

# *Scleria psammitica* R.Booth (Cyperaceae), a new species from Cape York Peninsula, Queensland

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## Summary

Booth, R. (2023). *Scleria psammitica* R.Booth (Cyperaceae), a new species from Cape York Peninsula, Queensland. *Austrobaileya* **13**: 7–13. A new species, *Scleria psammitica* R.Booth, is described and illustrated. Notes are provided on its distribution and habitat. A key to Queensland species of *Diplacrum* R.Br. and *Scleria* P.J.Bergius is provided.

Key Words: Cyperaceae; *Diplacrum*; *Scleria*; *Scleria psammitica*; flora of Australia; flora of Queensland; new species; taxonomy; identification key

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## Introduction

Cyperaceae is a cosmopolitan family which includes 95 genera (Larridon *et al.* 2021). *Scleria* P.J.Bergius (Bergius 1765: 142) is the sixth largest genus in the family, with about 260 species (Govaerts *et al.* 2015; Bauters *et al.* 2016). The genus is pantropical, consisting of 23 species in Australia, with *c.* four being endemic. The genus has received relatively little attention in Australia, with all formally recognised species having been named over 100 years ago.

The genus *Diplacrum* R.Br. was described to accommodate *D. caricinum* R.Br., a species where the glumes enclose the achene (resembling a sort of perigynium) (Brown 1810: 241). Brown compared *Diplacrum* to both *Scleria* and *Carex*, the latter based on an assumption that the glumes of *D. caricinum* were homologous with the perigynium or utricle in *Carex* species. Kunth (1835) subsequently argued that the glumes in *Diplacrum* and the utricle in *Carex* L. are not homologous and Bentham (1878) subsequently merged *Diplacrum* with *Scleria*. However, Simpson & Koyama (1998) and Govaerts & Simpson (2007) reinstated Robert Brown's *Diplacrum* as a genus. This has been corroborated based on

chloroplast (*ndhF*, *rps16*) and nuclear (ITS) DNA markers (Bauters *et al.* 2016). In the current classification of Cyperaceae based on an extensive nuclear genomic dataset the two genera are now placed in separate tribes (Larridon *et al.* 2021).

Amongst the Australian species of *Scleria*, only *S. sphacelata* F.Muell. is dioecious. After studying the collections of *S. sphacelata* at the Queensland Herbarium (BRI), several of the specimens, although superficially resembling *S. sphacelata*, were noted to be monoecious. All these specimens were collected in the sandstone hills surrounding Laura on Cape York Peninsula, north Queensland. After further study of collections of *Scleria* from the same area, several were also found identified as *S. brownii* Kunth. Preliminary descriptions for this species as *Scleria* sp. (Laura N.Byrnes 3285), were included in a DELTA key (Jessup *et al.* 2005 onwards) and the phrase name has been listed in the 'Census of the Queensland Flora' (Booth 2007, 2010, 2021).

Since then, more collections of this plant have become available for detailed taxonomic study. Critical examination of these by the author has now enabled this new species to be formally described and named as

*Scleria psammitica* R.Booth. A key to the Queensland species of *Scleria* is provided. It includes the two species of *Diplacrum* that occur in Queensland due to their superficial morphological similarity and likelihood of confusion with species of *Scleria*.

### Materials and methods

All herbarium specimens of *Scleria* held at BRI have been examined. Measurements were made from dried material. The description is modelled on those in Jessup *et al.* (2005 onwards). Specimens were viewed with a Nikon SMZ25 microscope and images were captured using NIS Elements Software with Z-stacking features (<https://www.microscope.healthcare.nikon.com/products/software/nis-elements>).

Common abbreviations in the specimen citations are Mt (Mountain, except where part of a National Park or State Forest name) and NP (National Park).

### Taxonomy

#### *Scleria psammitica* R.Booth, **sp. nov.**

Similar to *Scleria sphacelata* F.Muell. but differs in being monoecious versus dioecious; the glumes being appressed pubescent to scaberulous versus scabrid to glabrous, and yellow-brown to pale brown versus dark brown with reddish margins. **Type:** Queensland. COOK DISTRICT: Normanby Holding, Trap Creek catchment, S of Battle Camp Road, 21 June 2007, *P.I. Forster PIF32856 & K.R. McDonald* (holo: BRI [AQ0737233 comprising 1 sheet]; iso: CANB, NSW).

