

MATERIAL FOR THE FLORA OF MAHABALESHWAR-5

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[Continued from Vol. 79(3): 619]

MYRSINACEAE

1. Fruits many seeded; calyx thick and enclosing the fruit *Maesa*
1. Fruits 1-seeded; calyx not thick, not enclosing the fruit *Embelia*

Embelia Burm. f.

1. Flowers tetramerous *E. basaal*
1. Flowers pentamerous 2
 2. Leaves oblong-lanceolate; lateral veins indistinct *E. ribes*
 2. Leaves broadly elliptic; lateral veins prominent *E. tsjeriam-cottam*

1. ***Embelia basaal*** (Roem. & Schult.) DC., in Trans. Linn. Soc. (London) 17: 131, 1834; Dalz. & Gibs. 136; Mez, in Pfreich 9: 328, t. 54, 1902.

Ardisia basaal Roem. & Schultes, Syst. 4:517, 1819.

Samara rheedii Wight, Icon. t. 1591, 1852.

E. viridiflora Clarke, in Flora Brit. India, 3: 516, 1882 (non Scheff., 1867); Cooke, T. 2:86 (2: 145); Santapau, 399, 1962 & 302, 1963; Puri & Mahajan, 126.

Common rambling climbers with warted branches found at Dhobi's falls, Kate's point, Arthur seat, Lodwick point, Chinaman's Falls and near Madhu Kosh.

FLOWERS: June-November; FRUITS: December-April.

2. ***Embelia ribes*** Burm. f., Flora Ind. 62, t. 23, 1768; Graham, 104; Dalz. & Gibs. 137; FBI 3: 513; Cooke, T. 649 & 2: 84 (2: 143); Markham, 386; Birdwood, 17; Puri & Mahajan, 126.

E. glandulifera Wight, Icon. t. 1207, 1848; Dalz. & Gibs. 137.

It is a rare species in Fitzgerald Ghat. We

have only collected it in sterile condition.

LOCAL NAMES: Waiwarang, Vavding.

3. ***Embelia tsjeriam-cottam*** (Roem. & Schult.) DC., in Trans. Linn. Soc. (London) 17: 131, 1834; Wight, Icon. t. 1209, 1848; Mez, in Pfreich 9: 319, t. 52A-J, 1902; Santapau, 399, 1962 & 301, 1963.

Ardisia tsjeriam-cottam Roem. & Schultes, Syst. 4: 518, 1819.

E. robusta Brandis, For. Fl. 2: 284, 1874 (non Roxb. 1832); FBI 3: 515; Cooke, T. 2: 85 (2: 44); Birdwood, 17.

A large rambling or scandent shrub. Very common along the edges of the forest.

FLOWERS: September-December; FRUITS: September-March.

LOCAL NAMES: Ambuti, Wauri.

Maesa Forsk.

1. ***Maesa indica*** (Roxb.) DC., Trans. Linn. Soc. (London) 17: 134, 1834; Dalz. & Gibs. 136; Lisboa, 216; FBI 3: 509; Cooke, T. 649 & 2: 82 (2: 141); Birdwood, 17; Markham, 386; Lee, 646; Puri & Mahajan, 126.

Baeobotrys indica Roxb., Fl. Indica, 2: 230, 1824.

M. perottetiana DC., Prodr. 8:8, 1844.

M. indica var. *perottetiana* (DC.) C. B. Clarke, in Fl. Brit. India 3:509, 1882.

Common and abundant shrub along the fringes of forests and along road-sides in ghat areas. It is especially common at Bombay point, Tiger path, Dhobi's falls, Chinaman's falls, Fitzgerald ghat, Falkland point and Lodwick point.

FLOWERS & FRUITS: August-March.

LOCAL NAME: Atki.

SAPOTACEAE

1. Sepals uniseriate; stamens 5-6.....*Xantolis*
1. Sepals biseriate 2
 2. Petals 8 *Mimusops*
 2. Petals 6 *Manilkara*

Manilkara Adans.

1. ***Manilkara zapota*** (Linn.) van Royen, in *Blumea*, 7: 410, 1953.

Achras zapota Linn. Sp. Pl. 1190, 1753; FBI 3: 354; Cooke, T. 2: 96 (2: 156).

Cultivated occasionally in private gardens.

FLOWERS: Throughout the year.

LOCAL NAME: Chiku.

Mimusops Linn.

1. ***Mimusops elengi*** Linn., Sp. Pl. 349, 1753; FBI 3: 548 Cooke, T. 2: 95 (2: 155); Puri & Mahajan, 126.

A rare tree. Occasionally planted in gardens.

FLOWERS: June-October; FRUITS: September-March.

LOCAL NAME: Bakuli.

Xantolis Raf.

1. ***Xantolis tomentosa*** (Roxb.) Raf., Sylv. Tell. 36, 1838; van Royen, in *Blumea* 8: 226, 1957; Santapau, 142.

Sideroxylon tomentosum Roxb., Pl. Corom. 1:28, t. 28, 1795; Graham, 105; FBI 3: 538; Cooke, T. 2: 90 (2: 150).

Pouteria tomentosa Baehni, in *Candollea* 9: 368, 1942.

Common tree all over Mahabaleshwar. Some trees possess sharp, more than 3 cm. long spines, but very often trees are spineless.

FLOWERS: November-May; FRUITS: Throughout the year.

LOCAL NAMES: Kumbhal, Kate-kumbhal.

EBENACEAE

Diospyros nigrescens (Dalz.) Saldanha (*Maba nigrescens* Dalz.) has been reported by Mar-

kham and *Diospyros montana* Roxb. and *Diospyros assimilis* Bedd. have been reported by Birdwood, in his catalogue (p. 17), but there are no specimens in any of the herbaria consulted to support the presence of these species at Mahabaleshwar.

SYMPLOCACEAE

Symplocos Jaquin

1. Drupe ampuliform, ribbed *S. laurina*

1. Drupe ellipsoid *S. beddomei*

1. ***Symplocos beddomei*** C. B. Clarke, in Hook. f., *Flora Brit. India* 3: 582, 1882; Nairne, 174; Cooke, T. 648 & 2: 108 (2: 109); Lee, 646; Puri & Mahajan, 126.

S. racemosa Graham, cat. Bombay Pl. 104, 1839 (non Roxb., 1832); Lisboa, 217.

Hoppea racemosa Dalz. & Gibs. Bombay Fl. 140, 1861. Markham, 386.

Very common tree at Lodwick point, Tiger path, Lingmala, Chinaman's falls, Dhobi's falls, and Carnac point. Graham describes it as the most ornamental tree of Mahabaleshwar.

FLOWERS: December-January;

FRUITS: April-May.

LOCAL NAMES: Kauli, Lodhra, Lenda.

This species has been merged with *Symplocos racemosa* Roxb. by T. P. Ramamurthy, in *Flora of Hassan District* (p. 200, 1976). Clarke (l. c.) expressed his doubt about its being a variety of that species and gave a number of points which distinguish it from Roxburgh's plant, a major point being that the fruit is ovoid and wider near the base. Ramamurthy does not give any reason for merging the two species. His decision seems to have been based on opinion of Dr. H. P. Nooteboom (Leiden), rather than the type studies of the Indian species. Our materials show ovoid-oblong fruits and we prefer to keep it under *S. beddomei* Clarke, until the status of this name is proved to the contrary.

2. **Symplocos laurina** (Retz.) Wall. ex Graham, Cat. Bombay Pl. 1839; Puri & Mahajan, 126; Santapau, 143.

Myrtus laurina Retz., Obs. 4:26, 1786.

S. spicata Roxb. Fl. Ind. 2: 541, 1832; FBI 3: 573; Wight, Ill. t. 150; Cooke, T. 2: 108 (2: 169).

S. spicata var. *laurina* C. B. Clarke, in Flora Brit. India 3: 573, 1882.

Hoppea spicata Dalz. & Gibs. Bombay Fl. 140, 1861; Markham, 386.

S. cochinchinensis ssp. *laurina* (Retz.) Nooteboom, Apud Ramamurthy, in Fl. Hassan Dist. 198, 1976.

This species is recorded here on the authority of Puri & Mahajan's report from Mahabaleshwar. We have not seen it growing on the plateau.

In Flora of Hassan District, T. P. Ramamurthy treats this taxon as a subspecies of *S. cochinchinensis* (Lour.) Moore, the name of which is based on *Drupatris cochinchinensis* Lour. (1790). In fact *Myrtus laurina* Retz. (1786), the basonym of this subspecies, has a priority over Loureiro's name.

