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Netrostylis, a new genus of Australasian Cyperaceae removed from *Tetraria*

Russell L. Barrett[1–3] Jeremy J. Bruhl[4] and Karen L. Wilson[1]

[1]*National Herbarium of New South Wales, Royal Botanic Gardens, Sydney, Mrs Macquaries Road, Sydney, New South Wales 2000, Australia*
[2]*Australian National Herbarium, Centre for Australian National Biodiversity Research, GPO Box 1600, Canberra, Australian Capital Territory 2601*
[3]*School of Plant Biology, Faculty of Science, The University of Western Australia, Crawley, Western Australia 6009*
[4]*Botany and N.C.W. Beadle Herbarium, University of New England, Armidale, New South Wales 2351, Australia*
Author for Correspondence: russell.barrett@rbgsyd.nsw.gov.au

Abstract

A new genus, *Netrostylis* R.L.Barrett, J.J.Bruhl & K.L.Wilson is described for Australasian species previously known as *Tetraria capillaris* (F.Muell.) J.M.Black (Cyperaceae tribe Schoeneae). The genus is restricted to southern and eastern Australia, and the North Island of New Zealand. Two new combinations are made: *Netrostylis capillaris* (F.Muell.) R.L.Barrett, J.J.Bruhl & K.L.Wilson and *Netrostylis halmaturina* (J.M.Black) R.L.Barrett, J.J.Bruhl & K.L.Wilson. *Netrostylis* is a member of the *Lepidosperma* Labill. Clade.

Keywords: Cyperaceae; *Netrostylis*; *Tetraria*; *Neesenbeckia*; *Machaerina*; Schoeneae; Australia; New Zealand.

Introduction

Recent molecular phylogenetic studies in Cyperaceae have greatly increased our understanding of relationships in the family (Muasya *et al.* 2009; Muasya 2016; Larridon *et. al.* 2018a, 2018b, 2019; Barrett *et al.* 2019, 2021; Semmouri *et al.* 2019; Elliott *et al.* 2021; Larridon *et al.*, 2021a, 2021b). This paper provides a new generic name for a segregate group of Australasian species previously included in *Tetraria*, which molecular data have consistently shown to be unrelated to *Tetraria s. str.* Detailed studies of Australasian taxa in the *Lepidosperma* Labill. clade have consistently resolved *Tetraria capillaris* (F.Muell.) J.M.Black sister to the monotypic South African genus *Neesenbeckia* Levyns. These two taxa form a clade sister to the predominantly Australasian genus *Lepidosperma* and these three form a clade sister to the more widespread genus *Machaerina* Vahl. (Larridon *et al.* 2021b). The now established phylogenetic position of *Tetraria capillaris* was first recovered by Slingsby and Verboom (2006) and Verboom (2006). The genus *Tetraria* (*sensu* Levyns 1947, Bruhl 1995 or Goetghebeur 1998) has subsequently been significantly redefined, but remains paraphyletic (Slingsby and Verboom 2006; Verboom 2006; Barrett *et al.* 2012a; Viljoen *et al.* 2013; Elliott and Muasya 2017, 2018, 2019, 2020; Elliott *et al.* 2019, 2021). The nomenclatural changes proposed here are made in advance of a revised global classification of the family Cyperaceae with the aim of circumscribing a monophyletic *Tetraria* (Larridon *et al.* 2017, 2018b, 2021b; Elliott *et al.* 2021).

Tetraria capillaris has endured a rather tortuous history of generic placement in tribe Schoeneae. Originally described by Hooker (1858) as *Chaetospora capillacea* Hook.f., a name pre-dated by *Chaetospora capillacea* Nees (1834), Mueller (1875) recognised that a new epithet was required and created the name *Chaetospora capillaris* F.Muell. Following this, the generic placement has been in a state of regular flux. Bentham (1878) transferred this species to *Elynanthus* P.Beauv. ex T.Lestib.; Clarke (in Cheeseman, 1906) transferred it to *Cladium* P.Browne; Fernald (1923) placed it in *Mariscus* Scop.; Black (1934) placed it in *Tetraria* where it has generally been accepted (e.g. Moore and Edgar 1970; Rye 1987; Wilson 1993, 1994; Wheeler and Graham 2002); but Koyama (1956) transferred it to *Machaerina* Vahl. Koyama (1956) was the only one of these authors to correctly identify the relationship of this species with the *Lepidosperma* clade. The only other named species in this complex was originally named *Heleocharis* (*Eleocharis*) *halmaturina* J.M.Black by Black (1927) and subsequently transferred to *Tetraria* by Black (1943). *Tetraria monocarpa* (J.M.Black) J.M.Black does not belong to this complex, rather it is a synonym of *Schoenus carsei* Cheeseman (Blake 1943), which is superficially similar to *Tetraria capillaris*.

