

## A taxonomic treatment of *Chrysocephalum apiculatum* and *C. semipapposum* (Asteraceae: Gnaphalieae)

Paul G. Wilson

Western Australian Herbarium, Department of Parks and Wildlife,  
Locked Bag 104, Bentley Delivery Centre, Western Australia 6983  
Email: Paul.Wilson@dpaw.wa.gov.au

### Abstract

Wilson, Paul G. A taxonomic treatment of *Chrysocephalum apiculatum* and *C. semipapposum* (Asteraceae: Gnaphalieae). *Nuytsia* 27: 33–73 (2016). *Chrysocephalum apiculatum* (Labill.) Steetz and *C. semipapposum* (Labill.) Steetz are treated as distinct and endemic to Australia. In *C. apiculatum* 29 subspecies are recognised: subsp. *apiculatum*, subsp. *orarium* Paul G. Wilson, subsp. *congestum* Paul G. Wilson, subsp. *gracile* Paul G. Wilson, subsp. *filifolium* Paul G. Wilson, subsp. *caespitosum* Paul G. Wilson, subsp. *ramosissimum* (Hook.) Paul G. Wilson, subsp. *insigne* (Domin) Paul G. Wilson, subsp. *simpliciusculum* (Domin) Paul G. Wilson, subsp. *semiamplexicaule* (Domin) Paul G. Wilson, subsp. *exile* Paul G. Wilson, subsp. *barbellatum* Paul G. Wilson, subsp. *odorum* (DC.) Paul G. Wilson, subsp. *arachnoideum* (Domin) Paul G. Wilson, subsp. *stoloniferum* Paul G. Wilson, subsp. *argenteum* Paul G. Wilson, subsp. *gracilescens* (Domin) Paul G. Wilson, subsp. *erectum* Paul G. Wilson, subsp. *pilbarensis* Paul G. Wilson, subsp. *racemosum* (J.Black) Paul G. Wilson, subsp. *glandulosum* Paul G. Wilson, subsp. *variabile* Paul G. Wilson, subsp. *curvifolium* (Domin) Paul G. Wilson, subsp. *attenuatum* Paul G. Wilson, subsp. *flindersianum* Paul G. Wilson, subsp. *undulatum* Paul G. Wilson, subsp. *yorkense* Paul G. Wilson, subsp. *halmaturorum* Paul G. Wilson, and subsp. *norsemanense* Paul G. Wilson. In *C. semipapposum* five subspecies are recognised: subsp. *semipapposum*, subsp. *lineare* Paul G. Wilson, subsp. *brevifolium* (Sond.) Paul G. Wilson, subsp. *asperum* (Steetz) Paul G. Wilson, and subsp. *occidentale* (Benth.) Paul G. Wilson.

### Introduction

A study of the *Chrysocephalum apiculatum* (Labill.) Steetz complex (in which *C. semipapposum* (Labill.) Steetz is here included), has shown it to be an *ochlospecies* (see Cronk 1998), i.e. a species that cannot be readily defined and whose numerous infra-specific taxa cannot be readily circumscribed. For although the typical variant of each of the subspecies here recognised can be clearly distinguished from the typical variant of each of the other subspecies, each subspecies grades into one or more of those subspecies whose natural distribution overlaps, or evidently once overlapped.

An example of this phenomenon is found in *C. apiculatum* subsp. *curvifolium* (Domin) Paul G. Wilson. This taxon was described by Domin (1929) as *Helichrysum ramosissimum* var. *curvifolium* Domin, based on a collection made by Ferdinand Mueller in Arnhem Land (a name then applied to the region covering the northern-most part of what is now Western Australia and the Northern Territory). The plant is known from a relatively small area of the Kimberley division of Western Australia and is

apparently geographically isolated from all other variants of *C. apiculatum*. However, in recent years a plant intermediate in morphology between subsp. *curvifolium* and *C. apiculatum* subsp. *pilbarensis* Paul G. Wilson has been collected from Yerrrie Station in the Pilbara, a location almost halfway between the known distribution of subsp. *pilbarensis* to the south and subsp. *curvifolium* to the north-east, while in north-western Queensland a plant intermediate between subsp. *curvifolium* and *C. apiculatum* subsp. *gracilescens* (Domin) Paul G. Wilson has been collected. This suggests that these three taxa (as perhaps is the case with most or all of the subspecies recognised here) evolved relatively recently from a common ancestor.

### Classification

The most significant of the taxonomic problems is the circumscription of the two species that are involved. In recent years it has commonly been the practice to unite *C. semipapposum* with *C. apiculatum*, and not to recognise any infraspecific taxa. This is understandable, for to recognise one variant is to place the rest of the complex in limbo. The problem was acknowledged by Bentham (1867) when treating *Helichrysum semipapposum* (Labill.) DC. for *Flora Australiensis*. Here he stated that ‘having several hundred specimens before me from very numerous localities of this and the preceding species [*H. apiculatum*], I have in vain endeavoured to distribute them satisfactorily into two or any greater number of distinct groups...’. Although Bentham reluctantly recognised Sonder’s varietal name *Chrysocephalum squarrulosum* var. *brevifolium* Sond. (as *Helichrysum semipapposum* var. *brevifolium*) he added the note ‘I was for some time disposed to retain this as a distinct species, from its very different aspect, but the examination of some specimens lead me to suspect that it is rather a state of *H. semipapposum*, induced by circumstances of growth, than even a variety as adopted by Sonder.’

The confusing situation that was faced by Bentham is similar to that faced by subsequent botanists who have looked into the complex, and the present treatment is a further attempt to confront the problem.

### *Chrysocephalum apiculatum*

***Chrysocephalum apiculatum*** (Labill.) Steetz in Lehm., *Pl. Preiss.* 1: 474 (1845); *Gnaphalium apiculatum* Labill., *Nov. Holl. Pl.* 2: 43, t. 188 (1806); *Helichrysum apiculatum* (Labill.) D. Don, *Mem. Werner. Nat. Hist. Soc.* 5(2): 550 (1826). *Type*: ‘in capite Van Diemen’ [the southern tip of Tasmania], *Labillardière s.n.* (*lecto*, here designated: FI 006317 image seen; *isolecoto*: G 00471271 image seen, K 000349263 image seen).

?*Helichrysum ciliatum* f. *cunninghamii* DC., *Prodr.* 6: 196 (1838). *Type*: Plains of Bathurst, New South Wales, April 1817, *A. Cunningham s.n.* (*holo*: G-DC, photo seen).

*Chrysocephalum helichrysoides* Walp., *Linnaea* 14: 503 (1841). *Type*: ‘In Nova Hollandia, *J. Lhotsky legit.*’ (*n.v.*).

Prostrate to erect or sprawling *perennial herb* with a single stem or with several stems arising from near the base of the plant, to 40 cm high. *Stems* slender, variably cottony to woolly or glandular. *Leaves*: lower leaves to 10 cm long, decreasing in size towards apex of plant, linear to narrowly oblong to oblanceolate or obovate, acute or obtuse, acuminate or apiculate, flat or with recurved to revolute margins, appressed-villous to loosely woolly or glandular. *Capitula* in compact to loose terminal inflorescences. *Involucre*s hemispherical to cup-shaped, c. 8 mm high, principally yellow, rarely white, the outer bracts yellow or sometimes tinged dark reddish brown. *Outer bracts*: stipe

narrowly oblong, flat, *c.* 1 mm long, somewhat woolly, sparsely glandular abaxially, glabrous or variably hirsute adaxially; lamina ovate to obovate, obtuse, *c.* 3 mm long, translucent, sparsely long-ciliate medially otherwise glabrous. *Medial bracts*: stipe semiterete, *c.* 1.5 mm long, abaxially with sessile to very shortly stipitate glandular hairs; lamina narrowly oblong to elliptic or ovate, *c.* 3–6 mm long, obtuse to acute, firm, opaque, or translucent towards base, golden, prominently ciliate with stiff trichomes *c.* 0.5 mm long or the distal portion eciliate, woolly-ciliate towards base, adaxial surface glabrous or variably hirsute particularly towards base, abaxial surface glabrous or sparsely hirsute. *Innermost bracts*: stipe linear, 1–1.5 mm long, with fenestrate stereome; lamina narrowly oblong to shortly ovate, usually acute. *Female florets* comprising outer two rows, fertile; corolla very narrowly cylindrical; pappus bristles 0–8(9). *Bisexual florets* fertile: corolla narrowly cylindrical with obconical apex, *c.* 4 mm long, yellow; pappus bristles *c.* 5–14. *Pappus bristles* pale yellow to white, towards apex variably plumose or with only a few cilia, scabrous below, not broadened at base. *Achenes* terete to ellipsoid, *c.* 1.6 mm long, minutely scabrous.

*Notes on critical characters.* The number and morphology of the pappus bristles of the female florets provide useful characters for assisting in the discrimination of some taxa. They range in number from zero to 12 or more, with those in the female florets on the one flower head being either constant in number or varying only slightly; if variable in number then the female florets of the outer row of the capitulum will have fewer bristles than those of the inner row; thus the outer row may be epappose while the inner row may have one bristle. Usually if only one bristle is present it will be positioned on the adaxial margin of the achene apex; if two bristles are present then one will be adaxial and one will be lateral; if three are present then one will be adaxial and two will be lateral on opposite sides of the achene. With some subspecies the bristles appear to be readily shed and are therefore difficult to count; however, it is unclear how much of their caducous nature is dependent on the taxon and how much is dependent on the method and speed of drying of the material after collection.

The pappus bristles vary between subspecies in their colour and thickness, whether straight or undulate, and whether smooth all over or entirely barbellate, barbellate but plumose towards the apex, or barbellate with the teeth irregularly longer towards the apex. These differences appear to be taxon specific.

*Typification.* Labillardiere's personal collection passed to the herbarium in Florence (FI) and for this reason the specimen in that institution is nominated as the lectotype of *C. apiculatum*. I have not seen the type of *C. helichrysoides* but Walpers' description would place it in *C. apiculatum s.l.*, possibly in either subsp. *apiculatum* or subsp. *attenuatum* Paul G. Wilson.

*Chromosome numbers.* *n* = 12, *c.* 38 (Turner 1970: 384); *n* = 12, 24 (Watanabe *et al.* 1999: 784); *n* = *c.* 36, *B.L. Turner* 5604 (MEL) 7 mi [*c.* 11 km] NE of Seymour (not published); *n* = *c.* 48, *B.L. Turner* 5609, 8 mi [*c.* 13 km] N of Windsor (BRI) (not published); *n* = 12, *B.L. Turner* 5622, Peregian, Queensland (BRI) (not published).

### Key to subspecies of *Chrysocephalum apiculatum*

1. Stems variably glandular
  2. Margin of leaves undulate. [Stems and leaves with cottony hairs and sessile glandular hairs; female florets with *c.* 10 pappus bristles] [Gawler Ra. and adjacent Flinders Ra. and Eyre Pen., S.A.] ..... 26. subsp. **undulatum**
  - 2: Margin of leaves entire
    3. Capitula *c.* 8 mm diam.; stems glandular-pilose with weak multicellular hairs, sparsely cottony; leaves oblong, flat, to 4 cm long,

- semiamplexicaule at base. [Female florets with (4–)8 pappus bristles]  
[South-eastern Qld and north-eastern N.S.W.]..... **10. subsp. semimplexicaule**
- 3:** Capitula 4–6 mm diam.; stems variably glandular; leaves revolute or flat, base not or scarcely cordate
- 4.** Stems glandular-puberulous, sometimes cottony; female florets with 7–14 pappus bristles. [Leaves linear and revolute to narrowly elliptic and flat; capitula dense or loose] [Pilbara region, W.A.]..... **19. subsp. pilbarensis**
- 4:** Stems glandular-puberulous and woolly or shortly glandular-stipitate and sparsely cottony; female florets with 0–9 pappus bristles
- 5.** Leaves with sessile and glandular stipitate hairs; female florets with 4–9 pappus bristles
- 6.** Leaves narrowly oblong, acute, glandular-stipitate and sparsely cottony; female florets with (3–)4–7 pappus bristles.  
[Far south-eastern N.S.W. and eastern Vic.]..... **22. subsp. variabile**
- 6:** Leaves linear to oblong-obovate, often curved, tomentose; female florets with 4–9 pappus bristles.  
[East-central W.A. to east-central Qld]..... **21. subsp. glandulosum**
- 5:** Leaves glandular-puberulous; female florets with 0–2 pappus bristles
- 7.** Leaves woolly abaxially when young; female florets with 1 pappus bristle. [North-eastern N.S.W. and south-eastern Qld]..... **18. subsp. erectum**
- 7:** Leaves glandular-puberulous and with minute sessile glands; female florets with 0–2(–3) pappus bristles.  
[Western Vic., N.S.W. and south-eastern Qld]..... **24. subsp. attenuatum**
- 1:** Stems without glandular hairs
- 8.** Stems cottony or woolly
- 9.** Stems cottony
- 10.** Capitula in dense cymes or corymbs
- 11.** Pappus bristles in female florets 0–5
- 12.** Plants south coastal. [Leaves narrowly oblong to obovate, cottony, sericeous, or woolly; capitula in dense cymes; female florets with 4 or 5 pappus bristles]
- 13.** Leaves narrowly oblong to obovate, cottony, sericeous or woolly.  
[Near south coast of S.A. and Vic.]..... **2. subsp. orarium**
- 13:** Leaves linear to very narrowly obovate, sericeous or cottony.  
[Yorke Peninsula, S.A.]..... **27. subsp. yorkense**
- 12:** Plants not south coastal. [Leaves narrowly oblong to oblong; capitula compact; female florets with 1–6 pappus bristles]
- 14.** Medial involucre bracts ciliate to apex. [Leaves oblong to narrowly oblong; stems and leaves densely cottony; capitula in compact rounded corymbs; female florets with 1–5 pappus bristles]  
[South-eastern Qld and north-eastern N.S.W.]..... **14. subsp. arachnoideum**
- 14:** Medial involucre bracts with terminal portion eciliate
- 15.** Leaves narrowly oblong, cottony to hispid; stems densely cottony; capitula in compact rounded corymbs; medial involucre bracts



- with terminal 1.5 mm eciliate and glabrous; female florets with 2–4 pappus bristles. [South-eastern N.S.W.] ..... **13. subsp. *odorum***
- 15:** Leaves narrowly oblong to spatulate, woolly below and glabrous to glandular-pilose above; stems cottony; capitula crowded; medial involucre bracts with terminal 0.5 mm eciliate; female florets with 0–1(–2) pappus bristles. [New England tablelands and south-eastern Qld] ..... **9. subsp. *simpliciusculum***
- 11:** Pappus bristles in female florets (7–)9–10. [Leaves narrowly oblong to obovate; stems and leaves cottony; capitula corymbose] [East-central coastal Qld] ..... **8. subsp. *insigne***
- 10:** Capitula racemose. [Qld and northern N.S.W.]
- 16:** Leaves oblong. [Stems and leaves densely appressed-cottony; capitula small; female florets with 6–12 pappus bristles, the terminal hairs few and very short] [North-eastern Qld] ..... **12. subsp. *barbellatum***
- 16:** Leaves linear to narrowly elliptic or narrowly obovate
- 17:** Leaves revolute and slender-terete. [Leaves curved; stem and leaves glabrous to densely cottony; capitula slender-pedunculate; pappus bristles in female florets c. 10] [Kimberley region, W.A.] ..... **23. subsp. *curvifolium***
- 17:** Leaves linear to narrowly elliptic or obovate
- 18:** Leaves linear to narrowly elliptic; stems thinly appressed-cottony; female florets with 0–5 pappus bristles. [North-eastern Qld] ..... **17. subsp. *gracilescens***
- 18:** Leaves linear to narrowly obovate; stems cottony or woolly, female florets with 1–9 pappus bristles. [Capitula small, clustered, becoming racemose] [South-central Qld and north-central N.S.W.] ..... **7. subsp. *ramosissimum***
- 9:** Stems woolly
- 19:** Leaves woolly and minutely glandular. [Leaves narrowly oblong]
- 20:** Leaves narrowly oblong, glandular with minute sessile hairs, woolly on both surfaces; female florets with 6–8 very shortly plumose pappus bristles. [Stems sometimes woolly and glandular] [Near Norseman and the Fraser Ra., W.A.] ..... **29. subsp. *norsemanense***
- 20:** Leaves narrowly oblong or obovate, densely woolly; female florets in typical variant with 0 or 1 pappus bristles (some variants with up to 6 bristles). [Central-eastern W.A., northern S.A., southern N.T., south-western N.S.W. and south-western Qld] ..... **20. subsp. *racemosum***
- 19:** Leaves woolly, not glandular
- 21:** Involucre bracts yellow
- 22:** Involucre bracts smooth
- 23:** Leaves narrowly oblong to obovate, woolly; female florets with 0–6 shortly plumose pappus bristles. [Southern S.A., Vic., southern N.S.W. and Tas.] ..... **1. subsp. *apiculatum***
- 23:** Leaves linear to obovate; female florets with 1–3 (in typical variant) to 9 very shortly plumose pappus bristles. [Stems and leaves densely woolly to cottony; capitula small, clustered or becoming racemose] [North-eastern N.S.W. to south-eastern Qld] ..... **7. subsp. *ramosissimum***

- 22: Involucral bracts somewhat wrinkled. [Leaves narrowly elliptic to narrowly obovate; capitula solitary or in small corymbs; female florets with 7–12 sparsely and shortly plumose pappus bristles] [South-eastern N.S.W.] ..... **15. subsp. stoloniferum**
- 21: Involucral bracts white. [Stems woolly to sericeous; leaves narrowly oblong to narrowly oblanceolate, woolly to sericeous; capitula small, solitary or 2–5 in compact glomerules; female florets with 3–5 pappus bristles] [Kangaroo Is., S.A.] ..... **28. subsp. halmaturorum**
- 8: Stems sericeous
- 24: Leaves linear to narrowly oblong or narrowly obovate
- 25: Female florets with 1–5 plumose pappus bristles [Southern N.S.W. to Vic. and southern S.A.]
- 26: Medial leaves with entire margin, flat
- 27: Involucral bracts yellow
- 28: Leaves densely sericeous all over. [Leaves linear to narrowly obovate; capitula compact; female florets with 1–3 pappus bristles shortly plumose distally] [South-eastern N.S.W.] ..... **16. subsp. argenteum**
- 28: Leaves cottony
- 29: Leaves linear to narrowly spatulate, cottony all over; female florets with 0–4 pappus bristles shortly plumose distally. [Capitula congested] [Vic., southern N.S.W. and south-eastern S.A.] ..... **3. subsp. congestum**
- 29: Leaves towards base of plant crowded and narrowly obovate, towards middle linear-acuminate, adpressed-cottony; female florets with 1 or 2 shortly plumose pappus bristles [Southern Flinders Ra., S.A.] ..... **25. subsp. flindersianum**
- 27: Involucral bracts white. [Stems sericeous to woolly; leaves sericeous to woolly, narrowly oblong to narrowly oblanceolate; female florets with 3–5 pappus bristles] [Kangaroo Is., S.A.] ..... **28. subsp. halmaturorum**
- 26: Medial leaves with margins recurved and somewhat undulate. [Capitula in small corymbs; female florets with 0–1 pappus bristles] [Far eastern S.A. to north-western Vic. and south-western N.S.W.] ..... **4. subsp. gracile**
- 25: Female florets with 7–9 sparsely denticulate pappus bristles. [Leaves linear, acuminate, cottony; capitula small, corymbose to racemose] [South-eastern Qld and north-eastern N.S.W.] ..... **11. subsp. exile**
- 24: Leaves filiform. [South-west Vic. and south-eastern S.A.]
- 30: Leaves filiform, sericeous; capitula in compact terminal clusters; female florets with 1 or 2 shortly plumose pappus bristles [South-eastern S.A. and south-western Vic.] ..... **5. subsp. filifolium**
- 30: Leaves filiform to linear, densely sericeous becoming glabrous with age; capitula solitary or in a compact orbicular cyme; female florets with 5 or 6 very shortly plumose pappus bristles [Far south-eastern S.A. and far south-western Vic.] ..... **6. subsp. caespitosum**

### 1. *Chrysocephalum apiculatum* (Labill.) Steetz subsp. **apiculatum**

?*Chrysocephalum helichrysoides* Walp., *Linnaea* 14: 503 (1841). *Type*: 'In Nova Hollandia, Lhotsky legit.', *J. Walpers* (n.v.).