OLEACEAE

1. Climbing shrubs *Jasminum*
1. Erect shrubs or trees 2
2. Inflorescence terminal *Ligustrum*
2. Inflorescence axillary 3
3. Petals all connate *Olea*
3. Petals connate in pairs *Chionanthus*

Chionanthus Gaertn.

1. ***Chionanthus malabarica*** (Wall. ex G. Don) Bedd. For. Man. Bot. 154, 1872; Beddome, Fl. Sylvat. t. 239, 1872; Nair & Janardanan, Journ. Bombay nat. Hist. Soc. 78(2): 331, 1981.

Linociera malabarica Wall. ex G. Don, Gen. Syst. 4: 53, 1837; Graham, 109; Wight, Icon. t. 1246, 1848; FBI 3: 607; Cooke, T. 2: 117 (2: 178).

Rare tree at Mahabaleshwar.

FLOWERS: November-February.

LOCAL NAME: Heddi.

Jasminum Linn.

1. Leaves simple 2
2. An erect or sub-erect shrub *J. sambac*
2. Climbing shrubs 3
3. Bracts linear, subulate *J. malabaricum*
3. Bracts foliaceous *J. multiflorum*
1. Leaves compound *J. officinale*

1. ***Jasminum malabaricum*** Wight, Icon. t. 1250, 1848; FBI 3: 594; Cooke, T. 2: 111 (2: 172); Santapau, in Journ. Bombay nat. Hist. Soc. 46: 563 & 302, 1963; Puri & Mahajan, 126.

J. latifolium Graham, Cat. Bombay Pl. 110, 1839 (non Roxb., 1832); Dalz. & Gibs. 138; Lisboa, 216.

J. arborescens var. *latifolia* Talbot, Trees Bombay (ed. 2) 216, 1902; Cooke, T. 649; Birdwood, 17.

Common climber all over Mahabaleshwar.

FLOWERS & FRUITS: February-June.

LOCAL NAME: Kusar.

2. ***Jasminum multiflorum*** (Burm. f.) Anders. Bot. Rep. 8, t. 496, 1801; G. L. Shah, Fl. Gujarat, 411, 1978.

Nyctanthus multiflora Burm. f., Fl. Indica, 5, t. 3, f. 1, 1763.

J. pubescens Willd., Sp. Pl. 1: 37, 1797; FBI 3: 592; Cooke, T. 2: 112 (2: 173).

Ornamental shrub, cultivated for its flowers.

FLOWERS: Throughout the year.

LOCAL NAME: Mogra, Jui.

3. ***Jasminum officinale*** Linn. Sp. Pl. 7, 1753; FBI 3: 603; Cooke, T. 2: 114 (2: 175).

Cultivated shrub with white fragrant flowers.

FLOWERS: Throughout the year.

LOCAL NAMES: Chameli, Jati-Jaie.

5. ***Jasminum sambac*** Ait., Hort. Kew 1: 8, 1789; Graham, 110; Dalz. & Gibs. 137; Wight, Icon. t. 704; FBI 3: 591; Cooke, T. 2: 111 (2: 172).

Cultivated for its fragrant flowers.

FLOWERS: Throughout the year.

LOCAL NAME: But-mogri.

Ligustrum Linn.

1. ***Ligustrum perrottettii*** A. DC., in DC.

Prodr. 8: 294, 1844. var. **obovatum** (C. B. Clarke) Gamble, Fl. Madras 2: 798 (561), 1923.

L. neilgherrense var. *obovata* C. B. Clarke, in Fl. Brit. India, 3: 615, 1882; Cooke, T. 2: 119 (2: 181); Santapau, 399, 1962 & 302, 1963; Puri & Mahajan, 126.

L. neilgherrense Dalz. & Gibs. Bombay Fl. 159, 1861; (non Wight, 1848); Markham, 386; Nairne, 177; Cooke, T. 649; Birdwood, 17.

Common shrub all over Mahabaleshwar. Stem used for making walking sticks.

FLOWERS: August-November.

LOCAL NAME: Lokhandi.

Olea Linn.

1. ***Olea dioica*** Roxb., Fl. Ind. 1: 105, 1820; Graham, 109; Dalz. & Gibs. 159; Wight, Ill. 151; Lisboa, 216; Markham, 386; FBI 3: 612; Cooke, T. 648 & 2: 118 (2: 179); Birdwood, 17; Santapau, 398, 1962; Puri & Mahajan, 126.

One of the common trees at Mahabaleshwar. Very often infested by the parasite *Viscum*.

FLOWERS: January-April.

LOCAL NAMES: Par Jambhal, Karamba.

APOCYNACEAE

1. Plants armed with spines *Carissa*
1. Plants spineless 2
2. Scandent shrubs or climbers 3
3. Leaves in whorls *Allamanda*
3. Leaves opposite *Anodendron*
2. Erect shrubs or trees 4
4. Leaves alternate 5
5. Plants evergreen; fruit a drupe *Thevetia*
5. Plants deciduous; fruits a pair of follicles *Plumeria*
4. Leaves opposite or in whorls 6
6. Leaves in whorls 7
7. Leaves linear along whole length of branches; fruits elongated follicles *Nerium*
7. Leaves oblanceolate or obovate, near the ends of the branches; fruits ellipsoid drupes *Rauwolfia*
6. Leaves opposite 8
8. Corolla with coronary scales *Wrightia*
8. Corolla without coronary scales 9
9. Small garden herbs *Catharanthus*
9. Large shrubs or small trees 10
10. Plants deciduous; seeds cosmose, arillate *Holarrhena*
10. Plants evergreen; seeds with orange-red aril, not cosmose *Ervatamia*

Allamanda Linn.

1. ***Allamanda cathartica*** Linn., Mant. 2: 214, 1771; Cooke, T. 2: 144 (2: 207).

A. aubletii Pohl, Pl. Brass. 1: 75, 1827; Graham, 116; Dalz. & Gibs. suppl. 53.

Cultivated ornamental shrub, flowering throughout the year.

LOCAL NAME: Bote.

Anodendron DC.

1. ***Anodendron paniculatum*** DC., Prodr. 8: 444, 1944; Dalz. & Gibs. 147; FBI 3: 668; Cooke, T. 2: 141 (2: 204); Birdwood, 18.

Echites paniculata Roxb., Fl. Ind. 2: 17, 1832; Wight, Icon. t. 396 (non Poir, 1812).

Gymnema nepalensis Graham, Cat. Bombay Pl. 120, 1839 (non Wight, 1824).

This species is included here on authority of Birdwood.

Carissa Linn. (nom. cons.)

1. ***Carissa congesta*** Wight, Icon. t. 1289, 1848; Hains, in Indian Forester, 45: 385, 1919.

C. carandas Graham, Cat. Bombay Pl. 116, 1839 (non Linn., 1767); Dalz. & Gibs., 143; FBI 3: 630 (pro parte); Cooke, T. 2: 124 (2: 186); Lisboa, 217; Birdwood, 17.

Common spiny shrub along Kelger Ghat. Ripe fruits are eaten and raw fruits are used for pickles.

FLOWERS: February-June.

LOCAL NAME: Carvanda.

Catharanthus G. Don

1. ***Catharanthus roseus*** (Linn.) G. Don, Gen. Syst. 4: 95, 1837; Graham, 115; Dalz. & Gibs. suppl. 53; Santapau, 147.

Vinca rosea Linn. Syst. Nat. ed. 10, 944, 1759; FBI 3: 640.

Lochnera rosea Reich., Consp. Regn. Veg. 134, 1828; Cooke, T. 2: 129 (2: 192).

An ornamental garden plant, bearing pink or white flowers.

FLOWERS: Throughout the year.

LOCAL NAME: Sadaphuli.

Ervatamia Stapf

1. ***Ervatamia divaricata*** (Linn.) R. Br., in Roem. & Schultes, Syst. 4: 420, 1819; Burkill, in Rec. Bot. Surv. India, 10: 320, 1925.

Nerium divaricatum Linn., Sp. Pl. 209, 1753.

N. coronarium Jacq., Coll. 1: 138, 1786; Bot. Mag. t. 1865.

E. coronaria (Jacq.) C. Stapf in This.-Dyer, Fl. Trop. Africa, 4: 127, 1902; Cooke, T. 2: 134 (2: 197).

T. coronaria Willd. Enum. Hort. Berol. 275, 1809; Graham, 115; Dalz. & Gibs. 144; FBI 3: 646; Wight, Icon. t. 477.

Cultivated for its flowers which are offered for religious worship.

