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Drosera stipularis, a new species for the *D. petiolaris* complex from Cape York Peninsula, Queensland

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Abstract

Across tropical northern Australia 14 *Drosera* species are recognised within the *D. petiolaris* complex. The complex is placed in section *Lasiocephala*; a group of perennial sundews mostly characterised by an indumentum of white hairs upon the petiole. Here we describe a new species for the complex, *D. stipularis* Baleeiro, R.W.Jobson & R.L.Barrett, which is known only from white-sand habitats on Cape York Peninsula, Queensland. The new species is allied to *D. petiolaris* R.Br. ex DC. and *D. lanata* K.Kondo.

Introduction

Drosera petiolaris R.Br. ex DC. was first collected at Endeavour River, Queensland (Banks and Solander *s.n.*, BM) and was described by Robert Brown (in de Candolle 1824). The type specimen was evidently collected very late in the season, and has little fertile material present. The species was later found to be part of a morphologically variable complex distributed across northern Australia and Papua New Guinea. Tsang (1980) and Kondo (1984) recognised three additional taxa, namely *D. dilatatopetiolaris* K.Kondo, *D. falconeri* K.Kondo & Tsang and *D. lanata* K.Kondo, and were able to differentiate these from *D. petiolaris* based on floral and vegetative characters. These species were originally placed in *Drosera* subgenus *Rorella* sect. *Lasiocephala* Planch. (Planchon 1848; Marchant and George 1982) or ser. *Lasiocephala* (Planch.) Diels (Diels 1906) along with *D. fulva* Planch. and *D. banksii* R.Br. ex DC., and later under subg. *Lasiocephala* (Planch.) Schlauer (Lowrie 2013). In a recent classification, sect. *Lasiocephala* was included under subgenus *Drosera* (Seine and Barthlott 1994). A further eight species were subsequently described for the section from across northern Australia (Lowrie 1994, 1996a, 1996b, 1997, 1998, 2013) with a taxonomic key to all 14 species published by Lowrie *et al.* (2017).

Fieldwork identified a new member of the section that we describe here as *D. stipularis* Baleeiro, R.W.Jobson & R.L.Barrett, thus far known only from a restricted area of Cape York Peninsula, Queensland (Figs 1–3). *Drosera stipularis* is particularly recognisable for its prominent stipules that are held erect, and are therefore exserted well above the central rosette. *Drosera stipularis* is also readily recognisable for its short petioles and thin, erect stems. The presence of stipules in *D.* sect. *Lasiocephala* has not been reported in previous literature,

thus their taxonomic utility has not previously been assessed, though they are noted as present in the related but morphologically distinctive species *D. banksii* (Lowrie 2013).

Close examination of specimens at NSW found that stipules are also present in *D. lanata* and *D. petiolaris*, but they are usually obscured by dense hairs, or the divided stipule apices appear hair-like, so they are easily overlooked. Stipules can be seen in published photographs in Lowrie *et al.* (2017) of *D. lanata* (*loc. cit.* Fig. 2.380), *D. aff. paradoxa* (*loc. cit.* Fig. 2.391), and *D. petiolaris* (*loc. cit.* Figs 2.398, 2.401). It is likely that stipules are present in most members of *D.* sect. *Lasiocephala* though they were not observed in *D. subtilis* N.G.Marchant (Lowrie *et al.* 2017).

The indumentum on the petioles of *Drosera stipularis* is much sparser and finer than *D. lanata* and *D. petiolaris* and appears to be predominantly (but obscurely) dendritic, with a few simple hairs observed among the dendritic hairs (R.L.Barrett *pers. obs.*). Many species in *D.* sect. *Lasiocephala* exhibit significant elongation of the petioles post-anthesis (Lowrie 2013). In *D. stipularis*, the petiole does not elongate as the plants age, as it does in the apparently closely related *D. lanata* and *D. petiolaris*, so the mature petioles remain relatively broad.

