New Western Australian species of *Hypolaena* (Restionaceae) and a new section

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Abstract

Briggs, Barbara G. and Johnson, L.A.S. (National Herbarium of New South Wales, Mrs Macquaries Road, Sydney, NSW 2000, Australia) 2004. New Western Australian species of Hypolaena *(and a new section* Telopea *10(2): 573–580. Hypolaena* is divided into section **Homeolaena**, consisting only of *H. humilis* (Gilg) B.G. Briggs & L.A.S. Johnson and section *Hypolaena*, including the remaining seven species. Two of these species, **H. viridis** and **H. caespitosa**, are from the south of Western Australia and are newly described and illustrated. The name *H. grandiuscula* F. Muell. is adopted for a further taxon from the same region and a **lectotype** selected. All these three species occur from near Bussleton to near Walpole or Denmark; *H. viridis* and *H. caespitosa* are relatively common but *H. grandiuscula* appears to be rare throughout its range.

Introduction

As currently recognised, *Hypolaena* R. Br. (Brown 1810: 251) includes eight species (Linder et al. 1998, Briggs & Johnson 1999), including the two described here. It is typified by *H. fastigiata* R. Br., (typ. cons., ICBN 1988:170) which occurs in both western and eastern Australia. The other species are limited to the south of Western Australia, as follows: *H. exsulca* R. Br. (Brown 1810: 251), *H. humilis* (Gilg) B.G. Briggs & L.A.S. Johnson (recently transferred from *Leptocarpus*, Briggs & Johnson 1998), *H. robusta* K.A. Meney & J.S. Pate (Meney et al. 1996), *H. pubescens* (R. Br.) Nees and *H. grandiuscula* F. Muell. (name newly adopted here, see below). *Hypolaena pubescens* was originally described as *Restio pubescens* R. Br. (Brown 1810: 247) and was appropriately transferred to *Hypolaena* by Nees (1846: 69) but was, until recently, generally known as *Loxocarya pubescens* (R. Br.) Benth. (Bentham 1878: 242). We drew attention to its affinities to other *Hypolaena* species (Briggs & Johnson 1999), a placement also adopted by Meney et. al. (1999). The species here newly described were included in our conspectus of Restionaceae (Briggs & Johnson 1999); information on them and other *Hypolaena* species is given by Meney et. al. (1999). A description of the genus is provided by Linder et al. (1998) and an account of all species of *Hypolaena* will be given in the Flora of Australia (Briggs, Johnson, Porter & Krauss in preparation).

Although Brown (1810) included only two species, both Australian, when describing the genus, *Hypolaena* was later greatly enlarged, especially by Masters (1869, 1878), by the inclusion of South African species and by Australian species that were originally described in *Calorophus* Labill. and *Loxocarya* R. Br. The African taxa have since been removed, mostly to *Calopsis* (Linder 1985). The Australian species transferred by Masters to *Hypolaena* are now distributed among *Calorophus*, *Desmocladus*, *Empodisma* and *Loxocarya*, while Brown's original two species remain in *Hypolaena*.

Sectional classification of *Hypolaena*

Bentham (1878) divided *Hypolaena* into section *Hypolaena* (as *Eulypolaena*) and section *Calorophus*. *Calorophus* Labill. is now recognised at generic rank and the three species

† Deceased 1 August 1997.

Bentham placed in the latter section are now divided between *Calorophus* and *Empodisma* L.A.S. Johnson & D.F. Cutler (1973) (Johnson & Briggs 1991). Later, Bentham and Hooker (1883) again divided *Hypolaena* into sections, indicating their distinguishing features but not the species referred to each section. From the features and distributions given, section *Tenues* equates to section *Caloroplus* Benth. and section *Africanae* included only African taxa, both groups of species now excluded from *Hypolaena*; while section *Restioideae* included the species now remaining in *Hypolaena*. The past sectional division of the genus has thus been rendered ineffective.

H. humilis is, in our opinion, appropriately placed in *Hypolaena* but differs notably from the other species. As foreshadowed previously (Briggs & Johnson 1999), we consider that it is appropriate to establish a section with *H. humilis* as its only member, the other species being placed in the autonomic section *Hypolaena*, typified by *H. fastigiata* R. Br.