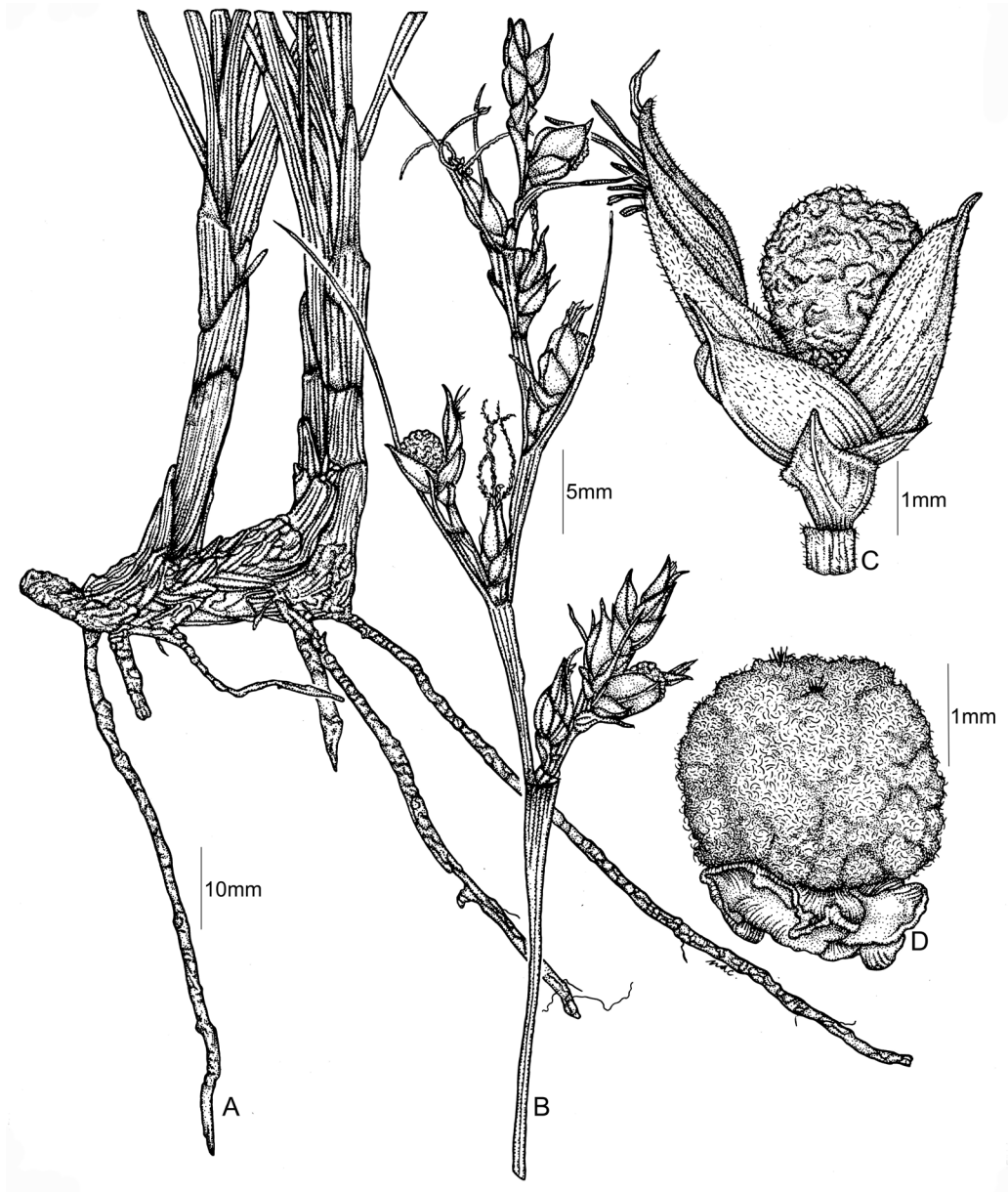
*Scleria* sp. (Laura N.Byrnes 3285): Booth (2007, 2010, 2021).

*Scleria* sp. Laura (N.Byrnes 3285) Qld Herbarium: CHAH (2012).