?*Helichrysum apiculatum* var. *eminens* Domin, *Biblio. Bot.* 89: 672 (1929). *Type citation*: 'Tasmanien, Gunn No. 112, etc.' (*lecto*, here designated: K 000349246 image seen).

Prostrate to erect or sprawling *perennial herb* with a single stem or with several stems arising from near the base of the plant, to 40 cm high. *Stems* slender, appressed-woolly. *Leaves*: lower leaves to 10 cm long, decreasing in size towards apex of plant, narrowly oblong to oblanceolate or obovate, rarely linear, acute or obtuse, acuminate or apiculate, flat (or sometimes with recurved margins), appressed to loosely woolly, to 10 cm long towards base, obtuse to acute. *Capitula* in compact to loose, rounded, terminal inflorescences. *Involucres* hemispherical to cup-shaped, c. 8 mm high, yellow, the outer bracts yellow or sometimes tinged dark reddish brown. *Outer bracts*: stipe narrowly oblong, flat, c. 1 mm long, somewhat woolly, sparsely glandular abaxially, glabrous adaxially; lamina narrowly oblong, obtuse, c. 3 mm long, translucent, sparsely long-ciliate medially otherwise glabrous. *Medial bracts*: stipe semiterete c. 1.5 mm long, abaxially with sessile to very shortly stipitate glandular hairs; lamina narrowly oblong-elliptic, c. 4 mm long, obtuse to acute, firm, opaque, golden, prominently ciliate with stiff trichomes c. 0.5 mm long, the distal portion (1.5–2 mm) typically eciliate, woolly-ciliate towards base, adaxial surface sparsely hirsute towards base, abaxial surface glabrous. *Innermost bracts*: stipe linear, 1–1.5 mm long, with fenestrate stereome; lamina narrowly oblong, acute, c. 3 mm long. *Female florets*: corolla very narrowly cylindrical; pappus bristles 0–6(–9). *Bisexual florets*: corolla narrowly cylindrical with obconical apex, c. 4 mm long, yellow; pappus bristles c. 10. *Pappus bristles* pale yellow, shortly and sparsely plumose at apex, scabrous below, not broadened at base. *Achenes* terete to narrowly ellipsoid c. 1.6 mm long, minutely scabrous.

*Selected specimens examined*. SOUTH AUSTRALIA: Mulgaria HS, c. 75 km SW of Marree, 13 Dec. 1964, *P. Aitken s.n.* (AD); Hincks Natl Park, c. 85 km N of Port Lincoln, 28 Jan. 1970, *C.R. Alcock* 3249 (AD); Billa Kalina Stn, 45 km E of Curdlawidny Lagoon, 22 Dec. 1984, *F.J. Badman* 1613 (AD); c. 19 km W of Termination Hill which is c. 40 km NW of Leigh Creek, 14 Nov. 1964, *T.R.N. Lothian* 3483 (AD); between Oodnadatta and William Ck on the Oodnadatta track, 1 Nov. 1989, *B. Nordenstam & A. Anderberg* 977 (AD); Cowell–Whyalla road c. 18.5 mi [c. 29.6 km] N of Cowell, 23 Jan. 1965, *R. Pearce s.n.* (AD); Pinkawillinie, c. 35 km WNW of Kimba, 15 Feb. 1959, *K.D. Rohrlach* 169 (AD); Sedan, c. 70 km NE of Adelaide, [no date], *Sedan School* 478 (AD); 15 km N of Overland Corner, c. 40 km W of Renmark, 29 Sep. 1971, *D.J.E. Whibley* 3638 (AD). NEW SOUTH WALES: Weddin Mtn, 6 Dec. 1975, *R. Pullen* 10232A (MEL). VICTORIA: c. 2 km from Kiata towards Dimboola, 11 Nov. 1969, *E. Canning* (CANB); 12 km W of Stawell, 30 Dec. 1988, *R.M. King* 9711 (MEL); midway between Avenel and Mangalore, 16 Oct. 1979, *A. Morton* 345 (MEL); Preston, 18 Oct. 1900, *P.R.H. St John s.n.* (MEL); Kaneira, Oct. 1917, *W.W. Watts* (MEL). TASMANIA: Macquarie Road between Carnarvon and Barton, 14 Dec. 1984, *A.M. Buchanan* 5020 (HO); near Remarkable Cave, 27 Dec. 1995, *A.M. Buchanan* 14046 (HO); New Norfolk, [no date], *R.C. Gunn* 112 (HO); Grasree Hill, 28 July 1930, *F.H. Long* 105 (HO); Flat Topped Bluff, Woolnorth Stn, 20 Jan. 1999, *A.C. Rozefelds* 1336 (HO).

*Distribution*. Found in south-central and south-eastern South Australia, Victoria, south-eastern New South Wales, and eastern and southern Tasmania.

*Notes.* In central South Australia and the Eyre and Yorke Peninsulas is found a variant that is open-branching, with woolly, linear to narrowly oblong leaves which often appear semiterete due to their revolute margins. The capitula, although initially clustered, become somewhat racemose with age. The inner medial involucral bracts are ovate-acute (not oblong), while the female florets appear to have consistently eight pappus bristles (in Eyre Peninsula the female florets appear to have 0–3 pappus bristles), though this last character is difficult to determine precisely in all collections. This variant appears to be intermediate between subsp. *apiculatum* and subsp. *congestum* Paul G. Wilson.

## 2. *Chrysocephalum apiculatum* subsp. *orarium* Paul G. Wilson, *subsp. nov.*

*Type:* c. 0.5 km west of Petrel Cove, Victor Harbour, Fleurieu Peninsula, South Australia, 30 December 1963, T.R.N. Lothian 2647 (*holo:* AD 96511083; *iso:* AAU).

Erect or spreading *perennial herb*. *Stems* white-cottony. *Leaves* narrowly oblong to obovate or broadly obovate, rounded to acute at apex, flat, to 6 cm long, closely cottony to woolly on both sides. *Capitula* in dense cymes arising from woolly peduncles. *Involucres* semiorbicular, to 10 mm diam., smooth, glossy yellow or the outer bracts pale reddish brown, woolly at base. *Medial bracts* with lamina oblong, c. 3.5 mm long, obtuse to rounded at apex, ciliate except for apex, glabrous or sparsely hirsute on adaxial surface towards base. *Female florets* with 4 or 5 pappus bristles. *Pappus bristles* shortly plumose towards apex.

*Selected specimens examined.* SOUTHAUSTRALIA: Victor Harbour, 1 Oct. 1977, R. Bates 3606 (AD); Pt. Elliott, 10 Jan. 1913, J.M. Black *s.n.* (AD); Hallett Cove, 4 Oct. 1965, H.M. Cooper (AD); 16 km SE of Hartley, 3 Oct. 1968, B.M. Grivell *s.n.* (AD); Lincoln Natl Park, 6 Nov. 1979, P.C. Heyligers 79016 (AD); Waitpinga, 5 Oct. 1969, D. Hunt 3052 (AD); Willaston, 1 Feb. 1968, D.N. Kraehenbuehl 3092 (AD); Mt Compass, 23 Nov. 1927, A. Morris *s.n.* (AD); Newland Head Conservation Park, 7 Oct. 1987, D.E. Murfet 577 (AD); Freemans Knob, 6 Dec. 1987, D.E. Murfet *s.n.* (AD); Canunda Natl Park, 11 Aug. 1982, L.D. Williams 12443 (AD); 44 mi [c. 70 km] from Elliston towards Lock, 19 Nov. 1968, J.W. Wrigley *s.n.* (CANB). VICTORIA: mouth of the Glenelg, W. Allitt (MEL); Captain Cook Natl Park, 10 Dec. 1969, A.C. Beauglehole 32254 & E.W. Finck (AD); Wilsons Promontory, 31 Dec. 2013, Pitcher *s.n.* (MEL); Brighton Beach, [no date], G.A. Poepper[?] 48 (MEL); Port Fairy, [no date], W. Whan 33 (MEL); Gabo Islands, May 1922, Lighthouse Keeper (NSW).

*Distribution.* This subspecies is largely restricted to localities along or near the south coast of South Australia and Victoria.

*Etymology.* The Latin word *orarius* means coastal and is adopted here since this subspecies is largely coastal in its distribution.

*Notes.* In near-coastal localities the leaves of this subspecies are obovate and rounded at their apex while in localities slightly inland they become narrowly oblong and obtuse to acute. It evidently grades into sub-coastal variants of subsp. *apiculatum*.

## 3. *Chrysocephalum apiculatum* subsp. *congestum* Paul G. Wilson, *subsp. nov.*

*Type:* Burrabool Flora and Fauna Reserve, Victoria, 12 October 1986, A.C. Beauglehole 82696 (*holo:* MEL 242756).

*Chrysocephalum* sp. 1, J.A. Jeanes in N.G. Walsh & T.J. Entwisle, *Fl. Victoria* 4: 794 (1999) p.p.

*Chromosome number.*  $n = c. 36$ , B.L. Turner 5604 (MEL).

*Multi-stemmed perennial herb* to 20 cm high with woody rootstock, possibly sometimes rhizomatous. *Stems* closely cottony to sericeous. *Leaves* often clustered near base of plant and more scattered towards apex, linear to narrowly spatulate, 2–6 cm long near base of plant, flat, diminishing upwards, evenly cottony on both surfaces. *Capitula* small, congested; peduncles 1–5 mm long, woolly. *Involucres* 4–5 mm high. *Outer bracts* ovate, acuminate, shortly ciliate. *Medial bracts* oblong and obtuse to acute or acuminate, sometimes somewhat curled, to narrowly ovate-lanceolate or narrowly oblong-acuminate, pale yellow to yellow, ciliate, minutely scabrid or smooth towards apex, abaxially sparsely hirsute towards base otherwise glabrous, adaxially variably hirsute. *Innermost bracts* with narrowly triangular acuminate lamina *c.* 1.2 mm long, ciliate to apex. *Female florets:* pappus bristles 0–4(–5). *Bisexual florets:* pappus bristles 3(?)–7. *Pappus bristles* shortly plumose in distal half otherwise scabrous, pale yellow. *Achenes* (slightly immature) oblongoid-ellipsoid, *c.* 0.7 mm long, scabrous.

*Selected specimens examined.* SOUTH AUSTRALIA: Blanchetown, 20 Jan. 1994, T.J. Bates 36097 (AD); near Overland Corner, 23 Oct. 1999, R.J. Bayer SA-99002 & G.T. Chandler (AD); between Keith and Tintinara, 90-Mile Desert, 16 Oct. 1965, D. Hunt 2510 (AD); Kinchina, 16 Oct. 1930, E.H. Ising s.n. (AD); 8 km NNE of Morgan Vale HS, 22 Oct. 1975, L.D. Williams 7277 (AD). NEW SOUTH WALES: 27 km NW of Cobar, 10 Sep. 1978, M.D. Crisp 4275 (CANB); Trangie, 16 Oct. 1924, A. Morris 1582 (BRI). VICTORIA: Dookie Agricultural College Reserve (4 km S of Mt Major), 6 Dec. 1992, I. Crawford 2038 (MEL); 3 km SW of Barmah, 2 Oct. 1978, T.B. Muir 6127 (AD); Port Phillip, [no date], J. Reader s.n. (MEL); 7 mi [c. 11 km] NE of Seymour, 28 Sep. 1965, B.L. Turner 5604 (MEL).

*Distribution.* Widespread in Victoria, southern New South Wales, and south-eastern South Australia.

*Etymology.* The epithet *congestum* refers to the crowded nature of the capitula in the inflorescence.

*Notes.* The collections included in this subspecies vary to some extent in their general morphology and in the shape and indumentum of the involucre bracts. It would appear, however, that to divide it into further infraspecific taxa would not provide a usable taxonomy since each of the variants appears to grade into other variants. The variants found in western Victoria certainly grade into those found in eastern South Australia, which, as is mentioned elsewhere, grade into the local variant of subsp. *apiculatum* and to the north possibly into subsp. *racemosum* (J.M.Black) Paul G.Wilson. It also appears to grade into subsp. *ramosissimum* (Hook.) Paul G.Wilson with the intermediate variant having somewhat more branching stems, smaller capitula, and narrower and more acuminate medial involucre bracts than are found in typical subsp. *congestum*. Due to this general variability it is not feasible to designate a particular character for use in discriminating the two taxa.

A specimen J.B. Cleland s.n. (AD 36916075), collected near Monarto in the Lower Murray Mallee of South Australia, appears to be intermediate between subsp. *congestum* and a variant of *C. semipapposum* subsp. *semipapposum*.

In the Murray Region of South Australia subsp. *congestum* appears to grade into the South Australian variant of subsp. *apiculatum*.



#### 4. *Chrysocephalum apiculatum* subsp. *gracile* Paul G. Wilson, *subsp. nov.*

*Type*: Kulkyne State Forest west of Lake Hattah, Victoria, 2 November 1958, *H.I. Aston* 138 (*holo*: MEL 2149154).

*Chrysocephalum sp. 1*, J.A. Jeanes in N.G. Walsh & T.J. Entwisle, *Fl. Victoria* 4: 794 (1999), *p.p.*

*Erect perennial herb* to 35 cm high, branching shortly above base. *Stems* several, slender, sericeous. *Leaves* towards base of plant narrowly oblong to narrowly oblanceolate, obtuse, margins somewhat recurved and slightly undulate, to 4 cm long, cottony on both surfaces; medial leaves slender and subulate due to revolute margins, to 4 cm long but becoming shorter towards apex of stem. *Capitula* small, arranged in small irregular corymbs; peduncles woolly. *Involucres* yellow, to 1 cm high. *Outer bracts* narrowly ovate, acuminate, shortly ciliate. *Medial bracts*: stipe slender, semiterete, abaxially sparsely glandular stipitate otherwise glabrous; lamina oblong, smooth, apex rounded to obtuse or shortly acute, eciliate towards apex, abaxially smooth, glabrous, adaxially very sparsely hirsute near basal margin. *Female florets* epappose or rarely with 1 pappus bristle. *Bisexual florets* with *c.* 9 pappus bristles. *Pappus bristles* shortly plumose in distal half otherwise scabrous, pale yellow.

*Selected specimens examined*. SOUTH AUSTRALIA: *c.* 32 mi [*c.* 52 km] N of Overland Corner, 9 Oct. 1965, *D.E. Symon* 3591 (AD); *c.* 24 mi [*c.* 40m km] NE of Overland Corner, 11 Oct. 1965, *D.E. Symon* 3818 (AD). NEW SOUTH WALES: 8 Oct. 1977, *B. Barnsley* 064 (CANB); *c.* 90 mi [*c.* 145 km] from Hay towards Euston, 26 Aug. 1968, *E.C. Canning* 2022 (CANB); 34 km from Euston towards Mildura; 13 km W of Balranald, 24 Oct. 1989, *B. Nordenstam & A. Anderberg* 785 (NSW); 6 mi [*c.* 10 km] E of Mandelman, 16 Nov. 1956, *T. & J. White* 2070 (NSW). VICTORIA: near Hattah, 25 Sep. 1949, *L. Chandler s.n.* (MEL); Pink Lakes, E shore of Lake Crosby, 3 Oct. 1979, *M.G. Corrick* 6423 (AD, MEL); 2 mi [*c.* 3 km] W of Hattah, 5 Oct. 1969, *L.A. Craven* 1600 (CANB, MEL); 14 mi [*c.* 20 km] N of Linga, 23 Sep. 1965, *R. Filson* 7396 (AD); Big Desert, Chinamans Well Tank, 12 Dec. 1985, *G.R. Lucas* 390 (MEL); Glencoe, *c.* 8 mi [*c.* 13 km] W of Hattah Lakes, 14 Nov. 1976, *J. Ogden* ANU 18038 (CANB); Wyperfeld Natl Park, 19 Oct. 1985, *D.M. Parkes s.n.* (MEL); *c.* 17 km NE of Campbell Tank, Sunset Country, 28 Sep. 1981, *P.S. Short* 1264 (MEL); *c.* 24 km N of Sunset Tank, 29 Sep. 1980, *P.S. Short* 1170 & *M.G. Corrick* (AD, MEL, NSW).

*Distribution and habitat*. Found in north-western Victoria, south-western New South Wales and far eastern South Australia. All collectors who indicated habitat note that it was growing in deep sand often in a mallee-*Triodia* association.

*Etymology*. The epithet *gracile*, from the Latin *gracilis*, slim, refers to the slender habit of the plant.

#### 5. *Chrysocephalum apiculatum* subsp. *filifolium* Paul G. Wilson, *subsp. nov.*

*Type*: 10 km south-east of Mt Arapiles, Victoria, 25 November 1994, *R.J. Bates* 40030 (*holo*: AD 99615117).

Tufted multi-stemmed *perennial herb* to 20 cm high. *Stems* filiform, mostly simple, closely sericeous to produce a silvery sheen. *Leaves* sericeous, filiform to very narrowly lanceolate, acuminate, those towards base of plant to 6 cm long, diminishing upwards; margins revolute usually obscuring abaxial surface, slightly undulate. *Capitula* 1–5 in compact terminal clusters, sessile to shortly pedunculate. *Involucres* hemispherical, *c.* 4.5 mm high. *Involucral bracts* dull yellow, somewhat translucent. *Outer*

*bracts* sessile to shortly stipitate, ovate, acute to acuminate, 2–3 mm long, scarious, eciliate towards tip, woolly at base. *Medial bracts*: stipe *c.* 1.5 mm long, sparsely glandular; lamina narrowly ovate, long-acuminate, *c.* 3 mm long, eciliate or minutely ciliate towards apex. *Innermost bracts*: stipe *c.* 2 mm long, very narrowly winged, glandular abaxially; lamina narrowly lanceolate, *c.* 1.5 mm long, ciliate to apex. *Female florets*: curved outwards at anthesis; pappus bristles 1 or 2. *Bisexual florets*: pappus bristles 5–7. *Pappus bristles* shortly plumose at apex. *Achenes* not seen in mature state.

*Selected specimens examined.* SOUTH AUSTRALIA: near Serviceton, 24 Nov. 1994, *R.J. Bates* 40005 (AD); north of Donovans, 3 Jan. 1996, *R.J. Bates* 41844 (AD). VICTORIA: Wimmera, [no date], *Dallachy s.n.* (MEL); Horsham, Apr. 1922, *J. Staer* (NSW 396307); Casterton-Dartmoor Road along Moonlight Road, 27 Sep. 1988, *N.G. Walsh* 2147 (MEL); Charlton, Oct. 1917, *W.W. Watts* 763 (MEL).

*Distribution and habitat.* Known from south-western Victoria and far south-eastern South Australia. Found in '[b]lack clay flats on roadside by old railway corridor', *vide R.J. Bates* 40030; 'confined to limestone cliff tops', *vide R.J. Bates* 41844; and '*Eucalyptus camaldulensis* open forest; silty clay soil, seasonally inundated', *vide N.G. Walsh* 2147. The variable habitats suggest that there may be several variants included in subsp. *filifolium*.

*Etymology.* The specific epithet is derived from the Latin words *filum*, a thread, and *folium*, a leaf, with reference to the usually very slender leaves found in this species.

*Notes.* This variety is distinctive because of its very slender leaves, and the leaves and stems being covered with a silvery sheen. Unusually, the stems frequently bear only one capitulum. The relatively small capitula with slender-tipped involucre bracts also distinguish it from the more widespread variant of subsp. *apiculatum* that is found in eastern Victoria. The specimen *W.W. Watts* 73 from Charlton differs from the typical variant in having leaves that are flat and linear-lanceolate, to 2 mm wide.

## 6. *Chrysocephalum apiculatum* subsp. *caespitosum* Paul G. Wilson, *subsp. nov.*

*Type:* south-eastern, upper banks of Dry Creek, west of Donovans Landing near Glenelg River, South Australia, 28 November 1968, *D.N. Kraehenbuehl* 5905 (*holo:* AD 108388).

