

FASCICLES OF FLORA OF INDIA

FASCICLE 7

LILIACEAE : TRIBE—SCILLEAE

D. B. DEB AND S. DASGUPTA



**BOTANICAL SURVEY OF INDIA
P. O. BOTANIC GARDEN
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LILIACEAE : TRIBE—SCILLEAE

D. B. DEB* AND S. DASGUPTA*

SCILLEAE

Reichenbach, Consp. Reg. Veg. 65. 1828.

Herbs small, bulbous, scapigerous. Leaves radical. Scape simple, naked. Racemes terminal, not involucrate. Flowers bisexual, hypogynous, campanulate, bracteate, pedicelled. Perianth in two whorls of 3 segments each; subapex hooded. Stamens 6, biseriate; anthers bilocular, dorsifixed, versatile, introrse, longitudinal; pollen oblong, monocolpate. Carpels 3, syncarpous; ovary superior, trilobed, trilocular; placentation axile. Fruits loculicidal capsules, trilobed, trilocular; pericarp stiff, crustaceous, light-yellow or brown.

Type : Scilla L.

Distrib. : 25 genera and about 715 species distributed all over the world (Hutchinson, Fam. Fl. Pl. 755. 1973). 3 genera and 16 species in India of which 4 are endemic.

- 1a. Perianth segments united more than one-third from the base. Filaments adnate along the tube except the tip. Seeds compressed ...1. **Dipcadi**
- 1b. Perianth segments free from the base. Filaments adnate to the base of the perianth segments. Seeds compressed or not:
 - 2a. Seeds few, not compressed, dull ...2. **Scilla**
 - 2b. Seeds many, compressed, shining ...3. **Urginea**

1. DIPCADI

Medik. in Act. Acad. Theod. Palat. 6 : 431. 1790; Baker in Journ. Linn. Soc. 11 : 395. 1871; Benth. in Benth. & Hook. f. Gen. Pl. 3 : 809. 1883; Hook. f. Fl. Brit. Ind. 6 : 345. 1892; Hutchinson, Fam. Fl. Pl. 756. 1973; Deb et Dasgupta in Journ. Bomb. Nat. Hist. Soc. 75 : 50. 1978.

*Botanical Survey of India, Howrah-711 103.

Bulbs tunicated, outer scales scarious, inner fleshy. Leaves radical, with sheathing base. Scapes as long as the leaves or longer, terete, stiff, with terminal raceme. Flowers campanulate; pedicel elongates with maturity, as long as bract or so. Perianth outer whorl campanulate, lobes lanceolate; inner whorl tubular, lobes deltoid or lanceolate, recurved at the tip, veins median. Stamens at the throat of the perianth tube; filaments adnate to the perianth tube, free portion short; pollen oblong, monocolpate, foveolate. Ovary oblong or obovoid, with numerous ovules in axile placentation; septal nectaries present in the ovary; style linear; stigma trifid. Capsules subglobose to obovoid. Seeds many in each locule, superposed, orbicular to rotund, compressed, wrinkled, obscurely winged, brownish black, glossy.

Distrib. : About 55 species distributed in the Mediterranean region, AFRICA, MADAGASCAR, INDIA, PAKISTAN, NEPAL. 9 species occur in India, of which 3 are endemic.

1a. Flowers 25-36 mm long. Styles 20-25 mm long ...1. **D. concanense**

1b. Flowers 8-15 mm long. Styles 3-6 mm long :

2a. Perianth segments unequal, outer whorl united up to one-third and those of the inner up to two-thirds of their length:

3a. Pedicels filiform. Filaments adnate wholly to the perianth tube:

4a. Fruits broader than long ...5. **D. montanum**

4b. Fruits as long as broad :

5a. Scapes 20-70 cm long, 10-16-flowered. Capsules stipitate ...8. **D. serotinum**

5b. Scapes 15-20 cm long, 4-12-flowered. Capsules sessile ...2. **D. erythraeum**

3b. Pedicels stout. Filaments adnate in most part to the perianth tube :

6a. Bracts as long as the pedicel ...7. **D. saxorum**

6b. Bracts much longer than the pedicel :

7a. Bracts coriaceous, acute ...3. **D. maharashtrensis**

7b. Bracts scarious, long acuminate ...9. **D. ursulae**

2b. Perianth segments equal, both the whorls united one-third to half of their length :

8a. Bracts 4-5 mm. Filaments 1-2 mm ...4. **D. minor**

8b. Bracts 6-10 mm. Filaments 4-5 mm ...6. **D. reidii**

1. **Dipcadi concanense** (Dalz.) Baker in Journ. Linn. Soc. 11 : 399. 1871; Hook. f. Fl. Brit. Ind. 6 : 346. 1892; Cooke, Fl. Pres. Bomb. 2 : 769. 1907 (Repr. ed. 3 : 277. 1958); Deb et Dasgupta in Journ. Bomb. Nat. Hist. Soc. 75 : 69. 1978. *Uropetalum concanense* Dalz. in Journ. Bot. 2 : 143 1850.

Figs. 1-2

Bulbs 1.2-1.8 cm, globose. Leaves few, 5-22 × *ca.* 0.2 cm. Scapes 18-28 cm long, narrow, erect, glabrous. Racemes 2-6-flowered. Flowers salver-shaped; tube narrow, 8-12 × 2-4 mm; pedicels 5-10 mm, filiform; bracts 3-5 mm, deltoid, scarious, acuminate. Perianth segments shining white, 6-nerved; outer lobes *ca.* 15 × 3 mm, lanceolate, acute, fimbriate, spreading from the middle; inner lobes 3-4 × 3 mm. Filaments 2 mm, filiform; anthers 3.0 × 0.7 mm, narrowly oblong. Ovary *ca.* 2.5 × 1.5 mm; obovoid oblong; stipe *ca.* 1.5 mm long. Capsules stipitate, 1.5 cm; lobes rounded. Seeds 6 in each locule, 8 mm across, rotund.

Type : India : Bombay, Dalzell s. n. (K!).

Distrib. : INDIA : Western Deccan in Maharashtra; endemic.

Specimens examined : Malabar-Konkan, Stocks & Law s. n. (K, E, CAL).

2. **D. erythraeum** Webb. et Berth. Phyt. Canar. 3:341. 1848; Cooke, Fl. Pres. Bomb. 2 : 770. 1907 (Repr. ed. 3 : 278. 1958); Deb et Dasgupta in Journ. Bomb. Nat. Hist. Soc. 75 : 53. 1978. *Hyacinthus serotinus* Forsskal, Fl. Aegyptiaco-Arabica 209. 1775. *Uropetalum unicolor* Stocks in Journ. Bot. 4 : 180. 1852. *Dipcadi unicolor* (Stocks) Baker in Journ. Linn. Soc. 11 : 397. 1871; Hook. f. Fl. Brit. Ind. 6 : 346. 1892.

Figs. 7-10

Junglee Bussar (Sind & Baluch.)

Bulbs 2.0-3.0 × 1.5-2.5 cm, ovoid. Leaves few, 15-20 × 0.2-0.6 cm, falcate. Scapes 15-20 × 0.2-0.3 cm, stiff, erect. Flowers 12-14 mm; pedicels 2-3 mm; bracts 7-9 mm, deltoid, membranous to scarious, acuminate.

Perianth outer segments slightly longer, lobes lanceolate, recurved at the tip, 5-nerved. Anthers 4.5×0.7 -1.0 mm. Ovary sessile, *ca.* 4×2 mm, oblong; style *ca.* 4 mm. Capsules 12-14 mm, quadrate, retuse above and below. Seeds rotund, 6-7 mm.

Type : Egypt : Kahirae in desertis, *Forsskal* (LINN).

Fls. : Aug.-Sept.

Distrib. : INDIA : Thar desert, Rajasthan; rare; PAKISTAN.

Specimens examined : Rajasthan, Bairaswara, 28-8-69, *Wadhawa* 5028 (BSA); Sind, *Stocks* 634 (K, CAL).

Ecol. : It grows on the hills of the arid region after rain.

