

A taxonomic treatment of tribe Lactuceae (Asteraceae) in Australia

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Abstract

A concise taxonomic treatment of tribe Lactuceae (Asteraceae) in Australia is presented, with descriptions of 35 species in 20 of the 23 genera in Australia. Keys to all genera and to species in 20 genera are presented. In this paper *Tolpis virgata* (Desf.) Bertol., *Reichardia picroides* (L.) Roth, and *Lactuca serriola* f. *integrifolia* (Gray) S.D.Prince & R.N.Carter are newly recognised as introduced taxa, and two subspecies of *Hedypnois rhagadioloides* (L.) F.W.Schmidt are recognised for the first time in Australia.

Introduction

Tribe Lactuceae is a large tribe in the Asteraceae with well over 1500 species predominantly in the northern hemisphere. Australia is poorly represented, having only six genera with native representatives and a total of only c. 18 native species. Seventeen further genera have introduced representatives in Australia. The vast majority of species in Australia have their entire or major part of their distribution south of tropical latitudes. Many species are widespread and common weeds of urban environments, wasteland and agricultural land. *Sonchus* and *Taraxacum* are represented by a mixture of native and introduced species, whereas *Launaea*, *Picris*, *Microseris*, *Youngia*, and *Actites* are represented by only native species. No genera are endemic to Australia.

The taxonomic review presented here is drawn from a *Flora of Australia* account of the Lactuceae recently prepared by the author. As it is likely to be several years before the *Flora* account is published, it is considered desirable to present the findings of my research at this time.

The Lactuceae is a relatively easily recognisable tribe of mostly non-spiny herbs, characterised by ligulate capitula (all florets zygomorphic), 5-lobed ligules, and abundant latex. A pappus is usually present and typically is composed of scales or bristles. Bristles are sometimes plumose. Achenial dimorphism, where the generally small proportion of achenes located peripherally on the receptacle differ from those located centrally, occurs in several genera. Sometimes these outer achenes are concealed within the concavity of the adjacent hardened involucre bract. The ligules of members of the Lactuceae are rather thin and have a truncate, distinctly 5-lobed apex. The ligule is most often yellow at least adaxially; the abaxial surface sometimes has a contrasting longitudinal stripe of various colours. Another common feature is the way in which withered corollas clump post-anthesis. These clumps commonly fall away from the capitulum en masse.

Species are described for 20 of the 23 genera occurring in Australia. The genera *Picris*, *Microseris*, *Taraxacum* did not come under the author's purview; however, generic descriptions are presented and taxonomic issues regarding these genera are discussed. For *Picris* a list of species is presented. Several species collected once or twice in Australia but not considered naturalised have been included in keys and discussed under their respective genera. Such species are from the genera *Cichorium*, *Crepis*, *Hieracium*, *Sonchus*, and *Tragopogon*.

Tribe LACTUCEAE

Herbs, mostly taprooted, with latex abundant. Hairs glandular or eglandular, sometimes 2–5-furcate, rarely stellate. Not stoloniferous or rhizomatous except in *Launaea sarmentosa* and *Hieracium aurantiacum* (stoloniferous) and *Actites megalocarpus* (rhizomatous). Leaves alternate and/or rosulate, pinnate-veined, or parallel-veined in *Tragopogon*, spiny and decurrent down stems in *Scolymus*, not glandular. Inflorescences terminal. Capitula ligulate, pedunculate, or less often sessile to sub-sessile; involucre bracts uni-, bi- or multiseriate, free or nearly so, sometimes with outgrowths; receptacle epaleate except in *Hypochaeris* and *Scolymus*, usually \pm flat. Florets all zygomorphic, bisexual, with tube generally pilose at least at summit; ligule commonly yellow especially adaxially, but also of other colours, with apex truncate, 5-lobed; anthers calcarate and caudate, with apical appendage thin, obtuse to rounded; style with acute hairs, \pm evenly distributed; style-branches generally long, tapering, with a single stigmatic area. Achenes homomorphic or dimorphic, terete or compressed, beaked* or not, with ribs ornamented or smooth; papillose hairs lacking. Pappus sometimes dimorphic, rarely absent, comprising bristles or scales; bristles/scales sometimes of two types within a pappus, smooth, scabridulous, barbellate, or plumose.

Notes: *The term beak refers to the cylindrical, much-narrowed section evident distally in some achenes. To qualify as a beak in this treatment this section must extend for 1 millimetre or more before dilating to receive the pappus. The diameter of beaks in Australian material varies from 0.1 to c. 0.5 mm.

In all descriptions below, the diameter of the involucre is the diameter in unpressed specimens measured c. mid-involucre.

Key to Genera

- 1 Stem leaves \pm rigid, spiny, decurrent as prominent wings down stems; capitula subsessile surrounded and exceeded by large foliaceous bracts; receptacular paleae c. 6 mm long, enclosing achene **1. *Scolymus***
- 1: Stem leaves absent or soft to firm, sometimes weakly spiny, not decurrent down stem; capitula not both subsessile and surrounded and exceeded by large foliaceous bracts; receptacular paleae absent or > 10 mm long, not enclosing achene
 - 2 Pappus of at least central florets with plumose bristles (i.e. bristles with long, extremely fine branches)
 - 3 Involucral bracts uniseriate (rarely an isolated outer bract present); achenes 10–50 mm long
 - 4 Leaves grass-like, parallel-veined, glabrous; peduncle not setose; ligule pale to dark purplish, or if yellow much shorter than involucre; achenes with a smooth transition into beak **23. *Tragopogon***
 - 4: Leaves not grass-like, pinnate-veined, with scattered hairs on both surfaces; peduncle setose, sometimes minutely so; ligule yellow, exceeding involucre; achenes with an abrupt junction between body and beak sections **17. *Urospermum***
 - 3: Involucral bracts bi- or multiseriate; achenes 3–15 mm long
 - 5 Receptacular paleae attending each floret **18. *Hypochaeris***
 - 5: Receptacular paleae absent