LOCAL NAME: Tagar.

Holarrhena R. Br.

1. ***Holarrhena antidysenterica*** (Heyne ex Roth.) DC., Prodr. 8: 413, 1844; Dalz. & Gibs. 145; FBI 3: 644; Cooke, T. 2: 133 (2: 195); Birdwood, 18; Santapau, 287, 1963; Puri & Mahajan, 127.

Echites antidysenterica Heyne ex Roth., Nov. Pl. Sp. 138, 1821.

Wrightia antidysenterica Graham, Cat. Bombay Pl. 249, 1839 (excl. Syn.).

H. codaga G. Don, Gen. Syst. 4: 78, 1837; Wight, Icon. t. 1297, 1848.

Rare shrub in open forests on the ghat region.

FLOWERS: March-October.

LOCAL NAME: Kuda.

Nerium Linn.

1. ***Nerium indicum*** Mill., Gard. Dict. (ed. 8), no. 2, 1768; Santapau, 150.

N. odorum Soland, Apud. Ait. Hort. Kew. 1: 297, 1789; Graham, 114; FBI 3: 655; Cooke, T. 2: 143 (2: 206).

Ornamental garden plant.

FLOWERS: Throughout the year.

Plumeria Linn.

1. ***Plumeria rubra*** Linn., Sp. Pl. 209, 1753; Woodson, Ann. Missouri Bot. Garden, 25: 297, 1938.

P. acuminata R. Br., in Ait. Hort. Kew. ed 2, 2: 70, 1811; Graham, 119; Santapau, 149.

P. acutifolia Poir., in Lam. Encycl. Meth. Suppl. 2: 667, 1812; Dalz. & Gibs. suppl. 52; FBI 3: 641; Lisboa, 217; Cooke, T. 2: 142 (2: 206).

P. rubra Linn. forma *acuminata* (Ait.) Santapau & Irani ex Shah, in Journ. Univ. Bombay, 30: 35, 1962.

Cultivated in gardens and generally planted near temples.

FLOWERS: December-June.

LOCAL NAMES: Khair Champa, Deo-champa.

Rauwolfia Linn.

1. ***Rauwolfia densiflora*** (Wall. ex Ed-

ward) Benth. ex Hook. f., Fl. Brit. India, 3: 633, 1882; Nairne, 179; Cooke, T. 649 & 2: 127 (2: 189); Birdwood, 18; Santapau, 287, 1963; Puri & Mahajan, 127.

Tabernamontana densiflora Wall., in Edwards Bot. Reg. 15: t. 1273, 1829.

Ophioxylon neilgherrense Wight, Icon. t. 1292, 1848; Dalz. & Gibs. 144.

Quite common shrub in partially shaded places among the undergrowths near Lingmala and Tiger's path.

FLOWERS: March-April.

Thevetia Linn. (nom. cons.)

1. *Thevetia peruviana* (Pers.) K. Schum., in Pfam. 4(2): 159, 1895; Merrill, in Phil. Journ. Sci. Bot. 9: 130, 1914; Santapau, 150.

Cerbera peruviana Pers. Syn. 1: 267, 1805.

T. nerifolia Juss. ex Steud. Nom. ed 2, 2: 680, 1841.

Cultivated ornamental plant. Flowers are said to be very poisonous and only used for religious offering.

FLOWERS: Throughout the year.

LOCAL NAME: Karanda.

Wrightia R. Br.

1. *Wrightia tinctoria* R. Br., in Mem. Verm. Soc. 1: 47, 1811; Graham, 114; Dalz. & Gibs. 145; Lisboa, 217; Lee, 646; Birdwood, 18; Cooke, T. 2: 137 (2: 200).

A rare tree at Mahabaleshwar.

FLOWERS: March-June;

FRUITS: April-December.

ASCLEPIADACEAE

1. Pollen masses granular, solitary; filaments partly or wholly free 2
2. Corolla 4 mm long, lobes valvate *Hemidesmus*
2. Corolla 10-15 mm long, lobes imbricate *Cryptolepis*
1. Pollen masses smooth, paired; filaments connate 3
3. Plants with underground tubers; corolla lobes connate at tips *Ceropegia*
3. Plants without tubers; corolla lobes free 4
4. Epiphytes; rooting at the nodes *Hoya*
4. Terrestrial plants, not rooting at nodes 5
5. Erect herbs or scandent shrubs 6
6. Fleshy succulent plants, leafless when in flowers 7
7. Plants upright erect, less than 15 cm. long *Frerea*
7. Plants scandent, 2-3 metres long *Sarcostemma*
6. Plants not succulent, leafy when in flowers 8
8. Plants erect 9
9. Stem and leaves glabrous; leaves lanceolate *Asclepias*
9. Stem and leaves cottony pubescent; leaves broadly ovate *Calotropis*
8. Scandent shrub *Gymnema*
5. Twining climbers 10
10. Pollen masses erect or horizontal 11
11. Corona lobes spreading; corolla green *Dregea*
11. Corona lobes adnate to the staminal column; corolla not green *Tylophora*
10. Pollen masses pendulous 12
12. Corolla divided to half its length *Holostemma*
12. Corolla divided up to the base *Cynanchum*

Asclepias Linn.

1. *Asclepias curassavica* Linn. Sp. Pl. 215, 1753; Edward, Bot. Rot. Reg. t. 81, 1815; Graham, 120; Dalz. & Gibs. suppl. 54; FBI 4: 18; Cooke, T. 2: 180 (2: 245); Santapau, 178.

Rare weed on banks of rivers and streams. Sometimes cultivated in gardens.

FLOWERS: Throughout the year.

Calotropis Linn.

1. *Calotropis gigantea* (Linn.) R. Br., in Ait. Hort. Kew. ed. 2, 78, 1811; Edward, Bot. Reg. t. 58, 1815; Wight, Ill. tt. 155, 156A; Graham, 120; Dalz. & Gibs. 149; Bot. Mag. t. 6862; FBI 4: 17; Lisboa, 217; Birdwood, 18; Cooke, T. 2: 151 (2: 214); Santapau, 171.

Asclepias gigantea Linn. Sp. Pl. 214, 1753.

Rare shrub in waste-lands. Leaves offered for worship.

FLOWERS: Throughout the year.

Ceropegia Linn.

- | | |
|--|-----------------------|
| 1. Stems erect | <i>C. lawii</i> |
| 1. Stems twining | 2 |
| 2. Corolla lobes as long as the tube..... | <i>C. vincaefolia</i> |
| 2. Corolla lobes $\pm$ 1/3 length of the tube... | <i>C. hirsuta</i> |

1. *Ceropegia hirsuta* Wight & Arn., in Wight, Contrib. 30, 1834; FBI 4: 71; Cooke, T. 2: 137 (2: 242); Blatter & McCann, in Journ. Bombay nat. Hist. Soc. 36: 535, 1933; Santapau, 177; Santapau & Irani, Bull. Bot. Soc. Bengal 12 (1 & 2): 10-11, 1958.

C. hispida Blatter & McCann, in Journ. Bombay nat. Hist. Soc. 35: 409, 1931.

Rare species on rocky ground on way to Panchgani.

FLOWERS: July-August.

2. *Ceropegia lawii* Hook., in Bot. Mag. t. 4093, 1844; FBI 4: 72; Cooke, T. 2: 177 (2: 240); Blatter & McCann 36: 535; Santapau, 176; Huber, in Mem. Soc. Broter 12: 64, t. 3, f. 31, 1957.

Quite common species at Lingmala, among the undergrowth in shady places.

FLOWERS: July-October.

3. *Ceropegia vincaefolia* Hook. f., Bot. Mag. t. 3740, 1839; Ansari, in Bull. Bot. Surv. India, 13: 190, 1971.

C. hirsuta var. *vincaefolia* Hook. f., in Fl. Brit. India 4: 74, 1883.

C. polyantha Blatter & McCann, in Journ. Bombay nat. Hist. Soc. 34: 936, 1931 & 36: 535, 1933.

C. oculata var. *subhirsuta* Huber, in Mem. Soc. Broter, 12: 65, 1952.

Rare species found at Lingmala and near Venna Lake.

FLOWERS: July-October.

Cryptolepis R. Br.

