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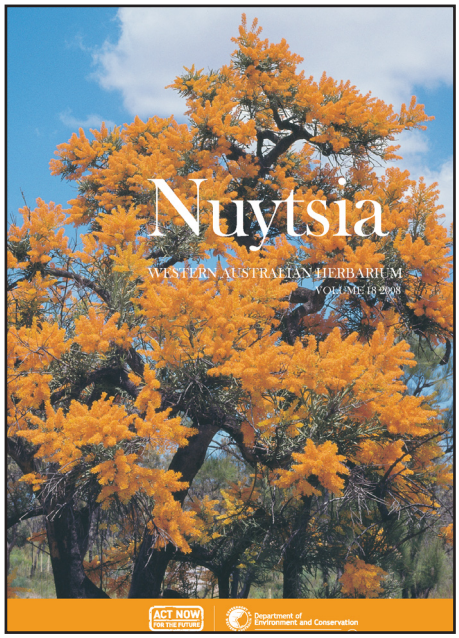

Wilson, P.G. Notes on the genus *Chrysocephalum* Walp. (Angianthinae: Asteraceae) with the description of one new species from Western Australia, and a new combination

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Notes on the genus *Chrysocephalum* (Angianthinae: Asteraceae) with the description of one new species from Western Australia, and a new combination

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Abstract

Wilson, P.G. Notes on the genus *Chrysocephalum* Walp. (Angianthinae: Asteraceae) with the description of one new species from Western Australia, and a new combination. *Nuytsia* 18: 331–338 (2008). The probability of the genus *Chrysocephalum* being paraphyletic is reviewed. *Helichrysum gilesii* F.Muell. is transferred to *Chrysocephalum*. A new species from the Gibson Desert, Western Australia is described and is compared with its close relative *C. gilesii* (F.Muell.) Paul G.Wilson. A widespread taxon from southern Australia which has been variously referred to as *Chrysocephalum apiculatum* (Labill.) Steetz or *C. aff. apiculatum* is shown to be *C. vitellinum* Sond.; this name is lectotypified. A key to the species of *Chrysocephalum* found in Western Australia is provided.

Introduction.

The acceptance by Anderberg (1991) of the genus *Chrysocephalum* Walp. as an Australian endemic taxon clearly distinct from *Helichrysum* Mill. was welcomed by the Australian taxonomic community and widely accepted in the horticultural industry. Anderberg's monograph should be consulted for a review of the data that supported that decision. This paper is concerned with a few of the points that have arisen during the preparation of a treatment of the genus for *Flora of Australia*.

Chromosome numbers

As was pointed out by Anderberg (1991), *Chrysocephalum* (Walpers 1841) is a genus not easily circumscribed if the species currently placed in *Leptorhynchos* Less. (Lessing 1832) and *Rutidosis* DC. (Candolle 1838) are excluded. The chromosome numbers for three of the four species referred to *Chrysocephalum* by Watanabe *et al.* (1999) have a base number of 12, while the fourth count applies to a species now transferred to *Leiocarpa* (Wilson 2001). Watanabe *et al.* (1999) also examined four species of *Leptorhynchos* each of which had a count of n = 12.

Of interest is a count made by Turner (1970) of '*Helichrysum* sp.' as *n*=10, the voucher of which is *Chrysocephalum vitellinum* Sond. (see below). If this count is correct it indicates that species in the genus *Chrysocephalum* have a chromosome number of n = 10 or 12.

These chromosome counts support the suggestion made by Anderberg (1991) that *Chrysocephalum* and *Leptorhynchos* should be considered congeneric in which case the latter generic name has priority since it was published earlier. However, until this matter can be thoroughly examined I am adopting the traditional generic circumscriptions and have therefore referred the species under consideration to *Chrysocephalum*.

Description

Chrysocephalum gilesii (F.Muell.) Paul G.Wilson, *comb. nov.*

Helichrysum gilesii F.Muell., *Fragm*. 10: 85 (1876).

Type: between the rivers Ashburton and Gascoyne, Western Australia, *E. Giles*. 'Inter fluvios Ashburton's et Gascoyne's River; E. Giles'(*holo*: MEL).