Uses : Bulbs are eaten in Sind and Baluchistan.

3. **D. maharashtrensis** Deb et Dasgupta in Journ. Bomb. Nat. Hist. Soc. 72 : 822. 1975 & 75 : 62. 1978.

Figs. 3-4

Bulbs 2.5×2.5 cm, globose, rooting profusely from the base. Leaves few, $25-30 \times 0.5-0.7$ cm, plicate, acute, coriaceous, glabrous. Scapes *ca.* 36 cm long, glabrous. Racemes 12-flowered, *ca.* 13 cm long. Flowers 11-13 mm; pedicels 2-3 mm; bracts persistent, $10-20 \times 3.0-3.5$ mm, subulate, coriaceous. Perianth: outer campanulate, inner tubular; lobes 2.0-2.5 mm broad, obtuse; nerves 5, convergent. Filaments 1-2 mm, filiform; anthers $2.5-2.7 \times 0.7$ mm, oblong. Ovary stipitate, $3.5-4.0 \times 2.5-3.0$ mm, broadly oblong, with numerous ovules; style stout, 4-5 mm.

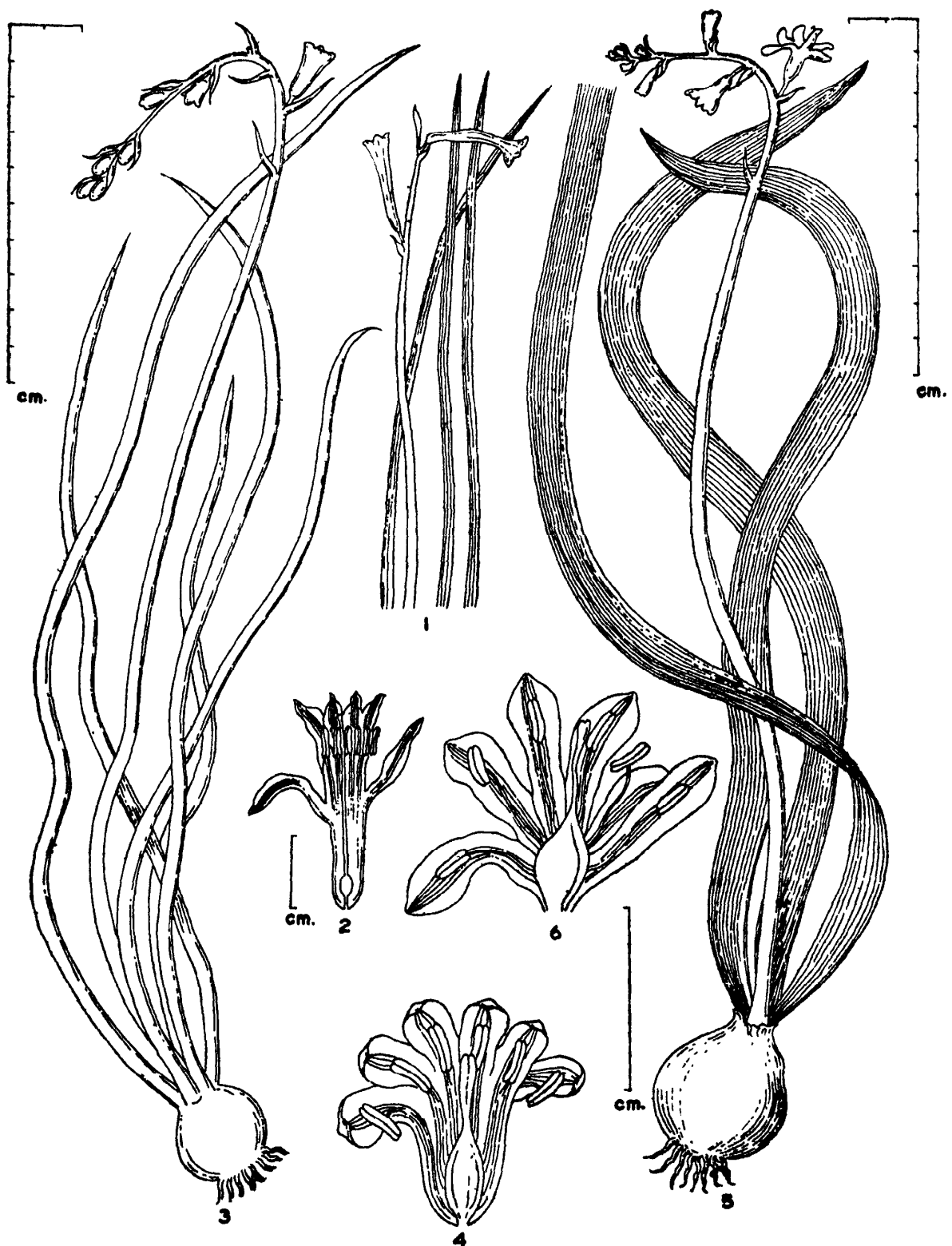
Type : India : Panchgani, 5th Sept. 1955, *Rukmini Bai* BR 933 (BLAT!).

Fls. : Sept.

Distrib. : INDIA : Western Deccan, Maharashtra.

4. **D. minor** Hook. f. Fl. Brit. Ind. 6 : 346. 1892; Cooke, Fl. Pres. Bomb. 2 : 770. 1907 (Repr. ed. 3 : 278. 1958); Deb et Dasgupta in Journ. Bomb. Nat. Hist. Soc. 75 : 66. 1978.

Bulbs $1.8-2.0 \times 1.5-2.0$ cm, ovoid, with fibrous roots at the base. Leaves $12-15 \text{ cm} \times 0.2-0.3$ cm, plicate, glabrous. Racemes 6-12-flowered. Flowers 8-9 mm; pedicels 3-5 mm, filiform; bracts $4-5 \times 3-4$ mm, deltoid, acuminate, scarious. Perianth outer segments narrower than the inner, all united one-



Figs. 1-6 : *Dipcadi concanense* (Dalz.) Baker 1. Habit of the plant. 2. Dissected flower. *D. maharashtrensis* Deb et Dasgupta 3. Habit of the plant. 4. Dissected flower. *D. reidii* Deb et Dasgupta 5. Habit of the plant. 6. Dissected flower.

third to half from the base, 7-9-veined. Anthers $2.5-3.0 \times 0.7$ mm, oblong. Ovary sessile, $3.0-3.5 \times 1.5-2.0$ mm, narrowly obovoid; style 3-5 mm.

Type : India : Konkan, Hewra Plain, Aug. 1859, Dalzell s. n. (K!).

Distrib. : INDIA : Deccan, Maharashtra.

Specimen examined : Peninsular India, R. Wight s. n. (E).

Notes : The type at Kew is a fragment only without bulb, leaf and fruit. There are only 5 scapes, two of which bear small flowers. This has not been collected after 1859.

This is allied to *Dipcadi erythraeum* Webb. & Berth. and *D. serotinum* (L.) Medik., differing from the former in having shorter bracts and from the latter in shorter size of the plant, perianth segments 7-9 nerved and united one third to half from the base.

5. **D. montanum** (Dalz.) Baker in Journ. Linn. Soc. 11 : 398. 1871; Hook. f. Fl. Brit. Ind. 6 : 346. 1892; Cooke, Fl. Pres. Bomb. 2 : 769. 1907 (Repr. ed. 3 : 278. 1958); Mooney, Suppl. Bot. Bih. Or. 201. 1950. *Uropetalum montanum* Dalz. in Journ. Bot. 2 : 142. 1850.