Netrostylis species have a particularly distinctive persistent style base, similar to those found in *Tetraria s. str*. and this is the main reason that *Netrostylis* was included in *Tetraria* by Black (1934) and this classification was supported by Blake (1943) based on the same character state. Blake (1943) noted the nearly distichous glumes, only one barren flower and minute hypogynous bristles present in some species. However, he particularly emphasised the persistent style base as a character shared with *Tetraria*. The habit is very different from *Tetraria*, more like that of *Neesenbeckia* and some *Machaerina* and *Lepidosperma* species where the leaves are reduced to bracts and the culms are terete or angled. These similarities are sufficiently close that Bentham (1878) included some material of *Netrostylis* in his new species *Lepidosperma leptostachyum* Benth. (Barrett and Wilson 2012).

Netrostylis is sister to the monotypic genus *Neesenbeckia* Levyns, endemic to the Cape Province of South Africa, which has a 6-fid style and the persistent style base on the nutlet is prominently 6-ribbed, smooth and white (Browning and Goetghebeur 2017). *Netrostylis* is allied to *Lepidosperma*, a genus with a very similar distribution that can be distinguished by the six (or three in *L. forsythii* A.A.Ham.) thickened, divided hypogynous scales at the base of the nutlet (Barrett *et al*. 2012c). *Netrostylis* also has affinities with *Machaerina* Vahl (including *Baumea* Gaudich.) which can be distinguished by the new ramets growing out at similar depth to parent ramet, fruit with spongy exocarps, and the lack of a fusiform, persistent style base (Larridon *et al*. 2021b).

Methods

Relevant specimens have been examined by the authors at: AD, AK, B, BM, BRI, CANB, CHR, DBN, FI, G, HO, HBG, K, L, LD, MEL, NE, NSW, P and PERTH. The description is based on herbarium material, however *N. capillaris* and *N. halmaturina* have also been examined in the field by the authors.

Key to genera in the *Lepidosperma* clade

1. Two middle glumes larger than others; perianth of 6 bristles equal to or longer than the nutlet; stigma 6-fid ..... ***Neesenbeckia***

1: Glumes of increasing length from the base, upper glumes the largest; perianth of thickened scales persistent at base of nutlet or bristles 0–5, shorter than the nutlet; stigma (2-)3-fid..... 2

2. Perianth of thickened scales persistent at base of nutlet; style base usually cap-like on nutlet (conical to pyramidal only in *L. evansianum* and *L. rostratum*) ..... ***Lepidosperma***

2: Perianth absent, of flattened scales, or of 1–5 bristles; style base persistent, shortly pyramidal or spindle-like..... 3

3. New ramets growing out at similar depth to parent ramet; style base shortly pyramidal (continuous with nutlet apex) ..... ***Machaerina***

3: New ramets growing out above parent ramet (candelabriform); style base spindle-shaped (constricted at base)..... ***Netrostylis***

Taxonomy

Netrostylis R.L.Barrett, J.J.Bruhl & K.L.Wilson, ***gen. nov.***

Type species: *Netrostylis capillaris* (F.Muell.) R.L.Barrett, J.J.Bruhl & K.L.Wilson (based on *Chaetospora capillaris* F.Muell.).