Principal distinguishing characters:

Inner involucral bracts with a thinly coriaceous narrowly oblong claw, sparsely pilose on margin and abaxial surface with hairs that have a stipe of 2–3 transversely placed cells and a narrowly ellipsoid (glandular?) apex of two parallel cells. The lamina is narrowly elliptic, acuminate, sparsely and shortly appressed pilose near the apex but otherwise glabrous except for the margin which is ciliate with simple slender acuminate hairs *c.* 0.5 mm long.

Multi-stemmed, tap-rooted *perennial herb*, to 50 cm high. *Stems* slender, branched, sparsely to moderately woolly, becoming glabrous towards apex. *Leaves* sessile, linear to narrowly elliptic, acuminate, to 6 cm long, thinly coriaceous, glabrous or sparsely woolly. *Capitula* solitary, terminal to branches, broadly turbinate or hemispherical, to 10 mm high; involucral bracts with narrowly oblong herbaceous claw papillose abaxially, and transparent, glossy, ciliate lamina, glabrous or minutely papillose towards apex, occasionally sparsely woolly on margin towards base. *Outer involucral bracts* very narrowly elliptic passing downwards into sessile peduncular bracts. *Medial involucral bracts*: claw narrowly oblong, 1–1.5 mm long, margin and adaxial surface with short stipitate glandular (?) hairs *c*. 0.05 mm long of which the swollen ellipsoidal apex is longitudinally divided into two cells while the short stipe is transversely divided into 2 or 3cells; lamina narrowly ovate, acuminate, transparent, ciliate, otherwise glabrous or minutely scabrous abaxially towards apex; lamina of innermost involucral bracts similar but narrower. *Florets* numerous, all bisexual; corolla shortly exceeding involucre, pale yellow. *Cypsela* narrowly cylindrical, *c*. 1.5 mm long, scabrous with globular myxogenic twin-hairs. *Pappus bristles c*. 10, capillary, barbellate, becoming very shortly plumose towards apex, persistent. (Figure 1 E–J)

Distribution. Widespread in the western-central and north-west regions of Western Australia, where found in the Little Sandy Desert, Pilbara, Gascoyne and Murchison IBRA Bioregions (Department of the Environment, Water, Heritage and the Arts 2008).

A recent collection from the Gibson Desert, Western Australia, brought attention to the presence of a distinct species that had been confused with *Chrysocephalum gilesii*. This is described below