The perennating buds of *Drosera stipularis* are held well above ground level by elongate stems, and this may offer protection from reflected heat under exposed conditions, as documented for pygmy *Drosera* species in south-western Australia (Pate 1989). Elongate stems are also seen in *D. paradoxa* Lowrie from the Northern Territory and Western Australia, however this species differs from *D. stipularis* in its long, thin petioles at maturity: 20–35 mm *v.* 4–7 mm long, and 0.2–0.4 mm *v.* 0.5–0.7 mm wide at centre, and it is unlikely to be closely related.

A comparison of key features is provided with the two most morphologically similar rosetted species of *Drosera* sect. *Lasiocephala* that also grow on Cape York Peninsula in Table 1.

Table 1. Key features comparing *Drosera lanata*, *D. petiolaris* and *D. stipularis*.

Character	*D. lanata*	*D. petiolaris*	*D. stipularis*
Stems	Thickened, to 15 mm long	Thickened, to 15 mm long	Slender, to 21 mm tall
Perennating buds	At or below ground level	At or below ground level	Held above ground level
Stipules	3.5–7 mm long, not exserted, obscured (sometimes prominent on new growth)	1.9–2.7 mm long, not exserted, obscured	3–5 mm long, exserted, prominent
Petiole elongation post anthesis	Elongates to 40+ mm	Elongates to 35+ mm	Not elongating (4–7 mm long)
Petiole indumentum	Dense, prominently dendritic	Dense to sparse, simple and obscurely dendritic	Sparse, obscurely dendritic
Inflorescence	Densely hairy below buds	Sparsely hairy below buds	Mostly glabrous below buds
Petiole distal end	Straight	Straight	Reflexed
Pedicels	~1.5–3.0 mm long at anthesis, elongating up to 3.9 mm long in fruit	~1.1–2.0 mm long at anthesis, elongating up to 2.5 mm long in fruit	~0.4–0.6 mm long at anthesis, elongating up to 1.0 mm long in fruit
Seed shape	Ovoid	Oblong	Ovoid
Habitat	Seasonally moist but well-drained sands in woodland	Seasonally moist and sometimes inundated sands in sedge lands and woodland	Exposed white sand pockets on unconsolidated dunes in low heathland

Taxonomy

Drosera stipularis Baleeiro, R.W.Jobson & R.L.Barrett, *sp. nov*.

Type: Queensland: Cape York Peninsula, [precise locality withheld] *R.W. Jobson 3134 & P.C. Baleeiro*, 13 Apr 2016 (holo: NSW 1056757; iso: BRI).

Diagnosis: *Drosera stipularis* is similar to *D. petiolaris* and *D. lanata* but differs by its slender *v.* thickened stems with perennating buds held above *v.* at or below ground level, the petiole not elongating post anthesis *v.* elongating to 40 mm long, petiole distal end reflexed *v.* straight, inflorescences being mostly glabrous *v.* hairy below first flower, short pedicels up to 0.6 mm long *v.* 3.0 mm long at anthesis, and the prominent stipules exserted well above the central rosette *v.* stipules not being prominent.