Tufted stoloniferous perennials, usually less than 1 m high (rarely to 1.6 m), rhizome tightly clumping to spreading, new culms within a ramet arising slightly higher than the parent culm resulting in a compact candelabrum arrangement. New ramets forming from long rhizomes. *Culms* scapose. Culms and leaves erect to spreading, terete or quadrangular, capilliform and decumbent to rigid and erect. *Leaves* basal; blade usually strongly reduced on the sheath (rarely to 3 cm long), ligule present, cleft. *Inflorescence* open or contracted paniculate, usually pseudolateral (sometimes appearing to be terminal and spicately condensed), usually with few spikelets. Primary bracts usually short, occasionally long, sheathing, often sub-erect. *Spikelets* with several spirally arranged, long persistent glumes of increasing length, upper 1 or 2 glumes each subtending a flower, enclosed by the wings of the next glume. Lower flower functionally male, upper (occasionally 2) flower(s) bisexual. Bristles absent or filiform. Hypogynous scales present, united and thickened only at the base, forming a small ring or cup fused to the base of the nutlet, sometimes producing 3 flat scales or up to 5 filiform, barbellulate bristles; *Stamens* 3. *Style* (2-)3-fid, hairy; style base distinct, much thickened, persistent, papillose-tuberculate. *Nutlet* ovate, rounded 3-angular, surface usually smooth below, usually scabrous on persistent, spindle-shaped style base. (Figures 1, 2)

Diagnostic characters: Related to *Neesenbeckia* Levyns, differing in the style being (2-)3-fid (*vs* 6-fid); the style base being spindle-shaped (*vs* variously swollen and 6 ribbed), usually papillose (*vs* glabrous), and brown (*vs* white); 3 stamens (*vs* 6); and candelabriform, slender (*vs* lateral, robust) rhizomes.

Distribution: A genus of about eleven species in Australia and New Zealand, most still undescribed (Barrett *et al*. 2012b). A revision currently in preparation plans to recognise five species endemic to south-western Australia, three species endemic to south-eastern Australia, two species endemic to north-eastern Australia and one endemic to New Zealand.

Etymology: Derived from the Greek *netron* (spindle) and *stylis* (style) in reference to the spindle-shaped style base persistent on the nutlets of this genus. Thus derived, *Netrostylis* is feminine (see Turland *et al*. 2018; Art. 62.2) as is *Tetraria*, so no alterations of epithet terminations are required for the two species transferred from that genus.

Fig. 1. A. *Netrostylis capillaris* spikelet (sp) with emergent style branches (sbr) and mature nutlet (nl) with ring-like persistent perianth (pr) and stout, elongated style base (sb). B. *Netrostylis halmaturina* fertile glumes (gl); immature style base (persistent base on nutlet with apex broken off) (sb); stamen (st); perianth filament (pf); and immature nutlet (nl). Vouchers: A: Rosebery, Tasmania, *S.T. Blake 18431* (BRI AQ156882); B: Cherry Gardens, South Australia, *J.B. Cleland s.n.* (BRI AQ156881). Photos by R.L. Barrett.