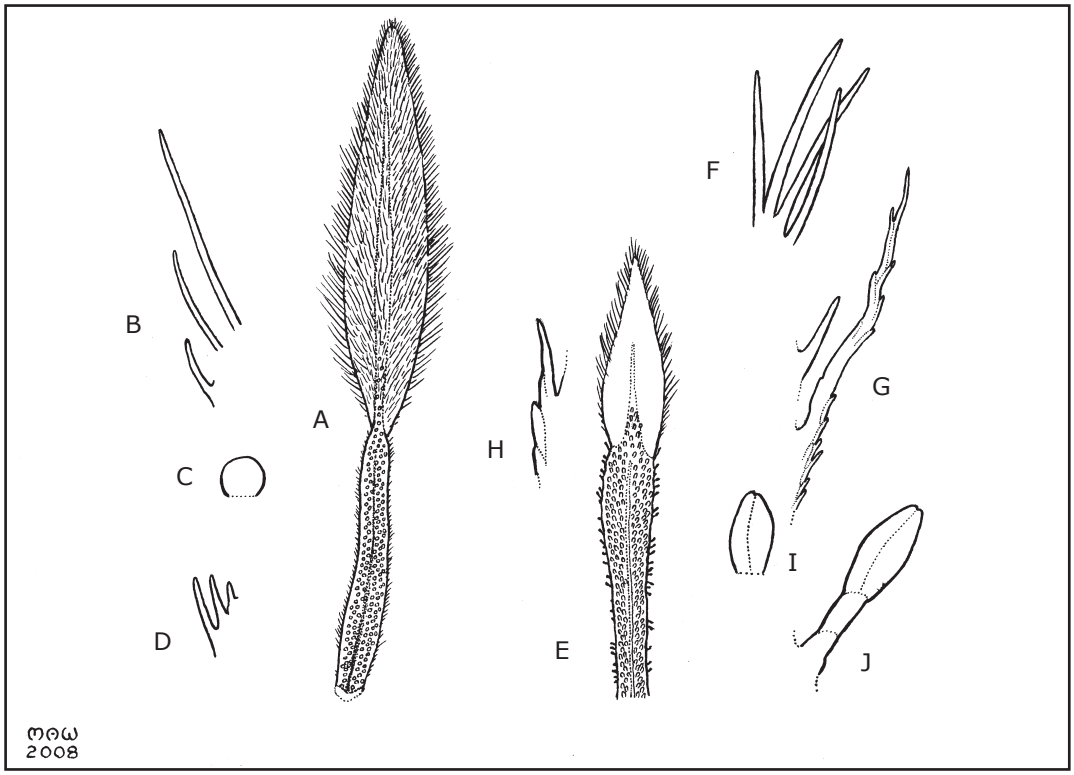

Figure 1. A – D. *Chrysocephalum sericeum*. A – innermost involucral bract, abaxial surface (× 11), B – marginal cilia on lamina (× 25), C – glandular hair on abaxial surface of claw (× 25), D – marginal cilia on claw (× 25); E – J. *Chrysocephalum gilesii*. E – innermost involucral bract, abaxial surface (× 11), F – marginal cilia on lamina (× 25), G – marginal cilia at junction of lamina and claw (× 25), H – marginal cilia near base of lamina (× 25), I – glandular hair on abaxial surface of claw, J – glandular hair on margin of claw (× 25). A – D drawn from *D.J. Pearson* 4015 (PERTH) and F – J drawn from *M.E. Trudgen* 15790 (PERTH).

Chrysocephalum sericeum Paul G.Wilson, *sp. nov*.

Chrysocephalo gilesii primo adspectu maxime simile sed ungue bracteis involucralibus interioribus ad marginem breviter ciliatis pilis uni-cellularibus *c*. 0.03 mm longis, pagina abaxiali glandibus globosis ornatis; lamina elliptica, acuminata, in superficiebus ambabus dense sericea, ad marginem ciliatis pilis gracilibus acuminatis ad 0.6 mm longis.

*Typu*s: Western Australia, Gibson Desert Nature Reserve, 24° 28' 00" S, 124° 52' 00" E, 10 May 1994, *A.R. Annels* 21A (*holo*: PERTH 04607465).

Erect multi-stemmed *perennial herb* to 40 cm high with a slender tap-root. *Stems* slender, with ascending branches that are cottony towards the apex otherwise glabrous. *Leaves* alternate, narrowly oblong and 50 × 4 mm or linear to 50 × 1 mm, acuminate, recurved on margin (at least in dried state), sparsely gland dotted, sparsely cottony when young, with a few minute globular hairs on abaxial surface otherwise glabrous. *Upper leaves* shorter and with scarious apices, grading into the outer involucral bracts. *Capitula* terminal, solitary, hemispherical, *c*. 10 mm high, homogamous, disciform; involucral bracts with glossy transparent very pale golden scarious ciliate laminae. *Outer involucral bracts*: base fleshy, lamina scarious, linear, acuminate, sparsely ciliate. *Medial involucral bracts*: claw narrowly oblong to 3.5 mm long, 0.5 mm wide, coriaceous, with globular glands on abaxial

surface; lamina narrowly ovate to ovate, acuminate, to 7 mm long, moderately ciliate (cilia slender, acuminate, 0.3–1 mm long), sparsely appressed-pubescent near tip otherwise glabrous. *Innermost involucral bracts*: claw *c*. 4 mm long, shortly ciliate on the margin with firm acuminate single-celled hairs *c*. 0.03 mm long, abaxial surface covered with globular glands; *lamina* acuminate-elliptic densely sericeous on abaxial and adaxial surfaces with simple slender hairs and on the margin moderately ciliate with simple slender acuminate hairs to 0.6 mm long that grade at the base to the short hairs on the claw. *Florets* bisexual, all fertile; corolla pale yellow, tubular, *c*. 7 mm long, shortly 5-lobed, glabrous; anther appendices narrowly oblong, obtuse; stigmas sub-globular. *Cypsela* terete, *c*. 1.7 mm long, 0.8 mm diam., densely covered with globose myxogenic twin-hairs (not seen in fully mature state); *pericarp* thick, translucent; testa brown. *Pappus bristles c*. 15, equal to corolla, white, capillary, free, barbellate, but setae longer and acuminate at apex. (Figure 1 A–D)

