc. : GOA : *Sanguem* : Surla ; Dudhsagar.

U. aurea Lour. Fl. Cochinch. 26, 1790. *U. flexuosa* Vahl, Enum. 1 : 198, 1805 ; FBI 4 : 329 ; C. 2 : 390 ; G. 2 : 689.

Fl. : November. *Ill.* : Wt. Ic. t. 1568.

Loc. : GOA : *Salcete* : Lake near Chinchinum.

Rare.

U. caerulea Linn. Sp. Pl. 18, 1753 ; G. 2 : 691. *U. racemosa* Wall. Cat. 1496, 1829 ; FBI 4 : 333. *U. nivea* Vahl, Enum. 1 : 203, 1805 ; C. 2 : 392.

Fl. : September. *Ill.* : Wt. Ic. tt. 1582, 1583.

Loc. : GOA : *Bicholim* : Between Bicholim and Ponda. *Sanguem* : Near Anwaldem (Molem) ; Molem Belgaum Road 62 km. DADRA.

Rare, along with *Drosera* sp. and grasses.

U. graminifolia Vahl, Enum. 1 : 195, 1804 ; G. 2 : 690. *U. caerulea* C.B. Cl. in FBI 4 : 331, 1884, non Linn. ; C. 3 : 392

Fl. & Fr. : September January. *Ill.* : Wt. Ic. tt. 1573 ; 1575 ; 1578, f. 2. (under other species of *Utricularia*).

Loc. : Dudhsagar.

The species grows in Goa area also.

U. reticulata Smith, Exot. Bot. 2 : t. 119, 1805 ; FBI. 4 : 331 ; DG. 138 ; C. 2 : 393 ; G. 2 : 690 ; S. 167.

Fl. : August October. *Fr.* : October November. *Ill.* : Wt. Ic. t. 1574 ; Wt. Ill. t. 143.

Vern. : Kavlyachya dolyachi vel (Konk.).

Loc. : GOA : *Bardez* : Agarvada, Pernem. *Ilhas* : Rice fields near Santacruz village. *Salcete* : Paddy fields, Verna Peternum ; Ballai Verna plateau ; Vernem. *Sanguem* : 15 km before Darbandora ; Castle rock on way to Anmod. *Canacona* : Angidiv.

Occasional, along with *Eriocaulon*, *Murdannia* etc., twining among grasses.

U. striatula Smith in Rees, Cyclop. 37 : no. 17, 1819 ; C. 2 : 393 ; G. 2 : 691 ; S. 168. *U. orbiculata* Wall. Cat. 1500, 1828 ; FBI 4 : 334.

Fl. : August. *Ill.* : Wt. Ic. t. 1581 (under *U. glochidiata*)

Loc. : GOA : *Sanguem* : Vibiyam forest, 13 km south of Sanguem ; Periche Tam (Cumbari). *Canacona* : Canacona-Margoa.

Rare, on moist tree trunks. An elegant annual, easily recognised in the field.

U. uliginosa Vahl, Enum. 1 : 203 ; 1804 ; G. 2 : 689 ; S. 188 (3rd ed.)
U. affinis Wight, Icon. t. 1580, f. 1, 1850 ; FBI 4 : 330 ; C. 3 : 392.

Fl. : September December. *Ill.* : Wt. Ic. 1578. f. 1 ; 1580, f. 1.

Loc. : GOA : *Satari* : Wagheri (Tanem). *Sanguem* : Molem Belgaum Road 62 km ; Ravanacha Dongar (Verlem) ; Suria.

Occasional.

GESNERIACEAE

Glabrous herbs ; leaves alternate, elliptic, acuminate, unequal-sided ; flowers in racemes

Rhynchosyris

Pubescent herbs ; lower leaves alternate, upper opposite, broadly elliptic, obtuse ; flowers in scorpioid cymes

Epithema

EPITHEMA Blume

Epithema carnosum Benth. Scroph. Ind. 57, 1835, var. *hispida*
C.B. Cl. in DC. Monogr. 5 : 178, 1883 ; FBI 4 : 369 ; C. 2 : 399 ; G. 2 : 697.

Fl. & Fr. : August. *Ill.* : Wt. Ic. t. 1354.

Loc. : GOA : *Sanguem* : Durgin hills.

Rare, on moist granite soil.

RHYNCHOGLOSSUM Blume

- | | |
|----------------------|---|
| 1. Perfect stamens 4 | <i>notonianum</i> |
| 1. Perfect stamens 2 | <i>obliquum</i> var. <i>parviflorum</i> |

Rhynchoglossum notonianum (Wall.) B.L. Burtt in Not. Roy. Bot. Gard. 24 (2) : 170, 1962. *Wulfenia notoniana* Wall. Tent. Fl. Nepal 46, 1826. *Klugia notoniana* (Wall.) A. DC. in DC. Prodr. 9 : 276, 1845 ; FBI 4 : 366 (incl. vars. *glabra* & *scabra*) ; C. 2 : 397 ; G. 2 : 696 ; S. 169.

Fl. : September - October. *Ill. Wt. Icon.* t. 1353 & *Ill.* t. 159.

Loc. : GOA : *Bicholim* : Bicholim. *Satari* : Pale village Valpoi ; Codal ; Nandore, Valpoi ; Nanecha Dongar (Codal) ; Golauli ; Valpoy. *Sanguem* : Choraudem ; Netravali ; Molem - Belgaum Road, 65 km ; Dudhsagar.

Rare in moist, shady, waste areas.

R. obliquum Bl. Bijdr. 741, 1826, var. **parviflorum** C.B. Cl. in DC. Mon. Phan. 5 : 162, 1883 ; FBI 4 : 367 ; C. 2 : 398 ; S. 169. *R. obliquum* DC. Prodr. 9 : 274, 1845, *pro parte*.

Fl. : July - November. *Fr.* : August - December. *Ill. Wt. Ill.* t. 150 bis. f. 7.

Loc. GOA : *Satari* : Satrem.

Rare in moist places.

BIGNONIACEAE

- | | |
|--|----------------------|
| 1. Perfect stamens 4 | |
| 2. Leaves bipinnate | <i>Radermachera</i> |
| 2. Leaves simple pinnate | |
| 3. Corolla yellow tinged with purple ; capsule curved or more or less spirally twisted | <i>Stereospermum</i> |
| 3. Corolla rosy - white ; capsule straight, linear, pointed | <i>Heterophragma</i> |
| 1. Perfect stamens 5 | <i>Oroxylum</i> |

HETEROPHRAGMA DC.

Heterophragma quadriloculare (Roxb.) K. Schum. in Pflanzenf. 4 (3b) : 243, 1895 ; S. 170 ; Dangs. 33. *Bignonia quadrilocularis* Roxb. Pl. Cor. 2 : 24, t. 145, 1800. *Heterophragma roxburghii* A. DC. Prodr. 9 : 210, 1845 ; FBI 4 : 381 ; DG. 139 ; C. 2 : 404 ; T. 2 : 311 ; G. 2 : 701.

Fl. : January - April. *Ill.* : T. f. 437.

Vern. : Murus, Panlag (Mar.) ; Adwi muggi (Kan.) ; Varas (Konk.).

Loc. : GOA : *Canacona* : Angidiv. NAGARHAVELI: Dudhari to Biddhari forest ; Velugaon ; Atola forest ; Barpam forest near Mandoni ; Dolara forest.

Rare, in the deciduous forest along ghat areas. The soft wood is used for fuel only.

OROXYLUM Vent.

Oroxylum indicum (Linn.) Vent. Dec. Gen. Nov. 9, 1808 ; FBI 4 : 378 ; DG. 139 ; C. 2 : 401 ; T. 2 : 306 ; G. 2 : 698 ; S. 169 ; Dangs. 33. *Bignonia indica* Linn. Sp. Pl. 625, 1753.

Fl. : May July. *Ill.* : Wt. Ic. tt. 1337 38.

Vern. : Tetu (Mar.) ; Davamdak (Konk.) ; Aralu, Podaval (Guj.).

Loc. : NAGARHAVELI ; Carchond forest ; Nana Randha.

Common in the evergreen forest of Concan and Kanara ghats and hence could also be located in the GOA area. The root bark is used in native medicine.

RADERMACHERA Zoll. & Moritz.

Radermachera xylocarpa (Roxb.) K. Schum. in *Pflanzenf.* 4(3b) : 243, 1895 ; C. 2 : 407 ; G. 2 : 702 ; S. 171. *Bignonia xylocarpa* Roxb. *Fl. Ind.* 3 : 108, 1832. *Stereospermum xylocarpum* Benth. & Hook. *Gen. Pl.* 2 : 1047, 1876 ; FBI 4 : 383 ; DG. 139 ; T. 2 : 315.

Fl. : April. *Ill.* : Wt. Ic. tt. 1335 & 1336.

Vern. : Kharsing (Mar.) ; Genasing (Kan.).

Loc. : GOA : *Canacona* : Tudal Ordofond. NAGARHAVELI : Jamunpada forest.

Rare.

STEREOSPERMUM Cham.

Branches glabrous ; corolla yellow, tinged with purple ; capsule sub-quadrangular

personatum

Branches viscidly hairy ; corolla dull purple ; capsule cylindrical

suaveolens

Stereospermum personatum (Hassk.) Chatterjee in *Bull. Bot. Soc. Beng.* 2 : 70, 1948 ; S. 171. Dangs. 34. *Dipterosperma personatum* Hassk.

in Flora 25 (2), Beibl. 28, 1842. *Stereospermum chelonoides* auct. non nisi partim A. DC.

Fl. : April.

Vern. : Hadaii (Kan.) ; Kirsal (Mar.) ; Patala (Guj.).

Loc. : GOA : *Satari* : Codal Satrem road, 5 km. *Sanguem* : Sidh forest ; *Nadquem*. *Canacona* : Tudal Ordofond.

Rare, along the roadside.

S. suaveolens (Roxb.) DC. Prodr. 9 : 211, 1845 ; FBI 4 : 382 ; DG. 139 ; C. 2 : 406 ; T. 2 : 314 ; G. 2 : 701. *Bignonia suaveolens* Roxb. Fl. 3 : 104, Ind. 1832.

Fl. : March April. *Ill.* : Wt. Ic. t. 1342.

Vern. : Parul (Mar.) ; Kusgo (Konk.).

Common, along Western ghats and reported by Dalgado also, hence included in this work.

Cult. species :

Millingtonia hortensis Linn. f. Suppl. 291, 1781 ; FBI 4 : 377 ; DG. 138 ; C. 2 : 409 ; T. 2 : 318.

Fl. : October December. *Ill.* : T. f. 441.

Vern. : Akarnum (Mar.) ; Akasnimb (Konk.) ; Millingtonia (Port.).

Planted as an avenue tree. Planted for its fragrant flowers.

PEDALIACEAE

Flowers yellow ; fruits with 4 spines on the margin ; seeds 2 in each cell

Pedalium

Flowers pink or purplish ; fruits without spines ; seeds many in each cell

Sesamum

PEDALIUM Linn.

Pedalium murex Linn. Syst. Nat. (ed. 10) 1123, 1759 ; FBI 4 : 386 ; C. 2 : 412 ; G. 2 : 704.

Fl. : September October. *Ill.* : Wt. Ic. t. 1615.

Vern. : Kadvaghokru (Guj.).

Loc. : DAMAN : Doler. DIU : Jalandhar-Diu road ; Gogale.

Rare, in open sandy soil.

SESAMUM Linn.

Pods abruptly and shortly beaked ; seeds smooth *indicum*

Pods acuminate into a beak ; seeds conspicuously reticulately rugose *mulayanum*

Sesamum indicum Linn. Sp. Pl. 634, 1753 ; FBI 4 : 387 ; DG. 140 ; C. 2 : 413 ; G. 2 ; 704 ; S. 172.

Fl. : August - October. *Fr.* : October - November.

Vern. : Til (Mar.) ; Ellu (Kan.) ; Dhavo til (Konk.) ; Gergilim (Port.).

Loc. : GOA : *Satari* : Onda. *Bardez* : Bardez : Baga jungle ; Borim ; Palim (Bastra). *Ilhas* : Panaji. *Salcete* : Rajyi village. *Marmugao* : Plateau near Vasco Navy office. *Sanguem* : Savardem. *Quepem* : Bali Quepem. *Canacona* : Angidiv. NAGARHAVELI : Khanvel. DAMAN : Dundorta ; Fort area ; Dongarpad Umberkoi.

Common on hill slopes as escapes from cultivation. Oil extracted from seeds is the commercial Gingely oil.

S. mulayanum Nair in Bull. Bot. Surv. Ind. 5 (3-4) : 251, 1963.

Fl. & Fr. : September. *Ill.* : Bull. Bot. Surv. Ind. 5 (3 & 4) : 252, f. 1, 1963.

Loc. : GOA : *Satari* : Volpoi ; Caranzol. *Sanguem* : Barazon. DIU : Jalandhar Diu road.

Rare in waste places. In the herbaria, often confused with *Sesamum indicum* Linn. Fairly widespread throughout India.

MARTYNIACEAE

MARTYNIA Linn.

Martynia annua Linn. Sp. Pl. 618, 1753 ; Dangs. 34. *M. diandra* Glox. Obs. Bot. 14, t. 1, 1785 ; FBI 4 : 386 ; C. 2 : 414.

Fl. : September.

Vern. : Vinchhido (Guj.). *Ill.* : Tadulingam & Venkatanarayana in Handb. Some South Indian Weeds, t. 123, f. 1-4, 1955 ; Backer in Fl. Males. ser. 1, 4 (3) : 221, f. 3, 1951.

Loc. : NAGARHAVELI : Dapara area. DAMAN : Fort area. DIU : Jhoola ; Gogale.

Occasional on waste places and along roadside.

ACANTHACEAE

- | | |
|---|-----------------------|
| 1. Climbers ; calyx minute, 10 to 15 - toothed | <i>Thunbergia</i> |
| 1. Erect or prostrate herbs or shrubs | |
| 2. Seeds not supported on hard retinacula | |
| 3. Calyx 4 - partite ; stamens 2 | <i>Nelsonia</i> |
| 3. Calyx 5 - partite ; stamens 4 | <i>Staurogyne</i> |
| 2. Seeds supported on hard, upward curved retinacula | |
| 4. Corolla without upper lip ; lower lip large, expanded, 3 - lobed | |
| 5. Suberect or prostrate herbs, rooting at nodes; leaves entire or dentate not spinous | <i>Blepharis</i> |
| 5. Erect shrubs ; leaves pinnatifid, spinous (mangrove) | <i>Acanthus</i> |
| 4. Corolla bilipped or with 5 subequal lobes | |
| 6. Corolla lobes twisted to the left in bud | |
| 7. Ovules more than 2 in each cell ; capsule with 6 or more seeds | |
| 8. Inflorescence spinous or not ; corolla distinctly 2 - lipped | <i>Hygrophila</i> |
| 8. Inflorescence never spinous ; corolla subequally 5 - lobed | |
| 9. Inflorescence of elongate spike - like clusters | <i>Hemigraphis</i> |
| 9. Inflorescence of single, axillary flowers or in triads | <i>Dipteracanthus</i> |
| 7. Ovules 2 in each cell ; capsule with 4 or less seeds | |
| 10. Corolla deeply 2 - lipped | <i>Calacanthus</i> |
| 10. Corolla subequally 5 - lobed | |
| 11. Corolla tube linear, long, slender ; stamens 2 | <i>Eranthemum</i> |
| 11. Corolla tube narrow below, usually infundibuliform upwards ; stamens 4 | |
| 12. Inflorescence terminal spicate, short, becoming paniculate by the shortening of the branches; pollen grains globose | <i>Thelepaepale</i> |
| 12. Inflorescence axillary and terminal, simple or compound spikes ; pollen grains ellipsoid | |

- 13. Bands on the grains septate *Carvia*
- 13. Bands on the grains punctate
- 14. Bracts simple hairy ; leaves broadly elliptic, acuminate, base cuneate *Nilgirianthus*
- 14. Bracts glandular hairy ; leaves elliptic-lanceolate, much acuminate, base decurrent into the petiole *Mackenzia*
- 6. Corolla lobes imbricate in bud
 - 15. Ovules 3 to 10 in each cell ; capsule normally with 6 or more seeds
 - 16. Flowers axillary, pseudo - verticillate, surrounded by spinelike cladodes *Bremekampia (Haplantodes)*
 - 16. Flowers in axillary cymes or terminal panicles, often spikate, without cladodes
 - 17. Capsule subterete ; seeds much compressed *Gymnostachyum*
 - 17. Capsule compressed ; seeds ovoid, hardly compressed *Andrographis*
 - 15. Ovules 2 or rarely 1 in each cell
 - 18. Corolla sub - equally 5 - lobed
 - 19. Calyx segments 4 *Barleria*
 - 19. Calyx segments 5
 - 20. Calyx 2 - lipped *Neuracanthus*
 - 20. Calyx subequal
 - 21. Stamens 4 ; corolla tube inflated above *Asystasia*
 - 21. Stamens 2 ; corolla tube slender *Pseuderanthemum*
 - 18. Corolla distinctly bilabiate
 - 22. Stamens 4 *Lepidagathis*
 - 22. Stamens 2
 - 23. Placentae separating elastically from the valves from the base upwards

24. Flowers in terminal or axillary, 1 sided spikes ; bracts with scarious margins *Rungia*
24. Flowers in terminal or axillary clusters or paniculate, often in umbel-like cymes ; bracts not scarious margined *Dicliptera*
23. Placentae not separating from the valves
25. Anther cells parallel, sub-equal ; bracts large, imbricate *Ecbolium*
25. Anther cells one higher than the other
26. Anther cells with a white basal spur-like appendage *Justicia*
26. Anther cells not spurred
27. Anther cells apiculate *Adhatoda*
27. Anther cells muticous
28. Bracts and bracteoles small ; flowers white *Rhinacanthus*
28. Bracts larger than bracteoles ; flowers pink or purple *Peristrophe*

ACANTHUS Linn.

Acanthus ilicifolius Linn. Sp. Pl. 639, 1753 ; FBI 4 : 481 ; DG. 141 ; C. 2 : 427 ; T. 2 : 335 ; G. 2 : 712 ; V. 31.

Fl. : April May. *Ill.* : Wt. Ic. t. 459.

Vern. : Marandi (Mar.) ; Holechulli (Kan.) ; Moramdo (Konk.).

Loc. : GOA : *Bicholim* : Ammona ferry crossing, muddy bank of river GOA. *Bardez* : Kolvelly ferry crossing ; *Borim* Zueri river. *Ilhas* :

Panaji, bank of river Mandovi. *Ponda* : Ponda Margao, near Borim bridge. DAMAN : Coileque area.

Common along the coast in marshy, saline and back water areas.

ADHATODA Nees

Adhatoda vasica (Linn.) Nees in Wall. Pl. As. Rar. 3 : 103, 1832 ; FBI f. 540 ; DG. 143 ; C. 2 : 493 ; T. 2 : 340 ; G. 2 : 758 ; S. 186 ; Dangs. 34 ; Pav. 184. *Justicia adhatoda* Linn. Sp. Pl. 15, 1753.

Fl. : November April. *Ill.* : T. f 448.

Vern. : Adulsa (Mar.) ; Adsale (Kan.) ; Adaso (Konk.) ; Noyer des Indes (Port.).

Loc. : GOA : *Pernem* : Tamboxim. *Canacona* : Ordofond. NAGARHAVELI : Silvassa. DAMAN : Varacunda.

Occasional near the villages, probably planted, also grown in gardens as a hedge plant. The roots and leaves are used in medicine.

ANDROGRAPHIS Wall.

Leaves acute, glabrous ; racemes laxly paniced ; capsule glabrous

paniculata

Leaves obtuse, hairy ; racemes axillary, not paniced ; capsule hairy

echioides

Andrographis echioides (Linn.) Nees in Wall. Pl. As. Rar. 3 : 117, 1832 ; FBI 4 : 505 ; C. 2 : 451. *Justicia echioides* Linn. Sp. Pl. 16, 1753.

Fl. & Fr. : September. *Ill.* : Wt. Ic. t. 467 ; Tadulingam & Venkatanarayana, in Handb. Some South Indian Weeds, t. 127, f. 1 - 6, 1955.

Loc. : DIU : Nagoa ; Castle area ; Nagoa, near Airport.

Rare, locally abundant.

A. paniculata (Burm.) Wall. ex Nees in Wall. Pl. As. Rar. 3 : 116, 1832 ; FBI 4 : 501 ; DG. 142 ; C. 2 : 541 ; G. 2 : 734. *Justicia paniculata* Burm. Fl. Ind. 9, 1768.

Fl. : December. *Ill.* : Wt. Ic. t. 518.

Vern. : Kreat (Mar.) ; Vhadlem kiraytem (Konk.) ; Chirayta (Port.).

The plant is used in medicine as a bitter tonic and febrifuge. Dalgado

records it for Goa and this species is also common in areas adjoining Goa.

ASYSTASIA Blume

- | | |
|--|--------------------|
| Branches and leaves green, glabrous or slightly pubescent ;
leaves usually decurrent on the petiole | <i>dalzelliana</i> |
| Branches and leaves grey puberulous ; leaves usually rounded,
subcordate or suddenly narrowed at base | <i>gangetica</i> |

Asystasia dalzelliana Santapau in Kew Bull. 1948 : 276, 1948 & in Rec. Bot. Surv. India 16 (1) ed. 2 : 181, 1960 ; S. 181. *A. violacea* Dalz. MS. ex C.B. Cl. in FBI 4 : 494, 1884 ; C. 2 : 467 ; G. 2 : 745. (*non* Dalz., 1850).

Fl. & Fr. : September-October.

Loc. : GOA : *Bardez* : Porvorim. *Salcete* : Margao. *Sanguem* : Organe (Netraveli). *Quepem* : Bali. *Canacona* : Butpal. NAGARHAVELI : Khanvel.

Occasional, on rocky slopes in shady areas alongwith *Chlorophytum*.

A. gangetica (Linn.) T. Anders. in Thwait. Enum. 235, 1859 ; G. 2 : 744 ; S. 181. *Justicia gangetica* Linn. Amoen. Acad. 4 : 299, 1759. *Asystasia coromandeliana* Wight ex Nees in Wall. Pl. AS. Rar. 3 : 89, 1832 ; FBI 4 : 493 ; DG. 142 ; C. 2 : 466.

Fl. : November February. *Fr.* : March April. *Ill.* : Wt. Ic. t. 1506.

Loc. : GOA. : *Satari* : Nanecha Dongar, Codal Ambechagol. *Canacona* : Chalmimelo, Tudal ; Brahmanadi, Nadquem.

Common on moist sandy areas. Sometimes cultivated in the gardens.

BARLERIA Linn.

- | | |
|--|--|
| 1. Shrubs or undershrubs with sharp intrapetiolar spines ;
usually whitish | <i>prionitis</i> |
| 1. Shrubs or undershrubs without spines | |
| 2. Flowers large, solitary in upper leaf axils ; seeds glabrous | <i>pratensis</i> |
| 2. Flowers in dense, strigosely hairy spikes ; seeds hairy | |
| 3. Outer calyx lobes spinous ciliate, prominently nerved
and reticulate, at length white ; bracts linear ;
flowers white | <i>cristata</i>
var. <i>dichotoma</i> |

3. Outer calyx lobes not spinous ciliate, denticulate, strigosely hairy, green; bracts ovate or lanceolate; flowers pale blue

strigosa
var. *terminalis*

Barleria cristata Linn. var. *dichotoma* (Roxb.) Prain, Beng. Pl. 812, 1903; C. 2 : 460; T. 2 : 336. *B. dichotoma* Roxb. Fl. Ind. 3 : 39, 1832.

Fl. & Fr. : October - December.

Vern. : Kuruvaka (Kan.).

Loc. : GOA : *Ponda* : Verem. *Canacona* : Poinguinam.

Rare, probably an escape from cultivation.

B. prattensis Santapau in Kew Bull. 1948 : 487, 1948 & in Rec. Bot. Surv. India, 16 (1) ed. 2 : 179, 1960, Dangs. 35; Pav. 179.

Fl. : October. *Ill.* : Univ. Bomb. Bot. Mem. 2 : tab. opp. p. 62, 1952.

Loc. : GOA : *Bardez* : Arvolam. *Salcete* : Goodier 2 km beyond Margao on way to Quepem. *Canacona* : Butpal, Kanpal hill top; Maxem Ghat. *Sanguem* : Foot of the hill, patiem. NAGARHAVELI : Morkhal; Umberkoi Dongarpad forest; Dudhri Bildhari forest; Saily; Khanvel; Dolara.

Occasional along forest edges, as undergrowth. Closely allied to *Barleria montana* and *B. gibsoni*. Though common in Peninsular India it has often been misidentified as *B. montana*, hence the rarity. Actually Beddome's Ic. t. 257 represents this species.

B. prionitis Linn. Sp. Pl. 636, 1753; FBI 4 : 482; DG. 141; C. 2 : 457; T. 2 : 335; G. 2 : 741; S. 178. Dangs. 35; Pav. 179.

Fl. : March - April. *Ill.* : Wealth of Ind. 1 : t. 24, f. 1.

Vern. : Pivalikuranti (Mar.); Mullugorante (Kan.); Koramti (Konk.); Kantashilia (Guj.).

Loc. : GOA : *Satari* : Bhatwadi near Nandore. *Canacona* : Bansare village, near Tudal. DAMAN : Fort area. DIU : Jalandhar; Nagoa.

Occasional in waste places near the villages.

B. strigosa Willd. var. *terminalis* (Nees) Clarke in FBI 4 : 490, 1884; C. 2 : 462; T. 2 : 336; S. 179. *Barleria terminalis* Nees in DC. Prodr. 11 : 225, 1847.

Fl. : October - December. *Fr.* : December - March.

Loc. : GOA : *Satari* : Codal. *Ponda* : Ponda Margoa, 8 km point. *Sanguem* : Molem, Avelde jungle; Verlem; Charasuria ghats (Netravali). *Canacona* : Butpal, Kanpal hill top; Badsare Wagal forest.

Frequent in open situations.

BLEPHARIS JUSS.

1. Leaves in opposite pairs *asperrima*
 1. Leaves 4 in a whorl *maderaspatensis*

Blepharis asperrima Nees in DC. Prodr. 11: 267, 1847; FBI 4: 478; C. 2: 424; G. 2: 712; S. 173.

Fl.: October–November. *Ill.*: Wt. Ic. t. 1534.

Loc.: GOA: *Bardez*: Betim Bardez; Betim hills. *Salcete*: Goodier, 2 km beyond Margao on way to Quepem. *Sanguem*: Molem Ponda; Molem; Chasuria ghats (Netravali). *Quepem*: Budsari Goundurgarha. *Canacona*: Polem. NAGARHAVELI: Dolara; Khanvel; Jamunpada forest; Sindhoni forest; Charchond forest; Umberkoi Dongarpad forest.

Common, undergrowth in the forests and along rocky slopes.

B. maderaspatensis (Linn.) Heyne ex Roth Nov. Pl. Sp. 320, 1821. *Acanthus maderaspatensis* Linn. Sp. Pl. 892, 1753. *Blepharis boerhaviaefolia* Pers. Syn. Pl. 2: 180, 1806; FBI 4: 478; C. 2: 424; G. 2: 712.

Fl.: September–January. *Ill.*: Wt. Ic. t. 458.

Loc.: NAGARHAVELI: Morkhal; Dongarpad Umberkoi.

*¹BREMEKAMPPIA Sreem.

Cladodes stout, villous and glandular hairy; capsules glabrous *verticillata*
 Cladodes slender, villous with soft, long hairs capsules
 pubescent *neilgherryensis*

*²**Bremekampia neilgherryensis** (Wt.) Sreem. in Bull. bot. Surv. Ind. 6 (2–4): 323, 1964. *Haplanthus neilgherryensis* Wt. Ic. 4 (4): 7, t. 1556, 1850; G. 2: 737; S. 178. *H. tentaculatus* Nees var. *neilgherryensis* C. B. Cl. in FBI 4: 507, 1884. *H. tentaculatus* Nees in DC. Prodr. 11: 513, 1847; DG. 142; C. 2: 453, p. p.; V. 82.

Fl.: March–April. *Ill.*: Wt. Ic. t. 1556.

Vern.: Jhankara (Mar.); Vhadlem kalem kiraytem (Konk.).

Loc.: GOA: *Satari*: Kawaliyan forest near Nandore. *Canacona*: Barsare village near Tudal; Barsare Wagai hill forest. NAGARHAVELI: Jamunpada forest; Velugaon; Sindhoni forest; Dongarpad Umberkoi. DAMAN: Fort area.

Occasional in dry situations usually in the undergrowth of the forests towards the margins.

*³*B. verticillata* (Roxb.) Sreem. in Bull. bot. Surv. Ind. 6 (2 4) : 323, 1964. *Justicia verticillata* Roxb. Fl. Ind. 1 : 135, 1832. *Haplenthus verticillatus* (Roxb.) Nees in DC. Prodr. 11 : 513, 1847 ; FBI 4 : 506 ; DG. 142, C. 2 : 452 ; G. 2 : 737 ; S. 177.

Fl. : November December.

Vern. : Jhankara (Mar.) ; Kalem kivaytem (Konk.) ; Kaly karujatum (Guj.).

Loc. : NAGARHAVELI : Jamunpada forest ; Carchond forest ; Morkhal ; Berpam forest, near Mandoni.

Rare, as forest undergrowth.

CALACANTHUS T. Anders.

Calacanthus grandiflorus (Dalz.) Radlk. in Sitz. Math. Phys. Acad. Muench. 13 : 279, 1883 ; S. 199 (3rd ed.). *Lepidagathis grandiflora* Dalz. in Kew Jour. Bot. 2 : 138, 1850. *Calacanthus dalzelliana* Anders. ex Benth. & Hook. Gen. Pl. 2 : 1088, 1876 ; FBI 4 : 478 ; C. 2 : 450 ; G. 2 : 732.

Fl. : October December. Fr. : November January. Ill. : Bedd. Icon. Pl. 54, t. 226.

Loc. : GOA : Sanguem : Verlem.

A gregarious shrub in shady areas.

CARVIA Brem.

Carvia callosa (Nees) Bremk. in Mat. Mon. Strob. 187, 1944. *Strobilanthes callosus* Nees Pl. As. Rar. 3 : 85, 1832 ; FBI 4 : 451 ; C. 2 : 444 ; S. 199 (3rd ed.) *S. grahamianus* Wt. Icon. t. 1520, 1850.

Fl. : August November. Fr. : December - June. Ill. : Wt. Ic. 1520.

*1 *Bremekampia* Sreem. becomes *nomen. illigit. superfl.* as the validly published earlier name. *Haplantodes* O. Ktze. is available (O. Kuntze & Post, Lexicon, 265, 1903).

*2 *Haplantodes neilgherryensis* (Wt.) Majumdar in Bull. bot. Soc. Bengal 25 ; 76, 1971.

*3 *H. verticillatus* (Roxb.) Majumdar *l.c.*, 76. G. Panigrahi and G. C. Das (Madras Herbarium 125th Ann. Souvenir, 43, 1978) indicate that the new combinations of Majumdar are revalidated by them.

Vern. : Karvi (Mar. & Konk.)

Loc. : GOA : *Sanguem* : Surla. NAGARHAVELI : Dongarpad - Umberkoi.

Dense undergrowth along the hilly slopes. A very showy plant when in flower.

DICLIPTERA JUSS. *nom. cons.*

Corolla 5 mm long ; capsules pubescent at the apex ; bracts 1.5 mm broad *micranthes*

Corolla 18 mm long ; capsule pubescent all over ; bracts nearly 13 mm broad *zeylanica*

Dicliptera micranthes Nees in Wall. Pl. As. Rar. 3 : 112, 1832. FBI 5 : 553 ; C. 2 : 481.

Fl. & Fr. : October.

Loc. : NAGARHAVELI : Dhapsa.

D. zeylanica Nees in DC. Prodr. 11 : 474, 1847 ; FBI 4 : 552 ; C. 2 : 482 ; G. 2 : 752 ; S. 184.

Fl. & Fr. : March May. *Ill.* : Wt. Ic. t. 1551.

Loc. : GOA : *Satari* : Masarde village near Valpoi ; Vangiri rice fields, 3 miles north east of Nandore. *Sanguem* : Talauli. *Canacona* : Barsare village near Tudal.

Occasional in wet shady areas.

DIPTERACANTHUS Nees emend. Bremek.

Prostrate or climbing ; leaves acute ; capsule pubescent *prostratus*

Suberect or erect ; leaves obtuse ; ovary and capsule glabrous *patulus*

Dipteracanthus patulus (Jacq.) Nees in Wall. Pl. As. Rar. 3 : 82, 1832. *Ruellia patula* Jaxq. Misc. Bot. 2 : 358, 1781 ; FBI 4 : 412 ; C. 2 : 432.

Fl. : September October. *Ill.* : Wt. Ic. t. 1505.

Loc. : DAMAN : Fort area. DIU : Jalandhar ; Castle area ; Nagoa, near Airport ; Rocky crevices, Nagoa.

Rare, in rock crevices.

D. prostratus (Poir.) Nees in Wall. Pl. As. Rar. 3 : 81, 1832 ; S. 174 ; Dangs. 36 ; Pav. 176. *Ruellia prostrata* Poir. in Lam. Encycl. 6 : 349, 1804 ; FBI 4 : 411 ; DG. 140 ; G. 2 : 714. *R. prostrata* var. *dejecta* C.B. Clarke in FBI 4 : 412, 1884 ; C. 2 : 431.

Fl. : September - October. *Fr.* : March. *Ill.* : Bedd. Ic. t. 282.

Vern. : Kali Dhraman, Kalighavani (Guj.).

Loc. : GOA : *Marmugao* : Cortallim Vasco. *Sanguem* : Sanguem area. NAGARHAVELI : Dhapsa ; Khanvel ; Atal forest area and surroundings. DAMAN : Fort area.

Occasional along roadside.

ECBOLIUM Kurz

Ecbolium viride (Forsk.) Alston var. *laetevirens* (Clarke) Sant. in Rec. Bot. Surv. India, 16 (1), ed. 1 : 185, 1960. *Ecbolium lineanum* Kurz var. *laetevirens* Clarke in FBI 4 : 545, 1885 ; DG. 143 ; C. 2 : 484 ; G. 2 : 752 ; S. 185.

Fl. & Fr. : September - November. *Ill.* : Wealth of Ind. 3 : f. 71.

Vern. : Dhakta adulsa (Mar.) ; Kappubobbuli (Kan.) ; Ranaboli (Konk.) ; Abolim azul (Port.).

Loc. : *Satari* : Near Poda village, Valpoi ; Satrem ; Nanecha Dongar (Codal). *Bardez* : Sukur forests. *Canacona* : Poinguinam ; Bicholim.

Occasional.

ERANTHEMUM Linn.

Bracts ovate, obtuse, mucronate or shortly apiculate, densely hairy on the midrib ; panicles uninterrupted, often simple

roseum

Bracts lanceolate, obtusely acuminate, viscidly glandular, hispid ; panicles compound, interrupted

capense var. *concanensis*

Eranthemum capense Linn. var. *concanensis* (T. Anders.) Sant. in Univ. Bomb. Bot. Mem. 2 : 34, 1952. *Daedalacanthus concanensis* T. Anders. MS. in T. Cooke Fl. Pres. Bombay 2 : 365, 1905. *D. montanum* var. *concanensis* C.B. Cl. in FBI 4 : 421, 1884 ; C. 2 : 441. *Eranthemum montanum* Roxb. var. *concanensis* : G. 2 : 720.

Fl. : March.

Loc. : GOA : *Canacona* : Badsare, Wagal village.

Rare along hill slopes.

Eranthemum roseum (Vahl) R. Br. Prodr. 477, 1810 ; G. 2 : 719 ; S. 175. *Justicia rosea* Vahl, Enum. t : 165, 1804 ; *Daedalacanthus roseus* Anders. in Journ. Linn. Soc. Lond. 9 : 487, 1867 ; FBI 4 : 419 ; DG. 140 ; C. 2 : 439.

Fl. : November April. *Fr.* : March May.

Vern. : Dasamuli (Mar.) ; Ranaboli (Konk.).

Loc. : GOA : *Satari* : Codal village. *Bardez* : Succoor forests near Porvorim ; Betim hills. *Salcete* : Goodier, 1 mile beyond Margao on way to Quepem. *Sanguem* : Foot of the hill of Patiem ; Sidh forests, near Bati village. *Quepem* : Budsari Goundugarha. *Canacona* : Ordofond - Butpal ; Ordofond Parsol hill. NAGARHAVELI : Morkhal ; Dongarpad Umberkoi ; Dudhuri to Biddhari forest ; Carchond forest.

Common undergrowth in forests. The root is used in indigenous medicine.

GYMNOSTACHYUM Nees

Flowers in axillary racemes or panicles ; stamens exerted ; capsule glabrous

latifolium

Flowers in terminal spikes or racemes ; stamens not exerted ; capsule glandular pubescent

glabrum

Gymnostachyum glabrum (Dalz.) T. Anders. in Journ. Linn. Soc. Lond. 9 : 506, 1867 ; FBI 4 : 509 ; C. 2 : 454. *Cryptophragmium glabrum* Dalz. in Kew Journ. Bot. 2 : 338, 1850.

Fl. & Fr. March April. *Ill.* : Bedd. Ic. t. 251.

Loc. : GOA : *Canacona* : Barsare Tudal ; Barsare Wagal, hill forest near Tudal ; Caranzol.

Rare in shady areas.

G. latifolium (Dalz.) T. Anders. in Journ. Linn. Soc. 9 : 505, 1867 ; FBI 4 : 509, 1884 ; C. 2 : 454 ; G. 2 : 738.

Fl. : November December. *Fr.* : March. *Ill.* : Bedd. Ic. t. 253 ; Wt. Ic. t. 1537.

Loc. : GOA : *Canacona* : Yed forests on way to Nadquem ; Nadquem.

Rare, along moist rocky slopes especially near streams.

HEMIGRAPHIS Nees

Hemigraphis latebrosa Nees var. **heyneana** Bremk. in Mat. Mon. Strob. 139, 1944. *Hemigraphis latebrosa* (Heyne ex Roth) Nees in DC. Prodr. 11 : 723, 1847 ; FBI 4 : 423 ; C. 2 : 434 ; G. 2 : 715.

Fl. : March May. *Ill.* : Wt. Ic. t. 1504.

Loc. : GOA : *Satari* : Nandore forest near Mahadevi river. *Sanguem* : Sidh forests near Bati. *Canacona* : Ordofond, Parsol hill. NAGARHAVELI : Berpam forest ; Morkhal ; Nana Randha ; Dudhni to Bildhara forest ; Carchond forest ; Sindhoni forest ; Umberkoi Dongarpad forest.

Common on hilly, shady areas.

HYGROPHILA R. Br.

Leaves long narrow, lanceolate, in whorls of 6, with sharp yellow spines ; flowers in sessile axillary whorls

auriculata

Leaves small, elliptic or suborbicular, opposite without spines ; flowers in terminal, dense or lax spikes

serpyllum

Hygrophila auriculata (Sch.) Heine in Kew Bull. 16 (2) : 172, 1962 ; Pav. 175. *Barleria auriculata* Sch. in Schumach. & Thonn. Beskr. Guin. Pl. 285, 1827. *Asteracantha longifolia* (Linn.) Nees in Wall. Pl. As. Rar. 3 : 90, 1832 ; C. 2 : 428 ; G. 2 : 712 ; S. 173. *Hygrophila spinosa* T. Anders. in Thwaites, Enum. Pl. Zeyl. 225, 1860 ; FBI 4 : 408 ; DG. 150.

Fl. : September November. *Ill.* : Wt. Ic. t. 449.

Vern. : Vikhara (Mar.) ; Kalavankabija (Kan.) ; Kalaso (Konk.).

Loc. : GOA : *Satari* : Caranzol. *Bardez* : Kolvelly ferry crossing. *Salcete* : Goodier 1 mile beyond Margao on way to Quepem ; Cuncolim. NAGARHAVELI : Atal forest ; Nana Randha ; on way to Sindhori forest Kanvel ; Velugaon ; Dhapsa ; Pholand river ; Morkhal ; Nala between Kawcha and Jamunpada. DADRA. DAMAN : Marvor ; Bamoti.

Common in wet, muddy places along streams and rice fields.

The plant is medicinal.

H. serpyllum (Nees) T. Anders. in Journ. Linn. Soc. 9 : 456, 1867 ; FBI 4 : 406 ; C. 2 : 429 ; S. 173. Dangs. 37. *Physichilus serpyllum* Nees in Hook. Comp. Bot. Mag. 2 : 311, 1837.

Fl. & Fr. : September. *Ill.* : Wt. Ic. t. 1493.

Vern. : Sarpat (Guj.).

Loc. : NAGARHAVELI : Silvassa, along Damanganga river ; Morkhal.
DAMAN : Regunvara ; Bimpor.

Occasional along river bank, often also in moist situations, in cultivated and fallow fields. A plant very variable in its habit, size and shape of the leaves.

JUSTICIA Linn.

The treatment of the various species so far included under *Justicia* is far from satisfactory. Bremekamp [Verh. Nederl. Akad. Wet. (2), 45 (2) : 61 & seq., 1948] has separated the various species of section 6 of C.B. Cl. (Section Rostellularia in FBI 4 : 536, 1885) and treated them under a distinct genus *Rostellularia* Rehb. f. Similarly Bremekamp (*l.c.*) and Ridley (Fl. Males. Pen. 2 : 593, 1923) treat *Justicia gendarussa* Burm. f. under *Gendarussa* Nees, the valid name being *Gendarussa vulgaris* Nees. In this work *Justicia* Linn. is treated in a broader sense as done by C.B. Clarke.

1. Calyx 5-partite, segments equal or sub-equal
 2. A large shrubby plant *betonica*
 2. Small procumbent herb *trinervia*
1. Calyx 4 - partite
 3. Spikes cylindrical ; bracts and bracteoles as long as or longer than the calyx lobes
 4. Bracts and bracteoles elliptic-ovate, scarious margined and with soft glistening, jointed hairs *simplex*
 4. Bracts and bracteoles linear - lanceolate ; white hairs of bracts and bracteoles short and close *procumbens*
 3. Spikes linear ; bracts and bracteoles shorter than the calyx lobes, all scarious margined *prostrata*

Justicia betonica Linn. Sp. Pl. 15, 1753 ; FBI. 4 : 525 ; DG. 142 ; T. 2 : 338 ; G. 2 : 755 ; *J. betonica* var. *ramosissima* Clarke in Hook. f. FBI 4 : 525 ; C. 2 : 486.

Fl. : October - December.

Vern. : Dhavo pokso (Konk.) ; Abolim, Branco (Port.).

Loc. : NAGARHAVELI : Jamunpada forest.

Common along ghat areas.

J. procumbens Linn. Sp. Pl. 15, 1753 ; FBI 4 : 539 ; DG. 143 ; C. 2 : 491 ; G. 2 : 756.

Fl. : October - March. *Ill.* : Univ. Bomb. Bot. Mem. 2 : tab. opp. p. 90, 1952.

Vern. : Karambal (Mar.) ; Ghati Pitpapad (Konk.).

Loc. : GOA : *Satari* : Katachemal (Ivorem) ; Wadicha Dongar (Caranzoi) ; Satrem. *Sanguem* : Ravanacha Dongar (Verlem) ; Molem Belgaum Road ; Castle rock on way to Anmond. Dudhsagar. NAGARHAVELI : Dhapsa.

Common weed in moist areas and also recorded by Dalgado.

Justicia prostrata (Clarke) Gamble in Fl. Pres. Madr. 1091, 1924. *J. diffusa* var. *prostrata* Clarke in FBI 4 : 538 ; C. 2 : 490.

Fl. & Fr. : August November.

Loc. : GOA : *Bardez* : Porvorim Betim, plateau area. *Salcete* : Raiya village. *Canacona* : Ordofond forest on way to Tudal.

Common as an undergrowth in the forest and on the bunds of rice fields. Closely allied to *J. diffusa* and often regarded as a variety under it. The lanceolate, scabrous, patently hairy bracts reaching upto 2.5 mm, readily distinguish this from *J. diffusa* proper which has almost glabrous bracts and are scarcely 1.2 mm long.

**J. simplex* D. Don, Prodr. Fl. Nep. 118, 1825 ; FBI 4 : 539 ; C. 2 : 490 ; G. 2 : 756.

Fl. & Fr. : March November.

Loc. : GOA : *Satari* : Nandorem along the river ; Nandore forest nala side ; Codal village ; Pale village ; Kutachemal (Ivorem) ; Wagheri ; Ambeachagol ; Nanecha Dongar. *Ponda* : Ponda - Margao, 8 km point. *Sanguem* : 1 mile before Molem ; Near Darbandora ; Potiem forest ; Molem-Colem ; Foot of the hill, Patiem ; Molem - Belgaum Road 73 km ; Madka Banglow ; Belgaum Road ; Chasuriaghat (Netravali) ; Barazon ; Bavanbanda (Molem Belgaum Road.). *Quepem* : Colomba - Rivona.

Very common in moist areas and in open grassy plateau.

J. trinervia Vahl, Enum. 1 : 156, 1804 ; FBI 4 : 256 ; C. 2 : 487 G. 2 : 755.

Fl. : October January.

Vern. : Sut (Mar.).

Loc. : GOA : *Salcete* : Margao Raiya road.

Rare. Often regarded a stunted form of *Justicia betonica* Linn. and scarcely different from it except for the smaller size.

**J. japonica* Thunberg, Fl. Jap. 20, 1784. Ellis (Bull. bot. Surv. India 22 : 195, 1980) proposed a new combination *Rostellularia japonica* (Thunb.) Ellis.

Cult. species :

Justicia gendarussa Burm. Fl. Ind. 10, 1768 ; FBI 4 : 532 ; DG. 142 ; C. 2 : 492 ; G. 2 : 755. *Ill.* : Wt. Ic. t. 468.

Vern. : Tev (Mar.) ; Kalo adaso (Konk.).

The species is grown in the gardens as hedge plant and is occasionally found wild. The leaves are used medicinally. Often treated under a distinct genus *Gendarussa* Nees under the valid name *G. vulgaris* Nees.

LEPIDAGATHIS Willd.

1. Seeds 4

2. Erect undershrubs ; bracts and bracteoles sharply spinous pointed and glandular pubescent

cuspidata

2. Diffuse or prostrate herbs

3. Leaves entire or nearly so ; bracts softly hairy on the back with spreading hairs

incurva
var. *mucronata*

3. Leaves crenate or crenate - serrate ; bracts hairy with simple glandular hairs

fasciculata

1. Seeds 2

trinervis

Lepidagathis cuspidata (Wall.) Nees in Wall. Pl. As. Rar. 3 : 97, 1832 ; FBI 4 : 519 ; C. 2 : 474 ; G. 2 : 748 ; S. 182 ; Dangs. 37 ; Pav. 180. *Ruellia cuspidata* Wall. Cat. 2405, 1830.

Fl. & Fr. : March May. *Ill.* Bedd. Ic. t. 227.

Loc. : GOA : *Sanguem* : Sanavali river near Colem ; Sidh forest near Bati village, *Sanguem*. *Canacona* : Butpal forest. NAGARHAVELI : Bcrpam forest, near Mandoni.

Occasional on rocky slopes near the river.

L. fasciculata (Retz.) Nees in Wall. Pl. As. Rar. 3 : 95, 1832 ; FBI 4 : 522 ; C. 2 : 476 ; G. 2 : 748 ; S. 183. *Ruellia fasciculata* Retz. Obs. 4 : 28, 1786.

Fl. : March. *Ill.* : Bedd. Ic. t. 228, 1874.

Loc. : GOA : *Canacona* : Butpal.

Rare, in shady places of the forest.

L. incurva Don var. *mucronata* Clarke ex Cooke Fl. Pres. Bomb. 2 : 397, 1904. *Lepidagathis hyalina* Nees in Wall. Pl. As. Rar. 3 : 95, 1832, var. *mucronata* Clarke in FBI 4 : 521, 1885 ; G. 2 : 748.

Fl. : March April.

Loc. : GOA : *Satari* : Kegdi forest, Nandore ; Dinachirai near Palem, Valpoi ; Vangiri forest near Nandore. *Canacona* : Butpal forest.

Occasional, seen both in open areas and as forest undergrowth.

Lepidaga this trinervis Wall. ex Nees in Wall. Pl. As. Rar. 3 : 96, 1832 ; FBI 4 : 517 ; C. 2 : 471 ; S. 182 ; Pav. 181.

Fl. & Fr. : November - April.

Vern. : Harancharo (Guj.).

Loc. : DAMAN : Dundorta. DIU : Jalandhar ; Castle area.

Rare on gravelly soil.

MACKENZIEA Nees

Mackenzia integrifolia (Dalz.) Bremek. in Mat. Mon. Strob. 182, 1944. *Endopogon intigrifolius* Dalz. in Kew Journ. Bot. 2 : 343, 1850. *Strobilanthes perfoliatus* T. Anders. in Journ. Linn. Soc. 9 : 471, 1867 ; FBI 4 : 458 ; C. 2 : 448 T. 2 : 333. *Strobilanthes intigrifolius* O. Kuntze, Rev. Gen. Pl. 499, 1891 ; G. 2 : 731.

Fl. & Fr. : March - April. *Ill.* : Wt. Ic. t. 1627.

Loc. : GOA : Canacona : Ordofond Butpal ; Chinchewal, on way to Butpal ; Kuntal near Caranzol.

Rare.

NELSONIA B. Rr.

Nelsonia canescens (Lamk.) Spr. Syst. 1 : 42, 1825. *Justicia canescens* Lamk. Encycl. 1 : 4, 1791. *Nelsonia campestris* R. Br. Prodr. 481, 1810 ; FBI 4 : 394 ; C. 2 : 420 ; G. 2 : 709.

Fl. : April.

Loc. : GOA : Satari : Codal Nanora road, 10 km. Canacona : Butpal forest.

Rare, in cleared areas.

NEURACANTHUS Nees

Neuracanthus sphaerostachyus (Nees) Dalz. in Kew Journ. Bot. 2 : 140, 1850 ; FBI 4 : 491 ; C. 2 : 465 ; S. 181 ; Dangs. 38 ; Pav. 179. *Lepidagathis sphaerostachya* Nees in DC. Prodr. 11. 254, 1847.

Fl. : August - November. *Fr.* : October onwards. *Ill.* : Wt. Ic. t. 1531.

Vern. : Ghosvel (Mar.).

Loc. : GOA : *Canacona* : Maxem ghat. NAGARHAVELI : Saily forest ; Khuntly forest ; Dolara forest ; Dongarpad Umberkoi.

Occasional, as forest undergrowth and along rocky slopes of the ghats.

NILGIRIANTHUS Bremek.

1. Flowers ebracteolate

2. Bracts hairy

lupulinus

2. Bracts glabrous or nearly so

heyneanus

1. Flowers bracteolate ; bracts glandular hairy

warreensis

Nilgirianthus heyneanus (Nees) Bremek. in Verh. Ned. Akad. Wet. 41(1) : 173, 1944. *Strobilanthes rugosus* Wight ; C. 2 : 444 ; G. 2 : 730.

Fl. : October - December.

Loc. : GOA : *Satari* : Wagheri. *Sanguem* : Madka Banglow (Molem-Belgaum Road) ; Molem - Belgaum Road 71 km ; Castle rock on way to Anmod.

N. lupulinus (Wall.) Bremek. in Verh. Ned. Akad. Wet. II ; 41 (1) : 173, 1944. *Ruellia lupulina* Wall. Cat. 2355 a & c, 1830. *Strobilanthes lupulinus* Nees in Wall. Pl. As. Rar. 3 : 85, 1832 ; FBI 4 : 443 ; C. 2 : 443 ; T. 2 : 328 ; G. 2 : 730.

Fl. : October - January. *Fr.* : February - April.

Loc. : GOA : *Satari* : Dinachi Rai near Palem, Valpoi. *Canacona* : Barsare village near Tudal.

Occasional, outside the village in shady areas.

N. warreensis (Dalz.) Bremek. in Verh. Ned. Akad. Wet. (II) 41(1) : 173, 1944. *Strobilanthes warreensis* Dalz. in Kew Journ. Bot. 2 : 341, 1850 ; FBI 4 : 370 ; DG. 141 ; C. 2 : 447 ; C. 2 : 728.

Fl. : October - December. *Ill.* : Bedd. Icon. t. 197.

Vern. : Karvi (Konk.).

Rare and endemic to the Western ghats. Dalgado records it for Goa, though I have not collected it.

PERISTROPHE Nees

Peristrophe bicalyculata (Retz.) Nees in Wall. Pl. As. Rar. 3 : 113, 1832 ; FBI 4 : 554 ; C. 2 : 495 ; G. 2 : 759 ; S. 187. *Dianthera bicalyculata* Retz. in Act. Holm. 297, t. 9, 1775.

Fl. & Fr. : October - December.

Loc. : NAGARHAVELI : Nana Randha ; Jamunpada forest ; Dhapsa.

It has been observed to be common in forest undergrowth and on wastelands in Goa.

PSEUDERANTHEMUM Radlk.

Pseuderanthemum malabaricum (Clarke) Gamble, Fl. Pres. Madr. 1064, 1924 ; S. 182. *Eranthemum malabaricum* Clarke in FBI 4 : 497, 1884 ; C. 2 : 468.

Fl. : February. *Fr.* : February - March.

Loc. : GOA : *Satari* : Matachi-rai near Palem. *Bardez* : Bastara.

Rare.

RHINACANTHUS Nees

Rhinacanthus nasuta (Linn.) Kurz in Journ. As. Soc. Beng. 39 : 79, 1870 ; S. 186. *Justicia nasuta* Linn. Sp. Pl. 16, 1753. *Rhinacanthus communis* Nees in Wall. Pl. As. Rar. 3 : 109, 1832 ; FBI 4 : 541 ; DG. 143 ; C. 2 : 494 ; T. 2 : 341 ; G. 2 : 758.

Fl. & Fr. : March - April. *Ill.* : Wt. Ic. t. 464.

Vern. : Dadmari (Konk.).

Loc. : GOA : *Canacona* : Barsare village.

Rare, on hillock among bushes.

RUNGIA Nees

1. Bracts dimorphic ; upper lip of corolla acute, not notched

2. Corolla 10 - 12 mm long ; barren bracts 8 - 12 mm long

crenata

2. Corolla 4 - 5 mm long ; barren bracts 3 - 4 mm long

pectinata

1. Bracts uniform ; upper lip of corolla notched or emarginate

3. Stems decumbent and rooting nearly glabrous *repens*

3. Stems erect, densely hairy *elegans*

Rungia crenata T. Anders. in Journ. Linn. Soc. 9 : 518, 1867 ; FBI 4 : 547 ; DG. 143 ; C. 2 : 478.

Vern. : Pitpapad (Konk.).

Cooke records the species from Goa jungles. It may be rare in the area.

R. elegans Dalz. in Dalz. & Gibs. Bomb. Fl. 196, 1861 ; FBI 4 : 549 ; C. 2 : 480 ; Dangs. 38.

Fl. : September.

Vern. : Dungri Khadsaliyo (Guj.).

Loc. : NAGARHAVELI : Saily ; Dhapsa ; Dolora. DAMAN : Dundorta.

Occasional, in grasslands. Specific status doubtful ; possibly a variant of *Rungia repens* (Linn.) Nees.

R. pectinata (Linn.) Nees in DC. Prodr. 11 : 469, 1847 ; S. 183. *Justicia pectinata* Linn. Amoen. Acad. 4 : 299, 1759. *Rungia parviflora* Nees var. *pectinata* Clarke in FBI 4 : 550, 1885 ; C. 2 : 478 ; G. 2 : 750 ; V. 83.

Fl. & Fr. : November March. Ill. : Wt. Ic. t. 1547.

Loc. : GOA : *Satari* : Dinachi-rai near Palem, Valpoi. *Bardez* : Porvorim ; Porvorim rocky plateau. *Ilhas* : Panaji Madgao ; Chimbhel reservoir Brahmapuri. *Sanguem* : Sidh forests near Bati ; Sanguem. *Canacona* : Nadquem Butpal ; Butpal ; Barsare vilage. NAGARHAVELI : Dongarpad Umberkoi ; Bank of Daman Ganga river on way to Kawcha ; Nana Randha.

Common in moist open fields and as forest undergrowth.

R. repens (Linn.) Nees in Wall. Pl. As. Rar. 3 : 110, 1832 & in DC. Prodr. 11 : 472, 1847 ; FBI 4 : 549 ; C. 2 : 480 ; S. 183. *Justicia repens* Linn. Sp. Pl. 15, 1753.

Fl. & Fr. : September. Ill. : Wt. Ic. t. 465 ; Tadulingam & Venkatanarayana, Handb. Some South Indian Weeds, t. 128, f. 1 9.

Loc. : DIU : Gogale.

Rare.

STAUROGYNE Wall.

Staurogyne zeylanica (Nees) O. Kuntze, Rev. Gen. Pl. 497, 1891 ; C. 2 : 422 ; G. 2 : 710. *Ebermaiera zeylanica* Nees in DC. Prodr. 11 : 74, 1747 ; FBI 4 : 397.

Fr. : March.

Loc. : GOA : *Sanguem* : Sanguem area.

Rare.

THELEPAEPALE Bremek.

Thelepaepale ixiocephala (Benth.) Bremek. in Verh. Ned. Akad. Wet. (II) 40(1) : 188, 1944 ; S. 176. *Strobilanthes ixiocephalus* Benth. in Fl. Ind. 32 : 557, 1849 ; FBI 4 : 444 ; DG. 141 ; C. 2 : 448 ; T. 2 : 329 ; C. 2 : 730.

Fl. : November May. *Fr.* : March May. *Ill.* : Wt. Ic. t. 1523 ; Bedd. Ic. t. 203 ; Talb. 2 : f. 445.

Vern. : Pit-karvi (Kan.).

Loc. : GOA : *Satari* : Jamad forest near Nandore ; Caranzol hill ; Nanecha Dongar near Codal-Ambechagol, Valpoi. *Ponda* : Ponda village. *Canacona* : Butpal Kanpal hill top ; near Tudal ; Yed, Nadquem Butpal.

Common as forest undergrowth. Used as fodder in Valpoi area.

THUNBERGIA Retz.

Bremekamp (Verh. Kon. Ned. Ak. Wet. A'dam, sect. 2, 50(4) : 1 90, 1955) prefers to treat this genus under Thunbergiaceae with *Thunbergia* as the type.

Thunbergia laevis Nees in Wall. Pl. As. Rar. 3 : 77, 1832 ; S. 172. *Thunbergia fragrans* Roxb. Pl. Cor. 1 : 47, t. 67, 1795 ; FBI 4 : 390 ; C. 2 : 417 ; G. 2 : 707. *T. fragrans* var. *laevis* Clarke in FBI 4 : 391, 1884 ; G. 2 : 707.

Fl. : October.

Loc. : GOA : *Quepem* : Colomba. *Canacona* : Butpal.

Cult species :

Thunbergia erecta T. Anders. in Jour. Linn. Soc. 7 : 18, 1864 ; C : 2 : 417. A shrub, native of tropical Africa, cultivated in Goa (Talauli, Sanguem).

Crossandra infundibuliformis (Linn.) Nees in Wall. Pl. As. Rar. 3 : 98, 1832. *Justicia infundibuliformis* Linn. Sp. Pl. 21, 1753. *Crossandra undulaefolia* Salisb. Parad, Land. t. 12, 1805 ; FBI 4 : 492 ; DG. 141 ; C. 2 : 455 ; G. 2 : 739.

Fl. : June January. *Ill.* : Wt. Ic. t. 460.

Vern. : Aboli (Mar.) ; Abolim (Port.).

Cultivated in the gardens and about temples, rarely found wild.

Graptophyllum hortense Nees in Wall. Pl. As. Rar. 3 : 102, 1832 ; FBI 4 : 545 ; DG. 143 ; C. 2 : 496 ; G. 2 : 759.

Vern. : Parvati pan (Konk.) ; Folhas de Cobra vibora (Port.).

It is grown in the gardens as an ornamental plant.

VERBENACEAE

(incl. AVICENNIACEAE)

- | | |
|---|-----------------------|
| 1. Inflorescence panicled racemes | <i>Duranta</i> |
| 1. Inflorescence dense spicate ; centripetal | |
| 2. Spikes capitate, ovoid ; stamens 4 | |
| 3. Creeping herbs, rooting at nodes ; calyx truncate or obscurely lobed | <i>Phyla</i> |
| 3. Erect or rambling shrubs ; branches prickly ; calyx 2 to 4 - lobed | <i>Lantana</i> |
| 2. Spikes long, slender ; stamens 2 | <i>Stachytarpheta</i> |
| 1. Inflorescence cymose, centrifugal | |
| 4. Cymes densely capitate, many flowered (Mangrove) | <i>Avicennia</i> |
| 4. Cymes lax, paniculate | |
| 5. Leaves digitate | <i>Vitex</i> |
| 5. Leaves simple | |
| 6. Corolla regular ; stamens equal | |
| 7. Trees ; flowers white ; calyx accrescent, becoming bladdery in fruit | <i>Tectona</i> |

7. Shrubs ; flowers pink ; calyx not enlarging in fruit *Callicarpa*
6. Corolla slightly 2 - lipped ; stamens didynamous
8. Trees or scandent shrubs
9. Corolla 1 cm or more long, yellow *Gmelina*
9. Corolla less than 0.5 cm long, white *Premna*
8. Herbs or shrubs, erect *Clerodendrum*

AVICENNIA Linn.

According to H. N. Moldenke, this genus should form the type of a separate family Avicenniaceae.

Leaves obtuse at apex, elliptic - oblong or obovate, attenuate at base ; anthers exerted ; style long *officinalis*

Leaves acute at apex, ovate or lanceolate, cuneate at base ; anthers included ; style short, conical *marina*

Avicennia marina var. *acutissima* Stapf & Moldenke, Geog. Distr. Avicenn. 32, 1939 & in Phytol. 1 : 411, 1940 & 7 : 225, 1960. *Avicennia officinalis* var. *alba* Clarke in FBI 4 : 604, 1885. *Avicennia alba* auct. non Blume (1825) : C. 2 : 517.

Fl. : March - April. *Ill.* : Wt. Ic. t. 1482.

Vern. : Tivar (Mar.).

Loc. : GOA : *Bardez* : Borim, Zucri river. DAMAN : Coileque area ; Varacunda ; Cale area. DIU : Swampy back water area.

Common along the coast and along banks of the rivers.

A. officinalis Linn. Sp. Pl. 110, 1753 ; FBI 4 : 604 ; DG. 146 ; C. 2 : 516 ; T. 2 : 362 ; G. 2 : 774 ; V. 84.

Fl. : April. *Ill.* : T. f. 456.

Vern. : Tivar (Mar.) ; Ipati (Kan.) ; Upati (Konk.) ; Salgueira boanca (Port.).

Loc. : GOA : *Bardez* : Kolvelly ferry crossing ; Borim Margoa, 8 km point ; Borim, Zucri river. *Ilhas* : Panjim bank of river Mandovi.

Dominant composition of the Mangroves of the creeks and river banks.

CALLICARPA Linn.

Callicarpa tomentosa (Linn.) Murray, Syst. Veg. (ed. 13) 130, 1774 ;

S. 188. *Tomex tomentosa* Linn. Sp. Pl. 118, 1753 ; *Callicarpa lanata* Linn. Mant. 2 : 331, 1771 ; FBI 4 : 567 ; DG. 144 ; C. 2 : 502 ; T. 2 : 345 ; G. 2 : 764 ; V. 83.

Fl. : November March. *Fr.* : March May. *Ill.* : Wt. Ic. t. 1480 ; T. f. 449.