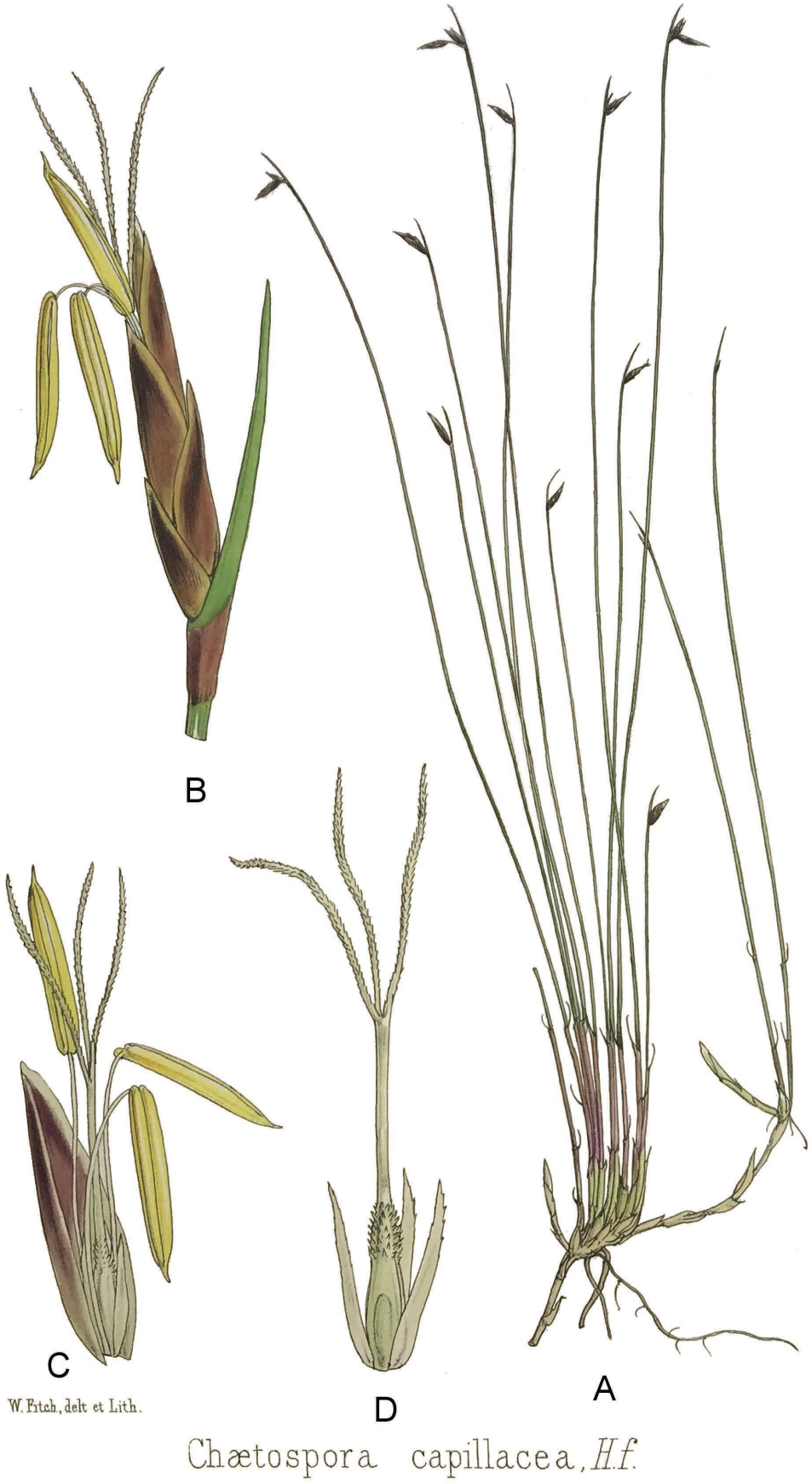

Fig. 2. *Netrostylis capillaris*. A. Habit. B. Fertile spikelet. C. Fertile glume and flower. D. Style, ovary and perianth scales. Reproduced and re-arranged from Hooker (1858: Tab. CXLI).

Affinities: Most closely allied to the monotypic genus *Neesenbeckia* Levyns. *Netrostylis* is distinguished from *Neesenbeckia* by the spindle-shaped persistent style base on the nutlet. *Neesenbeckia* has a distinctive (large when young), smooth, white, persistent style base on the nutlet, which is prominently 6-ribbed, and the style is also 6-fid (Browning and Goetghebeur 2017) versus (2-)3-fid in *Netrostylis*). The slender rhizome is characterised by an unusual candelabrum-type development. Each new shoot arises beside the parent shoot, but usually a little higher than the parent, creating a candelabrum shape. These candelabriform rhizomes of *Netrostylis* are quite distinctive and make it possible to recognise the genus from sterile specimens.

Netrostylis is otherwise allied to *Lepidosperma* which is easily distinguished by the hypogynous scales, which are thickened at the base but not or scarcely fused around the base of the nutlet. In some *Netrostylis* species, a prominent ring or cup-shaped base fused to the nutlet (often breaking off at maturity) is probably analogous to the hypogynous scales found in *Lepidosperma*, but this structure only sometimes produces 3 broad, thin scales or up to 5 filiform bristles. *Lepidosperma rostratum* S.T.Blake is unusual in having a rostrate persistent style base covered in fine papillae somewhat similar to that of *Netrostylis* (though lacking the fusiform apex), but genetic data place this taxon within *Lepidosperma* (Barrett *et al*., 2012c).

Netrostylis also has affinities with *Machaerina* Vahl (including *Baumea* Gaudich.). *Machaerina* can be distinguished by the fruit with spongy exocarp and the lack of a fusiform, persistent style base. *Baumea* has consistently been resolved within *Machaerina* in phylogenetic studies (e.g. Viljoen *et al*. 2013; Larridon *et al*. 2021b).

