# A Revised Handbook to the FLORA OF CEYLON

VOLUME VI



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## 20. LAGENANDRA[1]

Dalz., Hooker's J. Bot. Kew Gard. Misc. 4: 289. 1852; l.c. 5: t. 4. 1853; Schott, Prodr. 19. 1860; Engler, Pflanzenr. (IV. 23F) 73: 227. 1920; de Wit, Meded. Landbouwhogeschool 78–13: 1–45. 1978; Type: *L. toxicaria* Dalz.

[1]In preparing this text I am much indebted to de Wit (WAG), Jacobsen (C) and Bogner (M) who commented on the first draft. Bogner assisted with the key and donated a suite of clonotypes and specimens of plants cultivated at Munich. The major controversies centre on the status of *L. blassii* de Wit (cf. *L. lancifolia* here) and *L. schulzei* de Wit (cf. *L. thwaitesii* here).

Evergreen herbs with procumbent to erect rhizomes. Cataphylls prominent, usually 2-keeled. Leaves with elongate, shortly sheathing petioles; leaf-blades elliptic-ovate to linear, involute (double-rolled) in vernation. Inflorescence pedunculate. Spathe with two parts: the kettle (basal tube) with united margins and an apical blade which twists open from the base and extends into a tail; inside, at the juncture of the kettle and blade, is a strongly developed, incrassate, protruding collar. Spadix small, included in the kettle, with four parts: a basal pistillate portion (sometimes with olfactory bodies in the upper part); a thin, naked interstice; a staminate part; and a minute terminal appendix which is adnate to the base of the collar at the top of the kettle. Pistillate flowers naked, spirally arranged, unilocular with 1–6 (10) basal, erect ovules; stigma sessile or shortly thick-styled, terminal (and dome-shaped) or unequal (with a distinct sublateral lobe). Staminate flowers numerous, the two thecae of each stamen with a small horn, through which pollen is extruded. Infructescences globose, appearing fleshy, but ultimately, the fruit walls split longitudinally from the base and coil backwards, thereby releasing the seeds. Seeds ellipsoid, longitudinally ridged, with endosperm. Chromosome number: 2n = 36.

S. Asian: most in Ceylon, three in S. India and one in NE. India, in wet places (typically by running water) in lowlands and midlands.

Use not reported for Ceylon. Of growing commercial interest as aquarium and paludarium plants.

Vern. Kethala (spindle-yam) occasionally reported. Athiudayan also reported but probably more correctly applied to *Cryptocoryne.*

Not very much is known about variation patterns in *Lagenandra.* Until populations are studied in situ or in the laboratory, it may be difficult to distinguish the variation found within species from that resulting from naturally occurring hybridization between species.

Hybridization experiments (Jacobsen, unpubl. personal comm.) have shown that species of *Lagenandra* can easily hybridize, e.g., *L. lancifolia* × *L. erosa* and *L. koenigii* × *L. lancifolia.* It is therefore probable that, where species occur together under natural conditions, hybridization can take place. Some of the more deviant specimens encountered, especially the ones described as *L. schulzei* (cf. *L. thwaitesii*) and *L. blassii* (cf. *L. lancifolia*) and several other cultivated specimens, may have arisen through hybridization and introgression, perhaps both involving *L. lancifolia* and *L. thwaitesii.*

Non-taxonomic literature. (1) Svedelius, "Om den Florala Organisationen hos Aracesläktet *Lagenandra.*" Svensk Bot. Tidsskr. 4: 225–252. 1910 (Swedish with German summary) [note: his "*L. lancifolia* Thw." is *L. ovata*]. (2) Arends & Laan, "Somatic Chromosome Numbers in *Lagenandra* Dalzell." Meded. Landbouwhogeschool 78–13: 46–48. 1978.