Vern. : Kan phulia (Mar.) ; Ardri (Kan.) ; Ayamsar (Konk) ; Folhas da raspa (Port).

Loc. : GOA : *Satari* : Jamad forest near Nandore ; Nanecha Dongar near Codal Ambechagol. *Ponda* : Querim. *Canacona* : Kanpal hill top, Butpal ; Barsare village near Tudal ; Butpal.

Common in open forest areas.

CLERODENDRUM Linn.

- | | |
|--|-----------------|
| 1. Flowers in axillary, pedunculate, 3 to 9 flowered cymes ; straggling or sub-scandent shrubs | <i>inermis</i> |
| 1. Flowers in terminal panicles ; erect shrubs | |
| 2. Leaves oblong or elliptic, acute, coarsely serrate, base acute, glabrous ; flowers bluish purple, in terminal, glabrous pyramidal panicles | <i>serratum</i> |
| 2. Leaves large, ovate - acuminate, entire or denticulate, base cordate or rounded, thinly hoary on both sides ; flowers white, tinged with pink, in large, pubescent panicles | <i>viscosum</i> |

Clerodendrum inermis (Linn.) Gaertn. fruct. 1 : 271, t. 75, 1788 ; FBI 4 : 589 ; DG. 146 ; C. 2 : 511 ; T. 2 : 357 ; G. 2 : 769 ; S. 190. *Volkameria inermis* Linn. Sp. Pl. 637, 1753.

Fl. : September November. *Ill.* : Hort. Mal. 5, t. 49.

Vern. : Vanajai (Mar.) ; Kundali (Kan.) ; Siritmari (Konk.) ; Nochilha (Port.).

Loc. : GOA : *Pernem* : Pernem Bicholim. *Bicholim* : Tirla ; Ammona ferry crossing. *Satari* : Onda Molem. *Ilhas* : Panaji along sea shore ; Chimbhel reservoir Brahmapuri temple. *Salcete* : Margoa. *Canacona* : Pilegao ; Maxim ghat ; Angidiv. DAMAN : Cale river area Ucassin along the river bank.

Common along forest edges.

C. serratum (Linn). Moon. Cat. 46, no. 382, 1824 ; FBI 4 : 592 ; DG. 146 ; C. 2 : 512 ; T. 2 : 359 ; G. 770 ; S. 190. *Volkameria serrata* Linn. Mant. 90, 1767.

Fl. : August. *Ill.* : Wt. Ic. t. 1472 ; T. f. 455.

Vern. : Bharangi (Mar.) ; Kiritekki (Kan.) ; Bharangi (Konk.) ; Teca crespia (Port.).

Loc. : GOA : *Satari* : Ivorem, Buzuruco. *Bardez* : Aujuna ; Borim. *Salcete* : Raiyi village hills. *Ponda* : Curti village on Ponda Darbandora road. *Sanguem* : Siwai (Surla).

Occasional, near roadside.

Clerodendrum viscosum Vent. Jard. Malm. t. 25, 1803 ; S. 190. *C. infortunatum auct. non* Linn. FBI 4 : 594 ; DG. 146 ; C. 2 : 513 ; T. 2 : 358 ; G. 2 : 770.

Fl. : August - November. *Ill.* : Wt. Ic. t. 1471.

Vern. : Bhandira (Mar.) ; Parele (Kan.) ; Kadri (Konk.).

Loc. : GOA : *Satari* : Maloli village, near Police custom chowky, Valpoi ; Maloli forests ; Nanacha Dongar (Codal) ; Waghore (Tanem) Kutamal Ivorem. *Bardez* : Bastara. *Salcete* : Verna village. *Sanguem* : Varkim, 10 km south of Sanguem ; Molem Belgaum road 71 m & 63 km. *Canacona* : Kanpal hill top, Butpal ; Angidiv.

Common in open areas. The species is a native of Tropical America, introduced and now well naturalised in Goa. Cross bred varieties of different colours have been introduced into gardens.

DURANTA Linn.

Duranta repens Linn. Sp. Pl. 637, 1753 ; S. 191. *Duranta plumieri* ; Jacq. Select. Strip. Am. 186, 1763 ; FBI 4 : 560 ; C. 2 : 518.

Fl. : April. *Ill.* : Fl. Barbados, Gooding *et al*, f. 23, 1965.

Loc. : GOA : *Satari* : Masarde village near Valpoi ; Volpoi. *Sanguem* : Sanguem area.

Rare near cultivated fields. It is mostly planted in the gardens as a hedge plant.

GMELINA Linn.

Gmelina arborea Roxb. Pl. Cor. t. 3 : 42, 246, 1815 ; FBI 4 : 581 ; DG. 145 ; C. 2 : 504 ; G. 2 : 768 ; S. 189 ; V. 84.

Fl. : March - May. *Ill.* : Wt. Ic. t. 1470 ; Bedd. Fl. t. 253.

Vern. : Sirni (Konk.) ; Umi (Kan.) ; Shwan, Sinoy (Guj.).

Loc. : GOA : *Satari* : Cuntal near Caranzol.

Rare. Root, bark and fruits are used in medicine. The wood is strong and light.

LANTANA Linn.

Plants armed with recurved prickles ; flowers orange or pink coloured

camara
var. *aculeata*

Plants unarmed ; flowers white

indica

Lantana camara Linn. var. *aculeata* (Linn.) Moldenke in *Torreyia* 34 : 9, 1934 ; S. 187 ; Pav. 187. *L. aculeata* Linn. Sp. Pl. 627, 1753 ; G. 2 : 761 ; T. 2 : 344. *L. camara auct. non* Linn. (1753) ; FBI 4 : 562 ; DG. 144 ; C. 2 : 498 ; G. 2 : 774.

Fl. : September - November.

Vern. : Tantani (Mar.) ; Aripu (Kan.).

Loc. : GOA : *Pernem* : Terekhol. *Satari* : Caranzol ; Deosati ; Satrem. *Bardez* : Betim Bardez. *Ilhas* : Panaji along the sea coast. *Sanguem* : Verlem. NAGARHAVELI : Silvassa. DAMAN : Fort area ; Bomoti. DIU : Castle area.

Common, along sea shore especially in backwaters.

L. indica Roxb. Hort. Beng. 46, 1814 (*nom. nud.*) & Fl. Ind. 3 : 89, 1832 ; FBI 4 : 562 ; C. 2 : 498.

Fl. & Fr. : September. *Ill.* : Wt. Ic. t. 1464.

Loc. : DIU : Jalandhar Diu Road ; Castle area.

Rare.

PHYLA Lour.

Phyla nodiflora (Linn.) Green in *Pittonia* 4 : 46, 1899 ; S. 188 ; Dangs. 39 ; Pav. 185. *Verbena nodiflora* Linn. Sp. Pl. 20, 1753. *Lippia nodiflora* (Linn.) A. Rich. in Michx. Fl. Bor. Amer. 2 : 15, 1803 ; FBI 4 : 563 ; DG. 144 ; C. 2 : 499 ; G. 2 : 762.

Fl. : November April. *Ill.* : Wt. Ic. t. 1463.

Vern. : Jalapimpali (Mar.) ; Adali (Konk.) ; Ratveliyo (Guj.).

Loc. : GOA : *Ilhas* : Panaji, along the sea coast. *Canacona* : Angidiv.

NAGARHAVELI : Silvassa ; Dapara area. DADRA. DAMAN : Regunvara.
DIU : Gogale.

Common along sea shore and banks of streams.

PREMNA Linn.

Large scandent shrub ; corymbs purple ; calyx truncate *coriacea*

An erect tree ; corymbs greenish-yellow ; calyx 2 - lipped *corymbosa*

Premna coriacea C. B. Clarke in FBI 4 : 573, 1885 ; C. 2 : 506 ; T. 2 : 351 ; G. 2 : 766 ; S. 189.

Fl. : April. *Ill.* : T. f. 452.

Vern. : Chambari (Mar.) ; Zarangi balli (Kan.).

Loc. : GOA : *Satari* : Codal Satrem road, 5 km. *Canacona* : Nadquem ; Butpal forest near a stream.

P. corymbosa (Burm. f.) Rottl. & Willd. in Gesell. Nat. Freunde Neue Schr. 4 : 187, 1803. *Cornutia corymbosa* Burm. f. Fl. Ind. 133, t. 41, f. 1, 1768, non Lamk. *Premna integrifolia* Linn. Mant. 2 : 252, 1771 ; FBI 4 : 574 ; DG. 145 ; C. 2 : 506 ; T. 2 : 352. *Premna serratifolia* Linn. Mant. 2 : 253, 1771 ; G. 2 : 767.

Fl. : May July. *Fr.* : October - November. *Ill.* : Wt. Ic. t. 1469.

Vern. : Khara - narvel (Mar.).

Loc. : GOA : *Satari* : Nandore village. *Bardez* : Plateau area, Porvorim ; Betim ; Palem. *Canacona* : Angidiv.

Occasional on rocky, exposed slopes.

STACHYTARPHETA Vahl *nom. cons.*

Stachytarpheta jamaicensis (Linn.) Vahl, Enum. Pl. 1 : 206. 1805 ; Sant. in Rec. Bot. Surv. India, 16 (1), ed. 3, 212, 1967. *Verbena jamaicensis* Linn. Sp. Pl. 19, 1753. *Stachytarpheta indica auct.* (non *Verb. indica* Linn.) : FBI 4 : 564, C. 2 : 501 ; G. 2 : 763.

Fl. : August October. *Ill.* : Sims. in Bot. Mag. t. 1848, 1816.

Vern. : Kariyuttarani (Kan.).

Loc. : GOA : *Satari* : Volpoi. *Bardez* : Agoda. *Salcete* : Margao, Fatorda village near rest house ; Margao ; Gansua.

Rare, in waste places.

TECTONA Linn. f. *nom. cons.*

Tectona grandis Linn. f. Suppl. 151, 1781 ; FBI 4 : 570 ; DG. 144 ; C. 2 : 503 ; T. 2 : 346 ; G. 2 : 765 ; S. 188 ; Dangs. 39 ; Pav. 186.

Fl. : June August. *Fr.* : August November. *Ill.* : Bedd. Fl. Sylv. t. 250 ; T. f. 400.

Vern. : Sagwan (Mar.) ; Teginā (Kan.) ; Sylo (Konk.) ; Teca (Port.) ; Sag. (Guj.).

Loc. : GOA : *Satari* : Valpoi, Nagram. *Canacona* : Angidiv. NAGARHAVELI : Dolara forest ; Morkhal ; Carchond forest.

Occasional in deciduous forests.

VITEX Linn.

- | | |
|---|------------------------------------|
| 1. Cymes in axillary corymbs | <i>leucoxydon</i> |
| 1. Cymes in terminal panicles | |
| 2. Shrubs or small trees ; leaves 3 to 5 - foliate ; petiole not winged | |
| 3. Leaves trifoliate ; leaflets sessile, obovate - oblong | <i>trifolia</i> |
| 3. Leaves 3 to 5 - foliate ; leaflets petiolate, lanceolate | <i>negundo</i> |
| 2. Large trees ; leaves trifoliate | |
| 4. Petiole not or slightly winged | <i>altissima</i> |
| 4. Petioles more or less broadly winged | <i>altissima</i> var. <i>alata</i> |

Vitex altissima Linn. f. Suppl. 294, 1781 ; FBI 4 : 584 ; DG. 145 ; C. 2 : 509 ; T. 2 : 354 ; G. 2 : 772.

Fl. : May. *Fr.* : August. *Ill.* : Bedd. Fl. Sylv. t. 252, Wt. Ic. t. 1466.

Vern. : Balage (Mar.) ; Bulgi (Kan.) ; Bavalgi (Konk.).

Loc. : GOA : *Satari* : Nandore village ; Nandore forest on way to Maloli. *Sanguem* : Potiem forests.

Var. *alata* Trim. Fl. Ceyl. 3 : 358, 1895. *Vitex alata* Heyne in FBI 4 : 584 ; DG. 145 ; C. 2 : 510.

Fl. : April May.

Vern. : Dhavi rivti (Konk.) ; Carilha (Port.).

Loc. : GOA : *Canacona* : Butpal ; Nadquem Butpal road.

Rare.

V. leucoxydon Linn. f. Suppl. 293, 1781 ; FBI 4 : 587 ; DG. 145 ; C. 2 : 510 ; T. 2 : 355 ; G. 2 : 772 ; S. 189.

Fl. : March - April. *Ill.* : Wt. Ic. t. 1467 ; T. f. 453.

Vern. : Sangarbi (Mar.) ; Senkani (Kan.).

Loc. : GOA : *Satari* : Kawaliyan forest near Nandore ; Satre river near Codal ; Codal - Satrem road, 5 km. *Canacona* : Butpal forest ; Ordofond near Walgaon river.

Occasional, along river banks.

Vitex negundo Linn. Sp. Pl. 638, 1753 ; FBI. 4 : 583 ; DG. 145 ; C. 2 : 508 ; T. 2 : 353 ; G. 2 : 771 ; S. 189.

Fl. & Fr. : Throughout the year. *Ill.* : Wt. Ic. t. 519.

Vern. : Nirgud (Mar.) ; Lekki gidda (Kan.) ; Nimgud (Konk.) ; Negundo (Port.) ; Nagod (Guj.).

Loc. : GOA : *Satari* : Ponda village, Valpoi ; Codal forest ; Valpoi Tanem. *Bardez* : Borim -Margao, 8 km point. *Ilhas* : Panaji, along the sea coast. *Salcete* : Verna village plateau. *Canacona* : Nadquem village ; Jalan near Nadquem Butpal ; Angidiv. NAGARHAVELI : Saily. DAMAN : Varacunda.

Common along water courses near the villages and as hedges along the rice fields.

V. trifolia Linn. Sp. Pl. 638, 1753 ; FBI 4 : 583 ; C. 2 : 509 ; T. 2 : 353 ; G. 2 : 771.

Fl. : August - April.

Vern. : Indrani (Mar.).

Loc. : GOA : *Pernem* : Path between paddy fields in Pelereum village ; Terekhol. *Bardez* : Calangute sea beach. *Ilhas* : Panaji, along the sea coast. *Salcete* : Cuncolim ; Cavolossim. *Canacona* : Ordofond-Tudal.

Cult. species :

Clerodendrum indicum (Linn.) O. Kuntze, Rev.Gen. Pl. 2 : 506, 1891. *Siphonanthus indica* Linn. Sp. Pl. 109, 1753. *Clerodendrum siphonanthus* R. Br. in Ait. Hort. Kew. ed. 2, 4 : 65, 1812 ; FBI 4 : 595 ; DG. 146 ; C. 2 : 514 ; G. 2 : 770.

Fl. : September-October. *Ill.* : Wt. Ill. t. 173.

Vern. : Bharamgi (Konk.).

A native of Eastern India and Malesia, cultivated in gardens.

Verbena officinalis Linn. Sp. Pl. 20, 1753 ; FBI 4 : 565 ; DG. 144 ; C. 2 : 517 ; V. 83.

Vern. : Urgevao (Port.).

Cultivated in gardens, sometimes found as an escape.

LAMIACEAE

1. Stamens declinate, anther cells confluent
 2. Attachment of nutlets basilar
 3. Lower lip of the corolla not longer than the upper lip, flat or slightly concave
 4. Fruiting calyx deflexed, the upper lobe widest, large, ovate, recurved, the margins decurrent on the tube
 5. Corolla tube short, lower lip flat ; stigma bifurcate *Ocimum*
 5. Corolla tube long, lower lip concave ; stigma not bifurcate *Orthosiphon*
 4. Fruiting calyx sub - erect or declinate, the upper lobe broader than the others, the margins not decurrent on the tube
 6. Whorls crowded in axillary and terminal globose or ovate heads with imbricate bracts ; calyx sub-erect *Acrocephalus*
 6. Whorls racemose or spicate ; calyx usually declinate *Geniosporum*
 3. Lower lip of the corolla longer than the upper lip, deflexed, boat - shaped or saccate
 7. Corolla 2 - lipped, tube slender below swollen at the throat, upper lip short, lower longer concave or boat shaped
 8. Calyx 5 - toothed, enlarged in fruit *Plectranthus*
 8. Calyx obliquely 2 - lipped or sometimes sub-equal 5 - lobed, not enlarged in fruit *Anisochilus*
 7. Corolla 5 - lobed, tube cylindric, the lower lobe deflexed or saccate *Hyptis*
 2. Attachment of nutlets slightly oblique to the outer side, the nutlets also dorsally attached to the lobes of the disk leaving a large arcole on separation *Lavandula*
1. Stamens erect or spreading or ascending
 8. Perfect stamens 4
 9. Corolla lobes 4 ; stamens equal
 10. Calyx 5 - toothed ; stamens exerted
 11. Flowers in dense, long spikes ; corolla lobes equal ; filaments not bearded *Dysophylla*
 11. Flowers in clusters, forming panicles ; corolla lobes unequal ; filaments bearded *Pogostemon*

10. Calyx 5 - partite ; stamens included *Colebrookea*
9. Corolla lobes 5, 2 - lipped ; stamens didynamous
12. Upper lip of corolla short, nearly flat, not hooded *Anisomeles*
12. Upper lip of corolla hooded
13. Upper lip of corolla not woolly ; calyx 2 - lipped with a broad plate or pouch at the back, the mouth closed after flowering *Scutellaria*
13. Upper lip of corolla densely woolly ; calyx 5 - 10 toothed
14. Lower lip of corolla longer than the hood ; flowers white *Leucas*
14. Lower lip of corolla shorter than the hood ; flowers orange *Leonotis*
8. Perfect stamens 2 *Salvia*

ACROCEPHALUS Benth.

Acrocephalus indicus (Burm. f.) O. Kuntze, Rev. Gen. Pl. 511, 1891 ; G. 2 : 780 ; S. 192. *Prunella indica* Burm. f. Fl. Ind. 130, 1768. *Acrocephalus capitatus* Benth. in Bot. Reg. tt. 1282, 1300 & in Wall. Pl. As. Rar. 2 : 18, 1831 ; FBI 4 : 611 ; C. 2 : 525.

Fl. : August October.

Loc. : GOA : *Bicholim* : Usgao. *Salcete* ; Margao, fields near rest house. *Sanguem* : Aldune (Netravali) ; Cumbari.

Rare along rocky slopes.

ANISOCHILUS Wall.

Anisochilus verticillatus Hook. f. in FBI 4 : 929, 1885 ; C. 2 : 532 ; G. 2 : 788.

Fl. : August October.

Loc. : GOA : *Bicholim* : Usgao Onda ; Bicholim - Ponda. *Salcete* ; Bellai Verna plateau.

Rare on the rocky plateau.

ANISOMELES R. Br.

1. Stem and branches acutely quadrangular, stem softly pubescent ; fruiting calyx hispid

2. Cymes few flowered, pedunculate ; corolla white *heyneana*
 2. Cymes many flowered, sessile ; corolla pale - purple *indica*
 1. Stem and branches obtusely quadrangular, stem densely
 woolly ; fruiting calyx softly villous ; corolla deep purple *malabarica*

Anisomeles heyneana Benth. in Wall. Pl. As. Rar. 1 : 59, 1830 ; FBI 4 : 672 ; C. 2 : 543 ; S. 194 ; Pav. 191.

Fl. : September - November. *Fr.* : December - January.

Loc. : NAGARHAVELI : Saily forest ; Dudhni to Bildhari forest ; Umberkoi ; Dongarpad forest ; Velugaon ; Morkhal ; Sindhori forest.

Rare, on the slopes.

A. indica (Linn.) O. Kuntze, Rev. Gen. 512, 1891 ; G. 2 : 797. *Nepeta indica* Linn. Sp. Pl. 799, 1753. *Anisomeles ovata* R. Br. in Ait. Hort. Kew ed. 2, 3 : 364, 1811 ; FBI 4 : 672 ; DG. 151 ; C. 2 : 543.

Fl. : August - October. *Ill.* : Wt. Ic. t. 865.

Vern. : Gopali (Mar.) ; Gopli (Konk.).

Loc. : NAGARHAVELI : Morkhal.

It is used in medicine. Common along the Western ghats and also recorded by Dalgado for Goa.

A. malabarica R. Br. ex Sims. Bot. Mag. t. 2071, 1819 ; FBI 4 : 673, DG. 151 ; C. 2 : 544 ; G. 2 : 797.

Fl. : September. *Ill.* : Wt. Ic. t. 864.

Vern. : Chodhana (Mar.) ; Karitumbe (Kan.) ; Kak tumbo (Konk.).

Loc. : NAGARHAVELI : Khanvel ; Dapara area. DADRA. DAMAN : Fort area.

Infrequent, along the ghats. Common in areas adjoining Goa ; also reported by Dalgado.

COLEBROOKEA Sm.

Colebrookea oppositifolia Smith, Exot. Bot. 2 : 111, t. 115, 1805 ; FBI 4 : 642 ; DG. 149 ; C. 2 : 541 ; G. 2 : 796 ; S. 194.

Fl. : March - April.

Vern. : Tuggigidda (Guj.) ; Bhamini (Konk). *Ill.* : Talb. f. 458.

Loc. : GOA : *Canacona* : Barsare forest.

Rare, in waste places.

DYSOPHYLLA El-Gazzar & L. Watson ex Airy Shaw, *non* Bl.

Dysophylla stellata Benth. in Wall. Pl. As. Rar. 1 : 30, 1829 ; FBI 4 : 640 ; C. 2 : 540 ; G. 2 : 795 ; S. 193.

Fl. : November.

Loc. : GOA : *Ilhas* : Panaji Madgao, rice fields near Santacruz village.

Rare, in wet places.

Airy shaw (Wills Dict. Fl. Pl. 397 & 447, 1973), considers *Dysophylla* El-Gazzar & L. Watson ex Airy Shaw as congeneric and synonymous to *Eusteralis* Rafin. Panigrahi (Phytologia 32(6) : 473-479, 1976) following such resuscitation of the genus *Eusteralis* Rafin., considers the South Indian taxon *Dysophylla stellata* auct., Benth. *l.c. pro parte, non* Lour. (1790) as distinct and proposes, thereby, a new specific name, under *Eusteralis deccanensis* Panigrahi *l.c.*, 475.

GENIOSPORUM Wall.

Geniosporum tenuiflorum (Linn.) Merr. in Phillip. Journ. Sc. 19 : 379, 1921. *Ocimum tenuiflorum* Linn. Sp. Pl. 597, 1753. *Geniosporum prostratum* (Linn.) Benth. in Bot. Reg. Sub. t. 1300, 1830 ; et in Pl. As. Rar. 2 : 18, 1830 ; FBI 4 : 610 ; DG. 148 ; C. 2 : 525 ; G. 2 : 781.

The species is reported from South Concan by Nimmo but there is no specimen represented for the erstwhile Bombay Presidency. However, it is common along south of North Kanara in Peninsular India and Dalgado also records it for Goa.

HYPTIS Jacq.

Hyptis suaveolens (Linn.) Poit. in Ann. Mus. Hist. Nat. Par. 7 : 472, t. 29, f. 2, 1806 ; FBI 4 : 630 ; C. 2 : 560 ; G. 2 : 789 ; S. 195. *Ballota suaveolens* Linn. Syst. ed. 10, 1100, 1759.

Fl. & Fr. : August November.

Loc. : GOA : *Bicholim* : Usgao. *Satari* : Caranzol. *Bardez* : Palernum village ; *Bastara*. *Ilhas* : Santacruz. *Sanguem* : Barazon ; Aldane ; Bati Sidh. *Canacona* : Ordofond. NAGARHAVELI : Jamunpada forest ; Dongar-pad Umberkoi.

Occasional on exposed rocky areas and in wastelands.

LAVANDULA Linn.

Lavandula bipinnata (Roth) O. Ktze. Rev. Gen. 521, 1891. *Bysteropogon bipinnatus* Roth, Nov. Pl. Sp. 255, 1821. *Lavandula burmanni* Benth. Lab. Gen. Sp. 151, 1833 ; FBI 4 : 631 ; C. 2 : 534 ; G. 2 : 789.

Fl. : October November.

Vern. : Gorea (Mar.). *Ill.* : Wt. Ic. t. 1438.

Loc. : NAGARHAVELI : Dongarpad Umberkoi.

Occasional along exposed areas.

LEONOTIS (Pers.) R. Br.

Leonotis nepetaefolia (Linn.) R. Br. Prodr. 504, 1810 & in Ait. Hort. Kew 3 : 409, 1811 ; FBI 4 : 691 ; C. 2 : 555 ; G. 2 : 807 ; Dangs. 40 ; Pav. 192. *Phlomis nepetaefolia* Linn. Sp. Pl. 586, 1753.

Fl. : September.

Vern. : Dimpal (Mar.) ; Matisul (Guj.).

Loc. : GOA : *Pernem* : Terekhol. NAGARHAVELI : Velugaon. DAMAN : Jamper.

Rare, in wastelands.

LEUCAS R. Br.

- | | |
|---|------------------------|
| 1. Calyx mouth oblique | |
| 2. Bracts equalling the calyx, villous and long ciliate ; calyx distinctly ribbed | |
| 3. Calyx mouth not villous within | <i>aspera</i> |
| 3. Calyx mouth villous within | <i>zeylanica</i> |
| 2. Bracts smaller than the calyx, finely pubescent ; calyx smooth | <i>lavandulaefolia</i> |
| 1. Calyx mouth straight | |
| 4. Calyx teeth stellately spreading in fruit ; whorls many flowered | |
| 5. Leaves ovate, pubescent or glabrate ; calyx teeth slender, spreading, ciliate | <i>ciliata</i> |
| 5. Leaves linear-oblong, nearly glabrous ; calyx teeth recurved, pubescent | <i>stelligera</i> |
| 4. Calyx teeth erect in fruit ; whorls 2 - 4 flowered | <i>biflora</i> |

Lencas aspera Spreng. Syst. 2 : 743, 1825 ; FBI 4 : 690 ; DG. 151 ; C. 2 : 548 ; G. 2 : 803 ; Dangs. 40 ; Pav. 191.

Fl. : September October.

Vern. : Tumbo (Konk.) ; Tamba, Kubo (Guj.).

Loc. : *Pernem* : Terekhol. *Ilhas* : Panaji. NAGARHAVELI : Sindhoni forest ; Bank of Damanpada river on way to Kawcha. DAMAN : Jampor ; Fort area ; Cataria.

Rare in open, sandy areas.

L. biflora (Vahl) R. Br. Prodr. 504, 1810 ; FBI 4 : 683 ; C. 2 : 553 ; G. 2 : 804. *Phlomis biflora* Vahl, Symb. 3 : 77, 1794.

Fl. & Fr. : August November. *Ill.* : Wt. Ic. t. 866.

Loc. : GOA : *Satari* : Valpoi, Nagram ; Tanem ; Golauli ; Nagargao near Valpoi. *Sanguem* : Barazan mine area ; Nanecha Dongar-Codol Potiem forests ; Sanguem forest ; Aldune (Netravali) ; Bati ; Toutemol ; Cumbari. *Canacona* : Butpal.

Occasional, on exposed, rocky ground.

L. ciliata Benth. in Wall. Pl. As. Rar. 1 : 61, 1830 ; FBI 4 : 687 ; C. 2 : 554 ; G. 2 : 806 ; S. 194.

Fl. & Fr. : August April.

Loc. : GOA : *Satari* : Codal village ; Wagheri (Tanem) ; Satrem ; Jamad forest near Nandore hill ; Maloli forest ; Codal. *Sanguem* : Durgin forests ; Choraundem ; Madka Bangalow (Molem) ; Belgaum Road.

Occasional.

L. lavandulaefolia Rees, Cyclop. 20(2) : 1819 ; S. 194. *L. linifolia* Spreng. Syst. 2 : 743, 1825 ; FBI 4 : 465 ; DG. 151 ; C. 2 : 548 ; G. 2 : 803.

Fl. : August December. *Fr.* : March April.

Vern. : Tumbo (Port.).

Loc. : GOA : *Satari* : Nandore village. *Bardez* : Betim ; Bastaral ; coconut plantation area, Kolvelly ; Porvorim. *Ilhas* : Panaji sea coast. *Salcete* : Rocky plateau area, Cortalim Margoa ; Goodier, Margoa-Quepem ; Margoa. *Marmugao* : Nuvem. *Sanguem* : Valchem. *Canacona* : Ordofond Gotkanala. NAGARHAVELI : Dhapsa ; Dudeni ; Atal forest area and surroundings. DAMAN : Thana Paidi.

Common weed in cultivated fields, along roadsides and in waste places.

Leucas stelligera Wall. ex Benth. in Wall. Pl. As. Rar. 1 : 61. 1829 ; FBI 4 : 686 ; C. 2 : 553 ; G. 2 : 806 ; S. 194.

Fl. & Fr. : November - March.

Loc. : GOA : *Sanguem* : Moduca bungla jungle ; Tudon. *Canacona* : Choram hill top. Nadquem.

Rare, on rocky ground.

L. zeylanica R. Br. Prodr. 504, 1810 ; FBI 4 : 689 ; C. 2 : 549 ; Dangs. 41.

Fl. & Fr. : September. *Ill.* : Wt. *Ill.* t. 176.

Loc. : DIU : Jalandhar ; Castle area.

Rare, along roadsides.

OCIMUM Linn.

- | | |
|---|--------------------|
| 1. Pedicels as long as or longer than the calyx ; calyx glabrous within | <i>sanctum</i> |
| 1. Pedicels shorter than the calyx ; calyx hairy within | |
| 2. Lower calyx teeth longer than the upper lip | <i>americanum</i> |
| 2. Lower calyx teeth shorter than the upper lip | <i>gratissimum</i> |

Ocimum omericanum Linn. Cent. Pl. 1 : 15, 1755 ; S. 192. *O. canum* Sims. in Bot. Meg. t. 2452, 1824 ; FBI 4 : 607 ; DG. 147 ; C. 2 : 521 ; G. 2 : 777.

Fl. & Fr. : August - November *Ill.* : Tadulingam & Venkatanarayana in Handb. Some South Indian weeds, tt. 133 & 134, f. 1 - 9. 1955.

Vern. : Ramtulas (Konk.) ; Mangericao branco (Port.).

Loc. : GOA. : *Bardez* : Bastara. *Ilhas* : Panjim, along the sea coast. *Salcete* : Verna village, along roadside. NAGARHAVBLI : Silvassa, near Atal forest. DAMAN : Marvor ; Fort area. DIU : Gogale.

Common along roadsides.

O. gratissimum Linn. Sp. Pl. 1197, 1753 ; FBI 4 : 608 ; DG. 147 : C. 2 : 522 ; G. 2 : 777 ; Pav. 189.

Fl. : July : October.

Vern. : Mall tuisi (Mar.) ; Rantulas (Konk.) ; Aavachi Bavachi (Guj.).

Loc. : DIU : Nagoa ; Joola.

Often cultivated, sometimes found wild.

Ocimum sanctum Linn. Mant. 1 : 85, 1767 ; FBI 4 : 609 ; C. 2 : 521 ; G. 2 : 778 ; S. 192 ; Dangs. 41 ; Pav. 189.

Fl. & Fr. : May.

Vern. : Tulas (Konk.) ; Tulsi (Port.).

Loc. : GOA : *Pernem* : Amberem *Pernem. Satari* ; Nandore forest, near Mahadevi river. *Sanguem* : Bati Sidh. NAGARHAVELI : Dudeni ; Atal forests and surroundings.

Rare, probably an escape from cultivation.

Cult. species :

O. basilicum Linn. Sp. Pl. 597, 1733 ; FBI 4 : 608 ; DG. 147 ; C. 2 : 523 ; G. 2 : 777.

Vern. : Sabja (Mar.) ; Bhumy tulas (Konk.) ; Alfavaca (Port.).

Loc. : NAGARHAVELI : Bank of Damanganga river on way to Kawcha ; Velugaon.

The species is found only in cultivation. The seeds are medicinal and supposed to have cooling effect.

ORTHOSIPHON Benth.

Orthosiphon glabratus Benth. in Wall. Pl. As. Rar. 2 : 14, 1830 ; G. 2 : 779. *O. tomentosus* Benth. var. *glabratus* Hook. f. FBI. 4 : 614, 1885 ; C. 2 : 524.

Fl. & Fr. : August September.

Loc. : GOA : *Bardez* : Sukur village near Porvorim. *Salcete* : Verna village outskirts. *Sanguem* : Dudal.

Rare.

PLECTRANTHUS L'Herit. *nom. cons.*

1. Fruiting calyx indistinctly 2 - lipped, shortly subequally 5 - toothed

stocksii

1. Fruiting calyx distinctly 2 - lipped, upper lip broad, rounded

mollis

Plectranthus mollis (Ait.) Spreng. Syst. 2 : 690, 1825 ; S. 192. *Ocimum molle* Aiton, Hort. Kew 2 : 322, 1789. *Plectranthus incanus* Link, Enum. Hort. Berol. 2 : 120, 1822 ; FBI. 4 : 621 ; C. 2 : 529 ; G. 2.

Fl. & Fr. : September.

Loc. : GOA : *Marmugao* : Nuvem.

Rare.

Plectranthus stocksii Hook. f. *Fl. Brit India* 4 : 618, 1885 ; C. 2 : 528 ; G. 2 : 1120.

Fl. & Fr. : September - November.

Loc. : GOA : *Sanguem* : Tudon ; Verlem.

POGOSTEMON Desf.

- | | |
|--|---------------------|
| 1. Stems glabrous or nearly so, smooth and shining | <i>parviflorus</i> |
| 1. Stems hoary - pubescent or villous | |
| 2. Calyx teeth short | <i>benghalensis</i> |
| 2. Calyx teeth nearly as long as the tube | <i>purpurascens</i> |

Pogostemon benghalensis (Burm.) O. Kuntze, *Rev. Gen. Pl.* 2 : 529, 1891 ; S. 217 (ed. 3). *Origanum benghalense* Burm. *Fl. Ind.* 128, t. 38, f. 3, 1768. *Pogostemon plectranthoides* Desf. in *Ann. Mem. Mus. Nat. Paris* 2 : 155, t. 6, 1815 ; FBI 4 : 632 ; C. 2 : 536.

Fl. : September.

Loc. : NAGARHAVELI : Silvassa, along Damanganga river bank.

Rare.

P. parviflorus Benth. in Wall. *Pl. As. Rar.* 1 : 31, 1830 ; FBI 4 : 632 ; DG. 149 ; C. 2 : 536.

Fl. : December February.

Vern. : Pangli (Mar.) ; Pamglo (Konk.).

Loc. : GOA : *Satari* : Caranzol Suaveolon path. *Sanguem* : Baranzon. Old Goa.

A common species along the Western ghats.

P. purpurascens Dalz. Hook. *Kew Journ.* 2 : 337, 1850 ; FBI 4 : 632 ; C. 2 : 537 ; G. 2 : 792 ; S. 192.

Fl. & Fr. : November April.

Loc. : GOA : *Satari* : Near Nandore village. *Sanguem* : Maduka bungla jungle. *Canacona* : Choram hill top, Nadquem ; Nadquem hills.

Occasional, as forest undergrowth.

SCUTELLARIA Linn.

Scutellaria discolor Colebr. in Wall. Pl. As. Rar. 1 : 66, 1830 ; FBI 4 : 667 ; C. 2 : 545 ; G. 2 : 798.

Fl. : September November. *Fr.* : April May.

Loc. : GOA : *Safari* : Nandore forest near Mahadevi river. *Sanguem* : Netraveli.

Rare, on the rocky slopes.

SALVIA Linn.

Salvia plebeia R. Br. Prodr. 501, 1810 ; FBI 4 : 655 ; C. 2 : 557 ; S. 195 ; Dangs. 41.

Fl. : September.

Loc. : NAGARHAVELI : Dapara area ; Dudeni ; Bank of Damanganga river on way to Kawcha ; Morkhal.

Rare, in fields especially on moist soil.

Cult. species :

Anisomeles carnosus Wall. Pl. As. Rar. 2 : 18, 1831 ; FBI 4 : 627 ; DG. 148 ; C. 2 : 532 ; G. 2 : 788.

Fl. : September October. *Ill.* : Wt. Ill. t. 176b, f. 1.

Vern. : Kapurli (Mar.) ; Sujro hortelamv (Konk.).

Cultivated in the gardens.

Colens amboinicus Lour. Fl. Cochinch. 2 : 372, 1790 ; C. 2 : 531 ; G. 2 : 786, *C. aromaticus* Benth. in Wall. Pl. As. Rar. 2 : 15, 1831 ; FBI 4 : 625 ; DG. 148.

Ill. : Wt. Ill. t. 175.

Vern. : Patharchur (Mar.) ; Karmalo (Konk.) ; Borragem do Paiz (Port).

The species is cultivated for aromatic leaves, used for flavouring drinks and in medicine.

C. barbatus Benth. in Wall. Pl. As. Rar. 2 : 15, 1831 ; FBI 4 : 625 ; DG. 148 ; C. 2 : 530 ; G. 2 : 786.

Fl. : September. *Ill.* : Wt. Ic. t. 1432.

Vern. : Garmar (Mar.) ; Kormala (Konk.).

Cultivated for the roots which are pickled and eaten.

Lavandula vera DC. in Fl. Fr. Suppl. 398 ; DG. 149.

A pot plant sometimes found in the gardens.

Mentha arvensis Linn. Sp. Pl. 577, 1753 ; FBI 4 : 648 ; DG. 150 ; C. 2 : 559.

Vern. : Pudina (Mar.) ; Ortelamv (Konk.) ; Hartela doce (Port.).

Cultivated in the gardens.

M. piperita Linn. Sp. Pl. 576, 1753 ; FBI 4 : 647 ; DG. 150 ; C. 2 : 560.

Vern. : Pepermint (Konk.) ; Hertela pimenta (Port.).

Grown in the gardens.

M. viridis Linn. Sp. Pl. ed. 2, 804, 1763 ; FBI 4 : 647 ; DG. 149 ; C. 2 : 559.

Vern. : Pudina (Mar.) ; Ortelam (Konk.). Hertela verde (Port.).

Grown in the gardens.

Origanum majorana Linn. Sp. Pl. 590, 1753 ; FBI 4 : 648 ; DG. 150 ; C. 2 : 559.

Vern. : Murva (Mar.) ; Mijrikam (Konk.) ; Mangerona branca (Port.).

A native of South Europe and Asia Minor, cultivated in the gardens.

O. vulgare Linn. Sp. Pl. 590, 1753 ; DG. 150.

Vern. : Mijrikamv (Konk.) ; Ouregao (Port.).

Cultivated for essential oil.

Salvia officinalis Linn. Sp. Pl. 23 : 1753 ; DG. 151 ; C. 2 : 559.

Vern. : Salva (Port.).

Cultivated in gardens as an ornamental plant.

Thymus vulgaris Linn. Sp. Pl. 591, 1753 ; DG. 150.

Vern. : Tomilho, Thymo (Port.).

Cultivated in gardens for the aromatic leaves and oil.

NYCTAGINACEAE

BOERHAVIA Linn.

Fruit glandular along the ribs not at the crown ; flowers pink or purple

diffusa

Fruit with large glands at the crown ; flowers white

verticillata

Boerhavia diffusa Linn. Sp. Pl. 3, 1753 ; C. 2 : 563 ; G. 2 : 814 ; S. 196 ; V. 87 ; Dangs. 42 ; Pav. 194. *B. repens* Linn. Sp. Pl. 3, 1753 ; FBI 4 : 709 ; DG. 152.

Fl. : April. *Ill.* : Wt. Ic. t. 874.

Vern. : Raktavasu (Mar.) ; Punarnava (Konk.) ; Kommegida (Kan.) ; Satodi (Guj.).

Loc. : GOA : *Ilhas* : Panjai beach side. *Canacona* : Angidiv. DADRA : DAMAN : Fort area ; Marvor ; Cataria. DIU : Castle area ; Nagoa ; Gogale.

Occasional, along roadside. The roots are purgative, anthelmintic and febrifuge.

B. verticillata Poir. in Dict. Sc. Nat. 5 : 56, 1804 ; FBI 4 : 710 ; C. 2 : 564. *Commicarpus verticillatus* (Poir.). Standl. in Contrib. U. S. Nat. Herb. 18 : 101, 1916.

Fl. & Fr. : September. *Ill.* : Wt. Ic. t. 875.

Loc. : DIU : Jalandhar ; Jalandhar Diu Road ; Castle area ; Rocky creek in sea, Nagoa.

Occasional in undisturbed sandstone ditches near the sea.

Cult. species :

Bougainvillea spectabilis Willd. Sp. Pl. 2 : 348, 1799 ; DG. 152 ; C. 2 : 567 ; G. 2 : 815 ; S. 196.

Vern. : Bugamvil (Konk.) ; Bougainvillea (Port.).

Grown in gardens for beautiful coloured bracts.

Mirabilis jalapa Linn. Sp. Pl. 177, 1753 ; DG. 152 ; C. 2 : 567 ; G. 2 : 815 ; S. 196 ; V. 87.

Vern. : Gul-abbas (Mar.) ; Meremdi (Konk.) ; Boas noites (Port.).

A herbaceous plant grown in gardens, often found wild.

Pisonia grandis R. Br. Prodr. Fl. Nov. Holl. 1 : 422, 1810 ; Stemmerik in Fl. Males. ser. 1, 6(3), 464, f. 11, 1964. *Pisonia morindifolia* R. Br. in Wall. Cat. 7130, 1828 ; C. 2 : 566 ; G. 2 : 815. *Pisonia alba* Spanog in Linnaea 15 : 342, 1841 ; FBI 4 : 711 ; DG. 152.

Ill. : Wt. Ic. t. 1765.

Vern. : Chinai Salit (Mar.)

Grown in gardens.

AMARANTHACEAE

- | | |
|--|----------------------|
| 1. Leaves alternate or fascicled | |
| 2. Staminodes present between the stamens | <i>Aerva</i> |
| 2. Staminodes absent | |
| 3. Seeds many | <i>Celosia</i> |
| 3. Seed solitary | |
| 4. Flowers hermaphrodite | <i>Digera</i> |
| 4. Flowers unisexual or polygamous | <i>Amaranthus</i> |
| 1. Leaves opposite | |
| 5. Anthers 1 - celled | <i>Alternanthera</i> |
| 5. Anthers 2 - celled | |
| 6. Flowers all perfect, in spikes | |
| 7. Stamens with inter-posed staminodes | <i>Achyranthes</i> |
| 7. Staminodes absent | <i>Nothosaerva</i> |
| 6. Flowers in clusters, perfect only one, imperfect several with hooked bristles | |
| 8. Staminodes absent | <i>Pupalia</i> |
| 8. Staminodes present | <i>Cyathula</i> |

ACHYRANTHES Linn.

Leaves elliptic lanceolate, acute, membranous *var. porphyristachya*

Leaves elliptic or obovate, sometimes nearly orbicular, rounded at apex, thick *var. aspera*

Achyranthes aspera var. *aspera* Linn. Sp. Pl. 204, 1753 ; FBI 4 : 730 ; C. 2 : 580 ; Dangs. 42.

Fl. : September. *Ill.* : Wt. Ic. t. 1777.

Vern. : Aghedo (Guj.).

Loc. : NAGARHAVELI : Saily forest ; Khanvel. DAMAN : Cataria ; Fort area. DIU : Jalandhar ; Castle area. Gogale.

A. aspera Linn. var. *porphyristachya* Hook. f. in FBI 4 : 730, 1885 ; G. 2 : 824 ; S. 199. *A. aspera* Cooke, Fl. Bomb. Pres. 2 : 495, 1906 p.p. ; DG. 155.

Leaves elliptic lanceolate, acute, glabrous or pubescent, membranous.

Fl. & Fr. : November - May. *Ill.* : Wt. Ic. t. 1777.

Vern. : Aghada (Mar.) ; Aghado (Konk.).

Loc. : GOA : *Satari* : Masarde village near Valpoi. *Ilhas* : Chimbel water reservoir. *Sanguem* : Barazan mine area.

Occasional, on shady hill slopes.

AERVA Forsk. *nom. cons.*

1. Spikes axillary and terminal ; leaves opposite or alternate

2. Erect ; leaves alternate ; flowers unisexual, dioecious

persica

2. Climbing ; leaves alternate and opposite ; flowers bisexual

sanguinolenta

1. Spikes all axillary ; leaves alternate ; flowers unisexual and bisexual

lanata

Aerva lanata (Linn.) Juss. in Ann. Mus. Par. 2 : 131, 1803 ; FBI 4 : 728 ; DG. 155 ; C. 2 : 578 ; G. 2 : 825 ; S. 198 ; Pav. 197. *Achyranthes lanata* Linn. Sp. Pl. 204, 1753 (*non Celosia lanata* Linn., *ibid.*, 205).

Fl. : September. *Ill.* : Wt. Ic. t. 1766 bis A.

Vern. : Kapurphuti (Mar.) ; Tamdlo (Konk.) ; Bur, Kapuri Madhuri (Guj.).

Loc. : GOA : *Sanguem* ; DADRA. DAMAN : Fort area.

Rare, on loamy soil. Common in areas adjoining Goa.

A. persica (Burm.) Merrill in Phil. Journ. Sci. 10 : 348, 1921 ; S. 198. *Iresine persica* Burm. Fl. Ind. 212, 1768. *A. javanica* Juss. in Ann. Mus. Par. 2 : 131, 1803 ; FBI 4 : 727 ; C. 2 : 577.

Fl. : August - November. *Ill.* : Wt. Ic. t. 876.

Loc. : DIU : Gogale.

Rare, on sandy sea shore.

A. sanguinolenta (Linn.) Blume, Bijdr. 547, 1825 ; S. 198. *Achyranthes sanguinolenta* Linn. Sp. Pl. 294, 1762. *Aerva scandens* Wall. ex Moq. in DC. Prodr. 13(2) : 302, 1849 ; FBI 4 : 727 ; C. 2 : 577 ; G. 2 : 825.

Fl. & Fr. : March. *Ill.* : Wt. Ic. t. 724 (excl. seed & utricle).

Vern. : Velavo ; Gorakh ganjo (Guj.).

Loc. : GOA : *Canacona* : Choram hill top, Nadquem ; Angidiv. DIU : Castle area ; Nagoa.

Rare, on hill top.

ALTERNANTHERA FOTSK.

Alternanthera sessilis (Linn.) R. Br. ex DC. Cat. Hort. Monsp. 77, 1813 ; FBI 4 : 731 ; DG. 155. *Gomphrena sessilis* Linn. Sp. Pl. 225, 1753. *Alternanthera triandra* Lamk. Encycl. Method. 1 : 95, 1783 ; C. 2 : 584 ; G. 2 : 825.

Fl. & Fr. : August April. *Ill.* : Wt. Ic. t. 727.

Vern. : Kanchari (Mar.) ; Honagonne (Kan.) ; Koypa (Konk.).

Loc. : GOA : *Salcete* : Navelin beyond Margao on way to Quepem ; Margoa town ; Margoa, near rest house. *Canacona* : Butpal. NAGARHAVELI : Silvassa, Daman Ganga river bed ; Khanvel ; Morkhal ; Velugaon ; Nana Randha. DADRA. DAMAN : Cataria.

Common along roadside, on moist areas and river beds.

AMARANTHUS Linn.

- | | |
|--|--------------------|
| 1. Spinous herbs ; perianth lobes and stamens 5 | <i>spinousus</i> |
| 1. Spineless herbs ; perianth lobes and stamens 3 or 2 | |
| 2. Perianth lobes and stamens 2 | <i>tenuifolius</i> |
| 2. Perianth lobes and stamens 3 | |
| 3. Prostrate herbs ; flowers in axillary clusters | <i>tricolor</i> |
| 3. Erect herbs ; flowers in axillary and terminal spikes | |
| 4. Succulent herbs | <i>blitum</i> |
| 4. Non-succulent herbs | <i>viridis</i> |

Amaranthus blitum Linn. var. *oleracea* Hook. f. in FBI 4 : 721, 1885 ; DG. 154 ; C. 2 : 575 ; S. 197. *Amaranthus oleraceus* Linn. Sp. Pl. ed. 2, 1403, 1763.

Fl. : Throughout the year.

Vern. : Tandulja (Mar.) ; Pokal Bhaji (Konk.) ; Bredos (Port.).

The species is cultivated in the gardens and sometimes found to run wild. Common along the Western ghats and Dalgado also records it for Goa.

A. spinousus Linn. Sp. Pl. 991, 1753 ; FBI 4 : 718 ; DG. 153 ; C. 2 : 573 ; G. 2 : 819 ; S. 197.

Fl. & Fr. : August November. *Ill.* : Wt. Ic. t. 513.

Vern. : Kantanat (Mar.) ; Kamte bhaji (Konk.) ; Mulladantu (Kan.).

Loc. : GOA : *Ilhas* : Panjim along the sea coast. *Salcete* : Margao.
Marmugao NAGARHAVELI : Bank of Daman ganga river on way to Kawcha.

Rare. A weed of wastelands.

Amaranthus tenuifolius Willd. Sp. Pl. 4 : 381, 1805 ; FBI 4 : 722, DG. 155 ; C. 2 : 576.

Ill. : Wt. Ic. t. 718.

Vern. : Ghol (Mar.) ; Gholchi bhaji (Konk.).

Common.

A. tricolor Linn. (sens. ampl.) Sp. Pl. 989, 1753 ; Backer in Fl. Males. ser. 1, 4 (2) : 77, f. 2, 1949. *Amaranthus polygamus* Linn. Cent. Pl. 1, t. 32, 1755 ; FBI 4 : 721 ; DG. 154 ; C. 2 : 575 ; G. 2 : 820. *A. gangeticus* Linn. Syst. ed. 10, 2 : 1268, 1759 ; FBI 4 : 719 ; DG. 154 ; C. 2 : 574 ; G. 2 : 819.

Fl. : December - March. *Ill.* : Wt. Ic. tt. 512 & 719.

Vern. : Chavlai (Mar.) ; Domgte Bhaji (Konk.).

Commonly found in wastelands and in cultivated fields. Often cultivated as a pot-herb and used as vegetable.

A. viridis Linn. Sp. Pl. (ed. 2) 1405, 1763 ; FBI 4 : 720 ; DG. 154 ; C. 2 : 575 ; G. 2 : 820 ; S. 197.

Fl. & Fr. : September - November. *Ill.* : Wt. Ic. t. 1773.

Vern. : Lhananat (Mar.) ; Ran bhaji (Konk.) ; Bredo verde (Port.) ; Dhimado (Guj.).

Loc. : GOA : *Satari* : Nanecha Dongar (Codal). *Bardez* : Porvorim, near Geological Survey of India Office. *Quepem* : Rivona. *Canacona* : Angidiv. DAMAN : Fort area ; Cale village. DIU : Nagoa.

Rare, in wastelands.

Cult. species :

A. caudatus Linn. Sp. Pl. 900, 1753 ; DG. 154 ; C. 2 : 576 ; G. 2 : 819.

Vern. : Bhaji (Konk.) ; Bredo namorado (Port.).

Chiefly cultivated in gardens as ornamental plant.

A. hybridus Linn. Sp. Pl. 990, 1753, subsp. *cruentus* (Linn.) Thell. var. *paniculatus* (Linn.) Thellung in *Asch. & Gr. Syn.* 5, 1 : 247, 1914. *A. paniculatus* Linn. Sp. Pl. ed. 2, 1406, 1763 ; FBI 4 : 718 ; DG. 153 ; C. 2 : 573 ; G. 2 : 819.

Ill. : Wt. Ic. t. 720.

Vern. : Rajgira (Mar.) ; Rajgiro (Konk.) ; Bredo (Port.).

Cultivated.

CELOSIA Linn.

Celosia argentea Linn. Sp. Pl. 205, 1753 ; FBI 4 : 714 ; DG. 153 ; C. 2 : 570 ; G. 2 : 816 ; S. 196. Dangs. 43 ; Pav. 195. *Celosia cristata* Linn. Sp. Pl. 205, 1753 ; FBI 4 : 715 ; DG. 153 ; C. 2 : 571 ; G. 2 : 817.

Fl. & Fr. : August - November. *Ill.* : Wt. Ic. t. 1767.

Vern. : Kurdu (Mar.) ; Kurdu (Konk.).

Loc. : GOA : *Satari* : Caranzol ; Wadicha ; Dongar ; Tanem. *Bardez* : Betim ; Porvorim village fields ; Bastara. *Salcete* : Margao, fields near the rest house. *Marmugao* : Marmugao hill top around the fort ; Nuvem. *Sanguem* : Organi (Netravali) ; Bati Sidh ; Chasuria ghat. *Canacona* : Arvolam ; Colguinem ; Near naja, Dudhsagar to Castle rock side. NAGARHAVELI : Saily ; Dolara forest ; Morkhal ; Velugaon ; Bank of Daman ganga river on way to Kawcha ; Nana-Randha ; Umberkoi.

Common weed in fields and along rocky slopes. Also cultivated in gardens.

CYATHULA Bl. *nom. cons.*

Cyathula prostrata (Linn.) Blume, Bijdr. 549, 1825 ; FBI 4 : 723 ; DG. 155 ; C. 2 : 581 ; G. 2 : 820. *Achyranthes prostrata* Linn. Sp. Pl. ed. 2, 296, 1762.

Fl. & Fr. : October - March. *Ill.* : Wt. Ic. t. 733.

Vern. : Dhako mogro (Konk.).

Loc. : *Bicholim* : Usgao. *Satari* : Dinachirai near Valpoi, Deosali (Caranzol). *Ilhas* : Brahmपुरi temple near Velagoa. *Sanguem* : Molem ; Catalis (Netravali) Barazol. *Canacona* : Butpal, Kanpal hill top.

Frequent, in moist areas.

DIGERA Forsk.

Digera muricata (Linn.) Mart. Beitr. Amar. 77 (2), 1825 ; Dangs. 43 ; Pav. 198. *Achyranthes muricata* Linn. Sp. Pl. ed. 2 : 295, 1762.

A. alternifolia Linn. Mant. 50, 1767. *Digera arvensis* Forsk. Fl. Aegypt - Arab. 65, 1775 ; FBI 4 : 717 ; DG. 153 ; C. 2 : 572 ; G. 2 : 818.

Fl. : September. *Ill.* : Wt. Ic. t. 732 ; Backer in Fl. Males. ser. 1, 4 (2) : 80, f. 3, 1949.

Vern. : Gitana (Mar.) ; Kanajar (Guj.).

Loc. : DAMAN : Fort area. DIU : Nagoa.

Rare.

NOTHOSAERVA Wight

Nothosaerva brachiata (Linn.) Wt. Icon. 6 : 1, 1853 ; FBI 4 : 726 ; C. 2 : 580, G. 2 : 823. *Illecebrum brachiatum* Linn. Mant. 23, 1767.

Fl. & Fr. : October - January. *Ill.* : Wt. Ic. t. 1776 (excl. analysis under *Pseudanthus brachiatus*)

Loc. : GOA : *Bardez* : Bastara. NAGARHAVELI : Nala between Kawcha - Jamunpada ; Dhapsa ; Velugaon.

Occasional in waste places and along cultivated fields.

PUPALIA Juss. nom. cons.

Pupalia lappacea (Linn.) Juss. in Ann. Mus. 2 : 132, 1803 ; Pav. 199, *Achyranthes lappacea* Linn. Sp. Pl. 204, 1753. *Pupalia atropurpurea* Moq. in DC. Prodr. 13 (2) : 331, 1849 ; FBI 4 : 723 ; DG. 155 ; C. 2 : 582 ; G. 2 : 821.

Ill. : Wt. Ic. t. 731.

Vern. : Sitya kurdi (Konk).

Loc. : DAMAN : Dolera. DIU : Jalandhar ; Castle area ; Nagoa.

The species is common along the slopes of the ghats and it can be located in Goa also.

Cult. species :

Gomphrena globosa Linn. Sp. Pl. 224, 1753 ; FBI 4 : 732 ; DG. 155 ; C. 2 : 584 ; G. 2 : 825.

Ill. : Wt. Ic. t. 1784.

Vern. : Jafri gundi (Mar.) ; Buttamv Gamdo (Konk.) ; Perpetuas roxas (Port.).

Grown in the gardens for cut flowers, often found as an escape.

CHENOPODIACEAE

- | | |
|--|---------------------|
| 1. Embryo spiral, albumen nil | <i>Suaeda</i> |
| 1. Embryo annular or horse-shoe shaped | |
| 2. Stems leafy, not jointed | <i>Atriplex</i> |
| 2. Stems jointed, fleshy, seemingly leafless | |
| 3. Flowers in the scales of cone-like spikes | <i>Arthrocnemum</i> |
| 3. Flowers in cavities of successive joints | <i>Salicornia</i> |

ARTHROCNEMUM Moq.

Arthrocnemum indicum (Willd.) Moq. *Chenoped.* Enum. 113, 1840 ; FBI 5 : 12 ; DG. 156 ; C. 2 : 589 ; G. 2 : 828. *Salicornia indica* Willd. in *Ges. Naturf. Fr. Neue. Schr.* II, 111, t. 4, f. 4, 1799.

Fl. : December. *Ill.* : Wt. Ic. t. 737.

Vern. : Machur (Mar.).

Loc. : DIU : Salt marshes.

The species is common along the sea coast in salt marshes.

ATRIPLEX Linn.

Atriplex stocksii Boiss. *Diagn. ser.* 2, n. 4, 73, 1859 ; FBI 4 : 7 ; C. 2 : 588. *

Fl. : September. *Ill.* : Wt. Ic. 1789 (as *Obione stocksii*).

Loc. : DIU : Nagoa.

Rare, in rocky creeks.

SALICORNIA Linn.

Salicornia brachiata Roxb. *Fl. Ind.* (ed. Carey & Wall.) I : 82, 1820 ; FBI 5 : 12 ; C. 2 : 590.

Fl. : September - October. *Ill.* : Wt. Ic. t. 738.

Loc. : DIU.

Common in salt marshy areas. Young shoots pickled and also used as a pot herb.

SUAEDA Scop. *nom. cons.*

Leaves linear ; flowers polygamous ; stigmas 2-5 ; bracteoles with entire margins

monoica

Leaves oblong, ellipsoid or linear-obovate ; flowers bisexual ; stigmas 3 ; bracteoles with pectinate margins

nudiflora

Suaeda monoica Forsk. Fl. Aegypt. Arab. 70, 1775 ; FBI 5 : 13 ; C. 2 : 591.

Fl. : September October. *Ill.* : Wt. Ic. t. 1792.

Loc. : DIU : Castle area.

In backwaters and salty marshes.

S. nudiflora Moq. in Ann. Sc. Nat. 23 : 316, 1331 ; FBI 5 : 14 ; C. 2 : 591.

Fl. : September October. *Ill.* : Wt. Ic. t. 1796.

Loc. : DIU.

Common in salty marshes ; green leaves serve as vegetable.

Cult. species :

Beta vulgaris Linn. Sp. Pl. 222, 1753 ; FBI 5 : 5 ; DG. 156 ; C. 2 : 595 ; G. 2 : 830.

Vern. : Palak (Mar.) ; Bit (Konk.) ; Betarraba (Port.).

Cultivated in the gardens for vegetable.

Chenopodium album Linn. Sp. Pl. 219, 1753 ; FBI 5 : 3 ; DG. 156 ; C. 2 : 586 ; G. 2 : 827.

Fl. : November.

Vern. : Chakvat (Mar.) ; Chakvit (Konk.).

In fields and gardens ; extremely polymorphous.

Spinacia oleracea Linn. Sp. Pl. 1027, 1753 ; FBI 5 : 6 ; DG. 156 ; C. 2 : 595 ; G. 2 : 830.

Ill. Wt. Ic. t. 818.

Vern. : Palak (Mar.) ; Ispinaph (Konk.) ; Espinafre (Port.).

Cultivated in the gardens as vegetable.

BASELLACEAE

Cult. species :

Basella alba Linn. Sp. Pl. 272, 1753. *Basella rubra* Linn. Sp. Pl. 272, 1753 ; FBI 5 : 20 ; C. 2 : 594.

Fl. & Fr. : September February. *Ill.* : Wt. Ic. t. 896.

Vern. : Velbendi (Mar.); Valchi Bhagi (Guj., Konk.); Bacella (Port.).

Cultivated in the gardens as a pot herb.

POLYGONACEAE

POLYGONUM Linn.

- | | |
|--|-----------------|
| 1. Flowers in axillary clusters ; herbs with small leaves | <i>plebeium</i> |
| 1. Flowers in terminal racemes, capitate or in spikes ; leaves large | |
| 2. Inflorescence compressed, capitate | <i>chinense</i> |
| 2. Inflorescence in elongate, stout or filiform racemes or spikes | |
| 3. Nutlets trigonous ; stipules and bracts ciliate | <i>barbatum</i> |
| 3. Nutlets orbicular or biconvex ; stipules and bracts not ciliate | <i>glabrum</i> |

Polygonum barbatum Linn. subsp. *gracile* Steward in Contr. Gray Herb. 88 : 55, 1930 ; S. 201. *P. serrulatum* Hook. f. in FBI 5 : 38, 1886, (excl. var. *donii*) ; C. 3 : 7 (*non* Lagasca *nec* Meisn. *nec* Miq.).

Fl. : March.

Vern. : Dhaktasheral (Mar.).

Loc. : GOA : *Satari* : Nandore near Mahadevi nadi ; Nandore river, Valpoi. NAGARHAVELI : Chispana ; Nana Randha.

Occasional, along river banks.

P. chinense Linn. Sp. Pl. 363, 1753 ; FBI 5 : 44 ; DG. 157 ; C. 3 : 8 ; G. 2 : 833.

Fl. & Fr. : November April. *Ill.* : Wt. Ic. t. 1806.

Vern. : Paral (Mar.) ; Ran siori (Konk.).

Loc. : GOA : *Satari* : Nandore forests, near a stream. *Sanguem* : Moduka bungla jungle ; Verlem. *Canacona* : Badsare village.

Rare.

P. glabrum Willd. Sp. Pl. 2 : 447, 1799 ; FBI 5 : 34 ; DG. 157 ; C. 3 : 5 ; G. 2 : 832 ; S. 201 ; Danga. 45.

Fl. : September. *Ill.* : Wt. Ic. t. 1799.

Vern. : Siori (Konk.).

Loc. GOA : *Salcete* : Gornva Gavalossum, about 10 km. NAGARHAVELI : Silvassa ; Dudeni ; Pheland river ; Morkhal ; Silvassa, Damanganga river bed ; Saily.

Rare, along the river bank.

Polygonum plebeium R. Br. Prodr. 420, 1810 ; FBI 5 : 27 ; C. 3 : 4 ; G 2 : 832 ; S. 201 ; Dangs. 44 ; Pav. 201.

Fl. : March April. *Ill.* : Tadulingam & Venkatanarayana, Handb. Some South Indian weeds t. 153, f. 1-7, 1955.

Vern. : Zinako Okhrad (Guj.).

Loc. GOA : *Satari* : Satre river, Codal Ambechagol. *Canacona* : Ordofond. NAGARHAVELI : Chispana ; Dudeni. DAMAN : Regunvara ; Dabel.

Common on sandy soil on river banks and fields. Often wrongly spelt in the floras as "*P. plebejum*".

PODOSTEMACEAE

- | | |
|--|----------------------|
| 1. Flowers regular ; sepals 3, free or united ; spathe absent | <i>Ternstroemia</i> |
| 1. Flowers zygomorphic, naked ; the young buds covered by a spathe | |
| 2. Capsule not oblique, isolobous | <i>Polypleurum</i> |
| 2. Capsule oblique, anisolobous | |
| 3. Flowers with sepals | <i>Hydrobryopsis</i> |
| 3. Flowers without sepals | <i>Griffithella</i> |

GRIFFITHELLA Warm.

