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New Distributional Records to the Flora of Jalgaon District, Maharashtra, India

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ABSTRACT

While documenting the flora of the Jalgaon area, the authors discovered some fascinating species during their routine observations. The gathered taxa belong to the families Acanthaceae, Cucurbitaceae, Fabaceae, Gentianaceae, and Hydroleaceae. Upon reviewing the literature, they identified a novel distributional dataset for the flora of Jalgaon district. The incorporation of these new species represents a substantial progress that improves both the ecological and medicinal dimensions of the area. The recognition of their ecological roles and medicinal advantages opens new pathways for scientific research and practical use. These species are new distributional records for the flora of Jalgaon District, since they have not been previously documented or published. This research includes extensive phenological data, taxonomic descriptions, and colour images to aid with specimen identification.

Keywords: *New, Distributional record, Barleria, Blastania, Canscora, Eleiotis, Hydrolea, Flora.*

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Oneliner: *Barleria lavaniana* Patil, Yadav & Lekhak; *Blastania cerasiformis* (Stocks) A. Meeuse; and *Canscora tetraptera* (Naik & Pohle) Arun Pr. & Sardesai have been recorded as new distributional records for the Khandesh region, while *Eleiotis sororia* (L.) DC. and *Hydrolea zeylanica* (L.) Vahl represents new distributional records for the floral diversity of Jalgaon District.

Introduction

A district in Northern Maharashtra's Khandesh region, Jalgaon, along with Dhule and Nandurbar, boasts a varied floral wealth and a temperate climate. It is distinguished by natural hill ranges, including the Satpuda in the north, the Hatti in the southwest, and the Ajanta and Satmala ranges in the south. With the Girna, Waghur, Guli, Bori, Suki, Agnavati, and Bahula as its tributaries, the Tapti is the region's principal river. Biodiversity refers to the variety of species within a certain region. In the documention of floristic vegetation for diverse objectives, numerous components were not previously noted. Throughout our investigation of the area via many field trips across every season, we recorded fascinating taxa for the first time. A prior investigation conducted by [4] identified 813 species in 105 groups, encompassing 442 taxa, in the flora of Jalgaon District. Subsequently, several scholars engaged in the district's botanical studies contributed several new species to the Flora of Maharashtra. According to [11], [12], [13] and [2],[3].

Material and Methods

Systematic field expeditions were organised to collect plant specimens in the Jalgaon district for the first author's Ph.D. dissertation. The authors have collected specimens from several locations during the 2024 investigation of the Chalisgaon region's flora. Upon reviewing the literature, [1], [4], [5], [7], [9], [10], [11], [12], [13], specimens are identified and classified as *Barleria lavaniana* Patil, Yadav & Lekhak (Acanthaceae), *Blastania cerasiformis* (Stocks) A. Meeuse. (Cucurbitaceae), *Canscora tetraptera* (Naik & Pokhle) Arun P. R. & Sardesai (Gentianaceae), *Eleiotis sororia* (L.) DC. (Fabaceae) and *Hydrolea zeylanica* (L.) Vahl (Hydroleaceae).

Taxonomic Treatment

1. *Barleria lavaniana* S.S. Patil, S.R. Yadav & Lekhak in Pl. Syst. Evol. 305: 942. 2019. **(Fig.1).**

Perennial, multi-branched shrubs up to 1-1.5 m tall; woody, slender branches, pale white bark, shallowly fissured or flacking off, glabrous; tomentose immature portions; Leaves 3-12 by 2.8-7cm, petiolate, coriaceous, ovate, base rounded in young leaves, cuneate in older, apex acute; surface tomentose with stellate and glandular trichomes; thickly tomentose underneath. Tomentose 0.5-6cm petioles. 2-3-flowered axillary cymose inflorescence. Two bracteoles per flower, linear-lanceolate, persistent, light-green, tomentose, midrib conspicuous, 5-15 by 3-4 mm. Four-lobed, pale green calyx, two outer, two inner. Outer lobes tomentose outside, pubescent within; The edges are entire, involute, and the apex is acuminate. Inner calyx lobes 10-16 by 2-3 mm, linear-lanceolate, acuminate, tip divided into two teeth; Flowers 8-13cm long, corolla obscurely bilabiate, lobes subequal, pure white tinted purple, puberulent outside, glabrous inside; tube cylindrical, 7-11 cm long, wide at base, gradually narrowing at apex, somewhat inflated at stamen attachment, pale white, pubescent hairy. Androecium with 2 stamens and 3 staminodes. Stamens 5-5.3 cm tall, exserted, epipetalous; filaments pale white and flattened at base, white and slender above, glabrous except at base; anthers blue.

Ovary, ovoid, two locular, glabrous except at style attachment; ovules 4; style 12-13.3 cm long, terete, white, glabrous except basal. Hyaline, obliquely bifid stigma. Capsule cylindrical, oblong, 15-20 by 4-6 mm, stipitate, green when young, brown-black when old, apiculate apex, dehiscing explosively; Seeds 4 hairy, black.

