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Two new species of *Lepidagathis* (Acanthaceae: Barlerieae) from the low-elevation lateritic plateaus of Karnataka and Kerala, India

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Abstract: Two new species of *Lepidagathis* Willd. (Acanthaceae: Barlerieae), *L. dayanandanii* A.F.J.King, Gnanasek. & Arisdason and *L. narasimhanii* Gnanasek., A.F.J.King & Arisdason from the low-elevation lateritic plateaus of Karnataka and Kerala, respectively, are described here with a detailed description, illustrations, colour photographic plates consisting of field photos and micrographs of floral parts taken through light and scanning electron microscopes and IUCN conservation status. Furthermore, the diagnostic morphological characters of both new species are compared with allied species, *Lepidagathis keralensis* Madhus. & N.P.Singh and *L. ushae* Borude, Gosavi & Chandore, respectively, for precise recognition.

Keywords. Conservation status, *Lepidagathis keralensis*, *Lepidagathis ushae*, Low-elevation lateritic plateaus, Novelties, Revision.

Introduction

Lepidagathis Willd. (Acanthaceae: Acanthoideae: Barlerieae) is chiefly distributed in the pantropical regions (Manzitto-Tripp *et al.*, 2021), with 151 accepted species globally (POWO, 2023). It is represented by 33 species and seven varieties in India, of which 23 species and one variety are endemics (Arisdason *et al.*, 2020; Dhatchanamoorthy *et al.*, 2022; Gnanasekaran *et al.*, 2023a; More *et al.*, 2023). Although the genus shows a pan-Indian distribution, around 80% of the species are found only in the peninsular region, growing in four different habitats, namely (i) rocky outcrops of lateritic and basalt plateaus, (ii) dry open and lightly wooded scrub, grasslands or abandoned farmlands, (iii) foothills and margins of dry and moist deciduous forests, and (iv) coastal plains and deserts. Our analysis on the species distribution pattern in India shows that the low-elevation (50–200 m) and high-elevation (800–1000 m) lateritic plateaus of the Western Ghats alone harbour nearly one-third of the total *Lepidagathis* species reported from the country (Gnanasekaran & King, unpubl. data). This is probably owing to their unique geological and ecological specializations, soil availability, water availability and environmental extremes (Kulkarni *et al.*, 2022). In the last five years, a total of six new species have been described from these lateritic plateaus (Natekar *et al.*, 2019; Biju *et al.*, 2020; Borude *et al.*, 2020; Chandore *et al.*, 2020; More *et al.*, 2022, 2023), which corroborates the need to designate the lateritic plateaus (rocky outcrops) as one of the major centres of species diversity in India. Besides these new species, the detailed taxonomy of two low-elevation lateritic plateau species that are endemic to Kerala, *L. ananthapuramensis* V.S.A.Kumar, P.Biju, Sindhu Arya, Josekutty & Augustine and *L. keralensis* Madhus. & N.P.Singh have recently been discussed with a note on their revised diagnosis and circumscription, along with colour photographic plates (Gnanasekaran *et al.*, 2023b).

As a part of the Science and Engineering Research Board (SERB) funded research project on the 'Systematics of *Lepidagathis* Willd. (Acanthaceae) in India', a critical study of specimens based on intensive field studies coupled with an examination of herbarium specimens and scrutiny of relevant literature (Nees von Esenbeck, 1832, 1847; Dalzell, 1850, 1851; Clarke, 1885; Cooke, 1905; Gamble, 1924), we have recognised two distinct hitherto undescribed entities that are very different from earlier described species from the low-elevation lateritic plateaus. Therefore, both entities are described here as new species, namely *Lepidagathis dayanandanii* A.F.J.King, Gnanasek. & Arisdason

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from Karnataka and *Lepidagathis narasimhanii* Gnanasek., A.F.J.King & Arisdason from Kerala. Detailed descriptions, illustrations, colour photographic plates consisting of field photos and micrographs of floral parts and an IUCN Red List provisional conservation assessment are provided for the novelties. Besides, the diagnostic morphological characters of both new species are compared with allied species for precise recognition.

Materials and Methods

A series of field explorations were conducted to different low-elevation lateritic plateaus of Karnataka and Kerala between 2021 and 2023. During our explorations, we collected specimens of *Lepidagathis* from multiple localities. All the freshly collected specimens were critically studied using Stemi 508 Stereomicroscope coupled with Axiocam 208 camera (Zeiss, Oberkochen, Germany) for the gross morphological characters. This was supported by examination of herbarium specimens of *Lepidagathis* housed in different Indian (ARI, BLAT, BSI, CALI, MH, RHT, SKU and SUK) and foreign (B, BM, C, E, G, K, L, NY, P, S and US) herbaria [the Indian herbarium specimens were viewed in-person but those from elsewhere were viewed as digital images; acronyms of the herbaria are provided here after Thiers (updated continuously)].

Micro-morphological characters, such as indumentum and ornamentation of pollen grains and seeds of the new and allied species were examined using an Evo M18 Scanning Electron Microscope (Zeiss, Oberkochen, Germany). Mature floral buds were collected in the field and immediately fixed in 90% alcohol for morphological studies of pollen grains. Similarly, mature fruits with seeds were collected in the field and stored in paper pouches for seed morphological studies. For SEM study, fixed pollen grains and dry seeds were immersed in 100% alcohol and air-dried. The processed samples were mounted on stubs using double-sided adhesive tape. Subsequently, they were sputter-coated for 45–75 seconds with a gold-palladium mixture in a SC7620 mini sputter coater (EMITECH, Kent, U.K.) and scanned at the accelerating voltage of 5–15 KV. Multiple micrographs and measurements were taken using Image Tool software SmartSEM version 05.06.

The conservation status for both novelties was evaluated as per IUCN Red List Categories and Criteria version 15.1 (IUCN, 2022). The Extent of Occurrence (EOO) and Area of Occupancy (AOO) were calculated based on collection localities using the GeoCAT tool (Bachman *et al*., 2011) available at http://geocat.kew.org and Google Earth Pro version 7.3.

