Three new annual species of *Schoenus* (Cyperaceae) from the south-west of Western Australia

B.L. Rye

Western Australian Herbarium, Department of Conservation and Land Management, Locked Bag 104, Bentley Delivery Centre, Western Australia 6983

Abstract

Rye, B.L. Three new annual species of *Schoenus* (Cyperaceae) from the south-west of Western Australia. Nuytsia 11 (2): 263-268 (1997). Three new species in the Cyperaceae, *Schoenus badius* Rye, *S. plumosus* Rye and *S. variicellae* Rye, are described and illustrated. All are annual plants apparently endemic to the south-west of Western Australia and one of them is on the Priority Flora List.

Introduction

A survey of annual Cyperaceae species of the South West and Eremaean Botanical Provinces of Western Australia has recently been undertaken to locate taxa of conservation significance (Rye 1997). From this survey it appears that at least nine of the annual species of Cyperaceae have never been named. Most of the new taxa are considered to be too poorly known to name formally at this stage as there is only one collection of each. Two of the new taxa are known from many collections and a third taxon is known from two collections, all three being new species of *Schoenus*. These three *Schoenus* species are described and illustrated here. A key and distribution maps for all the annual *Schoenus* species of Western Australia are given in Rye (1997).

Descriptions of new taxa

Schoenus badius Rye, *sp. nov.*

Schoeno penniseti affinis sed nuce ad apicem leviter 3-lobata, seriebus cellularum grandioris in quoque pagina minus numerosis differt.

Typus: Vacant Crown Land, south of Mt Adams, east of Dongara, Western Australia, 10 September 1980, *E.A. Griffin* 2811 (*holo:* PERTH 01050397).

Schoenus sp. *Mt Adams* (*E.A. Griffin* 2811) on Priority Flora List of 1995.

Annual herb 50-120 mm high, glabrous except for the perianth segments, scabrous on the distal margins of the leaves, the margins of the bract blades and the ridges of the peduncles. *Stems* very slender, *c.* 0.3 mm diam., 4-6-ridged and sometimes more or less 4-angled. *Leaves* sheathing the base of each stem, the lowest ones with an open sheath 2-8 mm long and blade up to 14 mm long or sometimes absent, the uppermost ones with a closed sheath 7-15 mm long and blade 23-30 mm long; sheath pale brown with reddish tinges to red throughout, ribbed; blade 0.2-0.3 mm wide, channelled on adaxial surface. *Bracts* erect, with a reddish sheath 1.5-3 mm long and slender blade 3-32 mm long. *Inflorescence* of usually 4-6 short- to long-pedunculate spikelets per stem in 1-3 (usually 2) clusters or levels each subtended by a bract, the longest peduncle of the basal cluster 4-12.5 mm long. *Spikelets* narrowly ovoid, 5-6 mm long, 2- or 3-flowered, with 3 empty basal glumes, chestnut-coloured with pale green stripes corresponding with the margins and keel of the glumes. *Basal glumes* broadly ovate and keeled, 1-2.5 mm long. *Floral glumes* ovate and keeled, 4-5 mm long. *Perianth segments* exceeding the nut, 1.2-1.5 mm long, hair-like in the distal half, becoming slightly broader and with long fine antrorse hairs in basal half, white, shed with the nut. *Stamens* 3; anther *c.* 2.5 mm long. *Style* with 3 stigmatic branches. *Nut* trigonous-obovoid or broadly so and shortly beaked, *c.* 1.0 x 0.7 mm, 3-ridged, with 5-7 rows of medium-sized cells on each surface, each of the ridges protruding and smoothly rounded at the almost truncate summit of the nut, white; beak *c.* 0.2 mm long, slender. (Figure 1A-C)

Other specimen examined. WESTERN AUSTRALIA: Moresby Range, 16 Sep. 1978, *D. & N. McFarland* 1336a (PERTH).

Distribution. Probably endemic to the South West Botanical Province of Western Australia, known only from Moresby Range (north of Geraldton) and near Mt Adams (east of Dongara).

Habitat. One record from 'wet areas', the other from grey sand. One of the two herbarium sheets bears mixed material of *Schoenus badius* and *S. variicellae*.