Griffithella hookeriana (Tul.) Warm. in Danske Vid. Selsk. Skr. ser. 6, II : 13, 1901 ; C. 3 : 13 ; G. 2 : 838. *Mniopsis hookeriana* Tul. in Ann. Sc. nat. ser. 3, 11 : 105, 1849. *Podostemon hookerianus* (Tul.) Wedd. in DC. Prodr. 17 : 74, 1873 ; FBI 5 : 65.

Fl. & Fr. : November. *Ill.* : Wt. Ic. t. 1918, f. 4.

Loc. GOA : *Satari* : Poda village, Valpoi. *Canacona* : River opposite. Ordofond village.

Common, characteristic lichen like plant in the running waters.

HYDROBRYOPSIS Engl.

Hydrobryopsis sessile (Willis) Engl. in Engl. & Prantl, Nat. Pflanzenfam. 182 : 60, f. 53A-C, 1930. *Hydrobryum sessile* Willis in Ann. R. Bot. Gard. Peradeniya 1 (3) : 239, 1902 ; G. 2 : 839.

Fl. : April.

Loc. GOA : *Satari* : Caranzol.

This is rather a rare plant, not recorded by Cooke from Bombay Presidency.

POLYPLEURUM (Tayl. ex Tul.) Warming

Polypleurum stylosum (Wt.) J. B. Hall in Kew Bull. 26 (1) : 131, 1971. *Dicraea stylosa* Wt. Ic. 5 (2) : 33, t. 1917, f. 2, 1852. *Podostemon stylosus* Benth. in Benth. & Hook. Gen. Pl. 3 : 112, 1880 ; FBI 5 : 64.

Fl. : May. *Ill.* : Wt. Ic. t. 1917, f. 2 ; Subramanyam in C.S.I.R. Bot. Mon. 3 : 47, t. 31, 1962.

Loc. : GOA : *Satari* : Mahadevi nadi, Nandore village near Valpoi.

The species has not been recorded by Cooke. Locally abundant on the rocks in flowing streams.

TERNIOLA Tul.

Terniola zeylanica (Gardn.) Tul. Archives Mus. Hist. nat. Paris 6 : 190-192, t. 13, f. 3, 1852 ; FBI 5 : 62. *Lawia zeylanica* Tul. in Ann. Sc. nat. ser. 3, 11 : 112, 1849 ; C. 3 : 12 ; G. 2 : 837.

Fl. & Fr. : March.

Loc. : GOA : *Satari* : Satre river bed, Valpoi.

Occasional, adhering to the rocks in the river bed.

ARISTOLOCHIACEAE

ARISTOLOCHIA Linn.

Aristolochia indica Linn. Sp. Pl. 960, 1753 ; FBI 5 : 75 ; DG. 158 ; C. 3 : 16 ; G. 2 : 841.

Fl. : October. *Ill.* : Wt. Ic. t. 1858.

Vern. : Sapasan (Mar.) ; Isvariberu (Kan.) ; Sapur (Konk.) ; Raize de cobra (Port.).

Loc. GOA : *Canacona* : Ordofond Tudal ; Maxim ghat ; Ordofond-Sadashivagad.

Rare. Reportedly efficaceous against snake bite and valued for its anthelmintic properties.

PIPERACEAE

Erect or procumbent, succulent herbs ; flowers hermaphrodite

Peperomia

Woody climbers ; flowers dioecious

Piper

PEPEROMIA Ruiz. & Pav.

Peperomia pellucida (Linn.) H.B.K. Nov. Gen. 1 : 64, 1815 ; C. 3 : 21 ; G. 2 : 847 ; S. 203. *Piper pellucidum* Linn. Sp. Pl. 30, #1753.

Fl. & Fr. : August November.

Loc. : GOA : *Satarl* : Valpoi rest house. *Bardez* : Betim - Bardez ; Chopora ; Sukur village hill ; Betim hill slopes. *Salcete* : Raiyi village. *Marmugao* : Marmugao hill top around the fort ; Marmugao harbour. *Sanguem* : Sauverdem Railway Station ; Molem. *Quepem* : Rivona. *Canacona* : Angidiv.

Common in moist places.

PIPER Linn.

- | | |
|--|-------------------|
| 1. Bracts forming a cup under the flowers ; berries large in diam ; nodes much thickened | <i>nigrum</i> |
| 1. Bracts not forming a cup but adante to the rachis with decumbent free margins ; berries small ; nodes not thickened | |
| 2. Leaves membranous, ovate - cordate, oblique at base ; berries without prominent stigmas | <i>attenuatum</i> |
| 2. Leaves coriaceous, ovate elliptic, rounded at base ; berries with prominent stigmas | <i>wightii</i> |

Piper attenuatum Buch. Ham. in Wall. Cat. 6642 B,C,D., 1832 ; FBI 5 : 92 ; G. 2 : 845.

Fl. : April. *Ill.* : Wt. Ic. tt. 1933, 1935-37.

Loc. GOA : *Canacona* : Near streams at Barsare Tudal.

Rare.

Piper nigrum Linn. Sp. Pl. 28, 1753 ; FBI 5 : 90 ; DG. 159 ; C. 3 : 19 ; T. 2 : 376 ; G. 2 : 845 ; S. 203.

Fr. : October. *Ill.* : Wt. Ic. t. 1935.

Vern. : Kalimirch (Mar.) ; Menasinaballi (Kan.) ; Pokhlem mirim (Konk.) ; Pimenta (Port.).

Loc. GOA : *Satari* : Satrem, *Sanguem* : Madka Bangalow (Molem Belgaum Road) ; Patole (Netraveli). *Canacona* : Poinguinam.

Escape from cultivation.

P. wightii Miq. in Hook. Lond. Journ. Bot. 5 : 552, 1846 ; FBI 5 : 94 ; G. 2 : 845.

Fr. : November. *Ill.* Wt. Ic. t. 1939.

Loc. GOA : *Sanguem* : Foot of the hill Patiem.

Rare.

Cult. species :

P. betle Linn. Sp. Pl. 28, 1753 ; FBI 5 : 85 ; DG. 159 ; C. 3 : 20 ; T. 2 : 377 ; G. 2 : 845.

Ill. : Wt. Ic. t. 1926.

Vern. : Nagvel (Mar.) ; Vidyachim panam (Konk.) ; Betle (Port.).

Wildely cultivated for its leaf.

P. longum Linn. Sp. Pl. 29, 1753 ; FBI 5 : 88 ; DG. 158 ; C. 3 : 20 ; T. 2 : 377.

Vern. : Pipli (Mar.) ; Pipli (Konk.) ; Pimenta longa (Port.).

Cultivated.

MYRISTICACEAE

Anthers attached by their backs to a column formed of the connate filaments

Myristica

Anthers attached by their bases stellately to a peltate column formed of the connate filaments

Knema

KNEMA Lour.

Knema attenuata (Wall.) Warb. Monogr. Myrist. 590, 1897 ; G. 2 : 851 ; S. 204 : *Myristica artemuta* Wall. Cat. 6791, 1832, *nom. nud.* ; C. 3 : 24 ; T. 2 : 381.

Fl. : October February. *Fr.* : March April. *Ill.* : Bedd. Fl. Sylv. t. 271 ; T. f. 460.

Vern. : Hedaggal (Kan.) ; Rukt mara (Mar.) ; Ran - jayphal (Konk.).

Loc. : GOA : *Satari* : Vangiri forests, 3 miles north - east of Nandore ; Wagheri, Tonem. *Canacona* : Nadquem ; Nadquem Quer hills.

Rare in the forest.

MYRISTICA Gronov.

Myristica malabarica Lamk. in Mem. Acad. Sc. 162, 1788 ; FBI 5 : 103 ; DG. 160 ; C. 3 : 22 ; T. 2 : 378 ; G. 2 : 850.

Fl. : November March. *Fr.* : May onwards. *Ill.* : T. f. 459.

Vern. : Kayphal (Mar.) ; Ambedeki (Konk.) ; Noz moscada falsa (Port.).

The species is common in rain forests of Concan and North Kanara ; hence included it in this work though not collected from Goa. Mace (yellowish aril) and seeds are used for adulterating true Nutmeg.

Cult. species :

Myristica fragrans Houtt. Handleid. 3 : 333, 1774 ; DG. 159 ; G. 2 : 850.

Vern. : Jayphal (Konk.) ; Moscadeira (Port.).

A native of East Moluccas and cultivated for the seed "nutmeg" and the aril 'mace'.

LAURACEAE

1. Flowers unisexual

2. Flowers in axillary, sessile or pedunculate clusters

Actinodaphne

2. Flowers in axillary umbels

3. Fertile stamens normally 9 or 12, frequently more, rarely less ; involucrel bracts persistent in flower

Litsea

3. Fertile stamens 6 ; involucrel bracts early deciduous

Neolitsea

1. Flowers bisexual
 4. Anthers 2 - celled
 5. Fruit surrounded by enlarged perianth tube *Cryptocarya*
 5. Fruit not surrounded by enlarged perianth *Beilschmiedia*
 4. Anthers 4 - celled
 6. Leaves opposite or subopposite, usually 3 or more ribbed ; fruiting perianth enlarged into a cupule embracing the fruit *Cinnamomum*
 6. Leaves alternate, penninerved ; fruiting perianth not embracing the fruit
 7. Perianth lobes reflexed in fruit *Persea* (incl. *Machilus*)
 7. Perianth lobes deciduous *Alseodaphne*

ACTINODAPHNE Nees

Actinodaphne angustifolia Nees in Wall. Pl. As. Rar. 3 : 31, 1832 ; S. 205. *A. hookeri* Meissn. in DC. Prodr. 15 (1) : 218, 1864 (excl. var. *longifolia* and incl. vars. *dassypoda* & *glabrata*) ; FBI 5 : 149 ; C. 3 : 31 ; T. 2 : 392.

Fl. : April. *Ill.* : Wt. Ic. t. 1841 ; T. f. 465.

Vern. : Pisa (Mar.) ; Tudgensu (Kan.).

Loc. : GOA : *Satari* : Caranzol ; Codal Nanore, 10 km.

Common in the forest areas.

ALSEODAPHNE Nees

Alseodaphne semecarpifolia Nees in Wall. Pl. As. Rar. 2 : 72, 1830 ; FBI 5 : 144 ; DG. 161 ; C. 3 : 30 ; T. 2 : 391 ; G. 2 : 858 ; S. 205.

Fl. : July - December. *Ill.* : Wt. Ic. tt. 1826 & 1827 ; Bedd. Fl. Sylv. t. 297.

Vern. : Phudgus (Mar.) ; Rani (Konk.).

Common in Concan, North Kanara ghats and areas adjoining Goa. There is possibility of its being located in Goa ghats also.

BEILSCHMIEDIA Nees

Beilschmiedia gemmiflora (Bl.) Kosterm. in Jour. Sc. Res. Indonesia,

1 : 115, 1952, et in Reinw. 6 : 282, 1962. *Daphnidium gemmiflorum* Bl. Mus. Bot. Lugd. Bot. 1 : 352, 1831. *Beilschmiedia fagifolia* Bedd. Fl. Sylv. t. 263, 1872 (*non* Nees); DG. 160; FBI 5 : 122; C. 3 : 27; T. 2 : 38; S. 204.

Fl. : November - January. *Fr.* : March - May. *Ill.* : T. f. 462.

Vern. : Kajuri (Mar.); Kamatti (Kan.); Maida lakdi (Konk.).

Common, occurring in Concan and North Kanara, also reported by Dalgado and hence included in this work.

CINNAMOMUM Schaeffer.

Cinnamomum macrocarpum Hook. f. FBI 5 : 133, 1886; C. 3 : 28; T. 2 : 389; G. 2 : 857. *C. iners* Wt. Ic. t. 130; DG. 160.

Ill. : Wt. Ic. t. 130.

Vern. : Tamalpatr (Konk.); Canella brava (Port.).

The species has been observed in the Goa forest and is very similar to the cultivated species *C. zeylanicum*. It is doubtful whether it should be considered as a distinct species or a mere variety of *C. zeylanicum*.

Cult. species :

C. zeylanicum Bl. Bijdr. 568, 1825; FBI 5 : 131; DG. 161; C. 3 : 28; T. 2 : 388; G. 2 : 857.

Fl. : November - March. *Ill.* : T. f. 463.

Vern. : Dalchini (Mar.); Nisani (Kan.); Tiki (Konk.); Canella (Port.).

Common in the forest area and also cultivated. The dried bark is the 'cinnamon' of commerce.

CRYPTOCARYA R. Br.

Cryptocarya wightiana Thw. Enum. 254, 1861; FBI 5 : 120; DG. 160; C. 3 : 26; T. 2 : 385.

Fl. : December. April. *Ill.* : Wt. Ic. t. 1829; Bedd. Fl. Sylv. t. 229.

Vern. : Gulmur (Mar.).

Common along the ghat area. May be located from Goa ghats.

LITSEA Lamk.

1. Leaves crowded at the ends of the branches ; perianth segments incomplete or wanting ; stamens many, often 20 *deccanensis*
1. Leaves alternate ; perianth segments 6 ; stamens about 12
 2. Leaves green above, dull grey beneath when dry ; umbellules subsessile, in axillary clusters *coriacea*
 2. Leaves light green above and brownish beneath ; umbellules in racemes *wightiana*

Litsea coriacea Heyne ex Hook. f. in FBI 5 : 166, 1885 ; G. 2 : 865.

Fl. : November.

Loc. : GOA : *Satari* : Poda village

Rare.

L. deccanensis Gamble, Fl. Madras, 7 : 1235, 1985. *Litsea tomentosa* Heyne in Wall. (Cat. 2550, 1828) ex Hook. f. in FBI 5 : 157 ; C. 3 : 32 ; T. 2 : 394.

Fl. : November - December. *Ill.* : Wt. Ic. t. 1834, 1852.

Vern. : Chikna (Mar.) ; Dhade mara (Kan.).

Loc. GOA : *Satari* : Satrem.

Common in North Kanara and areas adjoining Goa.

L. wightiana (Nees) Benth. & Hook. f. Gen. Pl. 3 : 162, 1880 ; FBI 5 : 177 ; DG. 161 ; C. 3 : 34 ; T. 2 : 396 ; G. 3 : 866. *Cylicodaphne wightiana* Nees in Wall. Pl. As Rar. 2 : 68, 1830.

Fl. : August. November. *Ill.* : Wt. Ic. t. 1852, 1883.

Vern. : Keynagi (Konk.) ; Hammadi (Kan.).

Frequently found in the Concan and North Kanara areas, and should possibly occur in Goa also.

NEOLITSEA Merr.

Neolitsea zeylanica (Nees) Merr. in Philipp. Jour Sci. 1, Suppl. 57, 1906 ; G. 2 : 867. *Litsea zeylanica* Nees, Cinnamom. Disput. 58, 1823 ; FBI 5 : 178, *p.p.* ; Wight Ic. tt. 132 & 1844 ; C. 3 : 34.

Fl. & Fr. : October February. *Ill.* Bedd. Fl. Syl. t. 294.

Vern. : Kanvel (Mar.)

Loc. : GOA : *Satari* : Ambeachagol.

Occasional in moist forest area.

PERSEA Miller

Persea macrantha (Nees) Kosterm. in Reinw. 6 : 193, 1962. *Machilus macrantha* Nees in Wall. Pl. As. Rar. 2 : 70 ; 1831 ; FBI 5 : 140 ; DG. 161 ; C. 3 : 29 ; T. 2 : 390 ; G. 2 : 859.

Fl. : December - March. *Fr.* : February - April. *Ill.* : Wt. Ic. t. 1824.

Vern. : [Gulum (Mar.) ; Kardel (Konk.) ; Arvore de pau salgado (Port.).

Frequent, throughout the ghats of North Kanara and Concan.

CASSYTHACEAE

CASSYTHA Linn.

Cassytha filiformis Linn. Sp. Pl. 35, 1753 ; FBI 5 : 188 ; DG. 162 ; C. 3 : 35 ; T. 2 : 397 ; G. 2 : 868.

Fl. : August. October. *Ill.* : Wt. Ic. t. 1847.

Vern. : Amavel (Mar.) ; Beluballi (Kan.) ; Ankasvel (Konk.) ; Ramas da sebe (Port.).

Loc. : GOA : *Pernem* : Mandorem. *Bardez* : Baga jungle. *Salcete* : Cavollosum sea shore. *Marmugao* : Nuvem hills. *Canacona* : Polem.

Rare on *Woodfordia*, *Ardisia* & *Melastoma*.

THYMELAEACEAE

LASIOSIPHON Fresen.

Lasiosiphon eriocephalus Decne. in Jacq. Voy. Bot. 148, 1844 ; FBI 5 : 197 ; DG. 162 ; C. 3 : 36 ; T. 2 : 400 ; G. 2 : 871 ; S. 207.

Fl. : November - January. *Fr.* : March. - April. *Ill.* : T. f. 466 ; Wt. Ic. t. 1859.

Vern. : Rameta (Mar.) ; Mukurgal (Kan.) ; Rameto (Konk.).

Loc. GOA : *Sanguem* : Maduka bungla jungle ; Vaidugune (Netravali). *Canacona* : Tudal Dongri, Navishat ; Budsare Tudal.

Occasional on the hill slopes.

ELAEAGNACEAE

ELAEAGNUS Linn.

Elaeagnus conferta Roxb. Fl. Ind. 1 : 440, 1832 ; G. 2 : 873 ; S. 207.
E. latifolia Linn. Sp. Pl. 121, 1753 ; FBI 5 : 202 ; DG. 162 ; C. 3 : 37 ;
 T. 2 : 402.

Fl. : November January. *Fr.* : January May. *Ill.* : T. f. 467.

Vern. : Nildook (Mar.) ; Halige balli (Kan.) ; Ambgul (Konk.).

Loc. : GOA : *Sanguem* : Maduka bungla jungle. *Canacona* : Nadquem, Quer hills.

Occasional. According to Servettaz (Bull. Herb. Boiss., ser. 2. 8 : 389, & Mon. Elaeagn, 1909), *Elaeagnus latifolia* Linn. is a mixture of *E. conferta* Roxb., *E. latifolia* Linn. & *E. kolaga* Schlecht. According to the key based on perianth structure, the present species is referable to *E. conferta* only.

LORANTHACEAE

- | | |
|---|---------------------|
| 1. Parasites with leaves reduced to scales ; flowers unisexual, inconspicuous | <i>Viscum</i> |
| 1. Leafy parasites ; flowers hermaphrodite, large and showy | |
| 2. Flowers with a pair of bracteoles within a bract | <i>Macrosolen</i> |
| 2. Flowers without bracts and bracteoles | |
| 3. Flowers 4 - merous | |
| 4. Flowers in glabrous spikes | <i>Helixanthera</i> |
| 4. Flowers in axillary clusters or racemes | <i>Scurrula</i> |
| 3. Flowers 5 - merous | |
| 5. Flowers villous or pubescent | <i>Taxillus</i> |
| 5. Flowers glabrous | |
| 6. Corolla lobes longer than the tube, spirally coiled | <i>Helicanthes</i> |
| 6. Corolla lobes shorter than the tube, not spirally coiled. | <i>Dendrophthoe</i> |

DENDROPTHOE Mart.

Dendrophthoe falcata (Linn. f.) Etting. in Denkschr. Akad. Wissen. Math. Naturw. Cl. 32 : 52, 53, 58, t. 13. f. 14, 1872 ; S. 208 ; Dangs.

45. Pav. 203. *Loranthus falcatus* Linn. f. suppl. 211. 1781. *Loranthus longiflorus* Desr. in Lamk. Encycl. 3 : 598, 1789 ; FBI 5 : 214 ; DG. 162 ; C. 2 : 42 ; T. 2 : 411 ; G. 2 : 877.

Fl. : February March. *Fr.* : March May. *Ill.* : Wt. Ic. t. 302 ; T. f. 473-74.

Vern. : Vanda (Mar.) ; Maduk (Kan.) ; Bemdram (Konk.) ; Visco indiano (Port.) ; Vando (Guj).

Loc. : GOA : *Bardez* : Porvorim - Betim road. *Sanguem* : Paricha Tem (Cumbari) ; Molem Begaum Road. NAGARHAVELI : *Khurnly* forest ; Carc-hond forest ; Jamunpada forest.

A parasite on species of *Ficus*, *Mangifera indica* etc.

HELICANTHES Danser

Helicanthes elastica (Desr.) Dans. in Verhand. K. Akad. Wetensch. Amsterd. (Sect. 2) 29(6) : 55, 1933 ; S. 209. *Loranthus elasticus* Desr. in Lamk. Encycl. 3 : 599, 1792 ; FBI 5 : 216 ; C. 3 : 41 ; T. 2 : 414 ; G. 2 : 878.

Fl. & Fr. : August - November. *Ill.* : T. f. 475 ; Wt. Ic. t. 343.

Loc. : GOA : *Bicholim* : Tirla. *Satari* : Valley near Brahmipari temple ; Onda. *Bardez* : Nagoa. *Ilhas* : Mahim village near Bicholim. *Salcete* : Malda, 3 miles from Margoa on Courtallum road. *Canacona* : Canacona Bali.

Occasional on *Mangifera indica* and *Artocarpus* trees.

HELIXANTHERA Lour.

Helixanthera wallichiana (Schult.) Danser in Bull. Jard. Bot. Buitenz. (ser. 3) 10 : 317, 1929. *Loranthus wallichianus* Schult. f. Syst. Veg. 7 : 100, 1829 FBI 5 : 204 ; C. 2. 39 ; T. 2 : 405 ; G. 2 : 876.

Fl. : April June. *Fr.* : August September. *Ill.* : Wt. Ic. t. 143 ; T. f. 468.

Vern. : Banda (Mar.).

Loc. : GOA : *Satari* : Dinarai forest near pali, Valpoi.

Rare, on *Syzygium* species.

LORANTHUS Linn.

Scurrula philippensis (Cham. & Schl.) G. Don, Gen. Hist. 3 : 442, 1834 ; S. 210. *Loranthus philippensis* Cham. & Schl. in Linnaea 3 : 204, 1828. *L. scurrula* Hook. f. in FBI 5 : 208, 1886 ; C. 3 : 40 ; T. 2 : 407.

Fl. : September. Ill. : T. f. 407.

Loc. : GOA : Satari : Codal forest. Sanguem : Ranki.

Rare on *Terminalia tomentosa*. Closely allied to *Macrosolen parasiticus* (Linn.) Danser and often confused with it. (For the circumscription of the generic name *Loranthus* Linn. see *Taxon* 8 : 265, 1959).

MACROSOLEN Blume

Macrosolen capitellatus (Wt. & Arn.) Danser in Blumea 2 : 36, 1936 ; S. 209. *Loranthus capitellatus* Wt. & Arn. Prodr. 382, 1834 ; FBI 5 : 221 ; C. 2 : 44 ; T. 2 : 417.

Fl. : March May. Ill. : T. f. 418 ; Wt. Ic. t. 304.

Loc. : GOA : Satari : Caranzol hills. Sanguem : Kireban forest, Dargin Patiem. Canacona : Ordofond, Jhari Jawal ; Nadquem Quer hills ; Gondegran - Tudal.

Occasional on *Terminalia*, *Mangifera indica* and *Dillenia* trees.

TAXILLUS van Tiegh.

Taxillus tomentosus (Roth) van Tiegh. Bull. Soc. Bot. Fr. 42 : 256. *Loranthus tomentosus* Roth, Nov. Pl. Sp. 19, 1753 ; FBI 5 : 212 ; G. 2 : 876.

Fl. : October November.

Loc. : GOA : Bicholim : Usgao.

Rare on species of *Terminalia*.

TOLYPANTHUS Bl.

**Tolypanthus lagenifer* (Wight) van Tiegh. in Bull. Soc. Bot. France 42 : 249, 1895 ("lageniferus") ; Danser in Bull. Jard. Bot. Buitenz. (Ser. 3) 10 : 355, 1929. *Loranthus lageniferus* Wight, Icon. t. 306, 1840 ; FBI 5 : 218 ; C. 3 : 44 ; G. 2 : 878 ; S. 237 (3rd edn.).

*Later addition, hence not included in the Key.

Fl. : May August. *Fr.* July October. *Ill.* : Wt. Ic. t. 306 ; Talb. 2 : 415, f. 476.

Loc. : NAGARHAVELI : Nana Randha.

Frequent in deciduous forests, parasitic on *Tectona grandis*, *Helicteres isora* and others.

VISCUM Linn.

- | | |
|--|--------------------|
| 1. Young branches 4-angled, not swollen, nor contracted at the nodes | <i>angulatum</i> |
| 1. Stems and branches flattened, contracted at the nodes | <i>articulatum</i> |

Viscum angulatum Heyne ex DC. Prodr. 4 : 283, 1830 ; FBI 5 : 225 ; C. 3 : 47 ; T. 2 : 422, t. 481 ; G. 2 : 881 ; Seshagiri Rao in Jour. Ind. Bot. 36 (2) : 140, 1957 ; S. 238 (3rd ed.).

Fl. & Fr. : November May. *Ill.* ; Wt. Ic. 1017 *tantum* ; Seshagiri Rao *l.c.*, 141, f. 10.

Vern. : Bandaguli (Mar.).

Loc. : GOA : *Satari* : Ambaechagol.

Not common and even difficult to locate in the forest areas.

V. articulatum Burm. f. Fl. Ind. 211, 1768 ; FBI 5 : 226 (incl. var. *dichotoma*) ; C. 3 : 47 ; T. 2 : 423 ; G. 2 : 881 ; Seshagiri Rao *l.c.* 126. *Viscum nepalense* Spr. Syst. Cur. Post. 47, 1827 ; S. 238 (3rd ed., *p.p.*) *V. liquidambaricolum* Hayata. Ic. Pl. Formosa, 5 : 194, t. 71, 72, 1915.

Fl. : June August. *Fr.* : September November. *Ill.* : T. f. 482.

Vern. : Banda (Mar.) ; Vando (Guj.).

Loc. : GOA : *Bicholim* : After Amona ferry crossing. *Bardez* : Porvorim. NAGARHAVELI : Atola forest ; near Dudeni ; Dolar forest Morkhal ; Regunvara.

Fairly common.

SANTALACEAE

Unarmed shrubs ; flowers in 5-10 flowered axillary umbels ; stigma large, peltate

Osyris

Spinous trees ; flowers in short catkin - like spikes ; stigma 3-lobed

Scleropyrum

OSYRIS Linn.

Osyris wightiana Wall. ex Wt. Ic. 5 (2) : 17, t. 1853, 1852 ; S. 213.
Osyris arborea Wall. (Cat. 4035, 1831) ex DC. Prodr. 14 : 633, 1857 ;
 FBI 5 : 32 ; C. 3 : 50 ; T. 2 : 426 ; G. 2 : 883.

Fl. : November. *Ill.* : Wt. Ic. t. 1853 ; T. f. 484.

Vern. : Popli (Mar.) ; Kuriganda (Kan.).

Loc. : GOA : *Satari* : Wagheri (Tanem). *Ilhas* : Chimbel reservoir -
 Brahmapuri temple. *Sanguem* : Maduka bungla jungle. *Canacona* : Polem ;
 Aldune (Netravali).

Occasional on rocky areas. Both *Osyris wightiana* Wall. and *O.*
arborea Wall. refer to the same species but they are "nomina nuda". Wight
 effectively published *O. wightiana* in his Icones and thus validated the
 name.

SCLEROPYRUM Arn.

Scleropyrum wallichianum Arn. in Mag. Zool. & Bot. 2 : 550, 1838 ;
 FBI 5 : 234 ; DG. 163 ; C. 3 : 51 ; T. 2 : 427 ; G. 2 : 884.

Fl. : December - March. *Ill.* : Wt. Ic. t. 241.

Vern. : Bodliga (Kan.) ; Eltikamto (Konk.) ; Pereira dos diabos
 (Port.).

The species is found along the ghat areas of Concan and Kanara.
 Though I have not collected it from Goa, there is every chance of its
 being located here as it is found in the adjacent areas.

Cult. species :

Santalum album Linn. Sp. Pl. 349, 1753 ; FBI 5 : 231 ; DG. 163 ;
 C. 3 : 49 ; T. 2 : 424 ; G. 2 : 883.

Fl. : March - August. *Ill.* : T. f. 483.

Vern. : Chandan (Mar.) ; Gundada (Kan.) ; Chamdan (Konk.) ;
 Sandalo (Port.).

The plant yields the sandal wood of commerce used for carving etc.
 Sandal wood oil is distilled from the wood. The species is mostly found
 under cultivation only.

EUPHORBIACEAE

- 1. Flowers monoecious, aggregate in heads resembling a single flower with a calyx like involucre (Cyathium)
 - 2. Involucre regular or nearly so *Euphorbia*
 - 2. Involucre obliquely zygomorphic *Pedilanthus*
- 1. Flowers dioecious or monoecious, not arranged in cyathia, distinct, without any involucre
 - 3. Leaves trifoliolate *Bischofia*
 - 3. Leaves simple, entire alternate
 - 4. Flowers in axillary fascicles or solitary, axillary
 - 5. Cells of ovary 2 - ovuled
 - 6. Corolla present, of 5 scale-like petals *Bridelia*
 - 6. Corolla absent in both sexes
 - 7. Stamens connate by their connectives in a long or short column ; style also connate in a column *Glochidion*
 - 7. Stamens free or partially connate ; styles free or if partially connate, the style arms and stigma free
 - 8. Pistillode in male flowers large, 2 - 3 fld ; dioecious shrubs *Securinega*
 - 8. Pistillode absent in male flowers
 - 9. Disc present, usually conspicuous and glandular ; fruit capsular or baccate *Phyllanthus*
 - 9. Disc absent ; fruit fleshy, more or less succulent enclosing cocci or drupaceous
 - 10. Style or style arms slender
 - 11. Anthers sessile on the angle of the column ; small monoecious shrubs or under shrubs *Sauropus*
 - 11. Anthers adnate to the column ; monoecious shrubs or small trees *Breynia*
 - 10. Style much dilated *Putranjiva*
 - 5. Cells of ovary 1 - ovuled
 - 12. Petals present at least in the male flowers
 - 13. Flowers in 2 - 3 crotomous cymes or axillary racemes ; leaves palmately lobed *Jatropha*

13. Flowers in spikes or racemes ; leaves not palmately lobed
14. Erect or prostrate herbs, hispid or stellately tomentose *Chrozophora*
14. Erect shrubs or small trees, glabrous
15. Seeds strophiolate *Croton*
15. Seeds estrophiolate *Blachia*
12. Petals absent in either sex
16. Calyx in male flowers imbricate *Baliospermum*
16. Calyx in male flowers open or slightly imbricate, usually much reduced
17. Trees or shrubs ; stamens 3 ; filaments free
18. Leaves biglandular at base ; calyx 2 - 3 lobed ; fruit fleshy or pulpy *Sapium*
18. Leaves eglandular at base ; calyx deeply 5 - partite ; fruit crustaceous *Excoecaria*
17. Herbs ; stamens 2 - 4 ; filaments connate at the base *Sebastiania*
16. Calyx of male flowers closed in bud
19. Twining herbs with stinging hairs *Tragia*
19. Herbs, shrubs or trees without stinging hairs
20. Filaments connate in bundles or branched *Homonioia*
20. Filaments free
21. Stamens 1 - 3 ; anthers 4 - celled
22. Connective produced ; capsule large *Cleidion*
22. Connective not produced ; capsule small *Macaranga*
21. Stamens numerous ; anthers 2 - celled
23. Anthers not vermiculiform ; styles plumose or papillose
24. Leaves opposite ; flowers rather large, dioecious ; anther cells oblong ; style papillose *Trewia*
24. Leaves alternate ; flowers small, monoecious or dioecious ; anther cells globose ; style plumose *Mallotus*

- 23. Anthers vermiculiform or linear ; styles laciniate
- 25. Flowers in interrupted axillary racemes ; filaments ; with glands or ciliate or scales *Micrococca*
- 25. Flowers in axillary or terminal spikes or racemes ; filaments without glands or scales *Acalypha*
- 4. Flowers in axillary spikes, racemes or panicles
 - 26. Ovary 2 - celled ; male flowers in spikes and female in clusters ; fruit dehiscent *Aporosa*
 - 26. Ovary 1 - celled ; flowers of both sexes in slender racemes or spikes *Antidesma*

ACALYPHA Linn.

Leaves rhomboid - ovate, acute or subobtuse, base cuneate ; bracts shortly dentate, truncate ; capsule hispid *indica*

Leaves ovate, caudate - acuminate, base rounded ; bracts fimbriate ; capsule glabrous *ciliata*

Acalypha ciliata Forsk. Fl. Aegypt. Arab. 162, 1775 ; FBI 5 : 417 ; C. 3 : 109 ; Pav. 214.

Fl. & Fr. : September February.

Loc. : DAMAN : Varacunda ; Fort area. DIU : Castle area.

Occasional, in wastelands and along roadsides.

A. indica Linn. Sp. Pl. 1003, 1753 ; FBI 5 : 416 ; DG. 172 ; C. 3 : 108 ; G. 2 : 930.

Fl. : September. *Ill.* : Wt. Ic. t. 877 ; Wealth of India 1 : Pl. VI, f. 1.

Vern. : Khokli (Mar.) ; Kuppi (Kan.) ; Kipameni (Konk.).

Weed in wastelands. The species is distributed almost throughout the Western and Peninsular India, hence included.

ANTIDESMA Linn.

- 1. Leaves very obtuse, pubescent or tomentose ; calyx 5 - 7 partite ; stamens 4 - 7 ; ovary tomentose *ghaesebilla*
- 1. Leaves acute or acuminate ; calyx cupular, 4 - lobed ; stamens 2 - 4 ; ovary glabrous

2. Male flowers pedicellate
 3. Stamens 2 ; a large shrub *diandrum*
 3. Stamens 3 - 4 ; a small tree *menasu*
 2. Male flowers sessile *bunius*

Antidesma bunius (Linn.) Spreng. Syst. Veg. 1 : 826, 1825 ; FBI 5 : 358 ; DG. 169 ; C. 3 : 90 ; T. 2 : 464 ; G. 2 : 908. *Stilago bunius* Linn. Mant. 1 : 122, 1767.

Fl. : May June. *Ill.* Wt. Ic. t. 819.

Vern. : Amati (Mar.).

Common in rain forests of North Kanara and reported by Dalgado also, hence included here.

**A. diandrum* (Roxb.) Roth, Nov. Plant. Sp. 369, 1821 ; FBI 5 : 361 ; DG. 169 ; C. 3 : 90 ; T. 2 : 464 ; G. 2 ; 908 ; S. 220.

Fl. : May July. *Fr.* : August October. *Ill.* : Wt. Ic. t. 766.

Vern. : Ambti (Konk.).

Loc. : GOA : *Bicholim* : Usgao. *Satari* : Pishiyen forest near Pengeral village ; Ivorem Buzurca ; Valpoi near the hospital ; Onda. *Bardez* : Porvorim ; Baga jungle. *Sanguem* : Poliem forests ; Molem Belgaum road, 64 km ; Choraundem. *Canacona* : Butpal Nadquem.

Common in the forest.

A. ghaesembilla Gaertn. Fruct. 1 : 189, 1788 ; FBI 5 : 357 ; DG. 169 ; C. 3 : 89 ; T. 2 : 463 ; G. 2 : 908.

Fl. : July. *Fr.* : August. *Ill.* : Wt. Ic. t. 820.

Vern. : Pullampurasi gida (Kan.) ; Jomdri (Konk.).

Loc. : GOA : *Canacona* : Ordofond Butpal, 4 miles.

Rare inside the forest. The fruits and the leaves are pickled.

A. menasu Miq. ex Tul. in Ann. Sc. Nat. ser. 3, 15 : 215, 1851 ; FBI 5 : 364 ; DG. 169 ; C. 3 : 90 ; T. 2 : 464 ; G. 2 : 908.

Fl. : February April. *Fr.* : March May.

Loc. : GOA : *Satari* : Vangiri forest, Valpoi. *Sanguem* : Colem Caranzol, near old Railway Station ; Mattan Dongar (Netravali). *Canacona* : Nadquem hills ; Nadqu. - Quer hills ; Nadquem, Pangra Bag.

Occasional, inside the forest.

**A. acidum* Retz. ; Obs. Bot. 5 : 30, 1789

APORUSA Blume

Aporusa lindleyana Baillon, *Etud. Gen. Euphorb.* 645, 1858 ; FBI 5 : 349 ; DG. 169 ; C. 3 : 91 ; T. 2 : 461 ; G. 2 : 916.

Fl. : December February. *Fr.* : March May. *Ill.* : T. f. 501 ; Wt. Ic. t. 361.

Vern. : Sali (Kan.) ; Sal (Konk.).

Loc. : GOA : *Satari* : Valpoi Caranzol hill, 6 miles ; Kawaliyan forest near Nandore, Valpoi ; Codal. *Sanguem* : Sidh forests near Bati. *Canacona* : Butpal forest ; Butpal Nadquem ; Hathipawal Butpal ; Nadquem Quer hills ; Mehden forest near Nadquem.

Common, inside the forest.

BALIOSPERMUM Blume

Baliospermum montanum (Willd.) Muell. Arg. in DC. *Prodr.* 15 (2) : 1125, 1866 ; G. 2 : 939 ; Dangs. 45 ; Pav. 215. *Jatropha montana* Willd. *Sp. Pl.* 4 : 563, 1805. *Baliospermum axillare* Blume, *Bijdr.* 604, 1825 ; FBI 5 : 461 ; DG. 173 ; C. 3 : 106 ; T. 2 : 479.

Fl. : September November. *Fr.* : T. f. 508 ; Wt. Ic. t. 1885.

Vern. : Danti (Mar.) ; Danti (Kan.) ; Baktumbo (Konk.) ; Jamalgota (Guj.).

Loc. : GOA : *Pernem* : Terekhol. *Canacona* : Canacona Bali. NAGARHAVELI : Dalara forest ; Chispana forest.

Occasional, in forest undergrowth.

BISCHOFIA Linn.

Bischofia javanica Blume, *Bijdr.* 1168, 1826 ; FBI 5 : 345 ; DG. 168 ; C. 3 : 67 ; T. 2 : 460 ; G. 2 : 918.

Fl. : March April. *Ill.* : Bedd. *Fl.* t. 259 ; Wt. Ic. t. 1850.

Vern. : Bok (Mar.).

Though not collected by me from Goa, it is a common species along the ghats of Concan and North Kanara and hence included.

BLACHIA Baill.

Blachia denudata Benth. in Journ. Linn. Soc. 17 : 226, 1880 ; FBI 5 : 403 ; C. 3 : 100 ; T. 2 : 474 ; G. 2 : 936.

Fl. : November.

Loc. : GOA : *Canacona* ; Molem, Avelde Jungle.

Rare.

BREYNIA J.R. & G. Forst. *nom. cons.*

Calyx enlarged in fruit ; styles slender, bifid *retusa*

Calyx very slightly enlarged in fruit ; styles very short *rhamnoides*

Breynia retusa (Dennst.) Alston, Fl. Kandy, 22, f. 107, 1938. *Phyllanthus retusus* Dennst. Schluess. Hort. Malab. 24, 1818. *Melanthesa retusa* (Dennst.) Kostel. Allg. Med. Pharm. Fl. 5 : 1771, 1835. *Melanthesa turbinata* (Koen. ex Roxb.) Wt. Ic. 5 (2) : 26, t. 1897, 1852. *Breynia patens* Rolfe, in Journ. Bot. N.S. 11 : 359, 1882 ; FBI 5 : 329 ; DG. 168 ; C. 3 : 79 ; T. 451 ; G. 2 : 912.

Fl. : April - June. *Fr.* : August - September. *Ill.* : T. f. 496.

Vern. : Kangli (Mar.) ; Poem (Konk.) ; Fructa da Trindade (Port.).

Loc. : GOA : *Bicholim* : Cilguirem. *Sanguem* : Colem, Sonevali river ; Varkinchi mole, 6 miles south of Sanguem. *Canacona* : Butpal - Nadjune near a stream ; Ordofond Butpal, 4 miles ; Patiem forests. NAGARHAVELI : Sindhori forest.

Occasional.

B. rhamnoides (Retz.) Muell. Arg. in DC. Prodr. 15 (2) : 440, 1866 ; FBI 5 : 330 ; C. 3 : 79 ; T. 2 : 853 ; G. 2 : 912. *Phyllanthus rhamnoides* Retz. Obs. 5 : 30, 1789. *Melanthesa rhamnoides* (Retz.) Blume, Bijdr. 591, 1826.

Fl. : April - June. *Fr.* : August - November. *Ill.* : Wt. Ic. t. 1898.

Vern. : Bemari (Kan.).

Loc. : GOA : *Satari* : Along the road after entering Goa border from Anmod. *Sanguem* : Cumbari.

Rare.

BRIDELIA Willd.

1. Trees ; flowers in clusters

2. Flowers variously fasciated, or leafless terminal or axillary branches on terminal internodes ; flowers small upto 5 mm across *retusa*

2. Flowers almost invariably fascicled in the leaf axils only ;
flowers over 5mm or more across *squamosa*
1. Scandent or climbing shrubs ; flowers in axillary or terminal
spikes *scandens*

Bridelia retusa (Linn.) Spreng. Syst. Veg. 3 : 48, 1826 ; FBI 5 : 268 ;
DG. 166 ; G. 2 : 896 ; C. 3 : 68 (*p.p.*) ; T. 2 : 435. *Cluytia retusa* Linn.
Sp. Pl. 1042, 1753.

Fl. : April - October. *Fr.* : May - June. *Ill.* : T. f. 488.

Vern. : Asana (Mar.) ; Kamte asan (Konk.) ; Banteka (Port.).

Loc. : GOA : *Bicholim* : Usgao Onda. *Satari* : Valpoi, Masarde ;
Poda village, Valpoi ; Onda ; Wagheri (Tanem). *Ilhas* : Chimbel reservoir
Brahmapuri temple. *Salcete* : Madda, 3 miles from Margao ; Lake near
Chinchinim. *Sanguem* : Valkeri ; Verlem. Dudhsagar. NAGARHAVELI :
Bank of Damán ganga river ; Nana Randha.

Very common along forest fringes and roadsides.

B. scandens (Roxb.) Willd. Sp. Pl. 4 : 979, 1806 (*p.p.*) ; G. 2 : 896.
Cluytia scandens Roxb. Pl. Cor. 2 : 39, t. 173, 1798. *Bridelia stipularis*
Blume, Bijdr. 597, 1826 ; FBI 5 : 270 ; C. 3 : 68 ; T. 2 : 437, *p.p. non*
Linn.

Fl. : November. *Ill.* : Talb. 2 : f. 489.

Vern. : Bisal balli (Kan.) ; Phaterphod (Mar.).

Loc. : GOA : *Bicholim* : Mahim forest. *Bardez* : Bardez mine area.
Salcete : Margao rocky plateau ; Goodier, Margoa Quepem. *Canacona* :
Canacona Bali.

Occasional alongwith *Zizyphus*, *Ixora*, *Clerodendrum*.

B. squamosa (Lamk.) Gehrm. in Bot. Jahrb. 41, Beibl. 95 : 30,
1908 ; S. 243. *Cluytia squamosa* Lamk. Encycl. 5(2) : 54, 1790. *Bridelia*
retusa var. *squamosa* Muell. Arg. in DC. Prodr. 15 (2) : 493, 1866. *B.*
retusa Hook. f. in FBI 5 : 268, 1887 & C. 3 : 68, *pro parte, non* Spreng.
1826.

Fl. & Fr. : April - May. *Ill.* JBNHS. 50 : 308 (opp. p.), f. 2.

Vern. : Asana (Mar.).

Loc. : NAGARHAVELI : Morkhal.

The species can be located along the hilly slopes in Goa area also.

CHROZOPHORA JUSS.

1. An erect stellately hairy herb ; lower part of stem usually without branches ; leaves pale ; sepals of female flowers triangular *rottleri*
1. A prostrate stellately woolly herb ; diffusely branched from the root ; leaves dark - brown ; sepals of female flowers linear *prostrata*

Chrozophora prostrata Dalz. in Dalz. & Gibs. Bomb. Fl. 233 ; 1861 ; FBI 5 : 410 ; C. 3 : 105 ; S. 221 ; Dangs. 46 ; Pav. 212.

Fl. : September.

Vern. : Betookharad (Guj.).

Loc. : DAMAN : Dabel ; Dundorta. DADRA.

Rare, in the fields.

C. rottleri (Geis.) Juss. ex Spreng. Syst. 3 : 850, 1826 ; G. 2 : 921 ; S. 221 ; *Croton rottleri* Geis. *Crot. Monogr.* 57, 1807. *Chrozophora plicata* Voigt, Hort. Sub. Calc. 156, 1846 ; DG. 171 ; C. 2 : 104 (non A. Juss). *C. plicata* Hook. f. in FBI 5 : 409, 1887.

Fl. : April.

Vern. : Suryavarti (Mar.) ; Survarli (Konk.).

Loc. : NAGARHAVELI : Dhapsa.

Common in rice fields in Goa. A blue dye is obtained from the capsules when wetted.

CLEIDION BL.

Cleidion spiciflorum (Burm. f.) Merr. *Inter. Herb.* Amb. 322, in nota, 1917. *Acalypha spiciflora* Burm. f. *Fl. Ind.* 203, t. 61, f. 2, 1768. *Cleidion javanicum* Bl. *Bijdr.* 613, 1825 ; FBI 5 : 444 ; DG. 172 ; C. 3 : 116 ; T. 2 : 488 ; G. 2 : 927.

Fl. : October - December. *Ill.* : T. f. 512.

Common along Western ghats especially in Concan and North Kanara forests and likely to occur in Goa also.

CROTON LINN.

1. Shrubs or small trees ; leaves penninerved
2. Leaves silvery beneath with stellate hairs, base furnished with a pair of stipitate glands ; fruits covered with stellate hairs and scales *reticulatus*

2. Leaves glabrous beneath, base with no apparent glands ;
fruits covered with scales without stellate hairs *oblongifolius*
1. Undershrubs or herbs ; leaves with 3 - basal nerves *bonplandianum*

Croton bonplandianum Baill. Adans. 4 : 339, 1863 - 64. *C. sparsiflorum* Morong. in Ann. N.Y. Acad. Sci. 7 : 221 ; G. 2 : 920.

Fl. & Fr. : April.

Loc. : GOA : *Salcete* : Margao town.

Locally abundant in waste places in Margao town.

C. oblongifolius Roxb. Fl. Ind. 3 : 685, 1832 ; FBI 5 : 386 ; DG. 171 ; C. 3 : 96 ; T. 2 : 471 ; G. 2 : 919.

Ill. : T. f. 505.

Vern. : Gunsur (Mar.) ; Ghansuramg (Konk.).

A rare species collected from areas adjoining Goa and possibly can be located at Goa also. Dalgado recorded it for Goa.

C. reticulatus Heyne (in Wall. Cat. 7724B, 1828) ex Bedd. Ic. Pl. Ind. Or. t. 233, 1874 ; FBI 5 : 386 ; DG. 171 ; C. 3 : 96 ; T. 2 : 469 ; G. 2 : 919.

Fl. : October - January. *Ill.* : T. f. 504.

Vern. : Pandri (Mar.) ; Pandurang (Konk.)

The species is common at Ponda ghats (Ratnagiri district). There is every possibility of its being located in Goa area also.

Cult. species :

C. tiglium Linn. Sp. Pl. 1004, 1753 ; FBI 5 : 393 ; DG. 171 ; C. 3 : 98 ; G. 2 : 920.

Vern. : Jempal (Konk.) ; *Croton tinglio* (Port.).

Oil is extracted from the seeds of this cultivated species.

EUPHORBIA Linn.

(Note on †*Chamaesyce* S. F. Gray at the end)

1. Stem not developed above ground ; leaves all radical *fusiformis*
1. Stem well developed above ground ; leaves not all radical
2. Perennial shrubs ; stem and branches thick, fleshy ; glands of involucre without a petaloid limb
3. Leaves few, small, deciduous ; branches angled with 3 - 5, thick, sinuate wings *antiquorum*
3. Leaves many, large ; branches sub - cylindrical with twin, stipular spines on spirally arranged tubercles *neriifolia*

2. Annual herbs with slender stems and branches ; glands of involucre with or without petaloid limb
4. Glands of involucre conspicuous with a petaloid limb
5. Floral leaves distichously imbricating *pycnostegia*†
5. Floral leaves not distichously imbricating
6. Cocci winged *notoptera*†
6. Cocci not winged
7. Involucres in many flowered cymes *parviflora*†
7. Involucres solitary axillary *erythroclada*
4. Glands of involucre without a petaloid limb
8. Erect or ascending herbs with yellowish hairs *hirta*†
8. Prostrate herbs, glabrous or pubescent
9. Stems hispidly hairy ; capsules pubescent or hirsute
10. Cocci covered with appressed hairs, not prominently keeled *thymifolia*†
10. Cocci prominently keeled covered with spreading hairs *prostrata*†
9. Stems and capsules glabrous *bombaiensis*†

Euphorbia antiquorum Linn. Sp. Pl. 450, 1753 ; FBI 5 : 255 ; DG. 165 ; C. 3 : 57 ; G. 2 : 894.

Fl. : July - August. *Ill.* : Wt. Ic. t. 897.

Vern. : Tirikon (Konk.) ; Euphorbio (Port.).

Infrequent in Western and Peninsular India and often cultivated also. Dalgado records it for Goa and hence included in this work.

†**E. bombaiensis* Santapau in Bull. Bot. Soc. Beng. 8 (1 & 2) : 17, 1954 ; Pav. 208. *E. microphylla* Heyne in Roth Nov. Pl. Sp. 229, 1821 ; FBI 5 : 252 ; C. 3 : 65 ; S. 215 ; Dangs. 47 (*non* Lamk., 1788).

Fl. : September - November. *Fr.* : November - January.

Loc. : NAGARHAVELI : Dapsa ; Chispana. DIU : Jalandhar ; Rocky creek in sea, Nagoa.

Occasional, in the fields and along sea shore. The species is very similar to *E. thymifolia* except that it is glabrous.

E. fusiformis Buch. Ham. in Don, Prodr. Fl. Nep. 62, 1825 ; FBI 5 : 257 ; DG. 165. *Euphorbia acaulis* Roxb. [Hort. Beng. 36, 1814 (*nom. nud.*) &] Fl. Ind. 2 : 472, 1832 ; C. 3 : 57 ; G. 2 : 893.

**E. heyneana* Spreng. Syst. Veg. 3 : 791, 1826 (G. Panigrahi in Kew Bull. 29 : 695, 1974, Type not seen)

Fl. : April. May.

Vern. : Gajan (Konk.).

Common in Sawantwadi as well as in adjoining areas of Goa and should be possible to locate in Goa also. I have followed Santapau (Bull. Bot. Soc. Bengal, 8 : 3, 1954) in treating *Euphorbia fusiformis* and *E. acaulis* as synonymous in which case *E. fusiformis* has priority.

Euphorbia hirta Linn. Sp. Pl. 454, 1753 ; G. 2 : 892 ; S. 214 ; Dangs. 47 ; Pav. 207. *E. pilulifera auct. non* Linn., FBI 5 : 250 ; DG. 164 ; C. 3 : 64.

Fl. & Fr. : Throughout the year. *Ill.* : Wealth of India 3 : f. 141.

Vern. : Dudhi (Mar.) ; Achchegida (Kan.) ; Dudurli (Konk.) ; Rati Duden (Guj.).

Loc. : GOA : *Satari* : Masarde village near Valpoi ; Nanacha Dongar (Codal). *Quepem* : Budsari Goundugarha. *Sanguem* : Nandrona near Molem 1000¹. *Canacona* : Barsare village near Tudal ; Ordofond - Tudal. NAGARHAVELI : Bank of Daman ganga river on way to Kuweha ; Daman forest. DADRA. DAMAN : Fort area ; Dundorta. DIU : Nagoa ; Gogale.

Common in cultivated fields and along roadsides.

E. neriifolia Linn. Sp. Pl. 451, 1753 ; FBI 5 : 255 ; DG. 165 ; G. 2 : 893 ; S. 213 ; Dangs. 47 ; Pav. 206. *Euphorbia ligularia* Roxb. Fl. Ind. 2 : 465, 1832 ; C. 2 : 59 ; T. 2 : 432.

Fl. : September. *Ill.* : Wealth of India 3 : f. 142 ; T. f. 485.

Vern. : Nival Kamtem (Konk.) ; Neya dungra (Mar.) ; Yelekalli (Kan.) ; Thor (Guj.).

Loc. : NAGARHAVELI : Dhapsa. DAMAN : Varacunda.

Rare. Often confused with *Euphorbia nivulia* Buch. Ham. which has terete or obscurely angled stems whereas in *E. neriifolia* the branches are distinctly angular.

**E. nivulia* Buch. Ham. in Trans. Linn. Soc. 14 : 286, 1825 ; FBI 5 : 255.

Ill. : Wt. Ic. t. 1862.

Vern. : Thorkantalo (Guj.).

Loc. : DIU : Nagoa.

Rare, near the sea shore.

*Later addition, hence not included in the Key.

**Euphorbia notoptera* Boiss. in DC. Prodr. 15 (2) : 26, 1862 ; FBI 5 : 247 ; C. 3 : 61 ; G. 2 : 892.

Fl. & Fr. : August December.

Loc. : GOA : *Satari* : Onda ; Curchinum. *Bardez* : Agoda hill top ; Porvorim rocky plateau, near Geological Survey of India. *Ilhas* : Military camp Chimbel. *Salcete* : Madgao ; rocky plateau ; Bellei Verna plateau. *Sanguem* : Patiem forests ; Darbandora ; Barazon. *Canacona* : Ordofond - Tudal.

Frequent, on the rocky plateau.

†*E. parviflora* Linn. Syst. (ed. 10) 2 : 1047, 1759 ; S. 216 ; Pav. 207. *E. hypericifolia* Linn. Sp. Pl. 454, 1753 ; FBI 5 : 249 (*p.p.*) ; DG. 164 ; G. 2 : 892 ; *E. hypericifolia* var. *parviflora* Prain, Beng. Pl. 2 : 924, 1903 ; C. 3 : 63.

Fl. : September.

Vern. : Dudhmogra (Mar.) ; Dhakti dudurli (Konk.).

Loc. : NAGARHAVELI : Nana Randha ; Silvassa, Damanganga bed ; near Atal forest ; Dolara forest ; Khanvel ; Chispana forest. DADRA. DAMAN : Dundorta. DIU : Jalandhar ; Rocky creek in sea, Nagoa ; Gogale.

Frequent on the river bank and along sea shore.

E. prostrata Ait. Hort. Kew 2 : 139, 1789 ; FBI 5 : 266 ; Pav. 208.

Fl. & Fr. : September January.

Loc. : DIU : Castle area.

Rare, near the rocky sea shore.

†*E. pycnostegia* Boiss. Cent. Enph. 9, 1860 ; FBI 5 : 246 ; C. 3 : 60 ; S. 214.

Fl. & Fr. : September.

Loc. : DAMAN : Regunvara ; Dabel, near Tank. Dudhsagar along Rly. line.

Rare, near a stream.

†*E. thymifolia* Linn. Sp. Pl. 454, 1753 ; FBI 5 : 252 ; DG. 164 ; C. 3 : 64 ; G. 2 : 893 ; S. 215.

Fl. & Fr. : March April. *Ill.* : Wealth of India 3 : f. 144.

Vern. : Chakdiduhi (Mar.) ; Duduni (Konk.).

Loc. : GOA : *Satari* : Nandore near a river ; Nanecha Dongar. *Ilhas* : Panjim, near the sea shore. *Canacona* : Nadquem. NAGARHAVELI : Silvassa.

Occasional in moist places.

Cult. species :

Euphorbia heterophylla Linn. Sp. Pl. 453, 1753 ; C. 3 : 66.

Fl. : September.

Loc. : DAMAN : Fort area. DIU : Gogale. Diu island.

A native of North America, cultivated in gardens ; sometimes found as an escape.

E. tirucalli Linn. Sp. Pl. 452, 1753 ; FBI 5 : 254 ; DG. 164 ; C. 3 : 66 ; G. 2 : 893.

Fl. : August September.

Vern. : Sher (Mar.) ; Portugali nival (Konk.) ; Tithymalo (Port.).

Loc. : DAMAN : Fort compound ; Bimpur. DIU : Nagoa.

A native of Africa, planted as a hedge plant near villages,

Chamaesyce S.F. Gray, Nat. Arr. Brit. Pl. 2 : 260, 1821 is now considered by G.L. Webster (Jour. Arn. Arboretum 48 : 420, 1967) as distinct from *Euphorbia* Linn. based on the following characters :

- | | |
|--|-------------------|
| 1. Leaves alternate, rarely opposite, basal ones equal, stipules reduced or absent, branching monopodial | <i>Euphorbia</i> |
| 1. Leaves opposite, basal ones unequal, stipules present, branching sympodial | <i>Chamaesyce</i> |

Earlier, though a few workers followed this distinction, treating the herbaceous species under *Chamaesyce* and the succulent shrubby and tree forms under *Euphorbia*, many workers (A.R. Smith, Kew and others) studying this group indicate that, in view of the intermediate forms now being collected from Africa and Hawaii islands, it may be futile to delimit the two genera on conventional characters. However, data on anatomical characters and other allied aspects on the two genera are being gathered to establish a distinct generic status to *Chamaesyce* and the issue deserves further a careful scrutiny. L. Croizat in his elaborate treatment on the sub-generic clarification of *Euphorbia* Linn. while studying the South African and Malagasy species (*Webbia* 27(1) : 1-221, 1972), convincingly writes "*Chamaesyce* does fill all the requirements supposed to earmark a perfectly good genus. Whatever intermediates might be supposed to link it with other groups could easily be submitted to the test of growing a few plants from seed, and studying their manner of branching...".

Various species of *Euphorbia* marked with dagger (†) in the key above were transferred to the genus *Chamaesyce* by earlier authors.

A critical note on *Euphorbia indica* Lamk. [= *Chamaesyce indica* (Lam.) Croizat], a much confused weed, common in many parts of India and possibly in the areas covered under this flora, was published by Vatsavaya S. Raja and Piratla N. Rao (Ind. J. Bot. 2(2) : 202-208, 1979).

EXCOECARIA Linn.

Excoecaria agallocha Linn. Syst. Nat. ed. 1 : 288, 1759 ; FBI 5 : 472 ; DG. 173 ; C. 3 : 122 ; T. 2 : 494 ; G. 2 : 941.

Fl. : April - August. *Fr.* : September - November. *Ill.* : Wealth of India 3 : f. 154 ; Wt. Ic. t. 1865B.

Vern. : Geva (Mar.) ; * Hars (Kan.) ; Uso (Konk.) ; Guardo-olhos (Port.).

Loc. : GOA : *Pernem* : Terekhol. *Bicholim* : Condola area. *Satari* : Pilegao. *Bardez* : Kolvelly ferry crossing ; Baga jungle. *Ihas* : Panaji bank of river Mandovi. *Salcete* : Margao Madalca road. *Marmugao* : Near Sancoale. *Ponda* : Borim, Zueri river ; Borim - Ponda, 8 km point *Canacona* : Maxim ghat.

Common, along back waters.

GLOCHIDION Forst.

- | | |
|---|--------------------|
| 1. Stamens 4 or more ; style conical ; capsule beaked | <i>zeylanicum</i> |
| 1. Stamens 3 ; style sub globose or cylindrical, capsule not beaked | |
| 2. Branches, under surface of leaves, petioles and inflorescence velvety pubescent ; calyx of 5 - 6 sepals, distinct, connate at base | <i>velutinum</i> |
| 2. Branches and leaves glabrous ; calyx 6 - 8, toothed or lobed | <i>hohenackeri</i> |

Glochidion hohenackeri Bedd. For. Man. in Flor. Sylv. 193, 1873 ; FBI 5 : 154 ; C. 3 : 75 ; T. 2 : 446 ; S. 217. *G. lanceolarium* Dalz. in Dalz. & Gibs. Bo. Fl. 235, 1861 (non Voigt) ; DG. 167.

Fl. & Fr. : November - March. *Ill.* : T. f. 493.

Vern. : Bhoma (Mar. & Konk.) ; Sullai (Kan.).

Loc. : GOA : *Satari* : Dina-chi-rai near Pale ; Pale (Tanem) ; Wadicha Dongar ; Satrem. *Sanguem* : Foot of the hill patiém. *Canacona* : Devasthan, Nadquem.

Scarcely distributed in the forest. Closely allied to *Glochidion ellipticum*, differing only in the structure of calyx and stigma in female flowers.

Glochidion velutinum Wt. Icon. P. Ind. Or. 5(2) : 29, t. 1907, f. 2 ; 1852 ; FBI 5 : 322 ; C. 3 : 74 ; T. 2 : 499 ; G. 2 : 914.

Fl. & Fr. : August April. *Ill.* : T. f. 495.

Vern. : Showra (Mar.) ; Sallai-mara (Kan.).

Loc. : GOA : *Satari* : Nagargao ; *Ivorem. Sanguem* : Near Darbandora, Nandrona near Molem ; Molem ; Choraundem. *Canacona* : Ordo-fond Tudal.

Rare, in open forest areas along *Dillenia*, *Terminalia* and *Maesa*.

G. zeylanicum A. Juss. Tent. Euphorb. 107, t. 3, 1824 ; FBI 5 : 310. *G. zeylanicum* A. Juss. var. *intidum* Hook. f. in FBI 5 : 311. 1887 ; C. 3 : 73.

Fl. & Fr. : May December. *Ill.* : T. f. 492.

Vern. : Savregidda (Kan.).

Loc. : GOA : *Satari* : Valpoi. *Bardez* : Chopara, Kaisura fort. *Sanguem* : Colem Caranzol, old Railway Station ; *Periche Tem* (Cumbari) ; *Patrem*.

Rare.

HOMONIOIA Lour.

Homonoia riparia Lour. Fl. Cochinch. 637, 1790 ; FBI 5 : 455 ; C. 3 : 118 ; T. 2 : 490 ; G. 2 : 932.

Fl. & Fr. : September May. *Ill.* : Wt. Ic. t. 1868.

Vern. : Ran-kanher (Mar.).

Loc. : GOA : *Satari* : Poda village, Valpoi ; *Nandore*, near Mahadevi river. *Sanguem* : Talem Patiem. *Canacona* : Tudal village roadside. NAGARHAVELI : Duldeni ; Silvassa, Daman ganga river bed.

Occasional along the rocky river banks.

JATROPHA Linn.

Leaves deeply, palmately 3-5 lobed, lobes glandular serrate ; petioles with branched glandular hairs ; flowers red

gossypifolia

Leaves entire, angular or shallowly 3-5 lobed, glabrous or pubescent ; flowers yellow

curcas

Jatropha curcas Linn. Sp. Pl. 1006, 1753 ; FBI 5 : 383 ; DG. 170 ; C. 3 : 95 ; T. 2 : 467 ; G. 2 : 937 ; S. 220 ; Dangs. 48 ; Pav. 214.

Fl. : April May. *Fr.* : November. *Ill.* : T. f. 502.

Vern. : Mogalieranda (Mar.) ; Kadandla (Kan.) ; Mogli erandi (Konk.) ; Purgueira (Port.) ; Jamaigota, Magali Erand (Guj.).

Loc. : GOA : *Salcete* : Goodier, 1 mile beyond Margoa on way to Quepem; *Sanguem* : Colem village side ; Molem Belgaum Road 67 km. *Canacona* : Mukadomal, Ordofond. NAGARHAVELI : On way to Sindhori to Kawcha. DADRA. DAMAN : Varacunda ; Bimpur.

Occasional in open fields.

J. gossypifolia Linn. Sp. Pl. 1006, 1753 ; FBI 5 : 383 ; C. 3 : 95 ; T. 2 : f. 468 ; Dangs. 48.

Fl. : September. *Ill.* : T. f. 503 ; Tadulingam & Venkatanarayana in Handb. South Indian Weeds, t. 163, f. 1-10, 1955.