Robust perennial with a stout, woody rhizome; monoecious. Culms trigonous to terete, bases swollen, 30–65 cm tall, 1.5–2.5 mm wide, scabrous or papillose. Leaves: sheath scabrous, not winged; contra-ligule truncate,

ciliate; lamina 25–65 cm long, 1.75–3.5 mm wide, glabrous, or scabrous, apex acute. Inflorescence simple or once compound, panicle-like, 3–7-branched, 15–25 cm long, 2.5–4 cm wide. Involucral bracts leaf-like, lowest bract up to 25 cm long. Flowers unisexual. Spikelets sessile, or sub-sessile, 4–6 mm long, 2–2.8 mm wide. Glumes 3–5 per spikelet, broadly ovate, coriaceous, 2.5–4 mm long, apex acute to mucronate, surface appressed pubescent to scaberulous, yellow-brown to pale brown. Male flowers: stamens 3, anthers linear, 2.7–3 mm long. Female flowers: stigmas 3. Achene 3-sided or terete, wrinkled to rugulose, 2.5–3 mm long, 2–2.5 mm wide, white, with ferruginous hairs, rarely glabrous, apex rounded or slightly apiculate; disc brown, 3-lobed, shallow, lobes obtuse, undulate. **Figs. 1–3.**

**Additional selected specimens examined:** Queensland. COOK DISTRICT: NE corner of Piccaninny Wildlife Sanctuary, c. 35.6 km from the homestead, Apr 2014, *Jensen RJ3182* (BRI); Chuula Outstation, Kaanju Nation, Central Cape York, May 2005, *Smith 4866 & Claudie* (BRI); Orchid Creek Station, Wallaby Range; SW of Lockhart River, Cape York Peninsula, Apr 2014, *Forster PIF40910 et al.* (BRI); Bacon Creek, 15 km past Archer River, Apr 1988, *Forster PIF4039* (BRI); 18 km S of Coen on the Peninsula Development Road and just E of a borrow pit east of the road, Cape York Peninsula, Jun 2017, *Addicott EPA3809 & Newton* (BRI); Crystal Vale Station, 16 km S of homestead, 38.7 km SW of Coen, Jun 2018, *Leitch & Starkey QDA015161* (BRI); Mary Valley, S of the Peninsula Developmental Road, Apr 2009, *Wannan 5642* (BRI); Melsonby NP, N of Battle Camp Road; NW of Cooktown, May 2010, *Forster PIF36773 & Thomas* (BRI); Mt Jack Station, Cape York Peninsula, Oct 2009, *Wannan 5756 & Thompson* (BRI); 5 km ENE of disused airstrip, Mt Jack Station, Cape York, Mar 1995, *Garnett STG1228* (BRI); Bridge Creek Holding (proposed NP), N of Battle Camp Road; NW of Cooktown, May 2010, *Forster PIF36730 & Thomas* (BRI); Escort Creek Holding, ESE of Laura, Mar 2017, *Forster PIF44649 et al.* (BRI); Cormay Creek catchment, East Quinkan, SE of Laura, Mar 2017, *McDonald KRM18997 et al.* (BRI); Laura River on Crocodile Station, May 1975, *Byrnes 3285* (BRI); On track to Giant Horse art site, SE of Laura, Jul 1990, *Bean 1890* (BRI); adjacent to Split Rock Gallery, 14 km S of Laura, Apr 1992, *Neldner 3696 & Clarkson* (BRI); Turtle Rock area, Laura sandstone escarpment, Jan 1993, *Forster PIF12860 & Bean* (BRI); Amphitheatre on the NE side of Ngarrabullgan, May 2002, *Fox s.n.* (BRI [AQ764125]); Mt Mulligan, c. 40 km NW of Dimbulah, Apr 1985, *Clarkson 5766* (BRI).



**Fig. 1.** *Scleria psammitica*. A. habit showing the base of the plant and rhizome. B. inflorescence. C. spikelet with achene *in situ*. D. achene. All from Forster PIF32856 & McDonald (holotype, BRI). Scales as indicated. Del. N. Crosswell.



Fig. 2. *Scleria psammitica*. achene. From Forster PIF32856 & McDonald (BRI, holotype).

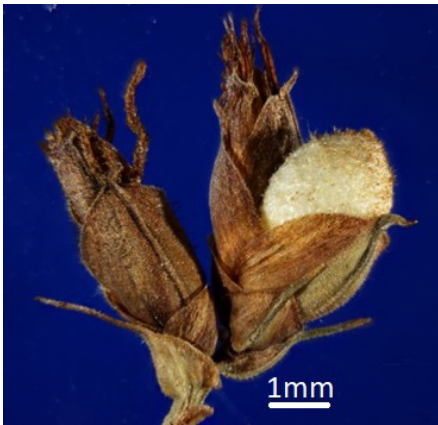


Fig. 3. *Scleria psammitica*. spikelet with *in situ* achene. From Forster PIF32856 & McDonald (BRI, holotype).