Phenology. Ephemeral annual herb, germinating after the winter rains have moistened the habitat sufficiently, with flowers and fruits recorded in September. One of the specimens was in an advanced stage of flowering and fruiting on 10 September, so probably began flowering in August.

Conservation status. CALM Conservation Codes for Western Australian Flora: Priority 2. There are only two collections of the species, the northern one from a reserve. Attempts to relocate the northern population in September 1995 were unsuccessful (S. Patrick pers. comm.), possibly because it was a particularly dry year not suiting ephemeral species. It could easily be overlooked in the field because of its small size and the presence of other, much more common, *Schoenus* species in its geographical range.

Etymology. From the Latin *badius* - chestnut brown, referring to the colour of the spikelets.

Notes. Similar to *Schoenus pennisetis*, which differs in its smoother nut with a rounded (not 3-lobed) summit and numerous rows of tiny cells on each surface. *S. pennisetis* also tends to have shorter glumes, the floral glumes being 3-4.5 mm long.

Schoenus plumosus Rye, *sp. nov.*

Schoenus sp. *south-west* (*G.J. Keighery* 5677).

Species haec ab *Schoeno humili* differt periantho exuto ad nuci affixo et seriebus cellularum super superficie nucis paucioribus; ab *Schoeno sculpto* differt glumis longioribus et segmentis perianthi multo prominentibus.

Typus: 1 km north of Serpentine, Western Australia, 18 September 1982, *G.J. Keighery* 5239 (*holo*: PERTH 02332523; *iso:* CANB).

Annual herb 70-180 mm high, erect, glabrous except for the perianth segments and sometimes the glume apices. *Stems* 0.5-1.2 mm diam., *c.* 10-ribbed. *Leaves* sheathing the base of each stem, the basal ones reduced to an open sheath or with a short blade, the uppermost ones with a closed sheath 11-24 mm long and blade 22-150 mm long; sheath red-brown to almost black, ribbed; blade 0.4-1.2 mm wide, channelled on adaxial surface. *Bracts* erect, becoming shorter up the stem, the uppermost ones with a pale to very dark red-brown sheath 3-5 mm long and blade 3-8 mm long. *Inflorescence* of up to 12 (usually 3-7) spikelets per stem borne in several 'clusters', each subtended by a bract, sometimes with short branches bearing 2-4 spikelets (each at a different level) as well as stout peduncles of varied sizes arising in the axil of each main bract, the longest peduncle or branch of the basal cluster 5-26 mm long. *Spikelets* narrowly ovoid, 6-7 mm long, 3-6-flowered, with the basal glume empty, pale green with dark red-brown stripes. *Basal glume* broadly ovate and keeled, 1.5-4 mm long, sometimes with a short blade. *Floral glumes* ovate to broadly ovate and keeled, (3.5)4-5.5 mm long, with a broad pale green keel and dark red-brown on each side of keel, sometimes with a narrow yellowish stripe separating the main two colours, the extreme margins often white to yellowish, sometimes with a few hairs or fine teeth on the keel or margins close to the apex. *Perianth segments* exceeding the nut, 2.0-2.6 mm long, plumose (with very dense fine cilia), white throughout at first, usually becoming pale ferruginous to dark red-brown in distal half, shed with the nut. *Stamens* 3; anther 0.6-1 mm long. *Style* with 3 stigmatic branches. *Nut* trigonous-ovoid or broadly so and prominently beaked, 1.4-1.7 x 0.7-1.0, 3-ridged, with 3-5 rows of cells between the ridges, the cells of the central rows large (usually much larger than the rest), the ridges tapering at the summit into the beak, white to pale brown throughout or sometimes with some cells (especially along the ridges) becoming dark red-brown to black; beak 0.3-0.4 mm long, broad. (Figure 1J-M)