## KEY TO THE SPECIES

1 Spathe distinctly warty outside
 2 Warts large (1.5–3.0 mm long); spathe limb abruptly globular-inflated above the kettle ..... **1. L. ovata**
 2 Warts small (to 1.0 mm); spathe limb subcylindric
  3 Spathe large (more than 10 cm long); female flowers scabrid-warty on the sides .... ..... **2. L. praetermissa**
  3 Spathe small (to 10 cm); female flowers with a ring of rather long protuberances below the stigma ..... **3. L. lancifolia**

1 Spathe smooth or merely roughened outside by papillae
 4 Leaf-blade sublinear, c. 10× longer than broad
  5 Leaf-blade to 50 cm long, margins smooth; inside of spathe-limb strongly laterally ribbed, outside dark purple ..... **4. L. koenigii**
  5 Leaf-blade to 20 cm long, margins erose; inside of spathe-limb rugose-spongy, outside green ..... **5. L. erosa**
 4 Leaf-blade ovate-lanceolate, to 5× longer than broad
  6 Spathe-limb strongly twisted to one side, inflated and opening subhorizontally; outside of spathe-limb whitish, inside black-purple and with tan, branched, hairlike protuberances ..... **6. L. jacobsenii**
  6 Spathe-limb suberect, cylindrical and opening subvertically; outside of spathe-limb purplish, inside with inconspicuous purplish protuberances
   7 Peduncle c. 2 cm; leaf-blades often silver-margined; stigma unequal; female flowers subscabrid on sides ..... **7. L. thwaitesii**
   7 Peduncle 7–12 cm; leaf-blades not silver-margined; stigma dome-shaped; female flowers with long protuberances below stigma ..... **8. L. bogneri**

**1. Lagenandra ovata** (L.) Thw., Enum. Pl. Zeyl. 334. 1864; de Wit, Meded. Landbouwhogeschool 78–13; 9, p.p. 1978. Type: Kerala. Illustr. *Karin-pola* Rheede, Hort. Mal. 11: t. 23. 1692 [repr. by de Wit, l.c. 5. 1978]. A specimen, 1079.12 (LINN) under *Arum ovatum,* is misidentified; it is *Aglaonema simplex* Blume, native to SE. Asia.

[*Karin-pola* Rheede, Hort. Mal. 11: 45, t. 23. 1692.]
*Arum ovatum* L., Sp. Pl. 967. 1753.
*Caladium ovatum* (L.) Vent., Mag. Enc. 4: 471. 1801; Vent., Arch. Bot. (Leipzig) 2: 351. 1801; Vent., J. Bot. (Schrader) 4: 319. 1801; Moon, Cat. 64. 1824.
*Cryptocoryne ovata* (L.) Schott in Schott & Endl., Melet. Bot. 16. 1832.
*Lagenandra insignis* Trimen, J. Bot. 23: 269. 1885; Trimen, Cat. 97. 1885; Hook. f., Fl. Br. Ind. 6: 496. 1893; Hook. f. in Trimen, Handb. Fl. Ceylon 4: 350. 1898; Engler, Pflanzenr. (IV. 23F) 73: 231. 1920. Type: Ceylon. *Trimen s.n.* (K, PDA).

A large herb with creeping rhizomes to 8 cm thick. Cataphylls to 30 cm. Leaves with petioles to 50 cm, basally clasping stem but otherwise sheathless; blade elliptic-ovate, to 50×12 cm, obtuse at base, acute-obtuse at apex. Peduncle to 25 cm. Spathe to 20 cm: kettle c. 3×2 cm; limb to 10×6 cm,

twisted and swollen, opening in 2nd half-twist, outside warty and dark purple, inside dark purple and finely striate but with striking white-tipped branching protuberances near collar, the tail vertical, to 8 cm. Spadix c. 3 cm long: pistillate portion c. 1 cm; naked portion c. 1 cm; staminate portion c. 1 cm; sterile appendage a few mm. Fruits with 3–5 basal seeds.

Distr. SW. Ceylon and SW. India.

Vern. Kethala, meaning sickle (or spindle?) yam given for *Nicolson 4248*. The same name also reported for *L. praetermissa*.

