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Lagenandra cherupuzhica (Araceae), a new species from Kerala, India

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Lagenandra cherupuzhica P. Biju, Josekutty & Augustine (Araceae), collected from a stream in lateritic hillocks at Cherupuzha, Kerala, India is described as a new species and illustrated. It morphologically resembles *L. meeboldii* and *L. nairii*, and its distinctive characters and possible relationships are discussed based on its vegetative and floral morphology.

Lagenandra (Araceae) contains amphibious species widely distributed in the wetlands of the Indian subcontinent. The genus is endemic to Bangladesh, Sri Lanka and India and has 16 species (Sivadasan & Babu 1995, Sivadasan *et al*. 2001). In India, the genus has six species and one variety, all endemic to the Indian subcontinent (Ansari *et al*. 2016). *Lagenandra* is closely related to *Cryptocoryne*, the two genera can, however, be distinguished by differences in leaf vernation and the arrangement of female flowers. Species of *Lagenandra* usually grow in aquatic or marshy habitats. They are submerged during the wet season (Prakashkumar *et al*. 2015), and begin to flower when the water recedes.

During floristic explorations in the lateritic hillocks of northern Kerala, we collected a specimen of *Lagenandra* from a stream in the lateritic hillocks at Cherupuzha, Kasaragod D istrict. On closer examination it turned out to be quite different from any of the known taxa.

Lagenandra cherupuzhica P. Biju, Josekutty & Augustine, *sp. nova* (Figs. 1 and 2)

TYPE: India. Kerala, Kasaragod District, Cherupuzha, 12°16´28.5´´N, 075°14´05.6´´E, 100 m a.s.l, 29 February 2014 *Biju & Augustine 2491* (holotype CAL; isotype MH). — PARATYPE: India. Kerala, Kannur District, Kallankode, 12°16´30.1´´N, 075°14´10.9´´E, 300 m a.s.l, 30 February 2014 *Biju & Augustine 2494* (MH)

ETYMOLOGY: The species is named after the type locality Cherupuzha in Kasaragod District, Kerala State, India.

Creeping, rhizomatous herbs. Rhizome 0.6–1.2 cm in diameter, annulate. Roots fibrous. Stipular sheath 3–5.2 cm, purplish, triangular, 2-keeled, acute-acuminate, leathery. Leaves alternate, horizontally placed over soil, 7.5–18 cm long; petiole terete, 1.5–7.4 cm long; lamina elliptic-lanceolate, 4–11 × 1.8–4.2 cm, acute at tip, oblique or obtuse at base, greenish and punctate above, smooth and purplish below,