Other specimens examined. WESTERN AUSTRALIA: Gibson Desert: Gary Hwy between Gunbarrel Hwy and Windy Corner, 24 July 1967, *J.S. Beard* 4851 (PERTH); Gibson Desert Nature Reserve, 14 May 2000, *T.B. Bragg* 2 (PERTH); *ibid*., 15 May 2000, *T.B. Bragg* 37 (PERTH); Eagle Bore Study Site, 25 July 2002, *T.B. Bragg* 2001-73 (PERTH); Patience Well, 4 Feb. 2001, *C.P. Campbell* 149 (PERTH); Gibson Desert Nature Reserve, 3 Sep. 1994, *N. Burrows* SM3 (PERTH); *ibid*., 17 Oct. 1997, *N. Burrows* JK 9 (PERTH); 12 km W of Young Range, Sep. 1992, *Desert Dreaming Expedition* 54 (PERTH); 32 km S of Windy Corner, Gary Hwy, 20 July 2001, *P.K. Latz* 17876 (PERTH); Plot 3, Spinifex Track, 6 Sep. 1998, *G.L. Liddelow* 37 (PERTH); Gibson Desert: 5 km E of Gary Hwy, 2 July 1984, *G.J. Morse* 226 (CANB, PERTH); 9 km SW of Young Range, 26 Apr. 1994, *D.J. Pearson* 4015 (PERTH); Clutterbuck Hills Aboriginal Reserve, Gibson Desert, *W.A. Thompson* 245 *& J. Fogarty* (PERTH).

Distribution. Only recorded from the western portion of the Gibson Desert IBRA Bioregion.

Habitat. Hummock (*Triodia*) grassland with associated *Acacia* shrubs. Red sandy clay loam over laterite and sandstone.

Phenology. This species appears to flower and fruit throughout the year, presumably in response to rainfall.

Conservation status. Evidently widespread in the western half of the Gibson Desert and not under threat.

Etymology. The epithet refers to the silky indumentum on the lamina of the innermost 2–3 rows of bracts.

Affinities. The affinities of this species are obviously with *Chrysocephalum gilesii*, a species with similar habit and inflorescence but generally with a more prominent white cottony indumentum on the lower portions of the stems and with almost glabrous laminae to the inner involucral bracts which also have a different type of glandular hairs on their abaxial surface. The two species are disjunct in their distributions, *C. gilesii* being found in inland regions of the Keartland, Fortescue, Ashburton and Austin Botanical Districts with its most easterly occurrence about 300 km west of the most easterly record for *C. sericeum*.

Photographs of *Chrysocephalum sericeum,* taken by C.P. Campbell, appear in the Western Australian Herbarium *FloraBase.*

This species was brought to my attention by Wendy Thompson, Conservation Officer with the Department of Environment and Conservation, who collected it in the Gibson Desert.

Six species of *Chrysocephalum* are currently recognised as occurring in Western Australia and these may be identified with the following key.

Key to species of *Chrysocephalum* found in Western Australia

1. Capitula solitary at ends of slender branches

2. Branches densely white tomentose; leaves erect or somewhat spreading

3. Leaves appressed to branch; capitula turbinate; involucral bracts minutely scabrous on outer (abaxial) surface ..... **C. puteale**

3: Leaves appressed or slightly spreading; capitula hemispherical; involucral bracts smooth on outer (abaxial) surface..... **C. eremaeum**

2: Branches glabrous or very sparsely woolly; leaves spreading

4. Lamina of involucral bracts glabrous (or slightly pubescent at base)..... **C. gilesii**

4: Lamina of innermost rows of involucral bracts sericeous on both surfaces ..... **C. sericeum**

1: Capitula clustered at ends of branches

5. Capitula turbinate; involucral bracts scabrous on outer (abaxial) surface ..... **C. pterochaetum**

5: Capitula hemispherical; involucral bracts smooth on outer (abaxial) surface ..... **C. apiculatum**

Note. The name *Chrysocephalum apiculatum* (Labill.) Steetz is here used in the broad sense so as to encompass several taxa that have still to be definitively circumscribed.