Figs. 11-16

Bulbs $1.0-3.0 \times 1.0-3.0$ cm, ovoid or ellipsoid. Leaves $10-20 \times 0.2-0.5$ cm, glabrous. Scapes 18-75 cm, erect, slender, glabrous. Raceme 5-15 cm long, 5-15-flowered. Flowers 11-13 mm; pedicels 2-8 mm; bracts $5-10 \times 3-4$ mm, deltoid or lanceolate, clawed, scarious. Perianth outer segments longer, campanulate, lobes obovate lanceolate; inner tubular, recurved at the tips; nerves 5-6. Anthers $2-3 \times 0.7$ mm, linear-oblong; pollen oblong. Ovary stipitate or substipitate, $3.0-5.0 \times 1.5-2.5$ mm, obovoid or oblong, with septal nectaries; style 3.5-6.0 mm. Capsules $5-10 \times 10-15$ mm, obovoid, deeply trilobed; pericarp thin, light-brownish yellow. Seeds 3-5 per locule, $3.5-6.0 \times 2.0-4.0$ mm, orbicular or elliptic or ovate elliptic.

1a. Ovary narrowly obovoid, stipitate ...var. **montanum**

1b. Ovary oblong, substipitate ...var. **madrasicum**

var. **montanum**

Deb et Dasgupta in Journ. Bomb. Nat. Hist. Soc. 75 : 56. 1978.

Scapes 18-25 cm. Flowers mildly perfumed, white, salmon pink or light brownish, sometimes greenish inside. Pollen $95-105\mu \times 60-65\mu$. Ovary

3.5 × 1.5-2.0 mm; stipe 1.0-2.5 mm; style 4-6 mm. Seeds 3.5-5.0 × 2-3 mm, orbicular or elliptic.

Type : India : Bombay, Sahyadri Mt., Dalzell s.n. (K!).

Fls. & Frts. : July-Aug.

Distrib. : INDIA : Mostly in the Western Ghats but also in hills of Central India and W. Himalaya at an altitude of 1100 to 2000 m. Himachal Pradesh, Madhya Pradesh, Maharashtra and Orissa.

Ecol. : Gregarious in grassland on shallow soil and lateritic plateau.

Chr. No. : $2n=20$ (Mahabale & Chennaveeraiah in Curr. Sci. 11 : 367. 1954 & Proc. Nat. Inst. Sci. Ind. Pt. B. 27. 4 : 153-171. 1961).

var. *madrasicum* (Barnes et Fischer) Deb et Dasgupta in Journ. Bomb. Nat. Hist. Soc. 75 : 59. 1978. *D. mdrasicum* Barnes et Fischer in Kew Bull. 1940 : 301. 1941.

Katuvengain (Tam.).

Fig. 17

Scapes 25-75 cm. Ovary 3.5-5.0 × 2.5 mm, stipe 0.5 mm; style 3.5-4.0 mm, stouter than the type. Seeds 4-6 × 4 mm, ovato-elliptic.

Type : India : Chingleput Dist., Tambaram, 70 m, Nov. 1937, *E. Barnes* 1801 (Lectotype K!); & Jan. 1939, *E. Barnes* 2085 (Paratype K!).

Fls. : May-Sept. ; *Frts.* : July-Nov.

Distrib. : INDIA : Deccan plateau, 300-1700 m, Madhya Pradesh and Tamil Nadu.

Specimens examined : Tamil Nadu : Guduvancheri, Sept. 1939, *Barnes* 2180 (K); Coimbatore, 1700 m, 29-7-1930, *Narayanaswamy* 396¹ (MH); Kudumady, Tirunelveli district, 333 m, 9-7-1959, *Sebastine* 8403 (MH).

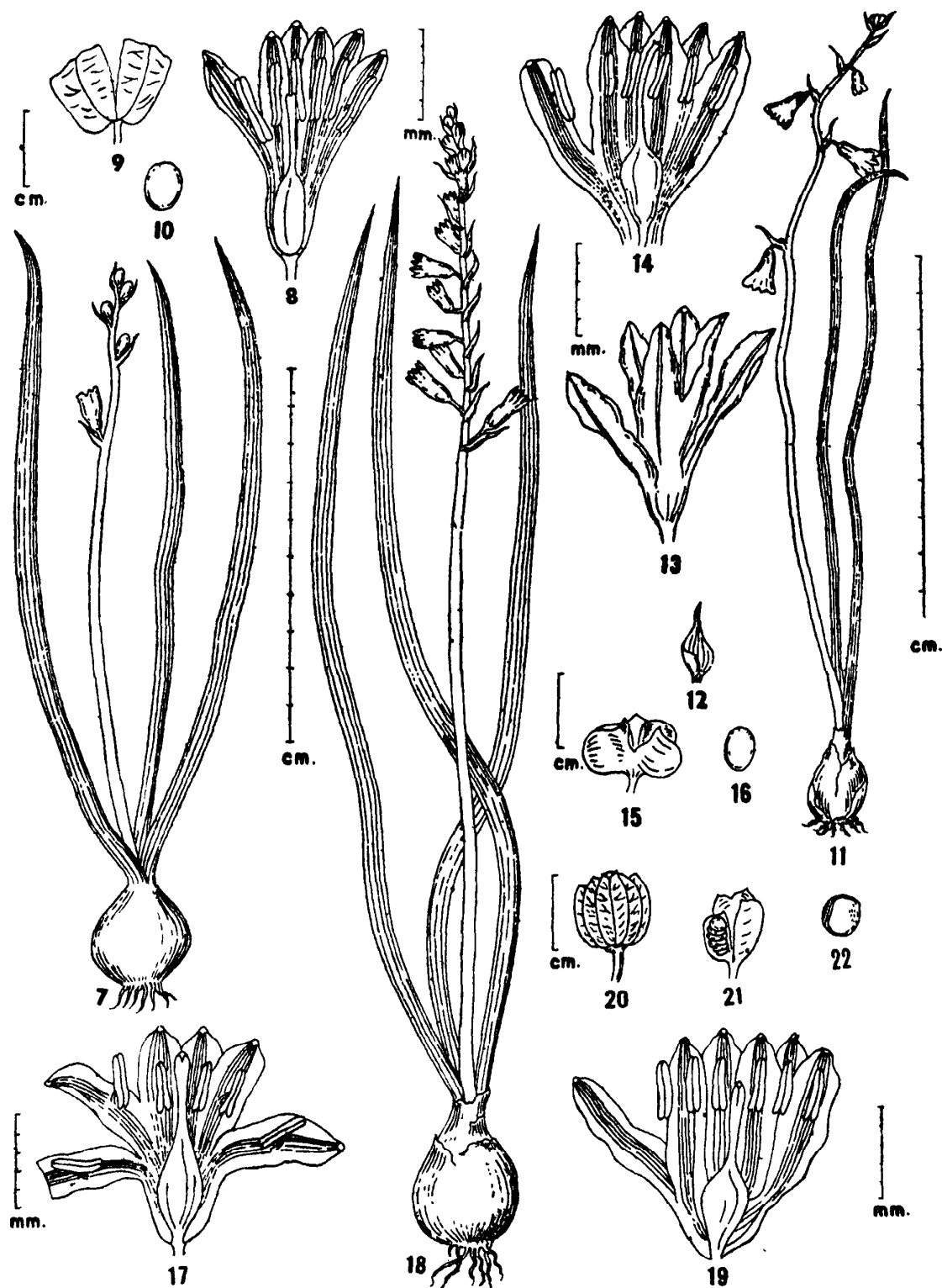
Ecol. : Common on dry stream beds, sandy and marshy places, in scrub jungles and in crevices of rocks.

Uses : Bulb is eaten at times of scarcity.

6. *D. reidii* Deb et Dasgupta in Journ. Bomb. Nat. Hist. Soc. 75 : 69. 1978.

Figs. 5-6

Bulbs about 4.0 × 3.5 cm, ovoid, shining white. Leaves few, as long as scapes or longer, 30-40 × 1.0-1.2 cm, broadly linear, veins appressed on the



Figs. 7-22 : *Dipcadi erythraeum* Webb. et Berth. 7. Habit of the plant. 8. Dissected flower. 9. Fruit. 10. Seed. *D. montanum* (Dalz.) Baker 11. Habit of the plant. 12. Bract. 13. Flower. 14. Dissected flower. 15. Fruit. 16. Seed. *D. montanum* (Dalz.) Baker var. *madrasicum* (Barnes et Fischer) Deb et Dasgupta 17. Dissected flower. *D. serotinum* (L.) Medik. 18. Habit of the plant. 19. Dissected flower. 20. Fruit. 21. Dissected fruit showing seed arrangement. 22. Seed.

lower surface. Scapes 30-40 cm long, glabrous. Racemes 10-18-flowered, 4-20 cm long, compact when young, lax on maturity. Flowers 13-15 mm; pedicels 6-10 mm, linear; bracts persistent, ovate or lanceolate, scarious. Perianth whorls campanulate; lobes narrowly oblong, thickened along the veins, frilled; veins 5-7. Anthers 2.5×0.7 mm, narrowly oblong. Ovary sessile, about 5×3 mm, oblong, trisulcate, glabrous; style 5.5-6.0 mm long.

