

***Stylidium costulatum* (Stylidiaceae), a new tropical species of triggerplant from the Kimberley, Western Australia and the lectotypification of *S. floodii***

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**Abstract**

Kenneally, Kevin F. and Lowrie, Allen. *Stylidium costulatum* (Stylidiaceae) a new tropical species of triggerplant from the Kimberley, Western Australia and the lectotypification of *S. floodii*. Nuytsia 9 (3): 343-349 (1994). A new species of *Stylidium* (Stylidiaceae) from the Kimberley Region, *S. costulatum* Lowrie and Kenneally is described and illustrated and *S. floodii*, its closest relative, is lectotypified. The terms *cunabulum* (for the dilated part of the column) and *torosus* (for the mobile column hinge) are proposed.

**Introduction**

A new species of tropical triggerplant, *Stylidium costulatum*, an apparent Kimberley endemic is described in order to validate the name for use in a forthcoming book on the plants of Broome and the Dampier Peninsula. It was referred to as a variant of *S. floodii* F. Muell. in the "Flora of the Kimberley Region" (Wheeler *et al.* 1992).

Its nearest relative appears to be the northern Australian tropical triggerplant *S. floodii* F. Muell. (*sensu* lectotypification) described by Ferdinand von Mueller in 1859 from specimens that he collected in the Roper River area of Northern Territory during A.C. Gregory's North Australian Exploring Expedition (July 1855-December 1856). Examination of type material at the National Herbarium of Victoria (MEL) and the Royal Botanic Gardens, Kew (K) revealed that the collection represents more than one taxon, necessitating lectotypification of *S. floodii*.

**Taxonomy**

***Stylidium costulatum* Kenneally and Lowrie, sp. nov. (Figures 1-3)**

Differt a *S. floodii* labello glabro, appendicibus faucis binatis, columna dilatata lorata, hypanthio manifeste costato, sepalis 5 duobus connatis.