Loc. : DAMAN : Jampore ; Airport area. DIU : Jalandhar.

Occasional on sandy areas in open fields, near villages.

Cult. species :

J. multifida Linn. Sp. Pl. 1006, 1753 ; FBI 5 : 383 ; DG. 170 ; C. 3 : 95 ; G. 2 : 937.

Vern. : Chini emrandi (Konk.) ; Arvora dos caraes (Port.).

Commonly cultivated in the gardens.

MACARANGA Thouars.

Macaranga peltata (Roxb.) Muell. Arg. in DC. Prodr. 15(2) : 1010, 1866 ; G. 2 : 928 ; S. 222. *Osyris peltata* Roxb. Fl. Ind. 3 : 855, 1832. *Macaranga roxburghii* Wt. Ic. 5(2) : 23 & 6, t. 1949, f. 4, 1853 ; FBI 5 : 448 ; DG. 172. *M. tomentosa* Wt. Ic. 5(2) : 23 & 6 : t. 1949, f. 1, 1853 ; C. 3 : 117 ; T. 2 : 489.

Fl. : January March. *Fr.* : March May. *Ill.* : Wt. Ic. t. 1949, f. 1 & 4.

Vern. : Chandoda (Mar.) ; Chandkal (Kan.) ; Chamdivado (Konk.).

Loc. : GOA : *Satari* : Nandore forest, Maloli ; Panchi forest near Nandore, Valpoi. *Sanguem* : Barazan mine area ; Netravoli (Malta Dongar). *Canacona* : Pahad near Nadquem.

Occasional in the forest.

MALLOTUS Lour.

1. Trees

2. Leaves ovate or ovate-lanceolate, greyish pubescent to fulvous tomentose and red glandular beneath; capsule 3-valved, red glandular *philippensis*

2. Leaves broadly ovate, orbicular or deltoid, densely white or fulvous stellate tomentose; capsules 3-4-valved, echinate with soft woolly spines *albus*

1. Erect, straggling or climbing shrubs

3. Erect shrubs, leaves opposite *stenanthus*

3. Straggling or climbing shrubs, leaves alternate *repandus*

Mallotus albus Muell. Arg. in *Linnaea* 34 : 188, 1865; FBI 5 : 429; C. 3 : 113; T. 2 : 483; G. 2 : 924.

Fl. & Fr. : November. *Ill.* : T. f. 510.

Loc. : GOA : *Sanguem* : Barazan mine area; Maduka bungla jungle. Rare.

M. philippensis (Lamk.) Muell.-Arg. in *Linnaea* 34 : 196, 1865; FBI 5 : 442; DG. 172; C. 3 : 113; T. 2 : 485; G. 2 : 924; S. 222. *Croton philippense* Lamk. *Encycl.* 2 : 206, 1786.

Fl. : November - December. *Ill.* : *Bedd. Fl. Sylv.* t. 289; T. f. 509.

Vern. : Shondri (Mar.); Kunkuma (Kan.); Semdri (Kan.); Arola (Konk.).

Loc. : GOA : *Bardez* : Betim - Bardez; Betim, on road side. *Sanguem* : Patole (Netravali). NAGARHAVELI : Dudhni to Bildhari forests.

M. repandus (Willd.) Muell.-Arg. in *Linnaea* 34 : 197, 1865; FBI 5 : 442; DG. 172; C. 3 : 117; T. 2 : 486; G. 2 : 924. *Croton repandus* Willd. in *Neue Schrift. Naturf. Fround, Berlin*, 4 : 206, 1803.

Fl. : September - October. *Ill.* : T. f. 511.

Vern. : Komati (Konk.); Folhas da Minta (Port.).

Though not collected from Goa, as it is common in Concan and North Kanara, it is included here.

M. stenanthus Muell. - Arg. in *Linnaea* 34 : 191, 1865; FBI 5 : 437; C. 3 : 114; G. 2 : 925; S. 250 (3rd ed.).

Fl. : September - January. *Fr.* : January - July.

Loc. : GOA : Dudhsagar.

MICROCOCCA Benth.

Micrococca mercurialis Benth. in Hook. Niger. Flora, 503, 1849 ; G. 2 : 929. *Claoxylon mercurialis* Thw. Enum. 271, 1861 ; FBI 5 : 412 ; C. 3 : 107.

Fl. : July August. *Fr.* : September.

Loc : GOA : *Bardez* : Calangute sea side, 6 miles west of Porvorim.

Rare, near the beach.

PEDILANTHUS Neck. ex Poit.

Pedilanthus tithymaloides (Linn.) Poit. in Ann. Mus. Par. 19 : 390, t. 19, 1812 ; FBI 5 : 239 ; C. 3 : 124 ; G. 2 : 942 ; S. 224. *Euphorbia tithymaloides* Linn. Sp. Pl. 453, 1753 ; DG. 165.

Fl. : January July.

Vern. : Vilayati-sher (Mar.) ; Nival (Konk.).

Loc. : GOA : *Bicholim* : Ammona ferry crossing. *Canacona* : Ordo-fond. NAGARHAVELI ; *Daphsa*. DAMAN : Fort area ; *Varacunda*.

Rare, along the paths, usually grown in the gardens as border plant.

PHYLLANTHUS Linn.

After Webster (Journ. Arn. Arb. 38 : 51 80, 1967), treating *Kirganelia* and *Emblia* under *Phyllanthus*.

- | | |
|--|------------------------|
| 1. Stamens 5 in 2 series, the outer with free filaments, the inner connate ; straggling shrubs | <i>reticulatus</i> |
| 1. Stamens 3 in one series, the filaments connate wholly, rarely in part ; erect trees, undershrubs or herbs, never scandent | |
| 2. Anthers erect ; cells dehiscing vertically ; filaments united in a column | |
| 3. Trees ; styles twice bifid ; fruit large, fleshy | <i>emblica</i> |
| 3. Herbs or undershrubs ; styles once bifid ; fruit a capsule of 3 crustaceous, 2 - valved, echinate cocci | |
| 4. Leaves scattered, cuneate, obovate ; capsules smooth | <i>maderaspatensis</i> |
| 4. Leaves distichously imbricating, oblong or linear - oblong ; capsules echinate | <i>urinaria</i> |
| 2. Anthers didymous or reniform ; cells dehiscing transversely | |
| 5. Leaves linear - oblong, obtuse or acute at apex ; stipules peltate ; seeds tubercled | <i>simplex</i> |

5. Leaves elliptic-obovate, broadly obtuse at apex, prominently distichous; stipules not peltate; seeds ribbed

fraternus

**Phyllanthus debilis* Klein ex Willd. Sp. Pl. 4 : 582. 83, 1804. *Phyllanthus debilis* "Herb. Ham." ex Hook. f. in FBI 5 : 299, 1887; C. 3 : 84.

Fl. & Fr. : September. *Ill.* : Webster in Journ. Arn. Arb. 38 : 307, t. 19, f. E F, 1957.

Loc. : DIU : Nagoa; Castle area; isolated rocky creeks; Gogale.

Occasional, along the sea shore.

P. emblica Linn. Sp. Pl. 982, 1753; FBI 5 : 289; DG. 166; C. 3 : 81; T. 2 : 441. *Emblica officinalis* Gaertn. Fruct. 2 : 122, 1791; G. 2 : 906, S. 219.

Fl. : March May. *Fr.* : August - November. *Ill.* : Wt. Ic. t. 1896; T. f. 491.

Vern. : Avla (Mar.); Nelli mara (Kan.); Amrali (Konk.); Mirabalano emblico (Port.); Amalan (Guj.).

Loc. : GOA : *Satari* : Codal; Kutachemal (Ivorem); Wadicha Dongar (Caranzol). *Salcete* : Lake near Chinchinum. *Sanguem* : Potiem forest; Colomba reserve forest; Verlem; Surla; Molem. *Canacona* : Nadquem Quer hills. NAGARHAVELI : Saily; Dolora forest.

Common in deciduous forests. The fruit is edible and a rich source for ascorbic acid.

P. fraternus Webster in Contr. Gray Herb. 176 : 53, 1955. *P. asperulatus auct. non.* Hutch. (1920); S. 245 (3rd ed.) *P. niruri auct. plur. (non Linn.)* : FBI 5 : 298; DG. 167; C. 3 : 84; G. 2 : 903.

Fl. : August November. *Fr.* : November March. *Ill.* : Wt. Ic. t. 1894.

Vern. : Bhuiavali (Mar.); Kiranelligida (Kan.); Bhumi-amvali (Konk.); Bhonyaamali (Guj.).

Loc. : GOA : *Bardez* : Kolvelly ferry crossing; Porvorim Betim road side. *Salcete* : Goodier, 1 mile beyond Margoa on way to Quepem; Margoa, fields near rest house. *Ponda* : Curti village, Ponda-Darbandora road. *Quepem* : Bali. *Canacona* : Nadquem. NAGARHAVELI : Morkhal. DAMAN : Fort area.

Common weed in cultivated fields and on dried up low lying areas.

**P. lawii* Grah. Cat. Pl. Bomb. 181, 1839; FBI 5 : 290; C. 3 : 82.

Fl. : September November.

*Later addition, hence not included in the Key.

Loc. : NAGARHAVELI : Bank of Damanganga river on way to Kawcha.

Phyllanthus maderaspatensis Linn. Sp. Pl. 982, 1753 ; FBI 5 : 292 ; DG. 167 ; C. 3 : 82 ; G. 2 : 902 ; S. 218 ; Pav. 210.

Fl. : July August. *Fr.* : August September. *Ill.* : Wt. Ic. t. 1895, f. 3.

Vern. : Kachora (Mar.) ; Kamorcha (Guj.).

Loc. : GOA : *Satari* : Caranzol. NAGARHAVELI : Saily. DAMAN : Fort area ; Dhapsa.

Occasional in the fields. Common along the Western and Peninsular India.

P. reticulatus Poir. in Lamk. Encycl. 5 ; 298, 1804 ; FBI 5 : 288 ; DG. 166 ; C. 3 : 81 ; T. 2 : 440. *Kirganelia reticulata* (Poir.) Baill. Etud. Gen. Euph. 613, 1858 ; G. 2 : 905 ; S. 219.

Fl. & Fr. : April November. *Ill.* : Wt. Ic. t. 1899.

Vern. : Pavan (Mar.) ; Hooli-balli (Kan.) ; Panpoi (Konk.) Daluvan, Shinavi, Puvan (Guj.).

Loc. : GOA : *Bardez* : Bastara. *Ilhas* : Panaji along the sea coast ; *Salcete* : Cuncolim. *Ponda* : Qurim. *Canacona* : Stream near Barsare Tudal ; Angidiv. DAMAN : Fort area. NAGARHAVELI : Nala between Khanvel and Jamunpada.

Occasional, alongwith *Calotropis*, *Erythrina*, *Melastoma* and *Desmodium* etc.

**P. simplex* Retz. Obs. Bot. fasc. 5 : 29, 1789 ; FBI 5 : 295 ; C. 3 83 ; G. 2 : 902 ; Dangs. 49 ; Pav. 210.

Fl. & Fr. : August November. *Ill.* : Wt. Ic. t. 1902, f. 1.

Vern. : Bhuiavali (Mar.) ; Motibhonyaanmali (Guj.).

Loc. : GOA : *Satari* : Ambeachagol. *Salcete* : Courtalum Madgoa plateau area. Kaisuva fort. *Ponda* : Curti village, Ponda Darbandora road side. *Sanguem* : Alduna (Netravali) ; Castle rock on way to Anmod. NAGARHAVELI : Morkhal, Bank of Damanganga river on way to Kawcha ; Saily. DADRA : DAMAN : Dundorta.

Occasional in the fields, open gravelly areas and grasslands.

P. urinaria Linn. Sp. Pl. 982, 1753 ; FBI 5 : 293 ; DG. 167 ; C. 3 : 83 ; G. 2 : 902 ; S. 218 ; Dangs. 49.

Fl. & Fr. : August April. *Ill.* : Wt. Ic. t. 1895, f. 4.

**P. virgatus* Forst. f. Prodr. 65, 1785 ; Backer & Bakh. f. Fl. Java 1 : 469, 1963.

Vern. : Lalmundajantali (Mar.) ; Kempukiranelli (Kan.) ; Karosada-bonyaanmali (Guj.).

Loc. : GOA : *Satari* : Nandore, along river bank ; Caranzol ; Nanecha Dongar. *Salcete* : Margoa, fields near rest house. *Sanguem* : Barazon ; Pericha Tem (Cumbari) ; Nandrona near Molem ; Bavanbunda. *Quepem* : Bali. *Canacona* : Nadquem ; Ordofond Butpal, 4 miles. NAGARHAVELI : Chispana area ; Sindhori forest. DADRA. DAMAN : Dundorta.

Common, in the cultivated fields and moist areas.

Cult. species :

Phyllanthus acidus (Linn.) Skeels, U.S.D.A. Bur. Pl. Ind. Bull. 148 17, 1909. *Averrhoa acida* Linn. Sp. Pl. 428, 1753. *Phyllanthus distichus* Muell. Arg. in DC. Prodr. 15(2) : 413, 1866 ; FBI 5 : 804 ; DG. 167 ; C. 3 : 86, T. 2 : 443.

Vern. : Harpharori (Mar.) ; Rajamvali (Konk.) ; Cheramela (Port.).

Cultivated. The fruits are eaten raw or cooked or pickled.

PUTRANJIVA Wall.

Putranjiva roxburghii Wall. Tent. Fl. Nep. 61, 1826 ; FBI 5 : 336 ; DG. 168 ; C. 3 : 86 ; T. 2 : 456 ; G. 2 : 917 ; S. 219.

Fl. : March May. *Fr.* : March December. *Ill.* : Wt. Ic. t. 1876.

Vern. : Putranjiva (Mar.) ; Saman (Konk.) ; Raiz da mostarda (Port.).

Common in areas adjoining Goa and also mentioned by Dalgado, hence included in this work. The stones of the fruits are made into necklaces and rosaries.

SAPIUM R. Br.

Sapium insigne Benth. var. *malabaricum* (Wight) Hook. f. in FBI 5 : 472, 1885 ; T. 2 : 492 ; S. 223. *Falconeria malabarica* Wt. Ic. t. 1866, 1852 ; *Sapium insigne* Cooke, Fl. Pres. Bomb. 2 : 622, 1906 (*p.p.*) ; DG. 173 ; G. 2 : 941.

Fl. : January March. *Fr.* : March April. *Ill.* : Wt. Ic. t. 1866 ; T. f. 513.

Vern. : Dudla (Mar.) ; Kurda (Kan.) ; Uso (Konk.).

Loc. : GOA : *Ponda* : Near Sirod village, Borim Sirod. *Canacona* : Ordofond Tuda! ; Hathipawal forest, on way to Butpal.

SAUROPUS Bl.

Sauropus quadrangularis Muell. Arg. in *Linnaea* 32 : 73, 1863 ; FBI 5 : 335 ; DG. 168 ; C. 3 : 78 ; T. 2 : 453 ; G. 2 : 911.

Fl. : June August. *Ill.* : Wt. Ic. t. 1900.

Vern. : Chikli (Mar.) ; Aruni (Sans.).

Occurs in areas adjoining Goa and it should be possible to locate it in Goa also.

SEBASTIANA Spreng.

Sebastiana chamaelea Muell. Arg. in DC. *Prod.* 15(2) : 1175, 1866 ; FBI 5 : 475 ; DG. 174 ; C. 3 : 124 ; G. 940.

Fl. : September - December.

Vern. : Bhui-erandi (Mar.).

Loc. : GOA : *Pernem* : Terekhol.

Rare.

SECURINEGA Juss.

Branches ending in spines

leucopyrus

Unarmed shrub

virosa

Securinega leucopyrus (Willd.) Muell. Arg. in DC. *Prodr.* 15(2) : 451, 1866 ; S. 217. *Flueggea leucopyrus* Willd. *Sp. Pl.* 4 : 757, 1805 ; FBI 5 : 328 ; DG. 168 ; C. 3 : 77 ; T. 2 : 455 ; G. 2 : 907 ; S. 217.

Fl. : May. *Ill.* : Wt. Ic. t. 1875.

Vern. : Pandharpalli ; (Mar.) ; Parpo (Konk.).

Common in open situations. The species is very similar to *S. virosa* except for the spinous nature of the branches.

S. virosa (Roxb. ex Willd.) Pax. & Hoffm. in *Pflanzenfam.* (ed. 2) 19C : 60, 1931 ; S. 217. *Phyllanthus virosus* Roxb. ex Willd. *Sp. Pl.* 4 : 578, 1805. *Flueggea microcarpa* Blume, *Bijdr.* 580, 1825 ; FBI 5 : 328 ; DG. 167 ; C. 3 : 77 ; T. 2 : 454. *Flueggea virosa* Baill. *Etud. Gen. Euph.* 593, 1858 ; C. 2 : 907.

Fl. & Fr. : October. *Ill.* : Wt. Ic. t. 1994 ; T. f. 497.

Vern. : Pandharpalli (Mar.) ; Bili-horli (Kan.).

Loc. : GOA : *Satari* : Masarde village near Valpoi ; Palle.

Rare. Hardly distinguishable from *Securinega leucopyrus* except for spine like branches and larger leaves seen in the latter species.

TRAGIA Linn.

Tragia muelleriana var. *unicolor* (Muell. - Arg.) Pax. & Hoffm. in Pflanzreich 68 : 81, 1935 ; S. 223. *T. miqueliana* var. *unicolor* Muell. Arg. in DC. Prodr. 15(2) : 843, 1866. *Tragia involucrata* Linn. Sp. Pl. 980, 1753 ; FBI 5 : 465 ; DG. 173 : C. 3 : 119 ; G. 2 : 931 (all p.p.).

Fl. & Fr. : August November.

Vern. : Dulagondi (Kan.) ; Pimt khatkhutli (Konk.).

Loc. : GOA : *Satari* : Along the road after entering Goa ; Caranzol ; Satrem ; Ambeachagal ; Ivorem Curdo Kunchemal. *Salcete* : Verna village, plateau. *Sanguem* : Catalia (Netravali). *Quepem* : Budsari Goundugraha. *Canacona* : Pahad near Nadquem ; Poinguinam.

Occasional on rocky slopes.

TREWIA Linn.

Trewia polycarpa Benth. in Gen. Pl. 3 : 318, 1880 ; FBI 5 : 424 ; C. 3 : 112 ; T. 2 : 482 ; G. 2 : 922 ; S. 249 (3rd ed.). *Trewia nudiflora* Wt. Ic. t. 1871, 1852 (female fls. only). *T. nudiflora* Linn. Sp. Pl. 1193, 1753 ; T. 2 : 481, 1911 ; C. 3 : 111 ; G. 2 : 922. (all in part.).

Fl. : December March. *Ill.* : Bedd. Fl. Sylv. t. 281 ; Wt. Ic. t. 1870 (male fls. only).

Vern. : Petari (Mar.) ; Tumri (Kan.) ; Bomvaro (Konk.).

Loc. : NAGARHAVELI : Dolara ; Carchond forest ; Velugaon ; Dudhni to Bildhari forest.

Common along river banks and streams. The species is very common in North Kanara and areas adjoining Goa and it should be possible to locate it in Goa also.

The other two spellings of the genus *Treulia* Stokes and *Treulia* Linn. are not correct. *T. nudiflora* Linn. is considered to be the valid species by some workers.

Cult. species :

Aleurites moluccana Willd. Sp. Pl. 4 : 590, 1805 ; FBI 5 : 384 ; DG. 170 ; C. 3 : 125.

Fl. : April May.

Vern. : Arkot (Mar.) ; Akrot (Konk.) ; Nogueira da India (Port.).

Cultivated in the gardens. The seeds are edible and oil is extracted which is used for cooking and burning.

Codiaeum variegatum (Linn.) Bl. Bijdr. 606, 1825 ; FBI 5 : 399 ; DG. 171 ; C. 3 : 125 ; G. 2 : 942.

Vern. : Kroton (Konk.) ; Folhas da China (Port.).

The species is a native of Molucca islands and is grown in the gardens.

Euphorbia pulcherrima Willd. ex Klotzch. in Otto & Dietr. Allg. Gart. 2 : 27, 1834 ; FBI 5 : 239 ; C. 3 : 66 ; G. 2 : 894. *Poinsettia pulcherrima* Dalz. & Gibs. Suppl. 76 ; DG. 165.

Vern. : Poinsettia (Port.).

The species is grown in the gardens for beautiful flowers (November - December).

Manihot esculenta Crantz, Inst. Herb. 1 : 167 ; 1766 ; *Manihot utilisima* Pohl, Pl. Bras. Icon. 1 : 32, t. 24, 1827 ; FBI 5 : 239 ; DG. 169 ; C. 3 : 125 ; G. 2 : 942.

Vern. : Portugalem chinem (Konk.) ; Tapioca (Port.).

The species was introduced by the Portuguese in Goa. Now cultivated for the edible tuberous roots and for ornamental purposes.

Ricinus communis Linn. Sp. Pl. 1007, 1753 ; FBI 5 : 457 ; DG. 173 ; C. 3 : 125 ; G. 2 : 933.

Vern. : Erand (Mar.) ; Haralu (Kan.) ; Vhadlo eramdo (Konk.) ; Ricino (Port.).

The species is a native of Africa, now cultivated and naturalised in Goa. The oil extracted from the seeds is used for burning and is medicinal. Collected in Sanguem and other areas of Goa and also in Nagarhaveli as an escape.

ULMACEAE

1. Leaves deciduous ; flowers in clusters appearing before the leaves ; fruit a samara

Holoptelea

1. Leaves persistent ; flowers on the young shoots persistent ; fruit a drupe

2. Flowers polygamous ; male sepals imbricate

Celtis

2. Flowers usually dioecious ; male sepals induplicate valvate

Trema

CELTIS Linn.

Celtis cinnamomea Lindl., FBI 482 ; C. 3 : 128 ; T. 2 : 498 ; G. 2 : 944. *C. wightii* Planch. in Ann. Sci. Nat. (ser. 4), 10 : 307, 1848 ; FBI 5 : 483 ; DG. 174 ; C. 3 : 129 ; T. 2 : 499 ; G. 2 : 944. *Celtis tetrandra* Talb. Trees Bomb. ed. 2, 322 (not of Roxb.), 1911 ; DG. 174.

Fl. : February April. *Ill.* : T. f. 514 ; *Wt. Ic. t.* 1969.

Vern. : Brumaj (Mar.) ; Murta Indiana (Port.).

Loc. : GOA : *Canacona* : Pahad near Nadquem.

After careful examination of the *types*, it is evident that *Celtis wightii* cannot be maintained as a distinct species and has to be merged with *C. cinnamomea* only. Further *Celtis tetrandra* Roxb. does not occur at both Concan and North Kanara areas and Dalgado's reference to the *C. tetrandra* is referable to *C. cinnamomea* only. I have included the species in this work as it is common in areas adjoining Goa and Dalgado also included it in his Flora.

HOLOPTBLEA Planch.

Holoptelea integrifolia Planch. in Ann. Sci. Nat. ser. 3, 10 : 266, 1848 ; FBI 5 : 481 ; DG. 174 ; C. 3 : 127 ; T. 2 : 497 ; G. 2 : 943.

Fl. : February March. *Ill.* : *Wt. Ic. t.* 1968.

Vern. : Vavli (Mar.) ; Aval (Kan.) ; Vamvlo (Konk.) ; Olmo da India (Port.).

Loc. : NAGARHAVELI : Nana Randha.

It is a common species of the Western peninsula and it should be possible to locate it in Goa also.

TREMA Lour.

Trema orientalis (Linn.) Blume, Mus. Bot. Lugd. Bat. 2 : 58, 1856 ; FBI 5 : 484 ; DG. 174 ; C. 3 : 129 ; T. 2 : 500 ; G. 2 : 945 ; S. 225. *Celtis orientalis* Linn. Sp. Pl. 1044, 1753.

Fl. & Fr. : October May. *Ill.* : *Wt. Ic. t.* 1971 ; T. f. 515.

Vern. : Gol (Mar.) ; Khargul (Konk.).

Loc. : GOA : *Bardez* : Porvorim, Geological Survey of India campus. *Sanguem* : Colem Caranzol, old Railway Station ; Molem Belgaum Road, old Goa. NAGARHAVELI : Sindhoni forest ; Dudhni to Bildhari forest.

Rare, probably planted.

URTICACEAE

1. Plants with stinging hairs
 2. Annual herbs ; stipules small or absent *Laportea*
 2. Perennial herbs or undershrubs ; stipules large, foliaceous *Girardinia*
1. Plants without stinging hairs
 3. Small, creeping, flaccid herbs *Pilea*
 3. Erect herbs, shrubs or small trees
 4. Leaves sub - opposite, distichous, sessile *Elatostemma*
 4. Leaves alternate, not distichous, petioled
 5. Herbs *Pouzolzia*
 5. Shrubs or trees
 6. Flowers in small heads in short dichotomous cymes *Debregeasia*
 6. Flowers in clusters on long spikes *Boehmeria*

BOEHMERIA Jacq.

Boehmeria scabrella (Roxb.) Gaud. in Bot. Freyc. Voy. 500, 1826 C. 3 : 135 ; S. 226. *Urtica scabrella* Roxb [Hort. Beng. 67, 1814 (*nom nud.*) &] Fl. Ind. 3 : 581, 1832. *Boehmeria platyphylla* Don var. *scabrella* Wedd. Mon. 365, 1856 ; FBI 5 : 578.

Fl. & Fr. : November *Ill.* : Wt. Ic. t. 691.

Loc. : GOA : *Satari* : Poda village, Valpoi ; Satrem ; Nanecha Dongar (Codal) ; Ambeachagal ; Wadicha Dongar. *Sanguem* : Barazon mine area ; Molem Avelde jungle ; Molem Belgaum Road ; Bati Sidh. *Quepem* : Budsari Goundugarha. Castle rock on way to Anmoda ; Dudhsagar.

Common.

DEBREGEASIA Gaud.

Debregeasia longifolia (Burm.) Wedd. in DC. Prodr. 16 (1) : 235, 1869 ; S. 227. *Urtica longifolia* Burm. Fl. Ind. 197, 1768. *Debregeasia velutina* Gaud. Bot. Voy. Bonite t. 90, 1844 46 ; FBI 5 : 590 ; C. 3 : 139 ; T. 2 ; 533 ; G. 2 : 971.

Fl. : November January. *Ill.* : Wt. Ic. t. 1959 ; T. f. 535.

Vern. : Lapsi (Mar.) ; Khargul (Konk.).

The species is common in the Concan and Kanara ghat areas and should possibly occur in Goa also.

ELATOSTEMMA Forst.

Elatostemma cuneatum Wt. Ic. 6 : 35 & t. 2091, 1853 ; FBI 5 : 568 ; C. 3 : 134 ; G. 2 : 963 ; S. 226.

Fl. & Fr. : August. *Ill.* : Wt. Ic. t. 2091.

Loc. : GOA : *Salcete* : Margoa, Borda village. *Sanguem* : Near Darbandora forest Chowky.

Rare, on wet places.

GIRARDINIA Gaud.

Girardinia zeylanica Decne. in Jacq. Voy. 152, 1844 ; C. 3 : 132 ; G. 2 : 960 ; S. 225. *G. heterophylla* var. *zeylanica* Decne. *l.c.* ; FBI 5 : 551. *G. heterophylla* Dalz. & Gibs. DG. 180 (*non* Decaisne).

Fl. & Fr. : October November. *Ill.* : Wt. Ic. t. 687.

Vern. : Kasti khat khulti (Konk.).

Loc. : GOA : *Bardez* : Betim ; Pilegao.

Rare, in waste areas.

LAPORTEA Gaud. *nom. cons.*

Laportea interrupta (Linn.) Chew in Gard. Bull. Singapore 19 : 200, 1965. *Urtica interrupta* Linn. Sp. Pl. 985, 1753. *Fleurya interrupta* (Linn.) Gaud. in Bot. Freyc. Voy. 497, 1826 ; FBI 5 : 548 ; DG. 180 ; C. 3 : 131 ; G. 2 : 959 ; S. 225.

Fl. & Fr. : August October. *Ill.* : Wt. Ic. t. 1975.

Loc. : GOA : *Pernem* : Chopedem near Agarvado. *Bicholim*. *Satari* ; *Palle* ; *Golauchi*. *Salcete* : Margoa harbour hills. *Sanguem* : Sanverdam railway station. DAMAN : Fort area.

Occasional as forest undergrowth and on rocky slopes.

PILEA Lindl.

Pilea microphylla (Linn.) Liebm. in Vidensk. Selsk. Skr. 5 (2) : 296, 1851 ; C. 3 : 160 ; G. 2 : 965 ; S. 227. *Parietaria microphylla* Linn. Syst. (ed. 10), 1308, 1759. *Pilea muscosa* Lindl. Coll. Bot. t. 4, 1821 ; FBI 5 : 551.

Fl. : August September.

Loc. : GOA : *Bicholim. Satari* : Valpoi, Administrator's office compound. *Marmugao* : Marmugao harbour. *Sanguem* : Sanguem area.

A succulent herb, grown as a border plant in the gardens. Rare on walls and in rock crevices.

POUZOLZIA Gaud.

Pouzolzia zeylanica (Linn.) Benn. Pl. Jav. Rar. 67, 1838 ; S. 226. Pav. 217. *Parietaria zeylanica* Linn. Sp. Pl. 1052, 1753. *Pouzolzia indica* Gaud. Bot. Freyc. Voy. 503, 1826 ; FBI 5 : 581 ; C. 3 : 137 ; G. 2 : 967.

Fl. & Fr. : August October. *Ill.* : Wt. Ic. t. 1980, f. 1, t. 2100, f. 40.

Loc. : GOA : *Pernem* : Chopora, Kaisuva fort. *Satari* : Dina rai forest ; *Satrem. Salcete* : Margoa, Borda village ; *Margoa. Canacona* : Ordofond - Tudal. *Dudhsagar. DAMAN* : Fort area.

Common on moist, rocky, gravelly soil.

CANNABINACEAE

Cult. species :

Cannabis sativa Linn. Sp. Pl. 1027, 1753 ; FBI 5 : 487 ; DG. 175 ; C. 3 : 160 ; G. 2 : 945.

Vern. : Ganja (Mar.) ; Bhang (Konk.) ; Linho canhamo (Port.)

The species is cultivated for the intoxicating drug "Bhang".

MORACEAE

- | | |
|---|-----------------|
| 1. Female flowers solitary or 2 - 3 on a peduncle ; male flowers in pedunculate heads | <i>Streblus</i> |
| 1. Flowers in globose heads or on or inside fleshy receptacle | |
| 2. Flowers on an open disc like receptacle | <i>Antiaris</i> |

- | | |
|--|-------------------|
| 2. Flowers crowded on the outside of oblong, irregularly globose receptacle | <i>Artocarpus</i> |
| 2. Flowers crowded on the inside of fleshy receptacle of which the mouth is closed by bracts | <i>Ficus</i> |

ANTIARIS Leschen.

Antiaris toxicaria (Pers.) Leschen. in Ann. Mus. Par. 16 : 478, 1810 ; FBI 5 : 537 ; DG. 179 ; C. 3 : 156 ; T. 2 : 530 ; G. 2 : 957. *Ipo toxicaria* Pers. Syn. 2 : 566, 1807.

Fl. : September October. *Fr.* : November December. *Ill.* : Wt. Ic. t. 1958 ; T. f. 534.

Vern. : Karwal (Mar.) ; Jasumdi (Konk.) ; Upas (Port.).

Loc. : GOA : *Canacona* : Angidiv.

Rare in Goa though common in adjoining areas of North Kanara in evergreen forests.

ARTOCARPUS Forst.

- | | |
|---|---|
| 1. Branchlets and leaves below glabrous ; stipules spathaceous ; fruits tubercled | <i>heterophyllus</i> |
| 1. Branchlets and leaves below pubescent or hairy ; stipules not spathaceous ; fruits spinous or smooth | |
| 2. Young parts strigosely or twany hairy ; fruits spinous, cylindric or oblong | <i>hirsutus</i> |
| 2. Young parts grey or rusty tomentose ; fruits smooth, globose | <i>gomezianus</i>
subsp. <i>zeylanicus</i> |

Artocarpus gomezianus Wall. ex Trec. ssp. *zeylanicus* Jarrett in Journ. Arn. Arb. 41 (1) : 9, 1960. *A. lakoocha* auct. non Roxb. FBI 5 : 543 ; DG. 180 ; C. 3 : 158 ; T. 2 : 529 ; G. 2 : 958.

Fl. : March April. *Fr.* : July August. *Ill.* : Wt. Ic. t. 681 ; T. f. 533.

Vern. : Otamb (Mar.) ; Womtemara (Kan.) ; Vomt (Konk.).

Loc. : GOA : *Satari* : Caranzol. *Canacona* : Nadquem ; Kadran-Nadquem.

Frequently found in the forest. Often mentioned as "*Artocarpus lakoocha* Roxb." in the various Floras. However, *Artocarpus lakoocha*

Roxb. is confined to the Eastern ghats of Peninsular India only and the common Western India species is referable to *A. gomezianus* ssp. *zeylanicus*.

Artocarpus heterophyllus Lamk. *Encycl.* 3 : 210, 1789. *Artocarpus integrifolia* auct. non Linn. f. : FBI 5 : 451 ; DG. 179 ; C. 3 : 158 ; T. 2 : 526 ; G. 2 : 957. *A. integer* mult. auct. non Merrill, 1917.

Ill. : Wt. Ic. t. 678.

Vern. : Phannas (Mar.) ; Kathal (Guj.).

Loc. : GOA : *Sanguem* : Vaidugune (Netraveli.).

The species is mostly found near the villages, indigenous in the forests of Western ghats. The syncarp is edible and the wood is used for furniture.

A. hirsutus Lam. *Encycl. Method.* 3 : 210, 1789 ; FBI 5 : 541 ; DG. 179 ; C. 3 : 157 ; T. 2 : 527 ; G. 2 : 957.

Fl. : January February. *Fr.* : April May. *Ill.* : Wt. Ic. t. 1957 ; T. f. 532.

Vern. : Amjeli (Konk.) ; Angeli (Port.) ; Halasu (Kan.).

Included in this work as this is common in areas neighbouring Goa and it should be possible to locate it in Goa also.

Cult. species :

A. incisa Linn. f. *Suppl.* 411, 1781 ; FBI 5 : 539 ; DG. 179 ; C. 3 : 159.

Ill. : Bot. Mag. t. 2869 71.

Vern. : Phiramgi phanas (Konk.) ; Frudo de pao (Port.) ; Bread fruit (Eng.).

This is a native of Pacific Islands, sometimes seen planted in the gardens.

FICUS Linn.

1. Leaves opposite, hispid or scabrid *hispid*
1. Leaves alternate
 2. Leaves scabrid or hispid
 3. Erect shrubs or trees, often epiphytic or climbing ;
leaves not polymorphous
 4. Leaves elliptic - ovate or obovate, base rounded ;
receptacles solitary, axillary *asperrima*

- 4. Leaves acute or cuneate, at base usually inequilateral, with one side more or less gibbous ; receptacles in pairs or fascicles *tinctoria* ssp. *parasitica*
var. *parasitica*
- 3. Creeping shrubs ; leaves polymorphous *heterophylla*
- 2. Leaves neither scabrid nor hispid
- 5. Leaves caudate
 - 6. Leaves narrowed at the base ; receptacles in axillary pairs, ovoid *talbotii*
 - 6. Leaves emarginate or truncate, at the base never narrowed ; receptacles in pairs or clusters on tubercles, usually in the axils of fallen leaves, depressed - globose *arnottiana*
- 5. Leaves not caudate
 - 7. Leaves pubescent or tomentose
 - 8. Leaves obtuse, elliptic or broadly ovate, base rounded, sub - cordate or slightly [narrowed, 3 - 7 ribbed ; receptacles red when ripe *benghalensis*
 - 8. Leaves short, abruptly acuminate, acute to ovate - elliptic, base rounded or emarginate, nerves 9 - 13 pairs ; receptacles orange - red when ripe *drupacea*
var. *pubescens*
 - 7. Leaves glabrous
 - 9. Petioles rarely 2.5 cm long *microcarpa*
 - 9. Petioles 2.5 cm or more long
 - 10. Receptacles sessile
 - 11. Receptacles in axillary pairs
 - 12. Basal bracts minute ; scarious ; primary nerves of leaves indistinct ; male perianth of 3 sepals ; receptacles purple when ripe *tstela*
 - 12. Basal bracts not scarious ; primary nerves of leaves distinct ; male perianth of 4 or 5 sepals ; receptacles whitish, flushed with red & dotted when ripe *virens*
 - 11. Receptacles 2 - 6 together on short tubercles *tajakela*
 - 10. Receptacles stalked
 - 13. Receptacles on short, leafless branches *racemosa*
 - 13. Receptacles axillary, solitary or in pairs *callosa*

Ficus arnottiana Miq in Ann. Mus. Lugd. Bat. 3 : 287, 1867 ; FBI 5 : 513 ; DG. 177 ; C. 3 : 149 ; T. 2 : 516 ; G. 2 : 953 ; S. 229 ; Pav. 219.

Recept. : August. *Ill.* : T. f. 524.

Vern. : Asti (Konk.).

Loc. : GOA : *Bicholim* : Nanora forest. *Salcete* : Bellai Verna plateau. *Canacona* : Butpal forest. NAGARHAVELI : Berpalm forest ; Dongarpad - Umberkoi.

Rare.

F. asperrima Roxb. Fl. Ind. 3 : 554, 1832 ; FBI 5 : 522 ; DG. 178 ; C. 3 : 153 ; T. 2 : 522 ; G. 2 : 955 ; S. 230.

Recept. : March. *Ill.* : Wt. : Ic. t. 633 ; T. f. 529.

Vern. : Kharvat (Mar.) ; Gargata (Kan.) ; Kharvamt (Konk.) ; Arvore de raspa (Port.).

Loc. : GOA : *Sanguem* : Foot of hill Patiem. *Canacona* : Pahad near Nadquem. NAGARHAVELI : Nana Randha.

Rare.

F. benghalensis Linn. Sp. Pl. 1059, 1753 ; FBI 5 : 499 ; DG. 176 ; C. 3 : 145 ; T. 2 : 507 ; G. 2 : 952 ; S. 228 ; Dangs. 50 ; Pav. 219.

Recept. : January April. *Ill.* : T. f. 518.

Vern. : Wad (Mar.) ; Al (Kan.) ; Vad (Konk.) ; Figueira de Bengala (Port.).

Loc. : GOA : *Bardez* : Porvorim Betim road.

Also planted along roadsides as an avenue tree in Goa and Nagarhaveli.

F. callosa Willd. in Mem. Acad. Berl. 102, 1798 ; FBI 5 : 516 ; C. 3 : 152 ; T. 2 : 521 ; G. 2 : 954.

Recept. : October - November. *Ill.* : King in Ann. Calc. 1 : 64, t. 84, f. V. 2 & t. 85, 1887.

Loc. : GOA : *Sanguem* : Chauswia ghat (Netravali). *Canacona* : Angidiv.

Common near the river and along roadsides.

F. drupacea Thunb. var. *pubescens* (Roth) Corner in Gard. Bull. 17 : 381, 1960. *Ficus mysorensis* Heyne ex Roth, Nov. Pl. Sp. 390, 1821 ; FBI 5 : 500 ; DG. 176 ; C. 3 : 145 ; T. 2 : 508 ; G. 2 : 952.

Recept. : May. *Ill.* : T. f. 519.

Vern. : Changal (Kan.) ; Bhurvar (Mar.) ; Dhavo vad (Konk.) ; Raizeira vidriada (Port.).

Loc. : GOA : *Sanguem* : Coleman caranzol.

Rare.

Ficus heterophylla Linn. f. Suppl. 442, 1781 ; FBI 5 : 518 ; DG. 178 ; C. 3 : 153 ; T. 2 : 521 ; G. 2 : 955.

Ill. : Wt. Ic. t. 659.

Vern. : Kharvamtivel (Mar.) ; Arvore da raspa perigosa (Port.).

Loc. : NAGARHAVELI : Carchond forest.

The species normally grows along the banks of rivers and streams.

F. hispida Linn. f. Suppl. 442, 1781 ; FBI 5 : 522 ; DG. 178 ; C. 3 : 154 ; T. 2 : 523 ; G. 2 : 956 ; S. 230 ; Dangs. 51 ; Pav. 218.

Recept. : May August. *Ill.* : T. f. 530 ; Wt. Ic. tt. 638, 641.

Vern. : Kalaumbar, Kharvoti (Mar.) ; Dhedumera (Guj.).

Loc. : GOA : *Pernem* : Tamboxim ; Chopra, Kaisuva fort. *Marmugao* : Vasco Courtallim. *Quepem* : Budsari Goundugarha. *Canacona* : Stream near Barsare Tudal. NAGARHAVELI : Jamunpada forest. DAMAN : Varacunda village.

Occasional along rocky areas.

F. microcarpa Linn. f. Suppl. 442, 1753. *F. retusa* auct. (*non*. Linn.) ; FBI 5 : 511 ; DG. 176 ; C. 3 : 146 ; T. 2 : 510 ; G. 2 : 952 ; S. 228.

Recept. : August November. *Ill.* : T. 2. f. 520.

Vern. : Pilal (Kan.) ; Dhavidekgol (Konk.) ; Figueira de Goa (Port.).

Loc. : GOA : *Bardez* : Porvorim ; Porvorim, Geological Survey of India bungalow ; Porvorim Betim road. *Canacona* : Ordofond.

Rare.

"*Ficus retusa* Linn." does not occur in India but is a native of Java. The Indian species is referable to *F. microcarpa* Linn. f. only.

F. racemosa Linn. Sp. Pl. 1060, 1753 ; Corner in Dansk Bot. Arkiv. 23 : 28, 1963. *F. glomerata* Roxb. Pl. Cor. 213, t. 123, 1798 ; FBI 5 : 535 ; DG. 178 ; C. 3 : 154 ; T. 2 : 524 ; G. 2 : 954 ; S. 230.

Recept. : March September. *Ill.* : T. f. 531.

Vern. : Umbar (Mar.) ; Rumadi (Kan.) ; Rumbad (Kank.) ; Rumbodo (Port.) ; Umardo (Guj.).

Loc. : GOA : *Satari* : Dhanve village, on river bank ; River bank near Ambechagol. *Salcete* : Verna village, along roadside. *Sanguem* : Periche Tem, Cumbari. *Quepem* : Budsari Goundugarha. NAGARHAVELI : Phalanoti river ; Dudhni to Bildhari forest ; Nana Randha ; Kherdy ; Saily.

Rare, probably planted as a roadside tree. Receptacles edible but full of insects, hence relished by monkeys and birds only.

Ficus talbotii King, Sp. Fic. 51, t. 63, fig. Q, 1888 ; FBI 5 : 512 ; C. 3 : 147 ; T. 2 : 511 ; G. 2 : 953.

Recept. : April. *Ill.* : T. f. 521.

Vern. : Atti mara (Kan.).

Loc. : GOA : *Canacona* : Ordofond Tudal.

Rare in the forest.

F. tinctoria Forst. f. subsp. *parasitica* var. *parasitica* Corner in Gard. Bull. 17 : 476, 1960. *Ficus gibbosa* Bl. var. *parasitica* (Koen.) King, Sp. Fic. 6, t. 26, f. A, 1887-89 ; FBI 5 : 497 ; C. 3 : 144 ; T. 2 : 506 ; G. 2 : 955. *F. parasitica* Koen. ex Willd. in Mem. Acad. Herol. 1798 : 102, 1801.

Recept. : October March. *Ill.* : Wt. Ic. t. 652.

Vern. : Umbar (Guj.).

Loc. : GOA : *Sanguem* : Sidh forests near Bati. NAGARHAVELI : Nana Randha ; Khanvel ; Sindhoni forest.

Rare along roadsides in open areas. Epiphytic initially, later arboreous.

F. tsiela Roxb. [Hort. Beng. 66, 1814 (*nom. nud.*) &] Fl. Ind. 3 : 549, 1832 ; FBI 5 : 515 ; DG. 177 ; C. 3 : 150 ; T. 2 : 518 ; G. 2 : 953.

Recept. : November May. *Ill.* : T. f. 526.

Vern. : Bili basri (Kan.) ; Pipri (Konk.) ; Marcegeiro (Port.).

Loc. : GOA : *Pernem* : Pelernum village. *Satari* : Caranzol Valpoi. *Bardez* : Porvorim Betim roadside.

Rare.

F. tjakela Burm. Fl. Ind. 227, 1768 ; FBI 5 : 514 ; C. 3 : 150 ; T. 2 : 518 ; G. 2 : 953.

Recept. : April. *Ill.* : T. f. 525.

Vern. : Kel (Mar.).

Loc. : GOA : *Sanguem* : Aldune (Netravali). *Canacona* : Nadquem. NAGARHAVELI : Carchond forest.

Rare, inside the forest near streams.

F. virens Ait. Hort. Kew. 3 : 451, 1789 ; S. (ed. 3), 358. *F. infectoria* Willd. *sensu* Roxb. Fl. Ind. 3 : 551, 1832 ; FBI 5 : 515 ; DG. 177 ; C. 3 :

151 ; T. 2 : 519 ; G. 2 : 953. *F. lacor* auct. non Buch. Ham. in T. L. S. 15 : 150, 1825.

Recept. : October. *Ill.* : Wt. Ic. t. 665.

Vern. : Pepri (Guj.).

Loc. : NAGARHAVELI : Berpam forest.

Rare.

Cult. species :

Ficus carica Linn. Sp. Pl. 1059, 1753 ; DG. 178 ; C. 3 : 156.

Vern. : Anjir (Mar.) ; Amjir (Konk.) ; Figos passados (Port.).

Widely cultivated. Syncarps are edible.

F. elastica Roxb. [Hort. Beng. 65, 1814 (*nom. nud.*) &] Fl. Ind. 3 : 541, 1832 ; FBI 5 : 508 ; DG. 176 ; C. 3 : 155 ; G. 2 : 956 ; S. 231.

Vern. : Rabra cho vad (Konk.) ; Figueira de caoutchuc (Port.).

The species is a native of Assam, Khasia hills, Burma and Malayan Archipelago, cultivated and sometimes grown as an ornamental tree in the gardens.

F. religiosa Linn. Sp. Pl. 1059, 1753 ; FBI 5 : 513 ; DG. 177 ; C. 3 : 149 ; T. 2 : 514 ; G. 2 : 953. S. 229 ; Dangs, 51 ; Pav. 219.

Ill. : Wt. Ic. t. 1967.

Vern. : Pipal (Mar.) ; Arati (Kan.) ; Pimpal (Konk.) ; Pimpollo (Port.).

Normally planted in the villages. Venerated by the Hindus.

STREBLUS Lour.

Streblus asper Lour. Fl. Cochinch. 2 : 615, 1790 ; FBI 5 : 489 ; DG. 175 ; C. 3 : 141 ; T. 2 : 502 ; G. 2 : 947.

Fl. : January March. *Ill.* : Wt. Ic. t. 1961 ; T. f. 516.

Vern. : Kharoti (Mar.) ; Bekar (Konk.).

Loc. : DAMAN : Cale.

The species has been collected from the areas adjoining Goa, hence it is included here for its probable growth in the Goa area also.

Cult. species :

Morus indica Linn. Sp. Pl. 986, 1753 ; FBI 5 : 492 ; DG. 175 ; C. 3 : 159 ; T. 2 : 535 ; G. 2 : 958.

Fl. : February June.

Vern. : Amoran (Konk.); Amoras (Port.); Indian Mulberry (Eng.).

Cultivated in the gardens. The fruits are edible.

CASUARINACEAE

Cult. species :

Casuarina equisetifolia J.R. & G. Forster, Char. Gen. 104, t. 52, 1776; FBI 5 : 598; DG. 181; C. 3 : 161; T. 2 : 536; G. 2 : 972; S. 232.

Fl. : September October. *Fr.* : May June.

Vern. : Sura (Mar.); Phiramgi saro (Konk.); Casuarina (Port.).

Planted in the gardens and along roadsides. The wood is used for fuel.

SALICACEAE

SALIX Linn.

Salix tetrasperma Roxb. Pl. Cor. 1 : 66, t. 97, 1795; FBI 5 : 626; DG. 181; C. 3 : 162; T. 2 : 537; G. 2 : 973; S. 232.

Fl. : October. *Ill.* : Wt. Ic. t. 1954; T. f. 536.

Vern. : Baiche (Kan.); Walung; Niranji (Konk.).

The species common along Concan and North Kanara region, is found to be growing along river banks and streams in Goa.

CERATOPHYLLACEAE

CERATOPHYLLUM Linn.

Ceratophyllum demersum Linn. Sp. Pl. 992, 1753; FBI 5 : 639; DG. 181; C. 3 : 165; G. 2 : 973; S. 232.

Fl. & Fr. : November. *Ill.* : Pflanzenf. 3 (2). f. 12; Wt. Ic. t. 1948, f. 1 4.

Vern. : Dhakto seval (Konk.).

Loc. : NAGARHAVELI : Velugaon.

Elegant aquatic, species common in tanks.

MONOCOTYLEDONS
HYDROCHARITACEAE

- | | |
|---|--------------------|
| 1. Stems branched, leafy | <i>Hydrilla</i> |
| 1. Stemless or with stolons or creeping root stock; leaves radical. | |
| 2. Leaves petiolate, broad, not grasslike; spathe winged; flowers solitary, hermaphrodite | <i>Ottelia</i> |
| 2. Leaves sessile, linear, grass like; spathe not winged; flowers dioecious, male scape many flowered | |
| 3. Perianth single; peduncle of female spathe spirally coiled | <i>Vallisneria</i> |
| 3. Perianth in two whorls; peduncle of female spathe not coiled | <i>Blyxa</i> |

BLYXA Thouars.

Blyxa echinosperma (Clarke) Hook. f. in FBI 5 : 661, 1883 ; C. 3 : 172. *Hydrotrophus echinospermus* C. B. Cl. in Journ. Linn. Soc. Bot. 14 : 8, t. 1, 1875.

Fl. & Fr. : August September.

Loc. : GOA : *Bicholim* : Bicholim area. *Canacona* : Butpal.

Gregarious near tanks and pools.

HYDRILLA Rich.

Hydrilla verticillata (Linn. f.) Royle, Ill. Bot. Himal. t. 376, 1839 ; FBI 5 : 659 ; DG. 183 ; C. 3 : 170. G. 3 : 977. *Serpicula verticillata* Linn. f. Suppl. 416, 1781.

Fl. : December. *Ill.* : Hartog in Fl. Males. ser. 1, 5 (4) : 385, f. 1, 1957 ; Aquatic angiospermes, f. 37, 1962 (CSIR Monogr. No. 3).

Common in tanks (Dalgado).

OTTELIA Pers.

Ottelia alismoides (Linn.) Pers. Syn. Pl. 1 : 400, 1805 ; FBI 5 : 662 ; DG. 183 ; C. 3 : 173 ; G. 3 : 978. *Stratiotes alismoides* Linn. Sp. Pl. 1 : 535, 1753.

Fl. : December April. *Ill.* : Hartog, l.c. 397 & 399, f. 10 & 11, 1957 ; Aquatic angiosperms, f. 43, 1962 (CSIR Monogr. No. 3).

Vern. : Olek alsem (Konk.).

Common in tanks (Dalgado).

VALLISNERIA Linn.

Vallisneria spiralis Linn. Sp. Pl. 1015, 1753 ; FBI 5 : 660 ; DG. 183 ; C. 3 : 171 ; G. 3 : 977 ; S. 233.

Fl. : April May. *Ill.* : Wt. Ill. tt. 23 & 24 ; Aquatic angiosperms, f. 39, 1962 (CSIR Mogr. No. 3).

Vern. : Saivala (Mar.) ; Seval (Konk.).

Common weed of tanks and lakes (Dalgado).

BURMANNIACEAE

BURMANNIA Linn.

Burmannia pusilla (Wall. ex Miers.) Thw. Enum. Pl. Zeyl. 325, 1864 ; FBI 5 : 665 ; S. 234. *B. coelestis* var. *pusilla* Trim. Handb. Fl. Ceyl. 4 : 131, 1898 ; C. 3 : 174. *B. coelestis* Fischer in G. 1399, 1928 (*non* Don) ; DG. 183.

Fl. : August October.

Loc. : GOA : *Pernem* : Amberem near Pernem. *Satari* : Valpoi ; Deosali, Caranzol ; Caranzol. *Curchinim*. *Sanguem* : Patiem forest ; Alduna, Verlem ; Talauli ; Patrem ; near Anvaldem (Molem) ; Bavanbunda, Molem - Belgaum Road. *Quepem* ; Bali.

Occasional in moist palces amongst grasses.

ORCHIDACEAE

1. Terrestrial or saprophytic herbs

2. Leaves not plicate, leaves and flowers appearing together ; anthers affixed to column by a broad base

3. Flowers large, about 7.5 cm across, white, showy

Platanthera

3. Flowers small not exceeding 3 cm across ; flowers greenish - white or yellow

- 4. Lip spurred, spur projecting beyond the lateral sepals
 - 5. Sepals subequal, more or less connivent ; stigmatic surface in the form of small swellings on the edge of lips *Peristylis*
 - 5. Sepals unequal, the lateral spreading or reflexed ; stigmatic lobes standing out as stalked appendages *Habenaria*
- 4. Lip not spurred, often saccate at the base
 - 6. Leaves and flowers not appearing together ; leaves petiolate, orbicular *Nervilia*
 - 6. Leaves and flowers appearing together ; leaves sessile, ovate or elliptic - lanceolate, acute, amplexicaul or sheathing
 - 7. Lip with basal auricles ; column very short, entire *Malaxis*
 - 7. Lip without basal auricles ; column long, margined or winged towards the apex *Liparis*
- 2. Leaves plicate, appearing much before flowers ; anthers separable from the column *Eulophia*
- 3. Epiphytic herbs
 - 8. Plants with distinct pseudobulbs
 - 9. Pseudobulbs flattened, discoid, rounded *Eria*
 - 9. Pseudobulbs elongate, ovoid or conical
 - 10. Pseudobulb of a single node
 - 11. Pseudobulbs conical - ovoid, dark green or brownish - purple with broad grooves along its length ; leaf apex acute ; scape 20 - 45 cm long *Pholidota*
 - 11. Pseudobulbs oblong, yellowish - green, 3 - 5 angled ; leaf apex obtuse or emarginate ; scape upto 12 cm long *Bulbophyllum*
 - 10. Pseudobulbs 2 or more noded
 - 12. Leaves thick, coriaceous ; inflorescence lateral ; lip with calli or keels at base *Cymbidium*
 - 12. Leaves membranous ; inflorescence terminal or lateral ; lip without calli or keels *Dendrobium*
 - 8. Plants without pseudobulbs
 - 13. Plants without a distinct stem ; leaves radical *Oberonia*
 - 13. Plants with a distinct stem ; leaves cauline
 - 14. Leaves terete ; scape upto 2 cm long, stout, woody *Luisia*
 - 14. Leaves flat, scape longer, herbaceous

15. Leaf apex bilobed, lobes unequal or sub-equal, rounded or subacute
16. Sepals and petals yellow with unequal, horizontal, crimson bars; lip 3.5 - 7.5 mm long, column without a foot *Acampe*
16. Sepals and petals pale - pink or pinkish-mauve ; lip 10 - 28 mm long, column with a stout foot *Aerides*
- 15 Leaf apex irregularly toothed with 1 - 3 sharp teeth
17. Flowers whitish or pale pink ; lip scarcely lobed ; spur laterally compressed, truncate at apex *Rhynchostylis*
17. Flowers variously coloured but not white or pale pink ; lip 3 - lobed ; spur short, oblong or conical, obtuse at apex *Vanda*

ACAMPE Lindl.

Acampe praemorsa (Roxb.) Blatt. & McC. in Journ. Bomb. nat. Hist. Soc. 35 : 495, 1932. *Epidendrum praemorsum* Roxb. Pl. Cor. 1 : 34, t. 43, 1795. *Acampe wightiana* Lindl. Fol. Orch. Acampe 2, 1853 ; C. 3 : 209 ; G. 3 : 1011. *Saccolobium wightianum* Hook. f. in FBI 6 : 62, 1890 ; DG. 185.

Fl. : September. *Ill.* : Wt. Ic. t. 1670 ; Sant. & Kapad. Orch. Bombay, t. 54, 1966.

Vern. : Kanphodem (Konk.).

Loc. : GOA : Bardez : Porvorim village forest. NAGARHAVELI : Dudeni. DAMAN : Dabel.

Epiphytic on *Mangifera* and *Strychnos*.

AERIDES Lour.

Flowers almost inodorous ; lateral sepals obovate ; petals rose - coloured, speckled with dots of a deeper color ; middle of lip quadrate - oblong *maculosum*

Flowers sweetly fragrant ; lateral sepals obliquely oblong ; petals pinkish - white, not speckled ; midlobe of lip ovate *crispum*

Aerides crispum Lindl. [in Wall. Cat. 7319, 1832, (*nom. nud.*) &] Gen. Sp. Orch., 239, 1833, cum descr. ; FBI 6 : 45 ; C. 3 : 203 ; S. 238.

Fl. : May June. *Fr.* : June September. *Ill.* : Wt. Ic. t. 1677 bis.

Loc. : NAGARHAVELI : Chispana forest.

Rare.

Aerides maculosum Lindl. in Bot. Reg. 1845, t. 58. FBI 6 ; 45 ; C. 3 : 203. Sant.

Fl. : May. *Ill.* : Wt. Ic. t. 1674 ; Sant. & Kapad. Orch. Bombay, t. 30. 1966.

Loc. : GOA : *Sanguem* ; Molem

BULBOPHYLLUM Thou.

Bulbophyllum neilgherrense Wt. Ic. Pl. Ind. Or. 5(1) : 6, t. 1650, 1852 ; FBI 5 : 716 ; C. 3 : 189 ; G. 3 : 992.

Fl. : December. *Ill.* : Sant. & Kapad. Orch. Bombay, t. 46, 1966.

Loc. : GOA : *Canacona* : Tudal Ordofond, near a stream ; Tudal village near a stream. Epiphytic on *Careya arborea* and *Syzygium* sp.

CYMBIDIUM Sw.

Cymbidium aloifolium Sw. in Nov. Act. Sc. Upsal. 6 : 73, 1799 ; FBI 6 : 11 ; DG. 185 ; C. 3 : 199 ; G. 3 : 1004.

Fl. : April May. *Ill.* : Wt. Ic. t. 1687 88.

Vern. : Sonu (Konk.).

Loc. : GOA : *Sanguem* : Chausuria ghods (Netraveli) ; Perichetem (Cumbari).

DENDROBIUM Sw.

1. Rhizome not distinct ; leaves several, bifarious ; flowers many, in racemes or in pairs, rarely solitary
2. Flowers cream coloured, about 1.5 cm across *ovatum*
2. Flowers pure white or tinged with pink or rosy-pink, about 2.5 - 4 cm across *barbatulum*
1. Rhizome distinct, creeping ; leaf one from top of pseudobulb ; flowers 1 or 2, borne on top of the pseudobulb *macraei*

Dendrobium barbatulum Lindl. Gen. Sp. Orch. 84, 1830 ; FBI 5 : 719 ; C. 3 : 184 ; G. 3 : 990 ; S. 235.

Fl. : November. *Ill.* : Sant. & Kapad. Orch. Bombay, t. 22, 1966.

Vern. : Jothia lasan (Mar.).

Loc. : GOA : Colem ghat area.

Rare on *Zizyphus* sp.

Dendrobium macraei Lindl. Gen. Sp. Orch. 75, 1830, *et* in Journ. Linn. Soc. 3 : 6, 1859 ; FBI 5 : 714 ; DG. 184 ; C. 3 : 182.

Fl. : June - August. *Ill.* : Sant. & Kapad. Orch. Bombay, t. 16, 1966.

Vern. : Joivansi (Mar.).

Common in Ramghat and other areas adjoining Goa. Though I have not collected it from Goa, it could be located in the area.

D. ovatum (Willd.) Kranz. in Pflanzent. 45 : 71, 1910 ; G. 3 : 990 ; S. 235. *Cymbidium ovatum* Willd. Sp. Pl. 4 : 101, 1805. *Dendrobium chlorops* Lindl. Bot. Reg. Misc. 44, 1844 ; FBI 5 : 719 ; DG. 184 ; C. 3 : 184.

Fl. : January. *Ill.* : Sant. & Kapad. Orch. Bombay, t. 21, 1966 ; Wt. Ic. t. 910 (as *D. barbatulum non* Lindl.).

Loc. : NAGARHAVELI : Khuntly forest.

Apparently endemic along Western India and it probably occurs in Goa also as it is common in the adjoining areas.

ERIA Lindl.

Eria microchilos Lindl. in Journ. Linn. Soc. 3 : 47, 1858 (nom et syn. tantum, non descr.) ; S. 236. *E. daltzei* Lindl. in Journ. Linn. Soc. 3 : 47, 1858 ; FBI 5 : 789 ; C. 3 : 194 (Omnes descr. tantum, non nom.).

Fl. : July August. *Fr.* : August September. *Ill.* : Sant. & Kapad. Orch. Bombay, t. 36, 1966.

Loc. : GOA : Pernem : Amberem. Satari : Nagargao. Sanguem : Molem.

Rare on tree trunk.

EULOPHIA R. Br.

Eulophia nuda Lindl. (in Wall. Cat. 7371, 1832, nom. nud. &) Gen. Sp. Orch. 180, 1883 ; FBI 6 : 5 ; DG. 184 ; C. 3 : 197 ; G. 3 : 1003.

Fl. : June. *Ill.* : Wt. Ic. t. 1690.

Vern. : Ambarkand (Mar.).

Common in North Kanara and Peninsular India and could be located in Goa also.

HABENARIA Willd.

- 1. Petals 2 - partite
 - 2. Leaves several, clustered about middle of stem flowers brownish-green ; scentless *multicaudata*
 - 2. Leaves 1 - 2 radical ; flowers white, faintly scented *grandifloriformis*
- 1. Petals entire
 - 3. Leaves 2, rarely more, flat on ground, opposite or sub-opposite, coriaceous, broadly ovate to suborbicular ; flowers greenish white ; petals narrow linear oblong *diphylla*
 - 3. Leaves radical or cauline, not flat on ground
 - 4. Flowers white ; lateral lobes of lip broader than midlobe, obliquely truncate—denticulate at apex
 - 5. Ovary sessile or subsessile ; lip 7 - 12 mm long ; stigmatic processes somewhat oblong, white *plantaginea*
 - 5. Ovary on long pedicel ; lip 14 - 29 mm long ; stigmatic processes clavate, green *longicorniculata*
 - 4. Flowers white, yellow or green ; lateral lobes of lip not broader than midlobe linear oblong to linear filiform
 - 6. Stem bafy upwards ; flowers white, then yellow, drying black, secund or subsecund *heyneana*
 - 6. Leaves radical, clustered at base of stem ; flowers yellow, not secund *marginata*

Habenaria diphylla Dalz. in Hook. Journ. Bot. 5(2) : 262, 1850; FBI 6 : 151 ; C. 3. 227 ; G. 1028.

Loc. : GOA : *Satari* : Ambeachagol ; Moira forest. *Sanguem* : Near Anvaldem.

H. grandifloriformis Blatt. & McCann, in Journ. Bomb. nat. Hist. Soc. 36(2) : 17, 1932 ; charac. emend. Sant. & Kapad. Orch. Bombay 17, t. 1, ff. 2 2, 1966 ; S. 240.

Fl. : September. *Ill.* : Sant. & Kapad. *l.c.*

Loc. : GOA : *Satari* : Maloli forest.

Rare along grassy slopes and one of the earliest Habenarias to bloom during monsoon.