Other specimens examined. WESTERN AUSTRALIA (all PERTH): Wambellup Nature Reserve, 11 Oct. 1994, *A.R. Annels* 4599 *& R.W. Hearn*; Gnangara, 19 Sep. 1945, *C.A. Gardner* 7692; Western side of Lake Indoon, 8 Sep. 1979, *G.J. Keighery* 2481; 9 km N of Capel, 1 Oct. 1982, *G.J. Keighery* 5677; Beaufort River flats, 19 km N of Kojonup, 22 Oct. 1983, *G.J. Keighery* 6841; above Misery Beach, Torndirrup National Park, 5 Dec. 1988, *G.J. Keighery* 8658a; Duranillin, 4 Nov. 1988, *G.J. Keighery* 10493; J. & B. Martyn Reserve, 13 km N of Midland, 31 Oct. 1988, *G.J. Keighery* 11614; *c.* 1 mile [1.6 km] from junction on Denmark-Albany road on the lower end, 21 Nov. 1980, *M. McCallum Webster* 647; 4 km N of Arthur River townsite, 18 Oct. 1975, *K. Newbey* 4862; Elgin, 16 Oct. 1947, *R.D. Royce* 2286; Capel, 25 Sep. 1948, *R.D. Royce* 2694.

Distribution. Endemic to the South West Botanical Province of Western Australia, extending from Lake Indoon south to near Capel and south-east to Albany.

Habitat. Occurs on the margins of winter-wet depressions and watercourses and in other damp habitats.

Phenology. Ephemeral annual herb, germinating after the winter rains have moistened the habitat sufficiently, and producing flowers and fruits between September and November.

Conservation status. Not considered to be at risk.

Etymology. From the Latin *plumosus* - feathery, referring to the prominent plumose perianth segments.

Notes. Somewhat intermediate in morphology between *Schoenus sculptus* and *S. humilis* but occurring mainly in more humid areas and therefore only slightly overlapping in geographical range with the other two taxa. *Schoenus sculptus* can be distinguished from *S. plumosus* by its shorter glumes (3-3.5 mm long) and lack of perianth segments, and also tends to have a smaller habit and a shorter beak on the nut. *Schoenus humilis* differs from *S. plumosus* in its persistent perianth, which is not shed with the nut, as well as in the patterning on its nut, which has more numerous rows of cells of more uniform size.

Schoenus variicellae Rye, *sp. nov.*

Schoeno odontocarpo arcte affinis sed glumis longioribus, antheris grandioribus et seriebus longitudinalibus cellularum super superficie nucis paucioribus differt.

Typus: 3 km south-east of Nanson Rd on Erupting Mud Rd, between Howatharra and Geraldton, Western Australia, 29 August 1983, *R.J. Cranfield* 3080 (*holo:* PERTH 02261448; *iso:* CANB, MEL, NSW).

Annual herb 30-160 mm high, erect, glabrous except for the inflorescence branches. *Stems* 0.3-0.4 mm diam., 4-6-ribbed. *Leaves* sheathing the base of each stem, the basal ones reduced to an open sheath, the uppermost ones with a closed sheath 6-20 mm long and blade 13-50 mm long; sheath pale to very dark red-brown, ribbed; blade 0.3-0.5 mm wide, channelled on adaxial surface. *Bracts* erect or spreading, becoming shorter up the stem, the uppermost ones with a pale to very dark red-brown sheath 1.3-1.6 mm long and blade 3-14 mm long. *Inflorescence* sometimes a single terminal cluster of up to 7 spikelets, sometimes of two dense clusters on each stem and sometimes of 2-4 clusters with one or more long-pedunculate spikelets or branches bearing a small cluster of spikelets as well as the densely clustered spikelets, each cluster subtended by a bract, the longest peduncle or branch of the basal cluster 1-25 mm long. *Spikelets* ovoid, 3.5-5 mm long, 2-4-flowered, with 2(3) empty basal glumes. *Basal glumes* broadly ovate and keeled, 1.3-2 mm long, often with a minute apical point 0.1-0.2 mm long. *Floral glumes* ovate to broadly ovate and keeled, (2.5)3-4 mm long, with a broad pale green keel (becoming reddish towards the base) and medium to dark red-brown on each side of keel, sometimes with a narrow yellowish stripe separating the main two colours, the extreme margins pale, often with a minute subterminal mucro. *Stamens* 3; anther 1.2-2.4 mm long. *Perianth segments* absent or minute (much shorter than the nut). *Style* with 3 stigmatic branches. *Nut* broadly trigonous-obovoid, often with a small apical point, 0.6-1.0 x 0.4-0.7 mm, 3-ridged, each of the ridges shortly produced at the summit into a horn, with 3-5 rows of cells between the ridges on each surface, the central rows usually with very large cells, white. (Figure 1G-I)