Family: Acanthaceae
Phenology: Flowering and fruiting in September-December
Distribution: The species is reported from Aurangabad, Osmanabad, Pune, and Satara districts of Maharashtra state, mostly found growing on rocky hill slopes.
Occurrence: Found growing at Kedarkund (Waterfall) of Patnadevi.

2. *Blastania cerasiformis* (Stocks) A. Meeuse in Bothalia 8: 12. 1962; *Ctenolepis cerasiformis* (Stocks) Naudin in Ann. Sci. Nat., Bot., ser. 5, 6: 13. 1866; C.B. Clarke in Hook. f. Fl. Brit. India 2: 630. 1879; Singh, Fl. Mah. 2:54. 2001; *Blastania fimbristipula* Kotschy & Peyr. in Pl. Tinn.: 15. 1867; Cooke, Fl. Pres. Bombay 1: 576. 1958 (Repr. ed.); Almeida Fl. Mah. 2: 309. 1998. *Zehneria cerasiformis* Stocks in Hooker's J. Bot. Kew Gard. Misc. 4: 49. 1852. **(Fig.2).**
Seasonal climber with elongated, sub-filiform, heavily branching, and angled stems, smooth, somewhat scabrid, or glabrous. Simple, thin tendrils. The membranous leaves are 5-10 cm long and wide, scabrid on both sides with white dots, and typically three-partite, but infrequently five-lobed, oval-oblong segments that are denticulate or crenulate at the margin, constricted at the base, the intermediate section is complete, the lateral segments are roughly two lobed. Petioles: thin, hairy, grooved, 2-4 cm long. Stipular bracts are reniform, scabrid, ciliate, and have stiff hairs that extend the length of the bract (0.6 -1 cm); they also have tiny white dots. 5-9 male flowers blooms at the peduncle's apex, which is 2-4 cm long, 1-3 mm long, with ebracteate pedicels. The calyx-teeth minute. Corolla minute, obtuse, spreading, ovate-oblong segments. Female flowers are solitary, on small peduncles. Fruit is 1 cm in diameter, round, globose, and glabrous. Two smooth, ovoid, yellowish-grey seeds that are 7-8 mm length and 3-4 mm wide.

Family: Cucurbitaceae
Phenology: Flowering and fruiting in August-September
Distribution: Reported from Chhat. Sambhaji Nagar in Maharashtra and Rajasthan.
Occurrence: Found growing along the road side amidst grasses, on field fens and electrical poles in Chalisgaon.

3. *Canscora tetraptera* (Naik & Pokle) Arun Pr. & Sardesai in Kew Bull.76:852, 2021. *Canscora diffusa* var. *tetraptera* Naik & Pokle, in J. Econ. Taxon. Bot. 7: 673, 1985. **(Fig.3).**
Annual herbaceous plant, upright, smooth, 18-20 cm in height. Stem is angular, winged, exhibits green, light yellow hues at maturity, with branching occurring at the apex; Foliar leaves are glabrous, simple, opposite, decussate, and either sessile or subsessile. They have a petiole that is approximately 5 mm long and ovate-lanceolate blades that are 1-3.1 by 1-1.7 cm. These leaves are conspicuous, tri-nerved, and have acute-acuminate at the tip and attenuate or cuneate at the base. The inflorescence leaves are roughly oblong, oval, 1-1.4 by 1 cm, with small glandular-hairy edges. Flowers 5-18; axillary or terminal lax, apparently uniparous cyme. Bracts may be linear or ovoid, 5-8 mm long, membrane-bound, foliaceous, and bordered with glandular hair.
Pedicels may be thick or dense, 6-11 mm long, thin or slender, and somewhat angular under the calyx. Calyx: 6-11 mm long, clearly four wings, 0.5-1 mm wide, persistent, and extending along the keel from base to tip. Corolla tube: pink, irregular, orbicular, with two broad (about 3 by 2.4 mm) and two thin (approximately 2.4 by 1.3 mm) petals; tube is membranous and up to 11-12 mm long, but not nearly as long as the calyx. A big stamen may fit through the gap formed by the union of the tips of the lower petals. Four anisomorphic stamens-three little and one large-with light yellow anthers that are about 1 mm long. The filaments of the upper stamens have not extended below them. 4-6 mm long, green, cylindrical ovaries; 4-5 mm long, short, strained styles; white-lobed, globose, two-valved stigmas that are bifid and have a prolonged, glabrous capsule. So many brown, tuberculate seeds of uneven form.

Family: Gentianaceae
Phenology: August-December is when flowers and fruit appear.
Distribution: Reported from Nasik, Pune, Palghar, Chhatrapati Sambhajinagar, and now from Jalgaon, Endemic to Maharashtra.
Occurrence: Found along the water streams of the Patnadevi forest range, Chalisgaon Dist. Jalgaon.