Specimens Examined. KALUTARA DISTRICT: Pelawatta Mookelane (forest), 13 May 1883, *Trimen s.n.* (K, PDA); Pelawatta, Pasdun Korale, 6 Mar. 1973, *Bogner 554* (M, US); Walmeegoda near Pelawatta, along ditches in coconut grove, 30–50 m, *Huber 307* (PDA, US). GALLE DISTRICT: Bataduwa, 1 mi NE. of Galle, locally abundant along water and associated with *Colocasia esculenta,* 4 Feb. 1979, *Nicolson 4248* (C, K, L, PDA, US); Galle, no information (Herb. Lindl. CAMB). DISTRICT UNKNOWN: "Zeylon", no date, *Koenig s.n.* (L, misidentified by Schott as *Cryptocoryne ciliata*).

Note. This striking species was confused with *L. toxicaria* of W. India by some authors and the name *L. toxicaria* was misapplied to yet another Ceylon species, here called *L. praetermissa.* True *L. ovata* in Ceylon was then named *L. insignis* and, subsequently, this name was misapplied to what is here called *L. jacobsenii.*

**2. Lagenandra praetermissa** de Wit, Aquariumpl. 299. 1983. Type: Ceylon, Pelawatta, *Nicolson 4257* (US; isotypes K, L, PDA, WAG).

*Lagenandra ovata* sensu auctt., non (L.) Thw., 1864, i.e., not as to type of basionym: Thw., Enum. Pl. Zeyl. 334. 1864; Alston in Trimen, Handb. Fl. Ceylon 6: 294. 1931; Alston, Kandy Fl. 68, fig. 367. 1938.

*Lagenandra toxicaria* sensu auctt., non Dalzell, 1852: Trimen, Cat. 97. 1885; Hook. f., Fl. Br. Ind. 6: 495. 1893 (as to Ceylon materials); Hook. f. in Trimen, Handb. Fl. Ceylon 4: 349. 1898.

Large herb with creeping rhizomes 3–5 cm thick. Cataphylls 1–2-keeled, thin, 20–40 cm. Leaves with petioles 30–60 cm, sheathing for 5–16 cm; blade elliptic, 30–45 × 9–12 cm, base acute to subobtuse, apex acute, long-tapering. Peduncles 7–22 cm (shorter in shade, longer in sun). Spathes purplish to tan, warty, 15–20 cm: kettle 2–4 cm, red to cream inside and longitudinally striate; limb 6–9 cm, dark red, finely horizontally ribbed and with a thick collar, opening by a half twist, tail 5–8 cm. Spadix 2.5–4.0 cm: pistillate for 1 cm; naked for 1–2 cm, turning purple with age, sometimes with 1–2 acicular bodies; staminate for 0.5–1.0 cm; appendix conoid, to 2 mm. Seeds green to brownish.

Distr. SW. Ceylon.

Ecol. Midlands and lowlands, along water.

Vern. Thwaites cited "kettula" for this species (misidentified as *L. toxicaria*). Hooker and Alston, using the same misidentification, cited "vetala." I suspect these are corruptions of "kethala" (spindle or sickle yam).

Specimens Examined. KANDY DISTRICT: Ambagamuwa ["7 Corles" = Seven Korales in Kurunegala District], Feb. 1853, [*Thwaites*], *C.P. 3315* (BM, FI, K, P, PDA); NW. of Galagedara, 22 Mar. 1975, *Jacobsen 22–9* (C); Halloluwa (islands in Mahaweli River, c. 3 km downstream from Peradeniya), 11 Feb. 1979, *Nicolson 4261, 4262* (C, K, L, PDA, US); Mahaweli near Kandy, [11?] Feb. 1979, *Kostermans 27351* (L). KALUTARA DISTRICT: Delwitiya Dola-Moropitiya, 28 Feb. 1977, *Waas 2094* (K, NY, PDA, US); Pelawatta, common weed, 6 Feb. 1979, *Nicolson 4257* (K, L, PDA, US). CULTIVATED: Munich, *Bogner 554a, 1330* (M); Copenhagen, *Jacobsen 3040* (C).

