

## A NEW SPECIES OF *BRACHYSTEMMA* (ASCLEPIADACEAE) FROM INDIA

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*Brachystelma ciliatum* Arekal et Ramakrishna sp. nov.,  
described from Karnataka, South India.

*Brachystelma laevigatum* Hook f., affinis, tamen  
different characteribus sequentibus: foliis lineari-  
lanceolatis, acuminatis, patentibus; floribus 6–8 mm  
dia., pedicellis 15–20 mm longis; corollis basi mem-  
branaceis, apice ciliatis et incurvatis, ciliis 6–12,  
1–1.5 mm longis; lobis coronae exterioribus orbic-  
ularis maculisque purpurascensibus.

Allied to *B. laevigatum* Hook. f., but differs from it  
in the following characters: leaves linear-lanceolate,  
acuminate, spreading; flowers 6–8 mm dia., pedicels  
15–20 mm long; corolla base membranous, tip incur-  
ved, apex ciliate; cilia 6–12, 1–1.5 mm long; outer  
corona lobes orbicular with purplish spots.

Holotype *Ramakrishna* 1311 A and isotypes *Rama-  
krishna* 1311 B–F were collected from Sonnipally,  
Kolar District, Karnataka State, India, at an altitude  
of 920 m on 27 June 1979. Holotype deposited in  
CAL and isotype *Ramakrishna* 1311 B in K and  
*Ramakrishna* 1311 C–F and paratypes *Ramakrishna*  
and *Arekal* 1340 A–E collected on 24 August 1979  
deposited at Post-Graduate Department of Botany,  
Manasagangotri, Mysore.

Geophytes with ovate to discoid tubers; tubers  
brownish fleshy 2–4 cm dia.; stems erect, 6–40 cm  
tall, unbranched to sparsely branched with watery  
sap, puberulous; hairs uniseriate, uni- or multicellular,  
tapering; buried part of stem smooth and colourless;  
aerial part purplish with pale opposite deltoid leaf  
scales, up to 2 mm long; leaf scars prominent. Leaves  
sessile or subsessile, variable in size, 20–60 × 1–2 mm,  
linear to linear-lanceolate, acuminate; midrib puberu-  
lous beneath, narrowly grooved above. Inflorescence  
axillary sessile umbels, 2–4 flowered, drooping; pedi-  
cels filiform 15–20 mm long, puberulous, becoming  
erect and stout after fertilization; bracts about 1.5 mm  
long; bracteoles 1 mm long, linear, purplish; calyx  
5-fid, lobes 1.5 × 3 mm, ovate, acute, purplish, puberu-  
lent outside; corolla 5-partite, reflexed, free up to  
two-thirds way down; lobes ovate, 1.5–2 × 1 mm,  
base glabrous, sepaloïd; apex violet, subacute, incurved,  
ciliate; cilia 6–12, 1–1.5 mm long, elongate, surface

ornamented; corona 2-seriate, glabrous, adnate to  
base of staminal column, 2 mm dia.; outer corona  
cupular, 0.75 × 2 mm, with 10 (5-bifid) short orbicular  
lobes; inner corona arising from inner margins of  
outer corona with 5 broad lobes, appearing to form  
one series with them, ovate; apices subacute, over-  
topping and incompletely covering anthers; anthers  
flattened incumbent over the stigmatic head, yellow,  
apex truncate; thecae lateral; pollinia about 0.02 mm  
long ovate-oblong; inner margins winged; corpus-  
culum dark-brown; caudicles tubular. Ovary carpels  
free, glabrous; stigmatic head pentangular, convex  
above, pale-yellowish; margins thin. Follicles single  
or paired, 5–9 cm long, glabrous, erect and divergent;  
seeds 7 × 2 mm, with central dark embryonic region;  
outer margin hyaline, comose; hairs white, 1.2 cm  
long (Fig. 1, A–J).