4. *Eleiotis sororia* (L.) DC., in Prodr. 2: 348, 1825; *Hallia sororia* (L.) Willd., Sp. Pl. ed. 4. 3:1170, 1802.; *Hedysarum sororium* L., Mant. Pl., 2:270, 1771; *Onobrychis sororia* (L.) desv., J. Bot. Agric., 3:80, 1814; *Eleiotis monophylla* DC., Prodr. 2:348, 1825; Baker in Hook f. Fl. Brit. India, 2:153, 1876; Cook, Fl. Pres. Bombay, 1:364, 1958 (Repr. Ed.); M.R. Almeida, Fl. Mah.2:71, 1998; N.P. Sing, Fl. Mah. Di., 1:681, 2001; Patil D.A., Fl. Dhule and Nand.,189, 2003. **(Fig.4)**.
Climber, prostrate, annual plant that grows to a height of 50-80 cm; robust stem angular at the top and terete at the bottom, glabrescent, coated in fine, silky hairs. Pinnately trifoliate, alternating leaves emerge in the axil of the stipule, triangular in shape ca. 4-6 by 1.4-2 mm. Petiole: 1-1.5 cm long, pilose, sparsely sericeous. Rachis glabrous to pilose, 2-2.5 cm long, with uncinate hairs at the base. Leaflets: elongated, acuminate, stipel, 1-2 mm long. Petiolule: pubescent, sericeous, vigorously repressed, 2-3 mm long. Terminal leaflet: big, reniform, 3.5-4.3 by 3-5 cm, with a cordate base, rounded apex, entire at edge, glabrous on top; ventrally densely packed with fine, silky, sericeous hairs; lateral veins are 6-7 per side. Lateral leaflets: oblong, tapering towards the proximal and distal ends, 13-20 by 3-4 mm, pubescent, sericeous along the margins and underneath, base cuneate, midrib prominent, apex obtuse, lateral veins obscure, glabrous above; Terminal and axillary inflorescence: 5-13 cm long; rachis: 2-3 cm long; densely packed with gland-tipped, small hairs. Peduncle, 3-4 cm long, coated with silky, sericeous hairs; base, 8 mm long, with long, uncinate hairs; The primary bract is 4-6 by 3 mm, with an obtuse, pointed, fimbriate edge at the apex, glabrous on both sides, ridges on the ventral side, and two immature flowers enclosed. Flowers are 3-6 mm long in two fascicles with 6-8 mm long pedicels, glabrous or sericeous and no uncinate hairs at the base. Light green to yellow calyx, pedicel 1.2-1.5 cm, base campanulate, truncate tube 1 mm long, coated with tiny gland-tipped hairs. Calyx ca. 2-3 mm long; teeth 0.5 mm in length, with a fimbriate edge and slightly gland-tipped hairs. Corolla: Salmon with orange to dark orange-red colouring, oblong, 5 by 4 mm, apex emarginate, base cuneate, claw ca.1 mm long, wings angular, 4 by 3 mm, apex obtuse. Keels 3 by 1.5 mm, angular to triangular, obtuse apex, unclear base.

Stamens: 1-2 mm, diadelphous, anthers ellipsoid ca. 0.3 by 0.2 mm; Ovary: Smooth, swollen glabrous, slender elongated style, 3mm, slightly curved, apically pubescent, with long hairs. Pods: glabrous, creamy with brown irregular patches, 0.8-10 by 0.3-0.4 mm, with upper and lower margins that are complete and unarticulated, a short or non-existent pod stipe ca. 0.5 mm, and a solitary seed. Fruiting pedicel: pubescent, uncinate base, 1.3-1.5 cm long, Seeds: 5-6 by 2-3 mm, brown, aril ca. 0.5 mm, young seeds yellow to creamy.

Family: Fabaceae
Phenology: Flowering and fruiting from September to December.
Distribution: Akola, Amravati, Aurangabad, Chandrapur, Dhule, Nanded, and Wardha. Now as an extended distribution to Jalgaon district, Chalisgaon, village Patna, on the way to the Chandika Devi Mata temple.
Occurrence: Found amidst along grasses. Rare, reported for the first time.
Conservation: Patil previously described this taxon in 2003, from Nandurbar district: however, this is the first record from the Jalgaon area. Because the population was only visible from one location in a small area, it needed to be protected against grazing animals and fodder collectors.