Taxonomic treatment

The ongoing research project on the 'Systematics of *Lepidagathis* Willd. (Acanthaceae) in India' has resulted in the discovery of two more new species from the lateritic plateaus of Karnataka and Kerala and are described below:

Lepidagathis dayanandanii A.F.J.King, Gnanasek. & Arisdason, sp. nov. **Figs. 1–3 and 7a & e**

Lepidagathis dayanandanii is morphologically similar to *L. ushae* but differs in having the following characters: (i) Vegetative leaves sub-sessile with petioles *c*. 1 mm long, elliptic, chartaceous, apex acute, purplish-green (*vs.* sessile, lance-ovate to oblong, rigid, apex acute with spinose process, green); (ii) Leaves of inflorescence bearing twig elliptic, thick and succulent (*vs.* lance-ovate to oblong, thin and rigid); (iii) Spikes both axillary and terminal, up to 3 cm long with maximum of 10 flowers (*vs.* only terminal, up to 7 cm long with maximum of 15 flowers); (iv) Flowers one or two per node (*vs.* always one flower per node); (v) Sterile bracts oblong (*vs.* lance-ovate to narrowly elliptic); (vi) Apex of leaves (inflorescence bearing twig), bracts, bracteoles and calyx lobes with a minute spinose process, less than 0.5 mm long (*vs.* with a long spinose process up to 1 mm long); (vii) Calyx posticous lobe lance-ovate to elliptic, length: width ratio is 2.7:1 (*vs.* lanceolate, length: width ratio is 3.4:1); and (viii) Corolla white, yellow at anthesis, 14.5–16.5 mm long, middle lobe of lower lip prominently broader than the lateral lobes (*vs.* always pale pink, 10–13 mm long, middle lobe of lower lip slightly broader than the lateral lobes).

Type: INDIA, **Karnataka**, Udupi district, Byndoor taluk, Areshiroor, N 13°49'41.76", E 74°44'53.29", 87 m, 23.04.2023, *A.F.J. King* 13009 (holo CAL; iso MH, Madras Christian College Herbarium, Chennai).

Prostrate perennial herb with woody rootstock; stems up to 1 m in diam., rooting at nodes, purplish-green when young, ash-coloured when old, well-branched, 4-angled, glabrous throughout, hirsute at nodes; internodal distance 3–20 mm. Leaves sub-sessile (petioles *c*. 1 mm long) opposite-decussate; vegetative leaves elliptic, 4–12 × 2–4 mm, base cuneate, margins entire, apex acute, purplish-green, glabrous, with 2–4 pairs of lateral veins; leaves of inflorescence bearing twig same as vegetative leaves except the apex acute with a minute (less than 0.5 mm long) spinose process, densely tomentose intermixed with glandular hairs throughout. Inflorescence a

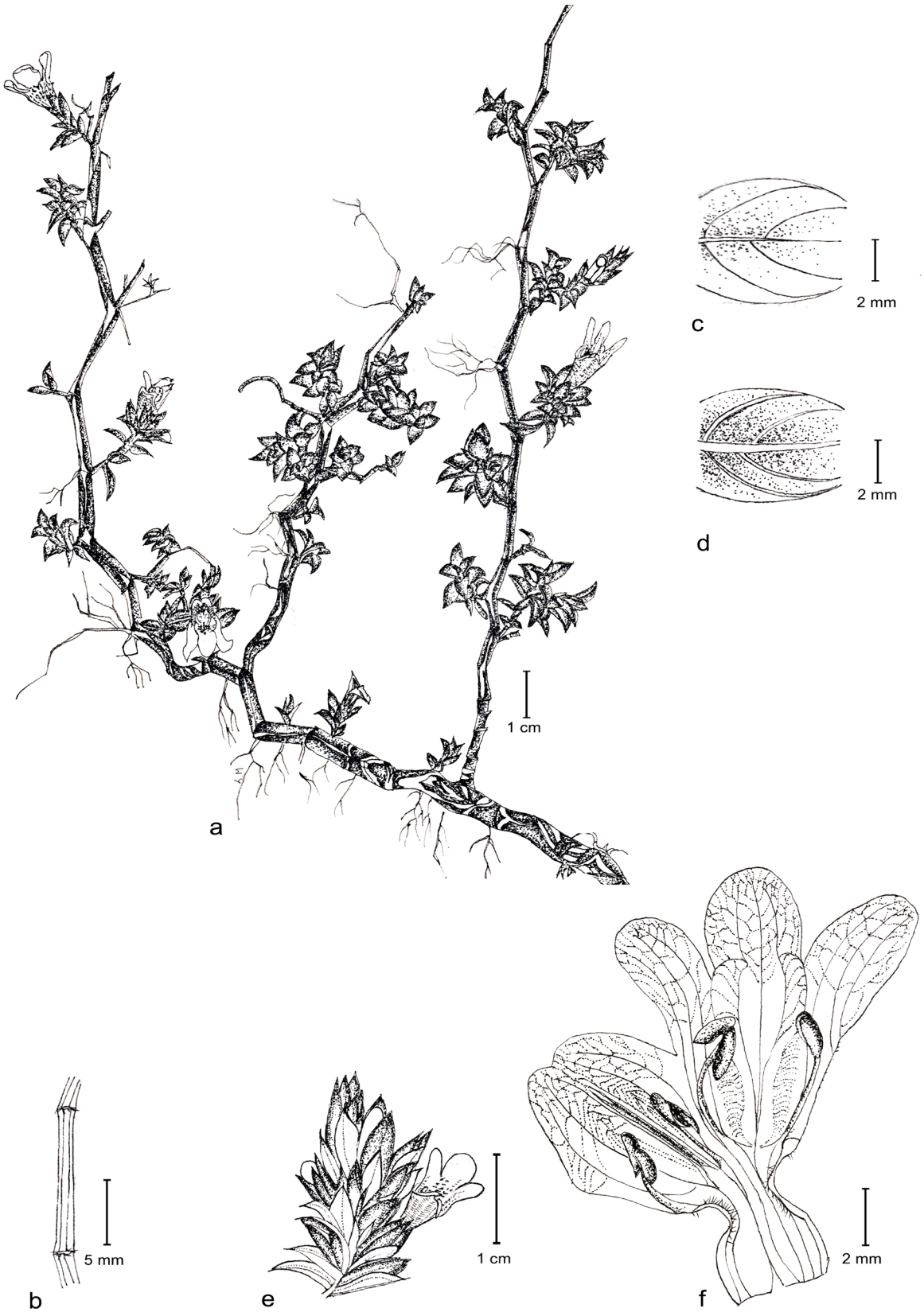

Fig. 1. *Lepidagathis dayanandanii* A.F.J.King, Gnanasek. & Arisdason; **a**. Habit; **b**. Portion of stem; **c**. Leaf – upper surface; **d**. Leaf – lower surface; **e**. Inflorescence close-up; **f**. Dissected corolla with androecium (from *A.F.J. King* 13009, Madras Christian College, Chennai; drawn by S. Madhura).