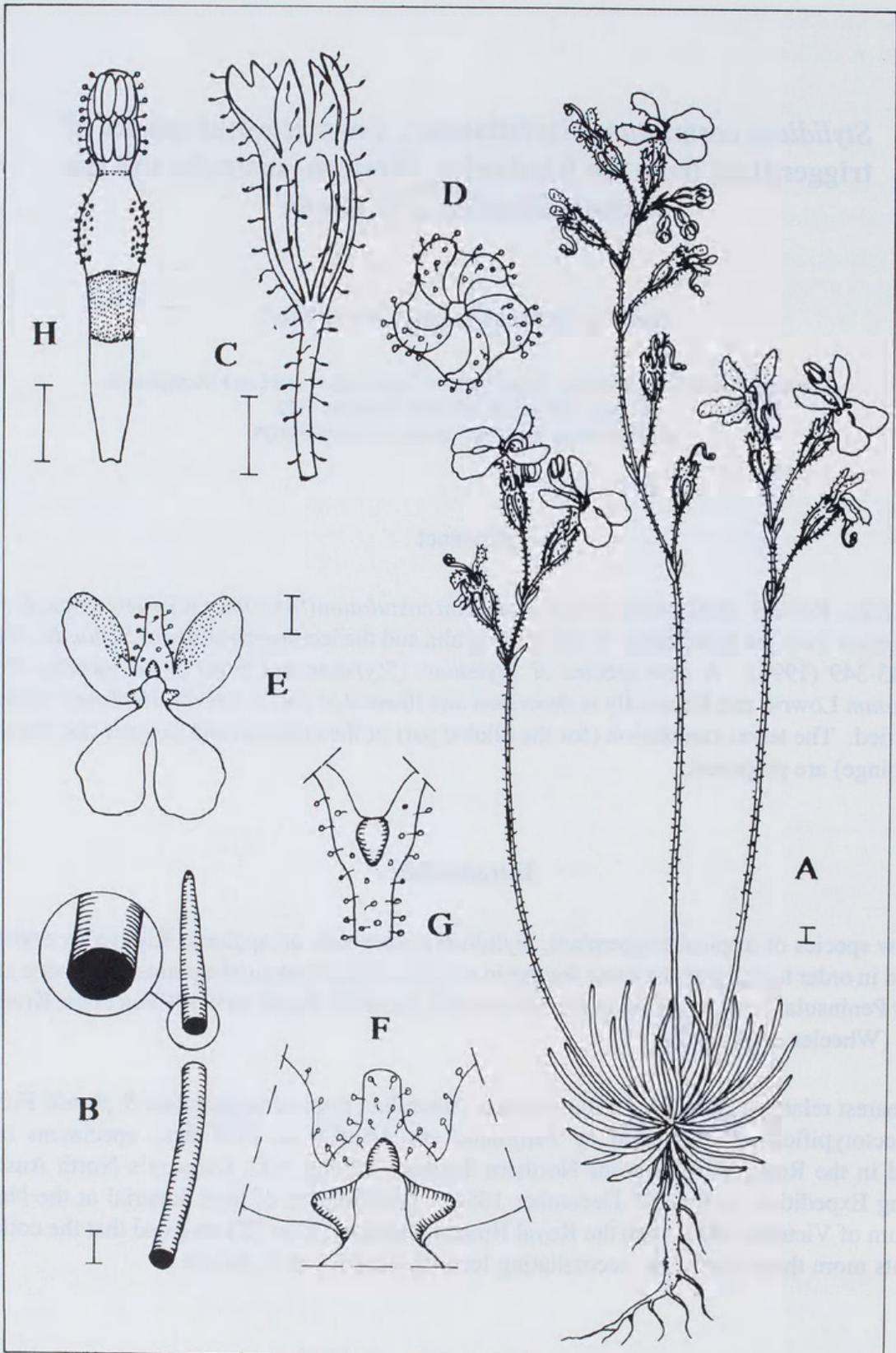


Figure 1. *Strylidium costulatum*. A - flowering plant; B - leaf of basal tuft; C - hypanthium showing glandular hairs on ribs and fusion of two sepals almost to apex; D - enlarged view of base of hypanthium showing helical ribs; E - corolla; F - enlarged section of corolla showing throat appendages; G - enlarged section of corolla tube showing labellum on sinus; H - adaxial view of column and anthers showing hinged portion (dotted) immediately below anthers, the dilated cunabulum with marginal papillae and the sensitive torus (stippled). Scale bar = 1 mm. All from M.D. Barrett 17 (PERTH).

*Typus*: Wonganut Spring, 19 km ESE of Coulomb Point, Dampier Peninsula, 17°25'S 122°19'E, Western Australia, 18 June 1984, *K.F. Kenneally* 9054/A (holo: PERTH 03058271; iso: MEL).

*Erect* annual herb to 10 cm high; stem reddish, glabrous, lower leaves scattered and often caducous. Upper leaves in a terminal tuft which may appear basal when the stem is short. *Leaves* linear, 7-25 mm long, c. 0.7 mm wide, glabrous, acute. *Inflorescence* of many cymose racemes, with 1 flower in the fork, sparsely glandular-hairy. *Scape* reddish, slender, 20-80 mm long, glabrous at base, glandular-hairy above. *Bracts* narrowly lanceolate, 1-4 mm long, usually acute; pedicels slender, 3-8 mm long. *Hypanthium* obovoid, 2-2.5 mm long at anthesis, glandular-hairy along ribs, helically coiled upwards. *Sepals* oblong to elliptic, 1.5-2 mm long, glandular-hairy, 2 fused almost to the apex, 3 free to base. *Corolla* yellow, lobes vertically paired; anterior lobes orange at the tips, elliptic, 3 mm long, 1.5 mm wide; posterior lobes obovate, 4 mm long, 2 mm wide; abaxial surface glandular-hairy. *Throat* appendages 2, opposite. *Labellum* ovate, 0.4 mm long, 0.4 mm wide, attached to base of corolla tube sinus. *Column* strap-like, 5.7 mm long, hinged below the anthers, with a dilated cunabulum bearing short papillae along the margins above the sensitive torosus. *Capsule* obovoid, 4.5 mm long and 1.2 mm wide, slightly compressed, with small, distinct, glandular-hairy ribs. *Seeds* light brownish orange, 0.2 mm long.

*Other specimens examined*. WESTERN AUSTRALIA: Coolabah Creek, Beverley Springs Station, 14 May 1992, *M.D. Barrett* 17 (PERTH); Wonganut Spring, 19 km ESE of Coulomb Point, Dampier Peninsula, 18 June 1984, *S.J. Forbes* 2372 (MEL, PERTH); ± 8 km W of Beverley Springs homestead, 12 August 1974, *A.S. George* 12254 (PERTH, CANB, K); 4 km E of Beagle Bay Mission, Dampier Peninsula, 30 May 1985, *J.B. Martin* 20 (PERTH); Mt Barnett Station, adjacent main road, 13 April 1980, *D.E. Symon* 12088 (AD, CANB, PERTH).