Netrostylis capillaris s.l. is similar in appearance to *Schoenus carsei,* which has a similar distribution in New Zealand, but a more restricted distribution in southern Australia relative to *Netrostylis*. When fertile, the two are readily distinguished by the flexuous rachilla and absence of a persistent style base on the nutlet in *S. carsei*, but the differences are more subtle in sterile specimens. When fresh, the culms of *Schoenus carsei* are 'striped' longitudinally with whitish stomatal zones alternating with yellow-green non-stomatal zones, but this is less obvious when dried. The culms of *Netrostylis* are relatively uniform in colour, stomatal zones rarely being strongly evident. A leaf ligule is present in *S. carsei* and in *N. capillaris*, but in the latter has a free limb that is cleft more or less in the middle. The persistent sheaths on the rhizome are usually straw-coloured in *N. capillaris* and light to dark brown in *S. carsei*. Gardner (1998a, 1998b) provides four additional useful vegetative characters to recognise *N. capillaris* (*vs S. carsei*) in New Zealand: culms usually <0.8 (*vs* 0.8–2) mm diam.; pith of culms finely but distinctly septate (*vs* continuous); reduced leaf blade <5 (*vs* 10–30) mm long; and the margins at the apex of the leaf sheath minutely setose (*vs* glabrous). In New Zealand, these species may grow together, but in Australia, *S. carsei* tends to grow in wetter habitats than *Netrostylis capillaris*.

Netrostylis capillaris (F.Muell.) R.L.Barrett, J.J.Bruhl & K.L.Wilson, ***comb. nov***.

Basionym: *Chaetospora capillaris* F.Muell., *Fragm.* 9: 34 (1875), based on *Chaetospora capillacea* Hook.f., *Fl. Tasman.* 2(2): 81 ([1858] 1859), *nom. illeg. non* Nees (1834); *Elynanthus capillaceus* Benth., *Fl. Austral.* 7: 377 (1878); *Schoenus capillaris* (F.Muell.) F.Muell., *Syst. Census Austral. Pl.* 128 (1882), *nom. illeg*., *non* Sw. (1788); *Cladium capillaceum* C.B.Clarke ex Cheeseman, *Man. New Zealand Fl.* 789 (1906); *Mariscus capillaceus* (Hook.f.) Fernald, *Rhodora* 25: 52 (1923); *Machaerina capillacea* T.Koyama, *Bot. Mag. Tokyo* 69: 63 (1956), *nom. illeg*., *nom. superfl*.; *Tetraria capillaris* (F.Muell.) J.M.Black, *Trans. Royal Soc. S. Austral.* 58: 169 (1934).

Type: Australia: Tasmania: Dry sandy banks by the Kermandie [River], Hospital Bay, south Huon River, [1850s], *A.F. Oldfield 145* (holo: K 000960101!).

Notes: The earliest published epithet for this species, *Chaetospora capillacea* Hook.f. was illegitimate at the time of publication, being a later homonym of *Chaetospora capillacea* Nees (1834), and therefore cannot be transferred to *Netrostylis*, thus the combination is based on Mueller's (1875) replacement epithet.

We have only located a single specimen matching the protologue, so we consider the cited specimen to be a holotype. It bears pencil drawings of the spikelets typical of those made by Hooker, and matching those published with the original description (Figure 2).

Netrostylis halmaturina (J.M.Black) R.L.Barrett, J.J.Bruhl & K.L.Wilson, ***comb. nov.***

Basionym: *Eleocharis halmaturina* J.M.Black, *Trans. Royal Soc. S. Austral.* 51: 378 (1927) (as *Heleocharis*); *Tetraria halmaturina* (J.M.Black) J.M.Black, *Fl. S. Austral.* (edn 2); 1: 153 (1943).

Type: South Australia: Kangaroo Island: Rocky River, 18 November 1924, *J.B. Cleland s.n.* (holo: AD 98018480!; iso: K 000960102!).

Notes: There is only a single collection at AD matching the protologue, and it is unlikely that the duplicate at K had been distributed at the time the species was described, so we consider these sheets to be a holotype and isotype respectively.