H. heyneana Lindl. Gen. & Sp. Orchid. 320, 1835 ; FBI 6 : 148 ; C. 3 : 225 ; G. 3 : 1028.

Fl. : August September.

Loc. : GOA : *Sanguem* : Ravanacha Dongar ; Verlem. Castle rock on way to Anmode.

Halenaria longicorniculata Graham, Cat. Bombay Pl. 202, 1839 ; S. 270 (3rd ed.). *H. longicalcarata* A. Rich. in Ann. Sci. Nat. Ser. 2, 15 : 71, t. 3 B, 1841 ; FBI 6 : 141 ; C. 3 : 223 ; G. 3 : 1027.

Fl. & Fr. : September - October. *Ill.* : Sant. & Kapad. Orch. Bombay, 29, t. 1, f. 1-1 ; Wt. Ic. t. 925.

Loc. : GOA : *Sanguem* : Dudhsagar ; Castle rock on way to Anmode.

H. marginata Coleb. in Hook. Exot. Bot. t. 136, 1825 ; FBI 6 : 150 ; C. 3 : 226 ; G. 3 : 1028 ; S. 243.

Fl. : September - October. : *Ill.* : Sant. & Kapad. Orch. Bombay, t. 5, f. 17, 1966.

Loc. : GOA : *Bicholim* : Usgao. *Satari* : Koparde ; Waghori ; Cumbari ; Ivorem ; Buzuruco ; Valpoi. *Sanguem* : Velemol, Cumbari ; Chorandem ; Molem ; Chausuria ghats (Netraveli). *Canacona* : Ordofond. DADRA. DAMAN : Dundorta.

Common on grassy slopes.

H. multicaudata Sedgw. in Rec. bot. Surv. India 6 : 352, 1919. G. 3 : 1026.

Fl. : August - September.

Loc. : GOA : *Sanguem* : Molem - Belgaum Road.

H. plantaginea Lindl. Gen. Sp. Orch. 323, 1835 ; FBI 6 : 141 ; C. 3 : 224 ; G. 3 : 1027 ; S. 241.

Fl. : October. *Ill.* : Wt. Ic. t. 1710 ; Sant. & Kapad. Orch. Bombay, t. 6, f. 25, 1966.

Loc. : GOA : *Salcete* : Margoa. *Sanguem* : Thalpenool, Cumbari ; Nandrona, near Molem.

Rare in moist, shady areas.

LIPARIS L.C. Rich.

Leaves erect, shortly petioled, alternate ; flowers pale yellow, tinged with purple ; bracts erect

nervosa

Leaves flat on ground, almost sessile and opposite ; flowers green, often tinged with yellow ; bracts deflexed

prazeri

Liparis nervosa (Sw.) Lindl. Gen. Sp. Orchid. 26, 1830 ; C. 3 : 180. *Melaxis nervosa* Sw. in Vet. Akad. Nya Handl. Stockh. 21 : 235, 1800. *Liparis paradoxa* Reichb. f. in Walp. Ann. 6 : 218, 1861 ; FBI 5 : 697 ; DG. 184.

Fl. & Fr. : July September. *Ill.* : Sant. & Kapad. Orch. Bombay, t. 42, 1966.

Vern. : Ran keli (Konk.).

I have not collected the species from Goa but it is common in the Concan and North Kanara areas and it should be possible to locate it in Goa also.

Liparis prazeri King & Prantl, in Journ. As. Soc. Beng. II, 66 : 582, 1897. *L. flavo-viridis* Blatt. & McC. in Jour. Bomb. nat. Hist. Soc. 35 : 360, f. 6, 1931.

Fl. & Fr. : August. *Ill.* : Sant. & Kapad. Orch. Bombay, t. 41, 1966.

Loc. : GOA : Canacona : Ordofond Butpal.

Rare, only 3 plants could be seen at one spot. In India, the distribution is confined to North Kanara and Goa only.

LUISIA Gaud.

Luisia tenuifolia Bl. var. *evangelinae* (Blatt. & McC.) Sant. & Kapad. in Journ. Bomb. nat. Hist. Soc. 59 : 829, 1922. *L. evangelinae* Blatt. & McC. in Journ. Bomb. nat. Hist. Soc. 35 : 493, t. 11, 1932. *L. tenuifolia* Hook. f. FBI 6 : 24, 1890 (*partim*) ; DG. 185 ; C. 3 : 205.

Fl. : March April. *Ill.* : Wt. Ic. t. 911 (excluding text).

Vern. : Amb-keli (Konk.).

According to Santapau & Kapadia the species mentioned as *Luisia tenuifolia* by Cooke from Bombay State is not the true *L. tenuifolia* Bl., but *L. evangelinae* Blatt. & McC. which they have reduced to a variety under *L. tenuifolia*. Possibly Dalgado's reference to *L. tenuifolia* pertains to var. *evangelinae* only. I have not collected the species from Goa.

MALAXIS Soland. ex Sw.

Malaxis versicolor (Lindl.) Sant. & Kapad. in Journ. Bomb. nat. Hist. Soc. 58 : 347, 1961. *Microstylis versicolor* Lindl. Gen. Sp. Orchid. 21, 1830 (*non* Wight 1844-45) ; C. 3 : 179 ; G. 3 : 985. *Microstylis rheedii* Wight Icon. 3(2) : 9, t. 902, 1844-45 ; FBI 5 : 690 ; DG. 184.

Fl. : June August. *Ill.* : Wt. Ic. t. 902 ; Sant. & Kapad. Orch. Bombay, t. 33, 1966.

Vern. : Kali (Konk.).

Common in areas adjoining Goa, hence included in this work.

NERVILIA Comm. ex Gaud.

Nervilia aragoana Gaud. in Bot. Voy. Freycinet t. 36, 1826 ; G. 3 : 1020. *Pogonia flabelliformis* Lindl. Gen. Sp. Orch. 415, 1840 ; FBI 6 : 121.

Fl. : June. *Ill.* : Wt. Ic. t. 1720 (as *Pogonia carinata*).

Loc. : GOA : *Ilhas* : Sukur village forest. *Canacona* : Near Ordofond forest office.

Rare on the slopes.

OBERONIA Lindl.

Oberonia brunoniana Wt. Ic. 5(1) : 3, t. 1622, 1851 ; FBI 5 : 681 ; C. 3 : 178 ; Sant. & Kapad. Bomb. nat. Hist. Soc. 57(2) : 263.

Fl. : February March. *Ill.* : Sant. & Kapad. Orch. Bombay, t. 15 A'-B' 1966.

Loc. : NAGARHAVELI : Chispana area.

Rare, in the deciduous forest.

PERISTYLIS Blume

Spur as long as or longer than sepals, linear subclavate

densus

Spur much shorter than sepals, saccate, globose

plantagineus

Peristylis densus (Lindl.) Sant. & Kapad. in Orch. Bombay 46, t. 9A-B, 1966. *Habenaria stenostachya* Benth. Fl. Hongk. 362, 1861 ; FBI 6 : 46 ; G. 1474.

Fl. & Fr. : August October. *Ill.* : Wt. Ic. t. 1702.

Loc. : GOA : *Sanguem* : Ravanacha Dongar ; Verlem.

P. plantagineus Lindl. Gen. Sp. Orch. 300, 1835 ; C. 3 : 216 ; G. 3 : 1030. *Habenaria wightii* Trimen, Cat. Ceyl. Pl. 91, 1885 ; FBI 6 : 162.

Fl. & Fr. : August October. *Ill.* : Wt. Ic. t. 921 ; Sant. & Kapad. Orch. Bombay, t. 10, A B, 1966.

Loc. : GOA : *Satari* : Valpoi and surroundings ; Codal. *Bardez* : Porvorim village. *Sanguem* : Tantencol. *Canacona* : Ordofond - Butpal forest.

Occasional, along forest clearings.

PHOLIDOTA Lindl.

Pholidota imbricata (Roxb.) Lindl. in Hook. Exot. Fl. Sub. t. 138, 1825 ; FBI 5 : 845 ; DG. 184 ; C. 3 : 190 ; G. 3 : 1000. *Cymbidium imbricatum* Roxb. [Hort. Beng. 63, 1814 (*nom. nud.*) &] Fl. Ind. 3 : 460, 1832.

Fl. : June July. *Ill.* : Wt. Ic. t. 907 ; Sant. & Kapad. Orch. Bombay, t. 40, 1966.

Vern. : Tolasi (Konk.).

Loc. : GOA : *Sanguem* : Pericha Dongar ; Cumbari.

Common species of the Western Ghats and it could be located in Goa area also.

PLATANThERA L.C. Rich.

Platanthera susannae (Linn.) Lindl. Gen. Sp. Orch. 259, 1835 ; C. 3 : 217 ; G. 3 : 1031 ; S. 239. *Orchis susannae* Linn. Sp. Pl. 939, 1753 ; *Habenaria susannae* R. Br. Prodr. 312, 1810 ; FBI 6 : 137.

Fl. : September October. *Ill.* : Wt. Ic. t. 920 ; Sant. & Kapad. Orch. Bombay, t. 7 & 8, 1966.

Loc. : GOA : *Satari* : Valpoi - Codal Road ; Ambeachagol. *Salcete* : Margoa. *Sanguem* : Dudhsagar ; Modka Bunglow (Molem Belgaum). *Canacona* : Butpal Nadquem. NAGARHAVELI : Khanvel, near Chaura village forest. Dongarpad - Umberkoi.

Occasional on rocky slopes along forest edges. The showy flowers are the largest amongst the wild orchids and the plant is worthy of cultivation.

RHYNCOSTYLIS Bl.

Rhynchostylis retusa (Linn.) Bl. Bijdr. 285, t. 49, 1825 ; FBI 6 : 32 ; DG. 185 ; C. 3 : 202 ; G. 3 : 1007 ; S. 237. *Epidendrum retusum* Linn. Sp. Pl. 953, 1753.

Fl. : May June. *Ill.* : Wt. Ic. t. 1745-46.

Vern. : Panas koli (Konk.) ; Foxtail orchid (Eng.).

Very common along the Western ghats and it should be possible to locate it in Goa also.

VANDA R. Br.

Vanda tessellata (Roxb.) Hook. ex G. Don in Lond. Hort. Brit. 372, 1830 ; G. 3 : 1010. *Epidendrum tessellatum* Roxb. Pl. Cor. 1 : 34, t. 42, 1795. *Vanda roxburghii* R. Br. in Bot. Reg. 6 : t. 506, 1820 ; FBI 6 : 52 ; DG. 185 ; C. 3 : 208.

Fl. : June - July. *Ill.* : Wt. Ic. t. 916 ; Sant. & Kapad. Orch. Bombay, t. 51, 1966.

Vern. : Rasana (Konk.).

A common epiphytic with reddish purple sepals and petals and bluish - purple lip. It has been included for Goa area as it is abundant along Western ghats.

ZINGIBERACEAE

- | | |
|---|-------------------|
| 1. Ovary 1 - celled ; parietal placentation | <i>Globba</i> |
| 1. Ovary 3 - celled ; axile placentation | |
| 2. Lateral staminodes broad | |
| 3. Spike crowned by a coma ; corolla tube funnel - shaped ; connective of anthers spurred at the base | <i>Curcuma</i> |
| 3. Spikes not crowned by a coma ; corolla tube long and slender ; connective of anthers not spurred | |
| 4. Filament short ; connective broad, crested | <i>Kaempferia</i> |
| 4. Filament long ; connective broad, not crested | <i>Hitchenia</i> |
| 2. Lateral staminodes small and narrow or absent | |
| 5. Spikes usually at the top of the leafy stem ; bracts bright red ; filaments forming with the produced connective an oblong, petaloid process | <i>Costus</i> |
| 5. Spikes usually produced direct from the root stock ; bracts not red ; filament short ; connective dilated and crested or 2 - lobed, not produced | <i>Zingiber</i> |

COSTUS Linn.

Costus speciosus (Koenig) Smith in Trans. Linn. Soc. 1 : 249, 1800 ; FBI 6 : 249 ; DG. 188 ; C. 3 : 243 ; G. 3 : 1041 ; S. 247. *Banksia speciosa* Koenig in Retz. Obs. 3 : 75, 1783.

Fl. & Fr. : August - November. *Ill.* : Wt. Ic. t. 2014.

Vern. : Koshi (Mar.).

Loc. : GOA : *Bicholim* : Collguirem. *Satari* : Moduka bungla jungle ; Ambechagol ; Satrem ; Ivorem Buzuruce ; Onda-Molem ; Quepem Sanguem. *Ilhas* : Chimbel. *Salcete* : Verna village along road side. *Sanguem* : Barazen mine area ; Molem Belgaum Road ; Dudhsagar ; Bati Sidh ; Talauli ; Patrem ; near Anvaldam (Molem) ; Viliyan forest. *Quepem* : Budsari Goundugarha. *Canacona* : Ordofond Butpal ; Ordofond near river. NAGARHAVELI : Saily forest ; Khanvel ; Chispana ; Dudhui to Bildhari forests ; Umberkoi.

Common along forest edges on moist, shady slopes.

CURCUMA Linn.

1. Flowering spike lateral and appearing usually before the leaves ; flowers pink or yellow
2. Small plants ; root stock small, tubers white inside ; coma dense, pink ; flowers bright yellow *neilgherrensis*
2. Large plants ; root stock large of palmately branched tubers, yellow inside ; coma more or less red or pink ; flowers pink ; lip yellow *aromatica*
1. Flowering spike in the centre of previously formed tuft of leaves ; flowers purple *decipiens*

Curcuma aromatica Salisb. Parad. Lond. t. 96, 1805 ; FBI 6 : 210 ; DG. 186 ; C. 3 : 236 ; G. 3 : 1036.

Fl. : May. *Ill.* : Wt. Ic. t. 2005.

Vern. : Ran-haldi (Mar.) ; Ambe-halad (Konk.) ; Zedoaria amarella (Port.).

Common in moist, shady places, sometimes cultivated. The tubers are used medicinally. Dalgado records it for Goa.

C. decipiens Dalz. in Kew Journ. Bot. 2 : 144, 1850 ; FBI 6 : 215 ; C. 3 : 237 ; G. 3 : 1036.

Fl. : August - October.

Loc. : GOA : *Pernem* : Pollem. *Satari* : Codal forest area ; Nanecha Dongar ; Satrem ; Ambechagol ; Wadicha Dongar ; Caranzol ; Nagargae ; Valpoi. *Salcete* : Raiyi village hills. Nuven hills, *Sanguem* : near plantation ; Nandrona near Molem ; Colomba. *Canacona* : Canacona-Margoa ; Potiem forests ; Butpal Nadquem. Moira forest. NAGARHAVELI : Saily forest.

Common on the edge of the hill slope as forest undergrowth.

C. neilgherrensis Wt. Ic. 6 : 16, t. 2006, 1853 ; FBI 6 : 210 ; DG. 186 ; C. 3 : 235 ; G. 3 : 1036.

Vern. : Kachar (Konk.); Araruta silvestre on da India (Port.); East Indian arrow-root (Eng.).

The species is very common along grassy slopes, meadows, open forest areas etc. throughout the Western ghats and is bound to occur in Goa also.

Cult. species :

C. longa Linn. Sp. Pl. 2, 1753 ; FBI 6 : 214 ; DG. 187 ; C. 3 : 238 ; G. 3 : 1086 ; Burt in Notes RBG. Edin. 35(2) : 212, 1977.

Vern. : Haldi (Mar.); Arishina (Kan.); Halad (Konk.); Acafrao da India (Port.); Turmeric (Eng.).

Cultivated for turmeric obtained from the tubers. The nomenclature of the taxon has been further clarified by B.L. Burt. (*l.c.*). *C. domestica* Valet (1918) is only a synonym.

C. zedoaria (Christm.) Roscoe in Trans. Linn. Soc. 8 : 354, 1807 et Monandr, Pl. Scitam. t. 109, 1825 ; FBI 6 : 210 ; DG. 186 ; C. 3 : 328 ; G. 3 : 1036 ; Burt in Gard. Bull. 30 : 61, 1977. *Amomum zedoaria* Christm. in Christm. & Panzer, Linn. Pflanzen Syst. 5 : 12, 1779.

Vern. : Kachora (Mar.); Kasturi arishina (Kan.); Ambe halad (Konk.); Zedoania amarella (Port.).

Cultivated.

Tubers used in indigenous medicine. Burt (*l.c.*) has recently clarified the nomenclature of the species.

GLOBBA Linn.

Globba bulbifera Roxb. in As. Res. 11 : 358, 1810 ; FBI 6 : 206 ; C. 3 : 230 ; G. 3 : 1035.

Fl. : November. *Ill.* : Wt. Ic. t. 2001.

Loc. : GOA : *Canacona*.

Rare.

Flowers are often replaced by bulbils. The species is common along Concan and North Kanara areas and hence is included here.

HITCHENIA Wall.

Hitchenia caulina (Graham) Baker in Hook. f. FBI 6 : 224, 1890 ; DG. 187 ; C. 3 : 233. *Curcuma caulina* Grah. Cat. Bomb. 210, 1839.

Fl. : August - October.

Vern. : Chava (Mar.) ; *Ill.* : Lisboa Journ. Bomb. nat. Hist. Soc. 2 140, t. opp. p. 140.

Included on the authority of Dalgado.

It yields arrow root of commerce and hence is widely cultivated.

KAEMPFERIA Linn.

Kaempferia galanga Linn. Sp. Pl. 2, 1753 ; FBI 6 : 219 ; DG. 187 ; C. 3 : 231 ; G. 3 : 1037.

Fl. : June - July. *Ill.* : Wt. Ic. t. 899.

Vern. : Chanda mula (Mar.) ; Kapur kacheri (Konk.).

Tubers are used in medicine. Possibly cultivated (Dalgado).

Cult. species :

K. rotunda Linn. Sp. Pl. 3, 1753 ; FBI 6 : 222 ; DG. 187 ; C. 3 : 233 ; G. 3 : 1037.

Fl. : April. *Ill.* : Wt. Ic. t. 2029.

Vern. : Bhui Champa (Mar.) ; Bhummy champo (Konk.)

Often cultivated in the gardens.

ZINGIBER Adans.

- | | |
|--|----------------------|
| 1. Leaves glabrous or nearly so beneath ; bracts green | <i>zerumbet</i> |
| 1. Leaves pubescent beneath ; bracts reddish | |
| 2. Lip yellowish - white, marked with purple lines ; side lobes of the lip small ; capsule ellipsoid | <i>macrostachyum</i> |
| 2. Lip yellowish - white without purple lines ; side lobes of the lip small ; capsule subglobose | <i>cassumar</i> |

Zingiber cassumar Roxb. in Asiat. Res. 11 : 347, t. 5, 1810 ; FBI 6 : 248 ; DG ; 188 ; C. 3 : 242 ; G. 3 : 1041.

Fl. : July August.

Vern. : Malabari - halad (Mar.) ; Agalesunthi (Kan.) ; Malbari - halad (Konk.).

The species is cultivated and also runs wild. Included on the authority of Dalgado.

Zingiber macrostachyum Dalz. in Kew Journ. Bot. 4 : 342, 1852 ; FBI 6 : 247 ; C. 3 : 241 ; G. 3 : 1041 ; S. 246.

Fl. : October.

Loc. : GOA : *Satari* : Nagargao. *Sanguem* : Moiem Belgaum Rood.

Rare along forest edges.

Z. zerumbet (Linn.) Roscoe ex Smith, Exot. Bot. 2 : 105, t. 112, 1805 ; FBI 6 : 247 ; DG. 188 ; C. 3 : 241 ; G. 3 : 1040. *Amomum zerumbet* Linn. Sp. Pl. 1 : 1, 1753.

Fl. : June July. *Ill.* : Wt. Ic. t. 2003.

Vern. : Ran alem (Konk.) ; Zerumbete (Port.).

Common at Concan and North Kanara areas. Dalgado also records it, hence included here. Often cultivated as well.

Cult. species :

Z. officinale Roscoe in Trans. Linn. Soc. 8 : 348, 1807 ; FBI 6 : 246 ; DG. 187 ; C. 3 : 242 ; G. 3 : 1040.

Vern. : Ale (Mar.) ; Alla (Kan.) ; Alem (Konk.) ; Gingibre (Port.) ; Zingiber (Eng.).

Cultivated. The rhizomes are used in medicine and pickled.

CANNACEAE

Cult. species :

Canna indica Linn. Sp. Pl. 1, 1753 ; FBI 6 : 260 ; DG. 189 ; C. 3 251 ; G. 3 : 1045 ; S. 247.

Vern. : Rankeli (Konk.) ; Bengaleira (Port.).

Cultivated for its showy flowers which are bright red, yellow or variegated.

MUSACEAE

ENSETE Horan.

Ensete superbum (Roxb.) Choeman in Kew Bull. 1947 ; 100, 1948 ; S. 248. *Musa superba* Roxb. [Hort. Beng. 19, 1814 (*nom. nud.*) &] Fl. Ind. 2 : 489, 1824 ; FBI 6 ; 261 ; C. 3 : 247 ; G. 3 : 1046.

Fl. : September October. *Ill.* : Wt. Ic. tt. 2017, 2018.

Loc. : NAGARHAVELI : Dalara forest.

Rare as forest undergrowth.

The seeds are reportedly efficaceous against small-pox. It should be possible to locate the species in Goa as it is very common in adjoining areas along the Western ghats.

BROMELIACEAE

Cult. species :

Ananas comosus (Linn.) Merr. Interpr. Herb. Amb. 133; 1917 ; S. 248. *Bromelia camosa* Linn. in Stickman Herb. Amb. 21, 1754. *Ananas sativus* Schult. f. Syst. 7 : 1283, 1830 ; DG. 190 ; C. 3 : 251 ; G. 3 : 1046.

Vern. : Ananas (Mar.) ; Ananasu hannu (Kan.) ; Ananes (Konk.) ; Pine apple (Eng.) ; Ananazeiro (Port.).

The species is a native of Tropical America ; often cultivated.

HAEMODORACEAE

OPHIPOGON Ker - Gawl

Ophiopogon intermedius Don Prodr. Fl. Nepal 48, 1825 ; FBI 6 : 269 ; C. 3 : 252 ; G. 3 : 1048.

Loc. : GOA. : *Sanguem* : Madka Banglow.

HYPOXIDACEAE

CURCULIGO Gaertn.

Curculigo orchoides Gaertn. Fruct. 1 : 63, t. 13, 1788 ; FBI 6 : 279 ; DG. 192 ; C. 3 : 255 ; G. 3 : 1050 ; S. 248 ; Dangs. 53.

Fl. : August - November. *Ill.* : Wt. Ic. t. 2043, f. 1 & 2 (as *Curculigo malabarica* Wt. & *C. brevifolia* Dryand.).

Vern. : Kali musali (Mar.) ; Masalkamdo (Konk.).

Loc. : GOA : *Bicholim* : Colguirem. *Satari* : Sukad forest near Maloli ; Maloli forests. *Marmugao* : Nuvem hills, Varne plateau. *Sanguem* : Sanguem forest ; Cumbari ; near Anvaldem, Molem. *Canacona* : Butpal - Nadquem.

Common on moist, shady areas in open grass fields and as forest undergrowth.

AMARYLLIDACEAE

Filaments attached to the perianth lobes but not connate	<i>Crinum</i>
Filaments united towards their base by an intervening petaloid membrane	<i>Pancratium</i>

CRINUM Linn.

Perianth erect, saucer - shaped, lobes linear ; stamens spreading	<i>asiaticum</i>
Perianth funnel - shaped, tube curved, lobes oblong - lanceolate ; stament declinates	<i>latifolium</i>

Crinum asiaticum Linn. Sp. Pl. 292, 1753 ; FBI 6 : 280 ; DG. 192 ; C. 3 : 256 ; G. 3 : 1051 ; S. 249 ; V. 104.

Fl. : May July. *Ill.* : Wt. Ic. tt. 2021 - 22.

Vern. : Nagdaun (Mar.) ; Nagdavam (Konk.).

Sometimes cultivated in the gardens also. Dalgado records it for Goa.

C. latifolium Linn. Sp. Pl. 291, 1753 ; FBI 6 : 283 ; DG. 192 ; C. 3 : 258 ; G. 3 : 1051 ; S. 249.

Fl. : May June. *Ill.* : Wt. Ic. t. 2019 20.

Vern. : Golkando (Konk.).

Loc. : NAGARHAVELI : Dudhui to Bildhari forest.

Occasional along the river banks in Goa (Dalgado).

PANCRATIUM Linn.

Pancratium triflorum Roxb. Fl. Ind. 2 : 126, 1832 ; FBI 6 : 285 ; C. 3 : 259 ; G. 3 : 1051.

Fl. : & *Fr.* : May - June.

Loc. : GOA : *Sanguem* : Coleman, near station.

Rare.

AGAVACEAE

Agavaceae Endl. is mostly based on habit, composed of the most advanced tribes formerly included either under Amaryllidaceae or Liliaceae.

Essentially*in this family the rootstock is never bulbous, habit mostly arborescent and inflorescence never umbelliform.

Cult. species :

Agave ingens Berger, Hort. Mort. 12 & 360, 1912.

Vern. : Latia girial (Mar.) ; Rádi ananás (Konk.) ; Piteira (Port.).

The species is commonly grown in gardens as an ornamental plant.

Sansevieria zeylanica Willd. Sp. Pl. 2 : 159, 1779 ; C. 3 : 252.
Sansevieria roxburghiana Schult. f. Syst. 7 : 357, 1829 ; FBI 6 : 271, DG. 191.

Fl. : January.

Vern. : Murba (Mar.) ; Murgali (Kon.k) ; Bowstring Hemp (Eng.).

Cultivated in gardens.

Yucca gloriosa Linn. Sp. Pl. 319, 1753 ; DG. 195 ; C. 3 : 283 ; G. 3 : 1067.

Vern. : Yacca (Mar.) ; Palmitos (Port.) ; Adams's needle (Eng.).

An ornamental plant of the garden.

TACCACEAE

TACCA Forst.

Tacca leontopetaloides (Linn.) O. Kuntze, Rev. Gen. Pl. 3 : 311, 1893 ; *Leontice leontopetaloides* Linn. Sp. Pl. 313, 1753. *Tacca pinnatifida* Forst. Char. Gen. 70, t. 35, 1778 ; FBI 6 : 287 ; DG. 192 ; C. 3 : 262 ; G. 3 : 1052.

Fl. : August September. *Fr. :* September - November.

Loc. : GOA : *Pernem* : Amberem near Pernem. *Ilhas* : Near Santa-cruz village. *Salcete* : Verna village outskirts. *Canacona* : Tudal Ordo-fond ; Sukur village hill. NAGARHAVELI : Saily, Dolara forest. DAMAN : Bamote.

Common in open areas and along hill slope.

DIOSCOREACEAE

DIOSCOREA Linn.

1. Stem twining to the left

2. Leaves simple

bulbifera

2. Leaves compound
3. Leaves 3 - foliate ; flowers sessile ; stamens 6 *hispida*
3. Leaves 3 - 5 foliate ; flowers pedicelled stamens 3 *pentaphylla*
1. Stem twining to the right
4. Stem conspicuously angled and winged *alata*
4. Stem neither angled nor winged
5. Leaves opposite and alternate, bases acute ; flowers solitary or in fascicled spikes *oppositifolia*
5. Leaves alternate, bases cordate or truncately cordate ; flowers on special flowering branches in panicled spikes
6. ovate - hastate ; capsule subquadrate, or obovate special flowering branches as long as or longer than the lives *glabra*
6. Leaves suborbicular, broadly ovate or subreniform ; capsule broadly obovate ; flowering branches shorter than the leave *wallichii*

Dioscorea alata Linn. Sp. Pl. 1033, 1753 ; FBI 6 : 296 ; DG. 193 ; G. 3 : 1056.

Fl. : August - October. *Ill.* : Wt. Ic. tt. 810, 812 ; Journ. Bomb. nat. Hist. Soc. 49(4) : Pl. 3, f. 1, 1951.

Vern. : Chinem (Konk.) ; Inhame (Port.) ; Yam (Eng.).

Loc. : GOA : *Satari* : Nagargao.

Rare along forest edges. Tubers edible and hence widely cultivated also.

D. bulbifera Linn. Sp. Pl. 1033, 1753 ; C. 3 : 265 ; G. 3 : 1055 ; S. 250 ; Pav. 223. *D. sativa* Thunb. Fl. Jap. 151, 1784 (*non* Linn.) ; FBI 6 : 295 ; DG. 193.

Fl. & Fr. : August - November. *Ill.* : Wt. Ic. t. 878.

Vern. : Karamdo (Konk.) ; Kadu-karanda (Mar.).

Loc. : GOA : *Satari* : Onda ; Wadicha Dongar, Caranzol ; Curchirum. *Bardez* : Botim ; Porvorim area. *Salcete* : Near Raiyi village. *Ponda* : Vernem. *Sanguem* : Potiem forests ; Molem Belgaum Road ; Molem ; Nandrona near Molem. *Quepem* : Quepem Sanguem. *Canacona* : Ordofond forest on way to Tudal ; Ordofond Tudal. NAGARHAVELI : Saily forest ; Dolara forest ; Chispana area. DADRA. DAMAN : Dolar.

Common inside the forest, climbing on *Tectona*, *Calycopteris*, *Wrightia*, *Bridelia* etc.

Dioscorea glabra Roxb. Fl. Ind. 3 : 803, 1832 ; FBI 6 : 294 ; C. 3 : 267 ; G.3 : 1056.

Fl. : November : Ill. : Prain & Burkill, Ann. R. Bot. Gard. Calc. 14 : 354, t. 131, 1938.

Loc. : GOA : *Quepem* : Budsari Goundugarha.

Rare, climbing on *Zizyphus*.

D. hispida Dennst. Schl. Hort. Malab. 15, 1818 ; G. 3 : 1055. **D. daemona** Roxb. Fl. Ind. 3 : 805, 1832 ; FBI 6 : 289 ; DG. 192 ; C. 3 : 264.

Fl. : August. Ill. : Wt. Ic. t. 811 ; Journ. Bomb. Nat. Hist. Soc. 49(4) : Pl. 2, f. 2, 1951.

Vern. : Karodi (Konk.) ; Raiz da bolsa (Port.).

Loc. : GOA : *Sanguem* : Potiem forests ; Chorundem.

Rare. The tubers are eaten by natives.

D. oppositifolia Linn. Sp. Pl. 1033, 1753 ; FBI 6 : 292 ; DG. 193 ; C. 3 : 266 ; G. 3 : 1056 ; S. 251.

Fl. : August. Fr. : September November. Ill. : Wt. Ic. t. 813.

Vern. : Marpasoli (Mar.).

Loc. : GOA : *Satari* : Maloli forests. *Bardez* : Betim ; Betim Hills' *Sanguem* : Verlem ; Erak (Pat-Netravali).

Occasional along the forest edges.

D. pentaphylla Linn. Sp. Pl. 1032, 1753 ; FBI 6 : 281 ; DG. 193 ; C. 3 : 264 ; G. 3 : 1056 ; S. 250 ; Dangs. 54.

Fl. & Fr. : September November. Ill. : Wt. Ic. t. 814.

Vern. : Shendvel (Mar.) ; Til-karamdi (Konk.) ; Grabosa (Port.).

Loc. : GOA : *Satari* : Onda ; Pale ; Wadicha Dongar, Caranzol ; Kutachemal, Ivorem. *Bardez* : Porvorim-Betim. *Ilhas* : Lake near Chinchinum ; Raj Bhavan ; Chimbhel reservoir - Brahmapuri temple. *Sanguem* : Maduka bungla jungle ; Borazon ; Surla ; Molem-Belgaum road ; Molem ; Chorandem ; near Anvaldem (Molem) ; Verlem. Castle rock on way to Anmode. *Canacona* : Ordofond Butpal, 10 km. NAGARHAVELI : Saily forest ; Morkhal.

Common.

Dioscorea wallichii Hook. f. in FBI 6 : 295, 1892 ; G. 3 : 1056 ; S.251.

Fl. : November. *Ill.* : Journ. Bomb. nat. Hist. Soc. 49(4) : Pl. 1, f. 2, 1951.

Loc. : GOA : *Satari* : Valpoi-Nagram. *Bardez* ; Betim-Bardez Goa ; Porvorim forest. *Ilhas* : 3 km ahead of Santacruz ; Chimbél reservoir to Brahmápurí temple. *Sanguem* : Sanguem Barazan mine area. NAGARHAYELI : Morkhal ; Dudhui to Bildhari forest ; Dongarpad Umberkoi.

Occasional, climbing on *Leea indica*, *Strychnos* etc.

Cult. species :

D. esculenta (Lour.) Burm. in Gard. Bull. S.S. 1, 396, 1917 ; G. 3 : 1055. *D. spinosa* Roxb. ex Hook. f. in FBI 6 : 291, 1892 ; DG. 193. *D. fasciculata* Roxb. Fl. Ind. 3 : 801, 1832 ; C. 3 : 267.

Vern. : Kangi (Konk.) ; Batata (Port.) ; Goa potato (Eng.).

Cultivated for its edible tubers.

LILIACEAE

- | | |
|--|---------------------|
| 1. Plants with thick, fleshy leaves, margins of leaves spinous | <i>Aloe</i> |
| 1. Plants not as above | |
| 2. Leaves minute scale-like ; stems modified into needle - like, slightly flattened cladodes | <i>Asparagus</i> |
| 2. Leaves well developed ; stems not modified into cladodes | |
| 3. Climbing plants, leaves ending in a tendril ; flowers large, showy | <i>Gloriosa</i> |
| 3. Erect herbs or undershrubs ; leaves not ending in a tendril ; flowers small | |
| 4. Undershrub, with a pronounced leafy stem above the ground | <i>Dracaena</i> |
| 4. Herbs without distinct stem above the ground | |
| 5. Root stock small, with or without fleshy tuberous roots | <i>Chlorophytum</i> |
| 5. Root stock a bulb or corm | |
| 6. Flowers solitary or few corymbose ; scape with few leaves | <i>Iphigenia</i> |

6. Flowers many, racemose on a simple, naked raceme
7. Flowers distant, usually appearing before the leaves ; seeds flattened *Urginea*
7. Flowers close, appearing [with the leaves ; scape with few leaves *Scilla*

ALOE Linn.

Aloe barbadensis Mill. Gard. Dict. n. 2. 1768. *A. perfoliata* var. *vera* Linn. Sp. Pl. 320, 1753 ; *A. vera* (Linn.) Webb. & Benth. non. Mill. 1768 : DG. 196 ; C. 3 : 283 ; G. 3 : 1062.

Fl. : March-April.

Vern. : Konkand (Mar.) ; Brahmi (Kan.) ; Sabar (Konk.) ; Herva babosa (Port.).

Loc. : DAMAN : Cale area.

Rare, along sandy beach, also grown in the gardens. Ofren goes under "*Aloe vera* Linn." in the floras.

ASPARAGUS Linn.

Asparagus racemosus Willd. var. *javanicus* Baker in Journ. Linn. Soc. 14 : 624, 1874 ; FBI 6 : 316 ; C. 3 : 270 ; S. 251. *A. jacquemontii* Baker, l.c., 615, 1874.

Fl. : September - November. *Ill.* : Wt. Ic. t. 2056.

Vern. : Shatavani (Mar.).

Loc. : *Satari* : Codal. Sanguem ; Perichetem, Tanem. *Canacona* ; Amdiga near Butpal ; Nadquem - Butpal ; Ordofond - Tudal ; Ordofond - Tudal, 3 km. NAGARHAVELI : Saily. DAMAN : Cale area.

Occasional, along forest edges in cleared areas.

Cult. species :

A. officinalis Linn. Sp. Pl. 313, 1753 ; DG. 194 ; C. 3 : 271.

Vern. : Asparg (Konk.) ; Espargo hortense (Port.).

Cultivated in the garden.

CHLOROPHYTUM Ker.

- | | |
|---|---------------------|
| 1. Flowers in simple or shortly branched, dense flowered racemes | |
| 2. Leaves lanceolate or oblanceolate, narrowed into a petiole | <i>breviscopum</i> |
| 2. Leaves linear or lorate, not narrowed into a petiole | |
| 3. Scape larger than the leaves ; anthers as long as filaments ; capsules orbicular | <i>tuberosum</i> |
| 3. Scape shorter than the leaves ; anthers longer than the filaments ; capsules broadly obovate | <i>malabaricum</i> |
| 1. Flowers in simple or branched racemes, scattered, solitary or in pairs | <i>orchidastrum</i> |

Chlorophytum breviscopum Dalz. in Kew Journ. Bot. 2 ; 141, 1850 ; FBI 6 : 333 ; C. 3 : 280.

Fl. & Fr. : August - October.

Loc. : GOA : *Bardez* : Sukur village. *Sanguem* : Varkin, 9 km south of Sanguem. *Canacona* : Butpal-Nadquem.

Occasional along the slopes.

C. malabaricum Baker in Journ. Linn. Soc. 15 : 331, 1876 ; FBI 6 : 335 ; G. 3 : 1066.

Fr. : November.

Loc. : GOA : *Canacona* : Ordofond-Butpal.

Rare. Often confused with *Chlorophytum tuberosum* (Roxb.) Baker, but the inflorescence is much denser in this species through shorter than the leaves.

C. orchidastrum Lindl. in Bot. Reg. t. 813, 1824 ; FBI 6 : 336 ; C. 3 : 282 ; G. 3 : 1066.

Fl. : August. *Ill.* : Wt. Ic. t. 2038.

Loc. : GOA : *Salcete* : Hill at Raiyi village, Margao-Borim.

Rare.

C. tuberosum (Roxb.) Baker in Journ. Linn. Soc. 5 : 332, 1875 ; FBI 6 : 334 ; C. 3 : 281 ; G. 3 : 1066 ; S. 252.

Fl. : October. *Ill.* : Wt. Ic. t. 2036.

Vern. : Kulai (Mar.).

Common along grassy meadows.

DRACAENA Linn.

Dracaena terniflora Roxb. Fl. Ind. 2 159, 1832 ; FBI 6 : 328 ; G. 3 : 272 ; G. 3 : 1062.

Fl. : April May. *Fr.* : September. *Ill.* : Wt. Ic. t. 2054.

Loc. GOA. *Satari* : Poshiyen forest, near Pengerol village ; Satrem ; Codal forest area. *Canacona* : Barsare forest.

Common undergrowth inside the forests.

GLORIOSA Linn.

Gloriosa superba Linn. Sp. Pl. 305, 1753 ; FBI 6 : 358 ; DG. 196 ; C. 3 : 274 ; G. 3 : 1061 ; S. 252 ; Dangs. 54 ; Pav. 224.

Fl. : August October. *Fr.* : October November. *Ill.* : Wt. Ic. t. 2047.

Vern. : Kallavi (Mar.) ; Hulyuguru (Kan.) ; Arti (Konk.) ; Raizde empose (Port.).

Loc. : GOA : *Satari* : Onda, Tanem. *Ilhas* : Santaacruz village. *Marmugao* : Nuvem hills ; Vascanda. *Quepem* : Bali. *Canacona* : Ordo-fond-Sadashivagad, about 10 km ; Tudal ; Angidiv. NAGARHAVELI : Saily ; Chispana area ; Morkhal. DADRA : Air-port area ; Cale area. DIU : Joola.

Common on hedges along the fields and in open forests associated with *Anacardium occidentale*, *Calycopteris*, *Bridelia*, *Jasminum* and *Mussaenda*.

IPHIGENIA Kunth

Iphigenia indica (Linn.) A. Gray in Kunth, Enum ; 4 : 213, 1843 ; FBI 6 : 357 ; C. 3 : 275 ; G. 3 : 1067. S. 252. *Melanthium indicum* Linn. Mant. 2 : 226, 1771.

Fl. August. *Fr.* : August September.

Vern. : Markallai (Mar.).

Loc. : GOA : *Satari* : Codal forest. *Salcete* : Raiyi village. *Sanguem* : Molem. *Canacona* : Ordofond-Butpal, 6 km. NAGARHAVELI : Atal forest.

Rare, on gravelly soil and rock crevices.

SCILLA Linn.

Scilla hyacinthina (Roth) Macbride in Contr. Gray Herb. (N.S.) 56 : 14, 1918. *Ledebourina hyacinthina* Roth, Nov. Pl. Sp. 195, 1821. *Scilla indica* Baker in Saund, Refug. Bot. 3 : 12, 1870 ; FBI 6 : 348 ; DG. 195 ; C. 3 : 276 ; G. 3 : 1067 (non Roxb.)

Fl. : June. *Ill.* : Wt. Ic. t. 2040, 2041.

Vern. : Lahankal-Kamdo (Konk.).

Loc. : NAGARHAVELI : Silvassa, near Atal forest ; Chispana area.
DAMAN : Dundorta.

Occasional on the slopes.

URGINEA Steinh

Urginea indica (Roxb.) Kunth, Enum. 4 : 333, 1843 ; FBI 6 : 347 ; DG. 195 ; C. 3 : 277 ; G. 3 : 1066 ; S. 252. *Scilla indica* Roxb. Fl. Ind. 2 : 147, 1832 (*non* Baker).

Fl. : March - April.

Vern. : Jangli-piaz (Mar.) ; Kal kamdo (Konk.) ; Cebola albana indiana (Port.).

Loc. : DAMAN : Cale area.

Rare on sandy beach.

Cult. species :

Allium cepa Linn. Pl. 300, 1783 ; FBI 6 : 337 ; DG. 195 ; C. 3 : 284 ; G. 3 : 1067.

Vern. : Piaz (Konk.) ; Kanda (Mar.) ; Cebola (Port.) ; Onion (Eng.) ; Kamdo (Guj.).

Cultivated for the edible bulbs.

A. porrum Linn. Sp. Pl. 295, 1753. *A. ampeloprasum* Linn. Sp. Pl. 294, 1753 ; FBI 6 : 337 ; DG. 195 ; C. 3 : 284.

Vern. : Khorat (Mar.) ; Alhos porro (Port.).

A. sativum Linn. Sp. Pl. 296, 1753 ; FBI 6 : 377 ; DG. 195 ; C. 3 : 284 ; G. 3 : 1067.

Vern. : Lasan (Mar.) ; Lasun (Konk.) ; Alho (Port.) ; Garlic (Eng.) ; Lahsun (Guj.).

Cultivated for its edible bulbs.

SMILACACEAE

SMILAX Linn.

Smilax zeylanica Linn. Sp. Pl. 1029, 1753 ; FBI 6 : 309 ; G. 3 : 1061 ; S. 253. *S. macrophylla* Roxb. [Hort. Beng. 72, 1814 (*nom. nud.*) &] Fl. Ind. 3 : 793, 1832 ; FBI 6 : 310 ; C. 3 : 271.

Fl. : August - September. *Fr.* : August - May. *Ill.* : Wt. Ic. t. 809.

Vern. : Ghotvel (Mar.) ; Kaval-kamti (Konk.) ; Salsaparrilha indiana (Port.).

Loc. : GOA : *Pernem* : Cargo. *Satari* : Valpoi-Nagram ; Wolancha Donga ; Caranzol ; Pelernum village ; Nandore road side ; Caranzol hills ; Codal ; Ivorem ; Buzruco. *Bardez* : Betim-Bardez ; Sukur village. *Ilhas* : Chimbél reservoir Brahmápurí temple. *Salcete* : Hill near Raiyi village, Margoa-Borim. *Sanguem* : Durgin forests ; Choraundem ; Molem-Belgaum Road ; Alduna (Verlem) ; Bati Sidh. *Quepem* : Budsari-Goundugarha. *Canacona* : Ordofond-Parsol hill ; Margoa Canacona, 8 km before Canacona ; Pahad near Nadquem.

Common in the forest along with *Dioscorea*, *Calycopteris* etc.

PONTEDERIACEAE

MONOCHORIA Presl

Monochoria vaginalis (Burm. f.) Presl ex Kunth, Enum. 4 : 134, 1843 ; FBI 6 : 363 ; DG. 196 ; C. 3 : 286 ; G. 3 : 1068. *Pontederia vaginalis* Burm. f. Fl. Ind. 80, 1768.

Fl. : March - November. *Ill.* : Aquatic angiosp. Bot. Mon. f. 47.

Vern. : Nelat-phal (Konk.).

Loc. : GOA : *Satari* : Masarde village near Valpoi ; Nandorem river, Valpoi. *Ilhas* : Panjim-Madgao. *Salcete* : Goodier, Margoa-Quepem ; Margoa, fields near the rest house ; Cuncolim ; Cavollosum.

Occasional, in the marshy areas along river banks and streams.

XYRIDACEAE

XYRIS Linn.

Xyris pauciflora Willd. Phytogr. 1 : 2, t. 1, f. 1, 1794 et Sp. Pl. 1 : 255, 1797 ; FBI 6 : 365 ; G. 3 : 1070.

Fl. & Fr. : November.

Loc. : GOA : *Ilhas* : Near Santacruz village, rice fields.

Rare in marshy rice fields.

COMMELINACEAE

1. All the six or at least 5 of the stamens fertile
2. Leaf sheath bulged to form a hollow pit ; inflorescence sessile, a much condensed cyme with 3-5 flowers embedded in hollow

- axil of leaf sheath ; bracteoles linear, thin, inconspicuous, not imbricating ; capsule embedded in leaf-sheath ; seeds pitted *Amischophacelus*
2. Leaf sheath not bulged to form a hollow pit ; inflorescence a peduncled scorpioid cyme of mostly many flowers and not embedded in axils of leaf-sheaths ; bracteoles foliaceous, biseriate, secund, conspicuous, imbricate ; capsule not embedded in leaf-sheath ; seeds rugose *Cyanotis*
1. Fertile stamens usually 3(2), staminodes 2 - 4
3. Inflorescence leaf-opposed, enclosed by a spathaceous bract and composed of 1 - 2 cincinni *Commelina*
3. Inflorescence otherwise, the cymes invariably paniculate
4. Three anticusous stamens normally fertile (sometimes including one antipetalous one), the three posticusous ones transformed into staminodes ; staminodes bifid or with 2 corpuscles at apex ; ovary 3 - celled with 1 ovule in each cell ; capsule 2-valved, sometimes with a 3rd dorsal cell, rarely inconsistently 3 - valved *Aneilema** (*sensu lato*)
4. Three fertile antisealous stamens alternating with 3 (rarely 2, 1 or 0) antipetalous staminodes ; sometimes one of the antisealous stamens transformed into a staminode or absent ; one of the anticusous and 2 (or one) of the posticusous stamens fertile ; staminodes hastate or trilobed ; ovary 3-celled with mostly 3 ovules in each locule ; capsule subequally 3-valved *Murdannia*

AMISCHOPHACELUS Rolla Rao et Kammathy

Amischophacelus axillaris (Linn.) Rolla Rao et Kammathy in Journ. Linn. Soc. 59 : 306, 1966. *Commelina axillaris* Linn. Sp. Pl. 42, 1753. *Cyanotis axillaris* (Linn.) J.A. Roem. & J.H. Schult., Syst. Veg. 7 (2) : 1154, 1830 ; FBI 6 : 388 ; C. 3 : 305 ; G. 3 : 1082.

Fl. & Fr. : August - November.

Loc. : GOA : *Marmugao* : Navelim beyond Madgao ; Marmugao near Dak bungalow.

Normally grows along the drainage and marshy places.

ANEILEMA R. Br.

The genus *Aneilema* R. Br. *sensu lato* (Commelinaceae) has been critically studied both from the taxonomic and bio-systematic angles by several workers since 1926 (morphological-Bruckner 1926 & 1930, Brenan 1952, Rolla Rao 1964, 1966 & 1971, Morton 1966, Joseph and Rolla Rao 1968, Faden 1974 ; anatomical - Tomlinson 1966 & 1969 ; cytological - Lewis 1964, Rolla Rao, Kammathy & Raghavan 1968 & 1972, Jones &

Jopling 1972, Faden 1975). With the available biosystematic data, the circumscription of the genus *Aneilema* R. Br. *sensu stricto* is extremely limited with restricted distribution in the world (mostly Australia) and various genera namely *Murdannia* Royle (India), *Dictyospermum* Wight (India), *Tricarpelema* Morton (Eastern India & Western China), *Rhopalephora* Hassk. (Asia) and *Lamprodithyros* Hassk. (Tropical Africa) have been resuscitated and considered to be more naturally designated.

The typification and synonymy of various taxa under these genera are under study by various workers and these details would be available later for a better understanding of the genus *Aneilema* R. Br. *sensu lato*.

**Aneilema scaberrimum* (Blume) Kunth, Enum. 4 : 69, 1843 ; FBI 6 : 382 ; G. 3 : 1079. *Commelina scaberrima* Blume Enum. 1 : 4 ; 1827.

Fl. : October. Ill. : Wt. Ic. t. 2071 (as *Dictyospermum protensum* Wight).

Loc. : GOA : Canacona : Poinguinam

Normally grows along moist areas.

During his monographic studies on *Aneilema* R. Br., Robert B. Faden, [Phytologia 37 (5) : 479-481, 1977] considers that *Rhopalephora* Hassk. is a distinct genus. It is distinguishable from *Aneilema* R. Br. its closest relative, by the combination of characters, namely, cincinni elongate and attached to a very short inflorescence axis, filaments fused basally, ovary and capsule densely covered with hook-hairs and smaller glandular, capitate hairs and ventral capsule valve deciduous. *Rhopalephora* is separable from *Dictyospermum* also by its inflorescence form and its cincinnus bracts persistent ; bracteoles perfoliate, persistent ; fruiting pedicels longer than the capsules, erect ; petals clawed ; filaments long, slender, basally fused ; ovary and capsule stipitate, puberulous ; and capsules bivalved, commonly with unequally developed locules.

Hence the nomenclature of this taxon* is changed by Faden :

**Rhopalephora scaberrima* (Bl.) Faden l.c. 480, 1977. *Commelina scaberrima* Blume Enum. Pl. Jav. 1 : 4, 1827. *Dictyospermum scaberrimum* (Bl.) Panigrahi, Phytologia 29 : 338, 1975.

COMMELINA Linn.

1. Spathe complicate, axillary

2. Erect herbs never rooting at nodes ; flowers white ; capsule 2 equal celled ; 2 valved with one seed in each cell ; seeds foveolate

suffruticosa

2. Prostrate creeping or procumbent herbs, rooting at all or at least at lower nodes ; flowers blue ; capsule 3 locular, upper

- locule dehiscent, 2-seeded, lower loculus indehiscent, 1-seeded, seeds not foveolate
3. Spathes 1 - 2 per branch ; staminodes 2, pollen grains smooth ; seeds reticulate *diffusa*
3. Spathe 3 - 6 per branch ; staminodes 3, pollen grains spiny ; seeds smooth *hasskarlii*
- 1, Spathe cucullate, axillary or terminal
4. Inflorescence axillary, peduncle distinct
5. Cymes 2-fid, inner cymes 2-flowered, outer 2-4 flowered ; ovary 3-celled, the anticonic cells 2-ovulate, the posticous 1-ovulate or obsolete *forskalaiei*
5. Cymes 2-fid, inner cymes with a single flower or represented by a stump, outer 6 - 8 flowered ; ovary 3 - celled, all the cells 1 - ovulate *paleata*
4. Inflorescence terminal, peduncle indistinct
6. Herbs rooting at nodes ; inflorescence not subtended by floral leaves ; cleistogamous flowers present ; ovary 3 - celled, the 2 anticonic cells 2 - ovulate, the posticous cell 1 - ovulate or obsolete ; seeds pitted *benghalensis*
6. Herbs or perennials not rooting at nodes ; inflorescence subtended by 3 - 5 floral leaves ; cleistogamous flowers absent ; seeds smooth
7. Herbs with small and tender stems confined to sandy dry tracts *albescens*
7. Perennials with tufted erect or trailing stems mostly in moist areas and not occurring on sandy, dry tracts
8. Root with thick fibres ; lamina highly variable, oblong, broadly lanceolate, elliptic (or even ovate or extremely linear, 3.5 - 15 × 1.5 - 4.5 cm, capsule 3 valved, all dehiscent or one indehiscent and warty ; seeds free in the cells *erecta*
8. Roots with thin fibres ; leaf 10 - 15 cm × 3 - 4 cm, not much variable, leaf base distinctly oblique with rusty brown hairs along the leaf sheath margin, capsule distinctly 3 - valved, all dehiscent *paludosa*

Commelina albescens Hassk. in Schweinf. Beitr. Fl. Aethiop, 210, 1867 ; FBI 6 : 373 ; C. 3 : 294 ; Puri *et al.*, Rec. Bot. Surv. India 19 (1) : 128.

Fl. & Fr. : September.

Loc. : DIU : Nagoa.

Rare, in rocky crevices along sea shore.

The species which is said to be restricted to desert regions of Rajasthan and further north is now collected in the small, sand filled holes along rocky edges projecting into the Arabian sea. Such habitat is quite interest-

ing and this record extends its distribution further south beyond desert zone. Attempts to grow it at Poona did not succeed.

Commelina benghalensis Linn. Sp. Pl. 41, 1753 ; FBI 6 : 370 ; DG. 196 ; C. 3 : 291 ; G. 3 : 1075 ; S. 253 ; Dangs. 54 ; Pav. 226.

Fl. & Fr. : April. *Ill.* : Wt. Ic. t. 2065.

Vern. : Kena (Mar.) ; Hittagani (Kan.) ; Kamchat (Konk.).

Loc. : GOA : *Sanguem* : Dudhsagar. *Canacona* : Barsare village near Tudal. NAGARHAVELI : Khanvel. DAMAN : Cataria.

Normally seen in moist areas of cultivated fields.

C. diffusa Burm. f. Fl. Ind. 18, t. 7, f. 2, 1768. *Commelina nudiflora* auct. non Linn. 1753 ; FBI 6 : 369 ; C. 3 : 290 ; G. 3 : 1074.

Fl. & Fr. : August - November.

Vern. : Kina (Mar.) ; Shishmuli (Guj.).

Loc. : GOA : *Satari* : Pali village ; Kutechemol Ivorim ; *Satrem* ; Nanecha Dongar (Codal). *Salcete* : Borda village, Margoa. *Sanguem* : Sanverdam railway station. *Quepem* : Budsari Goundugarha. NAGARHAVELI : Saily ; Bank of Daman Ganga river on way to Kawcha.

Occasional, in moist shade areas.

C. erecta Linn. Sp. Pl. 41, 1753. Rolla Rao in M.V.M. Patrika (Poona), 6 (2) : 53, 1971. *C. undulata* R. Br. Prodr. 270, 1810 : Rolla Rao in Notes Roy. Bot. Gardn. Edinburgh 26 (4) : 351, 1966. *C. kurzii* Cl. in Journ. Linn. Soc. 11 : 444, 1871 ; FBI 6 : 373 ; G. 3 : 1075.

Fl. & Fr. : September. *Ill.* : Journ. Bomb. Nat. Hist. Soc. 59 (1), Pl. 1 A.

Loc. : NAGARHAVELI : Silvassa, towards Atal forests. DAMAN : Fort area.

Occasional.

In India it has often been confused with *C. paludosa* Bl. but can be differentiated by its 3-5 floral leaves subtending the inflorescences. The species has a wide range of distribution from tropical America to Australia through Africa, India and Malesia, presenting interesting polyploids with extreme variation and most confusing intermediate forms. As such it provides a large number of synonyms.

C. forskalaiei Vahl, Enum. 2 : 172, 1806 ; FBI 6 : 371 ; C. 3 : 292 ; G. 3 : 1075.

Fl. & Fr. : September.

Loc. : GOA : *Ilhas* : Panaji along the sea coast. DAMAN : Fort area ; Calaria. DIU : Jalandhar ; Castle area ; Nagoa ; Rocky creek in sea, Nagoa ; Gogale.

Fairly common along cultivated fields and rocky creeks.

Commelina hasskarlii C.B. Cl. Comm. & Cyrt. Beng. 13, t. 3, 1874 & in DC. Mon. Phan. 3 : 157, 1881 ; FBI 6 : 370 ; C. 3 : 291 ; G. 3 : 1074.

Fl. & Fr. : September November.

Loc. : GOA : *Bardez* : Borim-Margoa, 8 km point. *Ilhas* : Panaji along sea coast ; rice fields near Santacruz village ; Panaji Margoa. *Sanguem* : Pat-Netraveli. NAGARHAVELI : Nala between Kawcha & Jamunpada ; on way to Sindhoni from Khanvel ; Saily ; near Atal forest ; Khanvel. DADRA : Tingra village. DAMAN : Dundorta.

C. paleata Hassk. in Miq. Pl. Jungh. 139, 1851 55 ; FBI 6 : 372 ; C. 3 : 294 ; G. 3 : 1075.

Fl. & Fr. : October. *Ill.* : Rolla Rao & Kammathy in Journ. Bomb. nat. Hist. Soc. 59 : 61, t. 1 C, t. 3, map. 2. 1962.

Loc. : GOA : *Salcete* : Verna village. *Marmugao* : Vasco Cortallim. *Sanguem* : Near Curti village. *Canacona* : Poinguinam ; Ordofond forest ; Ordofond Tudal.

Occasional on moist, rocky areas in association with Murdannian species.

C. paludosa Bl. Enum. Pl. Java, 1 : 2, 1827 ; Rolla Rao in Journ. Bomb. nat. Hist. Soc. 59 (1) : 60, 1962 and in Notes Roy. Bot. Gard. 25 (2) : 181, 1965 excl. var. *viscida* (C.B. Cl.) Rolla Rao et Kammathy. *C. obliqua* Buch. Ham. ex D. Don, Prodr. Fl. Nep. 45, 1825 (*non* Vahl, 1806) ; FBI 6 : 372 ; C. 3 : 293 ; G. 3 : 1075 ; S. 254 (all *pp.*).

Fl. & Fr. : July October. *Ill.* : Rolla Rao et Kammathy in Journ. Bomb. nat. Hist. Soc. 59 : 60, t. 8, 1962.

Vern. : Keni (Konk.).

Often confused with *Commelina erecta* Linn. (= *C. kurzii* C.B.Cl.) which is much more abundant along the Western Ghats than the present species. *C. paludosa* grows in variety of habitat but with limited variation and it always reveals $n = 30$, irrespective of its size, habitat or altitude.

C. suffruticosa Blume, Enum. Pl. Java, 1 : 3, 1827 ; FBI 6 : 374.

Fl. : September. *Ill.* Journ. Bomb. Nat. Hist. Soc. 52 : Pl. II.

Loc. : NAGARHAVELI : Saily ; Khuntly forest ; Khanvel.

Rare in the forest undergrowth.

Though Cooke has not recorded it for Gujarat or even for the entire Western India, it is now evident that the species extends almost throughout India excepting some parts of Deccan plateau.

CYANOTIS D. Don *nom. cons.*

Glabrous herbs with ovate - oblong leaves ; bracts and bracteoles glabrous or ciliate with long hairs ; filamental hairs of uniform colour ; seeds striate with 2 large pits on two of the faces

cristata

Floccosely silky or cobwebby woolly herbs with linear to linear - lanceolate leaves ; bracts and bracteoles cobwebby or floccose ; filamental hairs of two colours ; seeds faintly rugose, not pitted

fasciculata
var. *fasciculata*

Cyanotis cristata (Linn.) D. Don, Prodr. Fl. Nep. 46, 1825 ; FBI 6 : 385 ; C. 3 : 304 ; G. 3 : 1081 ; S. 256 ; Pav. 227. *Commelina cristata* Linn. Sp. Pl. 42, 1753.

Fl. & Fr. : August - November. *Ill.* : Wt. Ic. t. 2082.

Loc. : GOA : *Satari* : Palli village ; *Satrem* : Wadicha Dongar, Caranzol. *Bardez* : Porvorim, along road side ; Calangute sea beach ; Nagargao. *Sanguem* : Molem ; Belgaum Road ; Dudhsagar ; Castle rock on way to Anmode. NAGARHAVELI : Saily forests ; Khuntly forests ; Dolara forest ; Chispana forests. DAMAN : Fort area.

Common on moist, shady, grassy areas and along the beach.

C. fasciculata (Heyne ex Roth) Schult. f. Syst. 7 : 1152, 1830 ; FBI 6 : 387 ; C. 3 : 303 ; G. 3 : 1083 ; S. 256. *Tradescantia fasciculata* Heyne ex Roth, Nov. Pl. Sp. 189, 1821.

Fl. & Fr. : September - October. *Ill.* : Wt. Ic. tt. 2086 88.

Loc. : GOA : Castle rock on way to Anmode. NAGARHAVELI : Dolara forests.

Common on rocky slopes forming a thick mat and very showy. The specimens are referable to var. *fasciculata* which is much floccose or cobwebby.

MURDANNIA Royle *nom. cons.*

1. Stems tufted, forming gregarious, dense mats ; leaves narrowly filiform, hardly exceeding 2.5 mm in width, grasslike ; ovary 4 - 8 ovulate, seeds 2 - seriate in each cell

semiteres

1. Stems neither tufted nor forming dense mats ; leaves broader, exceeding 3 mm in width ; ovary 2 - many ovulate ; seeds 1 seriate in each cell

2. Ovary with a single ovule in each locule

vaginata

2. Ovary 2 - ovulate in each locule

3. Slender annuals with fibrous roots ; lamina linear to oblong, 2 - 6.5 × 0.4 - 0.8 cm ; flowers ± 6 mm across

nudiflora

3. Robust perennials with tuberous fleshy roots and lateral floriferous leafy branches ; lamina linear ensiform, 10 - 40 × 0.8 - 1 cm ; flowers upto 2.5 cm across *simplex*
2. Ovary 3 - many ovulate in each cell
4. Cymes axillary, 1 - 4 flowered ; flowers chrome - yellow to orange - brown *versicolor*
4. Inflorescence terminal, many flowered ; flowers bluish or bluish - violet
5. Perennials, rootstock thick, tuberous ; stems 30 - 150 cm tall ; leaves differentiated into radical & cauline, lamina of radical leaves 11 - 25 × 1.8 - 4.5 cm, of cauline 7.5 - 18 × 2 - 4.5 cm ; flowers white to pinkish - white *elata*
5. Annuals, rootstock thin, fibrous ; stems under 30 cm tall ; leaves uniform, lamina under 7.5 × 1.2 cm ; flowers blue or purplish - blue
6. Stems erect, rooting at lower nodes, mouth of sheath oblique ; lamina 2.5 - 7.5 × 0.5 - 1.2 cm linear to oblong, thick, folded backwards, drying straw - brown ; bracts cucullate ; seeds subcubical, minutely striate *dimorpha*
6. Stem prostrate to suberect, rooting at all nodes, mouth of sheath straight ; lamina 1.5 - 3.5 × 0.5 - 0.9 cm, narrowly lanceolate to oblong, drying glaucous ; bracts amplexicaul ; seeds angular, minutely scaberrulous *spiratum*

Murdannia dimorpha (Dalz.) Bruckn. in Pflanzenfam. ed. 2, 15A : 173, 1930 ; S. 255. *Aneilema dimorphum* Dalz. in Kew Journ. Bot. 3 : 138, 1851 ; FBI 6 : 377 ; C. 3 : 297 ; G. 3 : 1078.

Fl. & Fr. : August. *Ill.* : Wt. Ic. t. 2075.

Loc. : GOA : *Salcete* : Raiya village, about 6 km from Margao. *Marmugao* : Nuvem Dongri. *Sanguem* : Verlem ; Near Anvaldem (Molem) ; Molem Belgaum Road ; Castle rock on way to Anmode. *Canacona* : Ordofond Butpal, 6 km.

Occasional on moist areas.

M. elata (Vahl) Bruckn. in Engl. & Prantl, Pflanzenf. 15A : 173, 1930. *Commelina elata* Vahl, Enum. 2 : 178, 1805 ; *Aneilema herbaceum* Wall. Cat. 5223, 1831 32 ; C. 3 : 296. *A. lineolatum* Kunth, Enum. 4 : 69, 1843 ; FBI 6 : 376 ; G. 3 : 1078.