Figure 2. *Stylidium costulatum* photographed at Coolabah Creek, Beverley Springs Station, north-west Kimberley. *R. Barrett* 262 (PERTH).

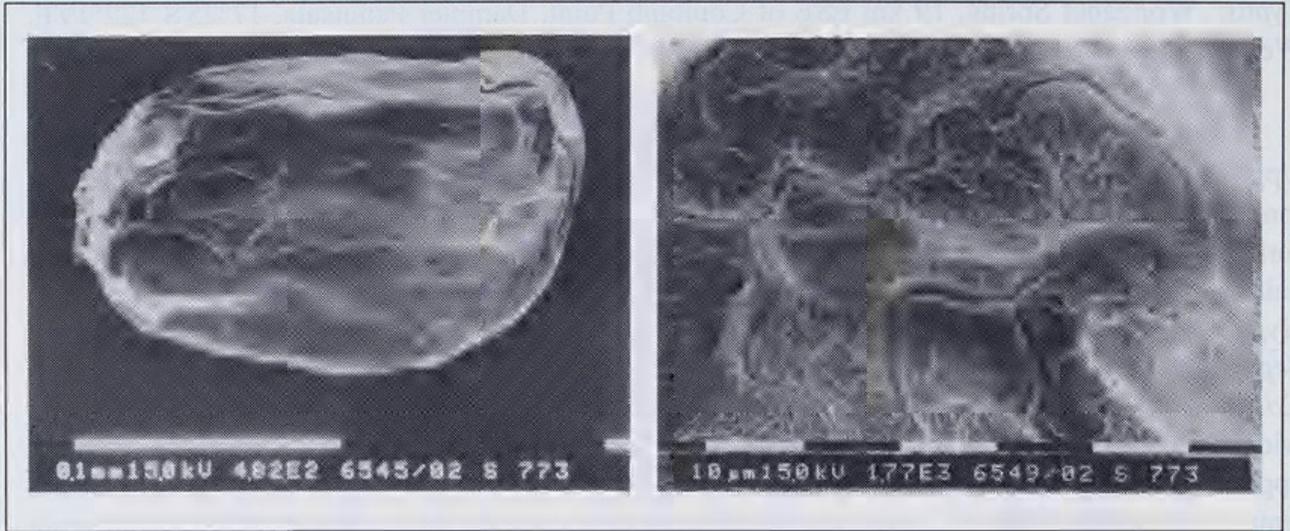


Figure 3. SEM photographs of a seed of *S. costulatum* showing the smooth surface and cells with ruminant margins. From George 12254 (PERTH).

**Distribution.** Dampier and Fitzgerald Districts, Northern Botanical Province (Beard 1980), extending from Coulomb Point Nature Reserve north of Broome, east to Beverley Springs Station, north east of Derby.

**Ecology.** In seasonally wet grasslands on sandy or clay soils, often adjacent to creeks or seasonally wet areas.

**Flowering period.** April-August.

**Conservation status.** CALM Conservation Codes for Western Australian Flora: Priority Three - Poorly Known Taxa - known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). This species appears to be widely distributed and at least one population is known to occur in the Point Coulomb Nature Reserve.

**Etymology.** The specific epithet alludes to the small ribs on the hypanthium and capsule.

**Notes.** *Stylidium costulatum* differs from *S. floodii* in having a glabrous labellum (not glandular-hairy), paired throat appendages (not crown-like), dilated strap-like column (not narrowed and tapered), prominently ribbed hypanthium (not ribbed), and in having two fused sepals (not 5 free). The seed coat of *S. costulatum* is smooth and has cells with ruminant margins. (Figure 3)

Both Carlquist (1978) and Wheeler *et al.* (1992) mention that *Stylidium floodii* and *S. desertorum* Carlq. are close. However, *S. costulatum* is differentiated from *S. desertorum* by the prominently ribbed hypanthium, smaller flowers and leaves lacking the hair-like mucro.