- 6 Spreading hairs absent; achenes pale, without transverse ridges, distal two-thirds not tapering, c. 1 mm diam **22. *Scorzonera***
- 6: Spreading furcate hairs present; all or most achenes orange-brown with transverse scale-like ridges and tapering in distal half and/or beaked (narrowest region < 0.5 mm diam.)
- 7 Plants scapose; hairs on stems and leaves bifurcate, with prongs not recurved; pappus of marginal achenes a corona of bristles to 1 mm long **19. *Leontodon***
- 7: Plants usually with cauline leaves; hairs on stems and leaves 2–5-furcate with prongs recurved; pappus of marginal achenes not as above
- 8 Capitula surrounded by a conspicuous whorl of 5 bracteal leaves 5–22 mm long and more than 4 mm wide; inner involucre bracts bearing a long setose sub-apical spur **20. *Helminthotheca***
- 8: Capitula not surrounded by a whorl of bracteal leaves as described above; inner involucre bracts without a sub-apical spur **21. *Picris***
- 2: Pappus never with plumose bristles (bristles either scabrid-barbellate or ± smooth) or pappus absent
- 9 Achenes beaked (see definition above)
- 10 Plants scapose; capitulum solitary **5. *Taraxacum***
- 10: Plants with stem leaves and/or branches; capitula few to numerous
- 11 Achenes strongly compressed **8. *Lactuca***
- 11: Achenes not or only slightly compressed
- 12 Stem leaves present at anthesis; all capitula distinctly pedunculate; bracts with spreading setose or glandular hairs; achenes ± gradually tapering, with ring of scales absent **4. *Crepis***
- 12: Stems often leafless at anthesis; capitula in ± sessile clusters along branches; bracts lacking setose or glandular hairs; achenes with a prominent ring of scales at the abrupt transition from body to beak **3. *Chondrilla***
- 9: Achenes not beaked (see definition above)
- 13 Stem leaves generally no more than 4; inner involucre bracts firm, strongly convex, at maturity; marginal and central achenes markedly different and/or their pappus very different in length
- 14 Leaf hairs simple; outer involucre bracts shorter or longer than inner bracts; achenes 1.3–2.0 mm long **15. *Tolpis***
- 14: Leaf hairs furcate; outer and intermediate involucre bracts shorter than inner bracts; achenes 4.5–9 mm long **16. *Hedypnois***
- 13: Stem leaves few to many; inner involucre bracts not firm or convex at maturity; achenes and/or pappus all similar
- 15 Ligule of florets entirely blue, rarely white or pink; pappus of minute scales **2. *Cichorium***
- 15: Ligule of florets yellow; pappus of bristles or hairs or pappus absent

- 16** Leaves divided with terminal lobe/segment markedly larger than lateral lobes; outer bracts ovate, 0.5–1 mm long; inner bracts 4–8 mm long, glabrous; pappus absent or c. 3 mm long
- 17** Stem leaves > 3; inner involucre bracts 5–8 mm long, becoming firm, keeled along its length; pappus absent **7. *Lapsana***
- 17:** Stem leaves 0–3; inner bracts 4–5 mm long, remaining thin, only keeled near base; pappus present..... **6. *Youngia***
- 16:** Leaves various; outer bracts variously shaped, > 1 mm long; inner bracts 2.5–20 mm long, glabrous or hairy; pappus > 3 mm long
- 18** Achenes all moderately to strongly compressed; pappus of somewhat persistent fine hairs and an inner series of early caducous bristles
- 19** Non-rhizomatous annuals or biennials; involucre to c. 12 mm long; achenes < 4 mm long..... **9. *Sonchus***
- 19:** Rhizomatous perennials; involucre mostly > 12 mm long; achenes > 4 mm long **10. *Actites***
- 18:** Achenes not or hardly compressed; pappus not of two types of bristles as above
- 20** Plants scapose; pappus of long scales or of bristles that broaden basally..... **13. *Microseris***
- 20:** Plants with stem leaves; pappus of bristles that do not broaden basally
- 21** Plants glabrous; outer involucre bracts broad-ovate to ovate, with a hyaline margin 0.3–2 mm wide
- 22** Prostrate plants to 0.05 m high, with runners bearing a single capitulum at few-leaved nodes; outer involucre bracts not cordate-based **11. *Launaea***
- 22:** Erect plants to c. 0.7 m high, without runners; outer involucre bracts strongly cordate-based **12. *Reichardia***
- 21:** Plants hairy; outer involucre bracts lanceolate to linear, with a hyaline margin hardly developed
- 23** Plants sometimes stoloniferous; leaves entire, with those on stem much reduced, narrowing to base, not stem-clasping; fine stellate hairs present; achenes not tapering distally **14. *Hieracium***
- 23:** Plants not stoloniferous; at least some leaves usually toothed or divided; cauline leaves not narrowing to base, with stem-clasping auricles; stellate hairs absent; achenes tapering distally **4. *Crepis***

1. SCOLYMUS L., *Sp. Pl.* 2: 813 (1753)

Annual, biennial or perennial herbs, branching. Hairs simple, non-glandular. Leaves predominantly cauline, rigid, spiny, decurrent down stems as green spiny wings. Inflorescences solitary or capitula few. Capitula sessile or sub-sessile; involucre bracts multiseriate; inner bracts not hardened, ± erect at maturity; receptacular paleae broadly oblong-elliptic or ovate in profile with apex obtuse to rounded, broadly-winged, enclosing and falling with achene. Florets: ligule golden-yellow. Achenes homomorphic, strongly compressed, unbeaked. Pappus homomorphic, of minute scales and sometimes bristles, with bristles not persistent; bristles scabrid-barbellate, uniform within a pappus.

A genus of three species from the Mediterranean region. A somewhat atypical member of tribe Lactuceae placed in a subtribe of its own by Bremer (1994). Leaves of *Scolymus* appear variegated due to the paler venation and marginal spines. Its fleshy roots have historically been eaten.

Key to species

- Biennials or perennials; leaves decurrent for c. 1–4 cm but mostly not extending to leaf below; stems moderately coarse-woolly; hairs on ligule drying pale; long pappus bristles 2 or 3 **1. *S. hispanicus***
- Annuals; most leaves decurrent for > 4 cm and typically extending to or beyond the leaf below; stems ± glabrous; hairs on ligule drying dark; long pappus bristles absent..... **2. *S. maculatus***

1. **Scolymus hispanicus* L., *Sp. Pl.* 2: 813 (1753)

Type: Italy; *n.v.*

Biennials or perennials to c. 0.9 m high, somewhat woolly on stems. Stem leaves deeply divided with segments spreading to antrorse, spiny; decurrent leaf-bases extending 1–4 cm down stem, mostly not extending to the leaf below, spiny; margin with scattered spinules. Capitula surrounded and exceeded by 3 or 4 foliaceous bracts 3–5 cm long, arising at base; involucre 10–15 mm long, c. 5–8 mm diam.; bracts with apex spinose and hyaline margin narrow; outer series 6–8 mm long; inner bracts 10–15 mm long; receptacular paleae ovate, c. 7 mm long, 5 mm wide, with apex erose. Florets: ligule 10–15 mm long; tube with pale hairs; style pubescence pale. Achenes 3–5 mm long, with faces obovate, yellowish-brown. Pappus a corona of minute scales and 2 or 3 long scabrid-barbellate bristles. *Golden Thistle*.

Notes: Native to the Mediterranean region. Occurs in central-eastern New South Wales in the Mudgee district, in far south-central New South Wales, and in central Victoria. A troublesome weed in Argentina, Chile and California, U.S.A. Grows in disturbed sites such as pastures and wasteland. Flowers late spring–summer.