Small densely caespitose *perennial herb*. *Stems* slender, erect, *c.* 16 cm high, densely sericeous or becoming glabrous with age. *Leaves* filiform to linear, 1.0–2.5 cm long, densely sericeous or becoming glabrous with age. *Capitula* small, terminal, solitary or in a compact orbicular cyme. *Involucres* usually hemispherical. *Involucre bracts* yellow or the outer pale reddish brown. *Medial bracts* narrowly oblong, acute, ciliate towards the base, otherwise glabrous. *Female florets*: pappus bristles 5–6. *Pappus bristles* pale yellow, very shortly plumose towards apex. Mature *achenes* not seen.

*Selected specimens examined.* SOUTH AUSTRALIA: The Crevices, Hundred of MacDonnell, 20 Nov. 1993, *D.N. Kraehenbuehl* 6142 (AD); Hundred of MacDonnell, *c.* 5 km ESE of Kongorong, 31 Oct. 1976, *D. Rowley* 94 (AD). VICTORIA: S of Glenisla Stn, Red Rock Creek area, 6 Dec. 1968, *A.C. Beauglehole* 29952 (MEL); Little River, May 1924, *A.C.F. Gates s.n.* (MEL).

*Distribution.* Recorded from far south-western Victoria and far south-eastern South Australia.

*Etymology.* The specific epithet is derived from the Latin *caespitosus*, 'growing in thick tufts or clumps'.

*Notes.* This subspecies is variable in the length of leaves. Subsp. *caespitosum* probably grades into subsp. *filifolium* with which it shares both habit and type of indumentum. The two subspecies differ in the shape of their involucre bracts and in the number of pappus bristles in the female florets.

**7. *Chrysocephalum apiculatum* subsp. *ramosissimum* (Hook.) Paul G. Wilson, *comb. et stat. nov.***

*Helichrysum ramosissimum* Hook. in T.L. Mitchell, *J. Exped. Int. Trop. Australia* 83 (1848); *Helichrysum apiculatum* var. *minor* Benth., *Fl. Austral.* 3: 625 (1867). *Lecto*, here designated (or possibly *holo*): ‘Springs N. of the Darling, Sub-Tropical New Holland’, 7 March 1846, T.L. Mitchell 26 (K 000349220 image seen).

Erect branching *perennial herb*. *Stems* slender, cottony or woolly. *Leaves* linear to narrowly obovate or obovate, to 3 cm long, flat, sparsely cottony to densely woolly above, densely cottony to densely woolly beneath. *Capitula* small, clustered or becoming racemose as they mature. *Involucre* hemispherical, c. 5 mm high. *Bracts* yellow, somewhat translucent towards base. *Medial bracts*: lamina narrowly oblong to narrowly lanceolate, obtuse to acuminate, ciliate-fimbriate to near tip, sparsely hirsute on abaxial and adaxial surfaces. *Innermost bracts*: lamina narrowly lanceolate, abaxially glandular. *Female florets*: pappus bristles (0–)1–9. *Bisexual florets*: pappus bristles 7–10. *Pappus bristles* pale yellow, filiform, scabridulous below, very shortly plumose at apex. *Achenes* sparsely scabrous.

*Selected specimens examined.* QUEENSLAND: 14 miles [c. 18 km] SW of Mirtna Stn, 27 July 1964, L.G. Adams 1161 (CANB); 44 km S of Roma, 29 Nov. 1972, D.F. Blaxell 1045 (NSW); between Dingo and Blackwater, 22 Feb. 1998, R.J. Fairfax 273 (BRI); Warwick, 12 Mar. 1931, C.E. Hubbard 5763 (BRI); Wyreema, 17 Mar. 1931, C.E. Hubbard 5892 (BRI); 5 km E of Mitchell, 23 Apr. 1961, R.W. Johnson 2230 (NSW); Warren Point Stn, 23 Aug. 1968, P.N. Martensz s.n. (CANB); 25 km N of Jandowae, 30 Nov. 1983, L. Pedley 5011 (BRI); 100 km SW of Warwick, 10 Jan. 1984, L. Pedley 5017 (BRI); South Durong, Dec. 1932, W. Smith s.n. (BRI); Kindon Stn, 6 Dec. 1938, L.S. Smith 557 (BRI); Isla Gorge, 9 Nov. 1993, I.R. Telford 11914 (BRI). NEW SOUTH WALES: Loomberah district, 17 Nov. 1954, R.H. Goode 160 (NSW); 9 miles [c. 15 km] from Balranald towards Euston, 15 Sep. 1965, M.E. Phillips s.n. (AD); Chaffey Dam, 4 May 1990, G.J. White s.n. (NSW); Ashley via Moree, Jan.–Feb. 1925, E.H. Zeck s.n. (NSW).

*Distribution.* Found in north-central New South Wales and south-central Queensland.

*Typification.* Mitchell in the protologue indicates that *Helichrysum ramosissimum* was found on the 5<sup>th</sup> March 1846 near the Caraway Ponds, c. 15 miles [c. 32 km] from the Barwan River towards the Narran River, i.e. northern New South Wales near Narran Lake [c. 29° 50' S, 147° 25' E]. K 000349220, determined by W.J. Hooker as *Helichrysum ramosissimum*, has a ‘T.L. Mitchell’ label indicating that it is number 26 collected on 7<sup>th</sup> March 1846 at ‘Springs N. of the Darling’; this is also the collection that was cited as the type by Domin (1929: 672). No other relevant material has been located.

Bentham (1867) did not cite any collections under his name *H. apiculatum* var. *minor*, but did cite *H. ramosissimum* as the only synonym, therefore I am basing both names on the collection Mitchell 26 (K), the lectotype (or holotype) of *H. ramosissimum*.

The typical variant of this subspecies (only known to me from the type specimen), has woolly branches and leaves while the female florets usually have only one pappus bristle. All other specimens included under subsp. *ramosissimum* have branches and leaves that are variably cottony and female florets

usually with >3 bristles. This, with the variation in the shape of the medial involucral bracts, indicates that several taxa are included under this name but these I have not been able to clearly distinguish.

*Notes.* This subspecies evidently grades to the south into subsp. *congestum* and to the east into subsp. *simpliciusculum* (Domin) Paul G. Wilson, *q.v.*

### 8. *Chrysocephalum apiculatum* subsp. *insigne* (Domin) Paul G. Wilson, *comb. et stat. nov.*

*Helichrysum insigne* Domin, *Biblio. Bot.* 89: 672 (1929). *Type citation:* 'Queensland: Maranoa River, Mitchell, Keppels Isles [near Rockhampton, lat. 23° 10' S], John MacGillivray XII. 1847, Voyage of Rattlesnake, Botany No. 210.' *Lecto*, here designated: Keppels Isles, Dec. 1847, *J. Macgillivray* 210 (K 000349220 image seen).

Multi-stemmed *perennial herb*, spreading, 10–50 cm high. *Stems* cottony. *Leaves* somewhat dense, narrowly oblong to obovate, narrowed towards base, obtuse, 4–6 cm long, flaccid, abaxial surface densely cottony, adaxial surface moderately cottony. *Capitula* in compact terminal corymbs with densely woolly peduncles. *Involucre*s semi-orbicular, woolly at base, pale yellow, *c.* 6 mm high. *Medial bracts* very narrowly oblong, acuminate, ciliate to apex, hirsute on both surfaces. *Female florets* with (7–)9–10 pappus bristles. *Pappus bristles* shortly, and often sparsely, denticulate (to plumose) towards apex.

*Selected specimens examined.* QUEENSLAND: 12 km N of Coolum, 28 Nov. 1989, *A. & A.L. Anderberg* 7075 (NSW); Teewah, just S of Cooloola, 19 Feb. 1979, *G.N. Batianoff* 1320 (NSW); Peregian Beach, Sunshine Coast, 20 Feb. 1979, *G.N. Batianoff* 1344 (BRI); Sunshine Coast near Noosa, 3 Oct. 1970, *C. Bell* 149 (BRI); Fraser Is., Sandy Cape, 27 Apr. 1966, *S.T. Blake* 22677 (BRI); Fraser Is., 14 Sep. 1979, *R. Coult*s 3 (BRI); Cooloola, 19 Dec. 1971, *A.G. Harrold* 00210 (BRI); Blackdown Tableland *c.* 32 km SE of Blackwater, 20 Apr. 1971, *R.J. Henderson et al.* 698 (NSW); Noosa, March 1919, *R.L. Higgins s.n.* (BRI); Sandy Cape, 1842, *J. Macgillivray* 15 (BRI, NSW, PERTH); 12 km W of Jackson, 30 Oct. 1978, *L. Pedley* 4499 (BRI); between Wyberba and Wallangarra, 30 Dec. 1962, *L. Pedley* 1173 (BRI); Shoalwater Bay, 22 June 1999, *N. Power* JB2227 (BRI); 2 km N of Coolum Beach, 25 Apr. 1975, *P. Sharpe* 1217 (BRI); Point Arkwright *c.* 1.5 km S of Coolum, 24 Oct. 1979, *P.R. Sharpe* 2601 (BRI); Peregian, 6 Oct. 1965, *B.L. Turner* 5622 (BRI).

*Distribution and habitat.* Recorded from Keppel Isles, Wide Bay district, Fraser Island, and Noosa Heads, south-eastern Queensland. The collections indicate that the typical variant (*sensu lectotypica*) of this subspecies is coastal, frequently growing on coastal dunes.

*Chromosome number.*  $n = 12$  *fide* *B.L. Turner* 5622, *in sched.* (BRI).

*Typification.* The two syntypes are from disjunct localities: the Macgillivray collection came from a coastal habitat while the Mitchell collection, which I have not seen, would presumably have been collected from about 500 km inland and if so represents a different taxon. The name is here lectotypified on the coastal plant from the Keppel Isles. K 000349220 was seen by Domin while he was writing up his paper for *Bibliotheca Botanica*.

*Notes.* I have seen no other collections from the lectotype locality, nor have I seen any collections from coastal areas between the Keppel Isles and the Wide Bay district. The lectotype differs from all other collections cited above in having very much broader leaves. To the north it evidently grades into



subsp. *barbellatum* Paul G. Wilson. In addition to varying in coastal areas in a north-south direction it also varies in a westerly direction, as exemplified by *L. Pedley* 4499 (12 km W of Jackson), *L. Pedley* 1175 (Wallangarra) and *R.J. Henderson et al.* 698 (Blackdown Tableland), each of which has linear leaves and a reduced number of pappus bristles in the female florets.

**9. *Chrysocephalum apiculatum* subsp. *simpliciusculum* (Domin) Paul G. Wilson, *comb. et stat. nov.***

*Helichrysum semiamplexicaule* var. *simpliciusculum* Domin, *Biblio. Bot.* 89: 674, Figure 206 p.p. (1929). *Type citation*: 'in arenosis prope Sunnybank haud procul Brisbane [Queensland] legi (XII. 1909).' *Type*: 'In collibus Sunnybank apud urbem Brisbane, Dec. 1909', *K. Domin* 9022 (PR 531639 n.v., photo seen).

Erect multi-stemmed *perennial herb* to 35 cm high arising from a single unbranched stock. *Stems* slender, cottony. *Leaves* well-spaced, narrowly oblong to spatulate, sometimes semiamplexicaule, 3–5 cm long, 0.5–1 cm wide, becoming smaller towards apex of stem, densely woolly below, glabrous to glandular-pilose above. *Capitula* terminal, crowded on short woolly peduncles or forming a short raceme. *Involucres* hemispherical, 4–5 mm high. *Outer and medial bracts*: stipe slender, sub-terete to semiterete, glandular-pilosulose on abaxial surface; lamina narrowly oblong to narrowly triangular, terminal 0.5 mm eciliate, hirsute on both surfaces, yellow, apex rounded to truncate (or acute), minutely crenulate or entire, sometimes slightly wrinkled. *Innermost bracts* lanceolate, ciliate to apex. *Female florets*: pappus bristles (0–)1(–2), predominantly 1 and adaxially placed, if 2 then one adaxial and one lateral. *Pappus bristles* very shortly and sparsely plumose towards apex, scabrescent below, pale yellow. *Achenes* scabrous (not seen in a mature state).

*Selected specimens examined*. QUEENSLAND: Bottle-tree Creek east of Gurulmundi, Nov. 1930, *E.H. Belsens* s.n. (BRI); headwaters of Perigara Creek, 7 km W of Bringalily Lookout Fire Tower, 26 Sep. 1992, *P.I. Forster* 11649 (BRI); Mimoso Creek, Blackdown Tableland, 27 Nov. 1972, *L.A.S. Johnson & D.F. Blaxell* 776 (NSW); 20 km from Cracow on Cracow – Taroom Road, Aug. 1962, *R.W. Johnson* 2506 (BRI); 50 km? NE of Goondiwindi, 24 Nov. 1974, *R.W. Johnson* 2963 (BRI); Tamborine, 17 Mar. 1965, *W.T. Jones* 2952 (CANB); Archer's Station, Aug. 1843, *L. Leichhardt* s.n. (NSW); 20 miles [c. 32 km] SW of Chinchilla, 21 Nov. 1969, *L. Pedley* 3029 (BRI); Racecourse Creek, NE of Wallangarra, 29 Jan. 1940, *L.S. Smith* 777 (BRI); Amiens, Feb. 1968, *K. Williams* s.n. (BRI). NEW SOUTH WALES. Mt Mullengen, July 1922, *W.F. Blakely & D.W.C. Shiress* s.n. (NSW 396469); Guyra, March 1917, *J.L. Boorman* s.n. (NSW 396540); Wallangarra, Jan. 1918, *J.L. Boorman* s.n. (NSW 396537); Casino, 4 Apr. 1912, *J.B. Cleland* s.n. (AD); Gilgai, 27 Dec. 1963, *J. Crawford* (AD); Angourie, Jan. 1950, *G.L. Davis* s.n. (NSW 584770); Tooloom Falls, 21 Nov. 1987, *Z. Donabaver* 16 (PERTH); Kings Plains Natl Park, 7 Mar. 1995, *J.T. Hunter* 2828 (NE); Tabulam to Tenterfield, c. 10 miles (16 km) W of Tabulam, 7 Jan. 1971, *H. Salasoo* 4616 (NSW).

*Distribution and habitat*. Found on the Northern Tablelands of New South Wales and in south-eastern Queensland. Recorded as growing on clay, sand, or granitic soil in open forest or grasslands.

*Notes*. Two collections from New South Wales contain material of both subsp. *simpliciusculum* and subsp. *semiamplexicaule* (Domin) Paul G. Wilson. These are as follows: Emmaville [29° 27' S, 151° 36' E], 1904, *J.L. Boorman* (NSW 396532); Chandlers Peak, Guyra, March 1917, *J.L. Boorman* (NSW 6346). The Guyra collection consists of mounted and unmounted material; it bears a note: 'A fairly common plant growing in patches at a few localities at Guyra especially on the Railway line'. The mounted specimen of subsp. *semiamplexicaule* has female florets with two or four pappus bristles,



which suggests that it may be a hybrid between the two taxa. There is, of course, the possibility that the admixture was caused subsequent to collecting.

### 9a. *Chrysocephalum apiculatum* aff. subsp. *simpliciusculum*

Apparently rhizomatous, multi-stemmed *perennial herb* to 40 cm high. *Stems* slender, cottony. Leaves well-spaced, narrowly obovate, to 3 cm long, obtuse, apiculate, green and very sparsely cottony above, woolly below. *Capitula* initially in compact corymbs becoming racemose at maturity. *Involucre*s yellow, hemispherical, 5–6 mm high. *Medial bracts* adaxially hirsute, abaxially glabrous or sparsely hirsute, narrowly oblong, acuminate or irregularly obtuse and crenulate, ciliate or denticulate to tip. *Female florets* with 7 pappus bristles.

*Distribution and habitat.* Found in south-eastern Queensland in the Wide Bay Pastoral District. Recorded as growing in woodland and also in ‘wallum’ country, i.e. sandy coastal heathland.

*Selected specimens examined.* QUEENSLAND: Wide Bay Military Training Area, c. 1 km N of Camp Ker, 16 Sep. 1980, *L.G. Adams* 3467 (CANB); 1 mile [c. 1.6 km] on the Childers side of Isis River, April 1947, *W.J. Bisset* S 435 (CANB).

*Notes.* This taxon is found in south-eastern Queensland, to the north of the recorded distribution of subsp. *simpliciusculum*. The two taxa are similar in general morphology but the female florets of true subsp. *simpliciusculum* have zero to two pappus bristles.

### 10. *Chrysocephalum apiculatum* subsp. *semiamplexicaule* (Domin) Paul G. Wilson, *comb. et stat. nov.*

*Helichrysum semiamplexicaule* Domin, *Biblio. Bot.* 89: 674, Figure 206 *p.p.* (1929). *Type:* near the Logan River, Queensland [c. 30 km S of Brisbane], March 1910, *K. Domin* (*n.v.*).

Multi-stemmed *perennial herb* arising from a single unbranched stock, erect, to 0.5 m high, moderately branched. *Stems* ascending, glandular-pilose with weak multicellular hairs, sparsely cottony, leafy. *Leaves* oblong, flat, to 4 cm long, 10 mm wide, sessile, semiamplexicaule at base, obtuse to acuminate, apiculate, scabrous to glandular-puberulous or cottony above, glandular-puberulous or woolly below. *Capitula* in dense corymbs or eventually elongated panicles; peduncles 5–10 mm long, woolly. *Involucre*s hemispherical, c. 8 mm wide. *Bracts* moderately hirsute abaxially, sparsely hirsute adaxially. *Medial bracts* narrowly oblong to narrowly ovate-acuminate, the terminal portion glabrous and eciliate. *Innermost bracts* linear, acute to acuminate, very sparsely hirsute. *Female florets:* pappus bristles (4–)8, persistent. *Pappus bristles* with terminal portion dentate (not plumose). *Achenes* narrowly oblongoid-ellipsoid, c. 1.3 mm long, pale grey-brown, minutely scabrous.

*Selected specimens examined.* QUEENSLAND: Lamington Natl Park, 13 Jan. 1938, *D.A. Goy & L.S. Smith* 162 (BRI); near Kuraby, 20 Sep. 1930, *C.E. Hubbard* 4090 (BRI); near Howard, Sep. 1988, *G. Leiper s.n.* (BRI); Spring Bluff, [no date], *J. Shirley s.n.* (BRI); sandy land, Logan Village, Logan River, Aug. 1910, *J. Shirley s.n.* (NSW 396354). NEW SOUTH WALES: Wallangarra, April 1914, *J.L. Boorman s.n.* (NSW); Ebor Falls, 30 Dec. 1940, *G. Davis s.n.* (NSW); between Dumaresq Ck and Mary White College, 3 km NW of Armidale, 9 Mar. 2005, *I.R. Telford* 12854 & *J.J. Bruhl* (NE).

*Distribution and habitat.* Recorded from south-eastern Queensland and far north-eastern New South Wales. Found growing on sandy soils in woodland or open situations.

*Notes.* A variable taxon that sometimes becomes sub-shrubby. The collections noted above from Wallangarra and Lamington National Park differ from typical specimens in that the branches and leaves are more cottony and lack the glandular hairs that are found on the typical variant.

**11. *Chrysocephalum apiculatum* subsp. *exile*** Paul G. Wilson, *subsp. nov.*

*Type:* Cabarita Homestead, Queensland, [no date,] *J.R. Clarkson* 350 (*holo:* BRI 620243).

Erect, caespitose *perennial herb* to 25 cm high. *Stems* slender, sericeous, mostly simple, foliaceous. *Leaves* narrowly linear to linear, acuminate, or towards base of stems very narrowly obovate, medial leaves *c.* 15 mm long, increasing to 25 mm towards base, diminishing upwards, adaxially sparsely cottony, abaxially densely cottony. *Capitula* small, initially corymbose becoming shortly racemose at maturity. *Involucre*s pale yellow, semiorbicular, *c.* 5 mm high. *Medial bracts* narrowly ovate, acuminate, the lamina *c.* 2.5 mm long, basal half becoming colourless and translucent, ciliate to tip, sparsely woolly-ciliate towards base, sparsely to very sparsely hirsute abaxially and adaxially. *Female florets:* pappus bristles 7–9. *Bisexual florets* narrowly turbinate. *Pappus bristles* weak, very sparsely denticulate towards apex.