#### Lectotypification of *Stylidium floodii* F. Muell.

There are four "type" sheets of *Stylidium floodii* F. Muell. known to us, two at the National Herbarium of Victoria (MEL) and two at Royal Botanic Gardens, Kew (K). Examination of these "types" has shown an admixture of two distinct species on two of the sheets and the description by

Mueller is based on both entities. We have chosen to lectotypify the name *S. floodii* F. Muell. on MEL 233150 as this sheet bears Mueller's original handwritten label. The specimens on this sheet all represent the one taxon and appear to be the taxon on which Mueller principally based his description. It is our intention to revise the "*S. floodii*" complex at a later date when we will deal with the identity of the element excluded from the type of *S. floodii*.

### Taxonomy

*Stylidium floodii* F. Muell., Fragm. Phyt. Austral. 1:149 (1859). - *Candollea floodii* (F. Muell.) F. Muell., Systematic census of Australian plants 86 (1883). (Figures 4 and 5)

*Type citation*: "Ad ripas glareoso-arenosas prope originem fluminis Victoriae et rivi Roper River". *Lectotype* (here selected): F. Mueller (MEL 233150). There are two handwritten labels on the sheet. The top one in pencil in Mueller's writing reads: "*Stylidium Floodii*, n. sp. Dry lagoons, tribut[ary] of the Roper. 8.7.56". The bottom label written in ink in Mueller's writing reads: "*Stylidium Floodii* F. V. Mueller. Dry lagoons on the Roper River, Gulf of Carpentaria". Both labels have been annotated on the back of their upper left corners with the letter "B" signifying that they had been seen by George Bentham during his preparation of Stylidiaceae for volume 4 of Flora Australiensis (Figure 4). *Isolectotype*: F. Mueller. "*Stylidium Floodii* f.v. Mueller. Roper River". Herbarium Hookerianum 1867 (K).

*Small slender annual* sometimes branching at base, with a shortly elongated stem with scattered leaves, often bearing a basal tuft of leaves (sometimes forming a tuft at point of secondary branching). *Leaves* linear, 25 mm long, c. 0.5 mm wide, acuminate, glabrous. *Inflorescence* of few to numerous filiform scapes forming a compound raceme. *Scapes* filiform, to 10.5 cm long, glandular-pilose. *Bracts* very narrowly ovate, to 2 mm long, acute, usually glandular-pilose. *Pedicels* slender, 1-4 mm long, glandular-pilose. *Hypanthium* narrowly turbinate, 1.2-2 mm long at anthesis. *Sepals* 5, free to base, narrowly oblong 0.8-1.2 mm long, glandular-hairy. *Corolla*, "beautifully red", lobes vertically paired; anterior lobes elliptic, 2 mm long, 0.6 mm wide; posterior lobes obovate, 3 mm long, 0.8 mm wide; abaxial surface densely glandular-hairy. *Throat appendages* 5, crown-like. *Labellum* ovate, 0.4 mm long, 0.25 mm wide, glandular-hairy on margins and apex, attached to base of corolla tube sinus. *Column* strap-like, 5 mm long, 0.8 mm wide, narrowing away from sensitive torus, abaxial surface slightly glandular-hairy towards the anthers. *Capsule* narrow-turbinate, 2.5-3.5 mm long, 1-1.5 mm wide, glandular-hairy. *Seeds* brownish orange, 0.2 mm long.

### Discussion

The type of *Stylidium floodii* was collected from the Roper River in the Northern Territory. According to Mueller's annotation on a Herbarium Hookerianum sheet at the Royal Botanic Gardens, Kew, it was first seen by Mr J. Flood (Mueller's assistant on the A.C. Gregory's North Australian Expedition) at Depot Creek.

In her seminal work on triggerplants Erickson (1958) used the terms "loket and pouch" for the peculiar in-folding at the apex of the column of some species of *Stylidium*. She described the column as bending forward into a pouch formed by the dilation of the column itself and resembling a miniature locket, with elastic hinges, enclosing the anthers inside the lid. We suggest the term *cunabulum* be used

for the “pouch” (or dilated part of the column), where the anthers rest when the column is in the set position against the labellum. The term *cunabulum* is derived from the Latin for cradle. In tropical triggerplants the major mobile hinge on the column is a focus from which to describe taxonomic features. Previously there has been no term applied to this feature. The term *torosus*, from the Latin for muscular, aptly describes this mobile hinge.