Hypolaena *section* Homeolaena *B.G. Briggs & L.A.S. Johnson*, **sect. nov.**

Type species: *H. humilis* (Gilg) B.G. Briggs & L.A.S. Johnson, Telopea 8: 28 (1998).

A sectione *Hypolaena* combinatione characterum sequentium distinguitur: nuces tepalis bractisque circumcinctae exutae; axis fulcrans floris feminei brevissimus, bracteis haud reductis instructus; tepala nuxem excedentia.

Distinguished from section *Hypolaena* by the whole female spikelet acting as the dispersal unit; dispersed with 4–6 bracts and the six tepals all surrounding the fruit; the female floral axis very short and with a pair of unreduced bracts similar in size and texture to the spikelet bracts and tepals; tepals imbricate and longer than the nut (Fig. 1a, b). In section *Hypolaena* the floral axis abscisses above the spikelet bracts in the fruiting stage; the nut is dispersed with the tepals and, below them, a short fleshy axis that appears to act as an elaeiosome and bears two reduced bracts near the base; tepals not imbricate, longer than the nut or (in most species) much shorter (Fig. 1c, 3c, d, h). Both sections of *Hypolaena* have compound female spikelets, although with a single flower; the compound structure is apparent only by careful dissection and comparison with related genera.

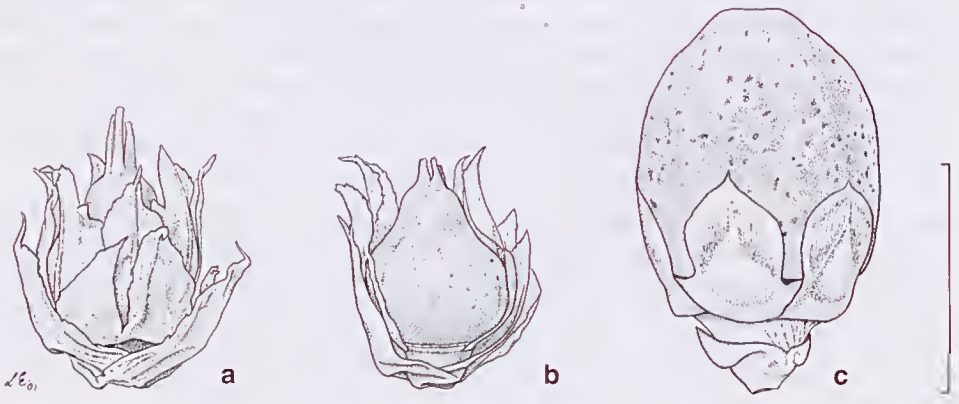

Fig. 1. Female spikelets in fruiting stage, **a–b**, *H. humilis*, **a**, as dispersed, nut surrounded by tepals, floral bracts and spikelet bracts; **b**, as (a) but some bracts and tepals removed (48 km SW of Ravensthorpe, *Briggs 460* NSW); **c**, *H. pubescens*, as dispersed, nut with tepals and floral bracts (10 km WNW of Busselton, *Briggs 6463* NSW). Scale bar = 2 mm.

Homeolaena is derived from the Greek *homoios*, uniform or similar and *laina*, a cloak, referring to the similarity between the floral bracts, spikelet bracts and tepals.

New species of section *Hypolaena* and an old name newly adopted

Hypolaena viridis *B.G. Briggs & L.A.S. Johnson*, **sp. nov.**

Type: Western Australia: Brockman Highway, 3.3 km W of junction with Sues Rd (c. 27 km E of Karridale), 6 Oct 1984, *B.G. Briggs 7571 & L.A.S. Johnson* ♂ (holo PERTH; iso NSW, AD, CANB, K, MEL, MO, NBG, PRE, RSA).

A *H. exsulca* combinatione characterum sequentium distinguitur: culmi plerumque 1–2 cm separati, concavo-convexi; vaginae culmorum abrupte contractae; bracteae spicularum feminearum non recurvatae.