1. *Cryptolepis buechanani* Roem. & Schultes, Syst. 4: 409, 1819; Graham, 113; Dalz. & Gibs. 148; Wight, Icon. t. 194; FBI 4: 5; Cooke, T. 2: 147 (2: 210); Puri & Mahajan, 127; Santapau, 151.

Rare. Only reported by Puri and Mahajan.

FLOWERS: April-June.

Cynanchum Linn.

1. *Cynanchum callialata* Ham., in Wight, Contrib. 56, 1834; Wight, Icon. t. 1279; FBI 4: 24; Cooke, T. 2: 157 (2: 221); Santapau, 152.

A rare climber near Lingmala.

FLOWERS: September-December.

Dregea E. Meyer (nom. cons.)

1. Suberect undershrubs; leaves lanceolate; pedicels more or less 1 cm. long.....
..... *D. angustifolia*

1. Climbing shrubs; leaves broadly ovate; pedicels $\pm$ 3 cm: long.....*D. volubilis*

1. *Dregea angustifolia* (Hook. f.) Santapau & Irani, in Bot. Mem. Univ. Bombay 4: 41, 1900.

D. volubilis var. *angustifolia* Hook. f., in Fl. Brit. India, 4: 47, 1883; Birdwood, 18.

Marsdenia volubilis var. *angustifolia* Blatter & McCann, Journ. Bombay nat. Hist. Soc. 36: 167, 1904.

This species is reported by Birdwood from Rotunda Ghat and Babington point.

FLOWERS: May-June.

LOCAL NAME: Dudhli.

2. **Dregea volubilis** (Linn. f.) Benth. ex Hook. f., in Fl. Brit. India, 4: 56, 1883; Talbot 2: 254; Birdwood, 18; Santapau, 154.

Asclepias volubilis Linn. f. suppl. 170, 1781.

Marsdenia volubilis Cooke, T., Fl. Pres. Bombay. 2: 166, 1904; FBI 4: 47; Santapau, 289, 1960; Puri & Mahajan, 127.

Hoya viridiflora R. Br., in Mem. Wern. Soc. 1: 27, 1809; Graham, 119; Wight, Icon. t. 586; Dalz. & Gibs. 153; Lisboa.

Wattakaka volubilis (Linn. f.) Stapf, in Curtis Bot. Mag. sub. t. 8976, 1923.

Climbing shrub, frequent near Lingmala.

FLOWERS: April-June; FRUITS: August-October.

LOCAL NAMES: Dhora, Amri, Hirandoti.

Frerea Dalz.

1. **Frerea indica** Dalz., in Journ. Linn. Soc. London, 8: 10, t. 3, 1865; FBI 4: 76; Blatter & McCann, 36: 535; McCann, Journ. Bombay nat. Hist. Soc. 41: 143, tt. 1-3, 1939.

Only Bishop R. D. Acland has reported to have seen this species among the rocks near Kate's point.

FLOWERS: September-December.

FRUITS: December-January.

Gymnema R. Br.

1. **Gymnema sylvestre** (Retz.) R. Br. ex Schultes, in Roem. & Schult. Syst. Veg. 6: 57, 1819; Wight, Icon. t. 349; Graham, 120; Dalz. & Gibs. 151; FBI 4: 29; Cooke, T. 649 & 2: 160 (2: 224); Lisboa, 217; Talbot 2: 249; Blatter & McCann, 36: 530; Birdwood, 18; Santapau, 288, 1963; Puri & Mahajan, 127.

Periploca sylvestris Retz., Obs. 2: 15, 1781.

Common plant in open forests. Leaves used by local people as antidiabetic drug.

FLOWERS: April-May;

FRUITS: September-January.

LOCAL NAMES: Kauli, Lamtani, Dodi, Pitani, Sirdoli.

2. **Gymnema montanum** (Roxb.) Hook. f., Flora Brit. India, 4: 31, 1883; Cooke, T. 649, 1885; Blatter & McCann, 36: 530.

Asclepias montana Roxb., Fl. Ind. 2: 45, 1832.

This species is reported by T. Cooke, in vegetation of Mahabaleshwar (1885). But he has not recorded it from Mahabaleshwar later in Flora of Bombay Presidency.

Hemidesmus R. Br.

1. **Hemidesmus indicus** Schultes, in Roem. & Schult. Syst. Veg. 6: 126, 1819; FBI 4: 5; Graham, 122; Wight, Icon. t. 594; Dalz. & Gibs. 147; Cooke, T. 2: 147 (2: 210); Talbot 232; Santapau & Irani, 94; Santapau, 289, 1963.

Periploca indica Linn. Sp. Pl. 211, 1753.

Frequent in the forest among undergrowth.

FLOWERS: July-January; FRUITS: January-May.

LOCAL NAME: Anantmul.

Holostemma R. Br.

1. **Holostemma annulare** (Roxb.) K. Schum., in Pfam. 4(2): 250, f. 71J-K, 1895; Santapau, 171.

Asclepias annularia Roxb., Fl. Ind. 2: 37, 1832.

H. rheedei Wall. Pl. As. Rar. 2: 51. 1851; Wight, Icon. t. 597; Graham, 121; Dalz. & Gibs. 148; FBI 4: 21; Talbot, 2: 245.

H. rheedeianum Cooke, T. Fl. Pres. Bombay 2: 156, 1904 (non Spreng., 1825).

Rare climber at Mahabaleshwar.

Hoya R. Br.

1. **Hoya pendula** Wight & Arn., in Wight Contrib. 36: 1834 (excl. syn.; non Wight, Icon. t. 474, 1840); Santapau, Journ. Bombay nat. Hist. Soc. 53: 504, 1956.

H. pallida Dalz. & Gibs. Bombay Fl. 152, 1861.

H. wightii Hook. f., Fl. Brit. India, 4: 59, 1883;

Nairne, 186; Cooke, T. 2: 169 (2: 234); Talbot 2: 258; Santapau, 155.

H. parasitica Graham, Cat. Bombay Pl. 119, 1839 (non Wall., 1830).

Common climber near Lodwick point, Lingmala.

FLOWERS: May-August;

FRUITS: August-January.

LOCAL NAMES: Amri, Dudhyal.

Sarcostemma R. Br.

1. *Sarcostemma acidum* (Roxb.) Voigt, Hort. Sub. Calcattensis, 542, 1845; Blatter & McCann, 36: 529; Santapau & Irani, 76.

Asclepias acida Roxb., Fl. Ind. 2: 31, 1832.

S. brevistigma Wt. & Arn., in Wight Contrib. 59, 1834; Wight, Icon. t. 595; Dalz. & Gibs. 149; FBI 4: 26; Lisboa, 217; Talbot 247.

This species is included here on the authority of Lisboa. We have not seen it on Mahabaleshwar plateau, though it is common between Panchgani and Wai.

FLOWERS: June-July.

LOCAL NAMES: Somalata, Somvel.

Tylophora R. Br.

1. *Tylophora dalzellii* Hook. f., Fl. Brit. India 4: 43, 1883; Nairne, 185; Cooke, T. 2: 163 (2: 227); Blatter & McCann, 36: 531; Santapau, 289, 1963; Puri & Mahajan, 127; Santapau, 154.

T. carnosa Dalz. & Gibs., Bombay Fl. 150, 1861 (non Wight, 1834).

A rare species at Mahabaleshwar.

FLOWERS: April-November.

BUDDLEJACEAE

Buddleja Linn.

1. *Buddleja asiatica* Lour., Fl. Cochinch. 72, 1790; Dalz. & Gibs. 180; Lisboa, 218; Birdwood, 18; Nairne, 188; Cooke, T. 2: 183 (2: 248); Puri & Mahajan, 127.

Rare species in Fitzgerald Ghat and at Bhilar Estate.

FLOWERS: January-April.

GENTIANACEAE

1. Flowers regular 2
2. Ovary 2-celled *Exacum*
2. Ovary 1-celled 3
3. Corolla with 1-2 glands at base on inner side *Swertia*
3. Corolla glandular inside.... *Centaurium*
1. Flowers irregular *Canscora*

Canscora Lam.

1. Stem not winged *C. diffusa*
1. Stems winged 2
2. Sepals strongly keeled *C. khandalensis*
2. Sepals not keeled *C. decurrens*
1. *Canscora decurrens* Dalz., in Kew J. Bot. 2: 136, 1850; Dalz. & Gibs. 157; FBI 4: 103; Cooke, T. 2: 192 (2: 257)

There are two specimens of this species in Blatter Herbarium from Mahabaleshwar, without collection locality data.

FLOWERS: October-December.

