

SHORT COMMUNICATION

***Cymbopogon procerus* (R.Br.) Domin, the
correct name for *Schizachyrium mitchelliana*
B.K.Simon (Poaceae: Andropogoneae), and
lectotypification of *Andropogon exaltatus* R.Br.**

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During research by the first author on cleistogamy (self-fertilisation within a flower that never opens) in Australian grasses it was observed that herbarium specimens of most Australian species of *Schizachyrium* Nees at BRI have cleistogamous spikelets and few specimens have chasmogamous spikelets. Examination of the only specimen, the type collection, of *S. mitchelliana* B.K.Simon on loan from PERTH revealed the spikelets to be chasmogamous arousing some curiosity about the identification of the specimen. The relatively large fasciculate inflorescences at first impression seemed inconsistent with the other seven Australian species of *Schizachyrium* and more consistent with some species of *Cymbopogon* Spreng. (Blake 1974). Although the specimen of *S. mitchelliana* has some deficiencies, as pointed out by Simon (1989), it was possible to obtain enough information to make a clear decision about its identification (**Table 1**).

Various botanical keys in the literature use a range of characters to separate *Cymbopogon* and *Schizachyrium* including racemes paired or single, leaves aromatic or not, spikelets not secund or secund, slender rachillas or stout and thickened upwards, respectively (Tothill & Hacker 1983; Macfarlane 1992; Simon & Alfonso 2011). Several of these characters were observed on the specimen of *S. mitchelliana* and they are readily visible

on the image on JSTOR Global Plants (<http://plants.jstor.org/>, accessed March 2020) which led to the redetermination of the specimen as *Cymbopogon* (**Table 1**). Following examination of herbarium specimens of *Schizachyrium* and *Cymbopogon* at BRI and from PERTH, and information from the literature including keys to species and diagnoses, the specimen of *S. mitchelliana* was determined as *Cymbopogon procerus* (R.Br.) Domin (Blake 1968, 1974; Soenarko 1977; Tothill & Hacker 1983; Macfarlane 1992; Watson & Dallwitz 1992; Barkworth 2003; Wipff 2003; Simon & Alfonso 2011). Further examination of specimens of *C. procerus* held at BRI unexpectedly revealed some inflorescences bearing both chasmogamous and cleistogamous spikelets, the anthers of equal size in both morphs.

Examination of the typification of *Andropogon procerus* R.Br. (the basionym for *C. procerus*) and the synonymous name *A. exaltatus* R.Br. has also revealed some issues, these being dealt with below.

Taxonomy

***Cymbopogon procerus* (R.Br.) Domin**, *Biblioth. Bot.* 85: 273 (1915); *Andropogon procerus* R.Br., *Prodr.* 202 (1810); *Sorghum procerum* (R.Br.) Kuntze, *Rev. Gen. Pl.* 2: 792 (1891); *Andropogon procerus* var. *genuinus* Hack., *Monogr. Phan.* [A.DC. & C.DC.]

Table 1: Comparison of morphological features for *Schizachyrium mitchelliana*, *Schizachyrium sensu* (Blake 1974) and *Cymbopogon procerus*

Character	<i>Schizachyrium mitchelliana</i>	<i>Schizachyrium sensu</i> (Blake 1974)	<i>Cymbopogon procerus</i>
Life cycle	base of plant absent from specimen	annual or perennial	mostly perennial
Leaves	not determined	not aromatic	aromatic
Ligule length (mm) type	2.8 membrane	< 2 usually a fringed membrane	2.7–7 membrane
Inflorescence	paired racemes; spikelet arrangement indeterminate	racemes mostly single; spikelets secund	paired racemes; spikelets not secund
Peduncle	slender, clavate	mostly broadly clavate	slender clavate
Rachilla	slender clavate; apex oblique, erose	mostly broadly clavate; apex oblique, undulate to flanged, hollow	slender clavate; apex oblique, erose
Sessile spikelet Presence of a proximal beak	no	yes	no
Lower glume apex Upper lemma apex	entire	notched or entire	entire
Upper lemma awn	lobes appressed to awn	deeply lobed, > ½ lemma, lobes usually divergent	lobes appressed to awn, usually < ½ lemma length
	arising from the sinus	arising dorsally at the sinus	arising from the sinus
Pedicillate spikelet Disarticulation	yes	retained	yes
Lower glume	awnless	awned or awnless and attenuate	awnless
Upper glume	present	absent or present	present
Floret	neuter	reduced, neuter or male	male or neuter
Caryopsis Outline	not seen	mostly narrow ovate	elliptical
X-section		shallowly biconvex	plano-convex

6: 594 (1889), *nom. inval.*; *Cymbopogon procerus* var. *genuinus* (Hack.) Domin, *Biblioth. Bot.* 85: 273 (1915), *nom. inval.*; *C. nardus* subvar. *procerus* (R.Br.) Roberty, *Boissiera* 9: 176, 179 (1960). **Type:** [Northern Territory]. Groote Eylandt[f], 15 January 1803, *R. Brown s.n.* [Bennett no. 6172]. (lecto: BM 000991814^{1,2} *i.d.v.* fide Blake 1974: 35; isolecto: K 00974926³ [lacking date and locality, with the locality added in 1964] *i.d.v.*).