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References

Barrett RL, Barrett MD, Wallace MJ, Bruhl JJ, Wilson KL (2012c) A preliminary phylogeny of *Lepidosperma* (Cyperaceae: Schoeneae). Chapter 7 in Barrett RL, (2012). *Systematic studies in Cyperaceae tribe Schoeneae:* Lepidosperma *and allied genera*. PhD Thesis. (School of Plant Biology, The University of Western Australia: Crawley)

Barrett RL, Bruhl JJ, Wilson KL (2012a) Resolution of the phylogenetic position and diversity of the *Tetraria capillaris* complex (Cyperaceae, Schoeneae): molecular evidence for a new genus and ten new species. Chapter 8 in Barrett RL, (2012). *Systematic studies in Cyperaceae tribe Schoeneae:* Lepidosperma *and allied genera*. PhD Thesis. (School of Plant Biology, The University of Western Australia: Crawley)

Barrett RL, Bruhl JJ, Wilson KL (2012b) Taxonomic revision of *Netrostylis*, a new Australasian genus of Cyperaceae tribe Schoeneae. Chapter 9 in Barrett RL, (2012). *Systematic studies in Cyperaceae tribe Schoeneae:* Lepidosperma *and allied genera*. PhD Thesis. (School of Plant Biology, The University of Western Australia: Crawley)

Barrett RL, Bruhl JJ, Wilson KL (2021) Revised generic delimitation of Schoeneae subtribe Tricostulariinae (Cyperaceae) with description of a new Australian genus *Ammothryon* and new species of *Tricostularia*. *Telopea* 24: https://doi.org/10.7751/telopea14454 In press.

Barrett RL, Wilson KL (2012) A review of the genus *Lepidosperma* (Schoeneae: Cyperaceae). *Australian Systematic Botany* 25: 225–294. https://doi.org/10.1071/SB11037

Barrett RL, Wilson KL, Bruhl JJ (2019) *Anthelepis*, a new genus for four mainly tropical species of Cyperaceae from Australia, New Caledonia and South East Asia. *Australian Systematic Botany* 32: 269–289. https://doi.org/10.1071/SB18047

Bentham G (1878) *Flora Australiensis: A description of the plants of the Australian Territory. Vol. VII. Roxburghiaceae to Filices*. (Lovell Reeve: London) https://doi.org/10.5962/bhl.title.141

Black JM (1927) Additions to the flora of South Australia No. 25. *Transactions of the Royal Society of South Australia* 51: 378–385. https://www.biodiversitylibrary.org/item/129843#page/400/mode/1up

Black JM (1934) Additions to the flora of South Australia No. 32. *Transactions of the Royal Society of South Australia* 58: 168–186. https://www.biodiversitylibrary.org/item/129835#page/192/mode/1up

Black JM (1943) *Flora of South Australia Part 1*. (edn 2). (Government Printer: Adelaide)

Blake ST (1943) Critical notes on the Gramineae and Cyperaceae of South Australia with descriptions of new species. *Transactions of the Royal Society of South Australia* 67: 42–61. https://www.biodiversitylibrary.org/item/129832#page/54/mode/1up

Browning J, Goetghebeur G (2017) *Sedge (Cyperaceae) genera of Africa and Madagascar*. (Troubador Publishing: Leicester, UK)

Bruhl JJ (1995) Sedge genera of the world: relationships and a new classification of the Cyperaceae. Australian Systematic Botany 8: 125–305. https://doi.org/10.1071/SB9950125

Cheeseman TF (1906) *Manual of the New Zealand Flora*. (John Mackay, Government Printer: Wellington) https://www.biodiversitylibrary.org/item/44765#page/5/mode/1up

Elliott TL, Barrett RL, Muasya AM (2019) A taxonomic revision of *Schoenus cuspidatus* and allies (Cyperaceae, tribe Schoeneae) –– Part 1. *South African Journal of Botany* 121: 519–535. https://doi.org/10.1016/j.sajb.2018.11.021

Elliott TL, Muasya AM (2017) Taxonomic realignment in the southern African *Tetraria* (Cyperaceae, tribe Schoeneae; *Schoenus* clade). *South African Journal of Botany* 112: 354–360. http://dx.doi.org/10.1016/j.sajb.2017.06.011

Elliott TL, Muasya AM (2018) A taxonomic revision of *Schoenus compar* - *Schoenus pictus* and allies (Cyperaceae, tribe Schoeneae) with three new species described from South Africa. *South African Journal of Botany* 114: 303–315. https://doi.org/10.1016/j.sajb.2017.11.020