Chromosome Number :  $2n = 22$

Field Notes : This species has been found to occur  
in about a stretch of 7 sq. km area of a scrub jungle,  
usually associated with short grasses and among dicoty-  
ledons like *Canthium parviflorum* Lam. and *Dodonaea  
viscosa* (Linn.) Jacq. Not common. In the long dry

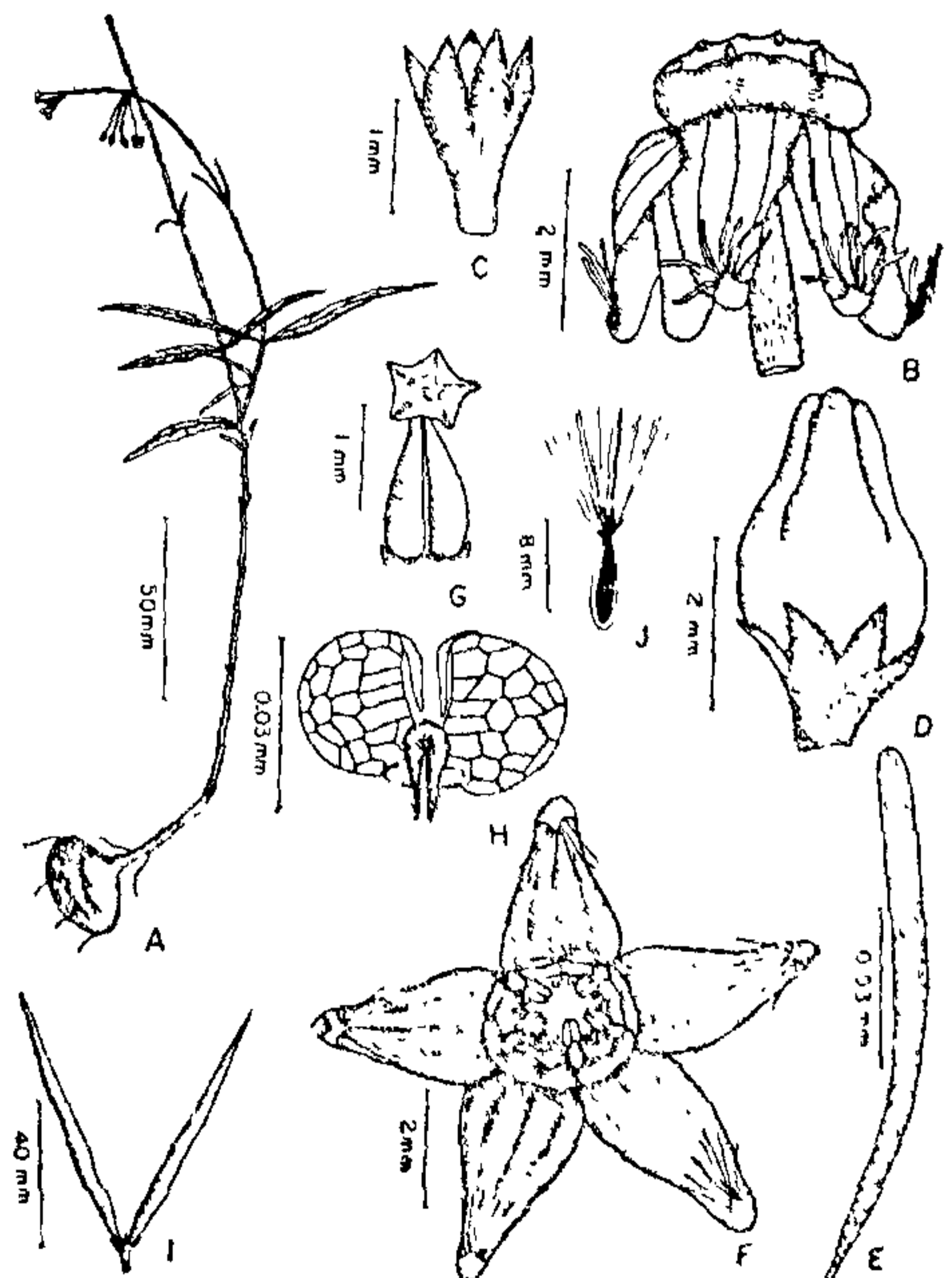


FIG. 1, A–J. A. Flowering plant. B. Flower. C. Calyx. D. Flower bud. E. Cilium with ornamentation. F. Flower, top view. G. Gynoecium. H. Pollinia. I. Follicles. J. Seed.