***5. Hydrolea zeylanica* (L.) Vahl** in Symb. Bot. 2: 46. 1791; C.B. Clarke in J.D. Hooker Fl. Brit. India 4:133. 1883; Cooke, Fl. Pres. Bombay 2:263. 1958 (Repr. ed.); Almeida in Fl. Maharashtra 3A: 281. 2001; Singh Fl. Mah. 2: 415. 2001. *Nama zeylanica* L. in Sp. Pl.: 226. 1753**. (Fig.5).**
An annual plant with stems that are 15-35 cm long that is either semi-aquatic or hygric. Stem Glabrous, terete, succulent, decumbent, green, and rooted at the lower nodes, with short, thin branches. The leaves are oblong or linear-lanceolate in form, 3-6 cm long, glabrous, tapering at the base, and have extremely short petioles. A large number of vivid blue flowers, approximately 1-1.3 cm in diameter, are grouped in racemes on short lateral stems. Green bracts and glandular hairs adorn the 3-7 mm long pedicels. The calyx is glandular, hairy, and 5-6 mm long; the tube is just 1 mm long and has sharp, lanceolate segments. Fruits have an enlarged calyx. Corolla, deeply divided, 5-6 mm long, with darker veins; tube short, lobes round and pointed. Protruding stamens, enlarged filaments at the base, and arrow-shaped anthers. Two distinct styles, proliferating. The ovoid-oblong capsule, which is 4-5 mm long and 2-3 mm broad, is encased in the enlarged persistent sepals. Numerous small, oblong seeds.

Family: Hydroleaceae
Flowering & Fruiting: Flowering and fruiting in November-February.
Distribution: It's found distributed in Kokan, Savantwadi, Mahad, Karjat, Khandala, Matheran, Kolhapur, Igatpuri, Ramtek, and now from Bodwad.
Occurrence: Found along grasses and hydrophytes. Rare, reported for the first time.
Conservation: This is the first report from Jalgaon district; the population was seen to be sparse.

Conservation and Sustainable Use
The discovery of these species may stimulate conservation efforts to preserve the plants in their indigenous habitats. Certain species may be rare and, thus, vulnerable to habitat destruction or excessive exploitation. Measures must be taken to safeguard these plants, ensuring that local communities get sustainable advantages without compromising their long-term survival.

Discussion
All specimens were collected from various places at different time periods within the Chalisgaon forest region. *Eleotis soraria* was spotted in the Patnadevi woodland along the roadside amid grasses, displaying a characteristic rhythmic movement of leaflets reminiscent of a telegraph plant.
Canscora tetraptera is morphologically unique from its allied species *C. diffusa,* with a calyx ca. 1mm broad winged and a style that is equal to or shorter than the ovary. [6] designated it as *C. diffusa* var. *tetraptera,* which was subsequently revised to species rank by [7]. In the past, this taxon was only acknowledged by [8] type specimens from Dhak, Pune, and P.R. Arun's from Nashik district; however, the Patnadevi Forest has recently discovered a new site in Chalisgaon. Compared to sister species *Blastania garcinia* and *Dactyliandra welwitschii*, *Blastania cerasiforme* differs significantly in that it has fairly large female flowers and spherical or globose fruit with just two smooth seeds. In *B. garcinia,* the fruit is obreniform, while in *D. welwitschii*, the seeds are globose, big, and have 8-12 angular, flattened seeds. *Barleria lavaniana* has similarities to *Barleria longiflora,* although it is distinguished by its involute bracteoles as opposed to non-involute ones. *Hydrolea zeylanica* is a semiaquatic, glabrous plant characterised by its vibrant blue flowers.
After examining the literature, it was found that among the five taxa collected, *Blastania cerasiformis*, *Barleria lavaniana*, *Canscora tetraptera* and *Hydrolea zeylanica* represent new distributional records for the Khandesh region; none of these have been previously reported or described from the Khandesh region, while *Eleotis soraria* constitutes a new addition to the flora of Jalgaon district.

Conclusion
The identification of newly documented species in the flora of Jalgaon District signifies a significant enhancement to the region's botanical richness. These newly found species have considerable ecological significance, underscoring the need to conserve the district's natural heritage. The introduction of these species may augment the biodiversity of the area and district, hence fostering a more robust environment.