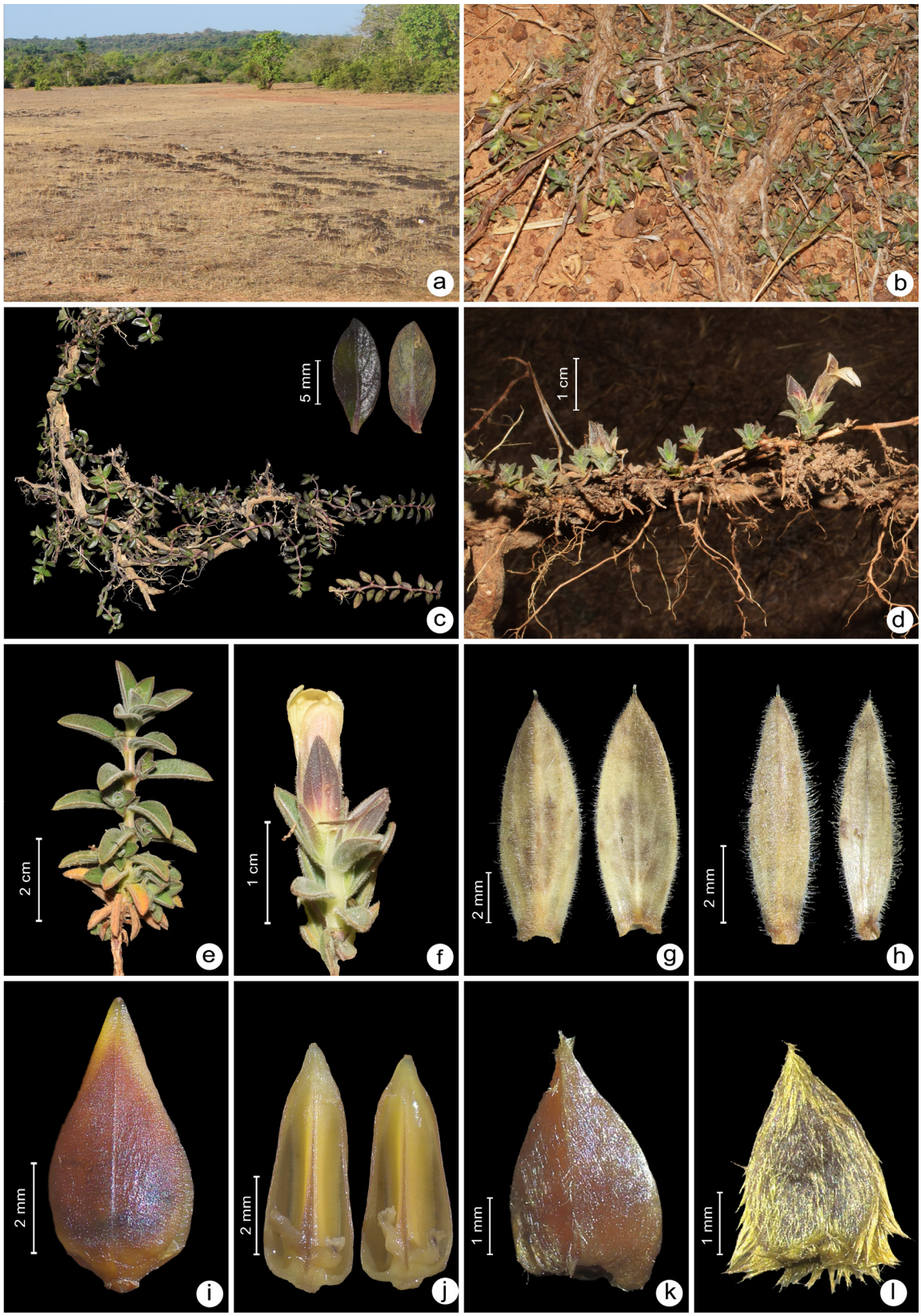

Fig. 2. *Lepidagathis dayanandanii* A.F.J.King, Gnanasek. & Arisdason: **a**. Habitat; **b**. Habit; **c**. Vegetative twig; **d**. Flowering twig; **e**. Reproductive leaves; **f**. Flower at anthesis; **g**. Outer (left) inner (right) surfaces of fertile bract; **h**. Outer (left) and inner (right) surface of bracteole; **i**. Capsule; **j**. Capsule split open; **k**, **l**. Seed with hygroscopic hairs (from *A.F.J. King* 13009 and *Abhishek Pujari* 13022, Madras Christian College Herbarium, Chennai; photos by A.F.J. King).