*Selected specimens examined.* QUEENSLAND: dam on Warwick–Cullendore Rd, 25 km SE of Warwick, 9 Apr. 2000, *G.N. Batianoff* 210712 & *B.S. Collyer* (BRI); Inglewood-Texas Rd 6 km N of Brush Ck, 21 Sep. 1993, *A.R. Bean* 6562 (BRI); 8 km W of Blackbutt towards Yarraman, 26 Nov. 1996, *A.R. Bean* 11389 (BRI); between Redbank and Goodna, 29 Dec. 1934, *S.T. Blake* 7163 (BRI); Biggenden, Burnett District, 11 Oct. 1930, *C.T. White* 7284 (BRI); between Miles and Chinchilla, 31 May 1946, *C.T. White* 1107 (BRI); 4 km E of Maidenwell towards Yarraman, 24 Apr. 1981, *K.L. Wilson* 3331 (BRI). NEW SOUTH WALES: Singleton Army Area 2, Minimbah Creek, 27 Nov. 1991, *I. Crawford & J. Graham* 1431 (CANB); *c.* 27 km E of Tenterfield, 4 Oct. 1974, *N.S. Lander* 543 (NSW).

*Distribution and habitat.* Found in far south-eastern Queensland and far north-eastern New South Wales. Recorded as growing on siliceous soil, brown clayey soil, sand, alluvial clay-loam, cleared brigalow country, and shallow loamy soil on serpentine.

*Etymology.* The epithet is the neuter form of the Latin *exilis*, meaning weak and slender, and refers to the very slender stems of this subspecies.

**12. *Chrysocephalum apiculatum* subsp. *barbellatum*** Paul G. Wilson, *subsp. nov.*

*Type:* 5 miles [*c.* 8 km] north of Oak Vale on Pentland-Wando Vale road, Queensland, 7 April 1974, *R. Carolin* 8366 (*holo:* NSW 396332; *iso:* SYD *n.v.*).

Erect, branching *perennial herb* to 40 cm high. *Stems* slender, densely appressed-cottony. *Leaves* oblong or the lower obovate, flat or slightly recurved on margin, *c.* 4 cm long and 6 mm wide, densely appressed-cottony below, moderately appressed-cottony above, acute, somewhat amplexicaule at base. *Capitula* small, forming a raceme to 12 cm long. *Involucre*s hemispherical, golden yellow. *Medial bracts:* lamina narrowly elliptic, *c.* 3 mm long, acute, hirsute on abaxial and adaxial surfaces except for tip and base, ciliate except for tip, woolly-ciliate at base; stipe glandular and sparsely woolly, *c.* 4 mm long. *Female florets:* pappus bristles 6–12. *Pappus bristles* very slender, *c.* 3.5 mm long, pale yellow, terminal portion very shortly ciliate.

*Selected specimens examined.* QUEENSLAND: 40 km E of Barcaldine on Capricorn Hwy, 17 May 1975, *J.R. Clarkson* 240 (CANB); 8 km E of Almaden, 8 Mar. 1982, *J.R. Clarkson* 2990 (CANB); Range View, c. 30 mi [c. 48 km] S of Ravenswood, 12 May 1954, *S.L. Everist* 5544 (BRI, CANB); Willots Knob, Wallaroo track, 7 Sep. 1988, *R.W. Groves* 9 (BRI); Dipperu Natl Park, 14 Sep. 1971, *K.R. McDonald* 00157 (BRI); South Perry Is., 5 Mar. 1906, *H. Tyson s.n.* (BRI).

*Distribution and habitat.* Found in north-eastern Queensland. Recorded as growing in Ironbark woodland in skeletal rocky soil, in gravelly brown loam, and in *Triodia* grassland in sandy red soil.

*Etymology.* The subspecific epithet *barbellatum* is derived from the Latin *barbellatus*, bearing short stiff hairs, and refers to the terminal hairs on the pappus bristles which are relatively few and short and do not form a plumose tip as is customary in the species.

*Note.* This subspecies grades into subsp. *insigne* towards the south.

### 13. *Chrysocephalum apiculatum* subsp. *odorum* (DC.) Paul G. Wilson, *comb. et stat. nov.*

*Helichrysum odorum* DC., *Prodr.* 6: 196 (1838); *Gnaphalium odorum* (DC.) Sch.-Bip., *Bot. Zeitung* 3: 171 (1845); *Chrysocephalum odorum* (DC.) Walp., *Rep. Bot. Syst.* 6: 238 (1846); *H. odorum* var. *typicum* Domin, *l.c. nom. illeg.* *Type:* Grassy hills on the Lachlan River, interior west from Port Jackson, July 1817, *A. Cunningham s.n.* (see comments below) (*holo:* G-DC G00471281 image seen; *iso:* K 000349224 image seen. Probable *isotype:* Lachlan River, 1817, *A. Cunningham* 296 (NSW)).

*Gnaphalium flavissimum* Sieb. ex Spreng., *Syst. Veg.* 3: 475 (1826); *Helichrysum flavissimum* (Spreng.) DC., *Prodr.* 6: 195 (1838); *C. flavissimum* (Spreng.) Steetz, *Pl. Preiss.* 1: 473 (1845); *Helichrysum apiculatum* var. *flavissimum* (Spreng.) Domin, *Biblio. Bot.* 89: 672 (1930). *Type citation:* ‘Nov. Holland’, [Sieber 336], (*isotype:* G-DC, photo seen, K, *p.p.*, MEL 2159006, *p.p.*).

Multi-stemmed *perennial herb* to 50 cm high. *Stems* slender, scarcely branched, densely cottony. *Leaves* well-spaced, sessile, narrowly oblong, acute to acuminate, c. 8 cm long towards base of plant, diminishing upwards, cottony abaxially, hispid adaxially to moderately cottony, sometimes superficially appearing glabrous. *Capitula* in compact rounded corymbs on short or slender, densely woolly peduncles. *Involucres* cup-shaped, 6–10 mm high, yellow. *Outer bracts* narrowly ovate, abruptly acuminate, c. 3 mm long. *Inner medial bracts:* lamina narrowly oblong, entire, acute or obtuse or irregularly truncate, c. 4 mm long, central portion abaxially sparsely hirsute, adaxially variably hirsute, terminal 1.5 mm glabrous and ciliate. *Innermost bracts* very narrowly elliptic, acuminate, basally diminishing to a scarious margin to stipe, terminally pale yellow, sparsely ciliate, glabrous. *Female floret:* pappus bristles 2–4. *Pappus bristles* yellow, shortly plumose towards apex. Mature *achenes* not seen.

*Selected specimens examined.* NEW SOUTH WALES: 20 km S of Narromine, 17 Oct. 1983, *W. Bishop* 108 & *E. Edgecombe* (NSW); Weddin Mountains Natl Park, 24 Nov. 1975, *J. Brickhill s.n.* (NSW); Clarence, 29 Nov. 1958, *C. Burgess s.n.* (CANB); Bumberry, 2 Oct. 1916, *J.B. Cleland s.n.* (AD); Lachlan River, 1817, *A. Cunningham* 296 (NSW); east of road from Byford to Bourke, 16 Sep. 1988, *W. Greuter* 20797 (NSW); 27 km W of Junee, 23 Oct. 1989, *R. Nordenstam* & *A. Anderberg* 762 (NSW); 1/2 mi [c. 0.8 km] S of Tumblong, 18 Oct. 1965, *M.E. Phillips s.n.* (CANB).

*Distribution.* Found in south-eastern New South Wales.

*Typification.* The holotype in G-DC has on it a note written by Alan Cunningham: ‘Grassy Hills on the Lachlan River / Interior west from / Port Jackson in / Long. 46° E. / July 1817’ ‘When fresh fragrant, like the Tonquin bean / Dipterix’. The fragrance mentioned has not been indicated by any other collector and is not apparent in dried material. The collection *A. Cunningham 296* (NSW) cited above is probably an isotype (see Orchard 2014).

Domin’s (1929: 1226) description of *H. odorum* var. *odorum* (as var. *typicum*) is as follows: ‘foliis supra glabris vel glabrescentibus, asperis’. His description was based on an Alan Cunningham collection in the Kew herbarium that came from New South Wales which he considered to be the type (presumably an isotype) of *H. odorum* DC.

*Notes.* This subspecies grades into subsp. *apiculatum*.

**14. *Chrysocephalum apiculatum* subsp. *arachnoideum*** (Domin) Paul G. Wilson, *comb. et stat. nov.*

*Helichrysum odorum* var. *arachnoideum* Domin, *Biblio. Bot.* 89: 672 (1929). *Type citation:* ‘Queensland: Subtrop. N. Holland, Mitchell IX. 1846 No. 549, Camp 29 [c. 26° 10' S, 148° 10' E]. N.S. Wales: New England, C. Moore.’ *Lecto*, here designated: Sub-Tropical New Holland, 1846, *T.L. Mitchell 549* (K 000349226 image seen).

Multi-stemmed *perennial herb* to 50 cm high. *Stems* simple or branched, densely cottony. *Leaves* ascending to erect, oblong to narrowly oblong, 4–7 cm long decreasing towards apex, densely cottony all over, rather flaccid. *Capitula* moderately large in compact rounded corymbs that elongate at maturity. *Medial bracts* yellow, narrowly oblong to narrowly lanceolate, acute to obtuse, c. 7 mm long, ciliate to apex, moderately to sparsely hirsute on both sides up to apex. *Female florets:* pappus bristles 1–5(–7). *Pappus bristles* very shortly plumose at apex. *Achenes* dark reddish brown to black.

*Selected specimens examined.* QUEENSLAND: Rocky Knob, SW of Helidon, 9 June 1990, *A.R. Bean 1606* (BRI); between Charleville and Westgate, 20 Apr. 1934, *S.T. Blake 5428* (AD); 8 km NE of Crows Nest, 3 May 1972, *L. Durrington 625* (BRI); near Barkers Ck, Bunya Mts, 11 Feb. 1995, *R. Fairfax 2* (BRI); Gwambagwine Ruined Castle Creek Catchment, Murphy Range, 11 Sep. 2000, *P.I. Forster 26047* (AD, BRI); Abercorn, June 1991, *G. Leiper s.n.* (BRI); Crows Nest, North Darling Downs, Oct. 1921, *C.T. White s.n.* (BRI); Helidon, 11 Dec. 1928, *J.B.W. s.n.* (BRI 248565). NEW SOUTH WALES: 6.5 km N of Guyra, 22 Feb. 2004, *L.M. Copeland 3689* (PERTH); Warrumbungles, 29 Oct. 1961, *G.L. Davis s.n.* (NE 40316).

*Distribution.* Found in inland south-eastern Queensland and north-eastern New South Wales.

*Typification.* Domin stated that the two syntype collections (Mitchell and Moore) were fully in accord with one another. This I have been unable to verify since I have not seen the collection made by Charles Moore.

*Notes.* This taxon grades into both subsp. *semiamplexicaule* and subsp. *racemosum*; it differs from the latter subspecies in the bracts being more oblong and hirsute on both surfaces.

**15. *Chrysocephalum apiculatum* subsp. *stoloniferum*** Paul G. Wilson, *subsp. nov.*

*Type:* 16 km along road from Mongarlowe along Nerriga road, New South Wales, 1 October 1981, *R. Coveny & T. James 82* (*holo:* NSW 585116).

*Stoloniferous perennial herb* to 20 cm high. *Stems* erect, branched towards base, woolly, moderately densely foliaceous. *Leaves* narrowly elliptic to narrowly obovate, 8–18 mm long, apiculate, margin slightly recurved, entire or slightly sinuate, sparsely woolly above, densely woolly below. *Capitula* solitary or in small corymbs terminal to stems. *Involucre*s hemispherical, 7–10 mm high. *Bracts* yellow or the outer scarious. *Outer bracts* sessile or subsessile, oblong, c. 3 mm long, acute, long-ciliate to apex, woolly at base. *Medial bracts*: stipe c. 2 mm long, sparsely cottony, glandular; lamina narrowly oblong to narrowly elliptic, 3.5–4 mm long, somewhat wrinkled, sparsely to moderately hirsute, ciliate to tip, obtuse to acute or acuminate or the apex irregularly lacerate and slightly curled. *Innermost bracts* very narrowly oblong, acuminate or blunt and lacerate at apex, ciliate, not glandular. *Female florets*: pappus bristles 7–12. *Pappus bristles* firmly filamentous, firmly affixed to achene, medially minutely denticulate, sparsely denticulate towards apex with the teeth up to 0.2 mm long (not plumose). *Achenes* narrowly cylindrical, c. 1.5 mm long.

*Selected specimens examined.* NEW SOUTH WALES: five miles [c. 8 km] east of Nerriga, 27 Oct. 1965, L.G. Adams 1479 (CANB); Jensens Swamp, D.M. Benson 2331 & D. Keith (NSW); Stingray Swamp F.R. site 2, Penrose SF, Moss Vale district, 17 May 1984, D. Binns, R. Shiels & R. Allen 84/223 (NSW); Hume Hwy, Paddy's River, 100 m E of bridge, 7 Dec. 1987, F.E. Davies 427 & T. Mulcahy (CBG); Barbers Creek, Jan. 1898, J.H. Maiden s.n. (NSW); Cox's River to Fish River and Sidmouth Valley (on the old track to Bathurst), April 1909, J.H. Maiden & R.H. Cambage s.n. (NSW); Braidwood – Clyde Mt, 4 Nov. 1952, C.W.E. Moore 2011 (CANB).

*Distribution and habitat.* This subspecies is found in south-eastern New South Wales. It is recorded as growing on a sandstone ridgetop in very open forest of *Eucalyptus mannifera*, in sandy soil with *Caesuarina nana* and *E. moorei*, and in swampland with *Empodisma minus* and *Restio australis*.

*Etymology.* The epithet refers to the apparent habit of the plant.

*Notes.* Described by Binns *et al.* 84/223 as being a 'low stoloniferous to tufted herb with ascending or erect branches'; the other collections seen could, from their appearance, have been stoloniferous although this character is not mentioned on the labels. Both the Binns and Davies collections have a solitary capitulum at the apex of the stems; the other collections seen have one to few capitula at the stem apex.

The pappus bristles are smooth near the base, medially with sparse very short teeth, while at the apex they have one to several longer teeth to 0.2 mm long; they are not plumose. The pappus of this species is similar to that found in some species of *Leptorhynchos* Less., but it appears to grade into other taxa that are clearly in the *C. apiculatum* group.

#### 16. *Chrysocephalum apiculatum* subsp. **argenteum** Paul G. Wilson, *subsp. nov.*

*Type:* Jararral Creek crossing on the Bungonia to Marulan road, New South Wales, 10 November 1966, M. Evans 2540 (*holo:* CANB 161475; *iso:* CANB 161476, NSW 585103).

*Caespitose perennial herb* (10–)20–35 cm high. *Stems* slender, closely and densely sericeous. *Leaves* flat, cauline, linear to narrowly obovate, 25–40 mm long, obtuse to acute, closely and densely silvery sericeous on both surfaces. *Capitula* forming a dense to shortly branched terminal inflorescence. *Involucre*s hemispherical, small, c. 6 mm diam. *Outer bracts* narrowly ovate, greyish yellow, entirely ciliate on margin. *Medial bracts*: lamina narrowly oblong to very narrowly ovate, acute to obtuse,



or narrowly lanceolate, entirely ciliate or eciliate towards apex, woolly ciliate at base, glabrous or sparsely hirsute on both surfaces, yellow. *Female florets*: pappus bristles 1–3(4). *Pappus bristles* pale yellow, shortly plumose towards apex.

*Selected specimens examined*. NEW SOUTH WALES (including A.C.T.): 19 km S of Bredbo, 4 Nov. 1995, *M.F. Braby s.n.* (CANB); Royalla, 18 Nov. 1962, *C. Burgess s.n.* (CANB); Black Mountain, 10 Oct. 1935, *T.G. Campbell s.n.* (CANB); Molonglo R., 21 Oct. 1998, *I. Crawford* 4838 (CANB); Canberra, 18 Nov. 1956, *Hj. Eichler* 13241 (CANB); Tinderry Mountains, 21 Nov. 1971, *T.G. Hartley* 13471 (CANB); Mt Ainslie, 8 Nov. 1970, *A. Kanis* 1449 (CANB); 16 km ESE Boorowa, 16 Dec. 1989, *A.M. Lyne* 66 (CANB); 23 km WNW of Urana, 12 Dec. 1995, *A.M. Lyne* 1894 & *S. Donaldson* (CANB); Canberra, Oct. 1938, *P. Monaghan s.n.* (NSW); Cooma, [no date,] *M. Mueller* 1774 (NSW); Braidwood district, 10 Dec. 1973, *M.E. Phillips* 13 (CANB); Canberra, 4 Nov. 1980, *G. Sessions* 17 (CANB); Bundong Stn, 11 Feb. 1976, *D. Verdon* 2101 (CANB).

*Distribution and habitat*. Recorded from south-eastern New South Wales (including the A.C.T.) where it grows in eucalypt woodlands, grasslands, and in open communities.

*Etymology*. The specific epithet is from the Latin *argenteus*, silvery, and refers to the silvery-sericeous indumentum on the branches and leaves that is typical of this subspecies.

**17. *Chrysocephalum apiculatum* subsp. *gracilescens* (Domin) Paul G. Wilson, *comb. et stat. nov.***

*Helichrysum gracilescens* Domin, *Biblio. Bot.* 89: 674, Figure 205 (1929). *Type citation*: ‘Queensland: Savannenwalder bei Pentland (Domin III. 1910) sowie auf den Sandsteinhügeln der Dividing Range westlich von Pentland (Domin II. 1910).’ *Lecto*, here designated: ‘in xerodrymic ap. opp. Pentland, sicut in collibus aren. Dividing Range ad occid. a Pentland’, Feb. 1910, *K. Domin* 9022 (PR 531638, photo seen PERTH). *Syntype*: Pentland, *K. Domin* 9020 (PR 531638, photo seen PERTH).

Erect multi-stemmed *perennial herb* with stout rootstock, *c.* 20 cm high. *Stems* with ascending branches, closely and thinly appressed white-cottony. *Leaves* moderately spaced, spreading and recurved, narrowly linear or very narrowly elliptic, to 3 cm long, acuminate, if linear closely revolute otherwise margin recurved, densely white-tomentose below, thinly appressed-cottony above. *Capitula* in compact to loose terminal racemes to 7 cm long. *Involucres* hemispherical, *c.* 4 mm high, yellow. *Medial bracts* *c.* 3.7 mm long; stipe slender, semiterete, *c.* 1.5 mm long, sparsely glandular abaxially; lamina narrowly elliptic, obtuse to acute or narrowly acuminate, *c.* 2 mm long, medially ciliate with eciliate apical portion of *c.* 0.5 mm, woolly-ciliate towards base, glabrous to sparsely hirsute on abaxial and adaxial surfaces. *Innermost bracts* *c.* 3.2 mm long; lamina narrowly oblong, obtuse, apex denticulate. *Female florets*: numerous, pappus bristles absent or 1–5 (type variant epappose). *Bisexual florets* with *c.* 12 bristles. *Pappus bristles* filamentous, very shortly plumose towards apex the cilia slender to 0.2 mm long. *Achenes* semiterete, *c.* 0.7 mm long, pale brown.

*Selected specimens examined*. QUEENSLAND: Cann Camp Ck, White Mountains Natl park, 15 Apr. 1992, *A.R. Bean* 4351 (BRI); 6 mi [*c.* 10 km] W of Pentland, *R. Carolin* 8332 (NSW); Torrens Ck, Aug. 933, *W.R. Chisholm s.n.* (BRI); Warrigal, 2 Feb. 1931, *C.E. Hubbard & C.W. Winders* 7106 (BRI); 3 miles [*c.* 5 km] SW of Pentland Township, 21 June 1953, *M. Lazarides* 3573 (AD, CANB, NSW, NT, PERTH); 4 km S of Natal Downs, 10 May 1991, *V.J. Nelder* 3098 (BRI); 55 km WNW Charters Towers, 5 Jan. 1982, *L. Pedley* 4815 (BRI); Burra Ra., *I.R. Telford* 11455 (CANB); *c.* 86 km SSE of Charters Towers, 19 June 1998, *E.J. Thompson* CHA524 (BRI).

*Distribution and habitat.* Recorded from north-eastern Queensland growing in savannah woodland (*vide* Domin), and ‘on sandy red earth in *Eucalyptus melanophloia* woodland’ (*vide* Pedley 4815).

*Typification.* The specimens of Domin 9022 (PR), as seen in a photograph, correspond to the published Figure 205 for which reason this collection has been selected as the lectotype.