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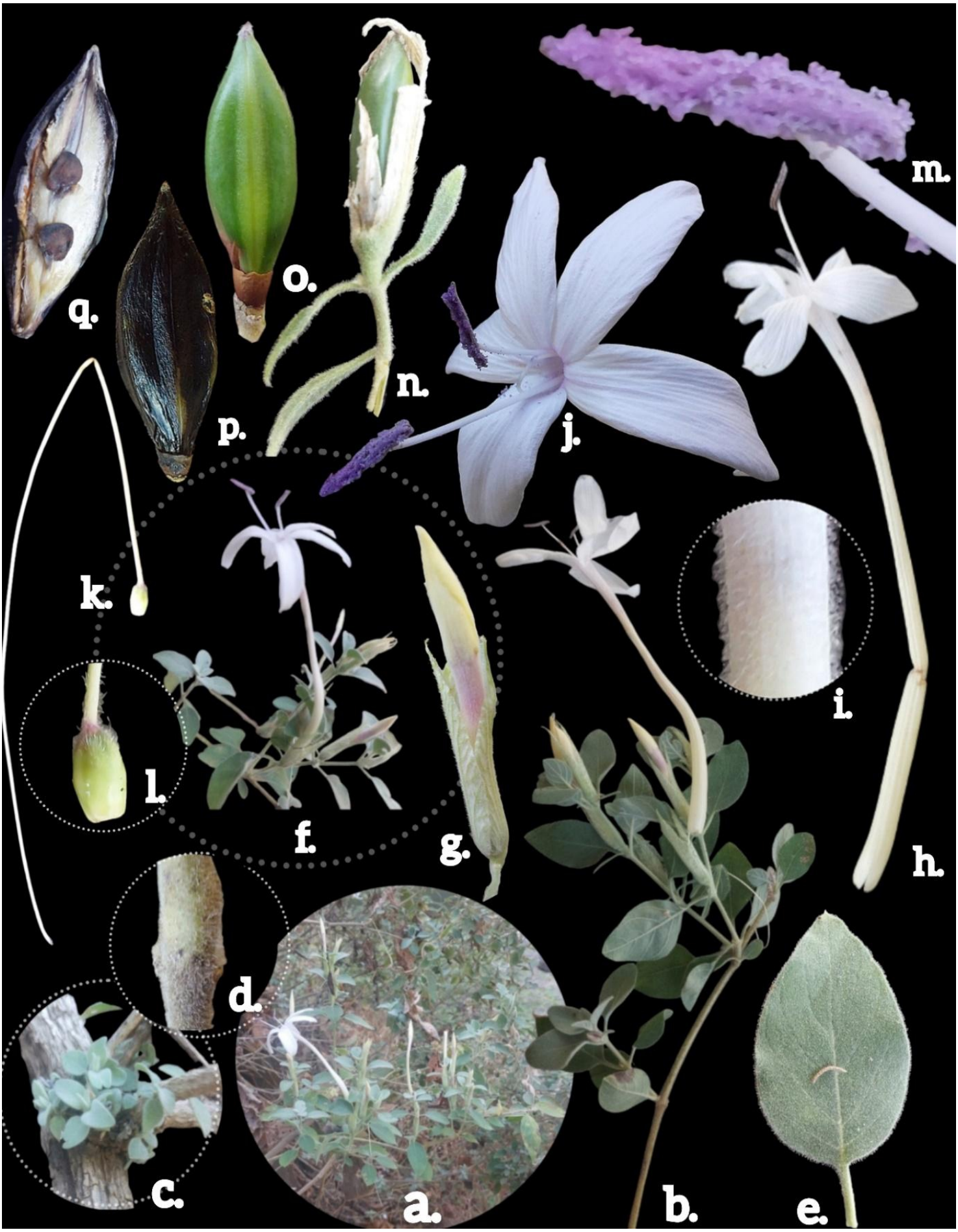

Figure 1. *Barleria lavaniana* Patil, Yadav & Lekhak. a. Habit, b. Twig, c. & d. Stem, e. Leaf, f. inflorescence, g. Bracts, h. & i. Flower and tube surface j. Flowers side view, k. & l. Stigma & ovary m. Anther(enlarged), n., o. & p. Pod developmental stages, q. Seeds.