2. *Canscora diffusa* (Vahl) R. Br., Prodr. 45, 1810 (in obs.); Graham, 123; Dalz. & Gibs. 158; FBI 4: 103; Nairne, 191; Cooke, T. 650 & 2: 191 (2: 257); Lisboa, 218; Birdwood, 19; Lee, 646; Santapau, 400, 1962; Puri & Mahajan, 127.

Gentiana diffusa Vahl, Sym. Bot. 3: 47, 1794.

C. lawii Wight, Icon. t. 1327, 1848 (non Clarke, 1875).

Common and abundant plant in moist rocky places with bright-red flowers. Plants have been collected from Chinaman's Falls & Fitzgerald Ghat.

FLOWERS: October-January.

3. *Canscora khandalensis* Santapau, in Kew Bull. 1948: 485, 1949; Fl. Khandala, 162.

There is only one specimen of this species from Mahabaleshwar, collected and identified by Rev. Fr. H. Santapau, from sides of Venna Lake. This specimen is a young plant.

Centaurium Hill.

1. ***Centaurium centauroides*** (Roxb.) Rolla Rao & Hemadr, in Journ. Bombay nat. Hist. Soc. 67: 357, 1970.

Chironia centauroides Roxb. Fl. Ind. 2: 283, 1824.

Erythraea roxburghii D. Don, Syst. 4: 206, 1837; Wight, Icon. t. 1325; Dalz. & Gibbs. 157; Cooke, T. 2: 190 (2: 255).

Common herb in drying rice-fields near Chinaman's Falls.

FLOWERS: October-May.

Exacum Linn.

1. Calyx not winged on the back.....*E. lawii*
1. Calyx winged on the back..... 2
 2. Leaves petioled..... *E. carinatum*
 2. Leaves sessile 3
 3. Corolla more than 2 cm. long.....
 - *E. bicolor*
 3. Corolla less than 1 cm. long
 - *E. pumilum*

1. ***Exacum bicolor*** Roxb., Fl. Ind. 1: 413, 1820; Graham, 123; Dalz. & Gibbs. 156; Wight, Icon. t. 1321; FBI 4: 96; Cooke, T. 2: 187 (2: 252); Birdwood, 18; Santapau, 401, 1962.

Sebaea carinata Graham, Cat. Bombay Pl. 124, 1839 (non Spreng., 1824).

This species is included on authority of Rev. Fr. H. Santapau.

2. ***Exacum lawii*** Clarke, in Fl. Brit. Ind. 4: 98, 1883; Woodrow, in Journ. Bombay nat. Hist. Soc. 12: 168, 1898; Birdwood, 18; Cooke, T. 650, 1885 & 2: 180 (2: 254); Puri & Mahajan, 127.

Rare species among the grasses at Lodwick point and Kate's point. Flowers bright gentian blue.

FLOWERS: September-October.

LOCAL NAMES: Jatali, Gaulan.

3. ***Exacum carinatum*** Roxb., Fl. Ind. 1: 415, 1820; T. P. Ramamurthy, in Fl. Hassan Dist. 425, 1978.

E. petiolare Griseb. in DC. Prodr. 9: 46, 1845;

Wight Icon. t. 1324 (2), 1848; Dalz. & Gibbs. 157; FBI 4: 98; Puri & Mahajan, 127.

E. pedunculatum Linn. var. *petiolare* Trim., Fl. Ceylon, 3: 182, 1895; Cooke, T. 2: 188 (2: 253).

This species is included on authority of Puri & Mahajan.

FLOWERS: October-December.

4. ***Exacum pumilum*** Griseb., in DC. Prodr. 9: 46, 1845; Wight, Icon. t. 1324; Dalz. & Gibbs. 157; FBI 4: 68; Cooke, T. 2: 188 (2: 254); Santapau, 401, 1962.

Common herb among grasses. Flowers bluish purple in colour.

FLOWERS: August-October.

Swertia Linn.

1. Petal with two glands at the base.....*S. minor*
1. Petals with single gland at the base.....

..... *S. densiflora*

1. ***Swertia densiflora*** (Griseb.) Kashyapa, in Kew Bull. 15: 42, 1961.

Ophelia densiflora Griseb., in DC. Prodr. 9: 125, 1845.

S. decussata Nimmo, in Graham, Cat. Bombay Pl. 249, 1839; (nomen nudum) Birdwood, 19; Nairne, 192; Cooke, T. 650, 1885 & 2: 194 (2: 259).

O. alba Arn., in Wight Ill. t. 157, f. 3F, 1850.

O. multiflora Dalz., in Hook. Kew Journ. 2: 135, 1850; Dalz. & Gibbs. 156; Lisboa, 218.

Quite a common plant at Mahabaleshwar. Roots are used in medicine as bitter tonic and sold in Mahabaleshwar Market.

FLOWERS: December-January.

2. ***Swertia minor*** (Griseb.) Knobl., in Bot. Centralbl. 60: 321, 1894; Cooke, T. 2: 193 (2: 259); Santapau, 296, 1963.

Ophelia minor Griseb., in DC. prodr. 9: 126, 1845; Wight, Icon. t. 1332; Dalz. & Gibbs. 156.

Pleurogyne minor Benth., Gen. Pl. 2: 816, 1876; FBI 4: 120.

Rare species among the grasses with pale mauve flowers. Collected only from Kate's point.

FLOWERS: September.

BORAGINACEAE

1. Prostrate or procumbent herbs.....*Coldenia*
1. Erect herbs 2
2. Fruits smooth*Mattiastrum*
2. Fruits glochidiate 3
3. Nutlets base not produced downwards...
.....*Adelocaryum*
3. Nutlets base produced downwards.....
.....*Cyanoglossum*

Adelocaryum Brandis

1. Stem red; flowers pale blue with dark centre.
.....*A. coelestinum*
1. Stem green; flowers uniformly dark-blue.....
.....*A. malabaricum*

1. ***Adelocaryum coelestinum*** (Lindl.) Brand., in Fedde Repert. 13: 549, 1915 & Pfreich, 78: 78, t. 8, 1921; Santapau, 290, 1963; Puri & Mahajan, 127.

Cyanoglossum coelestinum Lindl., in Bot. Reg. 25: t. 36, 1839; Dalz. & Gibs. 173; Lisboa, 218.

Echinosperrum coelestinum Wight, Icon. t. 1394, 1850.

Paracarym coelestinum Benth. & Hook. f., Gen. Pl. 2: 850, 1878; Birdwood, 19; FBI 4: 160; Nairne 197; Cooke, T. 650, 1885 & 2: 218 (2: 285); Lee, 646.

Fairly common and abundant, often gregarious on forest fringes and on exposed grassy slopes along road-sides. Plants bear cauline as well as radical leaves. Mahabaleshwar specimens come from Chinaman's falls, Wilson point, Fitzgerald ghat, Venna lake, Petit Road, Madhu Kosh and Pratapsingh Park.

FLOWERS: August-April.

2. ***Adelocaryum malabaricum*** (Clarke) Brandis, in Fedde Repert. 13: 549, 1915 & Pfreich. 78: 79, 1921.

Paracaryum malabaricum Clarke, in Flora Brit. India 4: 160, 1883; Birdwood, 19; Cooke, T. 650, 1885 & 2: 219 (2: 286); Santapau, 399, 1962 & 290, 1963.

Very common and abundant weed all over in latter half of monsoon. It is more abundant near Venna Lake, Chinaman's Falls, Wilson point, Kate's point.

FLOWERS: August-December.

Coldenia Linn.

1. ***Coldenia procumbens*** Linn. Sp. Pl. 125, 1753; Graham, 135; Dalz. & Gibs. 171; Lisboa, 218; FBI 4: 144.

This species is included on the authority of Lisboa.

FLOWERS: September-October.

Cyanoglossum Linn.

1. Flowers in racemes; pedicels long, filiform, longer than calyx*C. wallichii*

1. Flowers capitate or paniculate; pedicels short, shorter than calyx.....*C. zeylanicum*

1. ***Cyanoglossum wallichii*** G. Don, Gen. Syst. 4: 354, 1838; FBI 4: 157.

C. glochidiatum Wall. ex Lindley, in Bot. Reg. 27: t. 15, 1841; FBI 4: 156.

C. denticulatum DC., Prodr. 10: 150, 1845; FBI 4: 157.

Fairly common herb along margins of forests.

FLOWERS: June-November.