A noxious weed in Victoria.

Representative specimens: NEW SOUTH WALES: Hill Plain, south Deniliquin, *W.E. Mulham W822* (NSW). VICTORIA: c. 2–3 km NW from Werribee township, at Lollypop Ck, *V. Stajsic 1302* (CANB, MEL, NSW); Terrick Terrick State Park, *A.C. Beaglehole 82589* (MEL).

2. **Scolymus maculatus* L., *Sp. Pl.* 2: 813 (1753)

Type: Italy, *Herb. Linn.* 963.1; lecto: LINN, *vide* C. Jeffrey, *Regnum Veg.* 127: 86 (1993).

Annuals to c. 1.0 m high, ± glabrous. Stem leaves deeply divided with segments spreading to antrorse, spiny; decurrent leaf-bases extending several to many cm down stem, extending to or beyond the leaf below, spiny; margin with scattered spinules. Capitula surrounded and exceeded by 3 or 4 foliaceous bracts 3–4 cm long arising at base; involucre c. 15 mm long, c. 5–8 mm diam.; bracts with apex spinose and hyaline margin narrow; outer series 5–10 mm long; receptacular paleae obovate, c. 6 mm long, 4 mm wide, with apex entire. Florets: ligule 10–15 mm long; tube with dark hairs; style pubescence pale. Achenes 2.5–4 mm long, with faces obovate, yellowish-brown. Pappus a corona of minute scales, with long bristles absent. *Spotted Golden Thistle*.

Notes: Native to the Mediterranean region. Occurs in south-eastern Queensland and northern New South Wales as far south as Merriwa in the central-east of the state. Grows in heavier soils in disturbed sites such as pastures and wasteland. Flowers early summer.

A declared noxious weed in some shires in north-eastern New South Wales. The basal leaves are much softer and less spiny than cauline leaves and may be seen in younger plants.

Representative specimens: QUEENSLAND: 9 km south of Dirranbandi on road to Hebel, Maranoa, *G.N.Batianoff 2112181 & D.Halford* (BRI, MEL). NEW SOUTH WALES: 66 km north of Moree, towards Goondiwindi, *A.R.Bean 15836* (BRI, NSW); Wallangra, 19 Dec. 1983, *J.Black s.n.* (NSW).

2. CICHORIUM L., *Sp. Pl.* 2: 813 (1753)

Annual, biennial or perennial herbs, branching. Hairs simple, glandular and eglandular. Leaves basal and cauline. Inflorescences paniculate. Capitula pedunculate or sub-sessile; involucre bracts biseriate; basal portion of inner bracts hardened and erect at maturity. Florets: ligule violet-blue or blue, rarely white or pink. Achenes homomorphic, not compressed, beakless. Pappus of scales, persistent; scales uniform within a pappus.

A genus of about nine species from Europe, northern Africa and Asia. *Cichorium endivia*, Endive, is cultivated as a leaf vegetable in Australia but does not appear to be naturalised. It has been recorded from the Parkes and Wallendbeen areas of New South Wales and from Swan Hill in Victoria. Its frilly leaf margin, purplish florets, and longer pappus scales distinguish it from *C. intybus*.

Key to species

Ligules blue, or rarely white; pappus scales 0.2–0.3 mm long..... *C. intybus*
 Ligules purplish; pappus scales 0.6–1.0 mm long..... *C. endivia*

**Cichorium intybus* L., *Sp. Pl.* 2: 813 (1753)

Type: Europe, Herb. Linn. 962.1; lecto: LINN *n.v.*, *fide* H.W.Lack, *Fl. Iranica* 122: 6 (1977).

Perennials to c. 2 m tall, becoming much-branched, with short spreading eglandular hairs on stems and leaves, glabrescent. Basal leaves with l:w ratio (1–)3–8, divided or not; margin entire, denticulate or dentate; divided leaves with up to 6 retrorse segments per side; cauline leaves several, mostly undivided; base becoming slightly stem-clasping. Capitula numerous, with single capitula on a stout peduncle, or groups of 2 or 3 ± sessile capitula; involucre 9–12 mm long, 2–4 mm diam.; bracts glabrous, or with a few gland-tipped hairs or setae; outer bracts c. 6, ovate–narrow-ovate, 4–6 mm long, with a pale oval region proximally; inner bracts erect and firm at maturity; receptacle c. 3–4 mm diam. Florets: ligule c. 15–25 mm long, blue or rarely white; style pubescence pale. Achenes angular-obconical, 2–3 mm long, with ribs undeveloped, brown, sometimes mottled. Pappus 0.2–0.3 mm long, white. *Chicory*.

Notes: Native to Europe, northern Africa and Asia. Occurs in far south-western Western Australia, mostly south from Perth, in south-eastern Australia from Bundaberg in south-eastern Queensland SSW to Victoria and further west to far south-eastern South Australia, and in eastern Tasmania. Grows in disturbed environments, particularly on roadsides. Flowers spring–summer.

Cichorium intybus has been cultivated in Australia for its large tap-root which can be roasted and ground for mixing with coffee.

Representative specimens: SOUTH AUSTRALIA: Port Rd, Woodville near Woodville Rd intersection, *R.J.Chinnock* 3362 (AD). QUEENSLAND: Carneys Ck Rd, near Croftby, SW of Boonah, *P.I.Forster* 28063 & *G.Leiper* (AD, BRI, MEL, NSW). NEW SOUTH WALES: 19 km west of Glen Innes on road to Inverell, *J.J.Plat* 9, *R.G.Coveny* & *C.J.Dunn* (MEL, NSW). VICTORIA: c. 8 km NNW of Peechelba, along the Wangaratta to Yarrowonga Hwy, *H.I.Aston* 2171 (HO, MEL). TASMANIA: Hollow Tree Rd (Bothwell–Hamilton), 4.4 km from Lyell Hwy, *E.A.Brown* 94/173 & *K.L.Radford* (HO, NSW).

3. CHONDRILLA L., *Sp. Pl.* 2: 796 (1753)

Annual or perennial herbs, branching. Hairs simple, eglandular. Leaves basal and cauline. Inflorescences paniculate. Capitula \pm sessile; involucre bracts biserial; not hardened, reflexed at maturity. Florets yellow. Achenes homomorphic, not or hardly compressed, beaked. Pappus of bristles, persistent; bristles scabridulous, uniform within a pappus.

A genus of approximately 25 species, from Europe, northern Africa and Asia.

**Chondrilla juncea* L., *Sp. Pl.* 2: 796 (1753)

Type: Europe, Herb. Clifford 383, *Chondrilla* no. 1; lecto: BM, *vide* H.W.Lack, *Fl. Iranica* 122: 285 (1977).