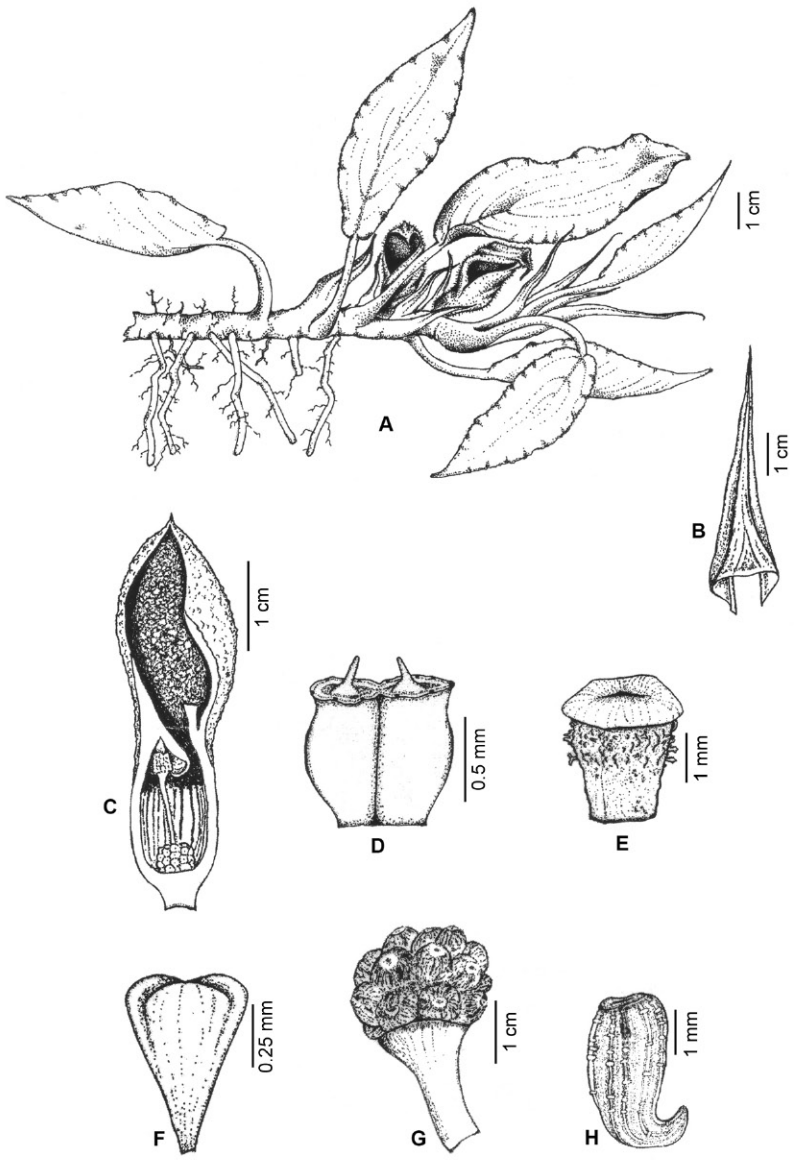

Fig. 1. *Lagenandra cherupuzhica* (from the holotype). — **A**: Habit. — **B**: Stipular sheath. — **C**: Spathe split open exposing spadix. — **D**: Male flower. — **E**: Female flower. — **F**: Sterile female flower. — **G**: Syncarpium. — **H**: Seed.

closely undulate marginally, with 8–10 veins on either side of midrib and 3–4 veins arising from base, parallel veins connected by oblique cross veins. Inflorescence 3.2–6 cm long; peduncle 0.3–1.2 cm long, terete; spathe divisible into basal tubular part and upper expanded limb, slightly constricted in middle between tube and limb, obliquely septate near constriction within, a part of septum folded to form a collar; basal tubular part of spathe 0.8–1.5 cm long, outer side rough, purplish and covered with whitish glandular hairs, inner side smooth with dark purplish lines; limb elliptic-oblong, up to 2.3–3.2 cm long, slightly twisted, oblique at opening, brownish purple, verrucose and densely glandular-hairy outside, brownish black or dark purple and bullate with numerous whitish hairs inside, mucronate or acuminate at apex, apex curved downwards at maturity; spadix 11.5–16 mm long, divisible into basal pistillate part, filamentous sterile region, staminate part and terminal sterile appendage; pistillate part subglobular with 20–30 spirally arranged female flowers and 3–7 closely packed sterile female flowers at