**Distribution and habitat:** *Scleria psammitica* is endemic to Cape York Peninsula in far northern Queensland between Mt Mulligan in the south and as far north as the Lockhart River (Map 1). The species invariably occurs in eucalypt-dominated woodland on sandstone hills, often restricted to crevices in outcropping rocks.

**Notes:** *Scleria psammitica* is morphologically similar to *S. sphacelata*, differing most obviously in being monoecious versus dioecious, the glumes being appressed pubescent versus scabrid to glabrous and brown to pale brown versus dark brown with reddish margins. It is also somewhat similar in appearance to *S. brownii* but differs in its larger more robust form, 30–65 cm tall versus 20–60 cm tall, culms 1.5–2.5 mm wide versus 1–1.5 mm wide and the pubescent or scaberulous glumes, versus glabrous glumes.

**Conservation status:** Although *Scleria psammitica* is apparently limited to sandstone hills, it is quite widespread within its geographic range and is not considered threatened.

**Etymology:** The epithet is derived from the Greek *psammitēs* (made from sand) and refers to the geological strata where the plant is commonly found.

**Key to the Queensland species of *Diplacrum* and *Scleria* (nomenclature as per Booth 2021).**

- 1. Glumes with long patent hairs, *c.* 1 mm long; inflorescence consisting of globose clusters of 1 to many spikelets on a long peduncle . . . . . ***S. carphiformis***
- 1. Glumes glabrous or with short hispid hairs < 0.5 mm long, without long, patent hairs . . . . . **2**
- 2 Small annuals (or short-lived perennials); rhizomes absent or not well developed . . . . . **3**
- 2. Perennials; rhizome well developed . . . . . **10**
- 3 Dwarf plants usually 1–10(–20) cm high; mature achene hidden by glumes and not readily visible (***Diplacrum***) . . . . . **4**
- 3. Plants (5–)15–60 cm high; mature achene not completely hidden by glumes and readily visible . . . . . **5**
- 4 Glume enclosing the achene prominently 3 or more nerved, apex 3-lobed . . . ***D. caricinum***
- 4. Glume enclosing the achene 1 or 2-nerved, apex acuminate, not lobed . . . . ***D. pygmaeum***

- 5 Inflorescence spike-like, not branched; spikelet clusters sessile, subtended by bracts not exceeding the spikelets . . . . . **S. pergracilis**
5. Inflorescence paniculate, subtended by bracts usually far exceeding the inflorescence . . . . . **6**
- 6 Plants frequently very hairy; disc of achene with many small bumps and protrusions; peduncles of the inflorescence clusters stout, often winged . . . . . **S. rugosa**
6. Plants glabrous or only slightly hairy; disc of achene smooth, with no protrusions; peduncles of the inflorescence clusters slender, not winged. . . . . **7**
- 7 Achene pubescent, beak purplish . . . . . **S. biflora**
7. Achene glabrous, beak not purplish. . . . . **8**
- 8 Disc lobes with short, erect, subulate tips . . . . . **S. tricuspidata**
8. Disc lobes not subulate tipped . . . . . **9**
9. Achene globose, with irregular elongated pits, a smooth triangular area immediately above each disc lobe . . . . . **S. laxa**
9. Achene oblong-ellipsoid, smooth . . . . . **S. novae-hollandiae**
- 10 Middle leaves of the fertile culms clustered in pseudo-whorls of 3–5 . . . . . **11**
10. Middle leaves not in pseudo-whorls of 3–5, evenly spaced along the stem . . . . . **13**
- 11 Disc of achene cup-like, covering at least the lower half of the achene . . . **S. sumatrensis**
11. Disc of achene shallowly 3-lobed, covering < 1/3 of the achene . . . . . **12**
- 12 Panicle branches at a narrow angle to the main axis; achene slightly rugulose to smooth, 2–2.5 mm long, hardly beaked, often tinged purple . . . . . **S. polycarpa**
12. Panicle branches widely spreading; achene pitted, with many shallow, rounded depressions, 2.5–3 mm long, beaked, white . . . . . **S. scrobiculata**
- 13 Leaf sheaths winged. . . . . **14**
13. Leaf sheaths not winged . . . . . **18**
- 14 Inflorescence a terminal, compact, much branched panicle; lowest involucre bract < 3 cm long, much shorter than the inflorescence . . . . . **S. poiformis**
14. Inflorescence terminal and with 1–5 lateral panicles some distance from each other; bracts leafy, > 3.5 cm long, as long or longer than the inflorescence . . . . . **15**
- 15 Plant stoloniferous, stolons covered with purplish, lanceolate scales; achene > 3 mm long, not beaked . . . . . **S. psilorrhiza**
15. Plant shortly rhizomatous; achene < 3 mm long, beaked. . . . . **16**
- 16 Disc deeply 3-lobed, lobes very acute, frequently bidentate at the tip; achene smooth . . . . . **S. levis**
16. Disc lobes rounded, obtuse; achene frequently cancellate (pitted). . . . . **17**
- 17 Contraligule 1–2 cm long, a scarious, oblong, purplish strap-like appendage; prominent, stiff bracteoles below each spikelet cluster, . . . . . **S. ciliaris**
17. Contraligule <1 cm long, with brown scarious margin; bracteoles indistinct . . **S. terrestris**