Andropogon exaltatus R.Br., *Prodr.* 202 (1810); *Andropogon exaltatus* var. *genuinus* Hack., *Monogr. Phan.* [A.DC. & C.DC.] 6: 596 (1889), *nom. inval.*; *Cymbopogon exaltatus* (R.Br.) Domin, *Biblioth. Bot.* 85: 273 (1915); *C. exaltatus* var. *genuinus* (Hack.) Domin, *Biblioth. Bot.* 85: 273 (1915), *nom. inval.*; *C. nardus* subvar. *exaltatus* (R.Br.) Roberty, *Boissiera* 9: 174, 180 (1960). **Type:** [Northern Territory]. North Coast, Island α, 1 March 1803, *R. Brown s.n.* [Bennett no. 6173]. (lecto [designated here]: BM 000991815⁴ *i.d.v.*, photo BRI; iso: CANB 378507 [with ‘North Coast’ and given to be Mallison’s Island, Arnhem Bay; no date or Bennett number] *i.d.v.*, E 00393616⁵ [with ‘N. Aust.’, no date] *i.d.v.*, K 000974929³ [right hand specimen on sheet, with ‘North C’ and no date or Bennett number, although it indicates being communicated by Bennett] *i.d.v.*, K 000974927³ [with no location and no date], W 28822³ [with ‘N. Coast N. Holland’ and no date] *i.d.v.*).

Schizachyrium mitchelliana B.K.Simon, *Austrobaileya* 3: 90 (1989), **syn. nov.** **Type:** Western Australia. Mitchell River Station, Admiralty Gulf, November/December 1973, *T. Kubicki* 53 (holo: PERTH 564249).

Distribution: Australia (Western Australia, Northern Territory, Queensland), East Timor, Papua New Guinea.

Typification: Brown (1810) in describing *Andropogon exaltatus* and *A. procerus* only mentioned “(T) v.v.” in the protologues for

each. Both *A. exaltatus* and *A. procerus* were recognised by Bentham (1878) who listed several collections for each species, including “Islands of the North Coast, *R. Brown*” and “Groote Island, *R. Brown*” respectively for each name. Domin (1915) combined both names under *Cymbopogon*; however, he did not mention type material.

It does appear that Brown made only the one collection for each species he described and that these can be considered as type material. This view was certainly followed by Blake (1968) when he synonymised *A. exaltatus* with *A. procerus* and stated that “*A. procerus* (*C. procerus* (R.Br.) Domin) was described from specimens from Groote Eylandt; *A. exaltatus* (*C. exaltatus* (R.Br.) Domin) was described from specimens from Mallinson I. at the entrance to Arnhem Bay”. Blake also annotated material at BM and K as type and isotype respectively for the two names.

(1) *Andropogon procerus* R.Br.

Blake (1974) stated “Type: Northern Territory, Groote Eylant, *R. Brown* [6172] (BM, holo; E, K)” and Soenarko (1977) gave “Type: Australia, Groote Eylandt, *R. Brown* 6172 (BM holo!- K, iso!)”. The number 6172 is the Bennett distribution number, not Brown’s collecting number. According to Vallance (1990), the Groote Eylandt collections on the 15 January 1802 were made “vicinity of the bluff head of Groote Eylandt E of Finch Island and on the plain to SE”. The Brown collection is known to be represented in two herbaria BM and K (online images on JSTOR Global Plants), and Blake indicated a further specimen in E. There do not appear to be multiple sheets at BM, so the designation of the BM specimen as type by Blake (1974) is now considered effective lectotypification (Art. 7.11 and 9.10) (Turland *et al.* 2018).

¹*i.d.v.* (*imago digitalis visa*); ²annotated as ‘type’ by S.T.Blake; ³annotated as isotype as S.T.Blake; ⁴annotated as ‘type’ by B.K.Simon; ⁵annotated as ‘isotype’ by B.K.Simon

(2) *Andropogon exaltatus* R.Br.

Brown (1810) published *Andropogon exaltatus* on the same page as *A. procerus*; however, this has been included in the synonymy of *A. procerus* by Blake (1974) and Soenarko (1977), with this synonymy upheld here. Blake (1974) stated “Type: Northern Territory, Mallinson’s I., *R. Brown* [6173] (BM, holo, photo BRI; E, K, W)” and Soenarko (1977) stated “Type: Australia, Mallinson’s Isl., *R. Brown* 6173 (BM holo!; K, iso!)”.

According to Vallance (1990), Brown collected only “on S side of Mallison Island” on 1 March 1803. The Brown collection of *Andropogon exaltatus* is spread through multiple herbaria with the specimens having (or lacking) the critical data that identify them as type material. When Brown collected the material, his locality did not have a known name and he merely referred to it as ‘North Coast, Island α’. To clearly establish typification of this name, we have selected BM 000991815 as lectotype. A further specimen (BM 000991816) that is not considered to clearly have a linking piece of original evidence to the type collection, merely has ‘Nova Hollandia Ora Septentrionalis Mr. Brown’ on the label. Given that Brown seems to have only collected it once, it is most likely that BM 000991816 represents a second accession at BM; however, this cannot be proven.

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