Type : India : Malphagarh, Byaus Wells above Kali valley, 2300 m, 16th July, 1886, *J. R. Reid* s. n.—(A, Holotype; B, Isotype E!).

Distrib. : INDIA : W. Himalayas, Himachal Pradesh.

7. *D. saxorum* Blatter in Journ. Bomb. Nat. Hist. Soc. 32 : 736. 1928; Deb et Dasgupta l.c. 75 : 62. 1978.

Bulbs $1.5-2.0 \times 1.5-2.0$ cm, globose. Leaves $16-25 \times 0.5-0.7$ cm, linear. Scapes 20-40 cm, glabrous. Raceme loose, 15-20-flowered. Flowers about 10 mm; pedicels 6-10 mm; bracts $5-7 \times ca. 3$ mm, ovate, acuminate, scarious. Perianth white with green stripes along the middle, sometimes buff turning to orange; veins 5-6. Anthers 2.0×0.7 mm, oblong; pollen oblong, $105-120 \mu \times 70-80 \mu$. Ovary stipitate, $3.5-4.0 \times ca. 2$ mm, oblong-obovoid, trigonous with conspicuous septal nectaries; stipe *ca.* 1 mm; style *ca.* 4 mm, stout. Capsules $8-10 \times 10-13$ mm, obovoid oblong; pericarp thin, crustaceous, light brownish yellow. Seeds 4-9 in each locule, $4-5 \times 3$ mm, orbicular, elliptic or quadrangular.

Type : India : Salsette, August, 1917, *Blatter & Hallberg* 1 (BLAT).

Fls. : June-Oct.; *Frts.* : July-Nov.

Distrib. : INDIA : Deccan, Maharashtra; endemic.

Ecol. : Very common on rocky hills.

Chr. No. : $2n=12$ (Mahabale & Chennaveeraiah in Curr. Sci. 11 : 367. 1954; Chennaveeraiah & Mahabale in Plant Embryology Symposium, CSIR, New Delhi, 12-22. 1962).

8. *D. serotinum* (L.) Medik. in Act. Acad. Theod. Palat. 6 : 431. 1790; Hook. f. Fl. Brit. Ind. 6 : 346. 1892; Deb et Dasgupta in Journ. Bomb. Nat. Hist. Soc. 75 : 52. 1978. *Hyacinthus serotinus* L. Sp. Pl. 317. 1753. *Uropetalum hydysuricum* Edgew. in Trans. Linn. Soc. 20 : 88. 1846. *Dipcadi hydysuricum* (Edgew.) Baker in Journ. Linn. Soc. 11 : 397. 1871; Hook. f. l. c. 347. 1892.

Figs. 18-22

Bulbs $2.0-3.5 \times 1.5-3.0$ cm, globose or ovoid. Leaves few, $18-34 \times 0.2-0.5$ cm, linear. Raceme 10-12 cm, 10-16-flowered, lax on maturity. Flowers 8-14 mm, white or pale pink; pedicels 5-10 mm; bracts $8-12 \times 4-5$ mm, lanceolate or deltoid-lanceolate, acuminate, scarious. Perianth persistent. Anthers $2-4 \times 0.7$ mm, linear-oblong; pollen oblong, $100-130 \mu \times 60-80 \mu$. Ovary sessile or stipitate, $3-5 \times 2.0-3.5$ mm, oblong or obovoid; style 3.0-4.5 mm. Capsules $8-10 \times 8-10$ mm, subglobose to obovoid; pericarp thin. Seeds 6-8 in each locule, $4.5-5.0 \times 3.5-4.0$ mm.

Type : Spain, *Linnaeus* (LINN)

Fls. : Feb.-June. ; *Frts.* : March-Sept.

Distrib. : INDIA : Western Himalayas up to 2700 m down from the Gangetic Plains, Himachal Pradesh, Kashmir, Madhya Pradesh, Uttar Pradesh; PAKISTAN, NEPAL.

Ecol. : Grows on the forest floor.

Notes : *R. Wight s. n.* (E), collected from Peninsular India, differs in fruit. Capsules larger, straw-coloured, 15-18 mm; seeds $5-6 \times 4-4.5$ mm, 14 seeds in each locule. Another gathering *R. Wight s. n.* (E), collected from Peninsular India has unusually small bracts and pedicels.

9. *D. ursulae* Blatter in Journ. Bomb. Nat. Hist. Soc. 32 : 735. 1928.

Bulbs $1.0-4.5 \times 1.0-4.0$ cm, globose or ovoid. Leaves 1-6, $15-66 \times 0.4-1.5$ cm, plicate. Scapes 1 or 2 per bulb, 15-70 cm. Raceme compact in bud, lax on maturity, 6-25 flowered. Pedicels 5-7 mm; bracts 10-26 mm, ovate, plicate. Perianth : outer lobes recurved at the middle; inner lobes shorter than the outer, recurved at the tips; veins 5-7 converging. Anthers $2.0-3.5 \times 0.5-0.7$ mm, oblong or linear-oblong; pollen oblong. Ovary stipitate or sessile, $4-5 \times 1.0-2.5$ mm, narrowly obovoid-oblong, trigonous; style 4.5-6.0 mm. Capsules obovoid oblong, straw-coloured. Seeds $3.5-6.0 \times 3.5-5.0$ mm, orbicular or ellipsoid.

1a. Scapes $15-20 \times 0.2-0.6$ cm; mature raceme 6-14-flowered. Ovary stipitate, $4-5 \times 1.5-2.5$ mm ...var. *ursulae*

1b. Scapes $30-70 \times 0.4-1.5$ cm; mature raceme 22-25-flowered. Ovary sessile, $4.5-4.7 \times 1.0$ mm. ... var. *longiracemosae*

var. *ursulae*

Deb et Dasgupta in Journ. Bomb. Nat. Hist. Soc. 75 : 63. 1978.

Bulbs 1.0×2.0 cm across. Leaves $15-30 \times 0.4-0.7$ cm. Flowers mildly

fragrant. Perianth white, cream or orange, greenish outside. Anthers $2.0 \times 0.5-0.7$ mm; pollen oblong, $85-105 \mu \times 60-80 \mu$. Stipe of the ovary 1 mm; style 5-6 mm, upper half papillose. Seeds $ca. 6 \times 5$ mm, orbicular.

Type : India : Maharashtra, Panchgani, 1500 m, August 1925, *Blatter* P-74 (BLAT!).

Fls. & Frts : June-Aug.

Distrib. : INDIA : Western Deccan, Maharashtra; endemic.

Ecol. : Abundant on gravelly, grassy hill top.

Chr. No : $2n = 20$ (Mahabale & Chennaveeraiah in *Curr. Sci.* 11 : 367. 1954; Chennaveeraiah & Mahabale in *Plant Embryology Symposium*, CSIR, New Delhi, 12-22, 1962).

var. *longiracemosae* Deb et Dasgupta in *Journ. Bomb. Nat. Hist. Soc.* 72 : 823. 1975 & 75 : 66. 1978.

Herbs 0.7-1.0 m tall; bulbs $3.0-4.5 \times 3.0-4.0$ cm, white. Leaves 30-66 cm $\times 0.5-1.5$ cm. Perianth white. Anthers $3.0-3.5 \times 0.7$ mm. Style 4.5 mm. Seeds $3.5-4.0 \times 3.5$ mm, orbicular, ovate or elliptic.