2. ***Cyanoglossum zeylanicum*** (Vahl ex Hornem.) Thunb. ex Lehm. Neue Schriften Naturf. Ges. Halle. 3(2): 20, 1817; Kazmi, J. Arnold Arbor. 52: 344, 1971.

Anchusa zeylanica Vahl ex Hornem., Enum. Hafn. 3, 1807.

C. denticulatum var. *zeylanicum* (Thunb.) C. B. Clarke, in Flora Brit. Ind. 4: 157, 1883; Cooke, T. 2: 217 (2: 284).

C. meeboldii Brandis, in Fedde Repert. 14: 323, 1916 & in Pfreinch. 72: 134, 1921; Santapau, 166; Puri & Mahajan, 127.

Included on the authority of Puri & Mahajan only.

FLOWERS: July-August.

Mattiastrum Brandis

1. ***Mattiastrum lambertianum*** (Clarke) Brandis, in Pfreich. 78: 61, 1921; Santapau, 291, 1963.

Paracaryum lambertianum Clarke, in Fl. Brit. India 4: 161, 1883; Birdwood, 19; Nairne, 197;

Cooke, T. 650 & 2: 219 (2: 287); Puri & Mahajan, 127.

Fairly common on hill slopes among grasses in the latter half of the monsoon. Abundant at Dhobi's Falls and Fitzgerald ghat. So far this species seems to be endemic to Mahabaleshwar.

FLOWERS: October-November.

EHRETIACEAE

Rotula Lour.

1. ***Rotula aquatica*** Lour. Fl. Cochinch. 121, 1790; Santapau, 164.

Rhabdia lycioides Mart. Nov. Gen. Sp. 2: 137, 1826; FBI 4: 145; Cooke, T. 2: 205 (2: 272).

R. viminea Dalz., in Hook. Icon. t. 823, 1854; Dalz. & Gibbs. 170.

Ehretia cuneata Wight, Icon. t. 1385, 1848.

In Poona (BSI) Herbarium there is one specimen collected by Cooke from Koyna Valley, below Mahabaleshwar. But we have not seen this plant on Mahabaleshwar plateau.

CONVOLVULACEAE

1. Outer three or all sepals much enlarged in fruit corolla tube uniformly enlarged from the base to the apex.....*Porana*

1. Sepals not enlarged in fruit; corolla tube not uniformly enlarged 2

2. Fruit dehiscent *Ipomoea*

2. Fruit indehiscent *Argyreia*

Argyreia Lour.

1. Bracts small, scaly, foliaceous.....*A. elliptica*

1. Bracts large, membranous..... 2

2. Leaves elongate-ovate, rounded at the base *A. involucrata*

2. Leaves broadly ovate, cordate at base.....
..... *A. boseana*

1. ***Argyreia boseana*** Santapau & Patel, in Trans. Bose Res. Inst. Calcutta, 22: 35, t. 3, 1958.

A. hookeri Cooke, T. Fl. Pres. Bombay 2: 255, 1905, (non Clarke, 1883); Talbot 2: 285; Santapau, 293, 1963; Puri & Mahajan, 127.

A. malabarica Woodrow, in Journ. Bombay nat. Hist. Soc. 12: 170, 1898.

Fairly common climber on forest trees. Flowers mauve-violet. This species is endemic to Mahabaleshwar and Panchgani.

FLOWERS: August-October.

2. ***Argyreia elliptica*** (Roth.) Choisy, in Mem. Soc. Phys. Genere 6: 417, 1833; Graham, 128; Dalz. & Gibbs. 169; Santapau, 293, 1963; Puri & Mahajan, 128.

Ipomoea elliptica Roth., Pl. Sp. 113, 1821.

Lettsomia elliptica (Roth.) Wight ex C. B. Clarke, in Fl. Brit. India 4: 192, 1883; Cooke, t. 2: 259 (2: 329).

Occasional twiner on forest trees.

FLOWERS: September-October.

LOCAL NAME: Bondvel.

3. ***Argyreia involucrata*** Clarke, in Fl. Brit. India. 4: 187, 1883; Talbot 2: 256; Cooke, T. 2: 256 (2: 325).

A. involucrata var. *inaqualis* Clarke, in Fl. Brit. India 4: 187, 1883.

This plant has been reported by Cooke, T., from Wada, below Mahabaleshwar. But it is not found on the plateau.

FLOWERS: July-August.

Ipomoea Linn.

1. Sepals entirely glabrous.....*I. diversifolia*

1. Sepals hairy on outer side..... 2

2. Sepals not long-attenuate at apex.....
..... *I. illustris*

2. Sepals long-attenuate or linear-acuminate at apex *I. congesta*

1. ***Ipomoea congesta*** R. Br., Prodr. 485, 1810; Oostroom, in Blumea 3: 500, 1940.

I. acuminata (Vahl) Roem. & Schultz, Syst. 4: 228, 1819 (non Ruiz & Pav., 1799).

Convolvulus acuminatus Vahl, Symb. Bot. 3: 26, 1794.

I. learii Paxt., Bot. Mag. 6: t. 267, 1839, Cooke, T. 2: 251 (2: 321).

Cultivated plant with dark blue flowers which fade to reddish colour. Occasionally seen in private gardens.

2. **Ipomoea diversifolia** R. Br. Prodr. 487, 1810; Oostroom, 365; Santapau, 170.

Pharbitis laciniata Dalz. in Kew Journ. Bot. 3: 178, 1851; Dalz. & Gibs. 167.

I. laciniata Clarke, in Fl. Brit. India, 4: 200, 1883; Cooke, T. 2: 250 (2: 319); Puri & Mahajan, 128.

I. dissecta Woodrow, in Journ. Bombay nat. Hist. Soc. 12: 171, 1898 (non Willd.); Birdwood, 19.

Rare plant on grassy slopes. Prostrate or ascending but not climbing or twining.

FLOWERS: October-November.

3. **Ipomoea illustris** Prain, Bengal Pl. 735, 1903; Oostroom, in Blumea, 3: 566, 1940; Santapau, 170.

I. companulata Choisy, in Mem. Soc. Phys. Geneve 6: 151, 1833; Wight, Icon. t. 1375; Dalz. & Gibs. 165; FBI 4: 211; Cooke, T. 2: 247 (2: 316); Lee, 646 (non Linn. 1753).

I. companulata var. *illustris* Clarke, in Fl. Brit. India, 4: 211, 1883.

I. soluta Kerr, in Kew Bull. 1941: 18, 1941.

FLOWERS: January-February.

Porana Burm.

1. **Porana racemosa** Roxb., Fl. Ind. 2:41, 1824; Graham, Cat. 133; Dalz. & Gibs. 167; Oostroom, in Blumea 3: 91, 1938; FBI 4: 222; Santapau, 167.

P. malabarica Clarke, in Fl. Brit. Ind. 4: 223, 1883; Nairne, 206; Cooke, T. 651 & 2: 226 (2: 294); Birdwood, 19; Puri & Mahajan, 128.

Fairly common climber on forest trees.

FLOWERS: October-November.

LOCAL NAME: Bhauri.

SOLANACEAE

1. Fruit a capsule..... 2
 2. Stamens 4 *Browallia*
 2. Stamens 5 3
 3. Stamens all 5 perfect *Datura*
 3. Stamens in 2 pairs and one much smaller or rudimentary *Petunia*
1. Fruit a berry 4
 4. Fruiting calyx persistent, highly accrescent 5
 5. Flowers pale or light blue..... *Nicandra*

5. Flowers yellow *Physalis*
4. Fruiting calyx not accrescent..... 6
6. Anthers dehiscing by apical pores..... 7
 7. Anthers linear; flowers in cymes..... *Solanum*
 7. Anthers ellipsoid; flowers in fascicles *Lycianthus*
6. Anthers dehiscing by longitudinal slits... 8
8. Corolla tubular *Cestrum*
8. Corolla rotate 9
 9. Flowers yellow..... *Lycopersicon*
 9. Flowers white *Capsicum*

Browallia Linn.

1. Calyx not glandular *B. americana*
1. Calyx glandular, viscid..... *B. viscosa*

1. **Browallia americana** Linn., Sp. Pl. 631, 1753; Bailey, Man. Cult. Pl. 880.

B. demissa Linn., Syst. ed 10, 1118, 1759; Dalz. & Gibs. suppl. 63; Cooke, T. 2: 276 (2: 346); Vartak, in Journ. Univ. Poona, 18: 91, 1960.