Perennials to c. 1.3 m high, becoming much-branched, with spreading to retrorse bristles 2–3 mm long and a close fine wool basally on stems. Basal leaves with l:w ratio c. 5–8, runcinately divided; margin dentate or denticulate; cauline leaves much smaller than basal leaves, narrow-linear, entire, not stem-clasping. Capitula many, with lateral capitula sub-sessile, single or in groups of 2 or 3; involucre 7–13 mm long, c. 2 mm diam.; bracts somewhat appressed woolly; outer bracts c. 6, ovate, c. 1 mm long; inner bracts c. 7–9, with hyaline margin slender and vestigial. Florets 9–12; ligule 7–10 mm long; style pubescence pale. Achenes 8–10 mm long; body c. oblong-ellipsoid, with ribs prominent, scaly distally, terminating in a ring of 5 scales surrounding base of beak, cream to brown; beak capillary, c. 50% longer than body, generally caducous with pappus. Pappus 6–7 mm long, white; bristles minutely scabridulous. *Skeleton Weed*.

Notes: Native to western Asia, Europe and northern Africa. Occurs in south-western Western Australia from Geraldton SE to Esperance, in south-eastern Australia from Bundaberg south to Victoria and extending further west from Victoria into far south-eastern South Australia. Grows in disturbed sites including roadsides and on agricultural land. Flowers late spring–autumn.

A declared noxious weed in Western Australia, South Australia, New South Wales, Victoria and Tasmania. Its ability to regrow from underground parts has made it difficult to eradicate by mechanical means. Hull & Groves (1973) identified three variants, but these have not been recognised taxonomically. Variation was greatest in the shape of the basal leaves, but also occurred in inflorescence and fruit morphology. The less common variants were largely restricted to central-eastern New South Wales. Narrow-leaf and broad-leaf forms have been recognised in South Australia.

Representative specimens: WESTERN AUSTRALIA: Eastern part of Curtin University Campus, Bentley, Perth, *B.J.Lepschi* 2532 (AD, CANB, MEL, PERTH). SOUTH AUSTRALIA: Abutting south boundary of the Hincks Natl Park sec. 40, Hd of Moody, *C.R.Alcock* 2563 (AD). QUEENSLAND: Thane Ck, near Warwick, 22 Dec. 1958, *J.Mitchell* (BRI). NEW SOUTH WALES: c. 8.5 km from Blakney Ck toward Bevendale, at Handy's Ck crossing, Southern Tablelands, *E.M.Canning* 6372 (AD, CANB, MEL, NSW). VICTORIA: c. 10 km east of Yarrowonga, along the Murray Valley Hwy, *H.I.Aston* 2173 (MEL).

4. CREPIS L., *Sp. Pl.* 2: 805 (1753)

Annual or biennial herbs, branching, or stemless in *C. pusilla*. Hairs simple, glandular and eglandular. Leaves predominantly basal. Inflorescences cymose or paniculate, Capitula pedunculate, sessile in *C. pusilla*; involucre bracts biserial; inner bracts mostly hardened, strongly convex and erect at maturity. Florets: ligule yellow. Achenes homomorphic or slightly dimorphic; sometimes slightly compressed, beaked or not. Pappus of bristles, persistent or not; bristles minutely scabridulous, uniform within a pappus.

A genus of approximately 200 species from the northern hemisphere, tropics and South Africa. The inner series of involucre bracts of most species of this genus become firm and strongly convex as fruits develop. Often achenes adjacent to these bracts are shorter and with a more curved body than more central achenes and tend to be housed within the convexity of the bract at maturity. Achenes have c. 10 prominent ribs.

Crepis dioscoridis L. from south-eastern Europe has been recorded once in Australia, from Meadows in the Southern Lofty Ranges, but there is no indication that it is naturalised. It is vegetatively similar to *C. capillaris* but with a larger more densely tomentose capitulum and longer achenes.

Key to species

- 1 Plants stemless; capitula sessile at base of plant **5. *C. pusilla***
- 1: Plants developing aerial stems, to 1 m high; capitula pedunculate
 - 2 Peduncles and involucre bracts with robust pale spreading eglandular bristles 1–2 mm long, the indumentum neither cobwebby nor with glandular hairs **2. *C. setosa***
 - 2: Peduncles and involucre bracts without bristles as above, the indumentum cobwebby and often also with spreading gland-tipped hairs to c. 1.5 mm long
 - 3 Stem leaves moderately hairy, entire to lobate; involucre bracts lacking black hairs; capitular buds nodding; central achenes 12–17 mm long, exceeding bracts at maturity **4. *C. foetida***
 - 3: Stem leaves glabrous or nearly so, or if moderately hairy then usually mostly pinnatisect; involucre bracts often with black midline hairs; capitular buds erect; central achenes 1.5–9 mm long, shorter than bracts at maturity
 - 4 Outer bracts lanceolate, 1.0–1.3 mm wide; achenes 6–9 mm long, beaked; pappus clearly overtopping bracts **3. *C. vesicaria***
 - 4: Outer bracts narrow-lanceolate to linear, 0.3–0.6 mm wide; achenes 1.5–6 mm long, not or hardly beaked; pappus not or hardly overtopping bracts
 - 5 Involucre not densely white-woolly, achenes 1.5–2.5 mm long **1. *C. capillaris***
 - 5: Involucre densely white-woolly, achenes 4–6 mm long ***C. dioscoridis* (see notes above)**

1. **Crepis capillaris* (L.) Wallr., *Erst. Beitr. Fl. Hercyn.* 287 (1840)

Lapsana capillaris L., *Sp. Pl.* 2: 812 (1753).

Type: not designated.

Crepis virens L., *Sp. Pl.* 2nd edn, 1134 (1763), *nom. illeg.* Type: not designated.

[*Crepis tectorum* auct. non L.: A.J.Ewart, *Fl. Victoria* 1197 (1931)]

Plants to c. 1.2 m high, glabrous except for spreading weak hairs on lower stem and leaf midrib. Basal leaves undivided, lobed or lyrate-pinnatisect, with l:w ratio c. 5–8, with segments c. spreading; margin entire or nearly so. Stem leaves few, undivided or lobate above mid-stem; base becoming sagittate, stem-clasping upwards. Capitula few to several; involucre 5–8 mm long, c. 1.5–3 mm diam.; outer bracts 8–10, 2–4 mm long, 0.3–0.6 mm wide, hairy or nearly glabrous; inner bracts usually cobwebby, with emergent usually blackish and broad-based gland-tipped hairs, hardened and convex at maturity or not; receptacle 1.5–4 mm diam. Florets: ligule 5–9 mm long; style pubescence sometimes slightly darkened. Achenes fusiform, 1.5–2.5 mm long, unbeaked, with ribs well-spaced, without ornamentation. Pappus caducous, 3–4 mm long, white. *Smooth Hawksbeard*.

