

***THESMOPHORA*, A NEW GENUS OF STILBACEAE
FROM SOUTH AFRICA**

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Thesmophora scopulosa Rourke (Stilbaceae) a monotypic genus endemic to the Ceres mountains, South Western Cape Province, South Africa, is described. It is characterized particularly by its pendulous ovules and 4-lobed corolla.

INTRODUCTION

The Cape endemic family Stilbaceae was originally established by Kunth in 1831 to accommodate *Stilbe* Berg. and the newly described *Campylostachys* Kunth, both of which had previously been associated with either the Globulariaceae or Selaginaceae (Kunth, 1831).

Subsequently, other genera were placed in the Stilbaceae, namely *Eurylobium* Hochst., *Euthystachys* A. DC. and *Xeroplana* Briq. In the most recent revision of the whole family eight species in five genera were recognized (Pearson, 1901:181–188). Since then a number of new species have been described in *Stilbe* (Gandoger, 1913: 25; Compton, 1944; Suessenguth, 1950: 56) and in *Xeroplana* (Rourke, 1977). Material of several more new and novel taxa has accumulated in herbaria during the past half century but has remained undescribed, possibly because the generic concepts are by no means clearly defined. In a review of the Stilbaceae at generic level Dyer remarked, 'several unidentified specimens appear to belong to undescribed species, the classification of which might necessitate the modification of generic limits. A thorough revision of the family is called for' (Dyer, 1975). This paper deals with one of these undescribed taxa that is morphologically so unlike any other genus in the family that I have placed it in a new monotypic genus, *Thesmophora*.

The issue as to whether the Stilbaceae should be accorded family rank or reduced to a tribe within the Verbenaceae in common with other segregates such as Chloanthaceae, Dicrastylidaceae, Nyctanthaceae etc. will be dealt with at a later stage when a thorough revision of the family has been completed. As Cronquist has remarked of these small segregate families: 'Their relationships are not in dispute, and the taxonomic rank at which they should be recognised is purely a matter of taste' (Cronquist, 1981). For the present, therefore, I follow Dyer (1975) and Dahlgren (1980) in recognizing the Stilbaceae at family level.

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Thesmophora Rourke, **gen. nov.**; calyce glabro actinomorpho 5-lobato; corolla bilabiata 4-lobata, lobis dense setosis, et ovario biloculari, loculis ovulo pendulo singulari tenentibus.

Type species: *Thesmophora scopulosa* Rourke.

Thesmophora scopulosa Rourke, **sp. nov.** Figs 1, 2.

Fruticulus nanus 150–300mm altus, suberectus, humifusus, petraeus. *Rami* manifeste quadriporecati, caespitibus pilosum inter citatrices foliorum. *Folia* ericoidea, sessilia, glabra, anguste lanceolata-acuta, 4–7mm longa, 1–1.2mm lata; margines serratae. *Inflorescentia* spica subterminalis 15–20mm longa, constans ex 20–35 floribus sessilibus. *Bracteae florales* duae, oppositae. *Calyx* tubularis, 5-lobatus, actinomorphus, 5mm longus glaber. *Corolla* tubularis, bilabiata, 4-lobata, 6mm longa; tubus glaber; lobi dense setosi; labium superum, amplum, galeatum, ovatum, rotundatum; labium inferum constans e lobis duobus lateralibus et lobo medio minuto. *Stamina* 4, parum exserta, medio corollae inserta. *Antherae* rotundatae, dorsifixae. *Ovarium* obconicum, minute stipitatum, glabrum, biloculare; loculi ovulo uno pendulo. *Stylus* rectus, glaber, filiformis, exigue exsertus, 3mm longus. *Stigma* minutum bilobum.

