

recting the Latin in the appropriate parts of the text. My thanks are also due to the Rev. Fr. H. Santapau for his encouragement.

M. P. NAYAR

Botanical Survey of India, Calcutta

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UTRICULARIA ROSEO-PURPUREA STAPF EX GAMBLE (LENTIBULARIACEAE)— A LITTLE KNOWN SPECIES

J. S. Gamble, in his *Notes on the flora of Madras* (Kew Bull. 1924: 237, 1924), with reference to the genus *Utricularia*, points out: "It is much to be hoped that Indian collectors will disentangle their specimens carefully in future so that the characters of the leaves and the little bladders may be recorded and if possible carefully drawn. Very few of the sheets of the collections dealt with had any notes on these points, and even notes of the colours of the flowers were almost invariably wanting". Keeping in mind Gamble's remarks, materials for a monograph of the Indian *Utricularias* are being gathered. Since properly preserved collections of *U. roseo-purpurea* were recently available, and along with authentic (matched with the *Type* at KEW) herbarium specimens of this species present in MH and CAL, it was found that additional information could be provided particularly on the leaves, bladders, fruits and seeds of this little known species hitherto reported only from S. India (W. Ghats) and Ceylon.

Utricularia roseo-purpurea Stapf ex Gamble, Fl. Pres. Madras 983, 1924; Alston in Trimen, Handb. Fl. Cey. 6 (Suppl.): 219, 1931. *U. rosea* auct. non Edgew. 1848; Oliver in J. Linn. Soc. Lond., Bot. 3: 184, 1859 p.p.; Clarke in Hk. f. Fl. Brit. India 4: 333, 1884.

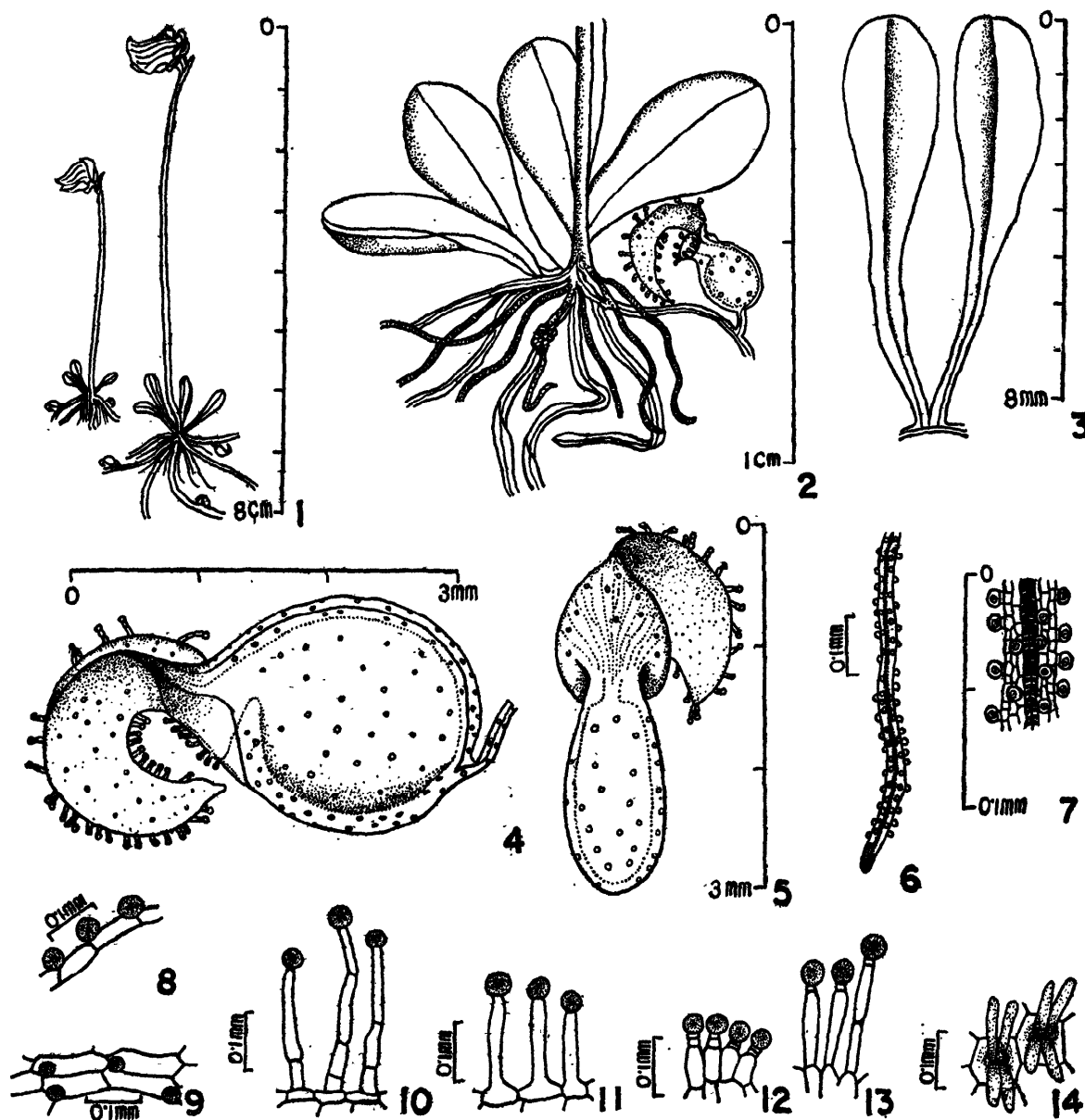
Terrestrial herbs; roots numerous, fasciculate at base of the scape, capillary, simple; stolons many from base of the scape, capillary, branched. Leaves including petioles up to 11 mm long, numerous, conspicuous at anthesis, more or less rosulate from base of the scape and scattered along stolons, spathulate; lamina 3.5 × 1.2 mm, 1-nerved, apex rounded, base tapering gradually into a filiform petiole. Traps including stalks 3.5 mm long, 1.2 mm in diameter, scattered on stolons and rarely on petioles, oval, short-stalked, eccentrically attached; mouth