B. elata Linn. Syst. ed 10, 118, 1759.

Dr. V. D. Vartak has reported this species from Mahabaleshwar. One of the specimens which we have examined (Vartak-2020) is *B. viscosa* H. B. K.

2. **Browallia viscosa** H. B. K., Nov. Gen. Sp. Pl. 2: 373, 1818; Bailey, 880.

Viscous, glandular hairy herbs with axillary flowers which are blue or violet purple in colour. Cultivated but very often found as an escape.

FLOWERS: December.

Capsicum Linn.

1. **Capsicum annum** Linn. var. *acuminatum* Fingerh. Mon. Capsicum 13, t. 2, f.c., 1832; Cooke, T. 2: 276 (2: 347); Santapau, in Journ. Bombay nat. Hist. Soc. 47: 661, 1948.

C. frutescens Roxb. Fl. Ind. 1: 574, 1832 (non Linn., 1753); Graham, 139; Dalz. & Gibs. suppl. 61; FBI 4: 239.

Cultivated for fruits which are used as spices and condiments.

FLOWERS: Throughout the year.

LOCAL NAME: Mirchi, Lal mirchi

Cestrum Linn.

1. Calyx lobes distinctly reflexed.....*C. diurnum*
1. Calyx lobes erect or spreading, not reflected*C. nocturnum*

1. ***Cestrum diurnum*** Linn. Sp. Pl. 191, 1753; Bailey, 873; Bor & Raizada, some Beaut. Ind. Clim. & Shrubs 118, 1954.

Cultivated in gardens. Flowers ivory-white in colour.

FLOWERS: Throughout the year.

LOCAL NAME: Din-ka-Raja.

2. ***Cestrum nocturnum*** Linn. Sp. Pl. 191, 1753; Bor & Raizada, 119; Bailey, 873; Santapau, 200; Puri & Mahajan, 128.

Cultivated ornamental plant. Produces strong fragrance during night and in early morning, which fades away after sun-rise.

FLOWERS: June-July.

LOCAL NAME: Rat-ki-Rani.

Datura Linn.

1. Flowers erect; fruits spiny 2
2. Fruits drooping*D. metel*
2. Fruits erect*D. stramonium*
1. Flowers drooping; fruits not spiny.....
.....*D. suaveolens*

1. ***Datura suaveolens*** Humbolt & Bonap. plant ex Willd., Enum. Hort. Berol. 227, 1809; Bor & Raizada, Some Beaut. Indian Clim. & Shrubs 130, 1954;

Brugmansia candida (non Pers. 1805); Graham, Cat. Bombay Pl. 141; 1839; Dalz. & Gibs. suppl. 63; Birdwood, 19; Nairne, 210; Cooke, T. 649, 1885.

B. suaveolens Bercht. & Presl. ex G. Don, Gen. Syst. 4: 475, 1838.

Datura arborea Cooke, T., Fl. Presidency Bombay 2: 274, 1905 (2: 344); (non Linn., 1753).

Fairly common tall shrub along roadsides and in wastelands with trumpet-shaped drooping flowers. It rarely produces fruits in Mahabaleshwar.

FLOWERS: May-July; FRUITS: December.

2. ***Datura metel*** Linn. Sp. Pl. 179, 1753;

Cooke, T. 2: 273 (2: 349); Santapau, Journ. Bombay nat. Hist. Soc. 47: 657; Bailey, 877; Bor & Raizada, l. c. 129.

D. fastuosa Linn. Syst. ed 10, 2: 932, 1759; FBI 4: 242; Cooke, T. 651 & 2: 273 (2: 343).

D. alba Nees, in Trans. Linn. Soc. 17: 73, 1834; Graham, 141; Wight, Icon. t. 852; Dalz. & Gibs. 174; Lisboa, 218.

D. fastuosa Linn. var. *alba* (Nees) Clarke, in Fl. Brit. India 4: 243, 1883; Cooke, T. 2: 273 (2: 344); Birdwood, 19.

This species is included on authority of Lisboa and Birdwood.

3. ***Datura stramonium*** Linn. Sp. Pl. 179, 1753; FBI 4: 242; Wettst, in Pfam. 4 (3b) 27, f. 13A-C, E-J, 1891.

D. tatula Linn. Sp. Pl. 256, 1762.

D. stramonium Linn. var. *tatula* Clarke, in Fl. Brit. India, 4: 242, 1883.

Occasional annual herb along roadsides in wastelands.

FLOWERS: June-July. FRUITS: September.

Lycianthus Hassl.

1. Calyx entire or obscurely 5-toothed....*L. laevis*
1. Calyx 5-8 conspicuous teeth.....*L. laevis*
var. *kaitisis*

1. ***Lycianthus laevis*** (Dunal) Bitter, Abh. Nat. Ver. Bremen. 24: 484, 1920; Baker & Bakh. Fl. Java 2: 476, 1955.

Solanum laeve Dunal, Solan. Synop. 22, 1816.

S. bigeminatum Nees in Trans. Linn. Soc. London, 17: 42, 1837; FBI 4: 231; Woodrow, in Journ. Bombay nat. Hist. Soc. 12: 173, 1898; Cooke, T. 2: 264 (2: 334); Puri & Mahajan, 128; Santapau, 47: 656.

L. bigeminata (Nees) Bitter, in Abn. Naturh. ver. Bremen. 24: 480, 1920.

S. neesianum Dalz. & Gibs., Bombay Fl. 175, 1861. (non Wall. ex Nees, 1837).

This species is included on the authority of Woodrow, T. Cooke and Puri & Mahajan. No reliable specimens were seen by us. Following subspecies of this species is quite common at Mahabaleshwar and might have been mistaken for the typical subspecies.

2. **Lycianthus laevis** (Dunal) Bitter, subsp. **kaitisis** (Bitter). comb. nov.

L. bigeminata (Nees) Bitter, subsp. *kaitisis* (Dun.) Bitter, in Abh. Naturh. Ver. Bremen 24: 481, 1920; Santapau, 47: 656.

S. kaitisis Dunal, in DC. Prodr. 13(1): 157, 1852.

S. denticulatum Clarke, in Fl. Brit. India, 4: 231, 1883 (non Blume, 1825); Wight, Icon. t. 1397, 1848; Cooke, T. 640 & 2: 264 (2: 334); Birdwood, 19; Puri & Mahajan, 128.

Common along roadsides and at the edges of forests.

FLOWERS: July-October;

FRUITS: August-December.

Lycopersicon Mill.

1. **Lycopersicon lycopersicum** (Linn.) Karst. ex Farwell, Ann. Rep. Comm. Park Boulevards Detr. 11: 83, 1900; G. L. Shah, Fl. Gujarat, 486, 1978.

L. esculentum Mill., Gard Dict. ed 8, No. 2, 1768; FBI 4: 237; Cooke, T. 2: 275 (2: 345); Santapau, 47: 660.

Solanum lycopersicum Linn. Sp. Pl. 185; Dalz. & Gibs. suppl. 61.

Occasionally in waste-lands along roadsides. Usually cultivated for its fruits.

FLOWERS & FRUITS: Throughout the year.

LOCAL NAMES: Tamatar, Tomato.

Nicandra Adans.

1. **Nicandra physaloides** (Linn.) Gaertn., Fruct. 2: 237, t. 141, f. 2, 1791; Graham, 140; Dalz. & Gibs. suppl. 62; FBI 4: 240; Cooke, T. 2: 275 (2: 346); Santapau, 47: 660; Birdwood, 19.

Occasionally found in waste-lands along roadsides. Very showy plant when in bloom.

FLOWERS: July-August.

Nicotiana Linn.*

1. Corolla tube linear.....*N. plumbaginifolia*

1. Corolla tube narrow below, ventricose above *N. tabacum*

* Cultivated or Escape.

1. **Nicotiana plumbaginifolia** Viv. Elench. Pl. Hort. Dinegro 26, t. 5, 1820; G. L. Shah, Fl. Gujarat, 487, 1978.

Rare weed along roadsides and in gardens.

FLOWERS: November-January.

2. **Nicotiana tabacum** Linn. Sp. Pl. 180, 1753; Graham, 140; Dalz. & Gibs. suppl. 63; FBI 4: 245; Lisboa, 219; Cooke, T. 2: 276 (2: 346); Santapau, 47: 660.

Rarely cultivated in gardens.

FLOWERS & FRUITS: December-April.

LOCAL NAME: Tambakhu.

Petunia Juss.

1. **Petunia violacea** Lindl., Bot. Reg. t. 1626, 1853; Dalz. & Gibs. suppl. 63.