*Notes.* Domin (1929), in a note under his new species *H. gracilescens*, states (in translation): ‘Definitely closely related to *H. ramosissimum*, nevertheless distinguished by its slenderness, leaves very narrow linear, racemes longer and capitula obviously smaller’. Domin had seen the type of *H. ramosissimum* at K.

In the collections from near Pentland (the type locality), the leaves are spreading and downwardly curved while the female florets are epappose or have only one bristle; in collections found some distance from Pentland the number of bristles ranges from two to five.

Subsp. *gracilescens* evidently grades to the south into a variant of subsp. *ramosissimum* but differs principally in having narrowly linear leaves, slender stems and branches, and somewhat smaller capitula.

#### **18. *Chrysocephalum apiculatum* subsp. *erectum* Paul G. Wilson, *subsp. nov.***

*Type:* Uralla–Bendemeer Road, New South Wales, 7 February 1966, *W. Hartley* 25, ex herb. *E.J. McBarron* 12124 (*holo:* NSW 585549).

Erect, sparsely branched, multi-stemmed *perennial herb* to 40 cm high. *Stems* and branches slender, woolly when young, variably glandular-puberulous. *Leaves* linear-acuminate, to 25 mm long, diminishing upwards, flat or with recurved to revolute margins, cordate at base; adaxial surface variably glandular-puberulous; abaxial surface variably glandular-puberulous and woolly at least when young. *Capitula* in a terminal compact cyme becoming racemose with age. *Involucre*s globose, *c.* 4 mm high. *Involucral* bracts dull yellow becoming translucent towards base. *Outer bracts* subsessile, ovate, acute, *c.* 2 mm long, ciliate to apex, glabrous adaxially, sparsely hirsute abaxially. *Medial bracts:* lamina narrowly ovate-lanceolate, ciliate to or near to tip, glabrous adaxially, somewhat hirsute abaxially. *Female florets* with one pappus bristle. *Bisexual florets* with *c.* 5 pappus bristles. *Pappus bristles* very pale yellow, shortly plumose near apex. Mature *achenes* not seen.

*Specimens examined.* QUEENSLAND: Jericho, June 1913, *J.L. Boorman s.n.* (NSW). NEW SOUTH WALES: between Borah and Huskisons, 7 Apr. 1843, *F.W.L. Leichhardt s.n.* (NSW); Eastwood State Forest, 16 Oct. 1990, *S. McIntyre* 1–3 (NSW); Hillgrove, 6 Mar. 1991, *S. McIntyre* 108-5 (NSW); 12 mi [c. 19 km] E of Armidale, 1 May 1949, *F.A. Rodway s.n.* (AD); 5 mi [c. 8 km] NE of Kenebri, Cumbil State Forest, 25 Aug. 1970, *H. Salasoo* 3926 (NSW).

*Distribution and habitat.* This species is recorded from a small area in north-eastern New South Wales between Kenebri and Armidale with a single collection from Jericho in eastern Queensland. The only habitat notes are those provided by *Rodway s.n.*, who stated that the plant was ‘plentiful on granite ridge’ and by *McIntyre* 108-5, who collected the plant in ‘highly disturbed roadside stock route, granite parent material’.

*Phenology.* The specimens (all in flower) were gathered from February to August.

*Etymology.* The subspecific epithet refers to the erect nature of the stems.

*Notes.* The collections recorded from New South Wales are uniform in morphology without any suggestion of intergradation with other subspecies. However, the capitula are similar in appearance to those of subsp. *ramosissimum* and to aff. subsp. *gracilescens*, but the female florets in the latter taxon have six to nine pappus bristles whereas in subsp. *erectum* there is only one bristle in the New South Wales form while in the collection from Jericho the female florets are epappose; the indumentum of the various subspecies is markedly different. The solitary collection from Jericho, Queensland, suggests that this taxon was once more widely distributed.

**19. *Chrysocephalum apiculatum* subsp. *pilbarensis* Paul G. Wilson, *subsp. nov.***

*Type:* east-west track running south of Savoury Creek, east of Cundlebar Homestead, Western Australia, 12 June 2002, *A.V. Slee* 4487A & *J.R. Connors* (*holo:* PERTH 08262063; *iso:* CANB 636350.1).

*Chrysocephalum* sp. Pilbara (H. Demarz 2852), Western Australian Herbarium, in *FloraBase*, <https://florabase.dpaw.wa.gov.au/> [accessed 16 January 2015].

*Perennial herb* with erect slender stems and branches. *Young stems* glandular-puberulous and often cottony; mature branches glandular-puberulous. *Leaves* linear and revolute to narrowly elliptic and flat, frequently auriculate at base and shortly decurrent, 2–10 cm long on mature branches, decreasing in length upwards, glandular-puberulous, sparsely to densely cottony. *Capitula* densely to loosely clustered with peduncles slender, to 10 mm long. *Involucres* lemon-yellow, urceolate or hemispherical, *c.* 6 mm diameter. *Outer bracts* sub-sessile, ovate-acuminate, ciliate except towards tip, sparsely cottony at base. *Median bracts:* claw slender, semiterete, *c.* 2 mm long, glandular abaxially; lamina narrowly ovate-acuminate, *c.* 3 mm long, semitranslucent towards base, medially ciliate, terminal 1/3 eciliate, basally cottony-ciliate, very sparsely hirsute on abaxial surface. *Innermost bracts:* stipe semiterete, very narrowly winged, glandular-puberulous abaxially; lamina narrowly lanceolate, *c.* 1.7 mm long, terminally eciliate. *Female florets* with (5?)–7–14 pappus bristles. *Achenes* obovoid, 1 mm long, grey.

*Selected specimens examined.* WESTERNAUSTRALIA: 21° 40' S 120° 40' E, 13 Sep. 1979, *G. Davis* 149 (PERTH); between Dales Gorge and Joffre Falls, 1 Nov. 1970, *H. Demarz* 2852 (PERTH); Canning Well, 20 Oct. 1991, *H.N. Foote* 146 (PERTH); Yandicoogina, 11 Mar. 1981, *K.J. Gibbons* 252 (PERTH); Rudall River region, Sep. 1986, *W.G. Martinick & Associates s.n.* (PERTH); Thirteen Creek, 22 June 1996, *A.A. Mitchell* PRP 11822 B (PERTH); Green Hole, Yarrie Stn, Pilbara Region, 25 June 1997, *A.A. Mitchell* PRP 1588 (DNA, PERTH).

*Distribution.* Largely confined to the Pilbara region of Western Australia.

*Conservation status.* This subspecies is well represented in the Pilbara region.

*Etymology.* The epithet *pilbarensis* refers to the region of Western Australia in which this subspecies has been principally collected.

*Notes.* This subspecies is similar to subsp. *glandulosum* and subsp. *curvifolium* but has broader leaves of which the lower ones are somewhat auriculate at the base and, along with the branches, are glandular-puberulous.

The pappus bristles readily detach from the achene which makes the counting of them difficult and the result frequently imprecise.

The collection *A.A. Mitchell* PRP 1588 from Yarrie Stn (20° 56' S, 120° 17' E) has slender leaves similar to those found in subsp. *curvifolium*, but the stems and leaves are glandular-puberulous and in this respect fits better with subsp. *pilbarensis*.

**20. *Chrysocephalum apiculatum* subsp. *racemosum* (J.M.Black) Paul G.Wilson, *comb. et stat. nov.***

*Helichrysum apiculatum* var. *racemosum* J.M.Black, *Fl. S. Austral.* 633 (30 June 1929). *Type citation*: 'North of Cooper's creek'. *Lecto*, here designated: Cordillo, South Australia, May 1924, *J.B. Cleland* (AD 966090571); *isolecto*: AD 968020120.

Erect, branching *perennial herb* to 30 cm high. *Stems* woolly, somewhat glandular or eglandular. *Leaves* narrowly oblong or narrowly obovate, densely woolly (not glandular), 2–4 cm long. *Capitula* in terminal clusters that become racemose with age. *Involucre*s small, c. 5 mm high, yellow. *Medial bracts*: stipe slender, subterete, glandular; lamina narrowly ovate-acuminate, glabrous on both sides, ciliate to tip. *Innermost bracts*: stipe slender, sometimes very narrowly winged towards apex; lamina narrowly ovate-acuminate, c. 1.5 mm long. *Female florets* in type variant epappose or with one bristle, in other variants up to 6 bristles. *Pappus bristles* sparsely and weakly ciliate.

*Selected specimens examined*. WESTERN AUSTRALIA: Mt Florrie, 28 Apr. 2001, *D.J. Edinger* 2301 (PERTH). NORTHERN TERRITORY: Docker River, 26 Mar. 1980, *T.S. Henshall* 2900 (DNA); Mt Winter, 23 Oct. 1986, *G. Leach* 1221 (NT); Ayers Rock, 30 Aug. 1957, *R. Schodde* 396 (AD); Bundooma, 22 May 1953, *T. Syko s.n.* (AD); 46 km W of Poeppels Corner, 20 Sep. 1987, *B.G. Thomson* 2130 (DNA); Ayers Rock, 7 Aug. 1954, *R.E. Winkworth* 106 (NT). SOUTH AUSTRALIA: Ernabella, Musgrave Ra., 1937, *G. Brumby s.n.* (AD); Danggali Conservation Park, 2 Mar. 1993, *D.D. Cunningham* 560 (AD); Walytjijata, 16 June 1983, *A. Kalotas* 829 (DNA24410); Chowilla, 23 ar. 1958, *S.A. Pastoral Board* (AD); 9.2 km NE of Mt Finke, 6 Oct. 1987, *D.E. Symon* for N.P.W.S. 1105 (AD); Ooldea, Nov. 1960, *H. Turner s.n.* (AD). QUEENSLAND: Welford Natl Park, 11 Sep. 1996, *E. Addicott* W18 (BRI); Hammond Downs, 10 July 1936, *S.T. Blake* 12052 (BRI); Tambo, 9 Dec. 1935, *S.L. Everist* 1453 (BRI); 60 km WNW of Windorah, 16 Sep. 1973, *R.J. Henderson* 2127 (AD); Naryilco–Tibooburra road, 30 May 1978, *M. Olsen* 713 (BRI); 50 km WNW of Quilpie, 28 Oct. 1977, *L. Pedley* 4461 (BRI); 20 km N of Thylungra, 9 Nov. 1990, *M.P. Zalucki s.n.* (BRI). NEW SOUTH WALES: Bottom Bore, 8 May 1977, *R.J. Chinmock* 3546 (NSW); Sturt Natl Park, 2 Sep. 1989, *B. Wiecek* 224 (NSW).

*Distribution*. Recorded from far eastern central Western Australia, southern Northern Territory, far south-western Queensland, northern South Australia, and far north-western New South Wales.

*Conservation status*. This subspecies is widely distributed and in areas that are not likely to be seriously affected by agricultural activities.

*Typification*. The lectotype bears a brown label on which J.B. Cleland has written 'In sandhills / Cordillo / 5/24'. J.M. Black subsequently wrote on the label '*Helichry. apicul. var. racemosum* J.M. Black / Type'. The capitula on this specimen have shed their florets and therefore the bristle number could not be determined; however, the isolectotype (AD 968020120) has fruiting florets in which the females are clearly epappose.

Some years after its description, the specimen *Mrs. Brumby s.n.* (Ernabella, Musgrave Ra., South Australia, 1937, AD 97240278) was determined by J.M. Black as *Helichrysum apiculatum* var. *racemosum* with the note: 'This is the same taxon as the common plant found in Central Australia'. It has small capitula arranged in a raceme, oblong to narrowly obovate, acute leaves, pale yellow, ovate-lanceolate or narrowly ovate-lanceolate involucre bracts, the terminal 0.7 mm ciliate, the surface glabrous, and ellipsoid-oblongoid achenes that are c. 0.9 mm long and minutely scabrous. A duplicate, also determined by Black as var. *racemosum*, has c. 6 pappus bristles on the female florets.

*Notes.* The collection *Arpad Kalotas* 829 (Walyititjata, north-western South Australia), has an accompanying note which states that the Pitjantatjara name for this plant is *tjulpuntjulpumpa*.

This subspecies appears to grade to the east into subsp. *ramosissimum* and to the west into subsp. *glandulosum*. To the south it grades into the Murray variants of subsp. *apiculatum* and subsp. *congestum*.

The collection *R. Bates* 25500 (10 km north of Paringa, 33° 10' S, 140° 58' E, South Australia, AD), appears to belong to this subspecies: it has female florets that are epappose. The collection *J.S. Womersley* 446 (c. 1.5 km W of Nelwood HS, 33° 58.5' S, 140° 55.5' E, AD), appears to be intermediate between *R. Bates* 25500 and specimens that are more typical of subsp. *congestum*, since the female florets have three pappus bristles.

It appears that in the type variant of subsp. *racemosum*, which is found near Cordillo Downs, the female florets are epappose or have a single bristle. Towards the west the number of bristles in the pistillate florets increases and the bracts alter in shape although the lamina remains glabrous on both surfaces. Collections from Ernabella in the Musgrave Range, that J.M. Black considered to belong to the same taxon as the type collection of subsp. *racemosum* (see below), is a closely related variant with c. six pappus bristles; it is cottony and slightly glandular-pilose. This variant is therefore somewhat intermediate between subsp. *racemosum* and subsp. *glandulosum*, but since it is morphologically closer to the former subspecies it is here treated under that name.

## 21. *Chrysocephalum apiculatum* subsp. *glandulosum* Paul G. Wilson, *subsp. nov.*

*Type:* 15 km south of Jameson, east of Warburton, Western Australia, 26 June 2011, *G. Cockerton & S. McNee* LCH 30704 (*holo:* PERTH 08298904).

Erect, somewhat aromatic *perennial herb* with numerous stems arising from base, to 30(–60) cm high; stems and leaves moderately to densely tomentose with sessile and stipitate glandular hairs, often with simple cottony hairs. *Leaves* linear to narrowly oblong or narrowly oblong-obovate, often curved, flat or with margins recurved and sometimes undulate, apex acuminate, base slightly amplexicaule and sometimes with margins decurrent; basal leaves narrowly oblong-obovate, to 7 cm long; upper leaves to 4 cm long. *Capitula* clustered in terminal irregular corymbs or racemes; inflorescence branches densely covered with subsessile and short glandular hairs. *Involucres* small, yellow. *Outer bracts:* sessile, narrowly ovate, acute, c. 2 mm long, surfaces smooth, glabrous, sparsely ciliate on margin, shortly woolly at base. *Medial bracts:* stipe slender, glandular-stipitate; lamina narrowly ovate to ovate, c. 3.5 mm long, surfaces smooth, glabrous, ciliate on margin except for distal 1/3, sparsely woolly-ciliate at base. *Innermost bracts:* stipe long slender, glandular; lamina narrowly elliptic, c. 1.7 mm long, ciliate on margin, otherwise glabrous. *Female florets* with c. 4–9 pappus bristles.



*Selected specimens examined.* WESTERNAUSTRALIA: 14 mi [c. 22.5 km] NE of Cosmo, 28 Sep. 1966, *A.S. George* 8104 (PERTH); 12 mi [c. 19 km] E of Wiluna, 18 Sep. 1957, *N.H. Speck* 849 (PERTH); 5 km W of Zanthus, 17 Sep. 1979, *J. Taylor* 567, *M.D. Crisp & R. Jackson* (CANB); 147 km SW of Warburton, 9 Apr. 1992, *F.A. Zich* 81 (CANB). NORTHERN TERRITORY: 6 mi [c. 10 km] E of Ayers Rock, 20 Sep. 1968, *A. Nicholls* 979 (NT). WESTERN AUSTRALIA–SOUTH AUSTRALIA: border, 28° 30' S, 129° 00' E, 22 July 1979, *V.J. Levitzke* 49 (AD). SOUTH AUSTRALIA: near Sentinel Hill, Musgrave Ra., June 1926, *H. Basedow* 52 (AD); Parabarana Hill area, 16 Sep. 1987, *G.H. Bell* 1294 (AD); Officer Ck, 20 Apr. 1950, *E.C. Black* (AD); tributary of Alberga R., 8 Oct. 1955, *N.T. Burbidge & M. Gray* 4593 (AD); Ernabella Mission Station, Musgrave Ranges area, June 1955, *G.W. Coombe s.n.* (AD); Mt Crombie, c. 60 km SSW of Amata, 16 Sep. 1985, *P. Copley* 1406 (AD); Mt Ive Stn, Gawler Range, 1 Sep. 1984, *T. Hall s.n.* (AD); 12 km SW of Iron Knob, 15 Nov. 1983, *K. Holiday* 831226 (AD); De Rose Hill Stn, c. 250 km NW of Oodnadatta, [no date], *T.R.N. Lothian* 766/54 (AD); Port Neill Lookout, Eyre Peninsula, 18 Nov. 1998, *D.E. Murfet* 3415 (AD); 10 km NNE of Mt Kintore summit, 16 Sep. 1955, *W.S. Reid s.n.* (AD); Murputja, Eastern Mann Ranges, 12 Oct. 1993, *M.J. Robertson* 11 (AD); 42 km W of Vokes Corner to Serpentine Lakes, 24 Aug. 1980, *J.Z. Weber* 6433 (NSW); Uno Range, 24 Sep. 1981, *D.J.E. Whibley* 7892 (AD). QUEENSLAND: c. 85 km SW of Winton, *L. Pedley* 5301 (AD, BRI); c. 6 mi [c. 10 km] SW of Yalleroi, 22 Oct. 1940, *L.S. Smith & S.L. Everist* 924 (BRI). VICTORIA: Wyperfeld Natl Park, c. 32.5 km N of Rainbow, 11 Nov. 1991, *A.M. Lyne* 657 & *B. Hadlow* (CANB).

*Distribution and habitat.* Found from eastern central Western Australia to western central Queensland. Generally recorded as growing in red sand but also found in a gravelly river-bed.

*Conservation status.* This subspecies is widely distributed in areas that are unlikely to be seriously disturbed.

*Etymology.* The subspecific epithet refers to the glandular hairs that are found on the leaves and branches.

*Notes.* In Western Australia this subspecies evidently grades into subsp. *pilbarensis* and in South Australia into subsp. *racemosum*.

## 22. *Chrysocephalum apiculatum* subsp. *variable* Paul G. Wilson, *subsp. nov.*

*Type:* 5.7 km from Kings Highway on road to Tarago and Goulburn, New South Wales, 28 November 1990, *G. Butler* 1590 (*holo:* CANB CBG 9011981).

Caespitose, stoloniferous *perennial herb*. *Stems* erect, foliaceous, to 40 cm high, simple or branched, shortly glandular-stipitate and sparsely cottony. *Leaves* narrowly oblong, to 5 cm long, acute, glandular-stipitate, sometimes cottony below. *Capitula* in terminal compact or loose corymbs (rarely solitary). *Involucre*s hemispherical, golden. *Medial bracts:* lamina narrowly ovate, acute to acuminate, c. 4 mm long, ciliate to near apex, woolly-ciliate towards base, hirsute on both surfaces. *Female florets* with (3–)4–7 bristles. *Pappus bristles* shortly ciliate towards apex.

*Selected specimens examined.* NEW SOUTH WALES (incl. A.C.T.): Canberra, 19 Feb. 1999, *I. Crawford* 5421 (CANB); Monaro Hwy 1 km N of Guises Ck, 17 Nov. 1986, *F.E. Davies* 120 (CANB); 10.7 km towards Captains Flat from Hoskinstown turnoff, 2 Dec. 1994, *S. Donaldson* 429 (CANB); 8 km from Yass toward Rye Park, 14 Nov. 1986, *J.E. Ward* 212 & *E.M. Canning* (CANB, PERTH). VICTORIA:

East Gippsland, Snowy River, c. 2.5 km from Gattamurh Ford, 22 May 1993, *D.E. Albrecht* 5254 (AD); 1/2 mi [c. 0.8 km] from Suggan Buggan River crossing, 17 Feb. 1969, *E.M. Canning* 030630 (CANB).

*Distribution and habitat.* Found in the A.C.T., south-eastern New South Wales, and eastern Victoria. Recorded as growing in grassland and woodland.

*Etymology.* The subspecific epithet is derived from the Latin word *variabilis*, liable to change, with reference to the morphological variation that is apparent within this subspecies.