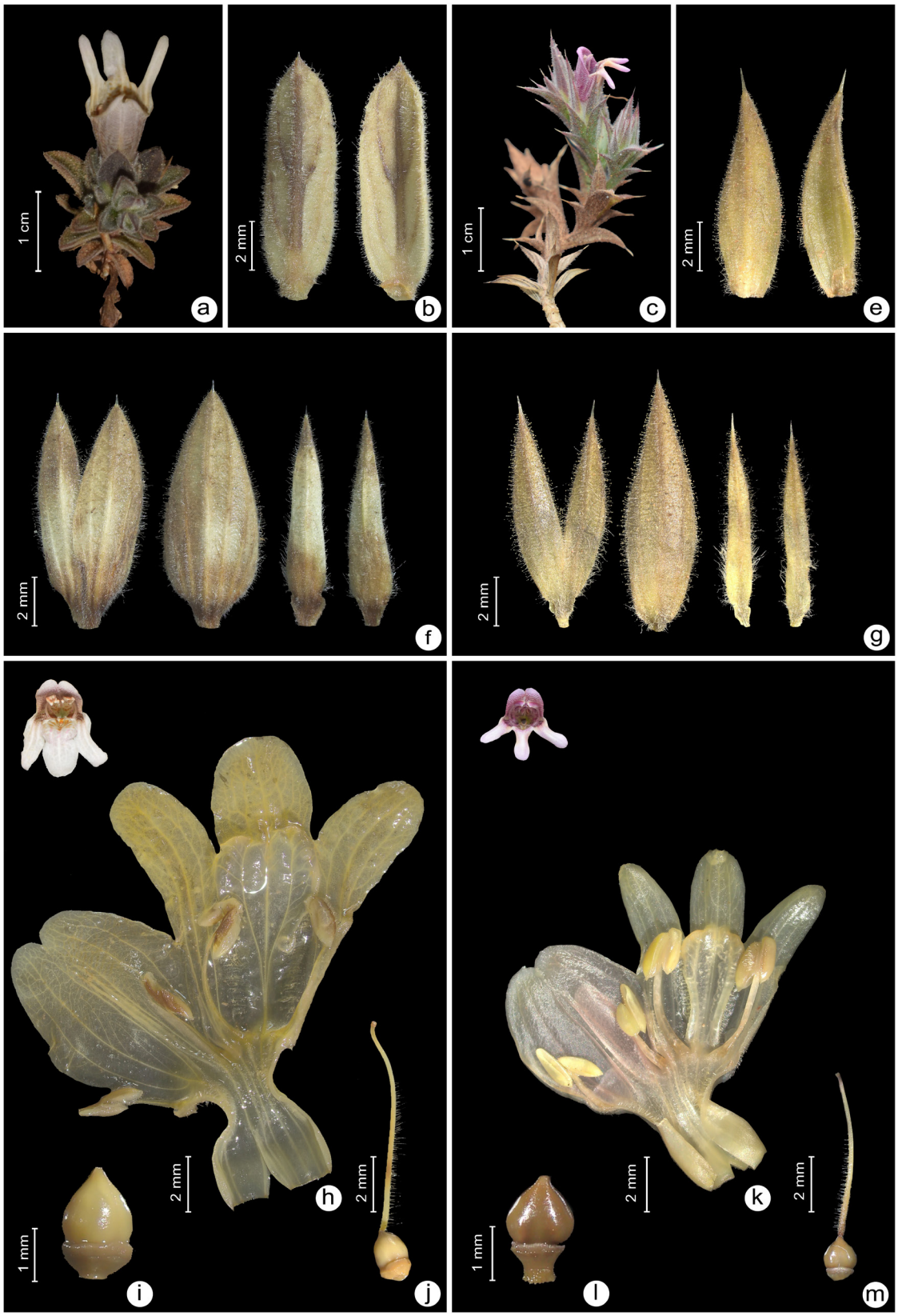

Fig. 3. Diagnostic characters of the new and allied species: **a**, **b**, **f**, **h**–**j**: *Lepidagathis dayanandanii* A.F.J.King, Gnanasek. & Arisdason; **c**, **e**, **g**, **k**–**m**: *Lepidagathis ushae* Borude, Gosavi & Chandore: **a**, **c**. Inflorescence close-up; **b**, **e**. Outer (left) inner (right) surfaces of sterile bract; **f**, **g**. Outer surface of calyx lobes; **h**, **k**. Dissected corolla with androecium; **i**, **l**. Ovary; **j**, **m**. Pistil (from *A.F.J. King* 13009 [*L. dayanandanii*] and *A.F.J.King* 12910 [*L. ushae*]; photos by A.F.J. King).

spike, axillary as well as terminal, 1–3 × 0.5–1 cm, green to purplish (bracts, bracteoles and calyx lobes). Flowers up to 10, arranged in 4 ranks as well as in 2 ranks, 1 or 2 flowers per node (half of the nodes bear 2 flowers). Bracts: sterile bract 1, (absent in half of the nodes), oblong, 8.2–10 × 2.3–2.5 mm, apex acute with a minute spinose process, tomentose intermixed with glandular hairs throughout, with 2 or 3 pairs of lateral veins; fertile bract 1, oblong to narrowly elliptic, 7.6–10.7 × 2–3.3 mm, otherwise as sterile bracts. Bracteoles 2, narrowly elliptic, 5–7 × 0.8–1.8 mm, apex acute with a minute spinose process, tomentose intermixed with glandular hairs throughout, 3-veined. Calyx 5-lobed; lobes heteromorphic, apices acute with a minute spinose process, tomentose intermixed with glandular hairs throughout; anticous lobes 2, equal, oblong to elliptic, 8–11 × 3.5–4.5 mm, 3–5-veined, connate at base (more than a quarter of its total length, i.e., 2.2–3.6 mm long), overlapping; posticous lobe lance-ovate to elliptic, 8.2–11 × 3–4 mm, 5–7-veined; lateral lobes 2, lanceolate to linear, 8–10.3 × 1–2 mm. Corolla 14.5–16.5 mm long, white (yellow at anthesis) with purplish-brown markings throughout the upper lip inside and orange patches on palate and purplish-brown horizontal striations only at membranous portion on either side of palate; tube 8–9.5 mm long, cylindrical below for 4–5 mm long, abruptly expanded above for 4–4.7 mm long, glabrous inside, retrorsely hirsute outside; upper lip arcuate, 3.2–3.7 × 5–6.5 mm, margins entire, apex minutely 2-lobed (0.4–0.8 mm long), each lobe 3-veined; lower lip 3-lobed, glabrous, 5–7 mm long including lobes; middle lobe prominently broader than lateral lobes, suborbicular, 2.7–4 × 3–4 mm, apex entire, 3-veined; lateral lobes oblong, 2.7–4 × 2.6–3 mm, 3-veined. Stamens 4, didynamous, filaments white with purple dots, adnate at base of expanded corolla tube, glabrous; anticous filaments 3.5–4.7 mm long; posticous filaments 2–2.7 mm long; anthers bithecous, thecae oblong-elliptic, divergent, 1.4–2 mm long, sparsely hairy at base of suture and at connectives, longitudinally dehiscing. Pollen grains prolate, 31.8–36.4 × 20.2–23.6 μm, tri-colporate; tectum reticulate, more open in area adjacent to apertures. Ovary sub-globose, 1.2–1.8 × 1.2–1.4 mm, glabrous, 2-loculed; ovules 2 in each locule; nectary disk cupulate; style 6.5–7.5 mm long, bristled-glandular-hairy up to half of its total length; stigma bi-lobed. Capsules ovoid in face view, 5.5–6.6 × 3–3.7 mm, glabrous; seeds 2 (one fertile, one abortive), ovoid in face view, 3.4–4.2 × 2–2.6 mm, covered with short hygroscopic hairs.

Flowering & fruiting: Flowering from February to April; fruiting from April to May.

Habitat: Open low-elevation lateritic plateaus with sandy soils, at elevations ranging from 80 to 100 m.