Rhizome creeping, stout, 4–6 mm diam.; scales glossy orange-brown, partly covering a brown pubescence. Culms spaced mostly 1–2 cm apart on the rhizome, erect to slightly sinuose, compressed and concavo-convex in section, striate, branched, 30–40 cm long, 0.5–1.5 mm wide, mostly glabrous but the lower part with flat multicellular hairs closely appressed to epidermis. Culm sheaths 5–12 mm long, tapering abruptly; with an auriculate, evanescent, membranous margin; lamina usually absent, if present then shortly erect, c. 1 mm long. Male spikelets 1–5(–7) on each of several short slender branches at a few upper nodes of the culm, pedicellate, mostly erect, narrow ovoid, 4.5–7.5 mm long; glumes 15–30, all fertile or with up to 6 sterile lower glumes, ovate, acute to minutely mucronate, concave, glabrous, brown, 1.8–2.3 mm long, with a broad apical hyaline margin. Female spikelets usually solitary and terminal on ± erect, slender branches, very-narrow ovoid, c. 15 mm long, c. 2 mm diam.; glumes 6–8, lanceolate, cuspidate, brown becoming greyish with age, glabrous, 6–13 mm long. Male flowers: tepals 6; outer tepals oblanceolate, truncate; 1.2–1.5 mm long; inner tepals slightly longer, ± flat, lanceolate to oblanceolate, acute to truncate; anthers c. 0.8 mm long. Female flowers: tepals 6, dark brown, oblong, blunt, appressed to the nut, c. 2.3 mm long. Nut: broad cylindrical, tapering distally, rugose, light-brown, 4 mm long. (Fig. 2 e–g).

The epithet is from the Latin, *viridis*, green, referring to the culms; most other *Hypolaena* species have grey-green culms.

Distribution: occurs in the south-west of Western Australia from the Busselton and Augusta districts to north of Walpole. Grows near streams, in poorly drained heathy swamps and woodland, on sand or clayey or peaty sand; sites moist most of the year; sometimes in seasonally inundated sites. Resprouts after fire.

Conservation status: common, not at risk.

Resembling *H. exsulca* but culms concavo-convex, spaced mostly 1–2 cm apart on the rhizomes; culm sheaths abruptly tapering and with an evanescent membranous margin; male spikelets tapering distally; bracts of female spikelets straight. *H. exsulca* has terete culms, spaced mostly 0.5 cm apart; culm sheaths gradually tapering and with a wide persistent membranous margin; male spikelets almost truncate; bracts of female spikelets becoming recurved. (Fig. 2 h–j).

Selected specimens examined: Western Australia; Darling: Jindong, Busselton district, 18 Oct 1948, *R. Royce 2861* ♀, *2862* ♂ (PERTH); Carbunup River, 1.5 miles [2.4 km] SW of Jindong, W.A., 20 Sep 1966, *Briggs 869* ♂ (NSW, MEL); c. 27 km E of Karridale, 6 Oct 1984, *Briggs 7572 & Johnson* ♂ (NSW, BRI, CANB, CBG, HO, K, L, MO, NBG, PERTH, PRE, RSA); Brockman Hwy, 18 miles [29 km] E of Alexandra Bridge, 19 Sep 1966, *Briggs 689* ♀, *692* ♂ (NSW, AD, PERTH); 6.4 km SW of Mt Frankland, 18 Sep 1966, *Briggs 649* ♂ (NSW, CANB); South Western Highway 37.5 km S of Deeside Coast Road, 7 Jan 1989, *K. Meney 4c* ♀ (NSW);12 km N of Walpole on North Walpole Road, 7 Oct 1984, *Briggs & Johnson 7613* ♂ (NSW, CANB, NBG, PERTH, PRE, RSA).

Hypolaena caespitosa *B.G. Briggs & L.A.S. Johnson*, **sp. nov.**

Inter species *Hypolaenae* combinatione characterum sequentium distinguitur: habitus caespitosus; culmi numerosissimi, graciles (0.5–1 mm diametro); pili valde appressi culmis ut videtur glabris.