Selected specimens examined. WESTERN AUSTRALIA (all PERTH): 3.2 km S of Namban on Geraldton Highway, 22 Aug. 1965, *A.C. Beauglehole* 12222; Perup River, E of Manjimup, Oct. 1948, *H. Butler*; 3.5 km NE of Cumby Cumby Soak, Jingemarra Station, 16 Sep. 1988, *R.J. Cranfield* 6151; Midland Junction, Sep. 1900, *W.V. Fitzgerald*; Gnangara, Oct. 1945, *C.A. Gardner*; Gingilup Swamps Nature Reserve, 19 Nov. 1991, *N. Gibson & M. Lyons* 1237; 9 km N of Capel, 1 Oct. 1982, *G.J. Keighery* 5758; Wooroloo, 1937, *M. Koch*; below Moore Hill, near Merredin, 11 Oct. 1980, *M. McCallum Webster* 507; Walga Rock, 5 Sep. 1991, *D.E. Murfet* 1123; Howatharra Hill Reserve, 26 Sep. 1995, *S. Patrick* 2423; *c.* 3 km NW of Shannon township, 12 Nov. 1986, *P.G. Wilson* 12375c.

Distribution. Endemic to Western Australia. Occurs mainly in the South West Botanical Province, extending from Kalbarri National Park south to Gingilup Swamps Nature Reserve (Scott River area) and