A dwarf, divaricate, ericoid shrublet 150–300mm in height with a single main stem, suberect to sprawling, usually growing in rock crevices. *Branches* slender, 1.5mm diam., prominently 4-ridged when young, later with lanate tufts between the leaf scars. *Leaves* ericoid, sessile, glabrous, in whorls of 4; very narrowly lanceolate-acute, 4–7mm long. 1–1.2mm broad, margins minutely serrate, apices mucronate; upper surface flattened, punctate, under surface convex with two parallel, longitudinal stomatal grooves. *Inflorescence* a subterminal spike, 15–20mm long, of 20–35 sessile flowers subtended by a glabrous foliaceous bract. *Floral bracts* two, opposite, glabrous, lanceolate-cymbiform, acute, prominently keeled. *Calyx* tubular, 5-lobed, actinomorphic, glabrous, 5mm long; lobes 1mm long, ovate-obtuse to rounded, apices incurved with a medium keel externally. *Corolla* 6mm long, tubular, 4-lobed, bilabiate; upper lip a greatly enlarged, ovate to rounded, galeate lobe; lower lip consisting of 2 equal lateral lobes, obtuse to rounded and a minute, acute, much reduced median lobe; tube slightly adaxially curved, infundibuliform, glabrous externally and internally; corolla lobes densely setose on outer surface. *Stamens* 4, slightly exserted, 3mm long, inserted in the corolla tube, alternating with lobes, posterior stamen absent; anthers 2-celled, rounded, dorsifixed. *Ovary* glabrous, obconic, laterally compressed, minutely stipitate, the apex prolonged into an asymmetrical, undulately lobed fleshy disc, cleft anteriorly and clasping style base; 2-chambered, each chamber with a single pendulous ovule arising from the top of the septum, one becoming abortive. *Style* glabrous straight filiform, 3mm long, slightly exserted. *Stigma* simple to minutely bilobed, apex papillate. *Mature seeds* not seen. Type: Slab Peak, Mitchell's Pass, Ceres Division, 5 x 1941, *E. Esterhuysen* 6170 (holo. BOL; iso. E, NBG, PRE, SAM).

This new genus, endemic to the mountains adjacent to the village of Ceres in the South Western Cape, is given the name *Thesmophora*, an epithet of the Greek goddess, Ceres.

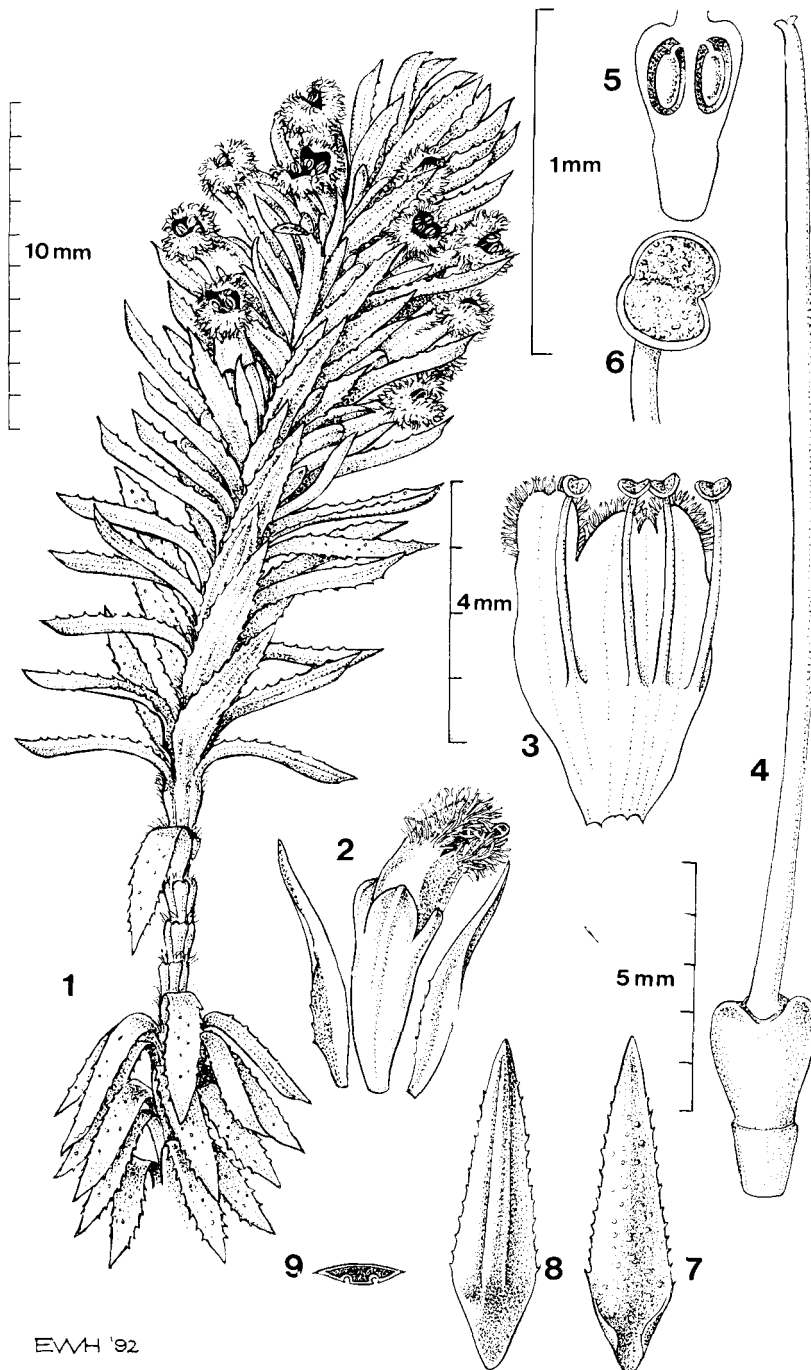


FIG. 1. *Thesmophora scopulosa* (Esterhuysen 6170). 1, Flowering spike; 2, mature flower, lateral view with floral bracts; 3, corolla opened longitudinally and flattened; 4, style, ovary and stipe; 5, lengthwise horizontal section through ovary; 6, anther; 7, leaf, adaxial surface; 8, leaf, abaxial surface; 9, leaf in cross-section.