terminal, arched over by a sickle-shaped upper lip with multicellular stalked glands. Inflorescence 6-20 cm tall, erect, straight; scape filiform, glabrous; flowers 1-6, sparsely arranged along upper half of the scape; scales few, medifixed, similar to bracts; bracts 2-3 mm long, medifixed, upper part oblong-lanceate, acute or obtuse, lower part shorter, triangular ovate; bracteoles similar to bracts but slightly narrower; pedicels minute, filiform, not recurved in fruit. Calyx lobes distinctly unequal, accrescent; upper lobe 2.5 × 3.6 mm at anthesis, broadly ovate or triangular ovate, obtuse at apex, 7-9 nerved, mid-nerve forked at apex; lower 2.4 × 2.3.5 mm, obovate to suborbicular, notched at apex, 8-9 nerved. Corolla pale-violet to pinkish with a yellow spot on the palate; upper lip 7.8 × 4.5 mm, broadly obovate or obcordate, semi-orbicular towards base, more or less retuse at apex, open and sparsely reticulately veined; lower 8.9 × 9.10 mm, broadly orbicular or subquadrate, rounded at apex, open and sparsely reticulately veined; spur 6.6.5 × 3.4 mm, subulate, straight, shorter than the lower lip, obtuse at apex. Stamens 2; filaments ± 1 mm long, filiform; anther-thecae subdistinct. Ovary globose, adnate to the base of upper calyx lobe; style short; stigma with lower lip semi-orbicular and upper lip obsolete. Capsules 3.4 mm in diameter, globose, dorsiventrally compressed, dehiscing by a vertical slit. Seeds many, minute, ellipsoid to obovoid; testa reticulate, minutely tuberculate (Figs. 1-39).