*Notes.* A variable taxon that appears to be close to subsp. *stoloniferum* from which it differs most obviously in having a glandular-stipitate indumentum. It grades northwards into subsp. *odorum*, as is apparent in the collection *Maiden & Cambage s.n.* ('Rydal to Fish River and Sidmouth Valley', NSW 6342).

**23. *Chrysocephalum apiculatum* subsp. *curvifolium* (Domin) Paul G. Wilson, *comb. et stat. nov.***

*Helichrysum ramosissimum* var. *curvifolium* Domin, *Biblio. Bot.* 89: 674 (1929). *Type:* 'Arnhems Land', Northern Australia, *F. Mueller s.n.* (*holo:* K 000349242 image seen; *?iso:* Sturts Creek, March 1856, *F. Mueller s.n.* (MEL 2158405A)).

Multi-stemmed, erect *perennial herb* to 40 cm high. *Stems* slender, becoming leafless towards apex, glabrous to densely cottony. *Leaves* cauline, linear-terete, closely revolute to midrib, the lowermost linear, densely cottony to almost glabrous, sparsely and minutely glandular-puberulous, margins slightly decurrent. *Capitula* with slender peduncles to 25 mm long, forming a compact to open raceme to 15 cm long. *Invulcres* hemispherical, c. 8 mm diam., pale yellow. *Medial bracts:* lamina narrowly ovate and abruptly acuminate, long-ciliate, becoming shortly ciliate or eciliate towards apex, woolly-ciliate towards base, surface mostly glabrous. *Innermost bracts:* lamina narrowly lanceolate, very sparsely hirsute. *Female florets* with 9 pappus bristles. *Bisexual florets* with 10(–?) pappus bristles. *Pappus bristles* colourless, very shortly plumose towards apex. *Achenes* narrowly obovoid, c. 1.2 mm long, scabrous.

*Selected specimens examined.* WESTERNAUSTRALIA: [localities withheld for conservation reasons] May 1905, *W.V. Fitzgerald* 897 (PERTH); 11 Sep. 1921, *C.A. Gardner* 1571 (PERTH); 14 Sep. 1921, *C.A. Gardner* 1580 (PERTH); 3 Aug. 1975, *A.S. George* 13193 (CANB, PERTH); 10 Aug. 1975, *A.S. George* 13634 (PERTH); 1907, *F.M. House s.n.* (PERTH); 4 Dec. 1991, *T. Willing* 481 (PERTH).

*Distribution and habitat.* Only known from the Kimberley region of Western Australia where it is recorded as growing in sand in low open forest and low woodland.

*Conservation status.* To be listed as Priority Three under Department of Parks and Wildlife Conservation Codes for Western Australian Flora (M. Smith pers. comm.).

*Phenology.* Recorded as flowering in May and August, fruiting in September.

*Typification.* The name 'Arnhem(s) Land' was broadly applied in the mid-nineteenth century to include what is now the far north of Western Australia. The collection in MEL, noted above, made by Mueller along 'Sturts Creek' is a good match with the holotype in K, which is labelled as coming from Arnhem Land. It is probable that they are of the same collection since in the early years of his collecting activity

Mueller was careful to send duplicate material to W.J. Hooker, Director of the Royal Botanic Gardens, Kew (see Mueller 1857). It is unlikely that the collection was made near Sturts Creek since this would have been 300–400 km south-east of the validated occurrence of the subspecies.

*Notes.* The recorded distribution of subsp. *curvifolium* is significantly disjunct from the distribution of all other subspecies of *C. apiculatum*, yet it is interesting that a collection made by A.A. Mitchell (*Mitchell* PRP 1588; DNA, PERTH) from Yarrie Stn (20° 56' S, 120° 17' E) in the Pilbara, has slender leaves similar to those found in subsp. *curvifolium*, but glandular-puberulous stems and leaves, in which character it fits better with subsp. *pilbarensis*.

#### **24. *Chrysocephalum apiculatum* subsp. *attenuatum* Paul G. Wilson, *subsp. nov.***

*Type:* Pilliga Forest Way, c. 15 km north-east of Kenebri, New South Wales, 2 December 1984, A.N. Rodd 4257 (*holo:* NSW 584851; *iso:* BRI *n.v.*, MEL *n.v.*).

?*Chrysocephalum helichrysoides* Walp., *Linnaea* 14: 503(1841). *Type citation:* 'In *Nova Hollandia Lhotsky legit.*' (*n.v.*).

*Perennial herb* to 0.3 m high. *Stems* slender, erect, glandular-puberulous. *Leaves* linear, flat or revolute on margins, to 35 mm long, acuminate, somewhat cordate at base, glandular-puberulous and with minute sessile glands, often sparsely cottony beneath. *Capitula* in compact clusters or open racemes; peduncles slender, to 10 mm long. *Involucre*s lemon-yellow, urceolate or hemispherical, c. 6 mm diameter. *Medial bracts:* stipe slender, semiterete, c. 2 mm long, glandular abaxially; lamina narrowly ovate-acuminate, to 3 mm long, translucent towards base, medially long-ciliate, terminally eciliate, basally sparsely cottony ciliate, hirsute on both surfaces. *Innermost bracts:* stipe semiterete, very narrowly winged, glandular-puberulous abaxially; lamina narrowly lanceolate, c. 1.7 mm long, terminally eciliate. *Female florets* with 0–2(–3) pappus bristles. *Pappus bristles* slender, shortly plumose towards apex otherwise scabrid. *Achenes* obovoid, c. 1.6 mm long, greyish brown.

*Selected specimens examined.* QUEENSLAND: 15 km ESE of Inglewood, 29 Mar. 1974, L. Pedley A7430 (NSW). NEW SOUTH WALES: 15 km W of Coonabarabran, 9 Dec. 1989, A. Anderberg & A.L. Anderberg 7149 (NSW); between Coonabarabran and Warrumbungle Natl Park, 5 km west of Coonabarabran, 19 Oct. 1994, R.J. Bayer NSW 94007 (CANB); Armidale to Enmore, 26 Jan. 1953, R.W. Jessup & M. Gray 1860 (CANB); 7.9 km from Yarrowwyck towards Bundarra, 26 Nov. 1996, D.L. Jones s.n. 14998 & M. Garratt (CANB); Tenterfield Creek, 4 km S of Wallangarra, [no date], N. Snow & B. Simon 7293 (BRI). VICTORIA: Wyperfeld Natl Park, 14 Nov. 1968, A.C. Beauglehole 29580 & E.W. Finck (MEL); Warracknabeal, 8 Sep. 1961, M.E. Phillips s.n. (CANB); Mt Abrupt, [Nov. 1879,] D. Sullivan 18 (MEL).

*Distribution and habitat.* This subspecies is found in western Victoria, south-eastern Queensland, and widespread in New South Wales, growing largely in eucalypt forest but also found along creek margins and in a variety of other habitats.

*Etymology.* The subspecific epithet refers to the shape of the mature leaves.

*Notes.* This subspecies is variable in morphology and it is possible that the variants found in different areas of eastern Australia evolved independently.

**25. *Chrysocephalum apiculatum* subsp. *flindersianum*** Paul G. Wilson, *subsp. nov.*

*Type*: Mambray Creek in Mount Remarkable National Park, southern Flinders Ranges, South Australia, 6 August 1974, *N.N. Donner* 4871 (*holo*: AD 97436226).

Erect *perennial herb* branching towards base. *Stems* closely appressed-white-sericeous. Leaves appressed-cottony, crowded towards base, flat, very narrowly obovate, apiculate, to 6 cm long; medial leaves linear, acuminate, flat or recurved (or the uppermost revolute), 1.5–4.5 cm long. *Capitula* in terminal compact corymbs to 2.5 cm diam. *Involucre*s hemispherical, *c.* 10 mm diam. *Bracts* pale yellow, dull. *Median bracts* narrowly ovate-acuminate, abaxially very sparsely hirsute, adaxially moderately hirsute, margin ciliate to near apex. *Female florets* with 1–2 pappus bristles. *Pappus bristles* shortly plumose near apex.

*Selected specimens examined*. SOUTH AUSTRALIA: Flinders Ranges: Middle Gorge, 4 Oct. 1980, *N.P. & W.S. s.n.* (AD); Wilpena Pound, Oct. 1974, *B. Beck s.n.* (AD); Melrose, Oct. 1922, *B. Beck s.n.* (AD); Wilpena Pound, Oct. 1925, *B. Beck s.n.* (AD); Germein Gorge, 30 Dec. 1974, *L. Haegi* 583 (CANB); Wilmington, Mt Maria, 21 Oct. 1928, *Anon. s.n.* (AD).

*Distribution and habitat*. Only recorded from the southern Flinders Ranges in South Australia. In one collection it is indicated that the plant was growing in ‘dark brown rocky clayey loam’.

*Etymology*. The subspecific epithet refers to the area in which the plant has been collected.

**26. *Chrysocephalum apiculatum* subsp. *undulatum*** Paul G. Wilson, *subsp. nov.*

*Type*: Barraranna Gorge, Flinders Ranges, South Australia, 4 November [1993], *R.J. Bates* 34830 (*holo*: AD 99427052).

Erect *perennial herb*, branched and with several stems arising from base, to 30(–60) cm high. *Stems* moderately tomentose with cottony hairs and sessile, globular, glandular hairs. *Leaves* narrowly oblong or narrowly oblong-obovate, flat and somewhat undulate on margin, tomentose on both surfaces with cottony hairs and sessile, globular, glandular hairs, the upper leaves somewhat auriculate at base. *Capitula* clustered in terminal irregular corymbs or racemes; branches densely covered with woolly and glandular hairs. *Involucre*s bright yellow. *Medial bracts*: stipe slender, glandular-stipitate, *c.* 3.5 mm long; lamina ovate-acuminate, 3–3.5 mm long, surfaces glabrous, ciliate except for terminal 1/3, glossy, smooth, basal half sparsely ciliate on margin otherwise eciliate, woolly-ciliate at base. *Innermost bracts*: stipe slender, narrowly winged, glandular-stipitate; lamina narrowly elliptic, *c.* 2 mm long, ciliate on margin except for apex, glabrous. *Female florets* with *c.* 10 pappus bristles.

*Selected specimens examined*. SOUTH AUSTRALIA: Nonning, Eyre Pen., 8 Apr. 1993, *R. Bates* 31861 (AD); Siam Stn, Gawler Stn, 12 Oct. 1968, *B. Copley* 2324 (AD); Mt Ive Stn, Gawler Ra., 1 Sep. 1984, *T. Hall s.n.* (AD); 12 km SW of Iron Knob, 15 Nov. 1983, *K. Holliday* 831226 (AD); Uno Ra., Uno Stn, 35 km W of Iron Knob, 10 Mar. 1981, *F. Mollenmans* 409 (AD); Buckleboo Conservation Reserve, 17 Oct. 1998, *D.E. Murfet* 3360 (AD); Lake Gilles Conservation Park, 24 Oct. 1998, *D.E. Murfet* 3366 (AD); 4 km SW of Yardea Hstd, 29 Aug. 1996, *A.G. Spooner* 15969 (AD); Uno Ra., near Hstd, 24 Sep. 1981, *D.J.E. Whibley* 7892 (AD).

*Distribution and habitat.* Restricted to the Gawler Ranges and to adjacent areas of Eyre Peninsula and the Flinders Ranges in South Australia. Recorded as growing in a variety of soils including gravelly soil, creek beds, rough rocky hillside, sandy loam, and limestone red loam.

*Etymology.* The infraspecific epithet is derived from the appearance of the leaf margin which is undulate when mature.

*Notes.* In the Flinders Ranges the leaves are somewhat woolly, narrowly oblong with undulate margins, and only minutely glandular, principally with sessile globular glands.

**27. *Chrysocephalum apiculatum* subsp. *yorkense* Paul G. Wilson, *subsp. nov.***

*Type:* Wauraltee, Yorke Peninsula, South Australia, 4 June 1989, *W.J. Quinn* 131 (*holo:* AD 98948492; *iso:* BR, C, CANB, CAS, PRE, S, SIU, TAI, TUR, all *n.v.*).

Small, much-branched, spreading *perennial herb* to 10 cm high. *Stems* cottony. *Leaves* linear to very narrowly obovate, 1–3 cm long, somewhat crowded, sericeous or cottony. *Capitula* in compact terminal cymes. *Involucre*s small, hemispherical, *c.* 6 mm high. *Outer bracts* reddish brown. *Medial bracts:* lamina yellow, oblong, *c.* 6 mm long, apex rounded to obtuse, long-ciliate to near apex, abaxially glabrous, adaxially very sparsely hirsute towards base. *Inner bracts:* lamina yellow. *Female florets* with 4 or 5 pappus bristles. *Pappus bristles* shortly plumose at apex.

*Selected specimens examined.* SOUTH AUSTRALIA: Yorke Peninsula: 6 km SSE of Moonta, 30 Sep. 1967, *B.J. Blaylock* 767 (AD); 15 km ESE of Minlaton, 10 Oct. 1970, *B.J. Blaylock* 1551 (AD); four mi [*c.* 6.5 km] from Stenhouse Bay, 19 Oct. 1966, *M.E. Phillips s.n.* (CANB); near Sturt Bay turnoff, 12 Oct. 1980, *A.G. Spooner* 7328 (AD).

*Distribution and habitat.* Recorded from Yorke Peninsula, South Australia. The only habitat note is that found on the type sheet which states that the specimen was growing in ‘grey loam and limestone’.

*Etymology.* The subspecific epithet is derived from the name of the region in which the subspecies is found.

*Notes.* A distinctive subspecies but evidently grading into subsp. *halmaturorum* Paul G. Wilson.

**28. *Chrysocephalum apiculatum* subsp. *halmaturorum* Paul G. Wilson, *subsp. nov.***

*Type:* Playford Hwy *c.* 5 km east of Harriet Rd, Kangaroo Island, South Australia, 8 December 1984, *G. Jackson* 1729 (*holo:* AD 98508271).

Multi-stemmed, spreading, often prostrate *perennial herb*. *Stems* closely woolly to densely sericeous. *Leaves* closely woolly or sericeous, narrowly oblong to narrowly oblanceolate, to 2 cm long towards base of plant, ±flat or recurved on margins, variably crenulate. *Capitula* solitary or 2–5 in compact glomerules. *Involucre*s small, hemispherical. *Medial bracts:* lamina *c.* 2.5 mm long, white, scarious, narrowly oblong, acute, sparsely hirsute abaxially and adaxially towards base, ciliate in basal half, woolly ciliate at base. *Innermost bracts:* lamina sub-orbicular to oblong, 0.5–1 mm long, very shortly ciliate all over. *Female florets* with 3–5 pappus bristles. *Pappus bristles* colourless or pale white.



*Selected specimens examined.* SOUTH AUSTRALIA: Rocky R., 2 Feb. 1940, *J.B. Cleland s.n.* (AD); Kangaroo Is.: Cape du Couedic, 3 Feb. 1948, *J.B. Cleland s.n.* (AD); 12 km ESE of Karatta, 12 Nov. 1989, *P. Copley, C. Baxter & R. Furner* NPKI 20422 (AD); near mouth of Stunsail Boom R., 28 Nov. 1971, *G. Jackson* 897 (AD); Playford Hwy, 8 Dec. 1984, *G. Jackson* 1729 (AD); Karatta, 12 Nov. 1886, *R. Tepper s.n.* (AD); 3 km S of South Coast Rd towards Hanson Bay, 9 Nov. 1958, *Paul G. Wilson* 816 (AD).

*Distribution and habitat.* Found on Kangaroo Island, South Australia, where it is generally noted as growing near the coast in sandy soil.

*Etymology.* The epithet *halmaturorum* is derived from the Greek word *halma* ‘to leap’ and the suffix *-orum* ‘of’ and is used here with reference to the kangaroo after which Kangaroo Island was named. The name was applied by Ferdinand Mueller as a species epithet in e.g. *Melaleuca halmaturorum* and *Eriostemon halmaturorum*, both of which were first collected on Kangaroo Island.

*Notes.* The specimen *Wilson* 816 differs from the other collections cited in having the involucre bracts very narrowly oblong, tinged with red, and denticulate at their apex.

A variant of subsp. *congestum* with large yellow capitula is also found on Kangaroo Island but the collections seen of this taxon have come from localities that differ from those of subsp. *halmaturorum* and no specimens that would suggest intergradation between the two have been noted.

A plant similar to subsp. *halmaturorum* is found on the South Australian mainland near the coast. This variant has slender stems and linear to filiform leaves that are covered with a close white velutinous indumentum, while the involucre bracts are very pale yellow and are sparsely hirsute adaxially; it appears to grade into subsp. *congestum* and is treated here as *aff.* subsp. *halmaturorum*.

## **28 bis. *Chrysocephalum apiculatum* *aff.* subsp. *halmaturorum***

Straggly multi-stemmed *perennial herb* to 30 cm high. *Stems* slender, covered along with the leaves in a dense, silvery white, woolly sheen. *Leaves* linear-spathulate, to 5 cm long at the base of plant, diminishing upwards and becoming linear and revolute. *Capitula* several in a dense terminal cluster. *Involucre* hemispherical, white to very pale yellow or yellow. *Medial bracts* narrowly oblong, c. 3.2 mm long, acute to obtuse, apically eciliate, glabrous abaxially, sparsely hirsute adaxially. *Female florets* with 4 or 5 pappus bristles.

*Selected specimens examined.* SOUTH AUSTRALIA: Yorke Pen., south west of Warooka, 26 Oct. 1985, *T. Hall* 175 (AD); Hundred of Coonarie, 26 Oct. 1985, *D.N. Kraehenbuehl* 4632 (AD); Yorke Pen., 24.5 mi [c. 40 km] from Yorketown toward Foul Bay, 18 Oct. 1966, *M.W. Phillips s.n.* (AD); Eyre Pen., Port Lincoln, Sep. 1907, *R.S. Rogers s.n.* (NSW); Eyre Pen., Streaky Bay, Sep. 1907, *R.S. Rogers s.n.* (NSW); Foul Bay Rd, 26 Oct. 1985, *A.G. Spooner* 9995 (AD).

*Distribution and habitat.* Found in South Australia in coastal areas of Yorke and Eyre Peninsulas.

**29. *Chrysocephalum apiculatum* subsp. *norsemanense* Paul G. Wilson, *subsp. nov.***

*Type:* north-east of Norseman, Western Australia [precise locality withheld for conservation reasons], 8 September 1962, *T.E.H. Aplin* 1821 (*holo:* PERTH 00426954).

Erect *perennial herb* *c.* 30–60 cm high. *Stems* several arising from base, simple or branching towards apex, woolly. *Leaves* narrowly oblong, to 6 cm long, diminishing upwards, acute to acuminate, woolly on both surfaces, usually minutely sessile-glandular. *Capitula* in terminal compact corymbs. *Involucre*s hemispherical, *c.* 7 mm high, yellow. *Bracts* smooth, glossy, firm; lamina ovate to elliptic, *c.* 4 mm long, proximal half ciliate, distal half to one third eciliate, woolly ciliate towards base, glabrous on both sides or very sparsely hirsute on adaxial side. *Female florets* with 6–8 very shortly plumose pappus bristles. *Pappus bristles* pale yellow to colourless.

*Selected specimens examined.* WESTERNAUSTRALIA: [localities withheld for conservation reasons] 20 Sep. 1947, *N.T. Burbidge* 2724 (CANB); 18 Oct. 1891, *R. Helms s.n.* (NSW588240); 11 Oct. 1989, *B. Nordenstam & A. Anderberg* 581 (PERTH); 4 Sep. 1968, *M.E. Phillips* 442 & *A. Sikkes* (NSW); 29 Oct. 1974, *D.J.E. Whibley* 4602 (AD, PERTH).

*Distribution and habitat.* Most of the collections come from within *c.* 50 km of Norseman, but with a few from the Fraser Range which is *c.* 90 km to the east. Field notes indicate that it grows in various soil types including yellow or red sand, yellow sandy clay, and calcareous soil.

*Conservation status.* To be listed as Priority Three under Department of Parks and Wildlife Conservation Codes for Western Australian Flora (M. Smith pers. comm.).

*Etymology.* The epithet is derived from the town of Norseman, which appears to be at the centre of the distribution of this subspecies, with the suffix *-ense*, to indicate origin.