Notes. This species was long misidentified with *L. toxicaria* of W. India which is smooth on the outside of the spathe and finely papillate (hairy) inside. It was this species to which Thwaites misapplied the name *L. ovata* when he published the combination.

Bogner (pers. comm.) indicated that there is a problematic element (*Jacobsen 3007*), perhaps identifiable with *L. lancifolia* and perhaps of hybrid origin, involving *L. ovata*. Bogner then provided two specimens, collected at Munich from material originally collected by Jacobsen in Ceylon without locality. These look to me like *L. praetermissa,* having spathes over 10 cm long and pistils with warty sides, not like *L. lancifolia* nor an intermediate between *L. lancifolia* and *L. ovata,* and leaves rather large, somewhat like *L. thwaitesii.**

**3. Lagenandra lancifolia** (Schott) Thw., Enum. Pl. Zeyl. 334. 1864; Hook. f., Fl. Br. Ind. 6: 496. 1893; Hook. f. in Trimen, Handb. Fl. Ceylon 4: 348. 1898; Engler, Pflanzenr. (IV. 23F) 73: 231. 1920; Alston in Trimen, Handb. Fl. Ceylon 6: 294. 1931; de Wit, Meded. Landbouwhogeschool 78–13: 17, fig. 3, foto 10. 1978. Lectotype (here designated): Ceylon, Ambagamuwa, Feb. 1855, *Thwaites, C.P. 3174* (K); "duplicates" to be found under *C.P. 3173* and *3174* in various herbaria.

*Cryptocoryne lancifolia* Schott, Bonplandia 5: 221. 1857; Schott, Gen. Aroid. t. 1, f. 2, 15. 1858; Schott, Prodr. 15. 1860.

*Lagenandra blassii* de Wit, Meded. Landbouwhogeschool 78–13: 38, 43, f. 12, foto 17–19. 1978; Bogner, Aqua Planta 3–78: 4, photo 3. 1978. Type: Cult. Munich from Ceylon, *Bogner 1126* (M; isotypes?/clonotypes? K,

*Note added in proof: This element was published as *Lagenandra dewitii* Crusio & de Graaf (Aqua Planta 2–86: 57, 1986.)

US); paratype: Cult. Wagenigen from Ceylon, *de Wit 16012* (WAG).

Stems creeping, c. 1 cm thick. Cataphylls to 5 cm. Leaves with petioles 5–35 cm, sheathing to 2 cm; blades ovate to narrowly ovate, 6–14×2.5–5.0 cm, obtuse to rounded at base, acute at apex. Peduncle 1–2 cm. Spathe 2–3 cm, well-ribbed and ribs warty (sometimes not); kettle c. 0.5 cm, vertically striate inside; limb 0.8–1.2 cm, horizontally ribbed to hairy; tail 0.5–1.0 cm. Spadix c. 1 cm: pistillate 0.3 cm, pistils c. 20; naked for 0.3 cm; staminate for 0.3 cm; appendix c. 0.1 cm. Pistils with rather long protuberances below the dome-shaped stigma; ovules 2–3, basal. Stamens 25–50.

Distr. SW. Ceylon.

Specimens Examined. KANDY DISTRICT: Ambegamuwa, Feb. 1855 *Thwaites, C.P. 3174* (BM, GH, K, PDA, the last with one infl. of *L. thwaitesii*). RATNAPURA DISTRICT: Ratnapura, near Kuruwita, 9 Mar. 1973, *Bogner 574* (WAG). DISTRICT UNKNOWN: no date, *Jacobsen s.n.* (M); no date, *Bogner 1126* (M, K, WAG, US); *s. coll. C.P. 3173* (BM [left specimen], FI, K[upper 2 specimens], PDA); *s. coll. C.P. 3174* (FI); Nov. 1958, *Cumming s.n.* (FI). CULTIVATED: Shirley Aquatics, several collections from 1961–1964, *s. coll. s.n.* (K); Copenhagen, *Jacobsen 3006* (C). UNPUBL. ILLUSTR.: "3174" (2 at PDA).