DIAGNOSTIC CHARACTERS

Thesmophora is unique in the Stilbaceae in having a zygomorphic, bilabiate, 4-lobed corolla and a tubular, actinomorphic 5-lobed calyx. Moreover, the corolla tube is quite glabrous internally lacking the usual ring of pubescence in the throat of the corolla as is found in all other Stilbaceae with the exception of *Xeroplana gymnopharyngia* Rourke. The two-chambered ovary has a single pendulous ovule in each chamber whereas other Stilbaceae have basal ovules.

Campylostachys is the only other genus in the family with a 4-lobed corolla but the corolla is actinomorphic with four equal lobes. The calyx in *Campylostachys* also differs in that it is not tubular but consists of five free, equal sepals.

OVULE NUMBER AND POSITION

Most major systematic works that have dealt with the Stilbaceae refer to the ovules as being single and basal in each of the two locules e.g.:-'basal, erect, anatropous' (Pearson, 1901); 'mit 2 oder 1 afrechten anatropen Samenanlagen' (Melchior, 1964); 'ovule 1, erect' (Hutchinson, 1969) and as 'ovules erect, anatropous' (Dyer, 1975). In a revision of the small Stilbaceous genus *Xeroplana* the single functional locule was reported to have 'a solitary basal ovule' (Rourke, 1977).

Thus there appears to be general agreement that Stilbaceae have a bilocular ovary (frequently becoming unilocular by abortion) with a solitary ovule arising from a basal position in one or both of the locules. However, as the ovaries in most Stilbaceae are very small (0.5–1mm long), simple dissection is a difficult and unreliable method of establishing ovule number and position. Therefore the previous statements on locule arrangement, ovule number and position need careful checking by serial sectioning.

In *Thesmophora scopulosa*, serial transverse and longitudinal sections of wax-embedded material were used to investigate the very small (0.6–0.8mm long x 0.4–0.5mm wide) ovary. Initially, at anthesis, the minutely stipitate obconic ovary is bilocular with the septum placed vertically in relation to the axis. There is a single pendulous ovule in each chamber arising from the septum. In the post-pollination phase one ovule aborts. This may be equally in either the right or left locule. The remaining ovule and its associated locule then enlarges, allowing for the development of a single seed. Thus, *Thesmophora* deviates significantly from the usual pattern in the Stilbaceae in having pendulous rather than basal ovules (Fig. 2).

RELATIONSHIPS

At first sight *Thesmophora* appears to be most closely allied to *Campylostachys* as they share the unusual character of a four-lobed corolla. (All other genera in the Stilbaceae have five-lobed corollas). There, however, the similarity ends for there are major differences between *Thesmophora* and *Campylostachys*, such as the strongly bilabiate, zygomorphic corolla in *Thesmophora* compared with the completely regular, actinomorphic corolla of *Campylostachys*, and also the absence of a ring of pubescence in the throat of the corolla in *Thesmophora*. Moreover, the sepals are completely free in *Campylostachys* but are fused for the greater part of their length to form a tube in *Thesmophora*.