Glands: These are present on the vegetative parts of the plant and are of two types: unicellular and multicellular. The unicellular glands are rounded, sessile (Figs. 4, 8, 9) and are distributed on the surface of the stolon, trap and its stalk. In addition, multicellular glandular hairs or trichomes are found on the various parts of the trap; along the outer surface of the sickle-shaped lip these hairs or trichomes have stalks, each made up of three or

four cells, supporting a rounded glandular head containing dense granular cytoplasm (Fig. 10); the trichomes on the inner surface of the lip, how-

ever, have unicellular stalks (Fig. 11); the glandular trichomes along the rim of the mouth are longer and the penultimate cells supporting the glandular



Utricularia roseo-purpurea Stapf ex Gamble

Figs. 1-14: 1. Flowering plants. 2. Base of flowering scape showing stolons, roots, leaves and traps. 3. Leaves. 4-5. Traps—lateral and top views. 6. Root. 7. Portion of root enlarged showing minute button-shaped glands and vascular strand. 8-9. Sessile glands. 10-13. Multicellular glandular hairs on various parts of trap. 14. Quadrifids.

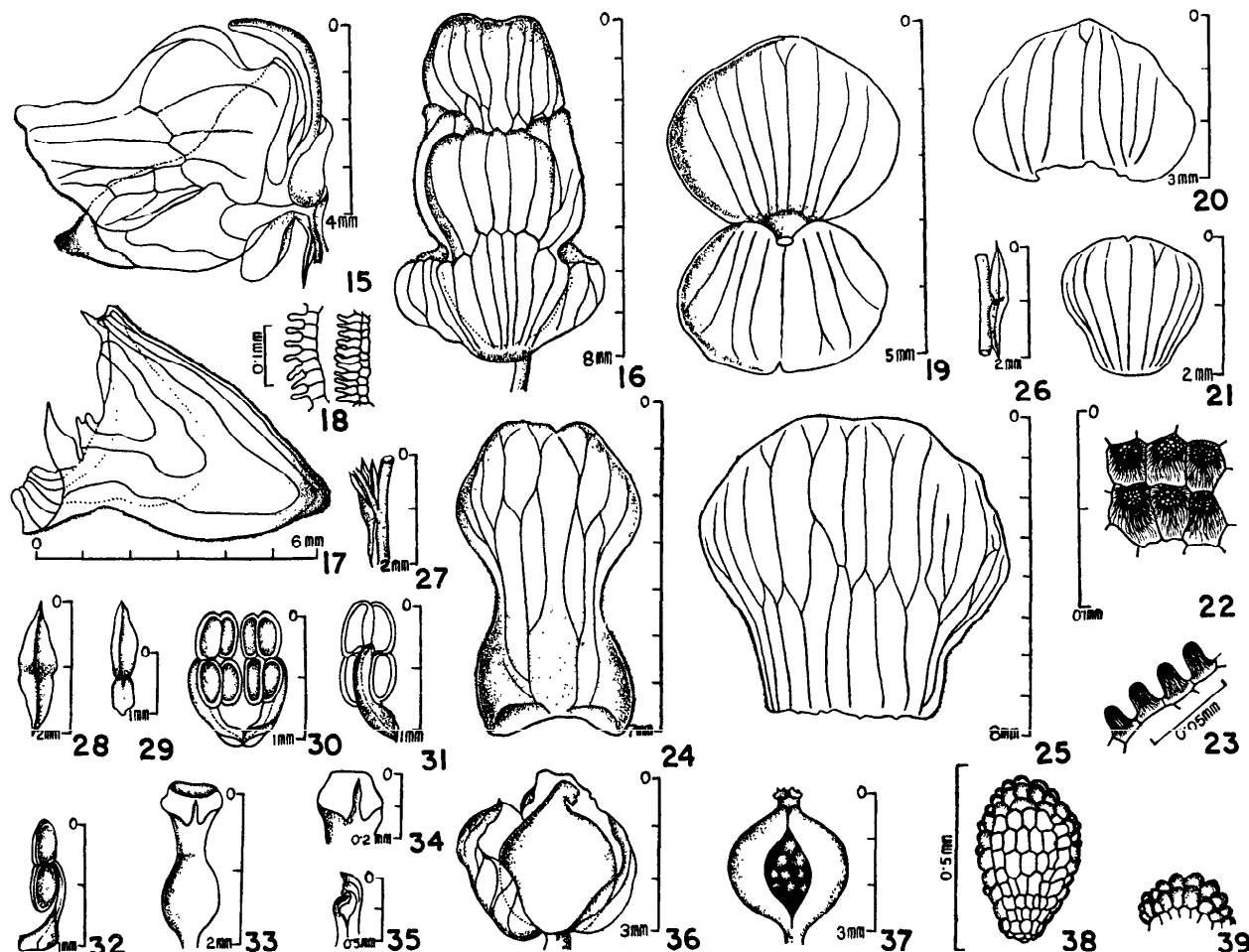
heads are small and rectangular in outline (Fig. 13); those along the inner surface of the mouth have short stalks and the glandular heads are supported