Notes. As noted by others, Thwaites' "C[eylon]. P[lants]." numbers are not collection numbers but are "species numbers" applied to different collections. In the case of *C.P. 3173* and *C.P. 3174* collections of two different species were confused, both involved with the typification of new species.

The first of these two species was *Cryptocoryne* (*Lagenandra*) *lancifolia* Schott. According to the protologue and a drawing (Schott Ic. 1778, W) this name is based on two specimens in Hooker's Herbarium (K) of what are *C.P. 3173* and *C.P. 3174* loaned to Schott, containing elements of both *L. lancifolia* and *L. thwaitesii*. The sheet with a single specimen, *C.P. 3174,* is *L. lancifolia*. The other sheet, *C.P. 3173,* has two specimens of *L. lancifolia* and a third (the lower one) is *L. thwaitesii*.

On the Schott drawing (Ic. 1778 W), which is regarded as part of the protologue, there are three specimens illustrated: the upper two sterile specimens are *L. thwaitesii* but the lower fertile specimen is *L. lancifolia*. In addition, there are enlargements of the inflorescence of *L. lancifolia,* two of which were later published by Schott (Gen. Aroid. t. 1, f. 2 and 15. 1858) as *L. lancifolia*. It is the fertile specimen, represented on Schott's drawing, that I am designating as lectotype; this is *C.P. 3174* (K, Herb. Hook.).

Later (1879) Engler named *L. thwaitesii,* based on material of *C.P. 3173* at Geneva, see notes under *L. thwaitesii* below.

*Lagenandra blassii* de Wit is a controversial element based on cultivated material. The leaves, although rather small (largest 8×3.5 cm in specimen at US from Bogner), are in the proportions of *L. lancifolia*. One of its distinc-

tive characters is the lack of a tail on the spathe, a character of known variability (de Wit's photograph shows a tail). The third character is that it has c. 50 stamens, while *L. lancifolia* has only c. 20 stamens. This is not an easy character to determine and I am dubious of it, suspecting this is something that could vary within a species concept. It is possible that *L. blassii* involves hybridization between *L. lancifolia* and *L. thwaitesii.* Dr. de Wit maintains the species, particularly emphasizing the divergent stamen number.

**4. Lagenandra koenigii** (Schott) Thw., Enum. Pl. Zeyl. 334. 1864; Hook. f., Fl. Br. Ind. 6: 486. 1893; Hook. f. in Trimen, Handb. Fl. Ceylon 4: 349. 1898; Engler, Pflanzenr. (IV. 23F) 73: 231. 1920; de Wit, Meded. Landbouwhogeschool 78–13: 20, fig 4, foto 11. 1978. Type: Said by Schott "India orientalis, forte Tranquebaria" [certainly Ceylon, not Tranquebar]. Label: "Arum ignotum, specimen mancum, *Koenig Ind. Or.* [*s.n.*]" (C).

*Cryptocoryne koenigii* Schott, Bonplandia 7: 81. 1859; Schott, Prodr. 16. 1860.

Stem creeping to erect, to 2 cm thick. Cataphylls conspicuous, to 17 × 2 cm. Leaves with petioles 12–35 cm, sheathing 5–10 cm; blade narrowly lanceolate, 17–37 × 1–2 cm, acute and long-tapered at base and apex. Peduncle 6–18 cm. Spathe 6–12 cm, fleshy, suberect to curved: kettle to 2 cm, vertically striate within; limb 4–5 cm, not twisted, smooth, outside black-purple to pale wine-red, inside dark purple, horizontally irregularly ribbed; tail to 6 cm. Spadix to 2 cm: pistillate for 0.6 cm; naked for 0.7 cm; staminate for 0.6 cm; appendix c. 0.2 cm. Pistils c. 35, warty outside; stigma rounded; ovules 1–3. Stamens 60–100.

Distr. SW. Ceylon.