season, no trace of the plant could be seen above ground. The tubers, called in the Telugu language "Potha Jougu Nimatayalu", are eaten by local people.

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### STRUCTURE AND ONTOGENY OF STOMATA ON THE PERICARP OF *ANETHUM GRAVEOLENS* LINN.

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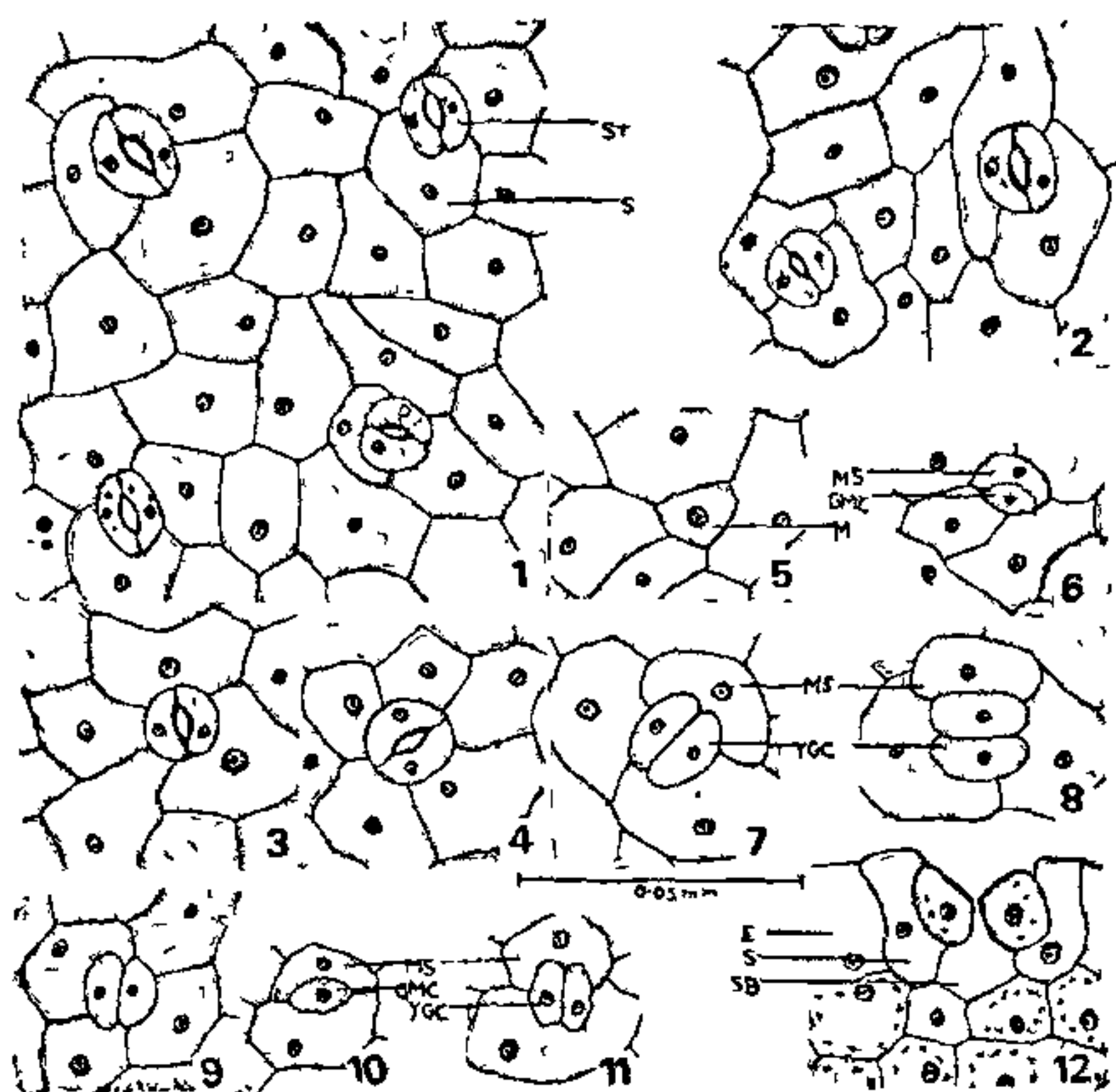
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WHILE literature regarding stomata on vegetative parts in Umbelliferae<sup>3</sup> is available, information regarding the stomatal studies on floral parts<sup>2</sup> is meagre. The present paper deals with the structure and development of stomata on the pericarp of *Anethum graveolens* Linn.