Type : India : Junagadh-Girnar hill, 25th Aug. 1958, *P. V. Bole* 743 (Holotype, BLAT!); & 29th Aug. 1952, *P. V. Bole* 851 (Paratype, BLAT!).

Fls. & Frts. : July-Aug.

Distrib. : INDIA : Western Deccan, Gujarat, Maharashtra.

Specimens examined : Girnar Hill, Maharashtra, 27-7-63, *Ansari* 88785 (BSI).

2. SCILLA

L. Sp. Pl. 308. 1753 & *Gen. Pl. ed.* 5. 146. 1754; Baker in *Journ. Linn. Soc.* 13 : 250. 1873; Benth. in Benth. & Hook. f. *Gen. Pl.* 3 : 814. 1883; Hook. f. *Fl. Brit. Ind.* 6 : 348. 1892; Hutchinson, *Fam. Fl. Pl.* 755. 1973; Deb et Dasgupta in *Bull. Bot. Surv. Ind.* 17 : 41. 1975.

Bulbs outer scales dry, papery, inner fleshy. Leaves radical with sheathing base. Scapes as long as the leaves, narrow, terete, glabrous. Raceme terminal. Flowers campanulate; pedicels bent outwards; bracts small, scarious. Perianth lanceolate, connate at the base, uninerved, acute, persistent. Stamens 6; filaments filiform, free, adnate to the base of the perianth-

segments; pollen oblong, monocolpate. Ovary with few ovules in each locule; style filiform; stigma triquetrous. Capsules small, pericarp thin, brown. Seeds few, neither compressed nor angular, nor winged, brown.

Distrib. : About 80 species, distributed in TEMPERATE EURASIA, SOUTH AFRICA, and a few in TROPICAL AFRICA. 3 species in INDIA.

1a. Bulbs imbricated. Raceme with numerous flowers (more than 40); pedicels 0.4-1.0 cm, filiform; bracts bifid. Ovules 1 per locule

...2. *S. hyacinthina*

1b. Bulbs tunicated. Raceme with 4-40 flowers; pedicels 1.0-1.5 cm, stout; bracts paired. Ovules 3-6 per locule :

2a. Synanthus (leaves and flowers produced simultaneously). Inflorescence 4-20-flowered; perianth violet, blue or mauve

...1. *S. hohenackeri*

2b. Hysteranthus (leaves produced after flowering). Inflorescence approximately 40-flowered; perianth pinkish-green ...3. *S. viridis*

1. *Scilla hohenackeri* Fisch. et Mey. Ind. Sem. Hort. Petrop. 11 : 79. 1838; Hook. f. Fl. Brit. Ind. 6 : 349. 1892; Bamber, Pl. Punj. 442. 1916; Deb et Dasgupta in Bull. Bot. Surv. Ind. 17 : 43. 1975. *S. griffithii* Hochr. in Bull. N. Y. Bot. Gard. 6 (21) : 264. 1910; Hunt in Curtis Bot. Mag. 179(1) : t. 621. 1972.

Figs. 23-27

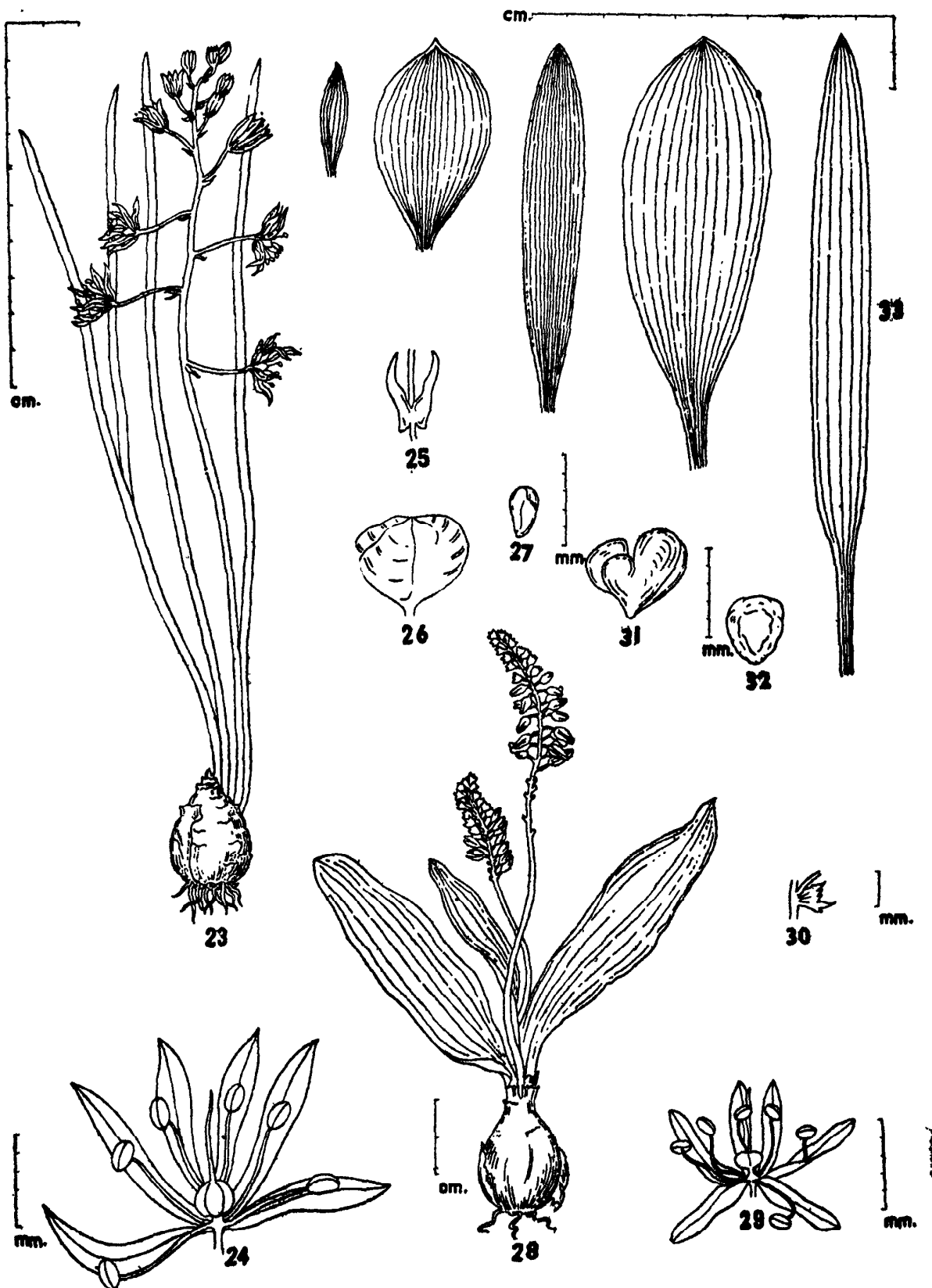
Bulbs 2.0-3.0 × 1.0-2.0 cm, ovoid, white to rusty white. Leaves 4-6, 10-32 × 0.2-1.0 cm, linear-lorate. Scapes 15-45 cm. Flowers 9-15 mm; bracts ± 4 mm long, deltoid or lanceolate. Filaments 3.5-4.5 mm; anthers 1.5-2.0 × 0.7 mm, oblong; pollen 54-65 μ × 32-49 μ, finely reticulate. Ovary 1-3 × 1-3 mm, globose-oblong, placentation axile; stipe less than 0.5 mm; style 4-5 mm. Capsules 5-6 × 7-8 mm, ovoid, obovoid or globose, deeply trilobed, 3-4 seeds in each locule. Seeds 2.5-3.0 × 1 mm, obovoid, brownish black, dull; seeds of different locules maturing at different times.

Type : Russia : Caucasus, *Hohenacker* (BM, L)

Fls. : March-April. ; *Frts.* : April-May.

It flowers in March at places up to 1000 m altitude and in April when growing above 1000 m.

Distrib. : INDIA : Drier western plains and drier western Himalayas, Gujarat, Kashmir; PAKISTAN, AFGHANISTAN.