Distribution: India, endemic to Karnataka.

Etymology: This species is named in honour of Dr. P. Dayanandan, former Head of the Department of Botany, Madras Christian College (Autonomous), Chennai, for his significant contributions in the field of Botany.

Specimens examined: INDIA, **Karnataka**, Udupi district, Byndoor taluk, Areshiroor, N 13°49'41.76", E 74°44'53.29", 87 m, 23.04.2023, *A.F.J. King* & *R.R. Kolte* 13010; *Ibid.*, 29.07.2023, *Abhishek Pujari* 13022; Ibid., 11.12.2023, *A.F.J. King* 13031 (Madras Christian College Herbarium, Chennai).

Conservation status: This species is known only from a single low-elevation lateritic plateau of 1 km^2 radius, *i.e.*, Areshiroor in Udupi district of Karnataka, where it is commonly found. The quality of habitat is under threat owing to the developmental activities such as construction of buildings and roads. Although, this species would qualify as 'Critically Endangered' [CR B2ab(iii)], it is required to carry out intensive field surveys around the type locality to determine the exact AOO and EOO. Therefore, it is provisionally assessed here as 'Data Deficient' [DD].

Notes: *Lepidagathis dayanandanii* can also be differentiated from *L. keralensis* by the following significant characters: (i) spikes 1–3 cm long and with up to 10 flowers (*vs.* up to 10 cm long and with up to 30 flowers), and (ii) corolla white, yellow at anthesis, 14.5–16.5 mm long (*vs.* pink, purplish at anthesis, 11.8–13.8 mm long).

Brahmadande and Nandikar (2023) synonymised *L. ushae* under *L. prostrata* Dalzell in a recently published synopsis of Indian *Lepidagathis*. However, we treat it as a distinct species here based on a thorough morphological studies of fresh and herbarium specimens. *Lepidagathis ushae* can be distinguished from the latter by the following characters: (i) Bracteoles lanceolate to narrowly elliptic, up to 8.5 mm long (*vs.* linear to oblong, up to 12 mm); (ii) Calyx anticous lobes oblong to narrowly elliptic, 8.5–9.5 × 1.5–2, connate for more than one-third of their total

length i.e., 2.8–3.6 mm (*vs.* lanceolate, 9.8–13.7 × 4–4.8, connate for less than a quarter of their total lengths, i.e., 1.8–2.5 mm long); (iii) Corolla small, 10–13 mm long (*vs.* large, 17–20 mm long); (iv) Seeds 3–3.7 × 2–2.4 mm (*vs.* 4.2–5 × 2.7–3.2 mm).

Lepidagathis narasimhanii Gnanasek., A.F.J.King & Arisdason, **sp. nov.** **Figs. 4–6 & 7c, g**

Lepidagathis narasimhanii is morphologically similar to *L. keralensis* but differs in having the following characters: (i) Vegetative leaves lanceolate to lance-ovate, 9–22.5 × 1.6–6.5 mm, sparsely hirsute throughout (*vs.* lance-ovate to oblong, 4–10 × 1.5–2 mm, glabrous); (ii) Inflorescence robust, 1.5–2 cm broad due to the spreading fertile bracts, with a maximum of 20 flowers (*vs.* narrow, up to 1 cm broad due to appressed sterile bracts, with a maximum of 30 flowers); (iii) one or two flowers per node and more than half of the nodes (3–9 out of 6–12 nodes) bearing two flowers (*vs.* always one flower per node); (iv) Sterile bracts present only in less than half of the nodes, narrowly ovate to elliptic, 8–14 × 2–5.5 mm (*vs.* present in all the nodes, lance-ovate to narrowly elliptic, 7.4–8.5 × 1.6–2 mm); (v) Fertile bracts 9–14.5 × 2.5–5.2 mm, up to 7-veined (*vs.* 7–9 × 1.7–2.6 mm, up to 5-veined); (vi) Bracteoles lanceolate to linear, 7–9 × 1.2–1.8 mm (*vs.* narrowly elliptic, 4.8–6.6 × 1–1.4 mm); (vii) Corolla 14.5–17 mm long, magenta/dark purplish-red, crimson red at anthesis (*vs.* 11.3–13.8 mm long, pink, purplish at anthesis; (viii) Capsules 5.3–7 mm long (*vs.* 4.5–5.7 mm long).

Type: INDIA, **Kerala**, Kasaragod district, Seethangolli, N 12°35'31.0", E 75°00'11.5", 75 m, 29.12.2021, *G. Gnanasekaran* & *A.F.J. King* 12847 (holo CAL; iso MH, Madras Christian College Herbarium, Chennai).