Fl. & Fr. : August - November. *Ill.* : Wt. Ic. t. 2072.

Loc. : GOA : *Satari* : Onda ; Caranzol. *Sanguem* : Potiem forests ; Bati ; Bavanbunda, Molem - Belgaum Road ; Durgin forests near Darbandora. *Canacona* : Ordofond - Butpal ; Butpal surroundings ; Butpal-Nadquem.

Occasional as forest undergrowth in moist areas.

Murdannia nudiflora (Linn.) Brenan in Kew Bull. 1952, 189, 1952 ; *Commelina nudiflora* Linn. Sp. Pl. 41, 1753 (p.p.). *Aneilema nudiflorum* R. Br. Prodr. 271, 1810 ; FBI 6 : 378 ; DG. 197 ; C. 3 : 298 ; G. 3 : 1078.

Fl. & Fr. : August - November.

Vern. : Nil phula (Konk.).

Loc. : GOA : *Satari* : Masarde village near Valpoi ; Satrem ; Ivorem, Burzuruco. *Bardez* : Sukur village. *Ilhas* : Rice fields near Santacruz village. *Salcete* : Margoa along roadside. *Marmugao* : Vasco Cortallim. *Sanguem* : Netraveli. *Canacona* : Butpal surroundings. NAGARHAVELI : Saily forest ; Khuntly forest area ; Dolara forest ; Chispana area. DADRA. DAMAN : Cataria ; Fort area.

Common on moist, shady, grassy areas along roadsides and in fields.

M. semiteres (Dalz.) Santapau in Poona Agr. Coll. Mag. 41 : 284, 1951 ; S. 255. *Aneilema semiteres* Dalz. in Kew Journ. Bot. 3 : 138, 1851. *A. paniculatum* Wall. ex C.B.Cl. in DC. Mon. Phan. 3 : 215, 1881 (non Wt. 1853) ; FBI 6 : 381 ; C. 3 : 300 ; G. 3 : 1079.

Fl. & Fr. : August. *Ill.* : Wt. Ic. t. 2078, f. 2.

Loc. : GOA : *Bicholim* : Usgao. *Salcete* : Verna village plateau. *Marmugao* : Marmugao harbour hillock. *Sanguem* : Darbandora ; Rumde ; Netraveli ; Surla ; Molem Belgaum Road ; Dudhsagar. *Canacona* : Ordofond- Tudal. Castle rock on way to Anmode.

Occasional amidst grasses on moist, rocky slopes and on plateau. Closely allied to *Murdannia juncooides* (Wt.) Rolla Rao et Kammathy, but the latter is a perennial with an underground bulb.

M. simplex Vahl, Brenan in Kew Bull. 1952 ; 186, 1952 ; *Commelina simplex* Vahl, Enum. 2 : 177, 1806. *Aneilema sinicum* Ker-Gawl. in Bot. Reg. t. 659, 1822 ; FBI 6 : 379 ; C. 3 : 299 ; G. 3 : 1078.

Fl. & Fr. : August - November. *Ill.* : Wt. Ic. t. 2075 ; Rolla Rao et Kammathy, in Journ. Bomb. nat. Hist. Soc. Pl. 11, 1962.

Loc. : GOA : *Salcete* : Margoa. *Sanguem* : Choraundem ; Near Anmode (Molem) ; Molem Belgaum Rd. *Canacona* : Butpal-surroundings ; Canacona ; Butpal - Nadquem. Castle rock on way to Anmode.

Occasional in forest undergrowth and in rice fields.

Often confused with *Murdannia gigantea* (Vahl) Bruckn. due to its superficial resemblance but can be differentiated by the scape and seeds (cf. Rolla Rao & Kammathy, *l.c.*).

M. spiratum (Linn.) Bruckn. in Engl. & Prantl, Pflanzenf. 15A : 173, 1930 ; S. 254. *Commelina spirata* Linn. Mant. 176, 1767. *Anellema spiratum* R. Br. Prodr. 271, 1810 ; FBI 6 : 377 ; C. 3 : 296 ; G. 3 : 1078.

Fl. & Fr. : September. *Ill.* : Wt. Ic. t. 2077.

Loc. : GOA : *Satari* : Palli village ; Wadicha Dongar, Caranzol. *Ponda* : *Querium*. *Sanguem* : Choraundem ; Netravali, Dudhsagar ; near Anvaldem (Molem). NAGARHAVELI : Umberkoi, Dongarpada forest ; Sindhori forest ; Atal forests ; near Silvassa ; Khuntly forest ; Khanvel ; Chispana.

Occasional in moist, shady areas.

Murdannia vaginata (Linn.) Bruckn. in Engl. & Prantl, *Pflanzenf.* 15A : 173, 1930. *Commelina vaginata* Linn. *Mant.* 177, 1767. *Aneilema vaginatum* R. Br. *Prodr.* 271, 1810 ; *FBI* 6 : 381 ; *C.* 3 : 300 ; *G.* 3 : 1079.

Fl. & Fr. : August September. *Ill.* : Wt. Ic. t. 2076.

Loc. : GOA : *Marmugao* : Verna-Marmugao. DADRA.

Rare in rice fields and grasslands.

Though the species is treated under *Dictyospermum* by Hong (*Acta Phytotax. Sin.* 12 : 459-488, 1974), Faden (*Taxon* 29(1) : 81, 1980) considers it under *Murdannia*, section *Vaginatae* Faden along with two other species.

M. versicolor (Dalz.) Bruckn. in Engl. & Prantl, *Pflanzenf.* 15A : 173, 1930 ; S. 254. *Aneilema versicolor* Dalz. in *Kew Journ. Bot.* 3 : 136, 1851 ; *FBI* 6 : 378 ; *C.* 3 : 298.

Fl. & Fr. : August September. *Ill.* : Wt. Ic. t. 2078, f. 3.

Loc. : GOA : *Satari* : Koparde ; Ivorem, Buzwaco. *Sanguem* : Varkim. DADRA.

Aneilema ochraceum Dalz. (*Kew Journ. Bot.* 3 : 135, 1851) is a different species altogether and its correct identity is *Murdannia crocea* (Griff.) Faden subsp. *ochracea* (Dalz.) Faden [*Kew Bull.* 32(1) : 188, 1977.]

Rare in association with *Eriocaulon* and *Cyperus* sp. in marshy places and near rivers.

FLAGELLARIACEAE

FLAGELLARIA Linn.

Flagellaria indica Linn. *Sp. Pl.* 333, 1753 ; *FBI* 6 : 391 ; *DG.* 197 ; *C.* 3 : 307.

Vern. : Silon (Konk.) ; Ratao falso (Port.).

The species is reported common near the sea coast among rocks in Concan. Dalgado records it for Goa.

ARECACEAE

- | | |
|--|-----------------|
| 1. Stem dichotomously branched | <i>Hyphaene</i> |
| 1. Stem not dichotomously branched | |
| 2. Leaves decomposed ; leaflets rhomboid or cuneate | <i>Caryota</i> |
| 2. Leaves simple pinnate ; leaflets acute | |
| 3. Scandent shrubs, climbing by hooked spines ; fruits covered with closely appressed scales | <i>Calamus</i> |
| 3. Erect, mostly unarmed trees or shrubs ; rarely lower pairs of leaflets transformed into spines ; fruits not covered with scales | <i>Phoenix</i> |

CALAMUS Linn.

Stems stout, erect ; leaflets in opposite or nearly opposite distant groups of 2 or 3 on each side in the basal part ; equidistant upwards *thwaitesii*
var. *canarana*

Stems slender ; leaflets not fascicled, more or less regularly equidistant *pseudo-tenuis*

Calamus pseudo-tenuis Becc. ex Hook. f. FBI 6 : 445, 1892 ; C. 3 : 317 ; T. 2 : 555 ; G. 3 : 1093.

Fl. : Throughout the year. *Ill.* : T. f. 538.

Common in the ghat areas.

Da'gado (l.c. 198) has mentioned *Calamus rotang* Linn. as common in the area which probably is a misidentification and it is nothing but *C. pseudo-tenuis*.

C. thwaitesii Becc. ex Hook. f. var. *canarana* Becc. in Ann. Royal Bot. Gard. Cal. 11 : 138-139, t. 12, 1908 ; G. 3 : 1093. *C. thwaitesii* Becc. ex Hook. f. in FBI 6 : 441, 1892 ; C. 3 : 317.

Loc. : GOA : *Sanguem* : Molem-Belgaum Road.

CARYOTA Linn.

Caryota urens Linn. Sp. Pl. 1189, 1753 ; FBI 6 : 422 ; DG. 198 ; C. 3 : 315 ; T. 2 : 559 ; G. 3 : 1089.

Fl. : Throughout the year. *Ill.* : Rheede Hort. Mal. t. 11.

Vern. : Bherli-mad (Mar.) ; Chundapara (Kan.) ; Birlomad (Konk.) ; *Palmeria breva* (Port.).

Common in the area as observed by me. The leaves give strong fibre, used in the making of ropes, baskets etc. The trees are tapped for toddy and the pith starch is eaten.

HYPHAENE J. Gaertn.

Hyphaene dichotoma (White) Furtado in Gard. Bull. Singapore 25 : 301, 1970. *Borassus dichotomus* White in Graham's Cat. Pl. Bombay 226, 1839. *Hyphaene indica* Becc. L'Agr. Colon. Florence 2 : 137-183, 1908 ; Seshagiri Rao Rolla in Journ. Bomb. nat. Hist. Soc. 60 : 761, 1963 & in *Principes* 8 : 49, 1964.

Fr. : September - December. *Ill.* : *Principes (l.c.)* f. 22, 23, 25, 26, 27. ; *JBNHS (l.c.)* f. 1 & 2.

Vern. : Oka mundel (Guj.) ; Doum Palm (Eng.).

Loc. : DAMAN : Jampore. DIU : Nagoa.

Occasional, along the sea-shore in Daman ; but it is the most dominant tree species of Diu Island and the adjoining mainland. These graceful branching palms with their towering stems and waving crowns present a majestic picture of beauty in such desolate landscape of Diu Island and such incomparable ancient denizens of this area which were reported to be covering the whole of Diu Island and the adjoining parts of Gujarat (Graham *l.c.*) during early part of last century, are being cut down now by the local people for fuel etc. Though seen in hundreds even on the Diu Island by the author during 60's, they are now considerably reduced in number due to unrestricted destruction.

This is an endangered species, a rare palm endemic to Diu, Daman, Coast of Gujarat and North Maharashtra (Rolla Rao *JBNHS l.c.*) which needs urgent protection.

PHOENIX Linn.

Phoenix sylvestris (Linn.) Roxb. [Hort. Beng. 73, 1814 (*nom. nud.*) &] Fl. Ind. 3 : 787, 1832 ; *FBI* 6 : 425 ; C. 3 : 311. T. 2 : 548 ; G. 3 : 1088 ; S. 257. *Elate sylvestris* Linn. Sp. Pl. 1189, 1753 (*p.p.*).

Fl. : January - February. *Ill.* : Rheede Hort. Mal. tt. 22 - 25 ; Mahabale & Parthasarathy in Journ. Bomb. nat. Hist. Soc. 60 ; t. 1, f. 1 ; t. 4, f. 13-15 ; t. 5, f. 17 ; t. 6, f. 23 - 24, 1963.

Vern. : Shindi (Mar.) ; Ichal (Kan.) ; Ram Khajuri (Konk.) ; Tama-reiro do matto (Port.).

Loc. : DAMAN : Regunvara ; also common in Dadra and Nagarhaveli.

Rare, often cultivated in the gardens. The leaves are used for making baskets, ropes and mats etc. The fruit is edible.

Cult species :

Areca catechu Linn. Sp. Pl. 1189, 1753 ; FBI 6 : 405 ; DG. 197 ; C. 3 : 319 ; T. 2 : 550 ; G. 3 : 1085.

Fl. : July - September. *Fr.* : November - January.

Vern. : Supari (Mar.) ; Kavugu (Kan.) ; Supari (Konk.) ; Arequiera (Port.).

Mostly cultivated for the fruits.

Borassus flabellifer Linn. Sp. Pl. 1187, 1753 ; FBI 6 : 482 ; DG. 199 ; C. 3 : 321 ; T. 2 : 561 ; G. 3 : 1000 ; S. 257.

Fl. : September.

Vern. : Tali (Kan.) ; Tadmad (Konk.) ; Palmeira (Port.) ; Tad, Tadmad. (Guj.).

Loc. : DIU : Nagoa. Also found in DADRA and DAMAN.

This species is a native of Tropical Africa. Often cultivated and grows gregariously. The leaves are used for thatching, making mats, fans and baskets etc. The pulp of the fruit is edible.

Cocos nucifera Linn. Sp. Pl. 1188, 1753 ; FBI 6 : 482 ; DG. 199 ; C. 3 : 322 ; T. 2 : 554 ; G. 3 : 1086.

Fl. : Throughout the year.

Vern. : Narel (Mar.) ; Tengina (Kan.) ; Mad (Konk.) ; Coco comum (Port.) ; Coconut pal (Eng.).

Cultivated. Kernel & oil edible ; leaves for thatching, mats, baskets etc. and tree tapped for toddy.

Corypha umbraculifera Linn. Sp. Pl. 1187, 1753 ; FBI 6 : 428 ; DG. 198 ; C. 3 : 319 ; T. 2 : 562 ; G. 3 : 1089.

Vern. : Tali (Mar.) ; Bainsi (Kan.) ; Karetel (Konk.) ; Arvore dos sombreiros (Port.).

Mostly cultivated in the gardens near the sea coast. The seeds are d and used for making beads and buttons etc.

PANDANACEAE

PANDANUS Linn.

Pandanus tectorius Soland. ex Parkinson, Journ. Voy. H.M.S. Endeavour 46, 1773 ; C. 3 : 328 ; G. 3 ; 1095. *P. fascicularis* Lam. Encycl. Method. 1 : 372, 1785 ; FBI 6 : 485 ; DG. 200.

Fl. : September.

Vern. : Kegdi (Konk.) ; Pandano Odorifera (Port.).
Loc. : GOA : *Salcete* ; Gansua. DAMAN : Cale area.
 Rare, along road side and sandy coast.

ARACEAE

1. Scandent or climbing plants with adventitious aerial roots
 2. Leaves ovate to sub-orbicular ; flowers monoecious *Rhaphidophora*
 2. Leaves linear to oblong - lanceolate ; flowers hermaphrodite *Pothos*
1. Erect herbs without adventitious aerial roots
 3. Floating, stemless herbs ; leaves in a rosette - like tuft *Pistia*
 3. Submerged, aquatic or marshy plants ; leaves not in rosette
 4. Ovaries in one whorl *Cryptocoryne*
 4. Ovaries spirally arranged *Lagenandra*
 3. Terrestrial or epiphytic, tuberous herbs
 5. Epiphytic herbs bearing leafless bulbiferous shoots *Ramusatia*
 5. Terrestrial plants not bearing leafless bulbiferous shoots
 6. Leaves simple
 7. Leaves ovate - hastate or sagittate ; small herbs *Theriophonum*
 7. Leaves sub - orbicular, peltate ; robust herbs or shrubs *Colocasia*
 6. Leaves compound
 8. Leaflets pedately or radially arranged *Arisaema*
 8. Leaflets 3 - partite, each division again variously cut *Amorphophallus*

AMORPHOPHALLUS Blume

Leaves bulbiferous at the forks *bulbifer*
 Leaves not bulbiferous *campanulatus*

Amorphophallus bulbifer (Roxb.) Blume, Rumphia 1 : 148, 1835 ;
 FBI 6 : 515 ; DG. 201 ; C. 3 : 336 ; G. 3 : 1107. *Arum bulbiferum* Roxb.
 [Hort. Beng. 65, 1814 (*nom. nud.*) &] Fl Ind. 3 : 510, 1832.

Fl. : April.

Vern. : Ran-suram (Konk.).

Loc. : GOA : *Sanguem* : Molem-Belgaum Road ; near Anvaldem (Molem).

The species is common at Sawantwadi, Ratnagiri district.

Amorphophallus campanulatus (Roxb.) Blume ex Decaisne in Nouv. Ann. Mus. Par. 3 : 366, 1834 ; FBI 6 : 513 ; DG. 201 ; C. 3 : 336 : 1107. *Arum campanulatum* Roxb. Pl. Cor. 3 : 68, t. 272, 1819.

Ill. : Wt. Ic. t. 785.

It is found growing wild along the river banks and is mostly grown in the gardens for tuberous roots which are edible.

Excl. species :

Dalgado records the occurrence of *Amorphophallus sylvaticus* Kunth (under *Synantherias sylvatica* Schott) in Goa and Woodrow also cites Marmugao as the locality. However, it appears that both mistook *A. commutatus* (Schott) Engl., a common species along the Western ghats for *A. sylvaticus* and this needs verification by fresh collections from Goa.

ARISAEMA Mart.

Spadix with appendage much longer than the spathe ; leaves usually pedatisect, sometimes nearly radiate ; leaflets 5 (rarely 4) - 18 ; flowers monoecious or dioecious

tortuosum

Spadix with appendage shorter than the spathe, rarely exerted from the tube ; leaves always radiate ; leaflets 5 - 9 ; flowers monoecious

murrayi

Arisaema murrayi (Graham) Hook. in Bot. Mag. t. 4388, 1848 ; FBI 6 : 507 ; C. 3 : 332 ; S. 258. *Arum murrayi* Graham, Cat. 229, 1839.

Fl. : June - July. *Fr.* : August - October.

Loc. : NAGARHAVELI : Saily.

Rare.

A. tortuosum (Wall.) Schott in Schott & Endlich. Melete. 1 : 17, 1832 ; FBI 6 : 502 ; DG. 200 ; C. 3 : 331 ; G. 3 : 1105. *Arum tortuosum* Wall. Pl. As. Rar. 2 : 10, t. 111, 1830.

Fl. : June July. *Ill.* : Wt. Ic. t. 788.

Vern. : Amu-mani-gidda (Kan.) ; Sarpache-Kamdo (Konk.).

Very common along Western ghats as an undergrowth in forest. Dalgado records it for Goa as common, hence included.

COLOCASIA Schott

Colocasia esculenta (Linn.) Schott, Melet. 1 : 18, 1832 ; S. 231. *Arum esculentum* Linn. Sp. Pl. 935, 1753. *Colocasia antiquorum* Schott, Melet. 1 : 18, 1832 ; FBI 6 : 523 ; DG. 201 ; C. 3 : 340 ; G. 3 : 1102.

Fl. : August. *Ill.* : Wt. Ic. t. 786, f. 2.

Vern. : Alu (Mar.) ; Kachchi (Kan.) ; Terem (Konk.).

Loc. : GOA : *Salcete* : Raiyi village ; Chopora.

Cultivated throughout.

CRYPTOCORYNE Fisch.

Cryptocoryne retrospiralis (Roxb.) Fisch. ex Wydler in *Linnaea* 5 : 428, 1830 ; FBI 6 : 493 ; C. 3 : 329 ; G. 3 : 1098. *Ambrosinia retrospiralis* Roxb. *Fl. Ind.* 3 : 492, 1832.

Fl. : January. *Ill.* : Wt. Ic. t. 772 ; Subramanyam in *Aquatic angiosperms* (*Bot. Mon.* 3), t. 50, 1960.

Loc. : GOA : *Canacona* : near Ordofond, river. NAGARHAVELI : Chispana ; Dudení.

Rare on the river beds.

Dalgado records *Cryptocoryne roxburghii* Schott for Goa. Graham (1839) as well as Dalzell & Gibson (1861) also state that this species is common in Bombay Presidency but they have evidently misidentified *C. retrospiralis* as *C. roxburghii* and quite possibly Dalgado refers to *C. retrospiralis* only. However, *Cryptocoryne unilocularis* Wt. (= *C. roxburghii* Schott) also occurs in peninsular India.

LAGENANDRA Dalz.

Lagenandra ovata (Linn.) Thw. *Enum. Pl. Zeyl.* 334, 1864 ; G. 3 : 1099. *Arum ovatum* Linn. *Sp. Pl.* 967, 1753. *Lagenandra toxicaria* Dalz. in *Hook. Journ. Bot.* 4 : 289, 1852 ; FBI 6 : 495 ; DG. 200 ; C. 3 : 330.

Fl. : January - March. *Fr.* : October - December.

Vern. : Vatsanab (Mar.).

Occasional in the marshy areas.

PISTIA Linn.

Pistia stratiotes Linn. *Sp. Pl.* 963, 1753 ; FBI 6 : 497 ; DG. 200 ; C. 3 : 328 ; G. 3 : 1097.

Fl. : July - November. *Ill.* : Roxb. *Cor. Pl.* t. 268 ; Subramanyam in *Aquatic angiosperms* (*Bot. Mon.* 3) : 75, t. 49, 1962.

Vern. : Jelo (Konk.) ; Water soldiers (Eng.).

Loc. : NAGARHAVELI : Charchond forest.

Common in the tanks (Dalgado).

POTHOS Linn.

Pothos scandens Linn. Sp. Pl. 968, 1753 ; FBI 6 : 551 (*p. p.*) ; DG. 202 ; C. 3 : 339 (*p. p.*) ; G. 3 : 1110 ; S. 261.

Fl. & Fr. : November - April. *Ill.* : Wt. Ic. t. 776.

Vern. : Bemdarli (Konk.) ; Folhas do lanca (Port.).

Loc. : GOA : *Sanguem* : Moduka bungla jungle ; Orgoni (Netravali).
Canacona : Nadquem ; Nadquem-Butpal ; Nadquem, near Devasthan.

Occasional.

REMUSATIA Schott

Remusatia vivipara (Roxb.) Schott, Melet. 1 : 18, 1832 ; FBI 6 : 521 ; DG. 201 ; C. 3 : 339 ; G. 3 : 1104 ; S. 260. *Arum viviparum* Roxb. [Hort. Beng. 65, 1814 (*nom. nud.*) &] Fl. Ind. 3 : 496, 1832.

Fl. : February. *Fr.* : July. *Ill.* : Wt. Ic. t. 798.

Vern. : Rukh alum (Konk.)

Loc. : GOA : *Satari* : Palli forests ; Caranzol. *Sanguem* : Surla.
Canacona : Tudal. NAGARHAVELI : Dolara forests. DAMAN : Dabel.

Occasional on *Ficus* sp.

RHAPHIDOPHORA Hassk.

Rhaphidophora pertusa (Roxb.) Schott in Bonpl. 5 : 45, 1857 ; FBI 6 : 546 ; DG. 202 ; C. 3 : 342 ; G. 3 : 1109. *Pothos pertusus* Roxb. Fl. Ind. 1 : 455, 1832.

Ill. : Wt. Ic. t. 781.

Vern. : Dodda-tippali (Kan.) ; Ghonesvel (Konk.).

The species is sometimes grown in the gardens.

THERIOPHONUM Blume

Therophonum infaustum N.E.Br. in Journ. Linn. Soc. 18 : 260, 1880 ; FBI 6 : 513 ; G. 3 : 1102.

Fl. : October.

Loc. : GOA : *Canacona* : Ordofond Butpal, 6 km.

Rare.

Excl. species :

Dalgado mentions *Typhonium divaricatum* (Roxb.) Dcne. as occurring in Goa but possibly it may be another species of *Typhonium* common in Concan area (c. 3 : 333 & 334).

Cult. species :

Acorus calamus Linn. Sp. Pl. 324, 1753 ; FBI 6 : 555 ; C. 3 : 341.

Vern. : Vaikhand (Guj.)

Roots medicinal, especially as insect repellent.

Alocasia indica Schott in Oestr. Bot. Wochenbl. 410, 1854 ; FBI 6 : 525 ; C. 3 : 341.

Ill. : Wt. Ic. t. 794.

The stem and root stock are eaten.

Amorphophallus campanulatus (Roxb.) Blume ex Decaisne in Nouv. Ann. Mus. Par. 3 : 366, 1834 ; FBI 6 : 513 ; C. 3 : 336 ; *Arum campanulatum* Roxb. Pl. Cor. 3 : 68, t. 272, 1819.

Ill. : Wt. Ic. t. 785.

Vern. : Suran (Guj.).

Cultivated for the large tubers which are eaten.

Colocasia esculenta (Linn.) Schott, Melet. 1 : 18, 1832 ; S. 261. *Arum esculentum* Linn. Sp. Pl. 965, 1753. *Colocasia antiquorum* Schott, Melet. 1 : 18, 1832 ; FBI 6 : 523 ; C. 3 : 340.

Vern. : Alu (Guj.).

Cultivated for tubers which are eaten.

NAJADACEAE

NAJAS Linn.

Najas minor (Pers.) All. Fl. Pedem. 2 : 221, 1785 ; FBI 6 : 569 ; C. 3 : 352. *Fluvialis minor* Pers. Syn. 2 : 530, 1807.

Fl. : September. *Ill.* : Rendle in Pflanzenr. 7 : 14, f. 4, s-t, 1901.

Loc. : DIU : Nagoa, air port.

Rare.

ERIOCAULACEAE

ERIOCAULON Linn.

1. Aquatic, submerged plants ; leaves linear ; anthers yellow or white

2. Plants of marshy areas ; leaves capillar, 2.5 - 5 cm ; scapes 5 - 15 cms long ; floral bracts glabrous *cinereum*
2. Plants of running water ; leaves linear, 10 - 23 cm ; scapes upto 30 cm long ; floral bracts bearded, villous or pubescent *dalzellii*
1. Plants of wet places (terrestrial) ; leaves lanceolate ; anthers black or greenish
3. Floral bracts glabrous, scarious
4. Heads globose
5. Floral bracts much longer than the flowers giving the head a glistening white echinulate appearance *stellulatum*
5. Floral bracts short closely imbricate ; peduncle thickened below head *vanheurckii*
4. Heads sub-globose or hemispheric
6. Receptacles glabrous ; leaves linear - oblong or ensiform ; sepals 2
7. Leaves linear-oblong with cuspidate apex *cuspidatum*
7. Leaves ensiform, subacute obtusely acuminate *truncatum*
6. Receptacles sparsely hairy ; Leaves linear to oblong-lanceolate ; sepals 3 *sexangulare*
3. Floral bracts white or grey, hairy on the back otherwise dark
8. Receptacle glabrous
9. Floral bracts oblong-obovate, truncate or rounded *xeranthemum*
9. Floral bracts acuminate giving the head an echinate appearance *robusto-brownianum*
8. Receptacle villous
10. Involucre bracts longer than the floral bracts and the flowers *dianae*
10. Involucre bracts shorter than the floral bracts and the flowers
11. Female sepals 3 ; heads grey or white *collinum*
11. Female sepals 2 ; heads woolly white *sedgwickii*

Eriocaulon cinereum R. Br. Prodr. 254, 1810 ; S. 262. *E. sieboldianum* Sieb. & Zucc. ex Steud. Syn. Pl. Cyp. 272, 1855 ; FBI 6 : 577 ; C. 3 : 357 ; G. 3 : 1127.

Fl. : September - November. *Ill.* : Fyson in Journ. Ind. Bot. 3 : Pl. 50, 51, 1922.

Loc. : GOA : *Bicholim* : Usgao. *Quepem* : Budsari - Goundugarha. *Canacona* : Tudal.

Occasional in marshy areas.

Eriocaulon collinum Hook. f. in FBI 6 : 584, 1894 ; G. 3 : 1128.

Fl. : March. *Ill.* : Fyson (l. c.) 2 : f. opp. p. 207, 1921.

Loc. : GOA : *Sanguem* : Talem Patiem. *Canacona* : Ordofond, Walgon river.

Rare, along river and streams.

E. cuspidatum Dalz. in Kew Journ. Bot. 3 : 281, 1851 ; FBI 6 : 581 ; C. 3 : 359 ; G. 3 : 1126.

Fl. : August. : November. *Ill.* : Fyson l. c. 2 : 317, t. 38, 1921.

Loc. : GOA : *Ilhas* : Chimbel reservoir Brahmapuri temple. *Salcete* : Madgaon. Marmugao : Nuvem hills, Varne plateau. *Canacona* : Tudal.

Occasional in the puddles.

E. dalzellii Koern. in Linnaea 27 : 605, 1856 ; FBI 6 : 580. *E. rivulare* Dalz. in Kew Journ. Bot. 3 : 280, 1851 (*non* Don, 1849) ; C. 3 : 355.

Fl. : November. *Ill.* : Fyson in Journ. Ind. Bot. 3 (1), Pl. 46, 1922.

Loc. : GOA : *Sanguem* : Molem ; Patrem.

Rare, near a stream.

E. dianae Fyson in Journ. Ind. Bot. 2 : 259, t. 11, 1921 ; G. 3 : 1128 ; S. 262.

Fl. : August. November.

Loc. : GOA : *Pernem* : Amberem. *Satari* : Wadicha Dongar (Caranzol) Marmugao : Vasco Cortallim. *Sanguem* : Near Anvaldem (Molem) ; Dudhsagar ; Patrem. *Canacona* : Ordofond, along river bank. NAGARHAVELI : Khanvel ; Chirpana area ; Umberkoi ; Morkhal ; Nana Randha Velegaon ; DADRA, DAMAN : Dabel.

Common in dried up ditches, river banks and cultivated fields.

E. dianae Fyson var. *longibracteata* Fyson in Journ. Ind. Bot. 2 : 259, Pl. 13, 1921.

Loc. : GOA : *Satari* : Tanem ; Nanecha Dongar ; Codal ; Satrem. NAGARHAVELI : Dhapsa.

E. robuste - brownianum Ruhl. in Engler Pflanzenreich 4 (30) : 77, 1903 ; Fyson in Journ. Ind. Bot. 2 : 264, t. 18, 1921 ; G. 3 : 1127.

Loc. : GOA : *Sanguem* : Surla.

E. sedgwickii Fyson in Journ. Ind. Bot. 2 (6 & 7) : 230, t. 16, 1921.

Fl. : September.

Loc. : GOA : *Pernem* : Pernem Agarvado, about 3 km.

Rare, in association with *Smithia*, *Murdannia* etc.

Eriocaulon sexangulare Linn. Sp. Pl. 87, 1753 ; FBI 6 : 580 ; C. 3 : 359 ; G. 3 : 1126.

Fl. : November. *Ill.* : Fyson, *l. c.* 2 : Pl. 39, 40, 1921.

Loc. : GOA : *Ilhas* : Panjim - Margoa. *Ponda* : Verem. *Sanguem* : Dudhsagar ; Castle rock on way to Anmode.

Rare, in dried rice fields.

E. stellulatum Koern. in Linnaea, 27 : 620, 1856 ; FBI 6 : 579 ; Fyson in Journ. Ind. Bot. 2 : 617, 1921 ; G. 3 : 1126.

Loc. : GOA : *Satari* : Waghem ; *Sanguem* : Surla ; Ravanacha Dongar ; Warlem ; Castle rock on way to Anmode.

E. truncatum Ham. ex Mart. in Wall. Pl. As. Rar. 3 : 29, 1832 ; FBI 6 : 578 ; G. 3 : 1127.

Loc. : GOA : *Sanguem* : Verlem ; Cumbari.

E. vanheurckii Muell. Arg. in Heurck. Obs. Bot. 2 : 98, 1870 ; G. 3 : 1127 ; S. 264.

Fl. : August - October. *Ill.* : Fyson, *l. c.* 2 : Pl. 41, 1921. (under *E. thomasi* Fyson).

Loc. : GOA : *Bicholim* : Usgao. *Bardez* : Sukur forest. *Salcete* : Verna. *Marmugao* : Vasco hills - Navy centre. *Canacona* : Ordofond-Butpal. *Sanguem* : Surla ; Verlem (Buta baicha Dongar).

Occasional, in the shady puddles in association with *Murdannia* sp.

E. xeranthemum Mart. in Wall. Pl. As. Rar. 3 : 29, 1832 ; FBI 6 : 584 ; C. 3 : 362 ; G. 3 : 1127.

Fl. : August. *Ill.* : Fyson, *l. c.* 2 : f. opp. p. 201, 1921.

Loc. : GOA : *Canacona* : Ordofond Butpal. *Sanguem* : Molem-Belgaum Road ; Dudhsagar.

Rare, in moist area.

CYPERACEAE

1. Flowers unisexual, primary branches of the inflorescence usually paniculate or reduced nearly to a spike
2. Hypogynium usually well developed forming a disc ; nut not enclosed in an utricle
2. Hypogynium not forming a disc ; nut enclosed in a well developed utricle
1. Flowers bisexual, primary branches of the inflorescence usually umbellate or spikelets solitary or in contracted heads
3. Flowering glumes all distichous ; hypogynous bristles absent

Scleria

Carex

4. Rachilla persistent, if rarely deciduous, keels of the nut bearing glumes not winged *Cyperus*
4. Rachilla deciduous ; keels of the nut bearing glumes always winged *Courtoisia*
3. Flowering glumes spirally arranged ; hypogynous bristles often present
5. Style bases swollen with a constriction above its point of insertion on the nut
6. Leaves absent ; hypogynous bristles present *Elaeocharis*
6. Leaves present usually at the base of the stem ; hypogynous bristles absent
7. Spikelets few flowered, clustered in heads *Rhynchosporia*
7. Spikelets many flowered, solitary, in umbels or congested corymbs
8. Style bases deciduous, leaving a tumor on the nut *Bulbostylis*
8. Style often persistent, if deciduous not leaving a tumor on the nut *Fimbristylis*
5. Style bases not swollen, gradually passing into the nut
9. Glabrous, leafless or leafy at the base only ; nuts trigonous, not beaked *Scirpus*
9. Glabrous or puberulus, leafy herbs ; nut with a long or short beak
10. Spikelets in dense, axillary, pedunculate and terminal clusters ; glumes awned *Fuirena*
10. Spikelets in broad, sub-umbellate panicles with spreading branches ; glumes not awned *Hypolytrum*

BULBOSTYLIS Kunth

- Spikelets in capitate heads *barbata*
 Spikelets in lax, simple or compound umbels *densa*

Bulbostylis barbata (Rottb.) C.B.Cl. in FBI 6 : 651, 1893 ; G. 3 : 1153. *Scirpus barbatus* Rottb. Progr. 27, 1772. *Stenophyllus barbatus* (Rottb.) Cooke, Fl. Pres. Bombay 2 : 887, 1908.

Fl. : September.

Loc. : GOA : Ilhas : Panjim. DAMAN : Cataria.

Rare on sandy soil.

B. densa (Wall.) Hand. - Mazz. in Karsten & Schenk, Vegetationsb. 20, 7 : 16, 1930. *Scirpus densus* Wall. in Roxb. Fl. Ind. 1 : 231, 1820. *Bulbostylis capillaris* Kunth var. *trifida* C.B.Cl. in FBI 6 : 652, 1893 ; G. 3 : 1153.

Fl. : August.

Loc. : GOA : *Satari* : Ambeachagol. *Marmugao* : Navem hills.

Rare on the gravelly hill slope.

The species superficially resembles *Fimbristylis tenera* R. & S. but can be differentiated by nut morphology.

CAREX Linn.

Carex filicina Nees in Wt. Contrib. 123, 1834 ; FBI 6 : 717 ; G. 3 : 1169.

Loc. : GOA : *Satari* : Ambeachagol ; Kutachemal ; Ivorem. *Sanguem*: Verlem ; Molem Belgaum Road ; Castle rock on way to Anmode.

Fairly Common.

COURTOISIA Nees

Courtoisia cyperoides Nees in Wt. Contrib. Bot. Ind. 92, 1834 ; FBI 6 : 625 ; C. 3. 391 ; G. 3 : 1143.

Loc. : GOA : *Satari* : Tanem ; Nanicha Dongar ; Codal.

Occasional.

CYPERUS Linn.

- | | |
|---|----------------------|
| 1. Plants floating in water ; base or angles of the nut corky | <i>cephalotus</i> |
| 1, Plants rooted in marshes, dry soil or sand ; nut not corky | |
| 2. Stigmas 3 ; nut trigonous or triquetrous | |
| 3. Rhachilla of spikelets persistent | |
| 4. Spikelets digitate or clustered, not spicate | |
| 5. Annuals or biannuals | |
| 6. Spikelets innumerable in globose heads | <i>difformis</i> |
| 6. Spikelets fewer in each head | |
| 7. Whole plant yellowish ; nut white when ripe | <i>flavidus</i> |
| 7. Whole plant greenish ; nut brown when ripe | |
| 8. Rhizome slender or creeping ; nut pale brown, smooth | <i>haspan</i> |
| 8. Rhizome absent ; nut white, minutely verrucose when ripe | <i>tenuispica</i> |
| 5. Perennials with woody rhizome | |
| 9. Inflorescence of one head | |
| 10. Stamen 1, spikelets 10-18 flowered | <i>leucocephalus</i> |

10. Stamens usually 3, spikelets 1 - 16 flowered
11. Spikelets 1 - 8 flowered *cyperoides*
11. Spikelets 8 - 16 flowered *arenarius*
9. Inflorescence umbellate *conglomeratus*
4. Spikelets distinctly spicate or racemose
12. Rhachilla of spikelets not or hardly winged
13. Annuals with tufted stem
14. Glumes obtuse or minutely mucronate, not cuspidate *iria*
14. Glumes cuspidate or aristate
15. Spikelets strongly compressed ; nut about half as long as the glume *compressus*
15. Spikelets not compressed ; nut less than half the length of the glume *squarrosus*
13. Perennials with woody rhizome and often long stolons
16. Leaves not more than 15.24 cm long *malaccensis*
16. Leaves more than 30.48 cm long
17. Glumes remote ; nut nearly as long as the glume *nutans*
17. Glumes not remote ; nut half as long as the glume *eleusinoides*
12. Rhachilla of spikelets distinctly winged
18. Rhizome stoloniferous
19. Leaves short, rarely half as long as the stem ; stem more or less articulate when dry *corymbosus*
19. Leaves long, more than half as long as the stem or longer ; stem not articulate
20. Leaves radical *rotundus*
20. Leaves arising from the stem *bulbosus*
18. Rhizome not stoloniferous *exaltatus*
3. Rhachilla of spikelets disarticulating above the 2 lowest glumes
21. Spikelets bearing 3 - 6 nuts ; nut ellipsoid, not beaked ; margins of glumes hyaline ; rhachilla with short, winged internodes *jvanicus*
21. Spikelets bearing 4 - 14 nuts ; nut oblanceolate - oblong, distinctly beaked ; margins of glumes not hyaline ; rhachilla with oblong persistent wings *compactus*
2. Stigmas 2
22. Fruit a dorsally compressed nut, ellipsoid or trigonous, orange *michelianus* subsp. *pygmaeus*

22. Fruit a laterally compressed nut, ovoid, black or brown
23. Rhachilla not disarticulating and falling off whole
24. Superficial cells of the nut longitudinally oblong or elliptic ; nut appearing zonate or muricate
25. Ridges obscure, not white
26. Spikelets lanceolate, 20 - 60 flowered ; nut obovoid, black *diaphanus*
26. Spikelets linear - oblong, up to 20 flowered ; nut globose - ovoid, brown *malabaricus*
25. Ridges glistening, white *flavescens*
24. Superficial cells of the nut nearly square ; nut appearing regularly dotted
27. Roots rhizomatous, creeping ; stem clothed with leaf sheath for 1/3 - 3/4 of their length *sanguinolentus*
27. Roots fibrous ; stem clothed with leaf sheath, only a little way above the base
28. Annuals ; glumes not white margined
29. Spikelets 6 - 10 flowered ; rhachilla winged ; stamens 2 - 3 *hyalinus*
29. Spikelets 20 - 50 flowered ; rhachilla not winged
30. Stamen 1 ; nut ellipsoid - oblong or sub - obovoid, very minutely apiculate *pumilus*
30. Stamens 2 ; nut broadly or narrowly obovoid, rounded and apiculate at apex *globosus*
28. Perennials ; glumes conspicuously white margined *albomarginata*
23. Rhachilla disarticulating and falling off
31. Rhizome very short ; stem close *metzii*
31. Rhizome elongate ; stem spaced, rarely close
32. Nut bearing glume winged in the upper half of keel *kyllinga*
32. Nut bearing glume not winged in the upper half of keel *brevifolia*

Cyperus albomarginata Mart. & Schrad. ex Nees in Mart. Fl. Bras. 2 (1) : 9, 1842 ; C. 3 : 371 ; S. 265. *Pycnus albomarginatus* Nees in Mart. Fl. Bras. 2 (1) : 9, 1842 ; FBI 6 : 594 ; G. 3 : 1133.

Fl. : August. Ill. Kuekenh in Pflanzenreich 101 : 258, f. 42, E - H.

Loc. : GOA : Salcete : Near Margoa ; Margoa rest house.

Rare, in swampy areas of the fields.

Cyperus arenarius Retz. Obs. fasc. 4 : 9, 1786 ; FBI 6 : 602 ; C. 3 : 378.

Fl. : September.

Loc. : DAMAN : Marvor ; Cataria.

Rare, on sandy beach.

C. brevifolius (Rottb), Hassk. Cat. Hort. Bogor. 24, 1844 ; S. 265. *Kyllinga brevifolia* Rottb. Descr. & Icon. 13, t. 4, f. 3, 1773 ; DG. 203 ; FBI 6 : 588 ; G. 3 : 1130.

Fl. & Fr. : August September. *Ill.* : Rottb. Ic. 13, t. 4, f. 3.

Vern. : Musta (Konk.) ; Conquinha (Port.).

Loc. : GOA : *Satari* : Satrem. *Sanguem* : Ghatte (Netraveli) ; Patele ; Bavanbunda (Molem Belgaum Rd.). NAGARHAVELI : Chispana area. DAMAN : Bimpur.

Rare in waste lands.

C. bulbosus Vahl, Enum. 2 : 342, 1806 ; FBI 6 : 611 ; C. 3 : 384 ; Pav. 229.

Fl. & Fr. : September. *Ill.* : Kuekenth *l.c.*, 101: 123, f. 15C E, 1936.

Loc. : DAMAN : Marvor.

Rare, near the sea shore and in cultivated fields.

C. cephalotus Vahl, Enum. 2 : 311, 1806. FBI 6 : 597 ; DG. 203 ; G. 3 : 1139.

Fl. : May.

Vern. : Bedar musta (Konk.).

The species is found floating in the tanks. Dalgado records it from Goa area.

C. compactus Retz. Obs. 5 : 10, 1789. *C. dilutus* Vahl, Enum. 2 : 357, 1806 ; C. 3 : 389. *Mariscus microcephalus* Presl, Rel. Haenk. 182, 1830 ; FBI 6 : 624. *M. compactus* Druce in Rep. Bot. Exch. Club Brit. Isl. 634, 1916 ; G. 3 : 1143.

Fl. : October.

Loc. : GOA : *Bicholim* ; *Pilegao*. *Ponda* : Ponda - Margoa. *Sanguem* : Patrem.

Rare along back waters.

C. compressus Linn. Sp. Pl. 46, 1753 ; FBI 6 : 605 ; C. 3 : 379 ; G. 3 : 1140 ; S. 265.

Fl. & Fr. : August October. *Ill.* : Kuekenthal in Pfreich. 156, f. 4A-D, 1936.

Loc. : GOA : *Marmugao* : Marmugao harbour hills. *Canacona* : Butpal. DAMAN : Cataria.

Occasional on shady, rocky places.

Cyperus conglomeratus Rottb. *Descrip. et Icon.* 21, t. 15, f. 7, 1773 ; FBI 6 : 602 ; C. 3 : 379.

Fl. & Fr. : Nov. *Ill.* : Kuekenth. *l.c.* 273, f. 30.

Loc. : GOA : *Ilhas* : Panjim coast.

Rare.

C. corymbosus Rottb. *Descrip. et Icon.* 42, t. 7, f. 4, 1773 ; FBI 6 ; 612 ; G. 3 : 1140 ; S. 298.

Fl. & Fr. : August - November. *Ill.* : Kuekenth. in *Pflanzenr.* 80, f. 10, 1936,

Loc. : GOA : *Satari* : Gulauli. *Sanguem* : Patrem ; Perichetem, Cumbari. NAGARHAVELI : Nana Randha ; Jamunpada forest.

C. cyperoides (Linn.) O. Kuntze, *Rev. Gen.* 2 : 333, 1898 ; S. 265. *Scirpus cyperoides* Linn. *Mant.* 2 : 181, 1771. *Meriscus sieberianus* Nees in *Linnaea* 9 : 289, 1835 ; FBI 6 : 622 ; G. 3 : 1143.

Fl. & Fr. : September - October. *Ill.* : Clarke, *Illustr. Cyp.* t. 23, f. 5 6.

Loc. : GOA : *Bicholim* : Pilegao ; Ordofond - Butpal ; Palle. *Satari* : Periche Tem, Cumbari., Nanecha Dongar ; Codal : Wadicha (Caranzol) ; *Satrem*. *Sanguem* : Bavanbuda, Molem-Belgaum Rd. ; Ghatt. (Netravali) ; *Sanguem* ; Dudhsagar. NAGARHAVELI : Dolara Forest ; Morkhal ; Dhapsa ; Umberkoi.

Occasional, in rice fields and in forest undergrowth.

C. diaphanus Schrad. ex. Roem. & Schult. *Mant.* 2 : 477. 1824. *C. latespicatus* Boeck. in *Fl.* 42 : 441, 1859 ; C. 3 : 368 ; S. 267. *Pycneus latespicatus* C.B.Cl. in FBI 6 : 590, 1893.

Fl. & Fr. : September.

Loc. : DAMAN : Marvor.

Rare in the moist fields.

C. difformis Linn. *Cent. Pl.* 2 : 6 & *Amoen. Acad.* 3 : 302, 1760 ; FBI 6 : 599 ; C. 3 : 376 ; G. 3 : 1139 ; S. 266.

Fl. & Fr. : September - November. *Ill.* : Kuekenth. *l.c.* 238, f. 27 F - H, 1936.

Loc. : GOA : *Bardez* : Baga jungle. *Ilhas* : Panaji ; Santacruz village rice fields. NAGARHAVELI : Dudeni ; Silvassa, Daman ganga river bed ; Khanvel ; Nana Randha. DADRA. DAMAN : Marvor.

Common on gravelly river beds and fallow rice fields.

C. eleusinoides Kunth, *Enum.* 2 : 39, 1837 ; FBI 6 : 608 ; C. 3 : 382 ; G. 3 : 1140 ; S. 298.

Fl. & Fr. March. October.

Loc. : GOA : *Sanguem* : Modka bunglow.

Occasional in moist areas.

Cyperus exaltatus Retz. Obs. 5 : 11, 1789 ; FBI 6 : 617 ; DG. 204 ; C. 3 : 386 ; G. 3 : 1141 ; S. 266.

Fl. : September. *Ill.* : Kuekenth. *l. c.* 65, f. 9A - F.

Vern. : Pen (Konk.).

Loc. : NAGARHAVELI : Saily ; Vehegaon. DAMAN : Dundorta.

Occasional along the banks of streams and in moist areas.

C. flavescens Linn. Sp. Pl. 68, 1753 ; S. 266. *Pycneus flavescens* Reich. Fl. Germ. Exc. 72, 1830 ; FBI 6 : 589.

Fl. : August.

Loc. : GOA : *Sanguem* : Ugem village.

Rare along roadside ditches.

C. flavidus Retz. Obs. fasc. 5 : 13, 1789 ; FBI 6 : 600 ; C. 3 : 375.

Fl. & Fr. : August October.

Loc. GOA. : *Satari* : Gulauli. *Sanguem* : Patrem.

Common in rice fields.

C. globosus All. Pl. Pedem. 49, 1789 ; C. 3 : 370 ; S, 266. *Pycneus capillaris* Nees in Linnaea 9 : 283, 1834 ; FBI 6 : 591.

Fl. & Fr. : September.

Loc. : GOA : *Quepem* : Colomba Rivona. Castle rock on way to Anmode.

Rare.

C. haspan Linn. Sp. Pl. ed. 1 : 45, 1753 ; FBI 6 : 600 ; C. 3 : 376 ; G. 3 : 1139.

Fl. : November. *Ill.* : Kuekenth. *l. c.* 246, f. 28 E G.

Loc. : GOA : *Sanguem* : Avelde jungle, Molem.

Rare along a stream.

C. hyalinus Vahl, Enum. Pl. 2 : 329, 1806 ; C. 3 : 369. *Pycneus pumilus* Nees in Linnaea 9 : 283, 1835 ; FBI 6 : 591.

Fl. & Fr. : September.

Loc. : DAMAN : Cale area.

Rare, among Mangroves.

Cyperus iria Linn. Sp. Pl. 45, 1753 ; FBI 6 : 606 ; C. 3 : 380 ; G. 3 ; 1140 ; S. 266. *C. iria* var. *paniciformis* C.B.Cl. in FBI 6 : 607, 1893.

Fl. : August.

Loc. : GOA : *Pernem* : Cargao. *Satari* : Tanem ; *Satrem*. *Bardez* : Baga jungle. *Marmugao* : Vasco hills, near Navy camp ; Nuvem. *Sanguem* : Molem ; Belgaum Road ; Bavanbunda. *Canacona* : Angidiv. NAGARHAVELI ; Jamunpada forest ; Nana Randha ; Silvassa ; Daman ganga river bed ; Khanvel. DADRA. DAMAN : Marvor, Bamoli.

Common in moist area of open fields.

C. javanicus Houtt. Nat. Hist. 2, 13 : Aanw. Pl. (1), t. 88, f. 1, 1782. *C. pennatus* Lam. Illust. 1 ; 144, 1791 ; C. 3 : 389. *Mariscus albescens* Gaud. in Freyc. Voy. Bot. 415, 1826 ; FBI 6 : 623 ; *M. pennatus* D. Don : G. 3 : 389.

Fl. : November. *Ill.* : Kuekenth. *l.c.* 479, f. 53 A G, 1936.

Loc. : GOA : *Bicholim* : After Amona ferry crossing. *Bardez* : Muddy flat on the other side of Kolvelly ferry crossing. *Ponda* : 5 miles from Ponda near Borim bridge, on way to Margoa.

Occasional on moist situations and along river banks.

C. kyllinga Endl. Cat. Hort. Vindob. 1 : 94, 1842 ; S. 267. *Kyllinga monocephala* Rottb. Descr. & Icon. 13, t. 4, 1773 (excl. syn. *nonnullis*) ; FBI 6 : 588 ; C. 3 : 390 ; G. 3 : 1130.

Fl. : August April. *Ill.* : Kuekenth. *l.c.* 606, f. 64 C - D, 1936.

Loc. : GOA : *Satari* : Palle. *Bardez* : Nagoa ; Chopora. *Marmugao* : Vasco Cortallim. *Ponda* : Qurem. *Canacona* : Barsare village ; Angidiv.

Frequent in sugarcane fields.

C. leucocephalus Retz. Obs. 5 : 11, 1789 ; FBI 6 : 602 ; C. 3 : 377 ; G. 3 : 1140 ; S. 267.

Fl. : August. *Ill.* : Kuekenth. *l.c.* 279, f. 31 A D.

Loc. : GOA : *Canacona* : Ordofond Tudal.

Rare.

C. malabaricus (Clarke) Cooke, Fl. Pres. Bomb. 2 : 856, 1908 ; S. 267. *Pycneus malabaricus* Clarke in Journ. Linn. Soc. 34 : 12, 1898.

Fl. & *Fr.* : September.

Loc. : GOA : *Sanguem* : Dudal.

Rare.

Closely allied to *C. diaphanus* Schrad. ex R. & S. and often misidentified. The denser inflorescence, fewer spikelets and nut morphology distinguish *C. malabaricus* from *C. diaphanus*. In *C. malabaricus* the

nuts are 1.2-1.4 mm, broadly ovoid with distinct transverse ridges whereas in *C. diaphanus* nuts are \pm 1 mm, rotund and with obscure ridges.

Cyperus malaccensis Lam. *Illust.* 1 : 146, 1791 ; FBI 6 : 608 ; DG. 203 ; C. 3 : 382 ; G. 3 : 1140.

Fl. & Fr. : October - November.

Vern. : Loho (Konk.) ; Junca (Port.).

Loc. : GOA. *Bicholim* : Amona ferry crossing, bank of the river ; Condola area ; Pilegao ; Tirla. *Bardez* : Kolvelly ferry crossing.

Occasional in marshy areas.

C. metzii (Hochst.) Mattf. & Kuekenth in *Pflanzenr.* 101 : 612, 1936 ; S. 267. *Kyllinga squamulata* Thonn. ex Vahl, *Enum.* 2 : 381, 1806 ; FBI 6 : 589 ; G. 3 : 1130. *K. metzii* Hochst. ex Steud. *Syn. Cyp.* 70, 1855.

Fl. : August - September. *Ill.* : C.B.Cl. *Ill. Cyp.* t. 1, f. 5-7.

Loc. : Goa : *Salcete* : Margoa, Bordo village. DAMAN : Cataria.

Rare, on sandy soil in the shade of a palm.

C. michelianus (Linn.) Link subsp. *pygmaeus* (Rottb.) Aschers & Graebn. *Syn.* 2(2) : 273, 1930 ; S. 267. *C. pygmaeus* Rottb. *Descr. & Icon.* 20, t. 14, f. 4-5, 1773 ; C. 3 : 372. *Juncellus pygmaeus* C.B.Cl. in FBI 6 : 596, 1893 ; G. 3 : 1133.

Fl. : September. *Ill.* : Kuekenth. *l.c.* 313, f. 35 F - G, 1936.

Loc. : GOA : *Satari* : Nanecha Dongar ; Codal. NAGARHAVELI : Bank of Daman ganga river on way to Kawcha ; Dudeni.

Rare on river beds.

C. nutans Vahl, *Enum.* 2 : 363, 1806, FBI 6 : 607 ; C. 3 : 381 ; S. 267.

Fl. & Fr. : September. *Ill.* : Kuekenth. *l.c.*, 101 : 37, f. 5 A - D. 1936.

Loc. : NAGARHAVELI : Dudeni. DAMAN : Regunvara.

Occasional on river beds.

C. pumilus Linn. *Cent. Pl.* 2 : 6, 1756 & Amoen. *Acad.* 4 : 302, 1788 ; C. 3 : 370 ; S. 267 ; *Pycneus nitens* (Retz.) Nees, *Nov. Act. Ac. Nat. Cur.* 19, Suppl. 1 : 53, 1843 ; FBI 6 : 591, 1893. *P. pumilus* Don, in *Bibl. Bot.* 85 : 417, 1916 ; G. 3 : 1132.

Fl. & Fr. : September. *Ill.* : Kuekenth. *l.c.* 377, f. 44 A - E, 1936.

Loc. : GOA : *Satari* : Pale village. *Salcete* : Near Margoa. *Sanguem* : Patrem ; Bavanbunda ; Molem-Belgaum Road. *Qupem* : Budsari-Goundugarha. NAGARHAVELI : Silvassa ; Damanganga river bed ; Saily ; Khanvel ;

Chispana ; Velugaon ; Nana Randha ; Bank of Damanganga river on way to Kawcha. DADRA : Tinga village. DAMAN : Marvor.

Common on moist, grassy areas.

Cyperus rotundus Linn. Sp. Pl. 45, 1753 ; FBI 6 : 614 ; DG. 204 ; C. 3 : 385 ; G. 3 : 1140 ; S. 268 ; Pav. 229.

Fl. : March August. *Ill.* : Kuekenth. *l.c.* 109, f. 13.

Vern. : Motha (Mar.) ; Tungegadde (Kan.) ; Barik moth (Konk.) ; moth (Guj.).

Loc. : GOA : *Canacona* : Barsare village, near Tudal. NAGARHAVELI : Chispana area ; Khanvel. DADRA. DAMAN : Fort area ; Bamoti ; Dundorta.

Rare on moist soil in the fields.

C. sanguinolentus Vahl, Enum. 2 : 351, 1806 ; C. 3 : 369 ; S. 268. *Pycreus sanguinolentus* Nees in Linnæa 9 : 283, 1836 ; G. 3 : 1132.

Fl. : September.

Loc. : GOA : *Satari* : Valpoi, Nasarde village ; Satrem. *Ponda* : Near Sancoale. *Sanguem* : Bavanbunda (Molem - Belgaum Road). NAGARHAVELI : Sindhoni forest. DADRA.

Rare in the moist areas of fields.

C. squarrosus Linn. Cent. Pl. 2 : 6, 1756. *C. aristatus* Rottb. Progr. 22, 1772 ; FBI 6 : 606 ; G. 3 : 380 ; G. 3 : 1440 ; S. 265.

Fl. : August September. *Ill.* : Kuekenth. *l.c.* 502, f. 55 F J, 1936.

Loc. : GOA : *Marmugao* : Marmugao harbour. DAMAN : Cale area.

Rare in rocky, open areas.

C. tenuispica Steud. Syn. 2 : 11, 1855 ; G. 3 : 1139. *C. flavidus* (non Retz.) ; FBI 6 : 600 ; C. 3 : 375.

Fl. : March November. *Ill.* : Kuekenth. *l.c.* 246, f. 28 A D.

Loc. : GOA : *Satari* : Nandore, near the river. *Bardez* : Pelernum village. *Ponda* : Verem. *Canacona* : Ordofond Butpal.

Rare on sandy river banks.

ELBOCHARIS R. Br.

Bristles glistening white, as long as the nut ; style base saucer - shaped

atropurpurea

Bristles reddish - brown, usually longer than the nut ; style base cone - like

geniculata

Eleocharis atropurpurea Kunth, Enum. 2 : 151, 1837 ; FBI 6 : 627 ; C. 3 : 403 ; S. 269.

Fl. & Fr. : September.

Loc. : NAGARHAVELI : Silvassa, Daman ganga river bed. DAMAN : Dabel.

Occasional on gravelly river beds.

E. geniculata (Linn.) Roem. & Schult. Syst. veg. 2 : 150, 1817. *Scirpus geniculatus* Linn. Sp. Pl. 1 : 48, 1753. *Eleocharis capitata* R. Br. Prodr. 225, 1810 ; FBI 6 : 627 ; C. 3 : 404 ; G. 3 : 1145.

Fl. & Fr. : September - November.

Loc. : GOA : *Ilhas* : Santacruz village, rice fields. NAGARHAVELI : Dhapsa. DAMAN : Marvor.

Occasional in fallow rice fields.

In the absence of nuts, dwarf forms of *Eleocharis geniculata* are indistinguishable from *E. atropurpurea*. However, in mature specimens these two species are distinguished by the nature of hypogynous bristles.

FIMBRISTYLIS Vahl

1. Spikelets solitary, rarely 2 or 3
 2. Leafless or nearly so ; bracts absent
 3. Nut narrowly elongate, cylindrical, curved *tetragona*
 3. Nut ovoid, biconvex with 6 - 8 transverse corrugations *acuminata*
 2. Leaves several ; bracts present
 4. Glumes boat - shaped, slightly keeled in fruit ; nut yellow dotted with white spots ; sessile *polytrichoides*
 4. Glumes not boat - shaped nor keeled ; nut white with a patch of brown on each face, long stalked *schoenoides*
1. Spikelets many, umbellate
 5. Stigmas 2 ; nut flattened
 6. Margins of glumes broadly white hyaline *cymosa*
 6. Margins of glumes not hyaline
 7. Small, annual, tufted herbs ; glumes glabrous
 8. Glumes prominently keeled ; nuts smooth *aestivalis*
 8. Glumes not keeled ; nuts ribbed and tuberculate *dichotoma*
 7. Tall, perennial herbs ; glumes ferruginous brown, puberulous in the apical half, glabrous below *ferruginea*
 5. Stigmas 3 ; nut trigonous
 9. Rhizome small ; spikelets solitary, glumes much keeled, acute, cuspidate ; rachilla with persistent wing

10. Style pubescent *ovata*
 10. Style glabrous *complanata*
9. Rhizome absent ; spikelets many ; glumes slightly keeled but not cuspidate ; rachilla not winged
11. Glumes spirally imbricate
 12. Stems 15.24 cm - 0.60 m long ; stamens 3 *quinquangularis*
 12. Stems less than 15.24 cm long ; stamen 1 *woodrowii*
11. Glumes distichous
 13. Slender annual ; glumes acute ; nuts narrowly obovate, yellowish brown *miliacea*
 13. Small tufted annual ; glumes obtuse ; nuts globose-obovoid, greyish - white
 14. Nuts sparsely tuberculate *glabra*
 14. Nuts not sparsely tuberculate *tenera*

Fimbristylis acuminata Vahl, Enum. 2 : 285, 1806 ; FBI 6 : 631 ; G. 3 : 1150.

Fl. & Fr. : August.

Loc. : GOA : *Sanguem* : Bhatal forest, 12 km north of Sanguem. NAGARHAVELI : Chispana area.

Rare.

F. aestivalis (Retz.) Vahl, Enum. 2 : 288, 1806 ; FBI 6 : 637 ; C. 3 : 395 ; S. 268. *Scirpus aestivalis* Retz. Obs. 4 : 12, 1786.

Fl. & Fr. : March - September.

Loc. : GOA : *Satari* : Valpoi ; Satre river between Codal - Ambechagol ; Nandore, river side. *Canacona* : Butpal forest.

Occasional on sandy river beds and cultivated fields.

Closely allied to *F. bisumbellata* (Forsk.) Bub., but can be distinguished by the smooth nut in the present species.

F. cymosa R. Br. Prodr. 228, 1810. *F. spathacea* Roth, Nov. Pl. Sp. 24, 1721 ; FBI 6 : 640 ; C. 3 : 396 ; G. 3 : 1151.

Fl. & Fr. : September. *Ill.* : Blatt. & McCann in Journ. Bomb. nat. Hist. Soc. 37 : Pl. 4.

Loc. : GOA : *Canacona* : Angidiv. DAMAN : Coileque area ; Ragunvara ; Cale area.

Rare on the sandy beach.

F. dichotoma (Linn.) Vahl, Enum. 2 : 287, 1806 ; *F. diphylla* (Retz.) Vahl, Enum. 2 : 289, 1806 ; FBI 6 : 636 ; C. 3 : 396 ; S. 268. *Scirpus diphyllus* Retz. Obs. 5 : 15, 1789.

Fl. & Fr. : August - September.

Loc. : GOA : *Satari* : Curchiram ; Deosali ; Caranzol ; Nanecha Dongar ; Codal Wolancha ; Caranzol. *Marmugao* : Vasco Cowalli. *Sanguem* : Potiem forest, 12 km ; Barazon ; Bavanbunda ; Molem-Belgaum Road ; Modka bungalow, Molem ; Sanguem - Darbandora. *Canacona* : Ordofond Butpal. NAGARHAVELI : Chispana area ; Silvassa, along Daman Ganga river. DADRA. DAMAN : Marvor ; Bimpur.

Common in open grassy meadows and in moist areas of cultivated fields.

Often confused with *F. bisumbellata* (Forsk.) Bub. due to nut morphology but the nuts are nearly twice as large in the present species. Further, the reddish brown spikelets, nature of inflorescence and plants, not drying and glaucous, are characteristic of this species.

Fimbristylis ferruginea (Linn.) Vahl, Enum. 2 : 291 ; 1806 ; FBI 6 : 638 ; C. 3 : 396 ; G. 3 : 1151 ; S. 268. *Scirpus ferrugineus* Linn. Sp. Pl. 50, 1753.

Fl. & Fr. : September - November.

Loc. : GOA : *Bicholim* Condola area ; Tula. *Marmugao* : Near the diversion to Sancoale on Vasco road. DAMAN : Regunvara ; Marvor.

Occasional on moist rocky, places.

F. glabra Hochst. ex Steud. Syn. Pl. Cyp. 111, 1855.

Fl. & Fr. : May - October.

Loc. : GOA : *Canacona* : Ordofond - Butpal.

Occasional on river bed and cultivated fields. The species is closely allied to *C. tenera* Roem. & Schult. except the nut is sparsely tuberculate.