Small perennial *herb* with stems 2–21 mm tall, previous season's growth persistent. *Leaves* forming a solitary rosette 13–25 mm diameter; *petioles* not elongating post anthesis, 4–7 mm long, 0.5–0.7 mm wide, with sparse, obscurely dendritic, white hairs on adaxial surface, dense obscurely dendritic hairs ~2 mm long on abaxial surface, with tuft of fine hairs near distal end where reflexed upward forming connection to lamina; lamina orbicular, 1.9–2.4 mm diameter, abaxial surface densely hairy, adaxial surface adorned with long glandular trichomes near circumference, with shorter or sessile trichomes on inner surface. *Centre of rosette* adorned short upright simple hairs surrounded by upright hyaline stipules. *Stipules* 3–5 mm long, 0.8–1.1 mm wide at base, subulate, tapering towards a partially reflexed apex then finely divided into 4–5 appendages. *Inflorescence* 1–3 per rosette, 25–125 mm long, 10–35 flowers in a scorpiod cyme; dense clusters of rosettes occasionally in place of flowers (possibly apomictic). *Peduncle* 15–40 mm long, ~2.5 mm wide near base, tapering slightly, mostly glabrous to just below the first flower, becoming hairy above first flower, indumentum of dense white appressed hairs. *Pedicels* short, mostly curved downward, 0.4–0.6 mm long, elongating to 1.0 mm long in fruit. *Sepals* obovate, 1.5–2 mm long, margin entire, abaxial surface dense indumentum of simple yellowish or whitish hairs. *Petals* obovate, margin entire, apex rounded, white, ~4 mm long, ~2.5 mm wide. *Stamens* 5, 0.8–1 mm long, filaments white, anthers and pollen orange. *Ovary* white, turbinate, 0.5–0.6 mm diameter. *Styles* 3, white, dividing into a few segments from near the apex. *Stigmas* white, papillose. *Seeds* black, ovoid, 0.4 mm long, 0.2 mm wide, surface with rows of prominent oblong cells giving a somewhat striated appearance. Figures 1 and 2.