Prostrate perennial herb with woody rootstock; stems spreading 1–2 m in diam., rooting at nodes, green to purplish when young, ash-coloured when old, well-branched, 4-angled; hirsute when young, glabrous when old; internodal distance 3–32 mm. Leaves sessile, opposite-decussate; vegetative leaves lanceolate to lance-ovate, 9–22.5 × 1.6–6.5 mm, base rounded or truncate, margins entire, apex acute with a minute spinose process, sparsely hirsute throughout; with 2–4 pairs of lateral veins; leaves of inflorescence bearing twig lance-ovate to elliptic, apex acute with a long-spinose apical process, tomentose throughout, otherwise same as vegetative leaves. Inflorescence a spike, raised at terminal of branches, 2–7 cm long, 1.5–2 cm broad (due to the spreading bracts), green to purplish-brown. Flowers up to 20, arranged in 4 ranks, very rarely in 2 ranks, 1 or 2 flowers per node and more than half of the nodes bear 2 flowers. Bracts: sterile bract 1 (present only in less than half of the nodes), narrowly ovate to elliptic, 8–14 × 2–5.5 mm, apex acute to acuminate with a spinose process, tomentose intermixed with glandular hairs throughout, 5–7-veined; fertile bract 1, narrowly ovate to elliptic, 9–14.5 × 2.5–5.2 mm, otherwise as sterile bracts. Bracteoles 2, lanceolate to linear, 7–9 × 1.2–2.2 mm, apex acuminate with a spinose process, tomentose intermixed with glandular hairs throughout, 3-veined. Calyx 5-lobed; lobes heteromorphic, apices acute to acuminate with a spinose process, tomentose intermixed with glandular hairs throughout; anticous lobes 2, unequal, lobes oblong to elliptic, 7.4–10.3 × 1.7–2.7 mm (large lobe) and 7.4–9.4 × 1.4–2 mm (small lobe), 3–5-veined, connate at base (a quarter to one-third of its total length, i.e., 2–3.7 mm long), overlapping; posticous lobe lance-ovate to ovate, elliptic, 9.5–12 × 2.6–6.2 mm, 5–7-veined; lateral lobes 2, lanceolate to linear-oblong, 6.5–9 × 1–2 mm. Corolla 14.5–17 mm long, magenta (dark purplish-red) throughout (crimson red at anthesis) with yellowish dots or patches on palate and purplish-brown horizontal striations only at membranous portion on either side of palate; tube 8–10.2 mm long, cylindrical below for 3.6–5.3 mm long, abruptly expanded above for 3.4–5 mm long, glabrous inside, retrorsely hirsute outside; upper lip arcuate, 3.3–4.6 × 4.8–6.7 mm, margins entire, minutely 2-lobed (0.5–1 mm long) at apex, each lobe 3-veined; lower lip 3-lobed, 5.7–7.3 mm long including lobes, glabrous; middle lobe broader than lateral lobes, suborbicular, 2.8–4 × 2.5–3.8 mm, apex entire or retuse, 3-veined; lateral lobes oblong, 2.5–3.6 × 2.2–3 mm, 3-veined. Stamens 4, didynamous; filaments purple to white, adnate at base of expanded corolla tube, glabrous; anticous filaments 3–5.4 mm long; posticous filaments 2.2–3.7 mm long; anthers bithecous; thecae oblong-elliptic, divergent, 1.2–2 mm long, purple to white, sparsely hairy at base of suture and at connectives, longitudinally dehiscing. Pollen grains prolate, 33.7–38.3 × 20.6–23.2 μm, tri-colporate, reticulate tectum more open in area adjacent to apertures. Ovary sub-globose, 1–1.6 × 1–1.3 mm, glabrous, 2-loculed; ovules 2 in each locule; nectary disk cupulate; style 7.5–9 mm long, bristled-glandular-hairy; stigma bi-lobed. Capsules ovoid in face view, 5.3–7 × 2.4–2.6 mm, glabrous; seed 2 (one fertile, one abortive), ovoid in face view, 2–3 × 1.6–2.3 mm, covered with short hygroscopic hairs.

Flowering & *fruiting*: Flowering from November to January; fruiting from January to April.

Fig. 4. *Lepidagathis narasimhanii* Gnanasek., A.F.J.King & Arisdason: **a**. Habit; **b**. Portion of stem; **c, d.** Leaf – upper and lower surfaces; **e**. Inflorescence close-up; **f**. Dissected corolla with androecium (from *G. Gnanasekaran & A.F.J. King* 12847; drawn by S. Madhura).

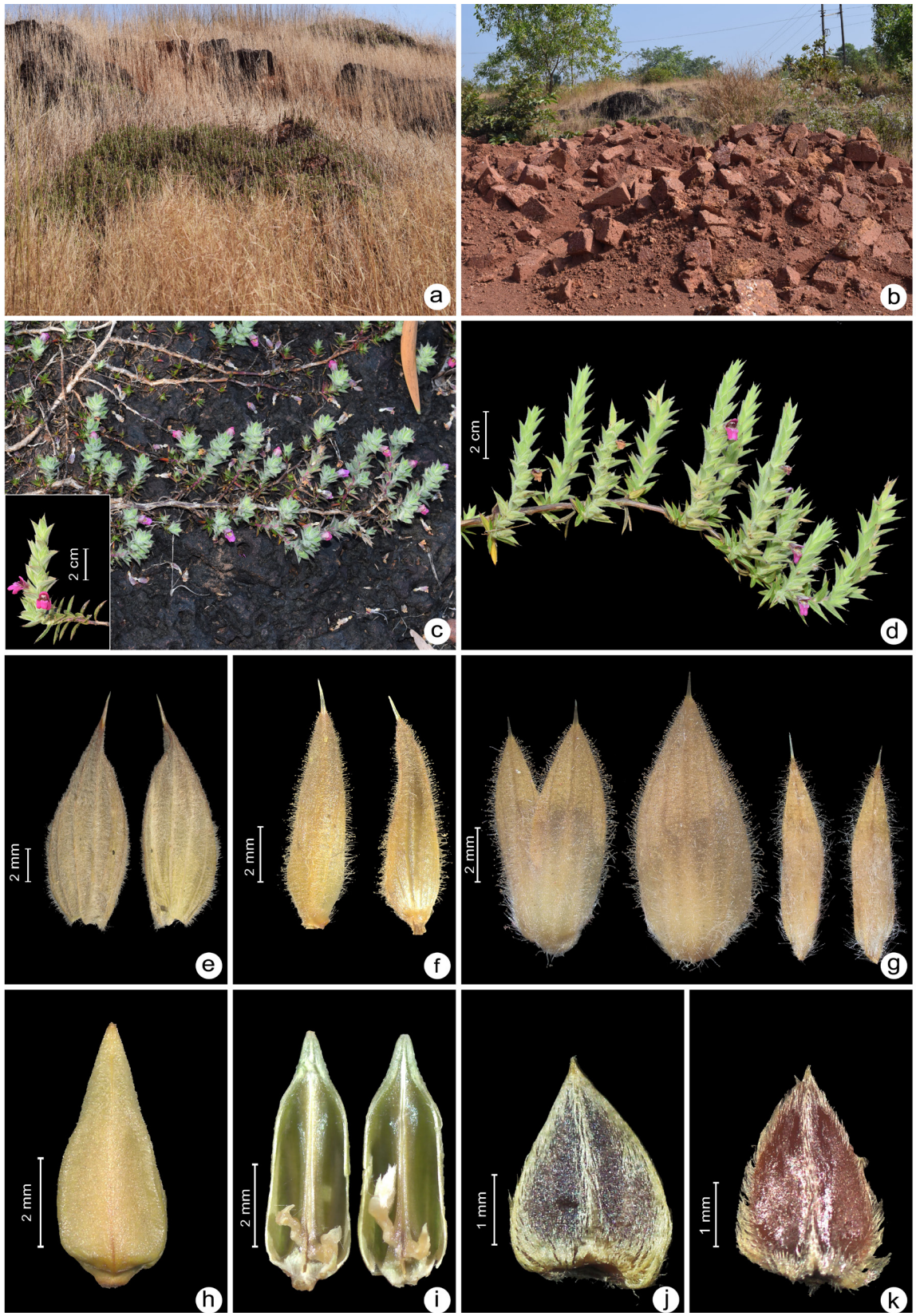

Fig. 5. *Lepidagathis narasimhanii* Gnanasek., A.F.J.King & Arisdason: **a**, **b**. Habitat; **c**. Habit, inset: inflorescence; **d**. Flowering twig; **e**. Outer (left) inner (right) surface of sterile bract; **f**. Outer (left) inner (right) surface of bracteole; **g**. Outer surface of calyx lobes; **h**. Capsule; **i**. Capsule split open; **j, k**. Seed with hygroscopic hairs (from *G. Gnanasekaran & A.F.J. King* 12847; photos a–d by G. Gnanasekaran, e–k by A.F.J. King).