Figs. 23-33 : *Scilla hohenackeri* Fisch. et Mey. 23. Habit of the plant. 24. Flower. 25. Bract. 26. Fruit. 27. Seed. *S. hyacinthina* (Roth) Macbride 28. Habit of the plant. 29. Flower. 30. Bract. 31. Fruit. 32. Seed. 33. Leaves.

Chr. No. : $2n = 10$ (Sundar Rao in Curr. Sci. 23 : 94-95, 1954 & 25 : 63-64, 1956).

Ecol. : Plants are found on hills between 660 m and 1500 m on rocky sides or crevices, grassy or fallow fields on the hill side, sometimes in association with holly-oak.

Notes : Hunt (l. c.) distinguished *S. griffithii* Hochr. from *S. hohenackeri* Fish. et Mey. by 9-15-flowered inflorescence, somewhat larger flowers, obovoid, pyriform capsules and pale white bulbs, etc. This distinction is not tenable. Inflorescence is 5-15-flowered in *D. C. Lowndes* 707 (E) and 7-20-flowered in *Drumond* 22021 (K). Capsule varies from ovoid pyriform to globose even in Griffith's Afghanistan collection.

2. *S. hyacinthina* (Roth) Macbride in Contrib. Gray Herb. Ser. 2. 56: 14. 1918; Deb et Dasgupta in Bull. Bot. Surv. Ind. 17 : 46. 1975. *Ledebouria hyacinthina* Roth, Nov. Pl. Sp. 195. 1821; Wt. Icon. Pl. Ind. Or. 6 : 21, t. 2040. 1853. *L. maculata* Dalz. in Kew Journ. Bot. 2 : 143. 1850. *Barnardia indica* Wt. l.c. 6 : 21, t. 2041. 1853. *Scilla indica* (Wt.) Baker in Saund. Refug. Bot. 3. App. 12. 1870; Hook. f. Fl. Brit. Ind. 6 : 348. 1892; Prain, Beng. Pl. 2 : 1074. 1903 (Repr. ed. 2:808. 1963); Cooke, Fl. Pres. Bomb. 2 : 767. 1907 (Repr. ed. 3 : 276. 1958); Duthie, Fl. Upper Gang. Pl. 3 : 264. 1920 (Repr. ed. 2 : 332. 1960); Haines, Bot. Bih. Or. 3:1096. 1925 (Repr. ed. 3:1145. 1961); Fischer in Gamble, Fl. Pres. Madr. 3 : 1527. 1928 (Repr. ed. 3:1067. 1957); Mooney, Suppl. Bot. Bih. Or. 202. 1950. *S. maculata* (Dalz.) Baker in Journ. Linn. Soc. 13 : 250. 1873.

Figs. 28-33

Suphadi Khus (Beng.); *Buikonda*, *Bollkanda*, *Paharikonda*, *Nanijangkikonda*, *Lahanakonda* (Mar.); *Shirunarivengayam*, *Narivengayam* (Tam.); *Korekhonda* (Madhya Pradesh).

Bulbs 1.5-5.0 × 0.5-3.0 cm, ovoid, cream-coloured, bitter to taste. Leaves 3-18 × 0.5-4.0 cm, linear to lanceolate, ovate, obovate, acute or obtuse, often maculate; bulbils or adventitious roots at the leaf-tips. Scapes 6-22 cm, slender. Flowers 5 mm, greenish pink; pedicels outspreading, pink; bracts 1 mm, obovate, scarious, serrated. Filaments *ca.* 4 mm, attenuated at apex, deep purple; anthers 0.7 × 0.5 mm, oblong; pollen 37-41 μ × 24-28 μ , finely reticulate. Ovary *ca.* 1 × 1 mm, globose; stipe *ca.* 0.5 mm; style 3.5-4.0 mm; stigma curved. Capsules *ca.* 5 × 5 mm, obovoid, unequally trilobed, one seed in each locule. Perianth and stamens persistent. Seeds *ca.* 3 × 3 mm, obovoid.

Type : India Orientalis, Heyne 84 in Wall. Num. List No. 5170B (K!, BM!).

Fls. : April-Nov.; *Frts.* : June-Jan.

Distrib. : INDIA : Covering all over Deccan extending up to the Gangetic plain in the north and Kalahandi, Manbhum to the east. Andhra Pradesh, Bihar, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh; SRI LANKA.

Chr. No. : $2n=30, 44, 45, 58, 60$, of which $2n=30$ is functional diploid. High degree of morphological variation and vegetative reproduction are ascribed to polyploidy [Raghavan & Venkatasubban in Cytologia 10(1-2): 189. 1939; Sundar Rao in Sci. & Cult. 18 : 336. 1953 & Curr. Sci. 25 : 164. 1956].

Ecol. : This plant grows from sea level up to 840 m on sandy soil or on rocky ground on bare lateritic or red gravelly soils amongst the grasses at the outskirts of the forest. It sometimes grows in association with *Iphigenia* Kunth, *Chlorophytum* Ker. and *Cyanotis* D. Don. In moist situation leaves touch the ground and form roots and bulbils. Winter rain in Tamil Nadu and Andhra Pradesh probably influences the flowering of this plant.

Uses : It is used as a substitute for *Urginea indica* Kunth as cardiac drugs, and also for sizing new clothes and threads for weaving.

Notes: Flowers at times modified to small bulbils with reduced perianth and sterile and vestigial reproductive organs.

3. *S. viridis* Blatter & Hallberg in Journ. Ind. Bot. Soc. 2 : 52. 1921; Deb et Dasgupta in Bull. Bot. Surv. Ind. 17 : 45. 1975.

Bulbs 5×4 cm, ovoid globose, pale green, bitter, smelling like potato; roots 10 cm, cylindrical, pale, arising from 15 mm diam., basal disk. Scapes 50 cm, slender, shining, yellowish purple. Flowers about 15 mm diam., stellate; pedicels 10-15 mm; bracts deciduous, ca. 2 mm, narrow, keeled, obtuse, reddish, lower surface hardened. Perianth pinkish, outer broader, oblong, subacute; inner blackish green, oblong, obtuse, midrib thick. Filaments upper part broader; anthers 1.5 mm long, oblong. Ovary ovoid, subtrigonal; style as long as the ovary, trigonal, clavate; stigma small, triangular.

Type : India : Khandala, September 1918, McCann 14500 (BLAT!).

Distrib. : INDIA : Maharashtra.

Notes : Plants brought by McCann from Khandala, in September 1918 flowered in March 1919 in St. Xaviers' College, Bombay. This plant has not been collected since its discovery. It does not appear to have survived under cultivation.

3. URGINEA

Steinh. in Ann. Sc. Nat. Ser. 2, 1 : 322. 1834; Baker in Journ. Linn. Soc. 13 : 215. 1873; Benth. in Benth. & Hook. f. Gen. Pl. 3 : 810. 1883; Hook. f. Fl. Brit. Ind. 6 : 347. 1892; Hutchinson, Fam. Fl. Pl. 756. 1973; Deb et Dasgupta in Bull. Bot. Surv. Ind. 16(1-4) : 116. 1974.

Bulbs tunicated; outer scales white, scarious; inner fleshy, deep-coloured. Leaves radical with sheathing base. Scapes narrow, terete, glabrous, with terminal raceme. Flowers campanulate; bracts solitary, small, scarious. Perianth subequal, outspreading, free to the base or nearly so. Stamens 6, filaments free, adnate to the base of the perianth segments, narrow, flattened. Ovary sessile, many ovules in each locule. Capsules oblong or globose. Seeds many, superposed, oblong, much compressed, winged, shining, deep brown.

Distrib. : About 100 species distributed in the Mediterranean region, AFRICA, INDIA, NEPAL. 4 species occur in India, of which 1 endemic.

Notes : Jessop in Journ. S. African bot. 43(4) : 265-319, 1977 reduced *Urginea* Steinh. to a synonym of *Drimia* Jacq. ex Willd. with which we are unable to agree.