- 18 Inflorescence a terminal, compact much branched panicle, subtended by small, glume like bracts < 12 mm long, much shorter than the inflorescence . . . . . **S. poiformis**
18. Inflorescence terminal and with 1–5 lateral panicles some distance from each other: bracts leafy, > 35 mm long, as long or longer than the inflorescence . . . . . **19**
- 19 Disc obsolete, or reduced to a narrow band at the base of the achene . . . . . **20**
19. Disc well developed . . . . . **21**
- 20 Culms 60–200 cm tall, 3–7 mm wide; leaf lamina 7–25 mm wide . . . . . **S. corymbosa**
20. Culms 30–60 cm tall, 1.4–2 mm wide; leaf lamina 1–4 mm wide . . . . . **S. lithosperma** var. **linearis**
- 21 Inflorescence solely with stamens, or stigmas with fruit, but not both. . . . . **S. sphacelata**
21. Inflorescence with both stamens and stigmas . . . . . **22**
- 22 Plant with the culms separated along a thick, robust rhizome; achene with curly ferruginous hairs, glumes tomentose; found on Cape York Peninsula in sandstone hills . . . . . **S. psammitica**
22. Culms clumped, stoloniferous; achene glabrous or slightly hispid; not found in sandstone hills. . . . . **23**
- 23 Large plants 1–2 m tall, culms 2–10 mm wide; inflorescence paniculate . . . . . **S. terrestris**
23. Smaller plants 5–60 cm tall, culms 0.8–1.5 mm wide; inflorescence of 2–5 fascicles on a long peduncle . . . . . **24**
- 24 Achene with a long cylindrical beak; contraligule tongue shaped up to 5 mm long . . . . . **S. mackaviensis**
24. Achene with a brown tip, no beak; contraligule absent or truncate and less than 0.5 mm long . . . . . **S. brownii**

The last two species are very closely allied and in North Queensland are not easy to differentiate. *Scleria brownii* occurs as far south as Port Curtis and only *S. mackaviensis* Boeckeler occurs in both south-east and north Queensland.

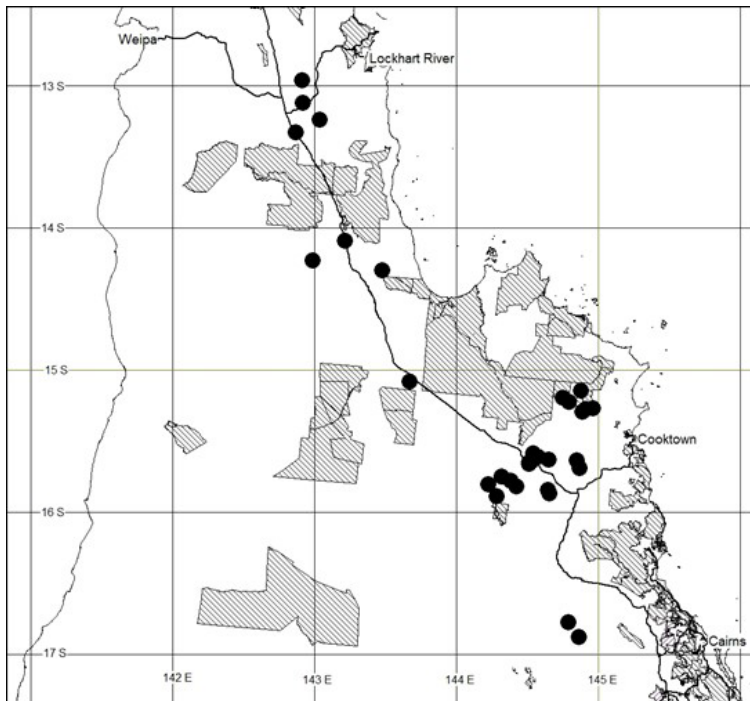
### Acknowledgements

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**Map 1.** Distribution of *Scleria psammitica*.