Type: Western Australia: Dennis Road, 5 km S of Brockman Hwy, c. 16 km E of Karridale, 6 Oct 1984, *B.G. Briggs 7590a & L.A.S. Johnson* ♀ (holo PERTH; iso NSW, AD, BRI, CANB, K, MEL, MO, NY).

Caespitose; basal scales brown, partly covering a woolly pubescence. Culms crowded, erect or ascending, usually somewhat compressed but often ± terete towards the base, striate, much-branched, 30–40 cm long, 0.5–1.0 mm diam, appearing glabrous but with flat multicellular hairs very closely appressed to epidermis. Culm sheaths red- or purple-brown when young, glabrous, 0.5–2.0 cm long, ± acute; lamina erect, caducous 2–12 mm long; margin auriculate, evanescent, membranous. Male spikelets 1–7(–12) on each of several short branches from the upper culm nodes, erect or occasionally pendulous, pedicellate, ± ovoid, 3–4 mm long; glumes 10–15, all fertile, ovate to obovate, acute to minutely mucronate, glabrous, brown, 1.5–2.0 mm long, with a broad apical hyaline margin. Female spikelets on slender pedicels arising at several upper nodes of the culm branches, initially very narrow-cylindrical, 6–10 mm long; glumes 5–8, lanceolate, brown, becoming prominently reflexed and hyaline with age, glabrous, 3.0–8.0 mm long. Male flowers: tepals 6; 2 outer tepals slightly longer, broad-oblanceolate, truncate, 0.8–1.0 mm long; inner tepals flat, lanceolate to oblanceolate, acute to truncate; anthers c. 0.8 mm long. Female flowers: tepals 6, light brown with a dark brown base, oblong, blunt, appressed to the nut, 1–1.5 mm long. Nut: narrowly cylindrical, orange-tan, 1.9–3.0 mm long, c. 1 mm wide. (Fig. 2 a–d).

The epithet is from the Latin *caespes*, a tuft or sod of turf, referring to the caespitose habit.

Distribution: occurs in the south-west of Western Australia, from near Busselton to east of Augusta. Grows in sedge and heath swamps on peaty sand or sand over ironstone (laterite) pavement; sites seasonally inundated, in more peaty and less well-drained sites than other *Hypolaena* species in the region. Killed by fire.

Conservation status: locally common, not at risk.

Distinguished from all *Hypolaena* species except *H. pubescens* by its caespitose habit. Differs from *H. pubescens* in its very numerous slender culms and lack of long (0.5–4 mm) spreading hairs. Related to *H. exsulca* and *H. viridis* which have culms at intervals on long rhizomes and larger spikelets.

Selected specimens examined: Western Australia; Darling: 1 km E of Ruabon, 10 Oct 1976, *Briggs 6731* ♂ (NSW, CANB, PERTH), *6732* ♀ (NSW), *6736* ♂ (NSW, PERTH); c. 7 miles (11 km) SE of Busselton, Boallia to Yoongarillup, 21 Sep 1966, *Briggs 795a* ♂ (NSW); Dennis Road, 5 km S of Brockman Hwy, c. 16 km E of Karridale, 6 Oct 1984, *Briggs 7588 & Johnson* ♂ (NSW, CANB, K, MO, NBG, PERTH, RSA), *7589* ♂ (NSW, B, L, MO, PE, PERTH), *7589a* ♂ (NSW, BOL, PERTH), *7590* ♂ (NSW, AD, BRI, CANB, HO, K, MEL, PERTH); Scott River Road, 4 km S of Payne Road, 20 Nov 1994, *K. Wilson 8969 & K. Frank* ♀ (NSW); 1.1 km E of Scott River Road, on Governor Broome Road, c. 16 km ENE of Augusta, 11 Sep 1990, *Briggs 8669, Johnson, K. Meney, J. Pate & P. Linder* ♀ (NSW), *8670* ♂ (NSW, PERTH), *8670a* ♂ (NSW, BOL); 0.5 km S of Brennan Ford, ENE of Augusta, 12 Sep 1977, *E.N.S. Jackson 3282*, ♂ , ♀ (AD, NSW).