Notes: Native to Europe. Occurs in far south-western Western Australia from Augusta east to Albany, in south-eastern Australia from Glen Innes SSW to southern Victoria and further west to Adelaide in far south-eastern South Australia, and in Tasmania. Grows in mesic environments, mostly in disturbed sites such as urban habitats and roadsides, in plains, forests and woodland, from sea-level to c. 1300 m. Flowers spring–autumn.

Prior to fruit development, the less divided leaves, smaller capitula and narrower outer bracts distinguishes *C. capillaris* from the otherwise similar *C. vesicaria* subsp. *taraxacifolia*. The inner involucre bracts of *C. capillaris* are glabrous adaxially, unlike those of *C. foetida*, *C. vesicaria* and *C. setosa*.

Representative specimens: WESTERN AUSTRALIA: c. 3.2 km east of Nannup, *R.D.Royce 8400* (MEL, PERTH). SOUTH AUSTRALIA: Onkaparinga R. near Mylor, 9 Dec. 1944, *J.B.Cleland* (AD). NEW SOUTH WALES: Adaminaby Cemetery, *I.Crawford 3782* (CANB, MEL, NSW). VICTORIA: Terang, *R.V.Smith 75/16* (AD, BRI, CANB, HO, MEL, NSW). TASMANIA: Franklin, *D.I.Morris 86491* (HO).

2. **Crepis setosa* Haller.f., in J.J.Roemer, *Arch. Bot. (Leipzig)* 1: 1 (1797)

Type: Peru, 1855–56, *Spruce 4191*; syn: B, E, C all *n.v.*, *fide* J.Solomon (2006a)

Plants to c. 1.0 m high, with spreading hairs on stems and leaves, long-setose on stems. Basal leaves undivided, lobed or lyrate-pinnatisect, with l:w ratio c. 4–8; margin entire or with scattered denticulations; cauline leaves few, undivided or lobate above mid-stem; base becoming auriculate, stem-clasping upwards. Capitula few or several; involucre 6–10 mm long, c. 3–4 mm diam.; outer bracts 8–10, 2–4 mm long, 0.7–1.0 mm wide, with long pale non-glandular hairs; inner bracts with similar indumentum, also slightly cobwebby, hardened and convex at maturity; receptacle c. 3 mm diam. Florets: ligule 5–9 mm long; style pubescence dark. Achenes 4–7 mm long, tapered into a beak; body fusiform, 2.5–4.5 mm long, with ribs well-spaced, scabridulous; marginal achenes shorter. Pappus persistent, 4–5 mm long, white. *Bristly Hawksbeard*.

Notes: Native to the Mediterranean region and south-western Asia. Occurs in north-eastern and south-central Victoria, and around Hobart in south-eastern Tasmania. There is an old record from Hornsby in central-eastern New South Wales. Grows mostly in disturbed sites such as roadsides and river flats but also extending into forest. Flowers summer–autumn.

Similar to *C. capillaris* except for the setose indumentum and the longer, beaked achenes.

Representative specimens: NEW SOUTH WALES: Hornsby, Feb. 1918, *W.H.Blakely* (NSW). VICTORIA: Porepunkah, next to Ovens R., *J.R.Hosking 1414* (CANB, MEL, NE, NSW). TASMANIA: Mt Nelson Rd, Hobart, 19 Jan. 1947, *W.M.Curtis* (HO).

3. **Crepis vesicaria* subsp. *taraxacifolia* (Thuill.) Thell., in Schinz & R.Keller, *Fl. Schweiz*, 3rd edn, 2: 361 (1914)

Crepis taraxacifolia Thuill., *Fl. Env. Paris* 409 (1799).

Type: France; *n.v.*

Barkhausia haenseleri Boiss. ex DC., *Prodr.* 7: 153 (1838), as *Haenseleri*; *Crepis vesicaria* subsp. *haenseleri* (Boiss. ex DC.) Sell, *Bot. J. Linn. Soc.* 71: 254 (1975). Type: Southern Spain, *E.Boissier*; *n.v.*

Plants to c. 1.2 m high, with spreading hairs on stem and leaves, sometimes rather sparse. Basal leaves lyrate 1- or 2-pinnatisect, with l:w ratio c. 5–8, with segments c. spreading; margin entire or with scattered teeth or denticulations; cauline leaves few, usually pinnatisect above mid-stem; base becoming dilated and stem-clasping upwards. Capitula few to many; involucre 8–12 mm long, c. 3–5 mm diam.; outer bracts 8–12, 3–5 mm long, 1.0–1.3 mm wide, nearly glabrous; inner bracts cobwebby, with emergent usually blackish and broad-based gland-tipped hairs, ?not hardened, slightly convex at maturity; receptacle 3–6 mm diam. Florets: ligule 5–9 mm long; style pubescence dark. Achenes 6–9 mm long, beaked; body c. fusiform, 3–4.5 mm long, with ribs well-spaced, scabridulous. Pappus persistent, c. 5 mm long, white. *Dandelion Hawksbeard*.

Notes: Native to Europe. Occurs in far south-eastern Australia from the Adelaide region in far south-eastern South Australia east to Ballarat in south-central Victoria. Also naturalised in New Zealand. Grows in waste land. Flowers spring–early summer.

A very common weed of roadsides between Warrnambool and Portland in Victoria. It has a similar indumentum to *C. capillaris* but its leaves are more divided, inflorescences more congested and with larger capitula, the outer involucral bracts are broader, and achenes much longer and beaked.

Representative specimens: SOUTH AUSTRALIA: Mt Watch Quarry area, c. 1 km from Millicent–Glencoe Rd, *A.A.Munir* 5341 (AD). VICTORIA: roadside near Drive-In Theatre, outskirts of Portland, *R.V.Smith* 67/130 (AD, CANB, MEL, NSW); Nigretta Falls on Wannon R., c. 7.5 km (direct line) ENE of Wannon, *I.C.Clarke* 2527 (AD, CANB, MEL, NSW).

4. **Crepis foetida* L., *Sp. Pl.* 2: 807 (1753) subsp. *foetida*

Type: France; *n.v.*

Crepis foetida a. *vulgaris* Bisch., *Beitr.* 252 (1851); *Crepis foetida* subsp. *vulgaris* (Bisch.) Babc., *J. Bot.* 76: 205 (1938). Type: *n.v.*

Plants to c. 0.8 m high, with spreading hairs on lower stem and leaves. Basal leaves divided or not, with l:w ratio c. 5–8; margin entire dentate or denticulate; cauline leaves few or several, entire or lobate above mid-stem; base becoming sagittate, stem-clasping upwards. Capitula few to several; involucre 9–12 mm long, c. 3–4 mm diam.; outer bracts 12–14, 4–6 mm long, 0.4–1.0 mm wide, hairy; inner bracts cobwebby, with numerous emergent pale slender-based gland-tipped hairs, hardened and convex at maturity; receptacle c. 2–4 mm diam. Florets: ligule 5–9 mm long; style pubescence mostly pale. Achenes 7–17 mm long, beaked, dimorphic; central achenes 12–17 mm long; body narrow fusiform, c. 4 mm long, with ribs crowded, scabridulous; marginal achenes 7–10 mm long. Pappus persistent, 5–8 mm long, white. *Stinking Hawksbeard*.