Elliott TL, Muasya AM (2019) Three new species and a new combination among Southern African *Schoenus* (Cyperaceae, tribe Schoeneae). *Phytotaxa* 401: 267–275. https://doi.org/10.11646/phytotaxa.401.4.4

Elliott TL, Muasya AM (2020) A taxonomic revision of the *Epischoenus* group of *Schoenus* (Cyperaceae, tribe Schoeneae). *South African Journal of Botany* 135: 296–316. https://doi.org/10.1016/j.sajb.2020.08.029

Elliott TL, van Mazijk R, Barrett RL, Bruhl JJ, Joly S, Muthaphuli N, Wilson KL, Muasya AM (2021) Global dispersal and diversification of the genus *Schoenus* (Cyperaceae) from the Western Australian biodiversity hotspot. *Journal of Systematics and Evolution* Online early. https://doi.org10.1111/jse.12742.

Gardner RO (1998a) *Schoenus carsei* and *Tetraria capillaris*. *Auckland Botanical Society Journal* 53: 38–40.

Gardner RO (1998b) *Schoenus carsei* revisited. *Auckland Botanical Society Journal* 53: 56–57.

Goetghebeur P (1998) Cyperaceae. Pp. 141–190 in K Kubitzki, H Huber, PJ Rudall, PS Stevens and T Stützel (Eds) *The families and genera of Vascular plants*. (Springer-Verlag: Berlin)

Hooker JD (1858) *The botany of the Antarctic voyage of H.M. Discovery Ships 'Erebus' and 'Terror', in the years 1839–1843, under the command of Captain Sir James Clark Ross. Part III. Flora Tasmaniae. Vol. II. monocotyledons and acotyledons.* (Reeve: London) https://www.biodiversitylibrary.org/item/90344#page/1/mode/1up

Koyama TM (1956) Taxonomic studies of the Cyperaceae V. § 12. A new classification of the genus *Cladium* in a wide meaning. *The Botanical Magazine, Tokyo* 69: 59–67.

Larridon I, Bauters K, Semmouri I, Viljoen J-A, Prychid CJ, Muasya AM, Bruhl JJ, Wilson KL, Senterrehi B, Goetghebeur PA (2018a) Molecular phylogenetics of the genus *Costularia* (Schoeneae, Cyperaceae) reveals multiple distinct evolutionary lineages. *Molecular Phylogenetics and Evolution* 126: 196–209. https://doi.org/10.1016/j.ympev.2018.04.016

Larridon I, Rabarivola L, Xanthos M, Muasya AM (2019) Revision of the Afro-Madagascan genus *Costularia* (Schoeneae, Cyperaceae): infrageneric relationships and species delimitation. *PeerJ* 7: e6528. https://doi.org/10.7717/peerj.6528

Larridon I, Verboom GA, Muasya AM (2017) (2555) Proposal to conserve the name *Tetraria* (Cyperaceae) with a conserved type. *Taxon* 66: 1226–1227. https://doi.org/10.12705/665.22

Larridon I, Verboom GA, Muasya AM (2018b) Revised delimitation of the genus *Tetraria*, nom. cons. prop. (Cyperaceae, tribe Schoeneae, *Tricostularia* clade). *South African Journal of Botany* 118: 18–22. https://doi.org/10.1016/j.sajb.2018.06.007

Larridon I, Zuntini AR, Barrett RL, Wilson KL, Bruhl JJ, Goetghebeur P, Baker WJ, Brewer GE, Epitawalage N, Fairlie I, Forest F, Kikuchi I, Pokorny L, Spalink D, Simpson DA, Muasya AM, Roalson EH (2021a) Resolving the generic limits in Cyperaceae tribe Abildgaardieae using targeted sequencing. *Botanical Journal of the Linnean Society* Online Early. https://doi.org/10.1093/botlinnean/boaa099

Larridon I, Zuntini AR, Léveillé-Bourret E, Barrett RL, Starr JR, Muasya AM, Villaverde T, Bauters K, Brewer GE, Bruhl JJ, Costa SM, Elliott TL, Epitawalage N, Escudero M, Fairlie I, Goetghebeur P, Hipp AL, Jiménez-Mejías P, Sabino Kikuchi IAB, Luceño M, Márquez-Corro JI, Martín-Bravo S, Maurin O, Pokorny L, Roalson EH, Semmouri I, Simpson DA, Spalink D, Thomas WW, Wilson KL, Xanthos M, Forest F, Baker WJ (2021b) A new classification of Cyperaceae (Poales) supported by phylogenomic data. *Journal of Systematics and Evolution*: JSE-2020-09-229. In press.