- | | |
|--|----------------------------|
| 1a. Pedicels shorter than bracts | ...4. <i>U. polyphylla</i> |
| 1b. Pedicels longer than bracts : | |
| 2a. Pedicels 10-35 mm; racemes loose | ...2. <i>U. indica</i> |
| 2b. Pedicels 4-7 mm; racemes dense : | |
| 3a. Capsules oblong; bracts persistent | ...3. <i>U. polyantha</i> |
| 3b. Capsules subglobose; bracts evanescent | ...1. <i>U. congesta</i> |

1. *Urginea congesta* Wt. Icon. Pl. Ind. Or. 6 : 28, t. 2064 (left hand figure). 1853; Hook. f. Fl. Brit. Ind. 6 : 348. 1892; Fischer in Gamble, Fl. Pres. Madr. 3 : 1527. 1928 (Repr. ed. 3:1067. 1957); Deb et Dasgupta in Bull. Bot. Surv. Ind. 16 : 121. 1974.

Figs. 34-38

Bulbs *ca.* 5×4 cm, ovoid. Leaves 12.5-15.0 cm, synanthus. Scapes 10-60 cm, slender. Racemes 5.0-7.5 cm, 10-14-flowered, ascending. Flowers 5-7×2-3 mm, white or purple; bracts 2-4×*ca.* 1 mm, minute, deltoid or lanceolate, spurred. Perianth *ca.* 5×2 mm, oblong-lanceolate, obtuse, sub-apex tubercled; nerves 1-2, median. Filaments 1.5-4.0 mm, narrow; anthers 2-4×1 mm, oblong; pollen 60-87 μ ×45-52 μ , oblong, finely reticulate. Ovary 2-3×1.0-1.7 mm, ovate, narrowly ovate or ovate-oblong; style *ca.* 3 mm, stigma trilobed. Capsules 8-10×6-8 mm, 9-12-seeded. Seeds 6-7×5-6 mm, elliptic, broadly winged.

Type : India : Sea-coast, Malabar, *R. Wight* (K).

Fls. : April-May; *Frts.* : May.

Distrib. : INDIA : On the hills of eastern and western sea-coast, Tamil Nadu, Maharashtra; SRI LANKA.

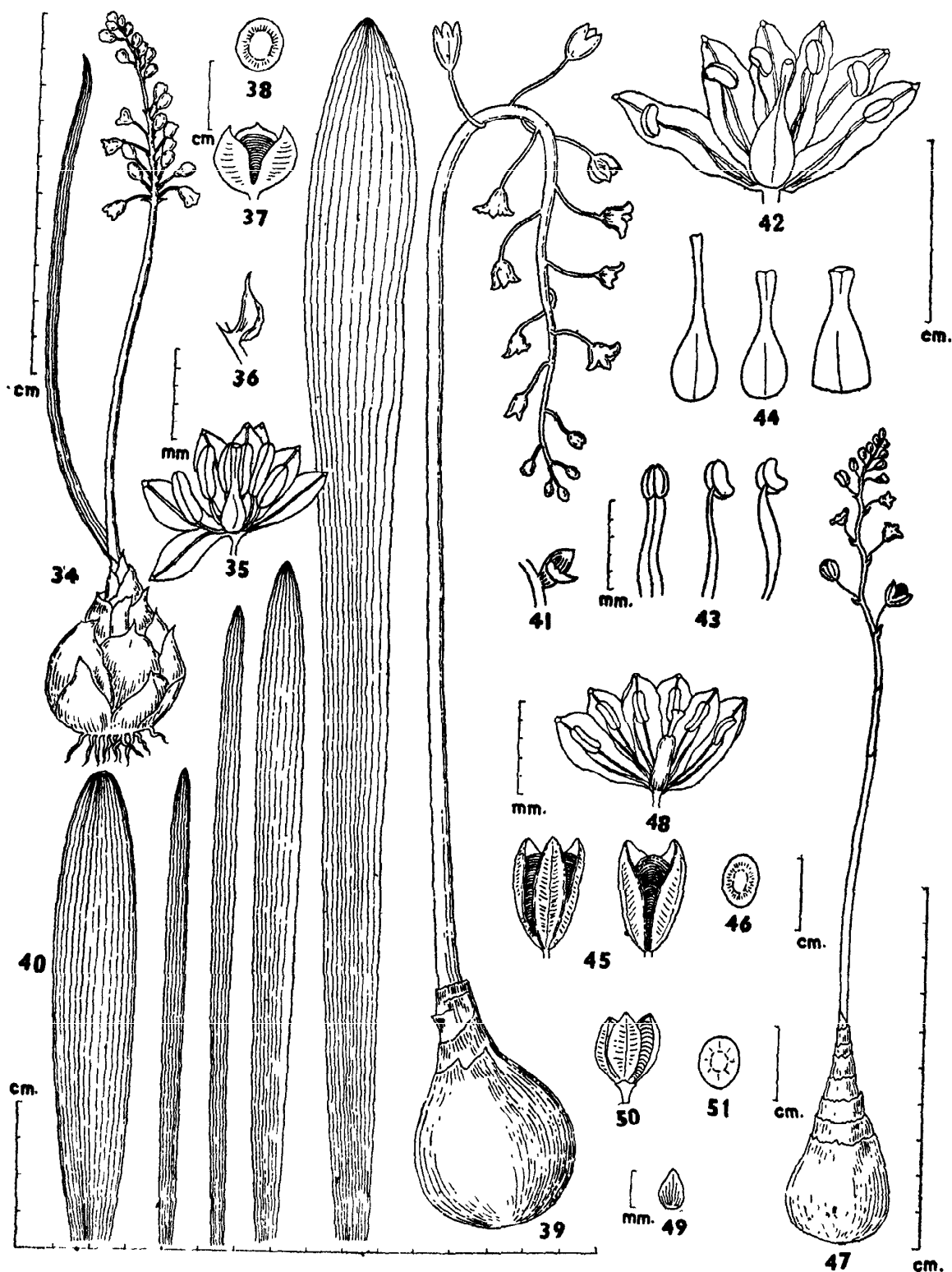
Specimens examined : Kambakkam hills, 6-5-1913, *Barber* 2922 (MH); Top of Vazirgad Fort, Purandar, 7-5-45, *Santapau* 6189 (BLAT).

2. *U. indica* (Roxb.) Kunth, Enum. Pl. 4 : 333. 1843; Wt. Icon. Pl. Ind. Or. 6 : 27, t. 2063. 1853; Hook. f. Fl. Brit. Ind. 6 : 347. 1892; Prain, Beng. Pl. 2 : 1074. 1903 (Repr. ed. 2 : 808. 1963); Cooke, Fl. Pres. Bomb. 2(4) : 768. 1907 (Repr. ed. 3 : 277. 1958); Duthie, Fl. Upper Gang. Pl. 3(2) : 264. 1920 (Repr. ed. 2 : 332. 1960); Haines, Bot. Bih. Or. 3 : 1096. 1925 (Repr. ed. 3 : 1145. 1961); Fischer in Gamble, Fl. Pres. Madr. 3 : 1526. 1928 (Repr. ed. 3 : 1966. 1957); Mooney, Suppl. Bot. Bih. Or. 202. 1950; Deb et Dasgupta in Bull. Bot. Surv. Ind. 16 : 118. 1974. *Scina indica* Roxb. Fl. Ind. 2 : 147. 1832. *S. coromandelina* Roxb. l. c. *Urginea coromandeliana* (Roxb.) Hook. f. l. c.; Fischer l. c. 3 : 1527. 1928 (Repr. ed. 3 : 1066. 1957). *U. wightiana* Hook. f. l. c. *U. govindappae* Boraiah et Fatima in Bull. Bot. Surv. Ind. 12 : 128. 1970.

Figs. 39-46

Vanapalandan (Sans.); *Jungli piyaz*, *Kanda* (Hindi & Beng.); *Phapor* (Punj.); *Gheswa* (Kumaon); *Nakkavalligadda* (Tel.); *Narivengayam* (Tam.); *Kanthanga* (Mal.); *Adavirulli* (Kan.).