Study of peel mounts of pericarp has revealed three types of stomata: Aperiogenous, Anisomesoperigenous and Diamesoperigenous<sup>1</sup> (Figs. 1-4). The epidermal cells are polygonal or rectangular elongated in various directions (Fig. 1). Stomata are oval and elliptical in shape with average size  $18.75 \times 14.87 \mu$ . The stomata are located at level with the outer epidermis having sub-stomatal cavities (Fig. 12). The meristemoids lie amongst the epidermal cells with dense cytoplasm and conspicuous nuclei (Fig. 5).

In Aperiogenous type, the meristemoid cell cuts off no subsidiary cell but metamorphoses directly into a guard mother cell. The latter undergoes a vertical division giving rise to two guard cells (Fig. 9). The stomata thus formed are surrounded by 4 to 5 epidermal cells (Figs. 3-4).

In Anisomesoperigenous type, the meristemoid cell divides by a curved wall resulting in a smaller triangular and a larger rectangular cell (Fig. 6). The larger rectangular cell metamorphoses into a subsidiary cell which is, thus, mesogenous in origin. The other two subsidiary cells are contributed by the epidermis and are, therefore, perigenous. Central cell (g.m.c.) undergoes division by a straight wall resulting in a pair of young guard cells. The division of the g.m.c. may be at right angles to the mesogene, parallel to it (Figs. 7,



FIGS. 1-12. Figs. 1-4. Anisomesoperigenous, Diamesoperigenous and Aperiogenous stomata. Figs. 5-8. Stages in development of Anisomesoperigenous stomata. Fig. 9. Young guard cells in Aperiogenous stomata. Figs. 10-11. Development of Diamesoperigenous stomata. Fig. 12. A stoma with sub-stomatal cavity (in T.S. of pericarp). (S—Subsidiary cell; M—Meristemoid; E—Epidermal cell; ST—Stomata; SB—Sub-stomatal cavity; MS—Mesogene; GMS—Guard mother cell; YGS—Young guard cell).

8) or in between the two, thus resulting in different orientation of the guard cells (Fig. 1). Eventually the young guard cells assume the characteristic crescentic shape.

In the case of Diamesoperigenous stomates, the meristemoid divides by a curved wall into two cells, the smaller one behaving as g.m.c. and the larger forming the first subsidiary cell (Fig. 10). The second subsidiary cell is perigenous in origin (Figs. 10-11). The g.m.c., enlarges and forms two young guard cells by a single vertical division (Fig. 11).

The stomatal index and stomatal frequency are 10.5% and 56.8% per  $\text{mm}^2$  and the percentage of Aperiogenous, Anisomesoperigenous and Diamesoperigenous stomates is 55.5, 10.00, 12.6 respectively.

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1. Fryns Claessens, E. and Van-Cotthem, W., "A new classification of the ontogenetic types of stomata," *Bot. Rev.*, 1973, 39, 71.