Notes: Native to Europe and south-western Asia. Occurs in far south-western Western Australia from Moore R. south to Kingston forest, in south-eastern Australia from the Yorke Peninsula in South Australia east to Tumut in south-eastern New South Wales and

SE to Wangaratta in north-central Victoria, with an isolated record from Buchan in far eastern Victoria. Grows in disturbed sites, often in poor soils, in urban environments, forest and woodland. Flowers most of year.

Readily identified in fruit by the extremely long beaks of the central achenes. These exceed the involucre bracts at maturity. The somewhat shorter marginal achenes are housed within the convexity of the involucre bract at maturity. At flowering, the nodding capitular buds and paler indumentum of the involucre distinguishes it from *C. capillaris* and *C. vesicaria* subsp. *taraxacifolia*. Specimens in Australia mostly conform to subsp. *foetida* as defined by Sell (1976), but some specimens have outer involucre bracts broader than 0.75 mm.

Representative specimens: WESTERN AUSTRALIA: Landers Rd, Lesmurdie, *A.A. Mitchell 4134* (PERTH). SOUTH AUSTRALIA: Northern Yorke Peninsula, Hundred of Wiltunga, *B. Copley 3308* (AD); on roadside, west end of Torrens Gorge, *A.G. Spooner 294* (AD). NEW SOUTH WALES: near Wee Jasper Caves, *M. Gray 5363* (BRI, CANB); Brocklesby, Dec. 1921, *J. Hunter* (NSW). VICTORIA: Green Rd, Upper Lurg, *J. Strudwick 770* (MEL).

5. **Crepis pusilla* (Sommier) Merxm., *Mitt. Bot. Munchen* 7: 275 (1968)

Melitella pusilla Sommier, *Nuov. Giorn. Bot. Ital.* 14: 497 (1907).

Type: *n.v.*

Plants to 0.02 m high, acaulescent, nearly glabrous. Leaves divided or not, with l:w ratio c. 5–12; margin entire or denticulate. Capitula few to several, sessile; involucre 2.5–4 mm long, c. 1 mm diam.; outer bracts 2–4, c. 1 mm long, glabrous, 0.5 mm wide; inner bracts glabrous, but hairs at base of involucre, morphology not known at maturity; receptacle c. 2 mm diam. Florets: ligule c. 1 mm long; style pubescence black. Achenes ellipsoid, c. 2 mm long, not or hardly beaked, with ribs crowded, ?smooth. Pappus persistent, 1–1.5 mm long, white. *Dandelion Crepis*.

Notes: Native to Portugal, Malta, Greece and Crete. Recorded from the Eyre Peninsula around Bascombe Well and Port Lincoln in South Australia, although its persistence is uncertain. Grows on agricultural land. Flowers spring.

Representative specimens: SOUTH AUSTRALIA: Eyre Peninsula, Hundred of Blesing, near Bascombe Well HS, c. 25 km WSW of Lock, *H. Eichler 19345* (AD, MEL); Proper Bay, Port Lincoln, *C.R. Alcock 2167* (CANB).

5. TARAXACUM Weber ex Wiggers, *Prim. Fl. Holsat.* 56 (1780)

Perennial herbs, scapose. Hairs simple, eglandular. Leaves all basal. Inflorescences solitary. Capitula pedunculate; involucre bracts multiseriate, soft and reflexed at maturity. Florets: ligule yellow. Achenes homomorphic, not compressed, beaked. Pappus of bristles, persistent, homomorphic; bristles scabridulous, uniform within a pappus.

About 2500 species worldwide, predominantly from Eurasia. This genus was not assessed in detail by the author. It is currently undergoing revision in Australia. The treatment of Scarlett (1999) represents some initial findings which has greatly diverged from the previously conservative assessments presented in state floras. Two native species and seven introduced taxa are recognised in Scarlett's treatment.

6. YOUNGIA Cass., *Ann. Sci. Nat. (Paris)* 23: 88 (1831)

Annual, biennial or perennial herbs, branching. Hairs simple, eglandular. Leaves all or mostly basal. Inflorescences cymose or paniculate. Capitula pedunculate; involucre bracts biseriate; soft and reflexed at maturity. Florets: ligule yellow. Achenes homomorphic,

not compressed or outer ones slightly compressed, unbeaked. Pappus of bristles, usually persistent, bristles scabrid-barbellate, uniform within a pappus.

A genus of c. 40 species predominantly from Asia.

***Youngia japonica* (L.) DC., Prodr. 7: 194 (1838)**

Prenanthes japonica L., *Mant. Pl.* 1: 107 (1767); *Crepis japonica* (L.) Benth., *Fl. Hongk.* 194 (1861).

Type: Japan; *n.v.*

[*Youngia thunbergiana* auct. non DC. (1838), *nom. illeg.*: J.D.Hooker, *Fl. Tasman.* 1: lxx (1859)]

Scapose or scapiform annuals to c. 0.6 m high, with spreading coarse hairs scattered or sparse on stems and leaves. Basal leaves to c. 20 cm long, with l:w ratio 3–8, often lyrate-divided, petiole-like basally; margin entire, denticulate or dentate; cauline leaves few, similar to basal leaves or much reduced, undivided. Capitula several to many; involucre 4–5 mm long, c. 1.5–2 mm diam.; outer bracts 3–5, ovate, 0.5–1.0 mm long, with hyaline margin broad; inner bracts 7–10, with a prominent pale keel developing basally, with hyaline margin alternately distinct and vestigial. Florets: ligule c. 3 mm long, yellow, possibly rarely white; style pubescence pale. Achenes narrow-ellipsoid, 1.5–2 mm long, slightly to moderately compressed, tapering to a neck c. 0.2 mm long, with ribs crowded, unequally prominent, ciliate, with cilia longer distally, reddish-brown or mid-brown. Pappus c. 3 mm long, white; bristles barbellate proximally.

Notes: Occurs in eastern Australia from Mt Windsor in far north Queensland south to Sydney in central New South Wales. Widely distributed in eastern Asia, including New Guinea. Grows in forests; also a weed of lawns and roadsides. Flowers most of year.

A form recorded from disturbed and urban localities has leaves with fewer sessile lateral segments, denser stem indumentum, and achenes that are mid-brown rather than darker reddish-brown. This form possibly has come from outside Australia and further investigation into this variation is warranted.