F. miliacea (Linn.) Vahl, Enum. 2 : 297, 1806 ; FBI 6 : 644, C. 3 : 397 ; G. 3 : 1152 ; S. 269. *Scirpus mileaceus* Linn. Syst. Veg. ed. 10 : 868, 1759.

Fl. & Fr. : March-November. *Ill.* : Blatt. & McCann in Journ. Bomb. nat. Hist. Soc. 37 : Pl. 3.

Loc. : GOA : *Satari* : Valpoi, Masarde village field ; Tanem ; Nandore on river bank ; Valpoi. *Bardez* : Kolvelly ferry crossing. NAGARHAVELI : Khanvel ; Jamunpada forest. Sindhoni forest ; Bank of Daman Ganga river on way to Kawcha ; Morkhal ; Velugaon. DADRA. DAMAN : Dundoria.

On sandy river banks and in fields.

F. ovata (Burm. f.) Kern, in Blumea 15 : 126, 1967 ; *Carex ovata* Burm. f. Fl. Ind. 194, 1768. *Fimbristylis monostachya* (Linn.) Hassk. Pl. Jav. Rar. 61, 1848 ; FBI 6 : 649 ; C. 3 : 399 ; G. 3 : 1152. *Cyperus monostachyus* Linn. Mant. 2 : 180.

Fl. : August.

Loc. : GOA : *Canacona* : Ordofond - Butpal.

Rare, in muddy areas.

Fimbristylis polytrichoides (Retz.) R. Br. Prodr. 226, 1810 ; FBI 6 : 632 ; C. 3 : 393. *Scirpus polytrichoides* Retz. Obs. 4 : 11, 1786.

Fl. & Fr. : September.

Loc. : DAMAN : Marvor ; Cale area. DIU : Diu - Banxiwara road.

Rare, in muddy areas.

F. quinquangularis Kunth, Enum. 2 : 229, 1837 ; FBI 6 : 644 ; C. 3 : 397 ; S. 269. *Scirpus quinquangularis* Vahl, Enum. 2 : 279, 1806.

Fl. & Fr. : September.

Loc. : NAGARHAVELI : Chispana area.

Rare, in moist areas in the fields.

F. schoenoides (Retz.) Vahl, Enum. 2 : 286, 1806 ; FBI 6 : 634 ; C. 3 : 394 ; G. 3 : 1150 ; S. 259. *Scirpus schoenoides* Retz. Obs. 5 : 14, 1789.

Fl. & Fr. : May - September.

Loc. : GOA : *Satari* Nandore village forest. DADRA. DAMAN : Marvor ; Bimpur.

Occasional in moist areas and also in grasslands.

F. tenera Roem. & Schult. Syst. 2, Mant. 57, 1824 ; FBI 6 : 642 ; S. 269.

Fl. & Fr. : May - October.

Loc. : NAGARHAVELI : Along the bank of Daman ganga river, Silvassa ; Khanvel ; Morkhal ; Dhapsa.

Rare, on river bed. Closely allied to *F. glabra* Hochst. ex Steud. with which it is often confused.

F. tetragona R. Br. Prodr. 226, 1810 ; FBI 6 : 631 ; C. 3 : 393 ; G. 3 : 1150 ; S. 269.

Fl. & Fr. : August - October.

Loc. : GOA : *Satari* : Valpoi ; Deosali ; Caranzol. *Sanguem* : On way to Sanguem near Bati forests ; Quepem - Sanguem. NAGARHAVELI : Dhapsa ; Chispana area. DADRA. DAMAN : Marvor ; Dabel.

Common in rocky puddles and grasslands.

F. woodrowii C.B.Cl. in Jour. Linn. Soc. 34 : 68, 1898 ; C. 3 : 398 ; S. 269.

Fl. & Fr. : September.

Loc. : GOA : *Satari* : Curchinum ; Tanem ; Nanecha Dongar ; Codal ; Wadicha Dongar, Caranzol. *Sanguem* : Bavanbunda, Molem-Belgaum road.

FUIRENA Rottb.

1. Glumes rigid, 7 ribbed ; claw of petals shorter than the blade ; awns usually curved ; nuts obovoid, acuminate, smooth *uncinata*
1. Glumes not rigid, 3 ribbed ; claw of petals as long as the blade ; awns not curved ; nuts broadly ovoid, cuspidate, smooth or faintly transversely lineolate *ciliaris*

Fuirena ciliaris (Linn.) Roxb. Fl. Ind. 1 : 184, 1820. *Scirpus ciliaris* Linn. Mant. 2 : 182, 1771. *Fuirena glomerata* Lam. Illust. 1 : 150, 1791 ; FBI 6 : 666 ; C. 3 : 412 ; G. 3 : 1158.

Fl. & Fr. : October - November.

Loc. : GOA : *Pernem* : Pernem village. *Satari* : Valpoi ; Tanem ; Caranzol ; Pale. *Bardez* : Kolvelly ferry crossing. *Salcete* : Near Santacruz village, rice fields. NAGARHAVELI : Velugaon ; Umberkoi ; Dhapsa.

Normally growing in rice fields.

F. uncinata Kunth, Enum. 2 : 184, 183 ; FBI 6 : 666 ; C. 3 : 413 ; G. 3 : 1158.

Fl. & Fr. : April.

Loc. : GOA : *Ponda* : Qurem. *Canacona* : Nadquem village near Butpal.

Rare, growing in open muddy fields.

HYPOLYTRUM L.C. Rich.

Hypolytrum nemorum (Vahl) Spr. Syst. 1 : 233, 1825. *Schoenus nemorum* Vahl, Symb. Bot. 3 : 8, 1794. *Hypolytrum latifolium* L.C. Rich in Pers. Syn. 1 : 70, 1805 ; FBI 6 : 678 ; G. 3 : 1161. *H. wightianum* Boeck. in Linnaea 37 : 130, 1871 ; C. 3 : 414.

Fl. & Fr. : March.

Loc. : GOA : *Canacona* : Yed forests, on way to Nadquem.

Found growing on the slope along a stream.

RHYNCHOSPORA Vahl

Rhynchospora wightiana Steud. Cyper. 148, 1855 ; FBI 6 : 669 ; G. 3 : 415 ; G. 3 : 1160 ; S. 269.

Fl. & Fr. : August - November.

Loc. : GOA : *Pernem* : Pernem - Bicholim. *Bicholim* : Condola area ; 8 km beyond Dodamarg ; Bicholim - Sanguelim, 5 km. *Satari* : Valpoi ;

Tanem ; Caranzol. *Bardez* : Porvorim village forest. *Sanguem* : On way to Sanguem, near Bati forest ; Bati ; Orgoni (Netravali). *Quepem* : Budsari-Goundugarha ; Quepem - Sanguem. NAGARHAVELI : Saily forest ; Khanvel. DADRA. DAMAN : Marvor.

Very common in grasslands alongwith *Themeda* and on open rocky plateau.

SCIRPUS Linn.

Stem stout, septate when dry ; heads usually near the base of the stem ; glumes hardly keeled ; nuts triquetrous *articulatus*

Stem rather slender ; heads usually above the middle ; glumes strongly keeled ; nuts trigonous *lateriflorus*

Scirpus articulatus Linn. Sp. Pl. 47, 1753 ; FBI 6 : 656 ; DG. 204 ; C. 3 : 406 ; G. 3 : 1156 ; S. 269.

Fl. & Fr. : September - November.

Vern. : Tarpokul (Konk.) ; Bunho (Port.).

Loc. : GOA : *Ilhas* : Panaji, near Santacruz village rice fields. *Salcete* : Cuncolim. DAMAN : Dabel ; Marvor.

Occasional in rice fields.

S. lateriflorus Gmel. Syst. Veg. 1 : 127, 1791 ; *S. supinus* Linn. var. *lateriflorus* (Gmel.) Koyama in Journ. Fac. Sci. Univ. Tokyo, 3, 7 : 30 2, 1958. *S. supinus* Roxb. Fl. Ind. 1 : 219, 1820 (non Linn. 1753).

Fl. & Fr. : August - October.

Loc. : GOA : *Salcete* : Near Cuncolim. NAGARHAVELI : Dhapsa ; Silvassa, along Damanganga river. DAMAN : Dabel.

Common in moist places alongwith *Monochoria* and *Nymphaea* etc.

SCLERIA Berg.

1. Annual, rhizome absent

2. Disc of female flowers cupular ; nut ellipsoid, terete or obscurely trigonous

annularis

2. Disc of female flowers 3-lobed ; nut globose, tessellately cancellate in vertical lines

tessellata

1. Perennial, with woody rhizome

3. Panicle with many capillary bracteoles

levis

3. Panicle with few or no capillary

terrestris

Scleria annularis (Nees) Kunth (En. 2 : 359, 1837, *nom. nud.*) ex Steud. Syn. 2 : 176, 1855; FBI 6 : 687; C. 3 : 418; *Hypoporum annulare* Nees in Linnaea, 9 : 303, 1835 *nom nud.*

Fl. & Fr. : September.

Loc. : DADRA

Rare.

Kern (Blumca 11 : 200, f. 7 g, 1961) cites *S. annularis* Nees ex Steud. for this species. Since the basionym is *Hypoporum annulare* Nees, the name should read only as *Scleria annularis* (Nees) Kunth ex Steud. according to Code.

S. levis Retz. Obs. 4 : 13, 1786. *Scleria hebecarpa* Nees in Wt. Contrib. Bot. Ind. 117, 1834; FBI 6 : 689; C. 3 : 419; G. 3 : 1163.

Fl. & Fr. : October - November.

Loc. : GOA : *Canacona* : Ordofond Butpal; Polem.

Rare, along rocky slopes.

S. terrestris (Linn.) Fass. Rhodora 26 : 159, 1924; *Zizania terrestris* Linn. Sp. 2 : 991, 1753. *Scleria cochinchinensis* (Lour.) Druce in Rep. Bot. Exch. 61, Brit. Isles 1916 : 646, 1917; G. 3 : 1163; *S. elata* Thw. Enum. 353, 1864; FBI 6 : 690. *S. melanostoma* Nees ex Boeck. in Linnaea 38 : 514, 1874; FBI 6 : 692.

Fl. & Fr. : November.

Loc. : GOA : *Sanguem* : Avelde jungle; Molem.

Rare. C. B. Clarke's treatment in FBI of this complex is extremely confusing. In fact it is one of the most difficult species of *Scleria* to identify and has a wide range of synonymy.

S. tessellata Willd. Sp. Pl. 4 : 315, 1805; FBI 6 : 686; C. 3 : 418; G. 3 : 1163; S. 270.

Fl. & Fr. : August - September.

Loc. : GOA : *Satari* : Caranzol; Ivorem, Buzurco; Ambeachagol. *Canacona* : Ordofond-Butpal, 6 km. NAGARHAVELI : Saily; near Khanvel. DAMAN : Dabel.

Common in cultivated fields.

POACEAE (GRAMINEAE)

1. Perennial or annual herbs with herbaceous culms; leaf blades usually sessile and not articulated with the sheath
2. Spikelets 2-flowered, falling entire at maturity, usually with the upper floret hermaphrodite or the male or barren and if

the latter, often reduced to the lemma or rarely the lemma entirely absent, all alike or more often differing in size, shape

3. Male and female Spikelets in different parts of the same inflorescence and of different appearance ; lemmas hyaline or membranous and thinner than the glumes

4. Fruit case entire

4. Fruit case 3-lobed

3. Spikelets all hermaphrodite or with male or barren and hermaphrodite spikelets mixed in the same inflorescence and so arranged that a male or barren spikelet is near a hermaphrodite spikelet, or if unisexual then the lemma of the fertile floret indurated

5. Spikelets often paired with one sessile and the pedicelled, those of each pair similar or more often dissimilar, rarely solitary and all alike ; glumes as long as the spikelets and enclosing the florets, more or less rigid and firmer than the lemmas which are both hyaline or membranous ; upper lemma usually awned

6. Spikelets solitary, pedicelled or almost sessile at the nodes of a tough or fragile rachis

6. Spikelets in pairs, similar or dissimilar, a sessile and a pedicelled or one short, the other long pedicelled, rarely the pedicel reduced

7. Spikelets of each pair similar, the sessile and the pedicelled hermaphrodite ; joints of the panicles thin, linear or somewhat expanded at the top

8. Spikelets arranged in more or less panicles or compound racemes along a long central axis

9. Spikelets unawned

9. Spikelets awned

8. Spikelets arranged in a single or in several racemes, the latter being digitate or arranged along a very short main axis

10. Lower glume broadly truncate ; pedicelled spikelet much reduced, usually represented by pedicel only, very rarely present ; stamens two

10. Lower glume not truncate ; pedicelled spikelet developed ; stamens usually three

7. Spikelets of each pair dissimilar, the sessile hermaphrodite, the pedicelled male or sterile, if sometimes similar then the joints of the raceme and the pedicel thick and swollen

11. Joints of the rachis and pedicel of the pedicelled spikelet swollen, 3-angled, rounded or flattened

12. Sessile spikelets with a hermaphrodite

Coix
Trilobachne

Dimeria

Saccharum
Spodiopogon

Apocarpis

Eulalia

- floret only, or occasionally with a male floret below; upper lemma unawned
13. Sessile spikelet spherical; lower glume pitted all over; pedicelled spikelet reduced *Hackelochloa*
13. Sessile spikelet not spherical in shape
14. Lower glume with a broad wing on each keel, ridged, perforated or sculptured *Manisuris*
14. Lower glume not winged on the keels *Ophiurus*
12. Sessile spikelets with a male and hermaphrodite floret; upper lemma awned
15. Racemes 1-noded, reduced to three heteromorphous spikelets enclosed in a boat-shaped spathe *Apluda*
15. Racemes many noded, not enclosed in a spathe-like sheath *Ischaemum*
11. Joints of the rachis and pedicel narrow, seldom thickened upwards, occasionally with a translucent longitudinal groove; sessile spikelets awned
16. Spikelets in racemes; racemes collected into whorled panicle not interrupted by spathes
17. Spikelets dorsally compressed *Sorghum*
17. Spikelets laterally compressed
18. Spikelets in groups, each consisting of a sessile and two more or less reduced pedicelled spikelets; lower glume smooth, not tuberculate *Chrysopogon*
18. Spikelets with many pairs of spikelets arranged in whorled racemes; lower glume tuberculate *Vetiveria*
16. Panicles of racemes interrupted by spathe or the espatheate racemes digitate; sometimes the joints and/or pedicels with a translucent median furrow
19. Upper lemma of the sessile spikelet laterally compressed; pedicelled spikelet reduced *Arthraxon*
19. Upper lemma of the sessile spikelet awned from the tip or from the cleft or upper lemma reduced to a

- hyaline base of the awn, very rarely unawned
20. Joints and pedicel with a translucent longitudinal furrow *Bothriochloa*
20. Joints and pedicel without a translucent furrow
21. Spikelets in heads with a spathe or spatheole at the base of the short peduncle
22. Involucral spikelets present
23. Involucral spikelets sessile *Themeda*
23. Involucral spikelets stalked *eilsowa*
22. Involucral spikelets absent
24. Upper lemma not cleft, awned from the tip *Pseudanthistiria*
24. Upper lemma 2-cleft, awned in the sinus
25. Inflorescence of two racemes *Andropogon*
25. Inflorescence a compound panicle *Cymbopogon*
21. Spikelets in racemes without spathe
26. Inflorescence a single terminal raceme or spike *Heteropogon*
26. Inflorescence of linear racemes, arranged on a single long or short central axis *Dicanthium*
5. Spikelets solitary or paired, more or less similar; glumes usually membranous, the lower usually smaller or sometimes suppressed; lower lemma mostly resembling the upper lemma, papery to very tough and rigid, usually awnless
27. Spikelets mostly unisexual *Spinifex*
27. Spikelets all similar in shape and sex

28. Spikelets with an involucre of bristles or subtended by a solitary bristle, falling with or without the bristle at maturity
29. Upper lemma smooth ; bristles caducous
30. Bristles numerous, formed of highly modified bristle or spine-like branchlets *Cenchrus*
30. Bristles solitary, formed by the prolongation of the branch beyond the terminal spikelet *Pseudoraphis*
29. Upper lemma transversely rugose ; bristles persistent *Setaria*
28. Spikelets not subtended by bristles
31. Spikelets arranged in more or less open panicles, or with the panicles contracted and spike like
32. Spikelets arranged in open or contracted panicles
33. Spikelets not or slightly gibbous *Panicum*
33. Spikelets distinctly gibbous and laterally much compressed *Cyrtococcum*
32. Spikelets usually arranged in cylindrical spike-like panicles *Sacciolepis*
31. Spikelets arranged in one sided spikes or spike-like racemes ; spikes or racemes digitate or scattered
34. Lemma of the upper floret more or less crustaceous or coriaceous, usually with narrow inrolled margins, exposing much of the palea
35. Lower glume and lowest internode of the rachilla not forming a swollen callus at the base of the spikelet
36. Spikelets abaxial
37. Lower glume usually absent ; spikelets plano-convex *Paspalum*
37. Lower glume present, although sometimes small
38. Glumes awnless, if acuminate then

- with the upper lemma mucronate *Paspalidium*
38. Glumes acuminate or awned, rarely only acute; upper lemma not mucronate
39. Leaf blade lanceolate to ovate; racemes loose to moderately dense; culms creeping and ascending *Opilsmanus*
39. Leaf blade linear; racemes dense, culms erect or sub-erect *Echinochloa*
36. Spikelets adaxial *Brachiaria*
35. Lower glume and lowest internode of the rachilla forming a swollen callus at the base of the spikelets; upper lemma mucronate or short awned *Eriochloa*
34. Lemma of the upper floret thinly cartilaginous, usually with flat hyaline margins
40. Spikelets awned *Alloteropsis*
40. Spikelets awnless *Digitaria*
2. Spikelets 1 to many flowered, breaking up at maturity above the more or less persistent glumes, or if falling entire, then not 2-flowered, with the lower floret male or barren and the upper hermaphrodite, usually more or less laterally compressed or terete or if 2-flowered and falling entire, the glumes and lemma all membranous
41. Spikelets sessile; inflorescence of digitate or solitary spikes or panicle of spikes
42. Spike solitary *Melanocenchris*
42. Spike digitate, umbelled or racemed
43. Spikelets with one fertile floret and one or more imperfect florets above them *Chloris*
43. Spikelets with one fertile floret, imperfect florets not present *Cynodon*
41. Spikelets borne in open or contracted or spikelike panicles

44. Spikelets usually with 2 or more fertile florets
45. Lemmas or rachilla-joints bearing long silky hairs which envelop the lemma; lemmas awnless, or with a straight awn from the tip often thin; tall grasses with usually large plume-like panicles
46. Lemmas glabrous; rachilla long villous *Phragmites*
46. Lemma hairy all over the back; rachilla glabrous *Arundo*
45. Lemma and rachilla glabrous or hairy but with the hairs not enveloped in the lemma, or if so, then the lemma with a geniculate awn; low or moderately tall grasses
47. Lemmas usually 5 to many nerved
48. Leaves broad, tessellately nerved; fruiting glumes with reflexed submarginal tubercle based bristles *Centotheca*
48. Leaves narrow, not tessellately nerved; fruiting glumes without such bristles *Aeluropus*
47. Lemmas usually 1 to 3 nerved
49. Spikelets in open, contracted spike or spike like panicles
50. Upper glume 1-nerved *Desmostachya*
50. Upper glume 3-nerved *Eragrostis*
49. Spikelets sessile or very short pedicelled, loosely to densely imbricate, in digitate or racemosely arranged spikes or spikelike racemes, very rarely in solitary spikes
51. Spikes racemose; glumes much longer than the lemmas *Dinebra*
51. Spike digitate or capitate; glumes shorter than the lemma
52. Axis and branches of the inflorescence ending in a spikelet *Eleusine*
52. Axis of the spike terminating in a sharp point; upper glume mucronate or awned; spikes digitate *Dactyloctenium*
44. Spikelets with one fertile floret (male or female in unisexual 1-flowered spikelets), with or without one or two male or barren floret below it, the latter often much reduced

53. Glumes minute or suppressed ; fertile lemma and palea very similar in shape and texture
54. Leaf blades ovate-oblong or ovate-lanceolate with inflated sheaths ; a floating grass *Hygroryza*
54. Leaf blades linear, acute or acuminate ; aquatic, forest grass *Oryza*
53. Glumes well developed ; fertile lemma and palea not similar
55. Spikelets with 2 florets ; the lower, male or barren, the upper hermaphrodite
56. Glumes equal in size, obtuse or mucronate ; upper lemma unawned *Isachne*
56. Glumes unequal, the lower acute, the upper acuminate ; upper lemma awned with a perfect awn or at least a bristle
57. Lemma of the upper floret glabrous, usually scaberulous or scabrid ; minutely 2-lobed at the apex, with the lobes produced into short capillary bristles or not, awned between the lobes or awnless *Aruudinella*
57. Lemma of the upper floret deeply bifid, bearded on the dorsal surface *Jansenella*
55. Spikelets with one fertile floret
58. Spikelets cylindrical, falling entire ; base of the glumes bearded ; lemma awned *Garnotia*
58. Spikelets cylindrical, ellipsoid-acute or definitely laterally compressed, not bearded at the base ; rachilla disarticulating above the more or less persistent glumes
59. Spikelets very rarely falling entire and then with firmly membranous to coriaceous lemmas
60. Lemmas hyaline or membranous at maturity ; spikelets awnless
61. Inflorescence elongate, spike-like ; fruit with a conspicuous beak *Urochondra*

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|--|----------------------|
| 61. Inflorescence a panicle ;
fruit without a beak | <i>Sporobolus</i> |
| 60. Lemmas indurated or rigid
at maturity ; Spikelets with
trifid awn | <i>Aristida</i> |
| 59. Spikelets falling entire at
maturity from the axis | |
| 62. Glumes 2 ; spikelets not
awned | <i>Zoysia</i> |
| 62. Glumes 3 ; spikelets awned | <i>Perotis</i> |
| 1. Shrubs or tress with woody, often tall persistent culms ; leaf
blades flat, many-nerved, often with transverse nervules,
usually with a petiole-like base and with articulated sheath | |
| 63. Spikelets in dense globose heads along the branches of a
large panicle | <i>Dendrocalamus</i> |
| 63. Spikelets in leafy or leafless panicles | <i>Bambusa</i> |

AELUROPUS Trin.

Aeluropus lagopoides (Linn.) Trin. ex Thw. Enum. Pl. Zeyl. 374, 1864 ; Bor, 380. *Dactylis lagopoides* Linn. Mant. 33, 1767. *Aeluropus villosus* Trin. ex C. A. Mey, Verz. Pflanz. Cauc. 18, 1831 ; FBI 7 : 334 ; C. 3 : 567.

Fl. & Fr. : September.

Loc. : DAMAN : Coileque area. DIU : Swampy back - water area Gogale.

Grows in salt marshes and along backwaters.

ALLOTEROPSIS J.S. Presl ex C.B. Presl, emend. Hitchc.

Alloteropsis cimicina (Linn.) Stapf. in Fl. Trop. Afr. 9 : 487, 1919 ; G. 3 : 1223 ; Bor, 276. *Milium cimicinum* Linn. Mant. Alt. 184, 1771. *Axonopus cimicinus* (Linn.) P. Beauv. Ess. Agrost 12, 1812 ; FBI 7 : 4 ; C. 3 : 441.

Fl. & Fr. : August. *Ill.* : Blatt. t. 83 ; Sena t. 35, f. A - J.

Loc. : GOA : Bardez : Nagoa. Marmugao : Nuvem, Dongri. DADRA. DAMAN : Dundorta.

Common on grassy hill slopes.

ANDROPOGON Linn.

Andropogon pumilus Roxb. Fl. Ind. 1 : 277, 1820 ; FBI 7 : 170 ; C. 3 : 459 ; Bor, 93.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, tt. 150 - 151 ; Blatt. t. 65, f. 1 7.

Loc. : DAMAN : Dundrota.

Rare, in grasslands.

APLUDA Linn.

Apluda mutica Linn. Sp. Pl. ed. 1, 82, 1753 ; Bor, 93 ; Pav. 242. *A. aristata* Linn. Amoen. Acad. 4 : 303, 1756 ; G. 3 : 1212 ; S. 280. *A. varia* Hack. var. *aristata* Hack in DC. Mon. Phan. 6 : 196, 1889 ; FBI 7 : 150. *A. mutica* Linn. var. *aristata* Pilger in Engl. & Prant. Pflanzenf. (ed. 2) 14C : 130, 1945.

Fl. & Fr. : September - November. *Ill.* : Blatt. & McC. Bomb. Gr. 29, t. 20, 1935.

Loc. : GOA : *Ihas* : Chimbhel water reservoir, near Panaji. NAGARHAVELI : Dolora forest ; Saily forest. DAMAN : Fort area. DIU : Jalandhar ; Castle area ; Rocky creek in sea, Nagoa.

Very common on hill slopes.

APOCOPIS Nees

Apocopis vaginatus Hack. in Ost. Bot. Zeitschr. 41 : 8, 1891 ; C. 3 : 485 ; Bor, 96. *A. wightii* var. *vaginatus* Hook. f. FBI 7 : 143, 1896.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, tt. 139 & 140 ; Blatt. t. 17.

Loc. : DAMAN : Marvor.

Rare, in grasslands. Cooke did not record the species from Bombay Presidency.

ARISTIDA Linn.

1. No articulation between the lemma and awns

2. Panicle contracted

adscensionis

2. Panicle effuse

hystrix

1. Articulation present between the tip of the lemma and base of the culm

3. Culm of awns less than 2 cm long; no white hairs on pedicels or in axils

royleana

3. Culm of awns more than 2 cm long; white hairs often present in axils and on pedicels

funiculata

Aristida adscensionis Linn. Sp. Pl. ed. 1, 82, 1753. var. *adscensionis* : FBI 7 : 224 ; C. 3 : 529 ; Bor, 407.

Fl. & Fr. : September - November. *Ill.* : Bor, f. 43.

Loc. : GOA : *Salcete* : Goodier ; *Cavallosum* - *Gansua*. NAGARHAVELI : *Silvassa*. DAMAN : Fort area.

Occasional, on gravelly soil.

A. funiculata Trin. et Rupr. Sp. Gram. Stip. 159 et in Mem. Acad. Sci. Petersb. ser. 6, 7 : 159, 1843 ; FBI 7 : 226 ; C. 3 : 531 (p.p.) ; Bor, 410.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, t. 177, Blatt. t. 142, f. 1-6.

Loc. : DAMAN : *Cataria*.

Rare.

A. hystrix Linn. f. Suppl. Pl. 113, 1781 ; FBI 7 : 225 ; C. 3 : 529 ; Bor, 410. Pav. 264.

Fl. & Fr. : October.

Loc. : DAMAN : On sand hills.

A perennial grass in drier tracts.

A. royleana Trin. et Rupr. Sp. Gram. Stip. 160 et in Mem. Acad. Sci. Petersb. ser. 6, 7 : 160, 1843 ; Bor, 412. *A. funiculata* var. *royleana* Hook. f. in FBI 7 : 227, 1896.

Fl. & Fr. : September.

Loc. : DIU : Airport, Nagoa.

Rare.

ARTHRAKON P. Beauv.

1. Lower glumes of sessile spikelets 2 keeled ; spikelets not laterally compressed

prianodes

1. Lower glumes of sessile spikelets not keeled, rounded on the back ; spikelets laterally compressed

2. Spikelets sessile and pedicelled; lower glumes of sessile spikelet bicuspidate *lanceifolius*
2. Spikelets all sessile; lower glume entire or minutely 2 toothed
3. Stamens 3, anthers nearly as long as the upper floral glumes *inermis*
3. Stamens 2 - 3, anthers less than half the length of upper floral glumes *quartinianus*

Arthraxon inermis Hook. f. in FBI 7 : 145, 1896 ; C. 3 : 487 ; S. 270 ; Bor, 100.

Fl. & Fr. : September - October. *Ill.* : Blatt. 45, f. 1 - 6.

Loc. : NAGARHAVELI : Khanvel. DADRA. DAMAN : Dundorta ; Dabel.

Common in fields and grasslands.

A. lanceifolius (Trin.) Hochst. in Flora 39 : 188, 1856 ; S. 270 ; Bor, 100 ; Pav. 246. *Andropogon lanceifolius* Trin. in Mem. Acad. Sci. Petersb. ser. 6, 2 : 1832 ; FBI 7 : 147 ; C. 3 : 488.

Fl. & Fr. : September - October. *Ill.* : Blatt. t. 48, f. 1 - 6.

Loc. : NAGARHAVELI : Near Silvassa. DADRA. DAMAN ; Fort area. DIU : Castle area ; Diu town, near Church.

Commonly growing on walls and along sea shore.

A. prionodes (Steud.) Dandy in Andrews, Fl. Pl. Sudan, 3 : 339, 1956 ; Bor, 101 ; Pav. 245. *Andropogon prionodes* Steud. Syn. Pl. Glum. 1 : 383, 1854. *Arthraxon lanceolatus* Hook. f. in. FBI 7 : 143, 1897, *p.p.*, *non* Hochst., C. 3 : 487.

Fl. & Fr. : September.

Loc. : DIU : Castle area.

Rare, on the sea shore. *A. lanceolatus* of Hook. f. in FBI is a mixture of *A. lanceolatus* (Roxb.) Hochst., *A. prionodes* (Steud.) Dandy, and *A. echinatus* (Nees) Hochst.

A. quartinianus (A. Rich.) Nash, in N. Amer. Fl. 17 : 99, 1912 ; S. 271 ; Bor, 102 ; Pav. 246. *Alectoridia quartiniana* A Rich. Tent. Fl. Abyss. 2 : 448, t. 99. 1851. *Arthraxon ciliaris* Beauv. Agrost. 3, t. 11, f. b ; FBI 7 : 145 ; C. 3 : 489.

Fl. & Fr. : September. *Ill.* : Blatt. t. 49, f. 1 - 6.

Loc. : NAGARHAVELI : Sally forest ; Dolora forest.

Rare, in the forest undergrowth.

ARUNDINELLA Raddi

- | | |
|--|----------------------------------|
| 1. Upper lemma not awned | <i>leptochloa</i> |
| 1. Upper lemma awned | |
| 2. Upper lemma bearing 2 setae on either side of the awn | |
| 3. Perennials | <i>setosa</i> var. <i>setosa</i> |
| 3. Annuals | |
| 4. Whole plant covered with tubercle based hairs ; spikelets 7 - 9 mm long ; stiff hairs at the tip of pedicel absent | <i>tuberculata</i> |
| 4. Whole plant not covered with tubercle based hairs ; spikelets 5 - 6 mm long ; stiff hairs at the tip of pedicel present | <i>nervosa</i> |
| 2. Upper lemma devoid of setae on either side of the awn | |
| 5. Spikelets small, not more than 2 mm long, glabrous | <i>pumila</i> |
| 5. Spikelets more than 2 mm (up to 5 mm) long, bristly | |
| 6. Panicle up to 50 cm long, very effuse and drooping ; glumes unequal | <i>metzii</i> |
| 6. Panicle usually compact ; glumes equal | <i>holcoides</i> |

Arundinella holcoides (Kunth) Trin. in Bull. Acad. Sci. Petersb. 1 : 71, 1836 ; Bor, 422. *Brandtia holcoides* Kunth, Rev. Gram. 2 : 511, t. 170, 1831. *Arundinella agrostoides* Trin. Sp. Gram. Ic. 3, t. 265, 1836 ; FBI 7 : 71 ; C. 3 : 523.

Fl. & Fr. : October. *Ill.* : Blatt. t. 128, f. 1 - 10.

Loc. : NAGARHAVELI, Silvassa, along Daman ganga river ; Ata forest ; Khanvel. DADRA.

Occasional, in the fields and on the slopes.

A. leptochloa (Nees ex Steud.) Hook. f. in FBI 7 : 76, 1896 ; G. 3 : 1247 ; Bor, 423. *Panicum leptochloa* Nees ex Steud. Syn. Pl. Glum. 1 : 62, 1854. *Arundinella gigantea* Dalz. in Dalz. & Gibs. Bomb. Fl. 293, 1861 ; FBI 7 : 76 ; C. 3 : 525.

Fl. & Fr. : October - November. *Ill.* : Blatt. t. 130.

Loc. : GOA : *Salcete* : Margoa ghat. *Sanguem* : Molem Avelde jungle. *Canacona* : Ordofond Butpal.

Rare, along forest undergrowth.

A. metzii Hochst. ex Miq. in Verh. Konink. Nederl. Inst. 3(4) : 31, 1851 ; FBI 7 : 72 ; C. 3 : 523 ; G. 3 : 1247 ; Bor, 423. *A. lawii* Hook. f. in Trim. Fl. Ceyl. 5 : 180, 1900 ; C. 3 : 523 ; G. 3 : 1247 ; S. 271.

Fl. & Fr. : November.

Loc. : GOA : *Bicholim* : Amona ferry crossing. *Satari* : Ponda village. *Bardez* : Porvorim ; *Betim*. *Ilhas* : Panaji Madgao ; Chimbhel reservoir - Brahmmapuri temple. *Salcete* : Goodier. *Sanguem* : Patiem foot hill area ; Molem.

Occasional.

Arundinella nervosa (Roxb.) Nees ex Hook. et Arn. Bot. Boeckey Voy. 237, 1836 ; Bor, 424. *Holcus nervosus* Roxb. Fl. Ind. 1 : 320, 1820.

Fl. & Fr. : November.

Loc. : GOA : *Bardez* : Porvorim.

Rare.

Very similar to *Arundinella setosa* Trin. but the present species is an annual and the inflorescence is a characteristically distinct, quite different from that of *A. setosa*.

A. pumila (Hochst.) Steud. Syn. Pl. Glum. 1 : 114, 1854 ; G. 3 : 1247 ; S. 271 ; Bor, 424. *Acranthemum pumilum* Hochst. ex A. Rich. Tent. Fl. Abyss. 2 : 414, 1851.

A. setosa Trin. Gram. Panic. 63, 1826 ; FBI 7 : 70 ; C. 3 : 521 ; Bor, 424.

Fl. & Fr. : September. *Ill.* : Blatt. t. 126.

Loc. : NAGARHAVELI : Saily ; Khanvel ; Dapara area. DADRA.

Occasional in grasslands.

A. tenella Nees & Wt. ex Steud. *l.c.* 1 : 5 ; FBI 7 : 71 ; C. 3 : 522.

Fl. & Fr. : September - November. *Ill.* : Blatt. t. 127, f. 1 - 9.

Loc. : GOA : *Satari* : Near Ponda village. *Quepem* : Budsari Goundugarha. *Canacona* : Ordofond Butpal ; Poinguinam. NAGARHAVELI : Saily forest ; Dolara forest.

Common on rocky slopes and along forest undergrowth.

A. tuberculata Munro ex Lisboa in Journ. Bomb. nat. Hist. Soc. 5 : 344, 1891 ; FBI 7 : 69 ; C. 3 : 521 ; Bor, 425.

Fl. & Fr. : November. *Ill.* : Blatt. t. 125.

Loc. : GOA : *Bardez* : Porvorim.

Rare. The only species of *Arundinella* seen along dry habitat.

ARUNDO Linn.

Arundo donax Linn. Sp. Pl. ed. 1, 81, 1753 ; FBI 7 : 302 ; C. 3 : 574 ; G. 3 : 1250 ; Bor, 413.

Fl. : July. *Ill.* : Bor, 414, f. 44.

Loc. : GOA : *Bardez* : Agoada.

Rare.

BAMBUSA Schreb.

Bambusa arundinacea (Retz.) Willd. Sp. Pl. 2 : 245, 1799 ; FBI 7 : 395 ; DG. 210 ; C. 3 : 569 ; G. 3 : 1286 ; S. 271. *Bambos arundinacea* Retz. Obs. Bot. 5 : 24, 1789.

Vern. : Velu (Konk.) ; Spodio (Port.). *Ill.* : Bedd. Fl. Sylv. t. 321, 1873.

Loc. : GOA : *Satari* : Codal village. *Sanguem* : Potiem foot hill area. *Canacona* : Ordofond Butpal.

Rare.

BOTHRIOCHLOA O. Kuntze

Bothriochloa pertusa (Linn.) A. Camus in Ann. Soc. Linn. Lyon, 1930, n. s. 76 : 164, 1931 ; Bor, 109. *Holcus pertusus* Linn. Mant. Alt. 301, 1771. *Andropogon pertusus* (Linn.) Willd. Sp. Pl. 4 : 922, 1806 ; FBI 7 : 173 ; C. 3 : 497.

Fl. & Fr. : September. *Ill.* : Blatt. 54, f. 1 - 11 ; Sena. t. 46, A - M.

Loc. : DADRA : DAMAN : *Cataria*. DIU : Podamo.

Common in grassland and on sandy soil near the sea.

BRACHIARIA Griseb.

- | | |
|---|--------------------|
| 1. Panicles linear with erect racemes of closely crowded, softly hairy spikelets | <i>eruciformis</i> |
| 1. Panicles various, oblong, lanceolate or spreading with loose, glabrous or slightly hairy spikelets | |
| 2. Spikelets 1.5 - 2.5 mm long ; rachis triquetrous | <i>reptans</i> |
| 2. Spikelets 2.6 - 4 mm or more long ; rachis triquetrous or flattened | <i>ramosa</i> |

Brachiaria eruciformis (Sibth. & J. E. Smith) Griseb. in Ledeb. Fl. Ross, 4 : 469, 1853 ; S. 272 ; Bor. 283. *Panicum eruciforme* Sibth. et. J. E. Smith, Fl. Graec. 1 : 44, t. 59, 1805. *P. isachne* Roth ex Roem. & Schult. Syst. Veg. 2 : 458, 1817 ; FBI 7 : 28 ; C. 3 : 448.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar, Tadulinga Mudaliyar, tt. 81 & 82 ; Blatt. t. 85, f. 1 - 8.

Loc. : DADRA.

Rare, in cultivated fields.

Brachiaria ramosa (Linn.) Stapf in Fl. Trop. Afr. 9 : 542, 1919 ; S. 272 ; Bor, 284. *Panicum ramosus* Linn. Mant. Pl. 1 : 29, 1767 ; FBI 7 : 36 ; C. 3 : 449.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Madaliyar, tt. 95 & 95 ; Blatt. t. 86, f. 1 - 8.

Loc. : NAGARHAVELI : Khanvel. DAMAN : Cataria.

Occasional, in open grasslands.

B. reptans (Linn.) Gard. et C. E. Hubb. in Hook. Ic. Pl. Sub. tab 3363, 1938 ; Bor 285. *Panicum reptans* Linn. Syst. Nat. ed. 10, 870, 1759. *P. prostratum* Lamk. Tab. Encycl. Meth. Bot. 1 : 171, 1791 ; et Encycl. Meth. Bot. 4 : 730, 1797 ; FBI 7 : 33 ; C. 448. *Urochloa reptans* Stapf in Fl. Trop. Afr. 9 : 601, 1920.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, tt. 91 & 92, Blatt. pt. 92 ; Sena. t. 32.

Loc. : DIU : Gogale.

Rare, along the sea coast.

CENCHRUS Linn.

- | | |
|--|------------------------|
| 1. Bristles or spines of the involucre antrorsely scabrid | |
| 2. Bristles connate at the base only | <i>ciliaris</i> |
| 2. Bristles connate into a cup, 1 - 3 mm long | |
| 3. Involucral bristles not spinose, the tips always filiform | <i>pennisetiformis</i> |
| 3. Involucral bristles spinose, tips not filiform | <i>setigerus</i> |
| 1. Bristles or spines of the involucre retrorsely scabrid | <i>biflorus</i> |

Cenchrus biflorus Roxb. Fl. Ind. 1 : 238, 1820 ; Bor, 287. *C. catharticus* Delile, Cat. Hort. Monsp. 1838 ; 4, 1839, in Linnaea 13, in Litt. Bericht, 103, 1839 ; FBI 7 : 90 ; C. 3 : 433.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, tt. 121 ; Blatt. t. 118.

Loc. : DAMAN : Marvor.

Rare, on the sandy beach.

C. biflorus of FBI 7 : 89, non Roxb. is another sp. i.e. *C. setigerus* Vahl.

Cenchrus ciliaris Linn. Mant. Alt. 302, 1771 ; Bor, 287 ; Pav. 255.
Pennisetum cenchroides Rich. in Pers. Syn. 1 : 72, 1805 ; FBI 7 : 88 ;
 C. 2 : 916.

Fl. & Fr. : December.

Loc. : DAMAN : Daman area.

Rare, a fodder grass.

C. pennisetiformis Hochst. & Steud. ex Steud. Syn. Pl. Glum. 1 : 109,
 1854 ; Bor, 289. *Pennisetum cenchroides* var. *echinoides* Hook. f. FBI 7 :
 88, 1896.

Fl. & Fr. : September.

Loc. : DIU : Nagao ; Gogale.

Growing on gravelly soil. Fodder remains green even in dry season
 and cattle relish it.

C. setigerus Vahl, Enum. Pl. 2 : 395, 1806 ; Bor, 290 ; Pav. 255.
C. biflorus Hook. f. FBI 7 : 89, 1896, *non* Roxb. 1820 ; C. 3 : 433.

Fl. & Fr. : November December.

Loc. : DAMAN : Cataria ; Jampor. DIU : Fields near Jalandhar ;
 Castle area.

Occasional on sandy soil near sea shore.

CENTOTHECA Desv.

Centotheca lappacea (Linn.) Desv. in Nouv. Bull. Soc. Philom. 2 :
 189, 1810 ; FBI 7 : 332 ; C. 3 : 566 ; G. 3 : 1279 ; Bor, 457. *Cenchrus*
lappaceus Linn. Sp. Pl. ed. 2, 1488, 1763.

Fl. & Fr. : October. *Ill.* : Blatt. t. 189.

Loc. : GOA : Bicholim ; Usgao.

Rare, in rice fields and along wastelands.

CHLORIS Sw.

- | | |
|--|----------------|
| 1. Empty lemma above the fertile floret solitary | <i>virgata</i> |
| 1. Empty lemma above the fertile floret two to four | |
| 2. A perennial, creeping below and rooting at nodes ; spikelets
cuneate with 4-5 awns ; rachis glabrous | <i>montana</i> |
| 2. An erect annual, spikelets with 3 awns, rarely 4 ; rachis
scaberulous | <i>barbata</i> |

Chloris barbata Sw. Fl. Ind. Occ. 1 : 200, 1797 ; FBI 7 : 292 ; C. 3 : 557 ; Bor, 465.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, tt. 199 - 201 ; Blatt. t. 171.

Loc. : DAMAN : Fort area.

A tall grass in cultivated fields.

C. montana Roxb. Fl. Ind. 1 : 331, 1820 ; FBI 7 : 292 ; Bor, 466.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, tt. 204 & 205.

Loc. : DIU : Castle area. Rocky creeks, Nagoa ; Rocky creek in the sea, Nagoa.

Occasional, along the sea shore.

C. virgata Sw. Fl. Ind. Occ. 1 : 203, 1797 ; FBI 7 : 291 ; Bor, 468 ; Pav. 261.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, t. 198 ; Blatt. t. 170, f. 1 - 5.

Loc. : DADRA. DAMAN : Coileque area.

Occasional, in fields and open grasslands.

CHRYSOPOGON Trim.

- | | |
|--|--------------------|
| 1. Pedicels half the length of the sessile spikelets or longer | <i>aciculatus</i> |
| 1. Pedicels shorter than half the length of the sessile spikelet | |
| 2. Leaves conspicuously distichous | <i>polyphyllus</i> |
| 2. Leaves not distichous | <i>fulvus</i> |

Chrysopogon aciculatus (Retz.) Trim. Fund. Agrost. 188, 1820 ; G. 3 : 1205 ; Bor, 115 ; *Andropogon aciculatus* Retz. Obs. Bot. 5 : 22, 1789 ; FBI 7 : 188 ; C. 3 : 504.

Fl. & Fr. : August - September. *Ill.* : Sena. t. 45.

Loc. : GOA : *Satari* : Palli village. *Salcete* : Margoa, on roadside. *Canacona* : Ordofond - Butpal.

Occasional in open grassy meadows and along roadsides.

C. fulvus (Spreng.) Choiv. Fl. Somala 1 : 327, 1929 ; Bor, 116 ; Pav. 244. *Pollinia fulva* Spreng, Pugill. 2 : 10, 1815. *Chrysopogon montanus* Trim. ex Spreng. Neue Entdeck. 2 : 93, 1821 ; S. 273. *Andropogon*

monticola Roem. & Schult. Mant. 665, 1827 ; FBI 7 : 192 cum vars ; C. 3 : 505.

Fl. & Fr. : September. *Ill.* : Blatt. t. 42, f. 1 6.

Loc. : DIU : Castle area.

Rare, along sea shore.

Chrysopogon polyphyllus (Hack.) Blatt. & McCann in Journ. Bomb. nat. Hist. Soc. 32 : 416, 1928 ; Bor, 118. *Andropogon polyphyllus* Hack. ex Hook f. FBI 7 : 194, 1896.

Fl. & Fr. : September. *Ill.* : Blatt. t. 43.

Loc. : NAGARHAVELI : Daman ganga river bed.

Rare, on rocky river bed.

COIX Linn.

Coix lacryma-jobi Linn. Sp. Pl. ed. 1, 972, 1753 ; FBI 7 : 100 ; DG. 207 ; C. 3 : 517 ; G. 3 : 1182 ; S. 273 ; Bor, 264.

Fl. & Fr. : September -October. *Ill.* : Blatt. t. 1.

Vern. : Lagrimas de job (Port.) ; Ran jamdhlo (Konk.) ; Khachor, Kasi, Kasai (Guj.).

Loc. : GOA : *Satari* : Onda-Molem. NAGARHAVELI : Dolara forest. DADRA. DAMAN : Dundorta ; Dabel.

Growing in rice fields.

CYMOPOGON Spreng.

Cymbopogon parkeri Stapf in Kew Bull. 1929 : 10, 1929 ; Bor, 131. *Andropogon laniger* Duthie, Ill. Fodder Grasses N. W. Ind. t. 23, 1886 (*non* Desf.) ; FBI 203.

Fl. & Fr. : September.

Loc. : DIU : Rocky creeks, Jalandhar.

Rare, near the sea shore on rocky creeks. According to Bor (*i.e.*), the species is said to be endemic to Uttar Pardesh only. Often confused with *Cymbopogon shoenanthus* (Linn.) Spreng.

CYNODON Rich.

Cynodon dactylon (Linn.) Pers. Syn. Pl. 1 : 85, 1805 ; FBI 7 : 288 ; DG. 209 ; C. 3 : 554 ; G. 3 : 1270 ; S. 273 ; Bor, 469. *Panicum dactylon* Linn. Sp. Pl. ed. 1, 58, 1753.

Fl. & Fr. : April. *Ill.* : Blatt. t. 166 ; Bor, 470, f. 52.

Vern. : Haryali (Mar.) ; Durva (Konk.) ; Gramina (Port.).

Loc. : GOA : *Satari* : Masarde village, near Valpoi.

Growing in rice fields.

CYRTOCOCCUM Stapf

Leaves elliptic - acute, linear - acute or lanceolate - acute, mostly 2.5 - 3 cm long ; spikelets hispidulous ; branches of the panicles glabrous

trigonum

Leaves oblong - elliptic, lanceolate, acuminate, usually over 10 cm long, rarely below 6 cm long ; spikelets glabrous ; branches of the panicle often pilose

oxyphyllum

Cyrtococcum oxyphyllum (Hochst. ex Steud.) Stapf in Hook. Ic. Pl. t. 3096, 1922 ; G. 3 : 1237 ; Bor, 291. *Panicum oxyphyllum* Steud. Syn. Pl. Glum. 1 : 65, 1854. *Panicum pilipes* Nees & Arn. ex Buese in Miq. Pl. Junghn. 3 : 376, 1854 ; FBI 7 : 57.

Fl. : March. *Ill.* : Blatt. t. 110.

Loc. : GOA : *Canacona* : Jamia ghatia, near Nadquem.

In shady places along the valley.

C. trigonum (Retz.) A. Camus in Bull. Mus. Hist. Nat. Paris 27 : 118, 1921 ; G. 3 : 1237 ; Bor, 292. *Panicum trigonum* Retz. Obs. Bot. 3 : 9. 1783 ; FBI 7 : 56.

Fl. : November.

Loc. : GOA : *Sanguem* : Barazan mine area.

Rare, seen in dense shady areas forming a mat.

DACTYLOCTENIUM Willd.

Stoloniferous ; spikes 2 - 5 cm long ; tip of the rachis shortly produced up to 2 mm long

aegyptium

Not stoloniferous ; spikes 0.5 - 2 cm long ; tip of the rachis produced up to 4 mm long

aristatum

Dactyloctenium aegyptium (Linn.) P. Beauv. Ess. Agrost. Expl. 72, t. 15, 1812; S. 274; Dangs. 57; Bor, 489; Pav. 259. *Cynosurus aegyptius* Linn. Sp. Pl. ed. 1 : 72, 1753. *Eleusine aegyptica* (Linn.) Desf. Fl. Atlant. 1 : 85, 1798; FBI 7 : 295; DG. 209; C. 3 : 560.

Fl. & Fr. : September - October. *Ill.* : Blatt. t. 176, f. 1 - 6. *Sena.* t. 10; Bor 490, f. 54.

Loc. : GOA : *Conacona* : Angidiv. NAGARHAVELI : Dapara. DAMAN : Fort area; Cataria. DIU : Sea shore, Nagoa; Sandstone ditch, Castle area; Gogale.

Common on sandy sea shore and grasslands.

D. aristatum Link. Hort. Berol. 1 : 59, 1827; Bor, 489.

Fl. & Fr. : September.

Loc. : DAMAN : Marvor.

Rare, on sandy soil. Usually misidentified as *Dactyloctenium indicum* Boiss. or as a dwarf form of *D. aegyptium* (Linn.) P. Beauv.

DENDROCALAMUS Nees

Dendrocalamus strictus (Roxb.) Nees in Linnæa 9 : 476, 1834; FBI 7 : 404; DG. 210; C. 3 : 572; G. 3 : 1286. *Bambusa stricta* Roxb. Fl. Ind : 103, 1832.

Fl. : September.

Vern. : Kamia bans (Mar.); Mango (Konk.); Bambu macho (Port.).

Loc. : NAGARHAVELI : Dolara. DAMAN : Between Thana Paidi and Jari.

Rare, in open fields. Sometimes planted in Goa area.

DESMOSTACHYA Stapf

Desmostachya bipinnata (Linn.) Stapf in Dyer, Fl. Cap. 7 : 632, 1900; Bor, 491; Pav, 258. *Briza bipinnata* Linn. Syst. Nat. ed. 10, 2 : 875, 1759. *Eragrostis cynosuroides* (Retz.) P. Beauv. Ess. 162, 1812; FBI 7 : 324; C. 3 : 550.

Fl. & Fr. : September - October. *Ill.* : Blatt. t. 162.

Loc. : DAMAN : Between Thana Paidi and Jari.

A rare grass in fields.

DICHANTHIUM Willem.

Dichanthium annulatum (Forsk.) Stapf in Fl. Trop. Afr. 9 : 178, 1917 ; G. 3 : 1206 ; Bor, 133. Pav. 247. *Andropogon annulatus* Forsk. Fl. Aegypt. Arab. 173, 1775 ; FBI 7 : 196 ; C. 3 : 508.

Fl. & Fr. : May - September. *Ill.* : Blatt. t. 62, f. 1 - 6.

Loc. : GOA : *Sanguem* : Colem near Souavali river. NAGARHAVELI : Silvassa, along Daman ganga river ; Atal forest ; Khanvel. DIU : Rocky creeks in the sea, Nagoa.

Occasional in grasslands and on rocky, sandy soil along river banks.

DIGITARIA Heist. ex Fabricius

Spikelets 1.25 mm long, tomentose ; hairs clavate - tipped *stricta*

Spikelets 2.5 - 3 mm long, bearded ; hairs not clavate - tipped *adscendens*

Digitaria adscendens (H.B.K.) Henr. in Blumea 1 : 92, 1934 ; S. 274 ; Bor, 298. *Panicum adscendens* H.B.K. Nov. Gen. & Sp. Pl. 1 : 97, 1815. *Digitaria sanguinalis* (Link) Scop. var. *ciliaris* Prain, Beng. Pl. 1181, 1903 ; C. 3 : 457. *Digitaria marginata* Link var. *fimbriata* Stapf in Fl. Trop. Afr. 9 : 440, 1919 ; G. 3 : 1222.

Fl. & Fr. : August - November. *Ill.* : Blatt. t. 78, f. 1 - 7 ; Sena. t. 36, f. a - H.

Loc. : GOA : *Pernem* : Pernem village. *Salcete* : Margoa. *Sanguem* : Ugem village.

Common in cultivated fields.

D. stricta Roth ex Roem. & Schult. Syst. Veg. 2 : 474, 1817 ; S. 275 ; Bor, 305. *Paspalum royleana* Nees ex Thw. Enum. Plant. Zeyl. 358, 1864 ; FBI 7 : 18. *Digitaria royleana* (Nees) Prain, Beng. Plants, 1182, 1903 ; G. 3 : 1223 ; C. 3 : 459.

Fl. & Fr. : August - September. *Ill.* : Blatt. t. 82, f. 1 - 6.

Loc. : GOA : *Salcete* : Borda village, near Margoa. DAMAN : Dundorta.

Occasional along grassy areas and on rocky walls.

DIMERIA R. Br.

Rachis flattened ; spikelets 1.5 - 2.5 mm long ; upper glume not winged

ornithopoda

Rachis filiform or trigonous ; spikelets 4 - 7 mm long ; upper glume with a rounded wing on the back

stapfiana

Dimeria ornithopoda Trin. Fund. Agrost. 167, t. 14, 1820 ; FBI 7 : 104 ; C. 3 : 462 ; Bor, 142 ; S (ed. 3) 309. *D. filiformis* (Roxb.) Hochst. ex Miq. in Verh. Nederl. Inst. 3 (4) : 35, 1851.

Fl. & Fr. : September. *Ill.* : Blatt. t. 4.

Loc. : DADRA.

Rare, on the bunds of the fields.

D. stapfiana C. E. Hubbard ex Pilger in Engl. & Prantl, Pflanzenf. 140 : 109, 1940 ; S. 275 ; Bor, 144. *Woodrowia diandra* Stapf in Hook. Ic. t. 2447, 1896 ; FBI 7 : 241 ; C. 3 : 533.

Fl. & Fr. : September - November. *Ill.* : Bor, t. 14, f. 13.

Loc. : GOA : *Satari* : Police chowky, near Maloli. *Bardez* : Porvorim. *Ilhas* : Chimbhel reservoir. *Marmugao* : Marmugao Madgoa. *Sanguem* : Potiem foot hill area. NAGARHAVELI : Saily ; Khanvel. DADRA.

Common in open grasslands.

DINEBRA Jacq.

Dinebra retroflexa (Vahl) Panzer in Denkschr. Acad. Wiss. Munchen 270, t. 12, 1814 ; Bor, 491 ; Pav. 255. *Cynosurus retroflexus* Vahl, Symb. Bot. 2 : 20, 1791. *Dinebra arabica* Jacq. Fragm. 77, t. 121, f. 1, 1807 ; C. 3 : 562.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, tt. 210 & 211 ; Blatt. t. 177.

Loc. : NAGARHAVELI : Saily.

Rare, in cultivated fields.

ECHINOCHLOA Beauv.

Spikelets 3 - 4 mm long, densely crowded, unawned ; grains not deciduous

frumentacea

Spikelets 5 mm long, awned ; grains deciduous

colinum

Echinochloa colonum (Linn.) Link, Hort. Berol. 2 : 209, 1833 ; G. 3 : 1230 ; S. 275 ; Bor, 308. *Panicum colonum* Linn. Syst. Nat. ed. 10, 2 : 870, 1759 ; FBI 7 : 32 ; DG. 205 ; C. 3 : 447.

Fl. & Fr. : August - November. *Ill.* : Sena. t. 22 ; Bor, 309, t. 34.

Vern. : Pakad (Konk.).

Loc. : GOA : *Pernem* : Chopedem. *Ilhas* : Chimbel reservoir Brahmapuri temple. *Salcete* : Margoa rest house. *Marmugao* : Marmugao harbour. *Sanguem* : Sauverdem railway station. NAGARHAVELI : Saily ; Silvassa, along Damán Ganga river ; Dapara ; Dudeni ; Khanvel. DADRA. DAMAN : Marvor ; Dundorta. DIU : Jhoola.

Common along moist places in fields, in grasslands and along railway lines.

E. frumentacea Link, Hort. Berol. 1 : 204, 1827 ; Bor, 311. *Echinochloa colonum* var. *frumentacea* Ridley, Fl. Malay Penin. 5 : 223, 1925 ; G. 3 : 1231. *Panicum crus-galli* Linn. var. *frumentaceum* Hook. f. FBI 7 : 31, 1896 ; DG. 205.

Fl. : October.

Vern. : Somva (Konk.).

Loc. : GOA : *Pernem* : Cargao. *Satari* : Pilegao. *Marmugao* : Nuvem. Rare, in rice fields.

ELEUSINE Gaertn.

Eleusine indica (Linn.) Gaertn. Fruct. 1 : 8, 1788 ; FBI 7 : 293 ; DG. 209 ; C. 3 : 560, G. 3 : 1273 ; S. 276 ; Bor, 493. *Cynosurus indicus* Linn. Sp. Pl. ed. 1, 72, 1753.

Fl. & Fr. : September.

Vern. : Maharnachni (Mar.) ; Nachno (Konk.) ; Nachnim (Port.).

Ill. : Blatt. t. 182, f. 1-6 ; Sena. t. 9, A E.

Loc. : GOA : *Canacona* : Angidiv. NAGARHAVELI : Dapara. DADRA. DAMAN : Coileque area.

Rare, in wastelands.

ERAGROSTIS P. Beauv. *emend.* Reichb.

1. Rachilla of spikelets fragile ; spikelets breaking up from above downwards

2. Stamens 3
3. Panicles spiciform ; spikelets 2 - 5 mm long ; lemma ciliate on the keel *ciliaris*
3. Panicles effuse ; spikelets 2.5-4 mm long ; lemma not ciliate on the keel
4. Sweet scented ; stem and rachis viscous *viscosa*
4. Not sweet scented ; stem and rachis not viscous *tenella*
2. Stamens 2 *diarrhena*
1. Rachilla of spikelets tough ; spikelets breaking up from below upwards.
5. Lemma up to 1.5 mm long
6. Plants glandular *pilosa*
6. Plants eglandular *gangetica*
5. Lemma over 1.5 mm long
7. Spikelets flat, ovate - elliptic or oblong, purplish in colour ; paleae deciduous with their glumes *unioloides*
7. Spikelets less compressed, linear or linear - oblong, green in colour ; paleae persistent *tremula*

Eragrostis ciliaris (Linn.) R. Br. in Tuckey Narr. Exp. Congo App. 478, 1818 ; FBI 7 : 314 ; G. 3 : 1263 ; Bor, 506 ; Pav. 256. *Poa ciliaris* Linn. Syst. Nat. ed. 10, 2 : 875, 1759.

Fl. & Fr. : September - November. *Ill.* : Blatt. t. 154.

Loc. : GOA : *Ilhas* : Panaji coast. DAMAN : Fort area. DIU : Jalandhar ; Rocky creek in the sea, Nagoa ; Gogale.

Common along the sandy coasts.

E. diarrhena (Schult.) Steud. Syn. Pl. Glum. 1 : 266, 1854 ; G. 3 : 1254 ; S. 276 ; Bor, 507. *Poa diarrhena* Schult. Syst. Veg. 2, Mant. 616, 1827. *Eragrostis interrupta* var. *koenigii* Stapf ex Hook. f. in FBI 7 : 316, 1896 ; C. 3 : 546. *E. interrupta auct. non* (R. Br.) Beauv.

Fl. & Fr. : September - November.

Loc. : GOA : *Ilhas* : Panaji along sea coast. NAGARHAVELI : Silvassa, along Daman ganga river.

Occasional on gravelly river bed. Erroneously referred to sometimes as *E. interrupta* (Lamk.) P. Beauv. but Beauvois did not base this species on *Poa interrupta* Lamk. The actual *E. interrupta* (R. Br.) P. Beauv. is an Australian species, quite distinct from *E. diarrhena*.

E. gangetica (Roxb.) Steud. Syn. Pl. Glum. 266, 1854 ; C. 3 : 547 ; S. 277 ; Bor, 508. *Poa gangetica* Roxb. Fl. Ind. 1 : 341, 1820. *Eragrostis*

stenophylla Hochst. ex Miq. in Ann. Bot. 2 : 27, 1851 ; FBI 7 : 318 (excl. syn. *nonnullis*).

Fl. & Fr. : September.

Loc. : DAMAN : Bimpur.

Rare, on gravelly soil.

Eragrostis pilosa (Linn.) P. Beauv. Ess. Agrost. 71, 162 & 175, 1812 ; FBI 7 : 323 ; C. 3 : 550 ; G. 3 : 1265 ; S. 277 ; Bor, 512. *Poa pilosa* Linn. Sp. Pl. 1753.

Fl. & Fr. : August. *Ill.* : Blatt. t. 160, f. 1-6.

Loc. : GOA : *Salcete* : Margoa, rest house.

Rare.

E. tenella (Linn.) P. Beauv. ex Roem. & Schult. Syst. Veg. 2 : 576, 1817 ; C. 3 : 545 ; Bor, 513 ; Pav. 257. *Poa tenella* Linn. Sp. Pl. ed. 1, 69, 1753. *E. tenella* var. *plumosa* (Retz.) Stapf in FBI 7 : 315, 1896 ; C. 3 : 545 ; S. 277.

Fl. & Fr. : September - October. *Ill.* : Blatt. t. 155 ; Sena. t. 8.

Loc. : DAMAN : Cataria.

Rare, on sandy soil.

E. tremula Hochst. ex Steud. Syn. Pl. Glum. 1 : 269, 1854 ; FBI 7 : 320 ; C. 3 : 549 ; G. 3 : 1264 ; Bor, 514.

Fl. & Fr. : September. *Ill.* : Blatt. t. 159.

Loc. : GOA : *Pernem* : Terekhol. DAMAN : Cataria.

An erect grass on sandy soil.

E. unioloides (Retz.) Nees ex Steud. Syn. Pl. Glum. 1 : 264, 1854 ; G. 3 : 1264 ; S. 277 ; Bor, 515 ; Pav. 258. *Poa unioloides* Retz. Obs. Bot. 5 : 19, 1789. *E. amabilis* Wt. Arn. ex Nees in Hook. & Arn. Bot. Beech. Voy. 251, 1838 ; FBI 7 : 317 ; C. 3 : 546 (*non* Linn.).

Fl. & Fr. : May - November. *Ill.* : Blatt. t. 156, f. 1-6.

Loc. : GOA : *Satari* : Masarde village. *Bicholim* : Amona ferry crossing. *Bardez* : Baga jungle ; Porvorim. *Ilhas* : Panaji coast. *Marmagao* : Vasco Navy Office plateau. *Quepem* : Budsari Goundugarha ; Rivona Colomba. *Canacona* : Butpal ; Querem. Angidiv. NAGARHAVELI : Silvassa, along Damanganga river ; Dolara. DADRA. DAMAN : Cataria ; fort area.

Very common in moist fields, on wastelands and on rocky slopes.

E. viscosa (Retz.) Trin. in Mem. Acad. Sci. Petersb. ser. 6, 1 : 397, 1831 ; S. 277 ; Bor, 515 ; Pav. 256. *Poa viscosa* Retz. Obs. Bot. 4 : 20.

1786. *Eragrostis tenella* var. *viscosa* Stapf in FBI 7 : 315, 1896 ; C. 3 : 546.