by a pair of superposed rectangular cells (Fig. 12). Lining the inner wall and facing the cavity of the trap, there are digestive glands, four in number,

called the quadrifids (Fig. 14). These are finger-shaped, radially arranged and enclose granular contents.

The apical regions of the roots resemble 'root tips' (Fig. 6); externally they are beset with numerous short-stalked, button-shaped glands (Figs. 6, 7).

Epidermal outgrowths: Minute, blunt, tubercular epidermal outgrowths are found on the outer surface of the sepals; these show delicate striations traversing from the apex towards the base (Fig. 23); at the apex these striations present a reticulate appearance (Fig. 22). Minute hairs, epidermal in ori-



Utricularia roseo-purpurea Stapf ex Gamble

Figs. 15-39: 15. Flower—lateral view. 16. Flower—abaxial view. 17. Spur—lateral view. 18. Hairs on outer surface of lower lip of corolla and spur. 19. Calyx—in flower. 20. Upper calyx lobe. 21. Lower calyx lobe. 22 & 23. Tubercular epidermal outgrowths on outer surface of sepal, showing striations. 24 & 25. Upper and lower lips of corolla. 26. Scale leaf on scape. 27. Base of pedicel with bract and bracteoles. 28. Bract. 29. Bracteole. 30-32. Front, back and side views of stamens. 33. Pistil. 34 & 35. Stigma—front and lateral views. 36. Capsule with persistent calyx. 37. Dehiscing capsule exposing seeds. 38. Seed. 39. Tubercles of seed enlarged.

gin, are present on the outer surface of the upper (Fig. 24) and lower lips (Figs. 17, 24) of corolla and spur (Figs. 15, 17); they are closely arranged on the spur (Fig. 18).

Specimens examined: KERALA STATE: Kottayam Dt.: Devicolam, 12 Oct. 1963, K. M. Sebastine 17542 (MH); Umaiya Malai, 17 Nov. 1965, B. V. Shetty 26486 (MH); Devicolam, Dec. 1909, A. Meeboldt

13517 (CAL). MADRAS STATE: Coimbatore Dt.: Paralai, Anamalais, 7 Nov. 1901, C. A. Barber 3982 (MH); Iyerpadi, Anamalais, 10 Nov. 1901, C. A. Barber 4025 (MH); Attakatti, Anamalais, 25 Jan. 1962, J. Joseph 13565 (MH).

Among Indian Utricularias, this species is allied to *U. caerulea* Linn., but can be differentiated as follows:

Flowers small; spur longer than the lower lip of the corolla, curved upwards, acute. Seeds more than 0.5 mm in diameter, reticulate ... *U. caerulea*

Flowers large; spur shorter than the lower lip of the corolla, straight, obtuse. Seeds less than 0.5 mm in diameter, reticulate and minutely tuberculate ... *U. roseo-purpurea*

During the course of this investigation it was noticed that a new combination was required for an Indian *Utricularia*.

Utricularia scandens Benj. subsp. *scandens* var. *firmula* (Oliver) Subr. & Baner. comb. nov. *U.*

wallichiana Wt. var. *firmula* Oliver in J. Linn. Soc. 3: 182, 1859; Clarke in Hk. f. Fl. Brit. India 4: 333, 1884.