Representative specimens: QUEENSLAND: Palm Tree Ck, 22 km SE of Toowoomba, *D. Halford Q634* (BRI, MEL). NEW SOUTH WALES: Torrington–Silent Grove Rd, *N.S. Lander 535a* (BRI, CANB, HO, MEL, NSW); Alum Mtn, Buladelah, July 1923, *H.M.R. Rupp* (MEL); Gloucester, Sept. 1965, *R.G. Coveny s.n.*, (NSW).

7. LAPSANA L., Sp. Pl. 2: 811 (1753)

Annual, biennial or perennial herbs, branching. Hairs simple, glandular and eglandular. Leaves predominantly cauline. Inflorescences paniculate. Capitula pedunculate; involucre bracts biseriolate; inner bracts somewhat firm and erect at maturity. Florets: ligule yellow. Achenes homomorphic, mildly compressed, beakless. Epappate.

A genus of c. ten species from Europe, Asia and north-western Africa.

****Lapsana communis* L., Sp. Pl. 2: 811 (1753) subsp. *communis***

Type: Locality unknown, Herb. Clifford 389, *Lapsana* no. 1A; lecto: BM, *fide* P.D.Sell, *Watsonia* 13: 301 (1981).

Annuals or biennials to c. 1.2 m high, with gland-tipped hairs on lower stem and sometimes upper stem, and short eglandular hairs on or near leaf margins. Basal leaves variably persistent; cauline leaves to 16 cm long, with l:w ratio 1–4, undivided or lyrate-divided, petiole-like basally, with 1 or 2 spreading or slightly retrorse lobes per side;

margin denticulate or dentate; blade or terminal segment ovate, with base truncate or cordate; upper-stem leaves tending to be undivided, narrow-elliptic, with base narrow-cuneate. Capitula few to many; involucre 5–8 mm long, c. 2–2.5 mm diam., with margin of bracts glabrous or inconspicuously ciliate; outer bracts 4–6, ovate, c. 1 mm long, with hyaline margin vestigial; inner bracts 6–10, keeled basally, slightly incurved, with hyaline margin vestigial. Florets: ligule 5–10 mm long; style pubescence black. Achenes narrow-ellipsoid to obconical, 3–5 mm long, slightly compressed, briefly tapering distally, with ribs crowded, not prominent, glabrous, pale brown or greenish. *Nipplewort*.

Notes: Native to Europe. Occurs in far south-eastern South Australia, south-central Victoria, and eastern Tasmania, central eastern and north-eastern New South Wales, and Killarney in south-eastern Queensland. Grows in or near sites of human habitation, in shady, damp environments, including forest. Flowers mainly summer.

Predominantly a weed of sites around human habitation. The glandular portion of the stem hairs is often lost early and hairs will appear eglandular.

Representative specimens: SOUTH AUSTRALIA: Lobethal, c. 25 km east of Adelaide, 13 Feb. 1965, *M.Tregus* (AD). QUEENSLAND: Moss Gardens, c. 15 km east of Killarney, *A.R.Bean 18321* (BRI, MEL, NSW). NEW SOUTH WALES: alongside Macdonald R., Bendemeer, *J.R.Hosking 1694*, *G.R.Hosking & T.L.Hosking* (CANB, MEL, NE, NSW). VICTORIA: south side of Yarra R., immediately NW of intersection of Don Rd with Warburton Hwy, Launching Place, *I.C.Clarke 3086* (CANB, HO, MEL). TASMANIA: Nicholls Rivulet, *A.M.Buchanan 15034* (HO).

8. LACTUCAL., *Sp. Pl.* 2: 795 (1753)

Annual, biennial or perennial herbs, branching. Hairs simple, eglandular. Leaves predominantly cauline. Inflorescences paniculate. Capitula ± sessile, sometimes clustered; involucre bracts multiseriate, soft and erect or reflexed at maturity. Florets yellow (in Australia), drying whitish or bluish. Achenes homomorphic, strongly compressed, beaked. Pappus of bristles, persistent (in Australia); bristles minutely scabridulous, uniform within a pappus.

A genus of c. 100 species from Europe, Asia, Africa and North America. The two species in Australia have complex panicles with a proportion of capitula sessile or short-pedunculate, slender capitula with relatively few florets, achenes that taper abruptly from the body to a long capillary beak, and often silvery stems.

Key to species

- Plants to c. 2 m high; lower stems prickly-setose or glabrous; upper-stem leaves (or the rachis if divided) narrow-linear; margin of at least larger stem leaves crowded-spinulose; involucre bracts typically ± reflexed at maturity; body of achene bearing minute whitish cilia distally; beak < 30% longer than body **1. *L. serriola***
- Plants to c. 1 m high; stems glabrous; upperstem leaves (or the rachis if divided) c. oblong to narrow-oblong; margin of all leaves without spinules; involucre bracts typically erect at maturity; body of achene scabridulous distally but with whitish cilia absent; beak > 30% longer than body **2. *L. saligna***

1. **Lactuca serriola* L., *Cent. Pl.* 2: 29 (1756)

Type: southern Europe, Herb. Linn. 950.3; lecto: LINN, *vide* S.D.Prince & R.N.Carter, *Watsonia* 11: 331–338 (1977).

Lactuca scariola L., *Amoen. Acad.* 4: 489 (1759). Type: the Bauhin plate in *Hist. Pl.* 2: 1003 (1656); lecto, *vide* I.M. de Vries & C.E.Jarvis, *Taxon* 36: 151–153 (1987).

Annuals or biennials to c. 2.0 m high, with lower stems and abaxial midrib of leaves prickly-setose, or less often stem glabrous, sometimes glaucous. Stem leaves to c. 20 cm long, with l:w ratio c. 4–8, divided or not; margin spinulose-denticulate, often becoming \pm smooth nearer summit; undivided leaves narrow-oblong; divided leaves with 1–3 broad retrorsely arching lobes or segments per side; base above mid-stem sagittate, stem-clasping. Capitula many to c. 100; involucre 6–10 mm long elongating to c. 15 mm long at maturity, c. 2 mm diam., with bracts reflexed at maturity; outer bracts 3–6, ovate, 1–2 mm long, with hyaline margin absent; longer intermediate bracts subequal to inner bracts at anthesis; inner bracts 4 or 5, with hyaline margin distinct. Florets: ligule 7–10 mm long; style pubescence pale. Achenes 6–8 mm long; body c. 3 mm long; faces narrow-obovate, mid-brown, with minute whitish cilia distally; beak as long as or up to c. 30% longer than body. Pappus persistent, c. 6 mm long, white; bristles extremely fine, minutely scabridulous. *Prickly Lettuce*.

Notes: Native to Europe and western Asia. The panicles of this species are typically pyramidal with capitula of primary branches tending not to diverge greatly from the branch. Leaves are typically twisted at the base so that the lamina is in a vertical plane and alternate leaves point in opposite directions. *Lactuca sativa*, from which edible lettuce varieties was derived, has more or less identical fruits to *L. serriola* but has involucre bracts that are finally erect. There is no clear evidence that it is naturalised in Australia. Another species sometimes confused with *L. serriola* is *L. virosa*; however, it has larger, darker achenes and leaves always undivided. Recorded by Everist (1981) as possibly poisonous to stock but nothing is known about the nature of the poisonous principle.