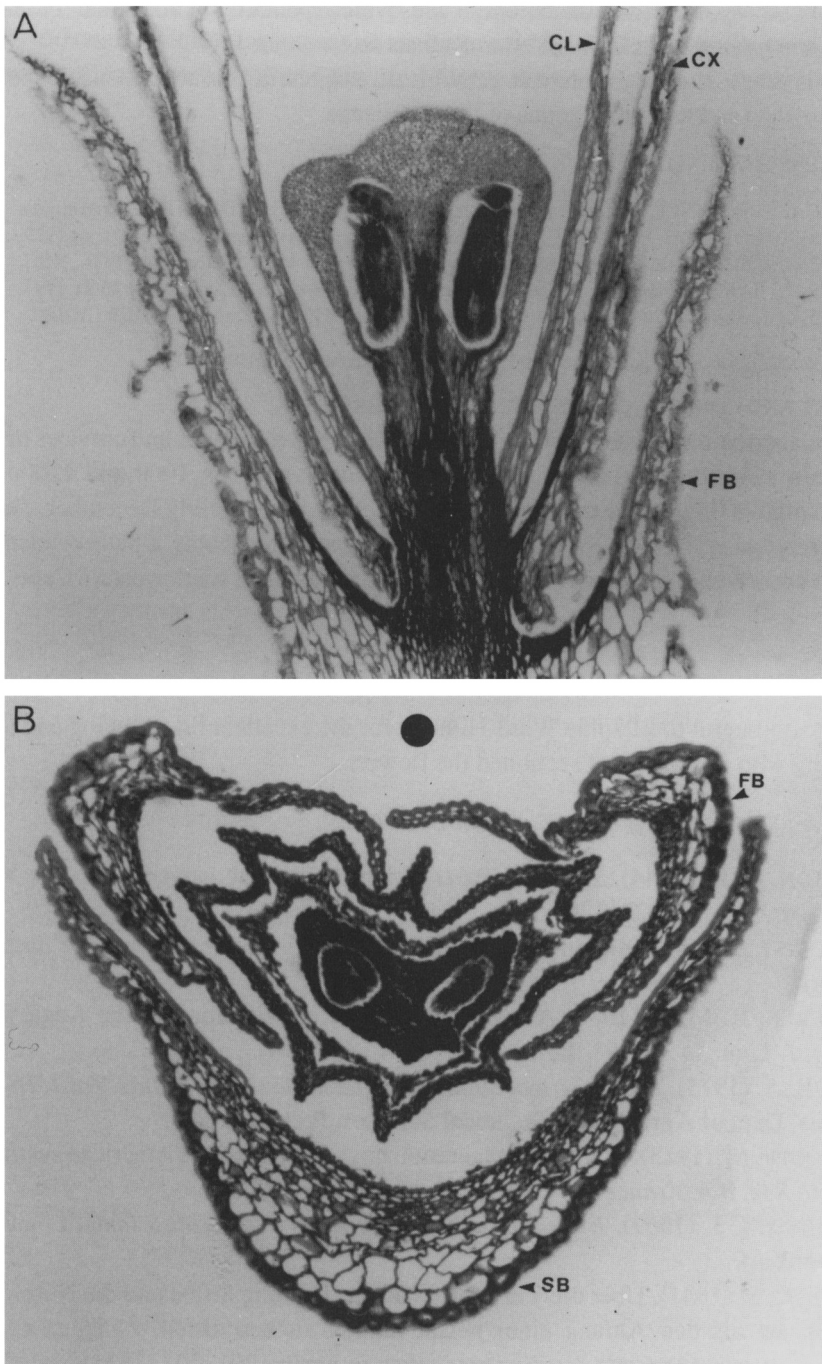


FIG. 2. *Thesmophora scopulosa* (Esterhuysen 6170). A, longitudinal horizontal section through base of flower showing pendulous attachment of ovules in the two-chambered stipitate ovary; B, transverse section through base of flower showing orientation of locules in relation to axis. CL, corolla; CX, calyx; FB, floral bract; SB, subsiding bract.

The markedly different attachment of the ovules (pendulous rather than basal) also sets *Thesmophora* apart from all other Stilbaceae.

At this stage it is therefore not possible to suggest a close relationship between *Thesmophora* and any other genus of the Stilbaceae.

SPECIMENS EXAMINED

CAPE PROVINCE. 3319 (Worcester): Slab Peak, Michells Pass (-AD), 5 x 1941, *Esterhuysen* 6170 (BOL, NBG, PRE, SAM); mountains overlooking Ceres, Castle Rock (-AD), xii 1929, *Stokoe* 2050 (BOL, K, PRE); Skeldeberg, Ceres (-AD), xii 1931, *Stokoe* 2640 (BOL, NBG, PRE, SAM); Castle rocks, near Ceres; rock crevices in cliffs on west side, 16 xi 1947, *Esterhuysen* 14157 (BOL); Ceres Wild Flower show, x 1937, comm. *Stokoe* 6479 (BOL).

Doubtful Locality: Kamiesberg, x 1929, *Stokoe* s.n. in herb. Marloth (PRE).

HABITAT AND CONSERVATION STATUS

This small ericoid shrublet, is a rock dweller growing in the cracks and crevices of Table Mountain sandstone cliffs or outcrops, at elevations between 1000 and 1200m. The pinkish mauve flowers are produced between September and early December. *Thesmophora scopulosa* is a rare, extremely localized species (probably a palaeoendemic) at present known only from two peaks in the Ceres mountains, south western Cape, South Africa.

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