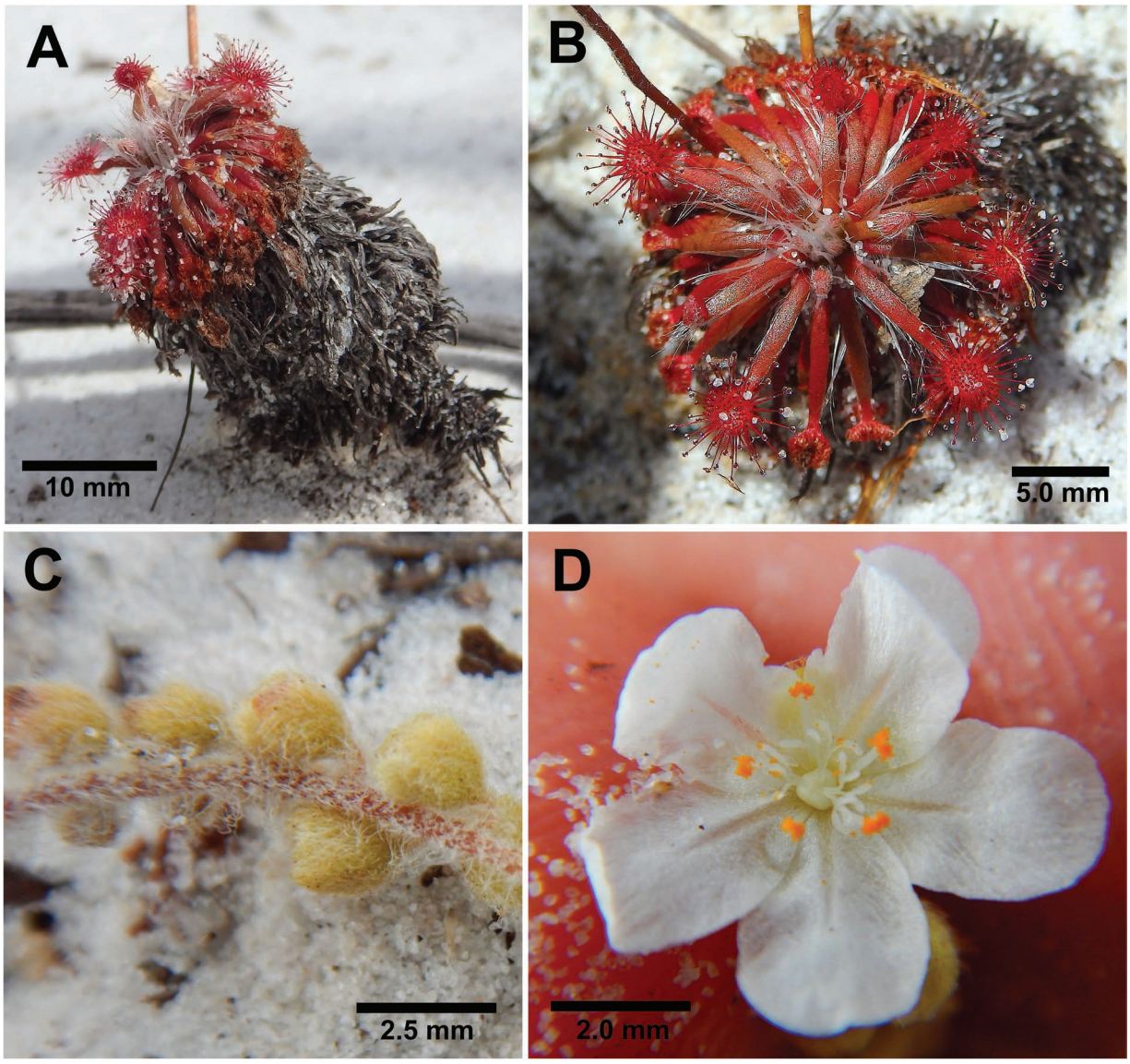

Fig. 1. *Drosera stipularis* A, habit, showing stem with previous year's growth persistent; B, rosette; C, partial inflorescence showing spent buds; D, flower. All images by P.C. Baleeiro.