During an examination of material of *Chrysocephalum apiculatum* from several Australian herbaria one variant from southern and south-eastern Australia stood out as specifically distinct, a fact also noted by several collectors, in particular R.J. Bates. This taxon was also recognised as a distinct species by J.A. Jeanes in the *Flora of Victoria* 4: 794 (1999) where it was referred to as '*Chrysocephalum* sp. 2'. The type material of *Chrysocephalum vitellinum* Sond. & F.Muell. ex Sond. (1853) on loan from MEL was found to be a precise match with this taxon.

Chrysocephalum vitellinum Sond. & F.Muell ex Sond., *Linnaea* 25: 514 (1853)

Type: 'Ultra Saltcreek, Novemb. Dr. Behr. In planitie circa urbem Adelaide. Nov. Lofty-ranges'. *Lectotype* here designated: Adelaide, Dr Ferdn Mueller, ex Herb. Sonder, lower specimen (MEL 2218946), see note.

Chrysocephalum sp. 2, J.A. Jeanes in N.G. Walsh & T.J. Entwisle, *Fl. Victoria* 4: 794 figure 158c (1999).

Plant annual, erect, single- or multi-stemmed, 2–25 cm high; stems slender, entire or branched, cottony. *Leaves* flaccid (?), oblong to narrowly obovate, to 3 cm long, obtuse, flat, prominently apiculate, shortly decurrent and slightly stem-clasping, cottony, shortly glandular-stipitate. *Capitula* congested in shortly pedunculate clusters forming a simple or branched inflorescence. *Involucre* cup-shaped, *c*. 5 mm diameter, woolly around base; *bracts* orange-yellow or the outer greyish. *Outer involucral bracts* shortly stipitate, narrowly ovate acuminate; *medial bracts*: stipe slender, terete, *c*. 1.2 mm

long, glandular, lamina narrowly oblong, *c*. 2 mm long, long-ciliate becoming shortly so towards the dentate, acute to acuminate apex. *Inner involucral bracts*: lamina narrowly oblong with obtuse often undulate or wrinkled ciliate apex; surfaces with sparse trichomes on each face that resemble the cilia, mid-vein prominent. Innermost involucral bracts with narrowly oblong to linear stipe *c*. 2.5 mm long with prominent scarious margins, grading into the narrowly oblong, acuminate, ciliate lamina, *c*. 1.5 mm long. *Corollas* bending outwards. *Outer florets* female, fertile. *Bisexual florets* numerous. *Pappus bristles* filamentous, shortly plumose towards apex, in female floret solitary and positioned on adaxial margin, in bisexual florets 3–4, appearing as though attached sub-apically to achene. *Achene* narrowly ellipsoidal, 0.8 mm long, acute, scabrous. (Figure 2)

Selected specimens examined. New South Wales: 'Curraweena', N of Cobar, *E. D'Arnay & K. Wells* 657 (CANB); Yathong NR via Mt Hope, *Slee & Holgate* 284 (CANB). Victoria: 30.6 km SE of Walpeup on road to Patchewallock, *M.G. Corrick* 6697 (CANB); State Forest 21.5 km west of Teddywaddy, *N.C. Scarlett* NS80-168 (AD). South Australia: Wundersitz Scrub, Hartley, *R. Bates* 203942; Chowilla floodplain, Wentworth road, *C. O'Malley* 078 (AD); road to Karoonda, *c*. 15 km from Murray Bridge, *D.J.E. Whibley* 9916 (AD).

Distribution. Western Victoria, western New South Wales, south-central and eastern South Australia.

Habitat. Growing in grasslands, herb fields, and open eucalypt forest.

Chromosome number. Turner (1970) published the chromosome number for a taxon he referred to '*Helichrysum* sp.' as n = 10. The voucher collection of this taxon from Tailem Bend, South Australia (*B.L. Turner* 5596 MEL), is *Chrysocephalum vitellinum* (see comment on chromosome numbers above).