Levyns MR (1947) *Tetraria* and related genera, with special reference to the flora of the Cape Peninsula. *Journal of South African Botany* **13:** 73–93.

Moore LB, Edgar E (1970) *Flora of New Zealand. Vol. II*. (Government Printer: Wellington)

Muasya AM (2016) The changing generic concepts in Cyperaceae — Cosmopolitan mega-genera and polyphyly of southern African taxa. *South African Journal of Botany* 103: 337. https://doi.org/10.1016/j.sajb.2016.02.125

Muasya AM, Simpson DA, Verboom GA, Goetghebeur P, Naczi RFC, Chase MW, Smets EF (2009) Phylogeny of Cyperaceae based on DNA sequence data: current progress and future prospects. *The Botanical Review* 75: 2–21. https://doi.org/10.1007/s12229-008-9019-3

Mueller FJH von (1875) *Fragmenta Phytographiae Australiae. Vol. 9*. (Melbourne Printers: Melbourne) https://www.biodiversitylibrary.org/item/7226#page/1/mode/1up

Nees von Esenbeck CGD (1834) Übersicht der Cyperaceengattungen. *Linnaea* 9: 273–306. https://www.biodiversitylibrary.org/item/109555#page/279/mode/1up

Rye BL (1987) Cyperaceae. Pp. 870–906 in NG Marchant and JR Wheeler (Eds) *Flora of the Perth Region*. (Western Australian Herbarium: Perth)

Semmouri I, Bauters K, Léveillé-Bourret É, Starr JR, Goetghebeur P, Larridon I (2019) Phylogeny and systematics of Cyperaceae, the evolution and importance of embryo morphology. *Botanical Review* 85: 1–39. https://doi.org/10.1007/s12229-018-9202-0

Slingsby JA, Verboom GA (2006) Phylogenetic relatedness limits co-occurrence at fine spatial scales: evidence from the schoenoid sedges (Cyperaceae: Schoeneae) of the Cape Floristic Region, South Africa. *The American Naturalist* 168: 14–27. https://doi.org/10.1086/505158

Turland NJ, Wiersema JH, Barrie FR, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Kusber W-H, Li D-Z, Marhold K, May TW, McNeill J, Monro AK, Prado J, Price MJ, Smith GF (2018) (Eds) *International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. Regnum Vegetabile 159*. (Koeltz Botanical Books: Glashütten) https://doi.org/10.12705/Code.2018

Verboom GA (2006) A phylogeny of the schoenoid sedges (Cyperaceae: Schoeneae) based on plastid DNA sequences, with special reference to the genera found in Africa. *Molecular Phylogenetics and Evolution* 38: 79–89. https://doi.org/10.1016/j.ympev.2005.05.012

Viljoen J-A, Muasya AM, Barrett RL, Bruhl JJ, Gibbs AK, Slingsby JA, Wilson KL, Verboom AG (2013) Radiation and repeated transoceanic dispersal of Schoeneae (Cyperaceae) through the Southern Hemisphere. *American Journal of Botany* 100: 2494–2508. https://doi.org/10.3732/ajb.1300105

Wheeler JR, Graham L (2002) Cyperaceae. Pp. 263–298 in JR Wheeler (Ed.) *Flora of the South West. Bunbury, Augusta, Denmark. Flora of Australia Supplementary Series 12*. (Australian Biological Resources Study, Canberra, Conservation and Land Management, Como and University of Western Australia Press: Crawley)

Wilson KL (1993) Cyperaceae. Pp. 293–396 in GJ Harden (Ed.) *Flora of New South Wales*. (University of New South Wales Press: Kensington)

Wilson KL (1994) Cyperaceae. Pp. 238–356 in NG Walsh and TJ Entwisle (Ed.) *Flora of Victoria Volume 2. Ferns and allied plants, conifers and monocotyledons*. (Inkata Press: Melbourne)

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