Hypolaena grandiuscula F. Muell.

(Mueller, Fragm. 8: 85, 1873)

H. fastigiata var. *grandiuscula* F. Muell., Fragm. 8: 85 (1873).

Fig. 2. a–d, *H. caespitosa*, **a–c**, female: **a**, habit (only a few of the many culms shown); **b**, inflorescence (*Briggs 7590a*); **c**, fruiting inflorescence (*Briggs 6732*); **d**, male inflorescence (*Briggs 6731*); **e–g**, *H. viridis*, **e**, female fruiting spikelet (*Briggs 689*), **f**, male: inflorescence, **g**, culm sheath (*Briggs 869*); **h–j**, *H. exsulca*, **h**, male inflorescence (*Orchard 1394*); **i**, plant habit with female inflorescences (*Wilson 8106*); **j**, culm sheath (Dec 1912, *Koch*). Scale bar: a, i = 5 cm; b–h, j = 1 cm.

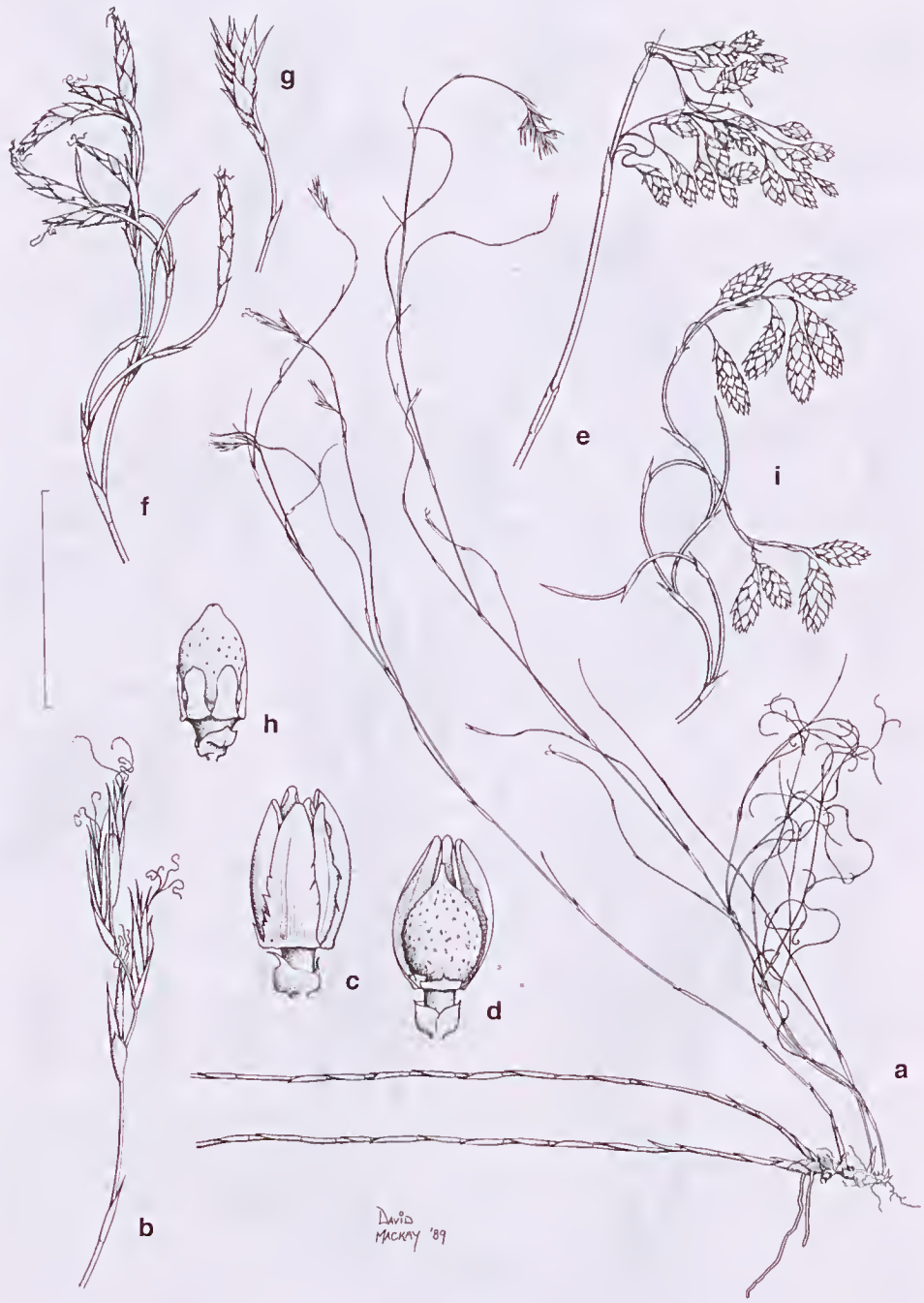

Fig. 3. **a–e**, *H. grandiuscula*, **a–d**, female: **a**, habit, **b**, inflorescence (Bow R., *Gittins 1765b*); **c**, fruit with tepals, **d**, fruit, some tepals removed (Yoongarillup, SE of Busselton, *Briggs 807*); **e**, part of male inflorescence (Bow R., *Gittins 1765a*); **f–i**, *H. fastigiata*, **f–h** female: **f**, part of female inflorescence, **g**, fruiting spikelet (W of Bremer Bay, *Briggs 7847*); **h**, fruit with tepals (SE of Nornalup, *Briggs 7628*); **i**, part of male inflorescence (Bremer Bay, *Briggs 7856*). Scale bar: a = 7.5 cm; b, e–g, i = 2 cm, c, d, h = 0.6 cm.

Type citation: in Australia occidentali prope sinum regis Georgi et montes Stirlingi reperi.

Type: Western Australia: KGS [King Georges Sound], *Oldfield* ♂ (**lectotype, here selected** MEL 14980). Residual syntypes: KGS, *Oldfield* ♂ (MEL 14978, 149879, 14984; 149885); sand near the sea, KGS, *Oldfield* ♂ (MEL 14986); S W Aust, Oct [18]67 ♂ [*Mueller*]. Residual syntype, specific determination doubtful: Stirlings Range, *Mueller* ♂ (MEL 14982)