Fl. & Fr. : September.

Loc. : NAGARHAVELI : Dolara. DAMAN : Dundorta.

Rare, in grasslands and moist situations.

ERIOCHLOA Kunth

Eriochloa procera (Retz.) C. E. Hubbard in Kew Bull. 1930 : 256, 1930 ; Bor 312 ; Pav. 253. *Agrostis procera* Retz. Obs. Bot. 4 : 19, 1786. *Eriochloa polystachya* Hook. f. in FBI 7 : 29, 1896 (non H.B.K.) C. 3 : 461.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, tt. 78 & 79.

Loc. : NAGARHAVELI : Saily ; Khanvel.

Rare, in the cultivated fields and marshy areas.

EULALIA Kunth

Perennial ; racemes many, 6 - 12

trispicata

Annual ; racemes few, 2 - 4

fimbriata

Eulalia fimbriata (Hack.) O. Kuntze, Rev. Gen. Pl. 2 : 775, 1891 ; 277 ; Bor, 155 ; Pav. 155. *Pollinia fimbriata* Hack. in DC. Mon. Phan. 6 : 164, 1898 ; FBI 7 : 112 ; C. 3 : 468.

Fl. & Fr. : September - November. *Ill.* : Blatt. t. 36.

Loc. : GOA : *Satari* : Maloli village, near Custom Chowky. *Bardez* : Porvorim. NAGARHAVELI : Saily ; Khanvel. DADRA. DAMAN : Dundorta.

Common on gravelly areas.

E. trispicata (Schult.) Henr. in Blumea 3 : 453, 1940 ; S. 277 ; Bor, 157. *Andropogon trispicatus* Schult. Syst. Veg. 2, Mant. 452, 1824. *Pollinia argentea* Trin. Bull. Acad. Sci. Petersb. 1 : 71, 1836 ; FBI 7 : 111 ; DG. 207 ; C. 3 : 468.

Fl. & Fr. : November. *Ill.* : Blatt. t. 35, f. 1 - 5.

Vern. : Soryo (Konk.).

Loc. : GOA : *Satari* : Near Ponda village.

Scarce.

GARNOTIA Brongn.

Garnotia tenella (Arn. ex Miq.) Janowski in Fedde, Rep. Sp. Nov. 17 : 86, 1921. *Berghausia tenella* Arn. ex Miq. Anal. Bot. Ind. 34, 1851. *Garnotia stricta non* Brongn. in Duperr. Voy. Coq. Bot. 133, t. 21, 1829 ; FBI 7 : 254 ; C. 3 : 534 ; G. 3 : 1255 ; S. 278 ; Bor, 569.

Fl. : September. *Ill.* : Blatt. t. 136.

Loc. : GOA : *Bicholim*.

Rare, in shady areas.

HACKELOCHLOA Kuntze

Hackelochloa granularis (Linn.) O. Kuntze, Rev. Gen. Pl. 776, 1891 ; S. 278 ; Bor, 159 ; Pav. 243. *Cenchrus granularis* Linn. Mant. 2 (App.) : 575, 1771 ; *Manisuris granularis* Linn. f. Nov. Gram. Gen. 40, 1779 ; FBI 7 : 159 ; C. 3 : 473.

Fl. & Fr. : September October. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, t. 147 ; Blatt. t. 22.

Loc. : DAMAN : Dundorta.

Rare, on gravelly soil.

HETEROPOGON Pers.

Heteropogon contortus (Linn.) P. Beauv. ex Roem. & Schult. Syst. Veg. 2 : 836, 1817 ; G. 3 : 1208 ; S. 278 ; Bor, 163. *Andropogon contortus* Linn. Sp. Pl. ed. 1, 1045, 1753 ; FBI 7 : 199 ; C. 3 : 510.

Fl. & Fr. : September November. *Ill.* : Blatt. t. 71, f. 1-5 ; Bor, f. 6.

Loc. : GOA : *Pernem* : Pernem *Bicholim*. *Bardez* : Porvorim rocky plateau. *Ilhas* : Santacruz village. *Salcete* : Goodier. *Quepem* : Quepem-Sanguem. NAGARHAVELI : Saily ; Dolara. DAMAN : Fort area.

Common in grasslands.

HYGRORYZA Nees

Hygroryza aristata (Retz.) Nees ex Wt. & Arn. in Edinb. New Phil. Jour. 15 : 380, 1833 ; FBI 7 : 95 ; DG. 207 ; G. 3 : 1277 ; Bor, 597. *Pharus aristatus* Retz. Obs. Bot. 5 : 23, 1789.

Fl. & Fr. : September - October. *Ill.* : Bor, f. 67 ; Subramanyam Aquatic Angios. f. 63, 1962.

Vern. : Devbhat (Mar.).

The species is found floating in lakes. Common throughout Western and Peninsular India and it should be possible to locate it in Goa as well.

The spelling *Hygrorrhiza* as used in the Indian Floras is found to be an orthographic error and hence the correct spelling, *Hygroryza*.

The species yields edible grains which are eaten by local people and also much relished by cattle.

ISACHNE R. Br.

Panicle ovoid or pyramidal ; spikelets 1.7 - 2 mm long	<i>globosa</i>
Panicle small, lax flowered ; spikelets 1.5 mm long	<i>millacea</i>

Isachne globosa (Thunb.) O. Kuntze, Rev. Gen. Pl. 2 : 778, 1891 ; S. 279 ; Bor, 580. *Milium globosum* Thunb. Fl. Jap. 49, 1784. *Isachne australis* R. Br. Prodr. 196, 1810 ; FBI 7 : 24 ; C. 3 : 439.

Fl. & Fr. : August - September. *Ill.* : Blatt. t. 122.

Loc. : GOA : *Bicholim* : Bicholim. *Bardez* : Chopedem, near Agarvado. *Salcete* : Margoa rest house. *Sanguem* : Molem Saverdem ; Dudal. *Quepem* : Quepem Sanguem. NAGARHAVELI : Silvassa, along Daman ganga river ; Saily ; Dolara ; Dapara. DADRA, DAMAN : Marvor ; Dundorta ; Dabel.

Abundant in rice fields and marshy areas.

I. millacea Roth Nov. Pl. Sp. 58, 1821 ; FBI 7 : 25 ; C. 3 : 439 ; G. 3 : 1244 ; S. 279 ; Bor, 582.

Fl. & Fr. : October - April. *Ill.* : Blatt. t. 123.

Loc. : GOA : *Satari* : Onda ; Pilegao. *Ilhas* : Panaji Margoa, rice fields. *Canacona* : Nadquem.

Occasional in rice fields.

ISCHAEUM Linn.

1. Margins of lower glumes of sessile spikelets expanded below the middle, incurved at the base ; upper and lower glume of pedicelled spikelets 1 - keeled

indicum

1. Margins of lower glume of sessile spikelets narrowly inflexed,

not expanded below ; lower glume of pedicelled spikelets 2-keeled

2. Leaves cordate or sagittate *semisagittatum*
 2. Leaves not cordate or sagittate *rugosum*

Ischaemum indicum (Houtt.) Merr. in Journ. Arn. Arbor. 19 : 320. 1938 ; Bor, 180 ; Pav. 241 ; S. (ed 3). 314. *Phleum indicum* Houtt. Nat. Hist 11, 13 : 198, t. 90, f. 2, 1782. *Ischaemum aristatum* Linn. Sp. Pl. 1049, 1753 ; C. 3 : 476 ; G. 3 : 1193 ; S. 279.

Fl. & Fr. : September - November. *Ill.* : Blatt. t. 12, f. 1 8. (as *Ischaemum cillare* Retz.).

Loc. : GOA : *Bicholim* : Amona ferry crossing, along river bank. *Satari* : Grassland near Onda. *Ihas* : Chimbél. *Salcete* : Goodier, Margoa Quepem. *Sanguem* : Patiém hillock ; Molem ghat. *Quepem* : Budsari Goundugarha NAGARHAVELI : Saily ; Dolara. DAMAN : Marvor ; Tampor.

Common on moist areas

I. rugosum Salisb. Icon. Strip. Rar. 1, t. 1, 1791 ; FBI 7 : 127 ; C. 3 : 477 ; S. 280 ; Dangs. 58 ; Bor, 184 ; Pav. 242.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar t. 132 ; Blatt. t. 7.

Loc. : NAGARHAVELI : Saily. DADRA.

Occasional, in open grasslands and cultivated fields.

I. semisagittatum Roxb. [Hort. Beng. 8, 1814 (*nom. nud.*) &] Fl. Ind. 1 : 322, 1820 ; FBI 7 : 130 ; C. 3 : 479 ; G. 3 : 1194 ; S. 280 ; Bor, 185. *I. conjugatum* Roxb. Fl. Ind. 1 : 323, 1820.

Fl. : October.

Loc. : GOA : *Salcete* : Margoa ghat. NAGARHAVELI : Saily ; Khanvel. DAMAN : Fort area.

Rare but gregarious in grasslands. There is no specific difference between *I. semisagittatum* and *I. conjugatum* and hence both have been united.

ISEILEMA Anderss.

Spathes very narrow with minute tubercles on the keel and margins ; stem prostrate rooting at base ; nodes more or less bearded

prostratum

Spathes comparatively broad, devoid of tubercles ; stem ascending from a stout sometimes creeping rhizome ; nodes not bearded

laxum

Iseilema laxum Hack. in DC. Monogr. Phan. 6 : 682, 1889 ; FBI 7 : 18 ; C. 3 : 516 ; Bor, 188.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, tt. 166 - 168.

Loc. : NAGARHAVELI : Dapara. DADRA. DAMAN : Fort area ; Marvor ; Daman.

Occasional, in the fields and grasslands.

I. prostratum (Linn.) Anderss. in Nov. Act. Soc. Sci. Upsal. ser. 3 (2) : 251, 1856 ; Bor, 188. *Andropogon prostratus* Linn. Mant. Alt. 304, 1771. *Iseilema wightii* Anderss. in Nov. Act. Soc. Sci. Upsal. ser. 3 (2) : 251, 1856 ; FBI 7 : 218 ; C. 3 : 516.

Fl. & Fr. : September. *Ill.* : Blatt. t. 73.

Loc. : DAMAN : Coileque area.

Rare.

JANSENELLA BOR

Jansenella griffithiana (C. Muell.) Bor in Kew Bull. 1955, 98, 1955. *Danthonia griffithiana* C. Muell. in Bot. Z. 14 : 347, 1856. *Arundinella avenacea* Munro ex Thw. Enum. Pl. Zeyl. 362, 1864 ; FBI 7 : 69 ; C. 3 : 520 ; G. 3 : 1246.

Fl. & Fr. : November. *Ill.* : Bor, f. 45.

Loc. : GOA : *Sanguem* : Avelde jungle, Mole.

Rare, on wet soil.

MANISURIS Lit n.

1. Joints of the racemes turbinate or swollen ; lower glume of the sessile spikelet broadly winged on one side and narrowly winged or equally winged on the other
2. Ridges of the glume pointing and overlapping upwards, joints stout turbinate, about 2 mm long and broad or broader
2. Ridges pointing and overlapping downwards, joint and pedicels about 4 mm long, fused to form a rather dumb-bell - shaped structure, tumid below

talbotii

goensis

1. Joints of the racemes clavate, several times as long as broad
3. Lower glume of sessile spikelet long - awned ; surface with well developed transverse ridges *acuminata* var. *acuminata*
3. Lower glume of sessile spikelet short - awned or awnless ; surface with well marked tubercular ridges, honey combed between *acuminata* var. *woodrowii*

Manisuris acuminata var. *acuminata* (Hack.) O. Kuntze, Rev. Gen. Pl. 2 : 779, 1891 ; G. 3 : 1220 ; Bor, 191. *Rottboellia acuminata* Hack. in DC. Mon. Phan. 6 : 291, 1889 ; FBI 7 : 155 ; C. 3 : 471.

Fl. & Fr. : November. *Ill.* : Bor, 193, f. 10, 2.

Loc. : GOA : *Ilhas* : Military camp Chimbél, plateau area, near Panaji.

Rare.

M. acuminata (Hack.) O. Kuntze var. *woodrowii* Bor, Grasses of Burma, India., 191, 1960.

Ill. : Bor, f. 10, 3.

Loc. : GOA : *Marmugao* : Nuvem.

Rare.

M. goensis Rolla Rao et Hemadri, Bull. Bot. Surv. Ind. 10(1) : 106, 1968.

Fl. & Fr. : October November. *Ill.* : Bull. Bot. Surv. Ind. 10(1) : 107, f. 1-24.

Loc. : GOA : *Bardez* : Porvorim rocky plateau. *Ilhas* : Panaji Madgoa. *Bicholim* : Usgao.

Occasional.

The species very closely resembles *Manisuris talbotii* in its habit and habitat but is quite distinct from it by its narrow cylindric racemes and thinner characteristically shaped joints at the base of each pair of spikelets.

M. talbotii (Hook. f.) Bor, Grasses of Burma, India., 192, 1960. *Rottboellia talbotii* Hook. f., FBI 7 : 155, 1896.

Fl. & Fr. : October November. *Ill.* : Bor, f. 10 ; Rolla Rao et Hemadri in Bull. Bot. Surv. Ind. 10(1) : 108, Pl. 1, f. 4 6.

Loc. : GOA : *Ilhas* : Military camp Chimbél, Plateau area near Panaji.

Occasional, probably endemic.

MELANOCENCHRIS Nees

Melanocenchris jacquemontii Jaub. & Spach. Ill. Pl. Or. 4 : 36, 1851 ; S. 281 ; Bor. 473 ; Pav. 230. *M. royleana* Nees ex Steud. Syn. Pl. Glum. 218, 1854. *Gracillea royleana* Hook. f. in FBI 7 : 284, 1896 ; C. 3 : 553.

Fl. & Fr. : September.

Loc. : NAGARHAVELI : Silvassa, near Atal forest. DAMAN : Dundorta. DIU : Nagoa.

Occasional, in rock crevices and along sea shore rocky area.

OPHIUROS Gaertn. f.

Ophiuros exaltatus (Linn.) O. Kuntze, Rev. Gen. Pl. 2 : 780, 1891 ; Bor. 199. *Aegilops exaltata* Linn. Mant. 2 : 595, 1771. *Ophiuros corymbosus* Gaertn. f. Fruct. 3 : 4, t. 181, 1805 ; FBI 7 : 160 ; C. 3 : 468.

Fl. & Fr. : September. *Ill.* : Blatt. t. 28, f. 1 8.

Loc. : DADRA. DAMAN : Dabel.

Rare, in open fields.

OPLISMENUS Beauv.

Annual, small diffuse grass ; awns pale barbelate, capillary, flexuous

burmannii

Perennial, tall, robust grass ; awns reddish smooth, viscid, filiform, stiff

compositus

Oplismenus burmannii (Retz.) P. Beauv., Ess. Agrost. 54, 168, 169, 1812 ; FBI 7 : 68 ; C. 3 : 443 ; G. 3 : 1232 ; S. 281 ; Bor. 317. *Panicum burmannii* Retz. Obs. Bot. 3 : 10, 1783.

Fl. & Fr. : September - November. *Ill.* : Blatt. t. 97.

Loc. : GOA : Bardez : Porvorim forest. NAGARHAVELI : Saily forest ; Khuntly forest. DADRA. DAMAN : Cataria ; Dundorta.

Common in shady areas of the forest and in fields.

O. compositus (Linn.) P. Beauv., Ess. Agrost. 54, 168, 169, 1812 ; FBI 7 : 66 ; C. 3 : 442 ; G. 3 : 1231 ; S. 281 ; Bor. 317. *Panicum compositus* Linn. Sp. Pl. ed. 1 : 57, 1753.

Fl. & Fr. : November. *Ill.* : Blatt. t. 96.

Loc. : GOA : *Satari* : Codal village. *Bardez* : Betim Bardez. *Ilhas* : Chimbel reservoir, near Panaji. *Sanguem* : Molem Ponda ; Molem. *Quepem* : Budsari Goundugarha.

Occasional, in moist shady places.

ORYZA Linn.

Oryza sativa Linn. Sp. Pl. ed. 1 : 333, 1753 ; FBI 7 : 92 ; DG. 206 ; C. 3 : 565 ; G. 3 : 1276 ; S. 281 ; Bor, 605.

Fl. : September. *Ill.* : Blatt. t. 187, f. 1 - 6.

Vern. : Bhat (Konk.) ; Arroz (Port.).

Loc. : GOA : *Bardez* ; Nagoa.

Cultivated but seen commonly as escape from cultivation. It constitutes the principal staple food of the people.

PANICUM Linn.

1. Spikelets oblong, ovate-oblong to elliptic, acute or obtuse

2. Spikelets 4 - 5 mm long

hippotherix

2. Spikelets up to 3.5 mm long

3. Annuals ; leaves linear ; lower glume 1/4 to 1/2 the length of the spikelet

psilopodium

3. Perennials ; leaves ovate-lanceolate ; lower glume 1/2 - 3/4 the length of the spikelet

notatum

1. Spikelets narrowly lanceolate to lanceolate-oblong, acute

paludosum

Panicum hippotherix K. Schum. in Engl. Pflanzenw. Ost. Afr. C. 103, 1895 ; Bor, 326. *P. obscurans* (Woodr.) Stapf in Journ. Bomb. nat. Hist. Soc. 13 : 434, 1901 ; C. 3 : 452.

Fl. & Fr. : September. *Ill.* : Blatt. t. 99.

Loc. : NAGARHAVELI : Silvasa. DAMAN : Cataria.

Occasional, growing on sandy soil.

P. notatum Retz. Obs. Bot. 4 : 18, 1786 ; Bor, 701. *P. montanum* Roxb. Fl. Ind. 1 : 315, 1820 ; FBI 7 : 53 ; C. 3 : 454 ; G. 3 : 1235 ; S. 281.

Fl. & Fr. : September - November. *Ill.* : Blatt. t. 105, f. 1 - 7.

Loc. : GOA : *Sanguem* : Patim forest hill area. *Canacona* : Ordo-fond Butpal. NAGARHAVELI : Dolara forest.

Occasional, on the grassy slopes of forest.

Panicum paludosum Roxb. [Hort. Beng. 8, 1814. (*nom. nud.*) &] Fl. Ind. 1 : 310, 1820 ; G. 1235 ; S. 281 ; Bor, 329. *P. proliferum* auct. non Lamk. : FBI 7 : 50, 1896 ; *P. proliferum* var. *paludosum* Stapf, in Dyer, Fl. Copen, 7 : 407, 1899 ; C. 3 : 454.

Fl. & Fr. : August.

Loc. : GOA : *Salcete* : Margoa, field near rest house.

Rare in the marshy areas of fields.

P. psilopodium Trin., Gram. Panic. 217, 1826 ; FBI 7 : 46 ; G. 3 : 1234 ; S. 281 ; Bor, 329.

Loc. : GOA : *Sanguem* : Ugem village.

Rare, in association with *Setaria*, *Digitaria* etc. The Goa specimens referable to var. *psilopodium* only.

Cult. species :

P. maximum Jacq. Collect. Bot. 1 : 76, 1786 et Ic. Pl. Rar. 1 : 2, t. 13, 1781-86 ; FBI 7 : 49 ; DG. 206 ; C. 3 : 455 ; G. 3 : 1235 ; Bor, 327.

Vern. : Gini gavat (Mar.) ; Guinea grass (Eng.) ; Fenoda guine (Port.).

Ill. : Bor, f. 37.

The species, a native of Africa is cultivated mostly for fodder.

P. miliaceum Linn. Sp. Pl. ed. 1 : 58, 1753 ; FBI 7 : 45 ; DG. 205 ; C. 3 : 456 ; G. 3 : 1234 ; Bor, 327.

Vern. : Varai (Mar.) ; Varay (Konk.) ; Milho miudo (Port.). Small millet (Eng.).

A native of Egypt and Arabia. The species is cultivated for its grain.

PASPALIDIUM Stapf

Spikes shorter than the internodes ; spikelets ovoid or subglobose, hardly compressed, obtuse or acute ; upper glume as long as upper lemma

flavidum

Spikes longer than the internodes ; spikelets ovate to ovate-lanceolate distinctly flattened, acute or apiculate ; upper glume almost equalling upper lemma

geminatum

Paspalidium flavidum (Retz.) A. Camus in Lecomte, Fl. Gen. Indo-China 7 : 419, 1922 ; G. 3 : 1229 ; S. 281 ; Bor. 333 ; Pav. 252. *Panicum flavidum* Retz. Obs. Bot. 4 : 15, 1786 ; FBI 7 : 28 ; C. 3 : 445.

Fl. & Fr. : September. *Ill.* : Blatt. t. 90, f. 1 9 ; Sena. t. 23, f. A F.

Loc. : GOA : *Bardez* : Porvorim village fields. NAGARHAVELI : Saily ; Dolara ; DADRA. DAMAN : Bimpor.

Common in fields and wastelands, in shady areas.

Paspalidium geminatum (Forsk.) Stapf in Fl. Trop. Afr. 9 : 583, 1920 ; G. 3 : 1229 ; Bor, 333. *Panicum geminatum* Forsk. Fl. Aegypt Arab. 18, 1775. *P. paspaloides* Pera. Syn. 1 : 81, 1805 ; FBI 7 : 30.

Fl. & Fr. : November. : *Ill.* : Ranga Achariyar & Tadulinga in Handb. South Ind. Gr. f. 84 & 85, 1921.

Loc. : GOA : *Pernem* : Pernem village.

are in moist areas.

PASPALUM Linn.

Paspalum scrobiculatum Linn. Mant. Pl. 1 : 29, 1767 ; FBI 7 : 10 ; DG. 205 ; C. 3 : 460 ; G. 3 : 1227 ; S. 282 ; Bor, 340.

Fl. & Fr. : April.

Vern. : Harik (Konk.). *Ill.* : Blatt. t. 87.

Loc. : GOA : *Bardez* : Nagoa. *Ponda* : Quem. *Canacona* : Nadquem village. Ordofond Butpal.

Rare.

PEROTIS Ait.

Perotis indica (Linn.) O. Kuntze, Rev. Gen. Pl. 2 : 787, 1891 ; G. 3 : 1256 ; Bor, 611. *Anthoxanthum indicum* Linn. Sp. Pl. ed. 1, 28, 1753. *Perotis latifolia* Ait. Hort. Kew. 1 : 85, 1789 ; FBI 7 : 98 ; C. 3 : 538.

Fl. & Fr. : November. *Ill.* : Blatt. 147 ; Bor, f. 72.

Loc. : GOA : *Pernem* : Terekhol, Panaji sea coast. DAMAN : Cataria ; fort area.

Rare, on sandy soil along sea coast.

PHRAGMITES Trin.

Phragmites karka (Retz.) Trin. ex Steud. Nom. Bot. ed. 2, 2 : 324, 1841 ; FBI 7 : 304 ; DG. 209 ; C. 3 : 527 ; G. 3 : 1251 ; Bor, 417. *Arundo karka* Retz, Obs. Bot. 4 : 21, 1786.

Vern. : Dernal (Konk.) ; Cannico (Port.).

The species is infrequent and sometimes cultivated also (Dalgado).

The pipe - like stems and leaves are used for thatching.

PSEUDANTHISTIRIA (Hack.) Hook. f.

***Pseudanthistiria heteroclita* (Roxb.) Hook. f.** FBI 7 : 219, 1896 ; G. 3 : 1212 ; S. 282 ; Bor, 203. *Anthistiria heteroclita* Roxb. Fl. Ind. 1 : 249, 1832.

Fl. & Fr. September - November. *Ill.* : Blatt. t. 76, f. 1 - 9.

Loc. : GOA : *Bicholim* : Amona ferry crossing, river bank. *Ilhas* : Near Chimbhel reservoir. *Sanguem* : Barazan mine area ; Ghat zone, Colem Molem. *Canacona* : Butpal Kanpal, hill top.

Frequent in grasslands.

PSEUDORAPHIS Griff.

***Pseudoraphis spinescens* (R. Br.) Vickery** in Proc. Roy. Soc. Queensl. 62(7) : 69, 1952 ; Bor, 353. *Panicum spinescens* R. Br. Prodr, 193, 1810. *Chamaeraphis spinescens* (R. Br.) Poir. in Lamk, Encycl. Meth. Bot. Suppl. 2 : 189, 1811 ; FBI 7 : 62 ; C. 3 : 437.

Fl. & Fr. : September.

Loc. : GOA : *Bardez* : Nagoa.

Rare, in stagnant water near paddy fields. Fodder relished by cattle.

SACCHARUM Linn.

***Saccharum spontaneum* Linn.** Mant. Alt. 183, 1771 ; FBI 7 : 118 ; DG. 207 ; C. 3 : 465 ; G. 3 : 1185 ; Bor, 214 ; Dangs. 58 ; Pav. 239.

Fl. : September - November. *Ill.* : Blatt. t. 31, f. 1 - 7.

Vern. : Bagberi (Mar.) ; Kans, Kansado (Guj.).

Loc. : DIU : Nagoa.

The species is fairly common along the Concan region in cultivated fields and along the edges of streams. Dalgado also records it for Goa.

Cult. species :

***S. officinarum* Linn.** Sp. Pl. 54, 1753 ; DG. 207 ; C. 3 : 466.

Vern. : Us (Mar.) ; Canna doce (Port.).

The species is extensively cultivated for extraction of sugar.

SACCIOLEPIS Nash

Culms robust, usually spongy below ; spikelets 4 - 5 mm long,
usually in interrupted crowded fascicles

interrupta

Culms slender, never spongy ; spikelets 2.5 - 3.5 mm long, in
continuous pseudo - spikes

indica

Sacciolepis indica (Linn.) A. Chase in Proc. Biol. Soc. Wash. 21 : 8, 1908 ; Bor, 357. *Panicum indicum* Linn. Mant. Pl. 2 : 184, 1771 ; FBI 7 : 41.

Fl. & Fr. : September. *Ill.* : Sena. t. 20.

Loc. : DADRA.

Rare, in grasslands.

S. interrupta (Willd.) Stapf in Fl. Trop. Afr. 9 : 757, 1920 ; G. 3 : 1238 ; Bor, 358. *Panicum interruptum* Willd. Sp. Pl. 1 : 341, 1798 ; FBI 7 : 40 ; C. 3 : 450.

Fl. & Fr. : November. *Ill.* : Blatt. t. 108.

Loc. : GOA : *Salcete* : Goodier.

Rare, in marshy areas.

SETARIA P. Beauv. *nom. cons.*

1. Bristles retrorsely barbed

verticillata

1. Bristles antrorsely barbed

2. Inflorescence a continuous cylindric false spike ; spikelets
3 mm long

glauca

2. Inflorescence an interrupted, narrow panicle ; spikelets
2 mm long

tomentosa

Setaria glauca (Linn.) P. Beauv. Ess. Agrost. 51 : 169, 173, 1812 ; FBI 7 : 78, *p. p.* ; C. 3 : 435 ; S. 283 ; Bor, 360 ; Pav. 251. *Panicum glaucum* Linn. Sp. Pl. ed. 1, 56, 1753.

Fl. & Fr. : August September. *Ill.* : Ranga Achariyar & Tadulinga in Handb. Some South Indian Grasses, f. 109, 1921.

Vern. : Kolara (Mar.).

Loc. : GOA : *Pernem* : Tirla. *Bardez* : Nagoa. *Salcete* : Raiyi village hill. *Sanguem* : Ugem near Potiem. NAGARHAVELI ; Dolara. DADRA. DAMAN : *Marvor*.

Common in cultivated fields and grasslands.

The species is often confused with *Setaria pallidifusca* (Schumach.) Stapf et C. E. Hubb. which is far more common as compared to the present species.

Setaria tomentosa (Roxb.) Kunth, *Rev. Gram.* 1 : 47, 1829 ; *Bor.* 365 ; *Pav.* 251. *Panicum tomentosum* Roxb. *Fl. Ind.* 303, 1820. *Setaria intermedia* (Roth) Roem. & Schult. *Syst. Veg.* 2 : 489, 1817 ; *FBI* 7 : 79 ; *C.* 3 : 436 ; *S.* 283.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, t. 110.

Loc. : NAGARHAVELI : Saily. DADRA. DAMAN : Dündorta. DIU : Gogale.

Common along sandy sea shore and in waste lands.

S. verticillata (Linn.) P. Beauv. *Ess. Agrost.* 51 : 178 ; 1812 ; *FBI* 7 : 80 ; *Bor.* 365 ; *Pav.* 250. *Panicum verticillatum* Linn. *Sp. Pl. ed.* 2, 82, 1762.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, tt. 111 & 112.

Loc. : DAMAN : Coileque area.

Rare, in wastelands.

Cult. species :

S. italica Beauv. *Agrost.* 51, 1812 ; *FBI* 7 : 78 ; *DG.* 206 ; *C.* 3 : 437 ; *G.* 3 : 1239.

Vern. : Rala (Mar.) ; Karg varay (Konk.) ; Milho painco (Port.) ; Italian millet (Eng.) DIU : Jhoola.

Cultivated as a food grain.

SORGHUM Pers.

Sorghum halepense (Linn.) Pers. *Syn.* 1 : 101, 1805 ; *S.* 283 ; *Bor.* 222 ; *Pav.* 243. *Holcus halepensis* Linn. *Sp. Pl. ed.* 1, 1047, 1753. *Andropogon halepensis* Brot. *Fl. Lus.* 1 : 89, 1804 ; *FBI* 7 : 182 ; *C.* 3 : 502.

Fl. & Fr. : September - October. *Ill.* : *Blatt.* t. 37, f. 1 - 12 ; *Sena.* t. 44, A - F.

Loc. : NAGARHAVELI : *Kharvel.* DADRA : DAMAN : Fort area ; Coileque area. DIU : Diu town near Church.

Common, in cultivated fields.

SPODIOPOGON Trin.

Spodiopogon rhizophorus (Steud.) Pilger in Pflanzenf. ed. 2, 14e : 119, 1940 ; S. 283 ; Dangs. 58 ; Bor, 246 ; Pav. 240. *Andropogon rhizophorus* Steud. Syn. Pl. Glum. 381, 1855. *Spodiopogon albidus* Benth. in Jour. Linn. Soc. 19 ; 60, 1881 ; FBI 7 : 108 ; C. 3 : 464.

Fl. & Fr. : September. *Ill.* : Blatt. t. 34, f. 1 8.

Loc. : NAGARHAVELI : Saily forest ; Dolara forest.

Rare, in forest undergrowth.

SPOROBOLUS R. Br.

- | | |
|--|------------------------|
| 1. Lower glume as long as the lemma, at least 3 quarters its length | <i>virginicus</i> |
| 1. Lower glume much shorter than the lemma, rarely 2/3 its length | |
| 2. Stamens 2 | <i>diander</i> |
| 2. Stamens 3 | |
| 3. Upper glume distinctly shorter than the lemma | <i>tenuissimus</i> |
| 3. Upper glume as long, nearly as long as or longer than lemma | |
| 4. Panicles effuse spreading at least at maturity ; lower branches truly whorled | |
| 5. Annuals, spikelets ovate lanceolate, acuminate | <i>coromandelianus</i> |
| 5. Perennials from a woody base ; spikelets oblong | <i>marginatus</i> |
| 4. Panicles contracted ; lower branches not truly whorled | <i>maderaspatanus</i> |

Sporobolus coromandelianus (Retz.) Kunth, Rev. Gram. 1 : 68, 1829 ; FBI 7 : 252 ; C. 3 : 542 ; Bor, 627 ; Pav. 263. *Agrostis coromandeliana* Retz. Obs. 4 : 19, 1786.

Fl. & Fr. : September. *Ill.* : Ranga Achariyar & Tadulinga Mudaliyar, tt. 181 & 182 ; Blatt. t. 153.

Loc. : DIU : Nagoa, Airport.

Rare.

S. diander (Retz.) P. Beauv. Ess. Agrost. 26 : 147, 178, 1812 ; FBI 7 : 247 ; C. 3 : 539 ; G. 3 : 1258 ; S. 284 ; Bor, 629. *Agrostis diandra* Retz. Obs. Bot. 5 : 19, 1789.

Fl. & Fr. : August September. *Ill.* : Blatt. t. 148, f. 1 - 6. Sena t. 14, f. A E.

Loc. : GOA : *Satari* : Valpoi. *Canacona* : Savardem, near railway station. NAGARHAVELI : Silvassa.

Occasional in moist, gravelly areas.

Sporobolus maderaspatanus Bor, in Kew Bull. 1957 : 234, 1957 et in Grasses of Burma, Ceylon, India & Pakistan, 632, 1960. *S. orientalis* auct. : FBI 7 : 251 ; C. 3 : 541 ; G. 3 : 1258.

Fl. & Fr. : September.

Loc. : DIU : Rocky creek in the sea, Nagoa.

Rare, in rocky creeks.

S. marginatus Hochst. ex A. Rich. Tent. Fl. Abyss. 2 : 397, 1851 ; Bor, 632 ; Pav. 263. *S. arabicus* Boiss. Diagn. ser. 1, 1 : 13 : 47, 1853 ; FBI 7 : 252 ; C. 3 : 541.

Fl. & Fr. : September October.

Loc. : DIU : Castle area.

Rare, near the sea shore, in drier tracts.

S. tenuissimus (Shrank.) O. Kuntze, Rev. Gen. Pl. 3 : 369, 1893 ; Bor, 633. *Panicum tenuissimum* Shrank, in Denkschr. Bot. Ges. Regensb. 2 : 26, 1822. *Sporobolus minutiflorus* (Trin.) Link, Hort. Berol. 1 : 88, 1827 ; FBI 7 : 248 ; C. 3 : 540 ; G. 3 : 1258.

Fl. & Fr. : September.

Loc. : GOA : *Ilhas* ; Panaji. *Canacona* : Angidiv.

Occasional, in association with *Impatiens* and *Cassia tora*.

S. virgatus (Linn.) Kunth, Rev. Gram. 1 : 67, 1829 ; Bor, 634. *Agrostis virginica* Linn. Sp. Pl. ed. 1, 63, 1753 ; FBI 7 : 249.

Fl. & Fr. : September.

Loc. : DIU : Swampy back water area.

Rare, in association with *Avicennia* along backwaters. Cooke does not record this species for Bombay Presidency.

SPINIFEX Linn.

Spinifex littoreus (Burm. f.) Merr. in Philp. Journ. Sci. Bot. 7 : 229, 1912 ; G. 3 : 1183 ; Bor, 366. *Stipa littorea* Burm. f. Fl. Ind. 29, 1768 ; *Spinifex squarrosus* Linn. Mant. 300, 1771 ; FBI 7 : 63 ; DG. 206 ; C. 3 : 428.

Fl. & Fr. : November April. *Ill.* : Ranga Achariyar & Tadulinga in Handb. Some South Indian Grasses, f. 105-106, 1921.

Vern. : Saramto (Konk.).

Loc. : GOA : *Ilhas* : Panaji coastal area.

Fairly common, restricted to the sandy coast.

THEMEDA Forsk.

- | | |
|---|---------------------|
| 1. Pairs of involucrel spikelets inserted at different levels | |
| 2. Involucrel spikelets without tubercle - based hairs | <i>cymbaria</i> |
| 2. Involucrel spikelets with tubercle - based bristles | |
| 3. Racemes under 1.5 cm long | <i>triandra</i> |
| 3. Racemes exceeding 1.5 cm long | <i>tremula</i> |
| 1. Pairs of involucrel spikelets inserted at same level | |
| 4. Involucrel spikelets over 6 mm long ; awns up to 6 cm long | <i>triandra</i> |
| 4. Involucrel spikelets less than 6 mm long ; awns shorter | <i>quadrivalvis</i> |

Themeda cymbaria Hack. in DG. Mon. Phan. 6 : 668, 1889 ; C. 3 : 514 ; G. 3 : 1210 ; Bor, 251. *Anthistiria cymbaria* Roxb. [Hoxb. Beng. 6, 1814 (nom. nud.) &] Fl. Ind. 1 : 255, 1820 (excl. syn. *Andropogon cymbarius* Linn.) ; FBI 7 : 215 ; DG. 208.

Vern. : Karad (Konk.) ; Balai hullu (Kan.).

Common along Concan area and Dalgado also records it. It is considered as a good fodder grass.

T. quadrivalvis (Linn.) O. Kuntze, Rev. Gen. Pl. 2 : 794, 1891 ; G. 3 : 1210 ; S. 284 ; Bor, 252. *Andropogon quadrivalvis* Linn. in Murr. Syst. Veg. ed. 13, 758, 1744. *Anthistiria ciliata* Linn. f. Suppl. 113, 1781 ; FBI 7 : 213 ; DG. 208. *Themeda ciliata* Hack. Mon. Andropog. in DC. Mon. Phan. 6 : 664, 1889 ; C. 3 : 514.

Fl. & Fr. September - November.

Loc. : GOA : *Ilhas* : Rice fields near Santacruz village. DADRA. DAMAN : Dundorta ; fort area.

Common along grassy areas.

T. tremula (Nees ex Steud.) Hack. in DC., Mon. Phan. 6 : 667, 1889 ; C. 3 : 515 ; G. 3 : 1210 ; S. 284 ; Bor, 254. *Anthistiria tremula* Nees ex Steud., Syn. Pl. Glum. 1 : 401, 1855 ; FBI 7 : 214.

Fl. & Fr. : November. *Ill.* : Sena, t. 49.

Loc. : GOA : *Satari* : Grassland near Onda. *Ilhas* : Panaji Margao, Rajbhavan area, Panaji.

Rare.

Themeda triandra Forsk., Fl. Aegypt. - Arab. 123 & 178, 1775 ; G. 3 : 1209 ; S. 284 ; Bor, 254. *Anthistiria imberbis* Retz. Obs. Bot. 3 : 11, 1783 ; FBI 7 : 211. *Themeda imberbis* (Retz.) Cooke, Fl. Bomb. 2 : 993, 1908.

Fl. & Fr. : September - November. *Ill.* : Sena. t. 48 ; Bor, f. 27.

Vern. : Karad (Konk.) ; Guntu nalai hullu (Kan.).

Loc. : GOA : *Ilhas* : Panaji Margao ; Rajbhavan area, Panaji. *Salcete* : Margao ghat. NAGARHAVELI : Saily ; Khanvel. DADRA, DAMAN : Cataria.

Common on sandy areas and in grasslands.

TRILOBACHNE Schenck ex Henrard

Trilobachne cookii (Stapf) Schenck ex Henrard in Meded. Rij. Herb. no. 67 : 4, 1931 ; S. 284 ; Bor, 268. *Polytoca cookii* Stapf in Hook. Icon. Plant. 24, t. 2333, 1894 ; FBI 7 : 101 ; C. 3 : 518.

Fl. & Fr. : September. *Ill.* : Blatt. t. 2 ; Bor, 269, f. 31.

Loc. : NAGARHAVELI : Dolora forest.

Rare, in the forest undergrowth.

UROCHONDRA C. E. Hubbard

Urochondra setulosa (Trin.) C. E. Hubbard in Hook. Ic. Pl. sub-tab. 3457, 1947 ; Bor, 634. *Vilfa setulosa* Trin. in Mem. Acad. Sci. Petersb. ser. 6, 6. Sci. Nat. 55, 1840 ; *Heleochoa dura* (Boiss.) Boiss. Fl. Orient. 5 : 477, 1884 ; FBI 7 : 236.

Fl. & Fr. : September. *Ill.* : Bor, 635, f. 77.

Loc. : DIU.

Rare, in the area but abundant locally, confined to regions of salt pans.

VETIVERIA Bory

Vetiveria zizanioides (Linn.) Nash in Small, Fl. South-east U.S. 67, 1903 ; G. 3 : 1201 ; S. 285 ; Bor, 258. *Phalaris zizanioides* Linn. Mant. Pl.

2 183. *Andropogon squarrosus* Hook. f. in FBI 7 : 186. DG. 208 ; C. 3 : 511 (non Linn. f.).

Fl. & Fr. : September. *Ill.* : Blatt. t. 40.

Vern. : Khas Khas (Mar.) ; Valerum (Konk.) ; Vetiver (Port.).

Loc. : DADRA. DAMAN : Nani Daman.

Rare in the fields ; also cultivated. The roots are made into mats to cover doors and windows in summer for cooling the atmosphere.

ZOYSIA Willd.

Zoysia matrella (Linn.) Merr. in Philipp. Journ. Sci. Bot. 7 : 230, 1912 ; Bor, 684. *Agrostis matrella* Linn. Mant. Pl. 2 : 185, 1771. *Zoysia pungens* Willd. in Ges. Naturf. Freunde Berlin, Neue Schr. 3 : 441, 1801 ; FBI 7 : 99 ; C. 3 : 537.

Fl. & Fr. : September.

Loc. : DAMAN : Cataria ; Marvor, on sandy hills.

Rare, on sandy saline soil.

Cult. species :

Bambusa vulgaris Shrad. in Wendl. Collect. 2 : 26, t. 47, 1810 ; FBI 7 : 391 ; DG. 210 ; C. 3 : 570.

Vern. : Udhabans (Mar.) ; Man (Konk.) ; Bambu (Port.).

Cultivated for the most useful Bamboo.

Cymbopogon citratus (DC.) Stapf in Kew Bull. 1906, 357, 1906 ; G. 3 : 1216 ; Bor, 126. *Andropogon citratus* DC. Cat. Hort. Monsp. 78, 1813.

Vern. : Oli—cha (Konk.) ; Citronella (Port.) ; Lemon grass (Eng.).

Cultivated for lemon oil.

C. martinii (Roxb.) Wats. in Atkins. Gaz. N. W. Prov. Ind. 392, 1882 ; G. 3 : 1217 ; Bor, 129. *Andropogon martinii* Roxb. Fl. Ind. 1 : 280, 1820. *A. schoenanthus* var. *martinii* Hook. f. in FBI 7 : 204, 1896 ; DG. 208 ; C. 3 : 511.

Vern. : Kusa tan (Konk.) ; Kasi hullu (Kan.) ; Surwai (Mar.) ; Esquinantho (Port.).

Cultivated for ginger grass oil and palmarosa oil of commerce.

Pennisetum typhoides (Burm.) Stapf & Hubb. in Kew Bull. 1933 :

271, 1933 ; S. 282 ; Bor, 350. *P. typholdeum* Rich. in Pers. Syn. 1 : 72, 1805 ; FBI 7 : 82 ; DG. 206 ; C. 3 : 432.

Vern. : Bajri (Mar.) ; Bajri (Konk.).

Cultivated for the edible grains.

Sorghum vulgare Pers. Syn. 1 : 101, 1805. *Andropogon sorghum* Brot. Lus. 1 : 88, 1804 ; FBI 7 : 183 ; C. : 3 : 511.

Fl. & Fr. : September.

Loc. : DiU : Jhoola.

Cultivated.

Zea mays Linn. Sp. Pl. 971, 1753 ; FBI 7 : 102 ; DG. 207 ; C. 3 : 574 ; Bor, 270.

Vern. : Maka (Mar.) ; Mako (Konk.) ; Milho grosso (Port.) ; Maize (Eng.).

Cultivated for the edible corn.

GYMNOSPERMS

GNETACEAE

GNETUM Linn.

Gnetum ula Brongn. in Duperrey, Voy. Coquille 12, 1829 ; S. 233. *G. scandens* Brandis, For. Fl. 502, 1874 ; FBI 5 : 642 ; DG. 181 ; C. 3 : 167 ; T. 2 : 543 ; G. 2 : 974.

Fr. : November - May. *Ill.* : T. f. 537.

Vern. : Kumbal (Mar.) ; Kodkan-balli (Kan.).

Loc. : GOA : *Satari* : Caranzol, near old railway station ; Kawaliyan forest, near Nandore ; Pasanchimali, near Codal ; Ambechagol. *Canacona* : Amdiga, near Butpal ; Butpal forest ; Nadquem - Quer hills, Ghatida.

Occasional, woody climbers in the forest.

CUPRESSACEAE

Cult. species :

Cupressus lusitanica Mill. Gard. Dict. ed. 8, 1768. *C. glauca* Lamk. Encycl. Method. 2 : 243, 1786 ; FBI 5 : 645 ; DG. 182 ; C. 3 : 168.

Vern. : Cedro de Goa (Port.) ; Saro (Konk.) ; Mexican Cypress, Goa cypress (Eng.).

A native of Mexico, cultivated in gardens and also introduced and acclimatised in Portugal (Dalgado).

Cupressus sempervirens Linn. Sp. Pl. 1002, 1753; FBI 5 : 645; DG. 182; C. 3 : 168.

Vern. : Cypreste (Port.); Saru (Konk.); Mediterranean Cypress (Eng.).

A native of mediterranean region, cultivated in gardens (Dalgado).

C. torulosa D. Don, Prodr. Pl. Nep. 55, 1825; FBI 5 : 645; DG. 182; C. 3 : 168; G. 3 : 975.

Vern. : Cypreste (Port.); Saro (Konk.); Himalayan Cypress (Eng.).

A Himalayan species extremely accommodating to varying climates, is cultivated in gardens (Dalgado).

CYCADACEAE

Cult. species :

Cycas circinalis Linn. Sp. Pl. 1188, 1753; FBI 5 : 656; DG. 182; G. 3 : 975.

Vern. : Palma da egreja; Amdesamotapanam (Konk.).

A small palm-like Cycad which grows in deciduous forests of south India, is cultivated in gardens.

It is observed that besides these species some more like *Thuja orientalis* Linn., *Cryptomeria japonica* (Linn. f.) D. Don, *Pinus* sp., *Cycas revoluta* Thunb. & *Cycas rumphii* Miq. etc. are also cultivated in gardens of Goa.

PTERIDOPHYTES

OPHIOGLOSSACEAE

OPHIOGLOSSUM Linn.

Ophioglossum costatum R. Br. in Prodr. Fl. Nov. Holl., 163, 1810; Panigrahi and Dixit in Proc. Nat. Inst. Sci. India 35B (3); 249, f. 38-39; 90-91, 1969. *O. fibrosum* Schum., Beskr. Guin. Pl., 452, 1827; Bedd., Handb. 465, f. 289.

Fr. : August. *Ill.* : Bedd. 465, f. 289.

Loc. : GOA : *Canacona* : Ordofond Butpal, 7 km.

Locally abundant, but rarely located.

MARATTIACEAE

ANGIOPTERIS Hoffm.

Angiopteris evecta (Forst.) Hoffm. Comm. Soc. Reg. Gott. 12 : 29, t. 5, 1796 ; Bedd. Handb. 460 ; Holtt. 2 : 44. *Polypodium evectum* Forst. Prodr. 81, 1786.

Fr. : November. *Ill.* : Bedd. 459, f. 285.

Loc. : GOA : *Sanguem* : Maduka bungla jungle.

Rare.

OSMUNDACEAE

OSMUNDA Linn.

Osmunda regalis Linn. Sp. Pl. 2 : 1065, 1753 ; Bedd. Handb. 450.

Fr. : November. *Ill.* : Bedd. 449, f. 276.

Loc. : GOA : *Satari* : Mava-cha-gunda, Valpoi-Caranzol.

Rare, along the river side in association with *Homonta*.

SCHIZAEACEAE

LYGODIUM Swartz

Lygodium flexuosum (Linn.) Swartz, Schrad. Journ. 106, 1801 ; Bedd. Handb. 457 ; Holtt. 2 : 57. *Ophioglossum flexuosum* Linn. Sp. Pl. 2 : 1063, 1753.

Fr. September - November. *Ill.* : Bedd. 457, f. 283.

Loc. : GOA : *Bicholim* : Mahim forest, near Bicholim. *Satari* : Valpoi - Nagram ; Nanache Dongar ; Codal ; Wadicha Dongar, Caranzol ; Nagargao. *Bardez* : Porvorim forest area. *Sanguem* : Near Anwaldem (Molem) ; Choraundem ; Cumbari ; Bati Sidh ; Patole. *Ilhas* : Near Santacruz. *Quepem* : Budsari - Goundugarha. *Canacona* : Barsare village, near Tudal ; Nadquem - Quer hills ; Ordofond. NAGARHAVELI : Morkhal.

Common in moist, shady area and on hedges along rice fields.

PTERIDACEAE

1. Sori occurring on the venation and the parenchyma of the whole or part of the under-surface of the frond (littoral fern)

Acrostichum

- | | |
|--|---------------------|
| 1. Sori confined to the venation, not on the whole or part of the under-surface of the frond | |
| 2. Sori occupying the ends of the veins only | |
| 3. Sori confluent on the inside of the recurved margins of the lobes of the frond | <i>Adiantum</i> |
| 3. Sori not confluent on the inside of the recurved margins | <i>Cheilanthes</i> |
| 2. Sori on the intramarginal veins connecting the ends of the normal veins | |
| 4. Rhizome hairy or bristly, not paleate ; sori exindusiate | <i>Pityrogramma</i> |
| 4. Rhizome paleate or sometimes hairy ; sori protected by indusium | |
| 5. Fronds pinnate to decompose, dictyostelic | <i>Pteris</i> |
| 5. Fronds simple, solenostelic | <i>Schizoloma</i> |

ACROSTICHUM Linn.

Acrostichum aureum Linn. Sp. Pl. 2 : 1069, 1753 ; Bedd. Handb. 440 ; Holtt. 2 : 409.

Fr. : November. *Ill.* : Bedd. 441, t. 268.

Loc. : GOA : *Satari* : Tivern.

Rare, in backwaters.

ADIANTUM Linn.

Adiantum philippense Linn. Sp. Pl. 1094, 1753 ; Holtt. 2 : 598. *A. lunulatum* Burm. f. Fl. Ind. 235, 1768 ; Bedd. Handb. 82, DG. 212.

Fr. : September November. *Ill.* : Bedd. 83, f. 43.

Vern. : Supli (Konk.) ; Avenca do paiz (Port.).

Loc. : GOA : *Satari* : Codal village ; Nanache Dongar (Codal) ; Ambeachegol ; Wadicha Dongar ; Caranzol. *Bardez* : Betim Bardez ; Porvorim forest area. *Sanguem* : Madka Bungalow, Molem ; Molem Belgaum road ; Periche Tem ; Cumbari ; Bati Sidh ; Patole (Netravali). NAGARHAVELI : Sindhoni forest ; Morkhal.

Common in the rock crevices near streams.

CHEILANTHES Swartz.

Cheilanthes tenuifolia (Burm.) Swartz, Syn. Fil. 129 : 332, 1806 ; Bedd. Handb. 92 ; Holtt. 2 : 590. *Trichomanes tenuifolia* Burm. Fl. Ind. 237, 1768.

Fr. : August. *Ill.* : Holtt. 2 : 591, f. 347.

Loc. : GOA : *Salcete* : Margoa, near Dakbungalow. *Sanguem* : Potiem forest.

Rare, along cut edges of hills slopes.

PITYROGRAMMA Link

Pityrogramma calomelanos (Linn.) Link, Handb. Gew. 3 : 20, 1833 ; Holtt. 2 : 593. *Acrostichum calomelanos* Linn. Sp. Pl. 2 : 1072, 1753. *Gymnogramma calomelanos* Kaulf. Enum. Fil. 76, 1824.

Fr. : May. *Ill.* : Holtt. 2 : 593, f. 348.

Loc. : GOA : *Satari* : Nandore village, near Mahadevi river.

Rare.

PTERIS Linn.

Stipe clothed with pale brown, linear scales ; lower pinnae linear, entire cordate or slightly auricled at base

vittata

Stipe naked ; lower pinnae forked or slightly pinnate

pellucida

Pteris pellucida Presl, Rel. Haenk. 1 : 55, 1825 ; Bedd. Handb. 106.

Fr. : November. *Ill.* : Bedd. Ferns South Ind. t. 38.

Loc. : GOA : *Canacona* : Ordofond Butpal.

Rare.

P. vittata Linn. Sp. Pl. 2 : 1074, 1753 ; Holtt. 2 : 396 ; *P. longifolia* auct. quad. Pl. Asiat., Bedd. Handb. 106, f. 55.

Fr. : May. *Ill.* : Bedd. 105, t. 55.

Loc. : GOA : *Satari* : Nandore forest, near Mahadevi river. *Sanguem* : Dudhsagar.

Rare, along river banks.

SCHIZOLOMA Gaud.

Schizoloma heterophyllum (Dry.) J. Sm. Journ. Bot. 3 : 414, 1841 ;
 Bedd. Handb. 80 ; Holtt. 2 : 345. *Lindsaya heterophylla* Dry. Tr. Linn.
 Soc. 3 : 41, t. 8, f. 1, 1797.

Fr. : April.

Loc. : GOA : *Canacona* : Nadquem.

Rare.

PARKERIACEAE

CERATOPTERIS Brongniart

Ceratopteris thalictroides (Linn.) Brongn. Bull. Soc. Philom. 186,
 1821 ; Bedd. Handb. 123 ; Holtt. 2 : 578. *Acrostichum thalictroides* Linn.
 Sp. Pl. 2 : 1070, 1753.

Fr. : November. Ill. : Bedd. 124, t. 63.

Loc. : GOA : *Bicholim* : Bicholim. *Ilhas* : Rice fields, near Santacruz
 village. *Canacona* : NAGARHAVELI : Dongerpad Umberkoi.

Rare, in rice fields and shallow waters of lake.

DAVALLIACEAE

NEPHROLEPIS Schott

Nephrolepis falcata (Cav.) C. Chr. Dansk. Bot. Ark. 9 : 15, 1937 ;
 Holtt. 2 : 381. *Tectaria falcata* Cav. Descr. 250, 1802.

Fr. : May. Ill. : Holtt. 2 : 377, f. 221.

Loc. : GOA : *Satari* : Nandore village, near Mahadevi river.

Rare.

ASPIDIACEAE

1. Fronds dimorphic

2. Veins forked, free

Egenolfia

2. Veins anastomosing

Bolbitis

1. Fronds uniform

3. Veins free

- | | |
|--|--------------------|
| 4. Indusium absent | <i>Dryopteris</i> |
| 4. Indusium elongate along vein | <i>Athyrium</i> |
| 4. Indusium reniform, fixed at sinus | <i>Thelypteris</i> |
| 3. Veins anastomosing | |
| 5. Sori elongate ; indusium linear | |
| 6. Sori short, only one to a vein | <i>Athyrium</i> |
| 6. Sori at least one on each lobe | <i>Diplazium</i> |
| 5. Sori rounded or nearly so ; indusium reniform | <i>Cyclosorus</i> |

ATHYRIUM Roth

Athyrium hohenackerianum (Kuntze) Moore, Ind. 49, 1857 ; Bedd. Handb. 163. *Asplenium hohenackerianum* Kuntze, Bot. Zeit. 771, 1849.

Fr. : August November. *Ill.* : Bedd. Ferns. South Ind. t. 150.

Loc. : GOA : *Satari* : Codal village ; Ambeachagol ; Wadicha Dongar, Caranzol. *Ponda* : Near Curti village, Ponda Darbandora. *Sanguem* : Molem Ponda ; Bati sidhi ; Potiem forest ; Dudhsagar. *Canacona* : Ordofond Butpal ; Ordofond Butpal, 7 km.

Occasional, on moist areas near rice fields and inside the forest.

BOLBITIS Schott

Bolbitis subcrenata (Hook. et Grev.) Ching, in C. Chr. Ind. Suppl. 3 : 50, 1934. *Acrostichum subcrenatum* Hook. & Grev. Ic. Fil. t. 110, 1829. *Gymnopteris subcrenata* Bedd. Handb. 437, 1883.

Fr. : March May. *Ill.* : Bedd. Handb. 437, f. 265.

Loc. : GOA : *Satari* : Panchi forest, near Nandore ; Poshien forest, near Pengeral village. *Sanguem* : Dudhsagar.

Rare, inside the forest near streams.

CYCLOSORUS Link

Cyclosorus parasiticus (Linn.) Tard. ex. Tard. et C. Chr. Notul. Syst. Paris 7 : 75, 1938. *Polypodium parasiticum* Linn. Sp. Pl. 2 : 1090, 1753. *Nephrodium molle* R. Br. Prod. Fl. N. Holl. 149, 1810 ; Bedd. Handb. 277.

Fr. : May.

Loc. : GOA : *Satari* : Pashiyan forest, near Pengeral village.
Rare, inside the forest near streams.

DIPLAZIUM Swartz

Diplazium esculentum (Retz.) Sw. Schrad. Journ. 1800. 2 : 312, 1803.
Hemionitis esculenta Retz. Obs. Bot. 6 : 38, 1791. *Anisogonium esculentum*
(Retz.) Presl, Tent. Pterid. 116, 1836 ; Bedd. Handb. 192.

Fr. : November. *Ill.* : Bedd. 193, t. 94.

Loc. : GOA : *Pernem* : Tamboxem.

Rare.

DRYOPTERIS Adans.

Dryopteris calcarata (Blume) Kuntze, Rev. Gen. Pl. 2 : 812, 1891.
Aspidium calcaratum Blume, Enum. Pl. Java, 159, 1828. *Lastrea calcarata*
Moore, Ind. Fil. 87, 1858 ; Bedd. Handb. 235.

Fr. : November. *Ill.* : Blatt. & d' Almeida, Ferns of Bombay,
Pl. 13.

Loc. : GOA : *Sanguem* : Maduka bungla jungle.

Rare.

EGENOLFIA Schott

Egenolfia appendiculata (Willd.) J. Sm. Ferns Brit. & For. 111,
1866 ; Holtt. 2 : 459. *Acrostichum appendiculata* Willd. Sp. Pl. ed. 4, 5 :
114, 1810. *Polybotrya appendiculata* J. Sm. Journ. Bot. 4 : 150, 1841 ;
Bedd. Handb. 424.

Fr. : November. *Ill.* : Bedd. Ferns South Ind. t. 194.

Loc. : GOA : *Sanguem* : Maduka bungla Jungle.

Rare.

Tectaria macrodonta (Fee) C. Chr. Index Fil. Suppl. 3 : 181, 1934.
Sagenia macrodonta Fee, Gen. Fil. 313, t. 24, [1852. *Aspidium cicutarium*
Swartz, Schrad. Jour. 1800. 36, 1801 ; Bedd. Handb. 220, 1883.

Loc. : GOA : *Sanguem* : Verlem ; Castle rock on way to Anmode.

Erect herb, about 15 cm high.

A genus added later hence not included in the key.

THELYPTERIS Schmidel

Thelypteris setigera (Blume) Ching, Bull. Fan. Mem. Inst. Bot. 10 : 1941. *Cheilanthus setigera* Blume, Enum. 138, 1828. *Lastrea tenericauis* (Wall.) Moore, Ind. 99, 1858 ; Bedd. Handb. 266.

Fr. : May. *Ill.* : Bedd. Ferns South Ind. t. 250.

Loc. : GOA : *Satari* : Nandore village, near stream.

Rare.

BLECHNACEAE

Climbing ferns ; fronds dimorphic ; sori covering the whole of lower surface of the fertile pinnae except a narrow marginal band ; indusium absent ; sterile pinnae with sharply toothed margins

Stenochlaena

Erect to ascending ferns ; fronds not dimorphic ; sori linear, parallel to the midrib ; indusium present

Blechnum

BLECHNUM Linn.

Blechnum orientale Linn. Sp. Pl. 2 : 1077, 1753 ; Bedd. Handb. 130 ; Holtt. 2 : 446.

Fr. : September November. *Ill.* : Blatt. & d' Admeida, Ferns of Bombay, 99, f. 36.

Loc. : GOA : *Satari* : Codal village ; Maloli forest. *Sanguem* : Dudhsagar—Castle rock.

Rare, in moist places.

STENOCHLAENA J. Smith

Stenochlaena palustris (Burm.) Bedd. Ferns Brit. Ind. Suppl. 26, 1876 ; Bedd. Handb. 421 ; Holtt. 2 : 412. *Polypodium palustre* Burm. Fl. Ind. 234, 1768.

Ill. : Bedd. 422, t. 253.

Loc. : GOA : *Sanguem* : Sanguem - Barazen mine area.

Rare.

POLYPODIACEAE

- | | |
|---|--------------------|
| 1. Fronds dimorphic | <i>Drynaria</i> |
| 1. Fronds not dimorphic | |
| 2. Fronds densely covered beneath with stellate hairs; sori usually confined to the apical half of the frond | <i>Pyrrosia</i> |
| 2. Fronds glabrous or with simple hairs; sori scattered irregularly on the veins or in two rows between adjacent main veins | <i>Microsorium</i> |

DRYNARIA J. Smith

Drynaria quercifolia (Linn.) J. Smith Journ. Bot. 3 : 398, 1841; Holtt. 2 : 182. *Polypodium quercifolium* Linn. Sp. Pl. 2 : 1087, 1753; Bedd. 341; DG. 211.

Fr. : November.

Vern. : Kadekou. Ill. : Holtt. 2 : 184, f. 88.

Loc. : GOA : Satari : Saverdem. Salcete : Lake near Chinchinum.

Rare, on trees.

MICROSORIUM Link

Microsorium membranaceum (Don) Ching, Bull. Fan. Mem. Inst. 4 : 309, 1833. *Polypodium membranaceum* Don, Prodr. Fl. Nepal 2, 1825. *Pleopeltis membranacea* (Don) Moore, Ind. 191, 1860; Bedd. Handb. 355.

Fr. : October.

Loc. : GOA : Satari : Codal.

Rare, on trees along forest edges.

PYRROSIA Mirbel

Rhizome with lanceolate - setaceous scales; fronds on their under surface matted with woolly or cottony tomentum *adnascens*

Rhizome with lanceolate ferruginous scales; fronds copiously furnished with orbicular ovate, small appressed peltate scales *lanceolata*

Pyrrosia adnascens (Sw.) Ching, Bull. Chin. Bot. Soc. 1 : 45, 1935; Holtt. 2 : 144. *Polypodium adnascens* Sw., Syn. Fil. 25 & 222, t. 2, f. 2,

1806 ; DG. 211. *Niphobolus adnascens* Kaulf, Enum. 124, 1824 ; Bedd. Handb. 325.

Fr. : October - November.

Vern. : Bemdarli (Konk.). *Ill.* : Bedd. 326, f. 176.

Loc. : GOA : *Salcete* : Lake area, near Chinchinum ; Onda.

Rare, epiphytic on *Artocarpus* etc.

Pyrrosia lanceolata (L.) Farw., Amer. Midl. Natur., 12 : 245, 1931.
Polypodium lanceolatum Linn. Sp. Pl. 2 : 1082, 1753.

Fr. : October - December.

Loc. : GOA : *Sanguem* : Chichegal Valkeri.

Rare.

SELAGINELLACEAE

SELAGINELLA P. Beauv.

Sporophylls ciliate ; arista of the median leaves more than half as long as lamina ; decumbent plants

proniflora

Sporophylls not ciliate, arista of the median leaves half as long as lamina ; erect or ascending

tenera

Selaginella proniflora (Lamk.) Baker in Journ. Bot. 22 : 156, 1885 ; Panigrahi & Dixit in Journ. Indian bot. Soc. 44 (2 & 3) : 230, 1967. *Lycopodium proniflorum* Lamk. Encycl. 3 : 652, 1791. *Selaginella dalzellii* Baker in Journ. Bot. 13 : 249, 1885.

Fr. : November. *Ill.* : Panigrahi & Dixit *l.c.* 232, f. 11.

Loc. : GOA : *Pernem* : Tamboxem.

Growing along with *Selaginella tenera* on moist situations.

S. tenera (Hook. & Grev.) Spring. in Bull. Ac. Brux. 10 : 232, 1843. *Lycopodium tenerum* Hook. & Grev. in Hook. Bot. Misc. 2 : 400, 1831.

Fr. : November.

Loc. : GOA : *Pernem* : Tamboxem. *Satari* : Codal village. *Ilhas* : Chimbel reservoir area ; Near Brahmapur temple. *Sanguem* : Patiem foot. hill area ; Goa ghat road, Anmod Molim.

Common, along hill slopes in rock crevices.

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