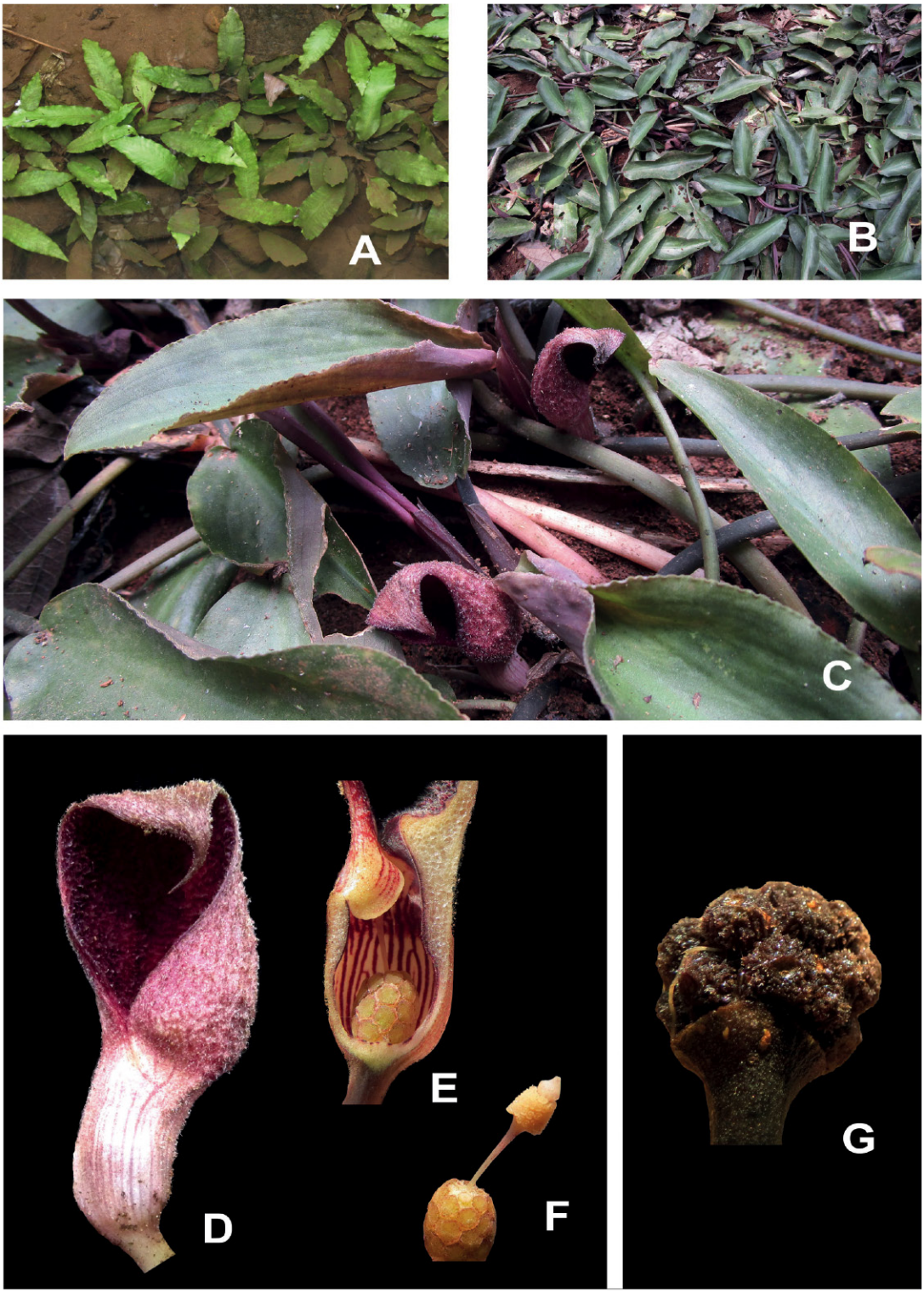

Fig. 2. *Lagenandra cherupuzhica.* — **A**: Plants in their natural habitat (under water.) — **B**: Plants in their natural habitat (exposed). — **C**: Plants with inflorescences. — **D**: Inflorescence. — **E**: Spathe cut open exposing spadix. — F: Spadix. — **G**: Syncarpium.