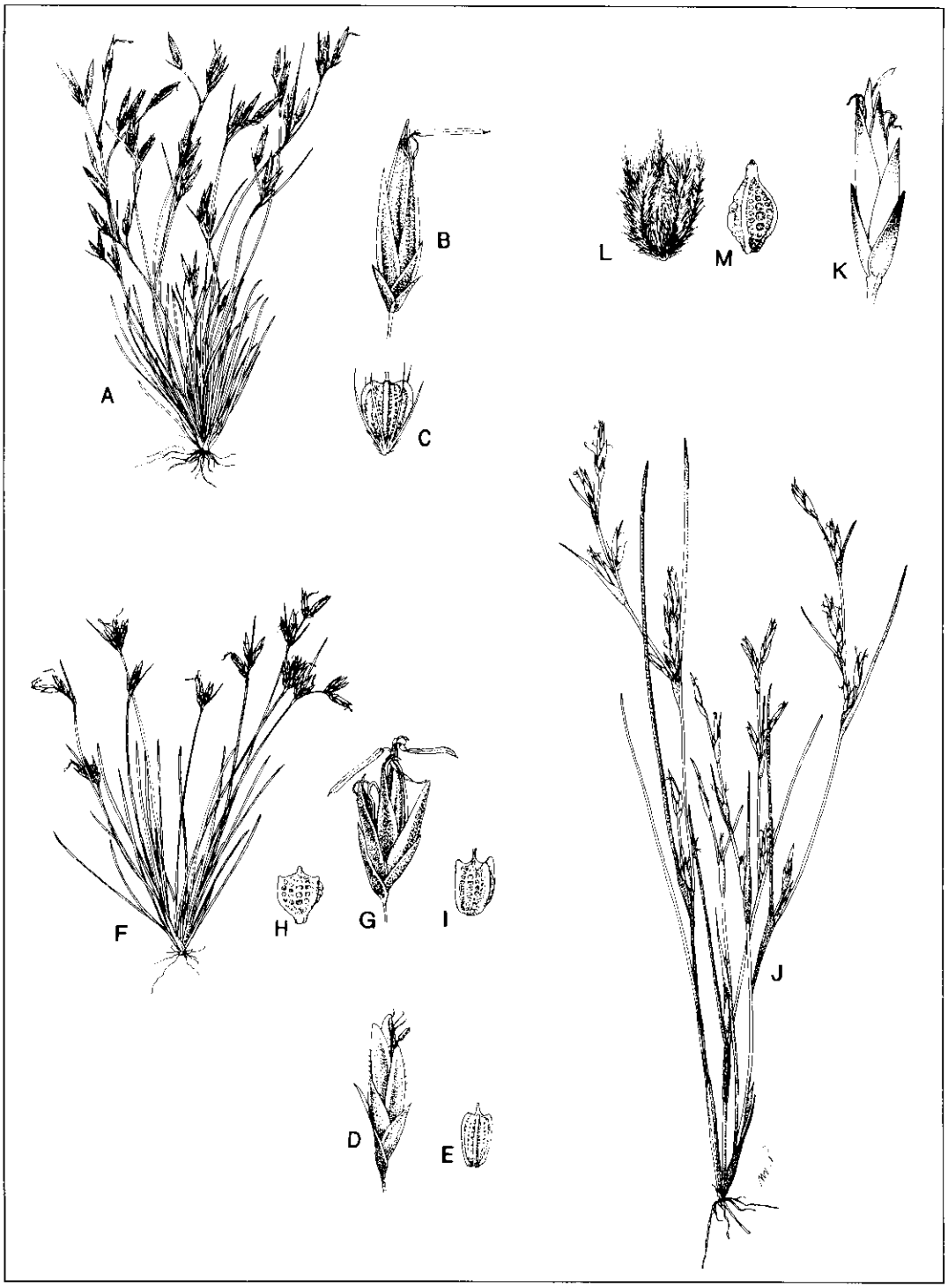

Figure 1. A-C - *Schoenus badius* A - whole plant (x1), B - spikelet (x5), C - fruit with perianth segments (x8); D,E - *Schoenus odontocarpus* D - spikelet (x5), E - fruit (x8); F-I - *Schoenus varicellae* F - whole plant (x1), G - spikelet(x6), H,I - fruit from two different collections to show variation in shape (x9); J-M - *Schoenus plumosus* J - whole plant (x1), K - spikelet (x4), L - fruit with perianth segments (x8), M - fruit (x8). Drawn from *E.A. Griffin* 2811 (A-C), *M. McCallum Webster* 655 (D,E), *R.J. Cranfield* 7459 (F-H), *E. Lindgren* 23 Sep. 1963 (I), *G.J. Keighery* 8658 (J,K) and *M. McCallum Webster* 647 (L,M).

Perup River, with a few scattered records inland to Walling Rock Station (west of Menzies) in the South-western Interzone.

Habitat. Occurs mainly in clay soils in winter-wet depressions or other damp situations near the west coast, also sometimes occurring inland and then often associated with granite or laterite.

Phenology. Ephemeral annual herb, germinating after the winter rains have moistened the habitat sufficiently, and producing flowers and fruits between August and November.

Conservation status. Widespread and commonly collected.

Etymology. From the Latin *varius* - varied or different and *cella* - chamber, referring to the varied sizes of the cells on the the surface of the nut. The epithet is treated as a noun in apposition.

Notes. Until recently, this species was generally included within *Schoenus odontocarpus* as in Rye (1987). In 1995, type material of *S. odontocarpus* was examined at MEL to determine which of the two taxa was true *S. odontocarpus* and then specimens of the new taxon were redetermined temporarily as *Schoenus* sp. aff. *odontocarpus*. *Schoenus odontocarpus* can be distinguished from the new species by its shorter floral glumes (1.5-2.5 mm long), which tend to have coarse hairs or teeth on the keel towards the apex, smaller anthers (0.5-0.8 mm long) and distinctive patterning on the nut. Its nut has 5-7 rows of cells between the ribs and the cells are of more uniform size than in *S. variicellae*.

There are two main variants of *Schoenus variicellae*. The typical variant has anthers 1.7-2.4 mm long and extends from Kalbarri south to Guildford and Wooroloo and inland to Walling Rock Station. The atypical variant has anthers 1.2-1.5 mm long and occurs in the extreme south-west from near Bunbury south-west to the lower Scott River and south-east to the upper Shannon River. The south-western variant also tends to have less densely clustered spikelets and shorter glumes than the typical variant but the two variants overlap in these characters.

Acknowledgements

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References

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