Note on lectotypification. There are three sheets in herb. MEL that have been segregated as being possible types of this name; each bears a specimen of *C. vitellinum* while two also have a specimen of *C. apiculatum s.l.*:

Sheet 1: 'Helichrysum vitellinum F. Muell.'; in pencil on same label: 'hoc veris. [verisimiliter?] H. flavissimum videtur! sive Chr. Ciliatum' Ex herb. J. Steetz (MEL 2217440).

This sheet contains one specimen which is of *Chrysocephalum vitellinum*.

Sheet 2: 'Helichrysum vitellinum Ferd. Muell. In planitiebus ante Lofty – range Octobr. Chrysocephalum flavissimum J.Hook. var.' [In Mueller's handwriting.] (MEL 2196377).

This sheet contains two specimens of which the upper one is *C. apiculatum* and the lower *C. vitellinum*. There is no indication that the specimens were seen by Sonder.

Sheet 3: 'Chrysocephalum vitellinum S. & M. / Adelaide / Dr Ferdn Mueller'. Ex herb. O.W. Sonder (MEL 2218946).

This is the only sheet that came from the Sonder herbarium and is the only one that bears on it a slip with the botanical name used by Sonder. The sheet contains two specimens of which the upper is *C. apiculatum* and the lower *C. vitellinum.*

Figure 2. *Chrysocephalum vitellinum*. Photograph of collection *A.C. Beauglehole* 82637 (MEL 680348), scale = 5 cm.

The lower specimen on Sheet 3 is here selected as lectotype. The specimen on Sheet 1 and the lower specimen on Sheet 2 may be syntypes or isosyntypes. I have not seen any collection of this species made by Behr near 'Saltcreek'.

This plant is sometimes associated on herbarium sheets with another member of the *C. apiculatum* group and in this case the extraneous material sometimes has a somewhat similar appearance, which suggests that it is of hybrid origin. If this is the case it could indicate that the recorded chromosome count for *C. vitellinum* is incorrect.

Acknowledgements

I am grateful to Margaret Wilson for illustrating the involucral bracts of *Chrysocephalum gilesii* and *C. sericeum*. The loan of specimens from the Australian herbaria AD, MEL and NSW was essential for the preparation of this paper. Some of the study was undertaken while the author was in receipt of a grant from the Australian Biological Resources Study. I am grateful to the referee for comments on an earlier manuscript.

References

Anderberg, A.A. (1991). Taxonomy and phylogeny of the tribe Gnaphalieae (Asteraceae). *Opera Botanica* 104: 1–195.

Candolle A.P. de (1838). *Prodromus systematis naturalis regni vegetabilis, sive enumeratio contractaordinum, generum, specierumque plantarum* ... Pars sexta, p. 158. (Treuttel et Wurtz: Paris.)

Department of the Environment, Water, Heritage and the Arts (2008). *Interim Biogeographic Regionalisation for Australia (IBRA), Version 6.1*. http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/index.html [accessed 8 June 2008]

Jeanes, J.A. (1999). *Chrysocephalum*. *In*: Walsh, N.G. & Entwisle, T.J. *Flora of Victoria*. Vol. 4. Dicotyledons Cornaceae to Asteraceae. (Inkata: Melbourne.)

Lessing, C.F. (1832). *Synopsis generum Compositarum*. (Berlin: Dunckeri et Humblotii.)

Sonder, O.W. (1853). Compositae. *Linnaea* 25: 450–530.

Turner, B.L. (1970). Chromosome numbers in the Compositae. XII. Australian species. *American Journal of Botany* 57: 382–389.

Walpers, G.W. (1841). Compositarum novarum, decas tertia. *Linnaea* 14: 503–510.

Watanabe, K., Short, P.S., Denda, T., Konishi, N., Ito, M. & Kosuge, K. (1999). Chromosome numbers and karyotypes in the Australian Gnaphalieae and Plucheeae (Asteraceae). *Australian Systematic Botany* 12: 781–802.

Western Australian Herbarium (1998–). *FloraBase – The Western Australian Flora*. Department of Environment and Conservation. http://florabase.dec.wa.gov.au/ [accessed June 2008]

Wilson, P.G. (2001). Leiocarpa, a new Australian genus of the Asteraceae tribe Gnaphalieae. *Nuytsia*13(3): 595-605