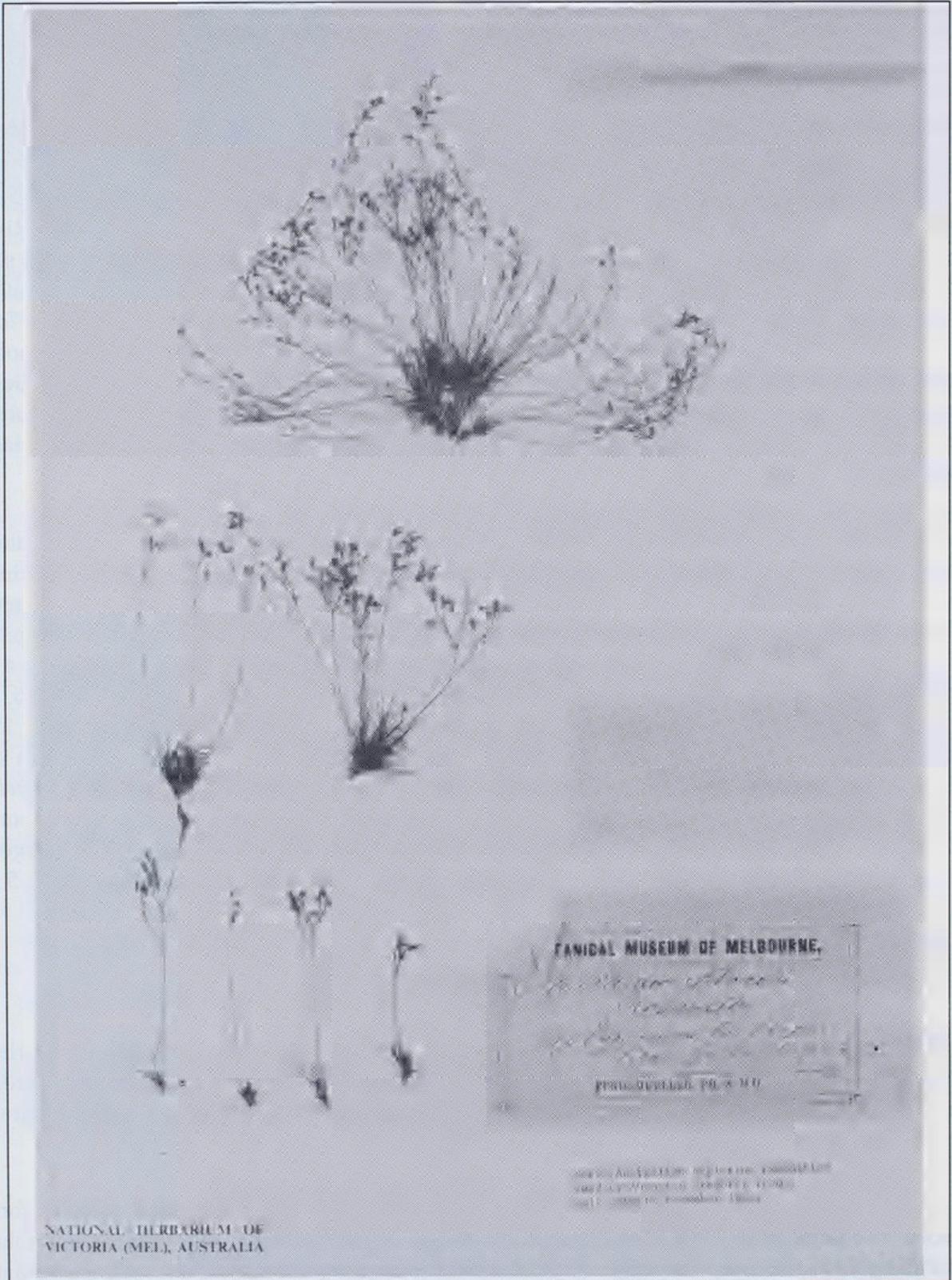


Figure 4. Lectotype of *S. floodii* F. Muell. (MEL 233150).