***Chrysocephalum semipapposum***

The segregation of different elements within *C. semipapposum* is complicated by the apparent merging of all the variants that are currently included within this species. This has evidently been the reason why those names that are available for one or other of the variants have rarely been adopted by botanists. In this treatment five subspecific taxa are recognised but with the understanding that each intergrades with one or more of the other subspecies.

There are numerous variants that have a geographical as well as a morphological basis, but these all grade into other variants and to distinguish them by an infraspecific name, while also distinguishing the intermediates, does not appear to be feasible. For this reason the subspecies recognised here are broad-based.

The typical variant of *C. semipapposum*, which was first collected by Labillardière from the south coast of Tasmania, is distinct, but it does grade into two other variants recognised here as subspecies: subsp. *semipapposum* has linear, revolute leaves that are tomentose beneath, and female florets that are epappose or have one bristle; subsp. *brevifolium* (Sond.) Paul G. Wilson also has narrow leaves but they are glabrous and glutinous, and the female florets typically have five pappus bristles; subsp. *lineare* Paul G. Wilson has linear leaves that are broader and are usually woolly all over, with female florets epappose or with one bristle.

### ***Helichrysum* names published by Gandoger based on Australian plants**

A number of names published by Gandoger (1918) in *Bulletin de la Société Botanique de France* apply to one or other of the subspecies of *C. semipapposum*. Gandoger indicated that these names could be recognised at the rank of forma under *H. semipapposum*, but there is doubt as to their valid publication since he did not directly link the proposed forma epithet with the species name. McGillivray (1973) treated them as being validly published as forma but not as species. Chapman (1991) and the *International Plant Name Index* list the names both as distinct species and as forma of *H. semipapposum*. The taxa are as follows (original descriptions are translated in all cases):

*Helichrysum sarcodes* Gand., *Bull. Soc. Bot. France* 65: 44 (1918); *H. semipapposum* f. *sarcodes* Gand., *l.c.* Original description: 'Leaves oblong-linear, woolly on both sides. Australia, Victoria at Mentone, Tovey'. This is probably a synonym of subsp. *lineare*, *q.v.*

*Helichrysum hirtoviscosum* Gand., *l.c.*; *H. semipapposum* f. *hirtoviscosum* Gand., *l.c.* Original description: 'Leaves glandular hairy, viscous. Australia, Victoria. Walter'. This is treated here as a synonym of subsp. *asperum*, *q.v.*

*Helichrysum abrotaniforme* Gand., *l.c.*; *H. semipapposum* f. *abrotaniforme* Gand., *l.c.* Original description: 'Leaves very glabrous. Capitula 3 m. [*sic.*] wide, inflorescences not viscous. – Australia. Victoria (Walter!)'. *Type specimen*: 'Australia. Victoria. 1902. Legit. Walter' (*holo*: LY n.v., photo seen NSW 805705). This is possibly a variant of *C. semipapposum* subsp. *brevifolium*, *q.v.*

*Helichrysum adonidiforme* Gand., *l.c.*; *H. semipapposum* f. *adonidiforme* Gand., *l.c.* Original description: 'Leaves very glabrous. Capitula 5 m [*sic.*] wide; inflorescence viscid'. *Type*: Flinders Range, Oct. 1901, Max Koch 598 (*holo*: LY n.v., photo seen NSW 805709). This is probably a variant of *C. semipapposum* subsp. *brevifolium*, *q.v.*

*Helichrysum sulcicaule* Gand., *l.c.*; *H. semipapposum* f. *sulcicaule* Gand., *l.c.* Original description: 'Leaves linear, more or less villous. Leaves floccose all over'. *Type*: 'Australia, Victoria, near Harrierville, 3 June 1910, J.W. Audas' (*holo*: LY n.v., photo seen NSW 805702). This is probably a variant of *C. semipapposum* subsp. *lineare*, *q.v.*

*Helichrysum porrectum* Gand., *l.c.*; *H. semipapposum* f. *porrectum* Gand. *l.c.* Original description: 'Leaves linear, more or less villous. Leaves snowy-white beneath, green and glabrous above. Leaves recurved, spreading, short'. *Type*: South Australia, Flinders Range, Oct. 1901, M. Koch. ['No. 1339' on sheet] (*holo*: LY n.v., photo seen NSW 805708). This is probably a variant of *C. semipapposum* subsp. *lineare*, *q.v.*

*Helichrysum maidenii* Gand., *l.c.*; *H. semipapposum* f. *maidenii* Gand., *l.c.* Original description: 'Leaves linear, more or less villous. Leaves straight. Involucral bracts curved, somewhat spreading, stems very straight, long and slender'. *Type*: New South Wales, Jenolan Caves, Nov. 1899, J.H. Maiden (*holo*: LY n.v., photo seen NSW 805704). This is probably a variant of *C. semipapposum* subsp. *lineare*, *q.v.* The collecting details cited above are taken from McGillivray (1973) since the photograph at NSW does not include them.

*Helichrysum readeri* Gand., *Bull. Soc. Bot. France* 65: 44 (1918); *H. semipapposum* f. *readeri* Gand., *l.c.* Original description: 'Stems subterete, involucral bracts glabrous slightly acute'. *Type*: Victoria,

Wimmera, pastures, 22 Jan. 1893, *F.M. Reader* (*holo*: LY n.v., photo seen NSW 805706). This appears to be *C. semipapposum* subsp. *semipapposum*, *q.v.*

*Helichrysum tasmanicum* Gand., *l.c.*; *H. semipapposum* f. *tasmanicum* Gand., *l.c.* Original description: 'Leaves more or less villous, linear, straight; involucre bracts straight, obtuse, base woolly; stem flexuose, angular, sulcate'. *Type*: Tasmania, *Simson* (*holo*: LY n.v., photo seen NSW 805707). This is probably a synonym of *C. semipapposum* subsp. *semipapposum*, *q.v.*

The following varietal names under *H. semipapposum* were published by J.D. Hooker, *Hooker's London J. Botany* 6: 121(1847): var. *latifolium* Hook.f., var. *filifolium* Hook.f., var. *ramosum* Hook.f., var. *scabridum* Hook.f. The descriptions are extremely brief (3–5 words), no collector or type is indicated, and the locality details common to all was 'Most of the above varieties are abundant throughout the colony' i.e. Tasmania. No attempt has been made to apply these names in the present revision.

***Chrysocephalum semipapposum*** (Labill.) Steetz in Lehm., *Pl. Preiss.* 1: 474 (1845); *Gnaphalium semipapposum* Labill., *Nov. Holl. Pl.* 2: 42, t. 187 (1806); *Helichrysum semipapposum* (Labill.) DC., *Prodr.* 6: 195 (1838); *Helichrysum apiculatum* f. *semipapposum* (Labill.) Siebert & Voss, *Vilmorin's Blumengärtneri* 1: 534 (1896). *Type*: 'capite Van-Diemen', 1793, *J. Labillardière* (*lectotype*, here designated: FI 006346 image seen; *isolecto*: G-DC G 00471323 image seen, MEL 2159090).

Stiffly erect, multi-stemmed *perennial herb* *c.* 20 cm high. *Stems* slender, erect, unbranched, striate from decurrent margins and midnerve of leaves, cottony. *Leaves* numerous, only slightly reducing in length upwards, filiform to narrow-linear, acute or acuminate, 1.5–3 cm long, margins revolute, decurrent, upper surface glabrous and glossy or slightly cottony, lower surface cottony, rarely the leaf glutinous. *Capitula* in a terminal compact rounded inflorescence, the branches glabrous or closely woolly. *Involucres* hemispherical to cup-shaped, *c.* 5 mm high; involucre bracts yellow, continuing onto peduncle and passing into uppermost leaves, scarious, with stiff cilia in medial portion of lamina and cottony-ciliate in proximal portion, sparsely pilose with cilia-like hairs on adaxial face, glabrous on distal half of abaxial face, pale gold to pale brownish yellow. *Medial bracts*: stipe narrowly oblong, flattened, narrowly winged, not glandular abaxially, woolly-ciliate, *c.* 2 mm long; lamina elliptic to broad-ovate, obtuse, *c.* 2 mm long, apical portion eciliate, basal portion woolly-ciliate, abaxially not hirsute, adaxially sparsely hirsute towards base. *Innermost bracts*: stipe linear, thick, *c.* 2.3 mm long, stereome fenestrate; lamina narrowly ovate-triangular to ovate, *c.* 1.3 mm long. *Female florets*: corolla narrowly cylindrical, very shortly 4-lobed; pappus bristles 0–7. *Bisexual florets*: corolla narrowly turbinate towards apex; pappus bristles *c.* 8–12. *Pappus bristles* shortly plumose towards apex, scabrid below. *Achenes* narrowly ellipsoid, *c.* 1.4 mm long, scabridulous.

*Note*. The stipe of the median involucre bracts is narrowly oblong and flattened, and may have sessile globular glands on its abaxial surface.

J.L. Boorman, in a note dated June 1909 on a specimen of *C. semipapposum* *s. str.* from Michelago, Murrumbidgee River, N.S.W., states 'a common plant found in all auriferous outcrops throughout the State, invariably dry places, this plant is to be met with. Such plants as *Bursaria spinosa* growing near it'. The relevant collection has the female florets epappose.

### Key to subspecies of *Chrysocephalum semipapposum*

1. Stems and leaves sericeous or tomentose, not glandular
2. Stems and leaves sericeous, ± glutinous [eastern Aust.]..... 1. subsp. **semipapposum**

- 2: Stems and leaves tomentose or cottony, not viscid [eastern Aust.] ..... 2. subsp. **lineare**
- 1: Stems and leaves glutinous or glandular
- 3: Stems glutinous, glabrous or very sparsely cottony [eastern Aust.] ..... 3. subsp. **brevifolium**
- 3: Stems minutely glandular pubescent or cottony
- 4: Stems pilose with glandular hispid hairs [eastern Aust.] ..... 4. subsp. **asperum**
- 4: Stems and leaves glandular, puberulous or cottony [Western Australia] ..... 5. subsp. **occidentale**

### 1. *Chrysocephalum semipapposum* (Labill.) Steetz subsp. **semipapposum**

*Helichrysum readeri* Gand., *Bull. Soc. Bot. France* 65: 44 (1918); *Helichrysum semipapposum* f. *readeri* Gand., *l.c.* Type: Victoria, Wimmera, pastures, 22 Jan. 1893, *F.M. Reader s.n.* (*holo*: LY n.v., photo seen NSW 805706).

?*Helichrysum tasmanicum* Gand., *l.c.*; *H. semipapposum* f. *tasmanicum* Gand., *l.c.* Type: Oceania. Tasmania, 1876. leg. *Simson s.n.* (*holo*: LY n.v., photo seen NSW 805707 p.p.). The photograph is lacking in clarity and the description too short to permit this name to be applied with confidence.

Rhizomatous, often somewhat aromatic, viscid *perennial herb*. *Stems* sericeous, not glandular. *Leaves* evenly arranged along stems, scarcely decreasing towards apex, narrowly linear, acute, on stem to 4 cm long, on axillary shoots to 1.5 cm long; margins revolute; upper surface glabrous, glossy-resinous; lower surface woolly-sericeous. *Capitula* numerous in a compact hemispherical inflorescence. *Involucres* cup-shaped. *Medial involucral bracts*: stipe semiterete, abaxially with sessile glandular hairs near base, distally slightly woolly and narrowly winged grading into lamina; lamina ovate, obtuse, ciliate in basal 2/3, toothed or entire and eciliate towards apex, adaxially glabrous or very sparsely hirsute, abaxially glabrous or slightly woolly or with sessile glandular hairs towards base. *Female florets* with 0–7 pappus bristles (epappose in typical variant).

*Selected specimens examined*. SOUTH AUSTRALIA: Southern Lofty, Mitcham, 5 June 1982, *W. Bushman* 286 (AD). NEW SOUTH WALES: Bowral, 23 Dec. 1962, *C. Burgess s.n.* (CANB); 15 km ESE of Connors Hill, 10 Feb. 1996, *M. Ito* 96066-1 (AD). VICTORIA: Brisbane Ranges Natl Park, 15 Jan. 1980, *E.G. Errey* 4938 (MEL); 6 km W of Omeo, 7 Jan. 1989, *R.M. King* 9774 (MEL); Otway Ranges, 1 Feb. 1965, *T.B. Muir* 3763 (MEL). TASMANIA: Port Dalrymple, Jan. 1804, *R. Brown s.n.* (CANB); Gangells Rd, Bagdad, 2 July 1991, *A.M. Buchanan* 12185 (HO); banks of South Esk R., 17 Oct. 1985, *W.F. Pataczek* 034 (HO).

*Distribution*. Found in central and eastern Tasmania, eastern New South Wales, Victoria, and in the Mt Lofty Ranges of South Australia.

In eastern New South Wales is found a variant that has the same general appearance as typical subsp. *semipapposum* except that the involucral bracts are longer and oblong, and the female florets have five pappus bristles.

*Notes*. Significant characters in the typical variant of *C. semipapposum* are the crowded leaves that are all similar in shape although diminishing in size upwards, turbinate (sometimes broadly so) capitula, involucral bracts with a woolly-ciliate, non-glandular stipe (but see description of the stipe above) and ovate or oblong lamina that is obtuse or rounded at tip, and pappus bristles of female florets usually absent or one.



## 2. *Chrysocephalum semipapposum* subsp. **lineare** Paul G. Wilson, *subsp. nov.*

*Type*: Woods Point Road, 2.8 km N of Walhalla, Eastern Highlands, Victoria, 9 December 1993, T.J. Entwistle 2375, M. Tindale & J. Kenrick (*holo*: NSW 299299).

*Helichrysum ciliatum* DC., *Prodr.* 6: 195 (1838). *Gnaphalium ciliatum* (DC.) Sch.Bip., *Bot. Zeitung* 3: 171 (March 1845). *Chrysocephalum ciliatum* (DC.) Steetz in Lehm., *Pl. Preiss.* 1: 474 (Aug. 1845). *Lecto*, here designated: ‘ad portum Western ad fretum Bass, legit cl. d’Urville, exped. de l’Astrolabe, 1829 [?]’; Port Western, Bass Strait, *Dumont d’Urville s.n.*, Expedition of the Astrolabe, 1829 [1826] (*lecto*: G-DC G 00471285 image seen; *isolecto*: P 00698455 image seen).

*α. urvillei* DC., *l.c.* 196. *Type citation*: ‘ad portum Western ad fretum Bass, legit cl. d’Urville (v.s.)’. *Type*: Port Western, Bass Strait, *Dumont d’Urville s.n.*, Expedition of the Astrolabe, 1829 (*holo*: G-DC G 00471285 image seen; *iso*: P 00698455 image seen).

*β. sieberi* DC., *l.c.* 196. *Type citation*: ‘in Nova-Holl. Sieb.! pl. exs. n. 484. FL. Nova-Holl. *Sieber* 484. (v.s.)’ (*holo*: G-DC G 00471306 image seen; *iso*: NY 00179178 image seen).

*γ. cunninghami* DC., *l.c.* 196. *Type citation*: ‘in planitiebus circa Bathurst legit cl. Cunningham aprili flor. (v.s.)’. *Type*: Plains of Bathurst, New South Wales, April 1817, *A. Cunningham s.n.* (*holo*: G-DC G 00471305 image seen; *iso*: K 00899290 image seen).

?*Helichrysum sulcaticaule* Gand., *Bull. Soc. Bot. France* 65: 44 (1918); *H. semipapposum* f. *sulcaticaule* Gand., *l.c.* *Type*: Australia, Victoria, near Harrietville, 3 June 1910, *J.W. Audas s.n.* (*holo*: LY n.v., photo seen NSW 805702).

*Helichrysum porrectum* Gand., *l.c.*; *H. semipapposum* f. *porrectum* Gand. *l.c.* *Type*: Flinders Range, South Australia, October 1901, *M. Koch* [‘No. 1339’ on sheet] (*holo*: LY n.v., photo seen NSW 805708).

?*Helichrysum sarcodes* Gand., *l.c.*; *H. semipapposum* f. *sarcodes* Gand., *l.c.* *Type*: Mentone, Victoria, 6 October 1907, *J.R. Tovey s.n.* (*holo*: LY n.v., photo seen NSW 805710).

?*Helichrysum maidenii* Gand., *l.c.*; *H. semipapposum* f. *maidenii* Gand., *l.c.* *Type*: Jenolan Caves, New South Wales, November 1899, *J.H. Maiden s.n.* (*holo*: LY n.v., photo seen NSW 805704). *Note*: The collecting details cited are taken from McGillivray (1973) since the photograph at NSW does not include them.

Multi-stemmed *perennial herb* to 80 cm high. *Stems* slender with numerous lateral branches, somewhat tomentose when young, loosely leafy to near apex. *Leaves* narrowly oblong, acute, *c.* 4 cm long, *c.* 4 mm wide, flat, sparsely cottony above, densely so below. *Capitula* in a terminal rounded corymb to 6 cm diam. *Involucres* sub-globular, *c.* 4 mm wide, yellow. *Outer bracts* somewhat woolly towards base. *Medial bracts*: stipe *c.* 0.5 mm long, woolly, cartilaginous, grading into the lamina; lamina narrowly ovate-acute to narrowly triangular, to 3.5 mm long, hirsute on both surfaces except for tip, ciliate almost to tip becoming woolly towards base. *Innermost bracts*: stipe narrowly oblong, cartilaginous, membranous on margins; lamina narrowly triangular, *c.* 1 mm long, ciliate and hirsute. *Female florets* epappose or with one bristle. *Pappus bristles* shortly plumose towards apex.

*Selected specimens examined.* NEW SOUTH WALES: Bago T.R., Batlow District, Feb. 1917, *W.A.W. de Beuzeville* 14 (NSW). VICTORIA: Mt Bogong, 22 Feb. 1972, *L.A. & C.L. Craven* 2138 (CANB); Eastern Ranges, Grant, McMillan Tk, 6 Jan. 1982, *R.A. Kilgour* 178 (CANB); Beechworth, 22 Dec. 1924, *MacGillivray s.n.* (AD); Mt Buffalo Natl Park near Anderson Peak, 27 Jan. 1982, *P.S. Short* 1395 (NSW); Victoria Ra., Grampians, 13 Dec. 1975, *H. Streimann* 2931 (CANB). TASMANIA: New Norfolk, 15 Dec. 1840, *M. Ballantine* [ex herb. *Gunn* 1173 (1842)] (NSW).

*Distribution and habitat.* Occurs in south-eastern New South Wales, Victoria, South Australia (Mt Lofty Range eastwards) and Tasmania. Recorded from many distinct habitats.

*Phenology.* December to February.

*Typification.* The date on d'Urville's collection of *H. ciliatum* in G-DC is probably the date that it was received by de Candolle since d'Urville's visit to Bass Strait was in 1826. No collections were directly cited by de Candolle under *H. ciliatum*; however, he recognised three formae of which the holotype of the first, *f. urvillei*, is selected as the lectotype of the species name.

*Notes.* There is a considerable variation within this subspecies and it evidently grades into both subsp. *semipapposum* and subsp. *asperum* (Steetz) Paul G. Wilson.

In south-eastern New South Wales is found a variant that resembles typical subsp. *lineare* but has female florets with three to six pappus bristles.

### 3. *Chrysocephalum semipapposum* subsp. *brevifolium* (Sond.) Paul G. Wilson, *comb. et stat. nov.*

*Chrysocephalum squarulosum* (DC.) Sond. var. *brevifolium* Sond., *Linnaea* 25: 515 (1853). *Helichrysum semipapposum* var. *brevifolium* (Sond.) Benth., *Fl. Austral.* 3: 625 (1867). Based on three elements: 1. *Helichrysum microlepis* DC. (1838), 2. 'Port Gawler et Pfeifer's Station, Martio' (*syn.*: MEL 2159100 & MEL 2159095 ex herb. Sonder – presumably these localities refer to collections made by F. Mueller), and 3. '*H[elichrysum]. glutinosum* F. Muell.' *in sched.* (*syn.*: MEL 2159094 & MEL 2159096 both ex herb. Sonder). *Lecto*, here designated: Plains of Bathurst [New South Wales], April 1817, *A. Cunningham* 82 (G-DC G 00471326 image seen; this is the holotype of *Helichrysum microlepis* DC.).