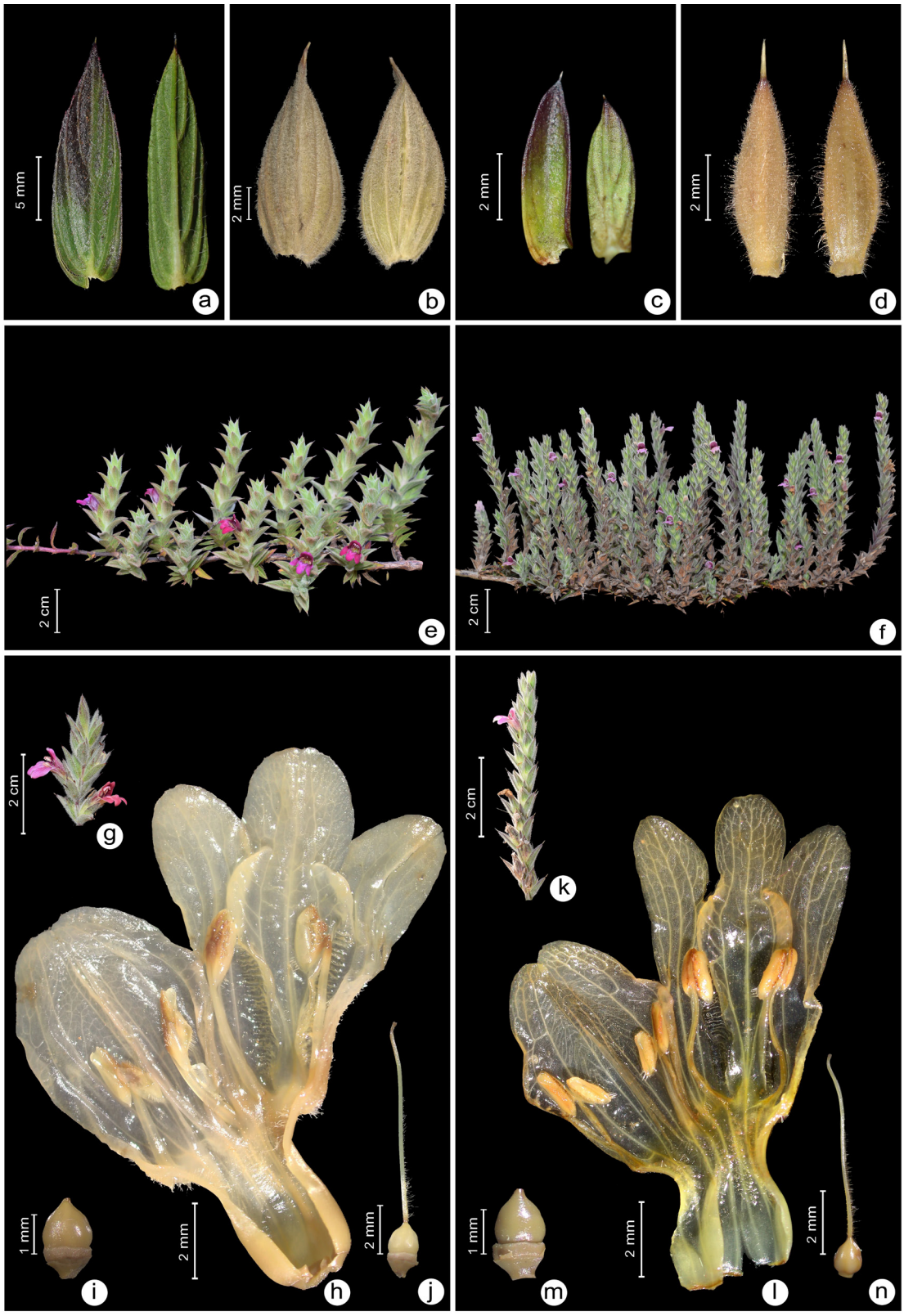

Fig. 6. Diagnostic characters of the new and allied species: **a**, **b**, **e**, **g–j**: *Lepidagathis narasimhanii* Gnanasek., A.F.J.King & Arisdason; **c**, **d**, **f**, **k–n**: *Lepidagathis keralensis* Madhus. & N.P. Singh. **a**, **c**. Upper (left) lower (right) surfaces of vegetative leaf; **b**, **d**. Outer (left) inner (right) surface of fertile bract; **e**, **f**. Inflorescence twig; **g**, **k**. Inflorescence close-up; **h**, **l**. Dissected corolla with androecium; **i**, **m**. Ovary; **j**, **n**. Pistil (from *G. Gnanasekaran & A.F.J. King* 12847 (*L. narasimhanii*) and *G. Gnanasekaran & A.F.J. King* 12835 (*L. keralensis*); photos a, e, f, g & k by G. Gnanasekaran; b–d, h–j, l–n by A.F.J. King).