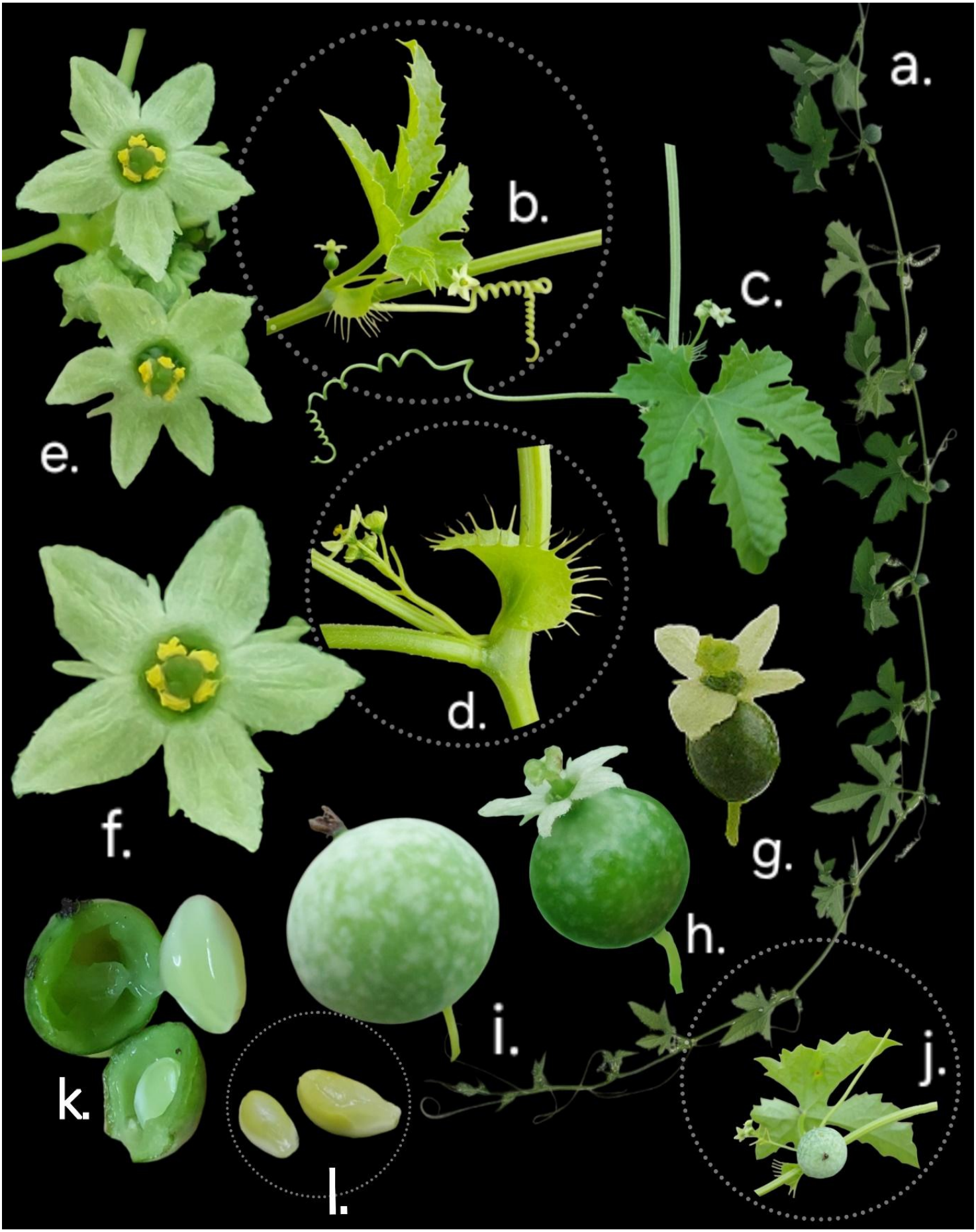

Figure 2. *Blastania cerasiformis* (Stocks) A. Meeuse a. Habit, b. Leaf, c. Tendril, d. Stipular bract e. Inflorescence and Flower f. Stamen, g., h., & j. Stages of fruit development I. Matured fruit k. Dehisced fruit l. Seeds