*Helichrysum microlepis* DC., *Prodr.* 6: 195 (1838); *Gnaphalium microlepis* (DC.) Sch.-Bip., *Bot. Zeit.* 3: 171 (1845). *Type citation*: 'frequens in planis apricis circa Bathurst Nov. Holl. aprili flor. legit cl. A. Cunningham' (*holo*: G-DC G 00471326 image seen, '82 / A suffruticose plant frequent on the plains of Bathurst. April 1817' *vide* Cunningham).

*Helichrysum adonidiforme* Gand., *Bull. Soc. Bot. France* 65: 44 (1918); *H. semipapposum* f. *adonidiforme* Gand., *l.c.* (1918). *Type*: Flinders Range, South Australia, October 1901, *M. Koch* 598 (*holo*: LY n.v., photo seen NSW 805709; *iso*: NSW 596603).

?*Helichrysum abrotaniforme* Gand., *l.c.*; *H. semipapposum* f. *abrotaniforme* Gand., *l.c.* *Type*: Australia. Victoria, 1902, *C. Walter s.n.* (*holo*: LY n.v., photo seen NSW 805705).

*Helichrysum squarulosum* DC., *Prodr.* 6: 195 (1838); *Gnaphalium squarulosum* (DC.) Sch.-Bip., *Bot. Zeit.* 3: 171 (1845); *Chrysocephalum squarulosum* (DC.) Sond., *Linnaea* 25: 515 (1853), *nom. illeg.*

*non* Steetz (1845). *Type citation*: ‘in apricis Novae-Hollandiae ad latus occid. montium coeruleorum prope Port Jackson jun. flor. legit cl. A. Cunningham!’ (*holo*: G-DC G 00471314 image seen, ‘84/ open forest country on the Western side of the Blue Mountains . . . Port Jackson, June 1817’; *iso*: K 000349221 image seen, ‘open forest country on the Western side of the Blue Mountains N.S. Wales, 22<sup>nd</sup> June 1817’).

*Note*. The name *Chrysocephalum squarrulosum* Steetz *q.v.* is based on a specimen that came from Western Australia.

Erect-branching, often multi-stemmed *perennial herb*, to 50 cm high. *Stems* slender, glutinous, glabrous or sparsely cottony, often densely cottony towards base. *Leaves* on distal part of stems and branches dense, 2–3 cm long, acute to obtuse, often apiculate, thick, glutinous, often tightly recurved on margins, decurrent, glabrous or sparsely cottony and with prominent midrib below, sparsely woolly when young; leaves towards base of plant 2–6 cm long, linear to very narrowly obovate, somewhat cottony; an obvious axillary bud present in most axils, that may be produced into a lateral branch. *Capitula* solitary or in loose, flat-topped corymbs terminal to stems and branches. *Involucre*s broadly turbinate to hemispherical, 5–6 mm high. *Bracts* dull pale yellow, semi-translucent at least towards base (but not consistently), not or scarcely hirsute. *Medial bracts* (including stipe) narrowly oblong to oblong or narrowly obovate, acute to acuminate, moderately fimbriate-ciliate with the tip shortly dentate, woolly towards base; stipe narrowly winged, sessile-glandular and woolly on abaxial surface. *Female florets* with (3–)6(–7) pappus bristles. *Pappus bristles* pale yellow, very shortly plumose at apex, minutely scabrous towards base. *Achenes* narrowly oblong-ellipsoid, *c.* 1 mm long, moderately scabrous.

*Selected specimens examined*. SOUTH AUSTRALIA: 15 km NNE of Bordertown, 3 Nov. 1962, *D. Hunt* 1352 (AD); Darke Peak Range, 28 Oct. 1983, *E.N.S. Jackson* 4976 (AD); 5 km ENE of Freeling Heights, Flinders Ranges, 6 Oct. 1981, *F. Mollenmans* 1093 (AD). NEW SOUTH WALES: 423 km from Roto toward Gilgunnia, 18 Oct. 1979, *E.M. Canning* 4931 (CANB); 22 km E of Rankins Springs, 18 Nov. 1975, *M.D. Crisp* 1557 (CANB). VICTORIA: Wedderburn, 9 Feb. 1992, *J. Connock* 313 (MEL); Dimboola, 1947, *E.T. Muir s.n.* (MEL); Melton, 13 Nov. 1990, *V. Stajsic* 15 (MEL); Nullawil, Nov. 1917, *W.W. Watts s.n.* (NSW).

*Distribution*. Found in central and south-eastern South Australia, central and eastern Victoria, and eastern New South Wales. The distribution appears to be very disjunct and requires further investigation.

*Typification*. In the isotype of *Helichrysum adonidiforme*, cited above, the female florets have four pappus bristles. A collection, *M. Koch* 589, Oct. 1901, in NSW, has been annotated by McGillivray (Oct. 1970) as ‘This is a good match for the Holotype of *Helichrysum adonidiforme* Gandoger’. It is possible that the holotype no. 598 is the same collection as no. 589 since several typographical errors occur in Gandoger’s paper. A further collection, *M. Koch* 598 (Port Pirie, S.A., Oct. 1901, NSW 596603), contains two specimens, one with old capitula, short resinous leaves *c.* 4 mm long on lateral branches and long linear leaves *c.* 25 mm long on main stem; the other with young capitula, and resinous linear leaves to 45 mm long. The latter specimen appears to be the same as the single specimen on sheet *M. Koch* 589 (NSW 125038). The epithet *adonidiforme*, i.e. having the form of the plant *Adonis*, suggests that Gandoger examined a specimen of the long-leaved plant. The numbers used by Koch were in effect species numbers, not collection numbers, since he applied the same number to different collections of what he assumed to be the same species.

*Notes.* A variable taxon as regards leaf form. The reason for this range of form, which is found on different stems of the same plant, is unclear. The number of capitula in an inflorescence is also variable, ranging from one to numerous.

A specimen (NSW 585260) with stems composed only of the short-leaved glandular form that came from Bathurst, New South Wales – the type locality of *Helichrysum microlepis* – has female florets with variably four or six pappus bristles. This form has only one to three capitula in a terminal cluster. These capitula were evidently formed at the end of flowering but in the morphology of their bracts closely match those on a specimen (*A.R. Bean* 17128, AQ 495708) with branches containing long leaves and rounded inflorescence with numerous capitula that came from the same general area. This specimen has five to seven pappus bristles in female florets. It would appear that the stems with short leaves bear only a few capitula whereas those with long leaves have numerous capitula that form a rounded inflorescence. The type of *H. microlepis* (herb. G-DC) is of the short-leaved plant in which the inflorescences are composed of a single capitulum.

Some variants of this subspecies are sparsely cottony on the stems and leaves suggesting that it grades into the narrowly linear variant of subsp. *lineare*, but, in all cases in which it was possible to check, in subsp. *brevifolium* pappus bristles on the female florets numbered four or more whereas in the narrow-leaved variant of subsp. *lineare* pappus bristles are typically absent. A variant found in both the Flinders Ranges and on Eyre and Yorke Peninsulas has very slender leaves and sometimes few or no pappus bristles on the female florets. This variant is included under subsp. *brevifolium* but could warrant recognition as a distinct taxon. There appears, however, to be no disjunction between this variant and the typical variant of subsp. *brevifolium*.

#### 4. *Chrysocephalum semipapposum* subsp. *asperum* (Steetz) Paul G. Wilson, *comb. et stat. nov.*

*Chrysocephalum asperum* Steetz in Lehm., *Pl. Preiss.* 1: 473 (Aug. 1845). *Type:* Near Port Jackson, 1838, *G.Th. Siemssen s.n. (holo: MEL 2218947).*

?*Chrysocephalum asperum* Steetz var. *glabriusculum* Steetz in Lehm., *Pl. Preiss.* 1: 473 (Aug. 1845). *Type citation:* ‘in insula van Diemen leg. cl. Gunn. Herb. Gunn. No. 501. (V.s. in herb. aulico Vindobonnensi!)’ (*n.v.*).

?*Helichrysum semipapposum* var. *scabridum* Hook.f. in *Hooker’s Lond. J. Bot.* 6: 121 (1847). *Type:* not indicated. Tasmania.

*Helichrysum hirtoviscosum* Gand., *H. semipapposum* var. *hirtoviscosum* Gand., *Bull. Soc. Bot. France* 65: 44 (1918). *Type:* Victoria, Australia, *C. Walter s.n. (holo: LY n.v., photo seen NSW 805711; ?iso: NSW 596624).*

Erect, multi-stemmed *perennial herb* to 90 cm high. *Stems* pilose with weak, minutely gland-tipped hairs. *Leaves* on main stems oblong to narrowly oblong, to 7 cm long, flat or recurved on margins, long-acuminate, auriculate at base, with sessile glands and sparsely villous with minutely gland-tipped hairs; leaves on axillary shoots densely arranged, short (c. 5–15 mm long), recurved and densely cottony below. *Capitula* sub-globular, numerous in terminal, woolly, compact hemispherical inflorescences to c. 6 cm diam. *Outer bracts* c. 4 mm long: stipe broad-oblong, coriaceous with broad, green stereome and narrow wings, abaxially woolly, adaxially glabrous and glossy, grading into lamina; lamina ovate, ciliate to tip, woolly in basal half. *Medial bracts* c. 5 mm long: stipe oblong, centrally coriaceous with

linear stereome, marginally winged, abaxially slightly woolly and with sparse short hairs, glabrous adaxially, grading into lamina; lamina broad-ovate, obtuse, abaxial surface smooth and glabrous distally, hirsute near base, adaxial surface hirsute except for tip. *Innermost bracts* c. 5 mm long: stipe oblong, coriaceous towards base, with central green stereome, with few sessile glands, marginally narrowly winged, abaxially with a few sessile glands, grading into lamina; lamina narrowly ovate, shorter than stipe, otherwise similar to medial bracts. *Female* florets epappose or rarely with one pappus bristle.

*Selected specimens examined.* QUEENSLAND: 20 km N of 'Forrest Vale', 7 Aug. 1990, *A.R. Bean* 2043 (BRI); 26.1 km W of St George, 28 Dec. 1998, *A.R. Bean* 14462 (BRI); Hebel–St George Rd, 24 Sep. 1999, *W. Semple* 135 (BRI). NEW SOUTH WALES: 5 km W of Coonabarabran, 19 Oct. 1994, *R.J. Bayer s.n.* (NSW); 4 km from Dalton, 27 Nov. 1985, *E.M. Canning* 6362 (CANB, PERTH); 3 km E of Moomboodool, 20 Oct. 1995, *S. Donaldson* 655 & *D. Mallinson* (CANB); Murrumbateman Cemetery, 3 Jan. 1969, *C.R. Dunlop* (CANB); Warialda State Forest, 29 Nov. 1996, *P.I. Forster* 20100 (BRI, NSW); 6 mi [c. 10 km] from Cathcart on Rocky Hall Rd, 3 Jan. 1960, *H.S. McKee* 6934A (CANB); Pilliga State Forest, 2 Dec. 1984, *A.N. Rodd* 4257 (BRI); 21 km E of Rankins Springs, 31 Oct. 1972, *A. Sikkes* 497 & *I.R. Telford* (CANB); Willala Hills, 12 Dec. 1973, *H. Streimann* 738 (CANB); Manna State Forest, 29 Nov. 1983, *K.L. Wilson* 5668 (NSW). VICTORIA: 13 km SW of Yarram P.O., 10 Dec. 1978, *A.C. Beauglehole* 62443 (MEL). TASMANIA: St Helens, 14 Nov. 1968, *G. Burns* TEB703 (HO). *Distribution.* Found in south-eastern Queensland, eastern New South Wales, eastern Victoria, and north-eastern Tasmania.

*Typification.* A slip of paper attached to the type sheet of *C. asperum* (MEL 2218947) has on it 'Nro. 122. Gnaphalium Sp.' This note is referred to by Steetz in his manuscript description on the holotype sheet (written by Steetz 21<sup>st</sup> July 1841) and may indicate that Siemssen sometimes numbered his specimens.

*Notes.* This subspecies is characterised by its glandular-pilose indumentum, hemispherical inflorescence and flat, broad, winged bract stipes without stipitate glands.

The subsp. *asperum* has several intergrading variants which it does not appear productive to recognise nomenclaturally. In particular, in western Victoria is found a variant with narrowly revolute acuminate leaves that are glandular-pilose beneath, while the axillary shoots bear compact obtuse leaves that are revolute, c. 4 mm long, and densely woolly. This variant, which grades to the east into the typical variant, is known from the following collections:

VICTORIA: 39 km S of Murrayville, 5 Nov. 1986, *A.N. Rodd* 5880 & *J. Gentle* (MEL, NSW); 22.4 mi [c. 60 km] N of Serviceton North, 30 Sep. 1963, *H.I. Aston* 1013 (AD); 1 km NE of Halls Gap, 24 Oct. 1976, *A.C. Spooner* 4864 (AD).

The typical variant of subsp. *asperum* has female florets that are epappose, but in a few collections the female florets have one to five bristles. These collections are from a few scattered localities and it is unclear whether this bristle count is due to hybridisation.

This subspecies grades into subsp. *lineare*.

##### **5. *Chrysocephalum semipapposum* subsp. *occidentale* (Benth.) Paul G. Wilson, *comb. et stat. nov.***

*Helichrysum apiculatum* var. *occidentale* Benth., *Fl. Austral.* 3: 625 (1867); based on *C. squarrulosum* Steetz, *C. flavissimum* (Spreng) Steetz, *C. canescens* Turcz., and *C. glabratum* Turcz., and citing



‘King George’s Sound and adjoining districts, *Drummond*, n. 20, 115, 121, 342, 343, *Preiss*, n. 23, 25, *Oldfield*, *Maxwell*.’ *Lecto*, here designated: *J. Drummond* 115 (K 00899295 image seen; *isolecto*: KW 001001506 image seen).

*Helichrysum brevicilium* DC., *Prodr.* 6: 196 (1838); *Chrysocephalum brevicilium* (DC.) Walp., *Rep. Bot. Syst.* 6: 238 (1846). *Type citation*: ‘in Nov.-Holl. ad portum Regis Georgii legit cl. d’Urville’ (*holo*: G-DC G 00471284 image seen: ‘Port du roi George, Nouv. Hollande / M. d’Urville 1829’).

*Chrysocephalum squarrulosum* Steetz in Lehm., *Pl. Preiss.* 1: 472 (1845). *Type citation*: ‘In sinu regis Georgii III. leg. cl. Preiss. Herb. Preiss. No. 23.’ (*syn*: MEL 2159620).

*Chrysocephalum glabratum* Turcz., *Bull. Soc. Imp. Nat. Moscou* 24(1): 197 (1851). *Type*: Western Australia, *J. Drummond* III. No. 115 (*holo*: KW 001001506 image seen; *iso*: K 00899295 image seen).

*Chrysocephalum canescens* Turcz., *Bull. Soc. Imp. Nat. Moscou* 24(1): 196–197 (1851). *Type*: ‘Nova Hollandia occidentalis’, *J. Gilbert* 285 (*holo*: KW n.v., photo seen PERTH; *iso*: MEL 2196378, label on MEL isotype: ‘*Chrysocephalum canescens* Turcz. / Nova Hollandia / Gilbert coll. n 285 / 1852.’ Ex herb. J. Steetz [presumably the date indicates the year in which the specimen was received by Steetz]).

Erect, multi-stemmed *perennial herb* 40–120 cm high. *Stems* slender, erect, variably glandular-puberulous or cottony, woolly near base. *Leaves* scattered along stem, linear, revolute, sparsely and minutely glandular-puberulous or cottony below or all over. *Capitula* in dense or open terminal rounded cymes. *Involucres* white or yellow, c. 10 mm high, rounded at base. *Outer bracts* subsessile, narrowly ovate, c. 3 mm long, obtuse to acute. *Medial bracts*: lamina narrowly ovate to narrowly oblong, c. 8 mm long, (obtuse to) acute or acuminate, abaxial and adaxial surfaces sparsely to moderately hirsute, apical 0.5 mm glabrous and eciliate. *Female florets* with (2–)3–7 pappus bristles. *Pappus bristles* narrow at base.

*Selected specimens examined*. WESTERN AUSTRALIA: Kukerin to Dumbleyung, 12 Nov. 1931, *W.E. Blackall* 1341 (PERTH); near Dumbleyung, Oct. 1931, *W.E. Blackall* 1341 (PERTH); Gibbs Rd, 1 Nov. 1997, *V. Crowley* 830 (PERTH); Booraan, Aug. 1950, *C.A. Gardner* 9538 (PERTH); Nyabing, N of Badgingarra, Mar. 1972, *A.S. George* 8628 (PERTH); Northam, Oct. 1900, *J.H. Gregory s.n.* (PERTH); Katanning, Nov. 1963, *G.T. Halpin s.n.* (PERTH); Toolibin to Harrismith, 3 Nov. 1995, *E.D. Kabay* 1028 (PERTH); Cowcowing, Sep. 1904, *M. Koch* 1223 (PERTH); 40 km W of Kojonup, 28 Dec. 1996, *C.M. Lewis* 194 (PERTH); 40 km NE of Ongerup, 16 Nov. 1984, *K. Newbey* 10845 (PERTH); Wongan Hills, Sep. 1915, *W.J. Petticrew s.n.* (PERTH); Toolibin, 16 Dec. 1998, *G. Warren* 155 (PERTH); 20 km S of Wickepin, 8 Oct. 1977, *W. Wittwer* 2051 (PERTH).

*Distribution*. Occurs in south-western Western Australia.

*Conservation status*. Evidently well represented in bushland.

*Notes on synonyms*. Steetz cited, with a question mark, *Helichrysum squarrulosum* DC. as a possible synonym of *C. squarrulosum* Steetz. Due to the expression of doubt *C. squarrulosum* Steetz is accepted as the legitimate name of a new species and not as a new combination based on *H. squarrulosum* DC. which is treated here as a synonym of *C. semipapposum* subsp. *brevifolium*.

*Notes.* A variant with white involucre bracts and white pappus bristles is found in south-western Western Australia. In six of the nine specimens examined it was possible to count the pappus bristles of the female florets and these numbered five, six, or seven. One collection from Kukerin collected by *J.W. Wrigley* in 1968 (CANB 036835) had off-white involucre bracts and three or four pappus bristles; it was accompanied by a collector's note that stated 'flowers white, pink, yellow'.

### Excluded Name

*Helichrysum semipapposum* var. *gunnianum* DC., *Prodr.* 6: 195 (1938) = *Coronidium scorpioides* (Labill.) Paul G. Wilson, *vide* Paul G. Wilson, *Nuytsia* 18: 326 (2008).

### Acknowledgements

I should like to thank my colleague Neville Marchant for making available his photographs of the type specimens of the Australian Asteraceae described by N.S. Turczaninow that are now in the Kiev herbarium, and also my colleague Juliet Wege who photographed the type specimens of Australian species of Asteraceae held in the Kew herbarium and made many corrections to the text. Thank you to Tony Orchard who, as referee, suggested many changes to an earlier draft, and to my colleague Kevin Thiele who also suggested many improvements to the text.

### References

- Bentham, G. (1867). *Flora Australiensis*. Vol. 3. (Reeve and Co.: London.)
- Chapman, A.D. (1991). *Australian Plant Name Index*. (Australian Government Publishing Service: Canberra.)
- Cronk, Q.C.B. (1998). The ochlopecies concept. In: Huxley, C.R., Lock, J.M. & Cutler D.F. (eds) *Taxonomy and ecology of the floras of Africa and Madagascar*. pp. 155–170. (Royal Botanic Gardens, Kew: London.)
- Domin, K. (1929). Beitrage zur Flora und Pflanzengeographie Australiens. *Bibliotheca Botanica* 89: 674.
- McGillivray, D.J. (1973). Michel Gandoger's names of Australian plants. *Contributions from the New South Wales National Herbarium* 4: 319–365.
- Mueller, F. (1857). Notes made during the recent expedition across the northern portion of Australia, under the command of Mr. Surveyor Gregory. *Hooker's journal of botany and Kew Gardens miscellany* 9: 193–199.
- Orchard, A.E. (2014). The dispersal of Allan Cunningham's botanical (and other) collections. *Telopea* 17: 43–86.
- Turner, B.L. (1970). Chromosome Numbers in the Compositae. XII. Australian Species. *American Journal of Botany* 57: 382–389.
- 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.