Cultivated in gardens in cold seasons. Sometimes found wild as an escape from cultivation.

FLOWERS: January-February.

Physalis Linn.

1. Stems glabrous; anthers yellow.....*P. minima*

1. Stems pubescent with appressed hairs, anthers greenish-blue *P. longifolia*

1. **Physalis longifolia** Nutt., in Trans. Amer. Phil. Soc. ser. 2, 5: 193, 1834; Santapau, 174.

P. peruviana Graham, Cat. Bombay pl. 140, 1839 (non Linn., 1753); Dalz. & Gibs. suppl. 61; FBI 4: 238; Santapau, 47: 657; Lisboa, 219.

P. pubescens R. Br. Prodr. 1: 447, 1810 (non Linn., 1753).

Rare weed in wastelands. This species goes under *P. peruviana* in our herbarium materials. According to Rev. Fr. H. Santapau, *P. peruviana* is a shrub or small tree, whereas the Mahabaleshwar plant is a herbaceous weed.

FLOWERS: November.

LOCAL NAME: Popti.

2. **Physalis minima** Linn. Sp. Pl. 183, 1753; FBI 4: 238; Graham, 140; Cooke, T. 2: 270 (2: 340); Santapau, 47: 657.

P. pubescens Wight, Ill. t. 166B, f. 6, 1850 (non Linn. 1753).

Rare weed in waste-lands along roadsides.

FLOWERS: July-August.

Solanum Linn.

1. Plants climbing *S. wendlandii*
1. Plants not climbing 2
2. Plants armed with spines 3
3. Herbs *S. melongena* (p.p.)
3. Shrubs or undershrubs 4
4. Leaves white tomentose on ventral surface *S. giganteum*
4. Leaves glabrous *S. indicum*
2. Plants unarmed 5
5. Shrubs *S. erianthum*
5. Herbs 6
6. Flowers in umbels, white *S. nigrum*
6. Flowers in racemes, pale violet or mauve coloured *S. melongena* (p.p.)

1. ***Solanum giganteum*** Jacq., Coll. 4: 125, 1790; Graham, 138; Dalz. & Gibs. 175; Wight, Icon. t. 893; FBI 4: 233; Nairne, 208; Cooke, T. 649 & 2: 266 (2: 336); Talbot 2: 303; Santapau, 399, 1962 & 309, 1963.

Very common and abundant, often very gregarious, along roadsides, in forest clearings and in waste-lands.

FLOWERS: August-November.

LOCAL NAMES: Chuna Jhad, Kutri.

2. ***Solanum indicum*** Linn. Sp. Pl. 187, 1753 (pro parte); Graham, 138; Wight, Icon. t. 346; Dalz. & Gibs. 174; Lisboa, 218; FBI 4: 234; Birdwood, 19; Cooke, T. 649 & 2: 266 (2: 336); Santapau, 47: 653 & 309, 1963; Puri & Mahajan, 128.

Common, at times gregarious, among the undergrowth of the forests.

FLOWERS & FRUITS: June-February.

LOCAL NAMES: Chiturti, Ran-vangi.

3. ***Solanum melongena*** Linn., Sp. Pl. 186, Graham, 138; Dalz. & Gibs. suppl. 61; FBI 4: 235; Cooke, T. 2: 269 (2: 339); Santapau, 47: 655.

S. esculentum Dunal, Hist. Solanum 208, t. 3, 1813.

Cultivated for fruits which are used as a vegetable. Occasionally found in waste lands

as an escape from cultivation.

FLOWERS & FRUITS: Throughout the year.

LOCAL NAME: Vangi.

4. ***Solanum nigrum*** Linn. Sp. Pl. 186, 1753; FBI 4: 229; Birdwood, 19; Nairne, 208; Cooke, T. 2: 263 (2: 332); Santapau, 47: 652; Puri & Mahajan, 128.

S. rubrum Mill., Gard. Dict. ed. 8, no. 4, 1768 (non Linn. 1767); Wight, Icon. t. 344, 1840.

S. incertum Dunal, Hist. Sol. 155, 1813; Graham, 137.

Common weed along road-sides, in gardens and moist wastelands.

FLOWERS & FRUITS: August-October.

LOCAL NAME: Ringni.

5. ***Solanum erianthum*** D. Don, Prodr. 96, 1825; Roe, in Taxon 17: 176, 1968.

S. verbascifolium Wight, Icon. t. 1398, 1848 (non Linn., 1753); Dalz. & Gibs. Bombay Fl. 175, 1861; FBI 4: 230; Cooke, T. 2: 263 (2: 333); Talbot 2: 302; Santapau, 47: 653 & 309, 1963.

S. pubescens Roxb. Fl. Ind. 2: 244, 1824 (non Willd., 1794). Willd., 1794).

Talbot has reported this species from late-rites of Mahabaleshwar. Not seen by us.

6. ***Solanum tuberosum*** Linn.* Sp. Pl. 185, 1753; Graham, 137; Dalz. & Gibs. suppl. 60; FBI 4: 229; Lee, 646; Lisboa, 219; Cooke, T. 2: 269 (2: 339); Santapau 47: 655.

Lycopersicon tuberosum Mill., Gard. Dict. ed. 8, no. 7, 1768.

The Potato plant is extensively cultivated on all possible cultivable lands. Tubers are dispatched to Bombay and Poona markets on wholesale basis. According to Graham, the red soil of Mahabaleshwar suits well for this crop.

7. ***Solanum wendlandii*** Hook. f. in Curt. Bot. Mag. t. 6914, 1887; Bor & Raizada, Some Beautiful Indian Clim. & Shrubs, 125, 1954.

Large twining perennial cultivated in local gardens.

FLOWERS: June.

(To be continued)

* Cultivated.

BREEDING HABITS AND ASSOCIATED PHENOMENA IN SOME INDIAN BATS¹

Part IX — *Hipposideros lankadiva* (Kelaart) — Hipposideridae

V. M. SAPKAL AND W. R. BHANDARKAR²

Specimens of *Hipposideros lankadiva* (Kelaart) were collected from old temples and unused tunnels from Chandrapur about 160 kilometres from Nagpur. This large bat lives in colonies which vary from a scattered gathering of 50 to 100 individuals to thousands. The bat is very active and both males and females are found in the same colony throughout the year. It has an annual breeding cycle and each female delivers a single young one during each cycle. Deliveries in the colony occur from the 10th May to the end of May. There is a dominance of the left side of the genitalia over the right a few cases showing ovulation and pregnancy in the right. The gestation period is prolonged due to a retarded development of the embryo after implantation and is of about 260 days. Females are sexually quiescent only for a short period from 1st week of August to the middle of August. The young ones do not attain sexual maturity in the year of birth. The colony shows a female dominant sex-ratio.

INTRODUCTION

Although the family Hipposideridae is represented by several species in India, some aspects of the breeding biology of only a few species have been studied (Gopalakrishna and Moghe 1960; Gopalakrishna and Bhatia 1980; Gopalakrishna and Bhatia 1983).

The present paper on the breeding habits of *Hipposideros lankadiva* is a part of the overall programme of the study of reproductive biology of Indian bats undertaken in this laboratory. This species has been chosen for detailed study because it not only exhibits some unusual features but it also differs considerably from the breeding behaviour of a closely related species, *Hipposideros speoris*. (Gopalakrishna and Bhatia 1983) inspite of living in the same geographical situation and under the same ecological conditions. In fact, *Hipposideros lanka-*

diva is often associated with *Hipposideros speoris* since the two species live in the same roost.

MATERIAL AND METHODS

Specimens of *Hipposideros lankadiva* were obtained from their natural roosting places at and near Chandrapur about 160 kilometres south of Nagpur. The specimens were collected from November 1976 to May 1979 such that every calendar month was represented by one collection or more. The specimens were netted at random during daytime and sometimes during the night. After recording the significant characteristics of the external genitalia in the males and the mammary nipples and pubic dugs in the females, the animals were killed by chloroform and their body weight recorded by a sensitive spring balance. The reproductive tracts were dissected out and fixed in Bouin's fixative or 10% formalin and were preserved in 70% alcohol. In the case of the males the right testis of each specimen was taken out of 70%

¹ Accepted May 1981.

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Bole, P. V. and Almeida, M. R. 1984. "MATERIAL FOR THE FLORA OF MAHABALESHWAR-5 INDIA." *The journal of the Bombay Natural History Society* 81, 364–380.

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