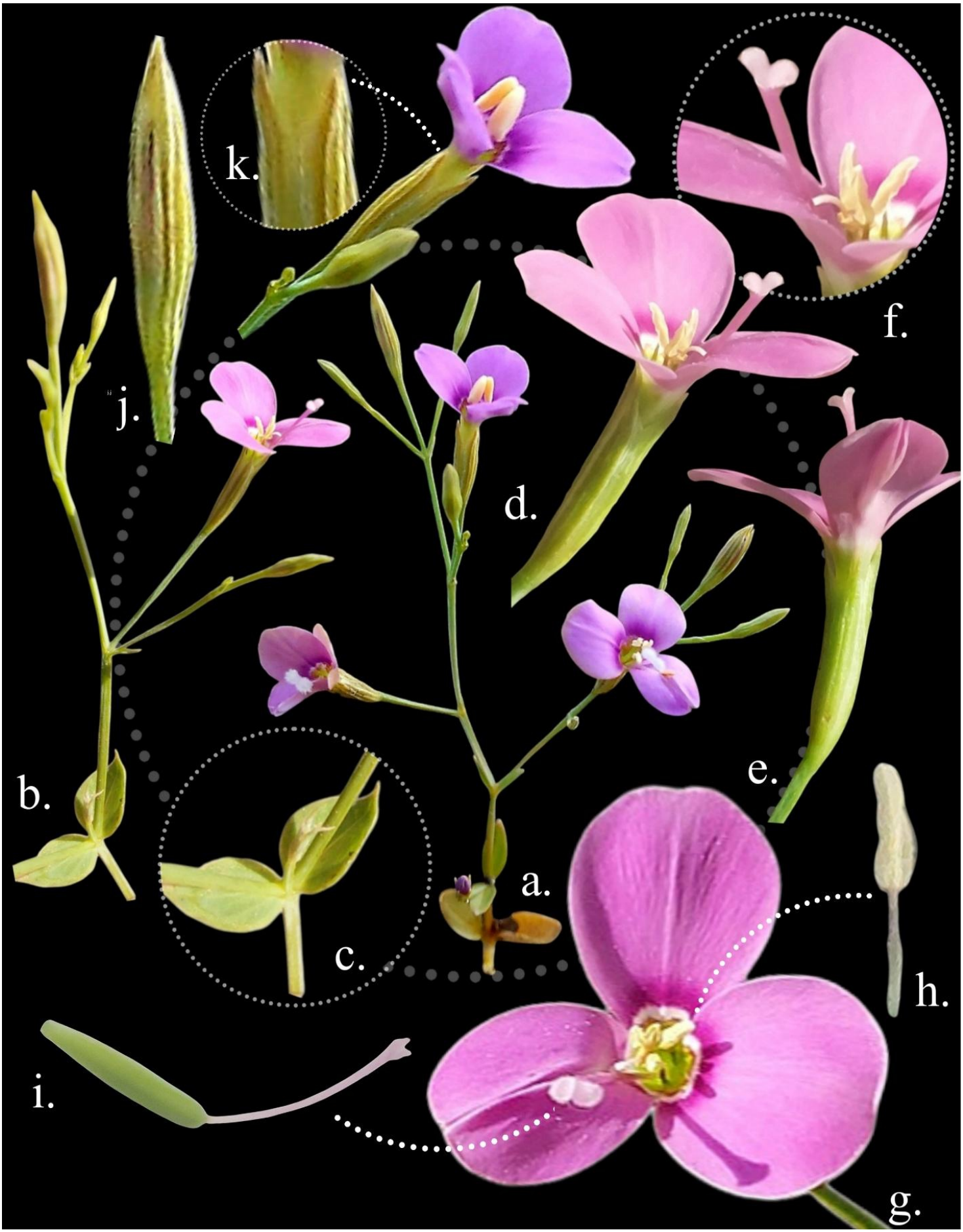

Figure 3. *Canscora tetraptera* (Naik & Pokle) Arun Pr. & Sardesai a. Habit, b. Branch, c. Leaves, d. Flower side view, e. Calyx f. Stamen & stigma, g. Flower top view h. Stamen i. Stigma j. Flower bud k. Calyx-winged enlarged