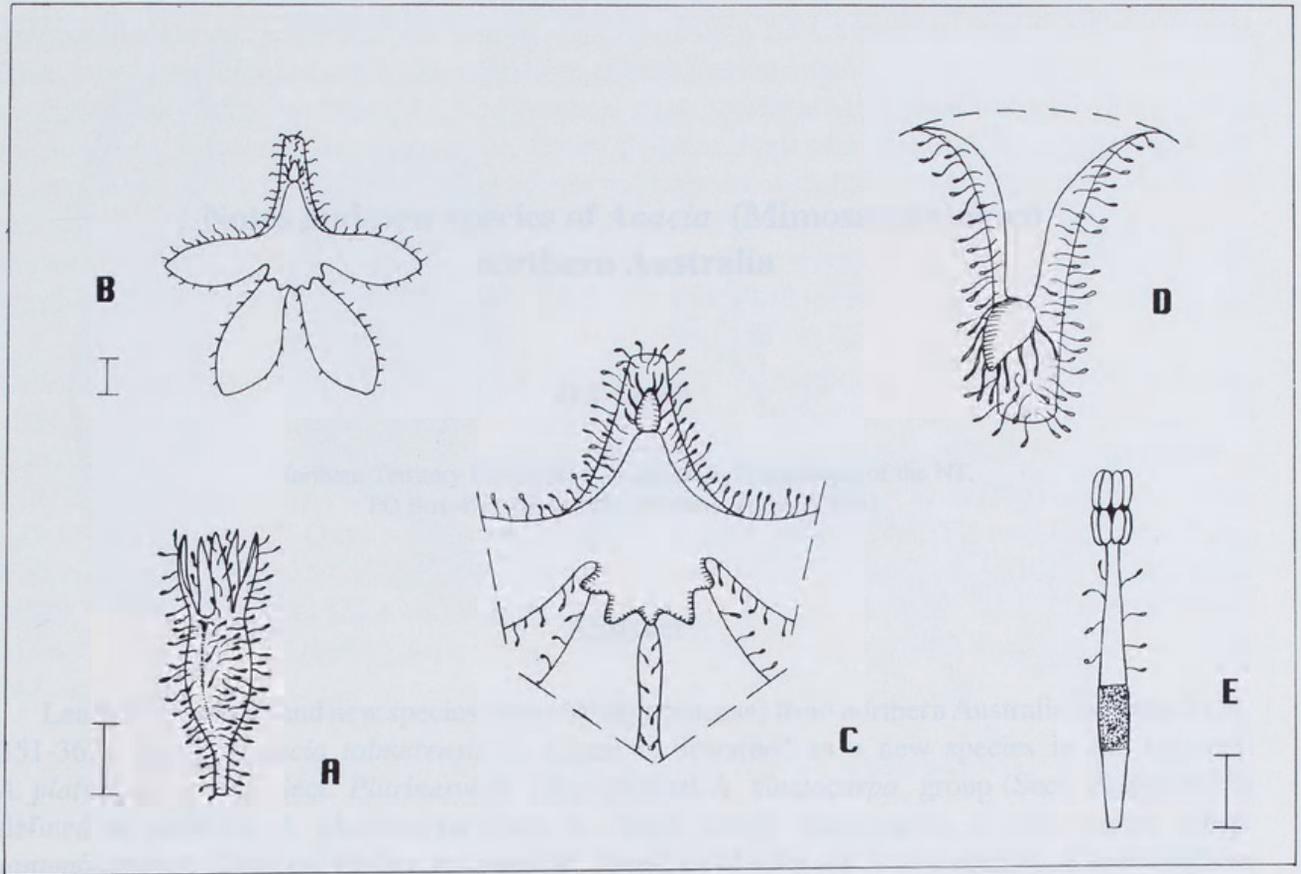


Figure 5. *Stylidium floodii*. A - hypanthium showing glandular hairs and five free sepals, B - corolla, C - enlarged section of corolla showing crown-like throat appendages, D - enlarged section of corolla tube showing labellum with glandular hairy margins, E - adaxial view of column showing sensitive torus (stippled) and sparse glandular hairs on adaxial surface. From Mueller (MEL 233150). Drawing by A. Lowrie.

### Acknowledgements

We wish to thank Brian Carter, John Martin and Tim Willing (Broome Botanical Society) and Anthony Raudino (CALM Volunteer), for assisting in the collection of *Stylidium costulatum* at Point Coulomb Nature Reserve. We also thank Matthew and Russell Barrett of Beverley Springs Station for their collections of Kimberley *Stylidium* species. Dr John Kuo, Electron Microscopy Centre, University of Western Australia, kindly provided the SEM photographs.

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