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K. SUBRAMANYAM AND L. K. BANERJEE
Botanical Survey of India, Calcutta

A NEW SPECIES OF *MANISURIS* LINN. (POACEAE) FROM GOA

Manisuris goaensis Rolla Rao et Hem. sp. nov.

Proxime affinis *M. talbotii*, a qua tamen differt racemis angustis cylindricis, et articulatione typice glaciiori ad basin cuiusque paris spicularum.

Gramen annuum, caespitosum; culmi 20-35 cm alti, graciles, primo longo-pilosi ad nodos, tandem glabri. Lamina 3.8 × 0.2-0.4 cm, linearis, incurvata, parce longo-pilosa supra, glabra infra; vagina 2.5-5 × 0.4-0.6 cm glabra utrimque; ligulae scariosae ad 0.25 cm longae, plus minusve laceratae ad apicem. Racemi solitarii, cylindrici, 3.5-7 cm longi; pedunculi parce vestiti capillis longis patentibus, tandem glabri; rachidum articulationes, 1.5-3 × 1.5 mm glabrae vel pilosae ad medium, dimidio superiore tumido. Spiculae sessiles: Gluma inferior coriacea, ovato-lanceolata, 9-14 mm longa (arista inclusa), 1.5-2.5 mm lata, dorso levi, glabro vel puberulo, transverse alte biporcata prope basin (porcis uno alteri deorsum insidente, glabris vel penitus pilosis densius vero ad apices sursum curvatos) inaequaliter alata utrimque ad margines desinens in aristam 5-8 mm longam; arista scabra et raro bifida. Gluma superior ± 3 × 1 mm, ovato-oblonga, membranacea, uninervia, ad apicem alata; flosculus inferior staminatus, antheris maturis ± 1 mm longis; lemma hyalinum, ovato-oblongum, ± 2.75 × 1.2 mm; flosculus superior bisexualis; antherae ± 1 mm longae; styli bini; stigmata plumosa; lemma paulo minus; paleae inferioris et superioris flosculorum identicae, hyalinae, ovatae, ± 2 × 0.75 mm. Spiculae pedicellatae: Pedicellus 2-3 mm longus, secus rachidem fusus sed distinctus; gluma inferior 8-13 mm longa (arista inclusa), 1.5-2.1 mm lata, coriacea, ad dorsum levis, glabra vel

puberula, alata ad unum marginem; ala 3-5 mm longa, disensens in aristam scabram ad 4-6 mm longam; gluma superior (ala inclusa) 3-4 mm longa, ± 1 mm lata, membranacea, navicularis, alata ad dorsum et desinens in aristam scabram 3 mm longam; flosculus inferior staminatus; antherae ± 1.5 mm longae; lemma oblongum, hyalinum ± 2.75 × 0.9 mm flosculus superior staminatus vel vacuus, raro bisexualis, seminibus nullis productis; lemma paulo minus; paleae inferioris et superioris flosculorum ovato-oblongae, hyalinae, 2.1 × 0.6 mm. Grana brunnea, subglobosa, lateraliter compressa, ± 1 mm diam.

Typus lectus prope vicum Verna in ditone Goa, die 8 novembris anni 1962 et positus sub numero Rolla Rao 84474A in CAL; isotypi Rolla Rao 84474 B-C positi in BSI; D in K; E in L. Paratypus Rolla Rao 92850A lectus ad Porvorim in ditone Goa die 8 novembris 1963 et positus in CAL; caeteri B in BSI; C in GH.

Manisuris goaensis Rolla Rao et Hem. sp. nov.
(Figs. 1-24).

The species is closely allied to *Manisuris talbotii* but distinct from it by its narrow cylindrical raceme and thinner characteristically shaped joint at the base of each pair of spikelets.

An annual tufted grass; culms 20-35 cm tall, slender, long hairy at nodes at first, glabrous at length. Leaf blade 3.8 × 0.2-0.4 cm, linear, incurved, sparsely long hairy above, glabrous beneath; sheath 2.5-5 × 0.4-0.6 cm, glabrous within and without; ligules scarious upto 0.25 cm long, more or less lacerated at apex. Raceme solitary cylindrical