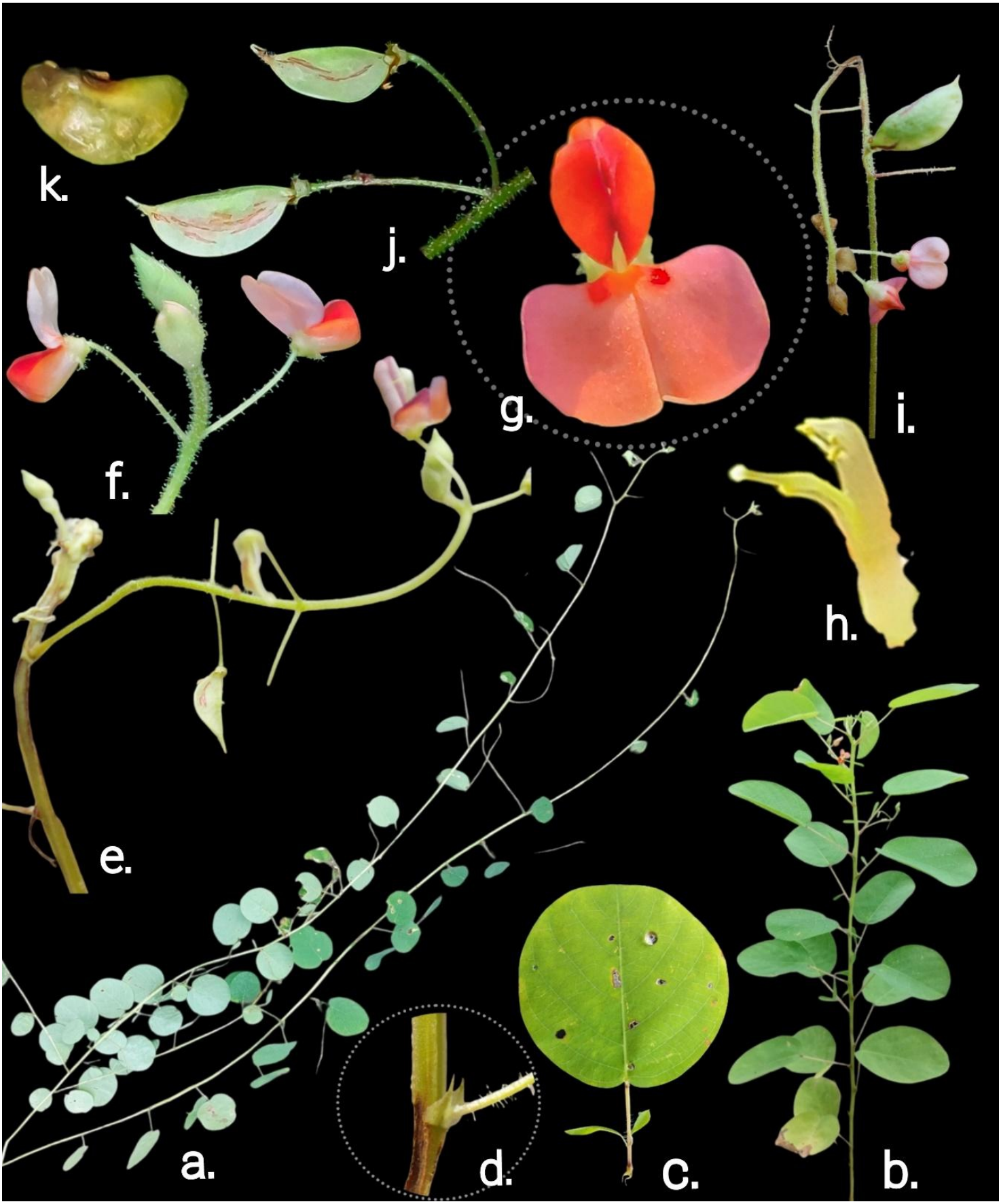

Figure 4. *Eleiotis soraria* (L.) DC. a. Habit, b. Twig, c. Leaf dorsal view with laterals, d. Angular stem & Stipule, e. Inflorescence pattern, f. Fascicle, g. Flower views, h. Reproductive organs, i. & j. Fruiting branch, & Immature pod, k. Seed.

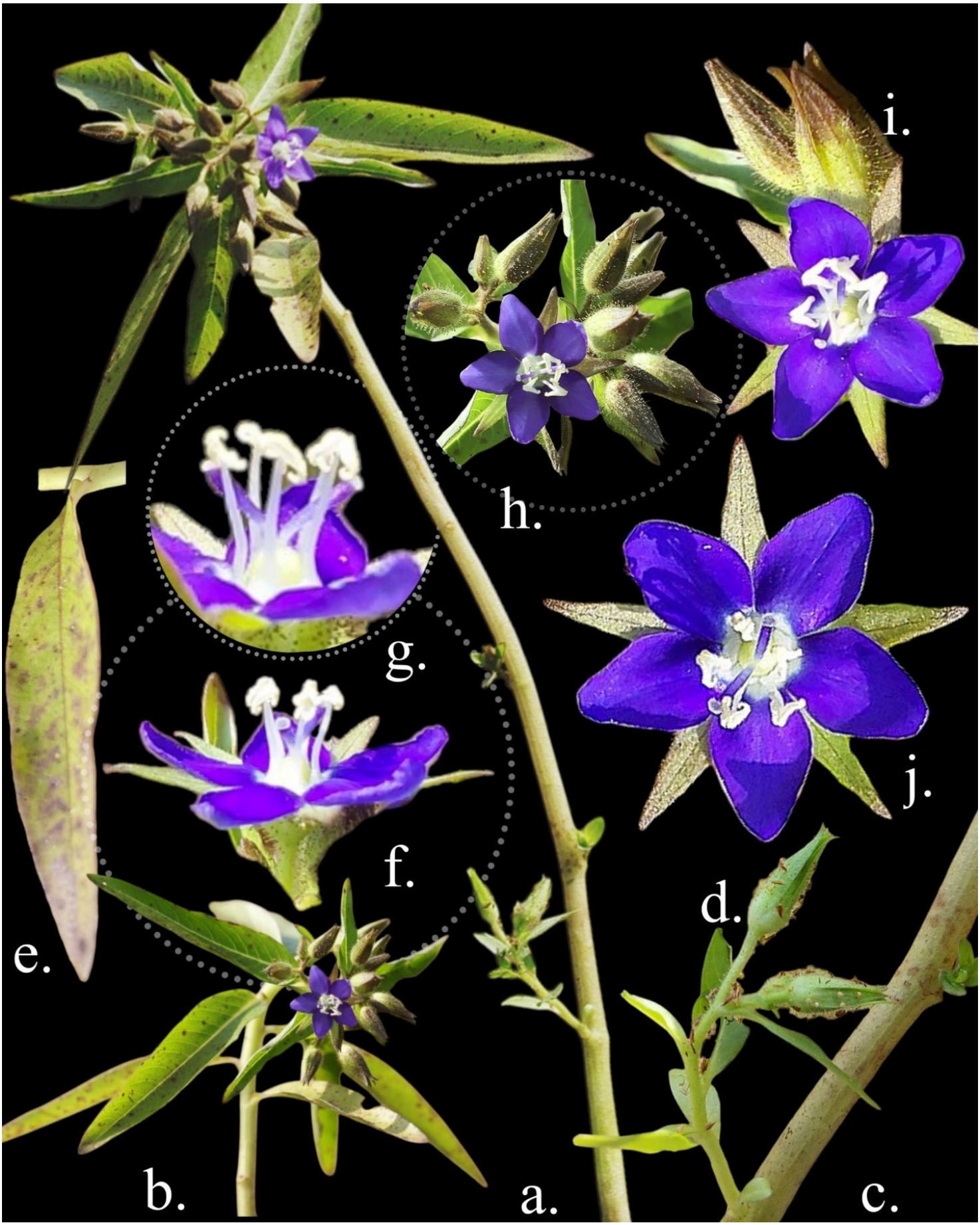

Figure 5. *Hydrolea zeylanica* (L.) Vahl. a. Habit, b. Twig, c. Stem d. Buds, e. Leaf f. flower side vies g. Stamens & stigma h. Inflorescence pattern, i. Calyx, j. Corolla,

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