apex, 3.5–4 × 3.7–3.9 mm; sterile part filamentous, 4–6 mm long, cream-colored; staminate part conoid with flat top, male flowers 60–80, spirally arranged in pairs, 2–3.5 × 2–2.3 mm; terminal sterile appendage ovate-conical, 2–2.5 × 1.2–1.3 mm, acute at apex, locked in collar formed by septum. Female flowers sessile, obovoid with broad top and narrow base, numerous prominent branched or unbranched trichomes on lateral side, 1.7–1.9 × 1.2–1.5 mm, pale greenish-hyaline; ovary unilocular, ovules 3; stigma pentagonal with a depression at middle. Sterile female flowers obovoid, 3-lobed at apex, 0.6–0.7 × 0.3–0.4 mm, white. Male flowers sessile, oblong, longitudinally constricted in middle, cupulate at apex and with two tubular, basally dilated appendages, undulate along rim and with pinkish spots, 0.3–0.4 × 0.5–0.6 mm, cream-colored, Infructescences syncarpic, not enclosed in basal cupular part of spathe, 1.1–3 × 0.7–0.9 cm, peduncle 1–1.7 cm long; berries 20–30 in each syncarpium, 3-seeded, 3–4 × 2.5–3 mm, obovoid, 5-angled, purplish brown, warty outgrowths at apex with a depression at middle, papillate, dehiscent by longitudinal splitting of pericarp from base upwards in water. Seeds 3, ovoid or fusiform, 2–2.2 × 0.6–0.7 mm, sometimes curved at one end, longitudinally ridged, oval or round thickenings on ridges.

Lagenandra cherupuzhica is compared here (Table 1) with its closest morphological matches *L. meeboldii* and *L. nairii* (Ramamurthy & Rajan 1984). *Lagenandra cherupuzhica* has some affinities with other Indian species such as *L. ovata*, *L. toxicaria*, and *L. keralensis*. With *L. ovata and L. toxicaria*, it shares 2-keeled stipular sheaths, spathes with a broad limb, spadices with the pistillate part subglobular, and similar male flowers. *Lagenandra cherupuzhica* is similar to *L. keralensis* in its smaller size, 2-keeled stipular sheath, spathes with a collar inside, and in characters of the male flowers. *Lagenanadra cherupuzhica* can easily be distinguished from the allied species by its horizontally spreading leaves, elliptic-lanceolate laminae that are purplish below, and spathes lacking a long, caudate apex, glandular-hairy outside, and with the apex curved downward at maturity.

DISTRIBUTION AND HABITAT. *Lagenandra cherupuzhica* is so far known only from banks of

Table 1. Morphological comparison of *Lagenandra meeboldii, L. nairii* and *L. cherupuzhica.*

	L. meeboldii	*L. nairii*	*L. cherupuzhica*
Stipular sheath	not keeled	not keeled	2-keeled
Leaf orientation	vertical or oblique	vertical or oblique	horizontal over soil
Petiole	longer than lamina	longer than lamina	shorter than lamina
Lamina	ovate; ventral side not punctate, dorsal side smooth and greenish, margin entire	ovate; ventral side punctate, dorsal side tomentose and greenish, margin entire	elliptic-lanceolate; ventral side punctate, dorsal side smooth and purplish, margin closely undulate
Peduncle length (cm)	ca. 2.4	ca. 4	0.3–1.2
Spathe	tubular part ca. 5 cm long, glabrous outside, collar absent at throat of tube; limb obovoid, equal to length of tubular part, smooth and glabrous outside; subulate-filiform appendage present, limb apex not curved downwards at maturity	tubular part ca. 2.5 cm long, hairy outside, collar present at throat of tube; limb triangular, equal length of tubular part, smooth and hairy outside; subulate-filiform appendage absent, limb apex not curved downwards at maturity	tubular part 0.8–1.5 cm long, glandular-hairy outside, collar present at throat of tube; limb elliptic-oblong, double length of tubular part, verrucose and densely glandular-hairy outside; subulate-filiform appendage absent, limb apex curved downwards at maturity
Pistillate part of spadix	subglobular	1–3-verticillate	subglobular
Male flower number	100–120	40–60	60–80
Syncarpium	not enclosed in cupular part of spathe	enclosed in cupular part of spathe	not enclosed in cupular part of spathe

streams originating from lateritic hillocks in Kannur and Kasaragod Districts of Kerala, India. The plants remain submerged during the rainy season, emerge as the water level decreases during summer, and begin flowering in January. Perennation is through rhizomes, which remain partially buried in the mud. The seeds are released in the rainy season, when the fruits come in contact with water and they are distributed by water.

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