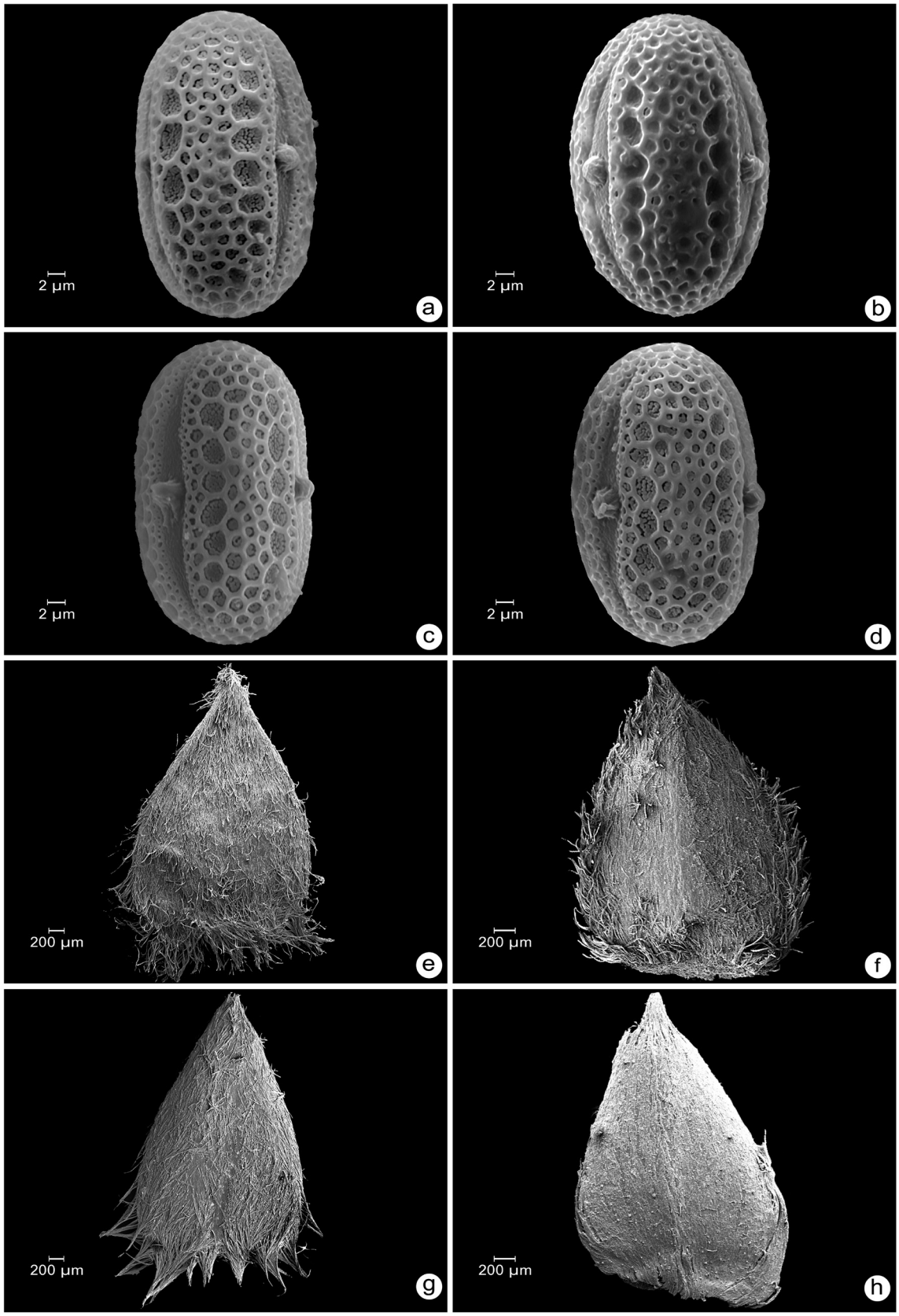

Fig. 7. Scanning electron micrographs of pollen grains (mesocolpial view) and seeds: **a**, **e**. *Lepidagathis dayanandanii* A.F.J.King, Gnanasek. & Arisdason; **b**, **f**. *Lepidagathis keralensis* Madhus. & N.P. Singh; **c**, **g**. *Lepidagathis narasimhanii* Gnanasek., A.F.J.King & Arisdason; **d**, **h**. *Lepidagathis ushae* Borude, Gosavi & Chandore (photos a–d by M. Boopathiayyanar; e–h by G. Gnanasekaran).

Habitat: On exposed rocky surface of low-elevation lateritic plateaus at elevations ranging from 50 to 120 m.

Distribution: India, endemic to Kerala.

Etymology: The species is named after Dr. D. Narasimhan, former Head of the Department of Botany, Madras Christian College (Autonomous), Chennai, for his outstanding contributions to plant taxonomy.

Specimens examined: INDIA, **Kerala**, Kannur district, Cheemeni, N 12°13'56.3", E 75°13'59.9", 117 m, 27.12.2021, *G. Gnanasekaran* & *A.F.J. King* 12835; Arippara, N 12°14'30.1", E 75°16'48.5", 117 m, 28.12.2021, *G. Gnanasekaran* & *A.F.J. King* 12836; *Ibid.*, 06.12.2022, *A.F.J. King* & *V.H. Ari* 12978; Hosdurg, N 12°17'50.3", E 75°09'40.4", 52 m, 28.12.2021, *G. Gnanasekaran* & *A.F.J. King* 12840; Neeleshwar, N 12°16'18.2", E 75°09'30.0", 52 m, 28.12.2021, *G. Gnanasekaran* & *A.F.J. King* 12839; Veeremalai Kunnu, N 12°13'55.7", E 75°09'24.3", 49 m, 28.12.2021, *G. Gnanasekaran* & *A.F.J. King* 12838; *Ibid.*, 06.12.2022, *A.F.J. King* & *V.H. Ari* 12979 (Madras Christian College Herbarium, Chennai). Kasaragod district, Seethangolli, N 12°35'31.0", E 75°00'11.5", 75 m, 15.10.2021, *A.F.J. King* & *S.P. Nithya* 12822; *Ibid.*, 29.12.2021, *G. Gnanasekaran* & *A.F.J. King* 12848; Edanad, near Government ITI, N 12°36'33.3", E 75°00'20.5", 92 m, 29.12.2021, *G. Gnanasekaran* & *A.F.J. King* 12849; Manjeshwar, N 12°34'42.0", E 74°59'25.1", 53 m, 29.12.2021, *G. Gnanasekaran* & *A.F.J. King* 12844; Soorambial, N 12°35'44.6", E 74°59'10.7", 72 m, 29.12.2021, *G. Gnanasekaran* & *A.F.J. King* 12846 (Madras Christian College Herbarium, Chennai).

Conservation status: The estimated EOO and AOO for this species are 360.5 km^2 and 36 km^2, respectively. Even if it was collected from only nine different localities of Kannur and Kasaragod districts in Kerala, the species found growing continuously in different suitable habitats between the collected localities. Although this species is very common in the localities where it was collected, it is noticed that those habitats face severe threats due to extensive mining of lateritic rocks for brick production and other developmental activities. The species is provisionally assessed here as 'Endangered' [EN B1ab(ii,iii), B2ab(ii,iii)].

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