Mueller simultaneously published alternative names for this taxon at specific and varietal rank; such publication at alternative ranks before 1953 does not invalidate these names (International Code of Botanical Nomenclature Art 34.2). We had previously, however, regarded these as provisional names and had applied the *nomen nudum 'H. macrotepala'* to this species (Briggs & Johnson 1999) and used that name in some herbarium annotations; our usage was also adopted by Meney et al. (1999).

Hypolaena grandiuscula (Fig. 3 a–e) resembles *H. fastigiata* R. Br. in its ascending rhizomes and general habit, but differs in the slender orange-brown female spikelets with tepals to 4 mm long (when fruiting) and males with glumes all fertile. It occurs in the south-west of Western Australia on sandy soils from near Busselton to east of Denmark but appears to be rare throughout its range. *Hypolaena fastigiata* (Fig. 3 f–i) has dark red-brown female spikelets with tepals to 1 mm long and males with few to many sterile lower glumes per spikelet; it occurs in the south of Western Australia and in eastern Australia from South Australia and Victoria to Tasmania, and through coastal districts to south-eastern Queensland.

Acknowledgments

Thanks go to the many people who assisted the study of Restionaceae over the years. Carolyn Porter, Siegfried Krauss, Barbara Wiecek, Louisa Murray, Anna-Louise Quirico, Vivian Shanker and others gave technical help. David Mackay and Lesley Elkan prepared the illustrations, while Peter Wilson advised on nomenclatural matters and the Latin diagnoses. The opportunity to examine specimens on loan or in other herbaria assisted the work. Co-operation and joint fieldwork with John Pate (University of Western Australia) and Kathy Meney (formerly of Kings Park and Botanic Garden, Perth) gave valuable insights. A grant from the Australian Biological Resources Study supported part of the study.

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Manuscript received 29 November 2001
Manuscript accepted 22 July 2003