Bulbs 2.5-10.0×2.5-6.5 cm, globose conical, yellowish white. Leaves 13-37×0.6-3.0 cm, linear, lanceolate or lorate, ensiform, hysternanthus. Scapes 17-100 cm, erect, purplish brown. Racemes 12-60 cm, 4-30-flowered. Flowers 0.5-1.2 cm, reddish green or variable; pedicels outspreading or



Figs. 34-51 : *Urginea congesta* Wt. 34. Habit of the plant. 35. Dissected flowers. 36. Bract. 37. Fruit. 38. Seed. *U. indica* (Roxb.) Kunth 39. Bulb with scape and inflorescence. 40. Variation in leaves. 41. Bract. 42. Dissected flower. 43. Variation in stamens. 44. Variation in carpels. 45. Fruits. 46. Seed. *U. polyantha* Blatt. & McCann. 47. Bulb with scape and inflorescence. 48. Dissected flower. 49. Bract. 50. Fruit. 51. Seed.

drooping or coiling; bracts 1-2 mm, deltoid, evanescent, often spurred. Perianth oblong-lanceolate, nerves one or few, median. Filaments 3.5-10.0 × 0.5-1.0 mm, variable in shape; anthers 1.0-2.5 × 0.7-1.0 mm; pollen 76-110 μ × 54-76 μ , oblong, reticulate. Ovary 3.5-8.0 × 1.7-3.0 mm, ovoid oblong or narrowly ovoid; style obconic to narrowly elongated; stigma trilobed. Capsules 10-20 × 5-10 mm, brownish yellow. Seeds 4-10 in each chamber, 4-7 × 3-4 mm; wing scarious.

Type : India : Coromandel, *W. Roxburgh s. n.* (K), the plate no. t. 1396 extant in CAL fully agrees with Roxburgh's description.

Fls. : Dec.-May. The flowers last only for a night, opening in the night and closing in the next morning (Haines, l. c. 1925);

Frts. : April-June, but occasionally in January (Burma).

Distrib. : INDIA : W. Himalayas, sandy hills all over India and sandy sea-coast. Andhra Pradesh, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh; NEPAL, BURMA, AFRICA.

Chr. No. : $2n=20$ [Raghavan in Journ. Ind. Bot. Soc. 14 : 151-158. 1935; Raghavan & Venkatasubban in Cytologia 11 (1-2) : 55-77. 1940; Kishore in Ind. Journ. Genet. Pl. Breed. 11(2) : 217. 1957]. Triploidy has also been observed (Raghavan l. c.) in *U. indica* Kunth. *U. govindappae* Boraiah et Fatima which is relegated to a synonym of *U. indica* has been found to have $2n=20$ (Boraiah & Fatima l. c.).

Ecol. : This plant occurs in a range of altitudes from sea-level to 2600m. It grows on dry habitat such as sandy ground, sandy gravels, sandstone and soils derived from garnetiferous gneiss and Khondalite (Mooney l. c.). It is also found in the pine forest as an undergrowth in the western Himalaya and Dipterocarpus forests in Burma.

Uses : Bulbs used as an important cardiac drug like *U. maritima* (L.) Baker in India from ancient and mediaeval times; also as anticancer as recently reported [Dhar *et al.* in Ind. Journ. Exp. Biol. 6(1-4) : 230. 1969]; powder of the bulb is a good adhesive containing mucilage and hence used in Calico printing [Beri & Pharasi in Indian For. 97(7) : 417. 1971].

Notes : Detailed investigation on the taxonomic importance of various vegetative and floral characters, their variations and geographical distribution etc. revealed that *U. coromandeliana*, *U. wightiana* and *U. indica* are not mutually exclusive in geographical distribution, nor is there any qualitative character to distinguish them to any extent. The authors are also

unable to trace any morphological character to distinguish *U. govindappae* from *U. indica* particularly so in the circumscription presented above.

3. *U. polyantha* Blatter & McCann in Journ. Bomb. Nat. Hist. Soc. 32 : 735. 1928; Deb et Dasgupta in Bull. Bot. Surv. Ind. 16(1-4) : 122. 1974.

Figs. 47-51

Bulbs globose-ovoid, up to 5.0×4.5 cm, neck 3.5 cm long. Leaves linear, hysteranthous. Scapes 15-60 cm, slender, rigid, greenish purple. Racemes up to 25 cm, 50-flowered. Flowers clavate, brownish purple; pedicels 5-7 mm, filiform, spreading and or ascending or appressed, almost double in length in fruit; bracts about 1 mm, deltoid, persistent. Perianth rotate, 5-6 mm, oblong, outer 3 mm and inner 2.0-2.5 mm broad, obtuse, uninerved. Filaments 2.5 mm, whitish; anthers oblong; pollen $65-87 \mu \times 45-60 \mu$, oblong, finely reticulate. Ovary oblong, 6-grooved, trilocular; style short, stout, 3-grooved; stigma trigonous. Capsules $10-11 \times 6$ mm, truncate, coriaceous, triquetrous, each carpel with an elevated groove in centre and with a slightly higher rib or margin. Seeds 2-10 in each locule, broadly ellipsoid, $6-7 \times 5-6$ mm, broadly winged, shining black.

Type : India : Panchgani, 1350 m, Maharashtra, March-April, 1926, *Blatter & McCann* 101 is a gathering of plants collected in different stages of flowering and fruiting. (101a-Lecto, 101-b-d and 101-A-C Paratypes, BLAT!).

Fls. : Mar.-May. Flowers open before dawn and remain in bloom until noon.

Chr. No. : $2n=20$ [Kamble & Ansari in Bull. Bot. Surv. Ind. 18(1-4) : 212-213. 1976].

Distrib. : INDIA : Eastern and Western Ghats, Gujarat, Karnataka, Maharashtra, Tamil Nadu; endemic.

Notes : Perianth encloses the fruit half way before ripening and then falls away.

4. *U. polyphylla* Hook. f. Fl. Brit. Ind. 6 : 348. 1892; Deb et Dasgupta in Bull. Bot. Surv. Ind. 16(1-4) : 123. 1974. *Ornithogalum polyphyllum* Heyne in Wall. Num. List No. 5062F. 1831, nom. nud., non Jacq. Icon. Rar. 2. t. 430. 1786.

Bulbs $2.0-4.5 \times 2.0-4.0$ cm, ovoid. Leaves $20-25 \times 2.5$ cm, filiform, involute at the margin. Scapes longer than the leaves, very slender.

Racemes 6-flowered. Flowers suberect; pedicels short; bracts 4 mm, longer than pedicels, subulate with broad membranous auricles. Perianth 0.8 cm long, oblong-lanceolate, obtuse, 5-nerved in the middle. Filaments slender, nearly as long as the perianth. Style elongate, as long as the perianth.

Type : India : Akya, Deccan peninsula, Heyne in Wall. Num. List No. 5062F (K, the duplicate of the same gathering in CAL agrees with the description.)

Distrib. : INDIA : Deccan Peninsula; known from the type collection only.

Chr. No. : $2n=20$ (Raghavan & Venkatasubban l. c.); seems to be based on misidentification.

Notes : Hook. f. (l. c.) reports "There is but one specimen in herb. Wall. without bulb, 'it resembles the Cape and European species, and is fastened down with *U. wightiana* and *Dipcadi serotina*.'" But Wallich 5062F extant in herb. CAL is represented by 3 specimens with bulbs, leaves, scapes and bracts but without flowers.

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FASCICLES OF FLORA OF INDIA

Family	Fascicle	Date of Publication
CORIARIACEAE	1	Oct. 1978
PAEONIACEAE	1	Oct. 1978
DILLENiaceae	2	May 1979
POACEAE (Tribe GARNOTIEAE)	3	Nov. 1979
SIMAROUBACEAE	4	April 1980
BALANITACEAE	4	April 1980
ORCHIDACEAE (GENUS COELOGYNE)	5	June 1980
PITTOSPORACEAE	6	Nov. 1980