Specimens Examined. COLOMBO DISTRICT: Moratuwa, Sept. 1886, *W.F[erguson] s.n.* (PDA); "cult. in R.B.G. Perad. (the Colombo plant)," Jan. 1890, *s. coll. s.n.* (PDA). RATNAPURA DISTRICT: Sinharaja, Sept. 1885, *Thwaites, C.P. 3496* (BM, CAMB, K, P, PDA, the last with 2 flowering specimens from Galpana, Mar. 1861); Pelawatta, Apr. 1886, *s. coll. s.n.* (PDA); Pelawatta, 6 Mar. 1973, *Bogner 564* (M, US, WAG). KALUTARA DISTRICT: "Calutara", 1829, *Macrae 1173* (CAMB). GALLE DISTRICT: Hiyare Reservoir, 20 Nov. 1971, *Balakrishnan 993* (US). DISTRICT UNKNOWN: Introduced by A. Blass in 1972 (from Ceylon), cult. Munich, no date, *Bogner 451* (M); *Jacobsen s.n.* (M).

Notes. Apparently flowering January–April in a diminutive aspect and fruiting in September in a larger aspect.

All specimens examined showed the undersurface of the leaf with a marginal vein (or two) covered with tiny, branched proliferations. All thin parts tend to be dark-punctate.

**5. Lagenandra erosa** de Wit, Meded. Landbouwhogeschool 78–13: 36, 43, fig. 11. 1978; Bogner, Aqua Planta 3–78: 4, photo on p. 3. 1978. Type: Ceylon. *Bogner 450* (WAG; isotypes/clonotypes?: C, M, US); paratypes: Cult. Munich, no date, *Bogner 576* (WAG); *Bogner 306* (WAG).

Stem creeping to erect, to 1 cm thick. Cataphylls 4–10 cm. Leaves with petioles to 16 cm, sheathing for 1–3 cm; blade linear, 8–20×0.5–1.5 cm, margins crisped-toothed (erose) near base, acute to long-tapered at base and apex. Peduncle to 15 cm. Spathe to 23 cm, slender and somewhat twisted, smooth outside: kettle 2–3 cm, green to purple outside, purple inside; limb to 20 cm, inside rugose-spongy, irregularly ribbed with protuberances; tail 5–10 cm. Spadix c. 2 cm: pistillate for 0.5 cm; naked for 1 cm, purple-red; staminate for 0.3 cm; appendix c. 0.2 cm. Pistils c. 40; style broad and warty; stigma dome-shaped; ovule solitary. Stamens c. 35.

Distr. Ceylon, exact locality unknown.

Note. All veins on the lower leaf-surfaces are covered with branched protuberances.

Specimen Examined. CULTIVATED: Munich, 1972, *Bogner 450* (US, 2 sheets).

**6. Lagenandra jacobsenii** de Wit, Aquariumpl. 291. 1983. Type: Kottawa, *Jacobsen s.n.* (WAG [pickled]; isotype [*Jacobsen 14–4*] at C.).

*Lagenandra insignis* sensu auctt., non Trimen, 1883 [= *L. ovata*]: de Wit, Meded. Landbouwhogeschool 78–13: 27, fig. 6. 1978; Bogner, Aqua Planta 3–78: 3, colour photo on title page. 1978.

Stem creeping, upturned at end, to 4 cm thick. Cataphylls 12–17 cm. Leaves with petiole 15–30 cm, sheathing to 5 cm; blade 15–30×7–10 cm, ovate to narrowly ovate, usually rounded at base and acute at apex. Peduncle 4–5 cm. Spathe to 20 cm; kettle 1–2 cm, vertically striate inside; limb 4–6 cm, with pronounced half twist and held horizontally, the outside greenish brown and granular, the inside deep purple, irregularly horizontally ribbed with scattered white-tipped, branching hair-like protuberances, collar red; tail 5–9 cm, erect. Spadix c. 3 cm: pistillate for 1 cm; naked for 1 cm; staminate for 1 cm; appendix conoidal, 0.3 cm. Pistils c. 70; style warty or with rather long protuberances; stigma dome-shaped; ovules 4–7.

Distr. SW. Ceylon.