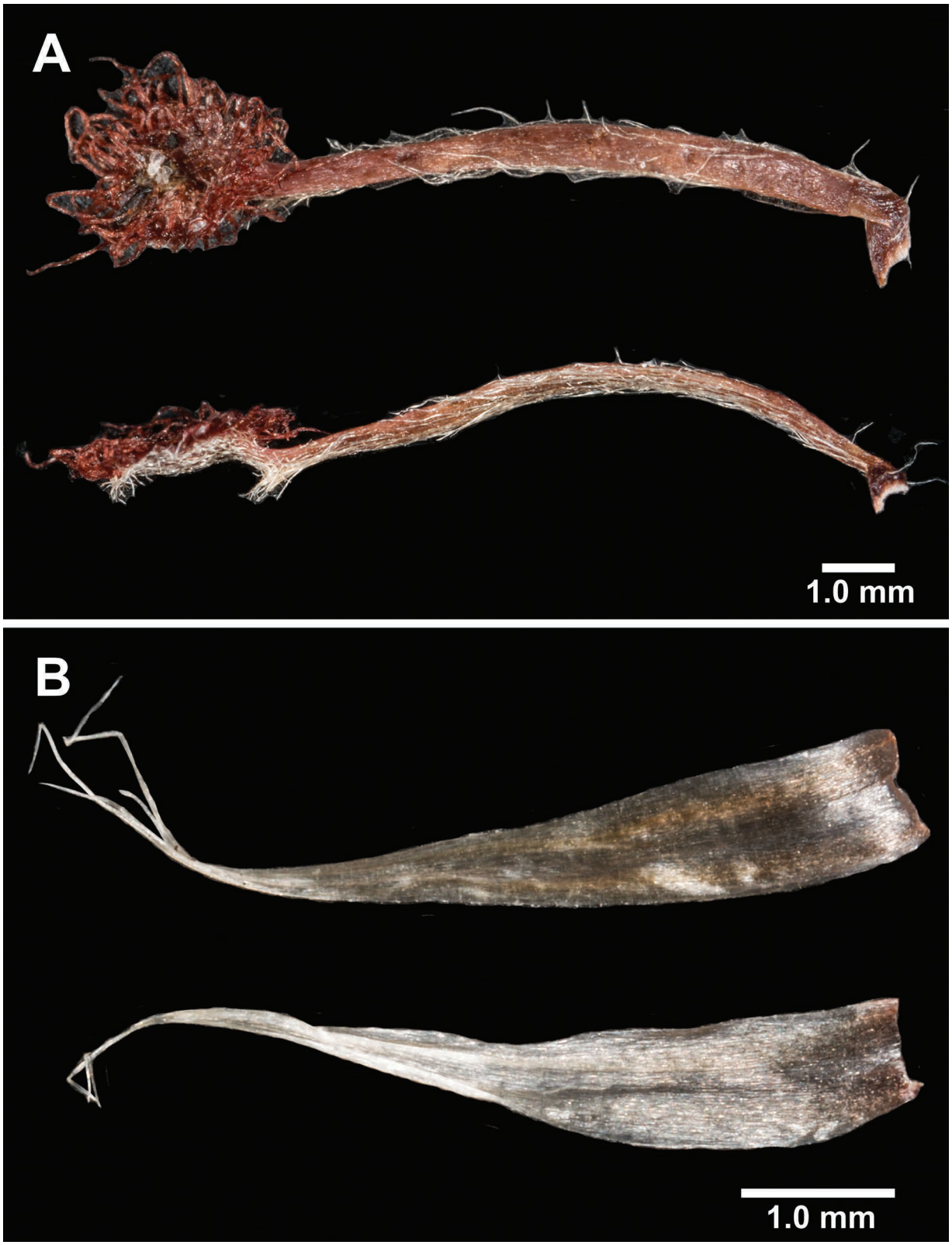

Fig. 2. *Drosera stipularis* A, leaf – dorsal-view (top) and side-view (bottom) showing indumentum; B, stipules. Scale bars = 1.0 mm. All images by R.L. Barrett.

Fig. 3. *Drosera stipularis* habitat east of Starke National Park on Cape York Peninsula, Queensland, showing a sand pocket microhabitat in background. Image by R.W. Jobson.

Additional specimens examined: Queensland: Cape York Peninsula, North of Cooktown [precise locality withheld], 6 Jul 2013, *R.W. Jobson 1928 & D. Quinn* (NSW 977107).

Etymology: The specific epithet refers to the erect to spreading stipules exserted above the central rosette.

Distribution and Ecology: Known only from two collections north of Cooktown and east of Starke National Park. Our examination of *Drosera* collections at BRI, and NSW, and examination of images of collections from the vicinity (held at CNS and JCU), uncovered no additional specimens. Both 2013 and 2016 specimens were located *c*. 300 m apart from each other. Found on moist pockets (each pocket *c*. 20 m^2) of fine sand substrate within low heath and sedges (Fig. 3). The moist fine sand pockets were infrequent across the location and were not observed elsewhere in nearby habitat. Within each pocket *D. stipularis* was common, forming several scattered colonies each containing *c*. 30 individuals (P.C. Baleeiro *pers. obs.*). Found in flower in April and July.

Conservation status: *Drosera stipularis* is known only from two collections in non-protected areas near Starke National Park and appears to be highly localised. The species may be more widespread and further study is required to determine extent of distribution, population's size, threats and conservation status. Localised inundation at the time of collection limited the degree to which the broader area could be surveyed.

Notes: The discovery of *Drosera stipularis* in a relatively well-explored region of Cape York Peninsula underscores the importance of botanical exploration of often over-looked microhabitats. The general distribution of *D. stipularis* overlaps with that of *D. lanata* and *D. petiolaris* on the eastern seaboard of Cape York Peninsula (Lowrie *et al.* 2017). The habitat for the latter two species is seasonally moist woodland and sedge land while the former is only known from fine sand pockets in low heathland (Fig. 3), and they are not known to co-occur. Neither *D. lanata* or *D. petiolaris* have petioles as markedly reflexed near the junction with the lamina (Fig. 2a), nor are their stipules exserted well above the central rosette (Figs 1, 2b). Likewise, they are not known to form a stem-like structure (Fig. 1a), instead the stem in both *D. lanata* and *D. petiolaris* is not obvious, remaining close to the ground.

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