Specimens Examined. KEGALLE DISTRICT: At post 62/7 between Ginigathena and Kitulgala, 16 July 1969, *Read 2213* (US). GALLE DISTRICT: Galle, 1 Nov. 1970, *Kundu & Balakrishnan 530* (PDA, US); Kottawa, 14 Mar. 1975, *Jacobsen 14–4* (C, WAG), 1977, *Karlsson s.n.* (K, M); Kottawa Forest, 12 mi. NE. of Galle, 4 Feb. 1979 *Nicolson 4250* (K, L, PDA.

US). CULTIVATED: Munich, from Karlsson 1977 coll., 1980, *Bogner s.n.* (US).

Note. de Wit (1978) illustrated and described this species under the name *L. insignis (= L. ovata)* from pickled material collected at Kottawa by Jacobsen in 1975.

**7. Lagenandra thwaitesii** Engler in DC., Mon. Phan. 2: 621. 1879; Trimen, Cat. 97. 1885; Hook. f., Fl. Br. Ind. 6: 496. 1893; Hook. f. in Trimen, handb. Fl. Ceylon 4: 348. 1898; Engler, Pflanzenr. (IV. 23F) 73: 230. 1920; de Wit, Meded. Landbouwhogeschool 78–13: 22, fig. 5, foto 12–13. 1978. Type: Ceylon. *Thwaites, C.P. 3173* (G); "duplicates" to be found under both *C.P. 3173* and *3174* in various herbaria.

*Lagenandra schulzei* de Wit, Meded. Landbouwhogeschool 78–13: 35, 43, fig. 10, foto 15–16. 1978; Bogner, Aqua Planta 3–78: 4. 1978. Type: Cult. Wageningen, *de Wit 16013* (WAG, non vidi).

Stems creeping, to 1 cm thick. Cataphylls to 9 cm. Leaves with petioles to 20 cm, sheathing to 4 cm; blades undulate to entire, usually with silvery-whitish margins but sometimes concolorous, usually narrowly ovate to lanceolate, to 20×4 cm, base usually acute (sometimes obtuse), apex long-tapered. Peduncle 1–7 cm. Spathe to 10 cm, greenish brown to purple below to purplish above, finely roughened outside by vertical striae: kettle to 2 cm, the inside vertically striate, glossy, black-purple; blade to 4 cm, inside with subhorizontal protuberances or ribs and dark purple, the collar with white-tipped, branching protuberances; tail to 4 cm, occasionally absent. Spadix c. 2.2 cm: pistillate for 0.7 cm; naked for 1 cm, dark purple; staminate for 0.4 cm; appendix conoidal, 0.3 cm. Pistils 20–35, warty; style rather smooth; stigma subsymmetrical; ovules 8–10. Stamens more than 60. Fruits with persistent style, to 0.2 cm long, 3–4-seeded; seeds brownish, 0.6×0.2 cm.

Distr. SW. Ceylon.

Specimens Examined. KALUTARA DISTRICT: "Calutara", no date, [*Thwaites*], *C.P. 3173* (PDA), Hewesse, Mandagala Mukalane, Mar. 1877, [*Thwaites?*], *C.P. 3173* (PDA). RATNAPURA DISTRICT: "Adam's Peak [Nuwara Eliya District], no doubt from Ratnapura or Ambegamuwa [Kandy District]," no date, *Gardner, C.P. 3173* (PDA, pro parte); Sinharaja Forest, Apr. 1855, [*Thwaites*], *C.P. 3173* (PDA, pro parte); Warukandeniya-Sinharaja in primary wet forest c. 400 m, 24 Feb. 1977, *Waas 1976* (NY, PDA, US); Weddagala, 22 Sept. 1977, *Meijer & Gunatilleke 1436* (L, US). GALLE DISTRICT: Udugama, 7 Mar. 1973, *Bogner 566* (M, WAG); Kanneliya Forest Reserve, Aug. 1975, *Jayasuriya 2265* (PDA, US); Ceylon Plywood Co., Udugama, 15 Mar. 1975, *Jacobsen 15–11* (C); 18 mi. NE. Galle towards Udugama, 14 Mar. 1975, *Jacobsen 14–7* (C); Gode Kanda (hill) E.

of Hiniduma, 150 m, 5 Feb. 1979, *Nicolson 4256* (K, L, PDA, US). DISTRICT UNKNOWN: no information, *s. coll., C.P. 3173* (BM [the 2 spec. to right], CAL, K [the lower spec. of 3]). CULTIVATED: Shirley Aquatics, 16 June 1959, *s. coll. s.n.* (K); Shirley Aquatics, Feb. 1961, *s. coll. s.n.* (K); no locality, July 1858, *Brünner s.n.* (K).

Notes. When Engler (in DC., 1879) published *L. thwaitesii* he cited only "Ceylon (Thwaites n. 3173 in h. DC.)." I assume that this constitutes a holotype, being either "the one specimen... used by the author" or "the one specimen... designated by him as the nomenclatural type." As was explained above under *L. lancifolia*, the materials of *C.P. 3173* and *C.P. 3174*, were badly mixed on distribution. Because of the mixed materials of *C.P. 3173* and *3174*, involving several collectors and collections made at different dates from different localities, the "duplicates" cannot be accepted as nomenclatural types.

Sastry (Bull. Bot. Survey India 9: 296. 1968) concluded that Engler (1879) erred in citing *C.P. 3173* as type of *L. thwaitesii.* He was looking at a specimen of *C.P. 3173* (CAL) which Engler (c. 1905) had annotated as *L. lancifolia.* Actually, the specimen is *L. thwaitesii* and Engler (c. 1905) simply misidentified it as *L. lancifolia.*

The material called *L. schulzei* is controversial. This element is known only from cultivation and seems to be only a small-spathed aspect of *L. thwaitesii* with rather broad leaves for the species. Some hybridization has been done experimentally and it is possible that *L. schulzei* is of hybrid origin and, perhaps, involved with introgression, involving *L. lancifolia* and *L. thwaitesii.* de Wit (pers. comm.) indicates that, if a dozen specimens of both *L. thwaitesii* and *L. schulzei* were mixed he could sort them in the dark. It is my belief that, if we had a dozen collections of each (not clones!), we would find a spectrum bridging the characters separating the taxa. The final decision, obviously, awaits the study of more material of these elements.

**8. Lagenandra bogneri** de Wit, Meded. Landbouwhogeschool 78–13: 33, 42, fig. 9. 1978; Bogner, Aqua Planta 3–78: 4, photo on p. 3. 1978. Type: Ceylon. 1973, *Bogner 1131* (M; isotypes/clonotypes?: K, US, WAG).

Stems creeping, to 18 × 1.5 cm. Cataphylls to 10 cm. Leaves with petioles 5–20 cm, sheathing 2–3 cm; blade 6.5–13 × 1–6.5 cm, ovate to narrowly ovate, usually rounded at base, acute at apex. Peduncle 8–18.5 cm. Spathe 8–13 cm, light- to yellow-green: kettle to 2 cm, vertically striate inside; limb slightly twisted, to 4 cm, minutely papillate outside on ribs, wrinkled inside; tail 3–7 cm. Spadix 1.5 cm: pistillate for 0.3 cm; naked for c. 0.8 cm; staminate for 0.3 cm; appendix very short. Pistils c. 20, with rather short protuberances below the subdome-shaped stigma; ovule solitary. Stamens c. 50.

Distr. SW. Ceylon.

Vern. Wanaketelle (*Hoogland 11446*).

Note. This species has a distinctively long peduncle.

Specimens Examined. RATNAPURA DISTRICT: Sinhagala-Sinharaja, primary wet forest, c. 400 m, 23 Feb. 1977, *Waas 1938* (K, NY, PDA, US); Weddagala, 300 m, date?, *Hoogland 11446* (CANB, K, L, PDA); Weddagala, 13 Feb. 1973, *Jayasuriya & Burtt 1134* (PDA), 200 m, 2 Feb. 1979, *Kostermans 27266* (L, US). DISTRICT UNKNOWN: no loc., 20 Feb. 1976, *Bogner 1131* (M, WAG, US).