Two forms of *L. serriola* were recognised by Prince and Carter (1977) and both of these occur in Australia.

Key to forms

Stem-leaves, in middle third at least, lobate to subpinnatisect **a.** forma *serriola*
 Stem-leaves all entire or at the most with a few shallow broad
 teeth **b.** forma *integrifolia*

a. **Lactuca serriola* L. forma *serriola*

Mid-stem leaves lobate to subpinnatisect, with 1–3 spreading or retrorsely arched lobes/segments per side; upper-stem leaves lobate, or sometimes reducing to entire upwards; branch leaves lobed or entire.

Notes: Occurs in far south-western Western Australia, south from Geraldton, with an outlier west of Wiluna, and in southern and central Australia. Grows in disturbed sites including roadsides, wasteland and agricultural land. Flowers spring–autumn.

In more arid regions of Australia, including the Northern Territory, this form has relatively few prickles. Mid-stem leaves must be examined to distinguish this form from forma *integrifolia*.

Representative specimens: WESTERN AUSTRALIA: 17.5 km south of Goodwood Rd on Upper Capel Rd, c. 7 km WSW of Kirup, *B.J.Lepschi & T.R.Lally BJL3342* (AD, CANB, PERTH). NORTHERN TERRITORY: Ormiston Gorge, Heavitree Ra., *G.W.Carr 1479 & A.C.Beauglehole 45258* (CANB, DNA, MEL). SOUTH AUSTRALIA: section 16, 35°11'S, 138°37'E, Southern Lofty region, *A.W.Bell 135* (AD, MEL). QUEENSLAND: 'The Hermitage', Biggenden, *P.I.Forster 7660* (AD, BRI, MEL). NEW SOUTH WALES: north side of Oberne Rd, 5.7 km east of Tarcutta,

P.C.Jobson 4576, R.G.Coveny & P.G.Kodala (BRI, MEL, NSW). VICTORIA: Terrick Terrick State Park, *A.C.Beauglehole 82660* (MEL). TASMANIA: Pass Rd, Rokeby, *A.M.Buchanan 15149* (HO).

b. **Lactuca serriola* forma *integrifolia* (Gray) S.D.Prince & R.N.Carter, *Watsonia* 11: 337 (1977)

L. virosa var. *integrifolia* Gray, *Nat. Arr. Brit. Pl.* 2: 417 (1821).

Type: [presumably Great Britain], *A.Buddle*, H.S. 118 folio 2; lecto: BM, fide S.D.Prince & R.N.Carter, *op. cit.* 338.

Mid-stem leaves entire or sometimes some with a few shallow broad teeth; upper-stem leaves entire; branch leaves entire.

Notes: Occurs in south-eastern Australia from Adelaide in far south-eastern South Australia ESE to Omeo in the eastern Victoria, with isolated records from north-eastern New South Wales, south-eastern New South Wales and from around Alice Springs in central Australia. Grows in disturbed sites including urban environments and agricultural land. Flowers spring–autumn.

Although the two forms are readily distinguished in the field, herbarium material commonly lacks sufficient evidence of the stem leaves to make a determination. Forma *integrifolia* appears to be less common than forma *serriola* but in Melbourne, Victoria at least forma *integrifolia* is common.

Representative specimens: SOUTH AUSTRALIA: Fullarton, *Hj.Eichler 14607* (AD). NEW SOUTH WALES: Traffic Education Centre, Armidale, *R.G.Coveny 16371* (AD, BRI, CANB, HO, MEL, NE, NSW). VICTORIA: Baranduda Ra. Regional Park, *A.C.Beauglehole 88474* (MEL).

2. **Lactuca saligna* L., *Sp. Pl.* 2: 796 (1753)

Type: Habitat in Gallia, Lipsiae' [western Europe], Herb. Burser VI: 11; lecto: UPS, fide I.M. de Vries & C.E.Jarvis, *Taxon* 36: 153 (1987).

Annuals or biennials to c. 1 m high, glabrous except for sparse bristles on abaxial midrib of leaves, not glaucous. Stem leaves to c. 20 cm long, with l:w ratio c. 3–30; divided or not, undivided leaves linear to narrow-linear; divided leaves with 1–3 narrow retrorsely arching segments per side; base above mid-stem stem-clasping, narrowly sagittate; margin entire or remotely toothed. Capitula many; involucre 6–10 mm long, elongating to c. 15 mm long at maturity, c. 1–1.5 mm diam., with bracts ± erect at maturity; outer bracts 2 or 3, ovate, c. 2 mm long; longer intermediate bracts subequal to inner bracts at anthesis; inner bracts 4 or 5. Florets: ligule 7–10 mm long; style pubescence pale. Achenes 7–10 mm long; body 3–4 mm long; faces elliptic, dark-brown, commonly mottled blackish, scabridulous distally, tapering somewhat abruptly to a capillary beak; beak c. 40–90% longer than body. Pappus persistent, 4–5 mm long, white; bristles extremely fine, ± smooth. *Willow-leaf Lettuce*.

Notes: Native to Europe and western Asia. Occurs in far south-western Western Australia mostly around Perth but also further east, in south-eastern Australia from Gympie in far south-eastern Queensland SSW through eastern New South Wales to Victoria and from Victoria west to Kangaroo Island in south-eastern South Australia, and in Hobart in far south-eastern Tasmania. Grows in disturbed sites such as urban environments and agricultural land. Flowers spring–autumn.

Representative specimens: WESTERN AUSTRALIA: Benger Swamp, c. 12 km south of Harvey, *J.J.Alford 1664* (PERTH). SOUTH AUSTRALIA: Zadows landing, c. 6 km south of

Mannum, *C.R.Alcock 11104* (AD). QUEENSLAND: Coolmunda dam, 16 km west of Inglewood, *G.N.Batianoff 2010400* & *C.Appelman* (BRI, CANB, DNA, NSW). NEW SOUTH WALES: Sinclairs Lookout, 14.4 km west of Glen Innes, *C.J.Dunn 41*, *J.Plat*, & *R.Coveny* (BRI, MEL, NSW). AUSTRALIAN CAPITAL TERRITORY: Coffins Crossing of Molonglo R., 3.6 km SSW of Cook P.O., *R.Coveny 11581* & *P.Hind* (CANB, NSW). VICTORIA: Murray R. 3 km SW of Tocumwal P.O., *A.C.Beauglehole 63986* (MEL). TASMANIA: roadside, Sandy Bay, 2 May 1958, *W.M.Curtis* (HO).

9. *SONCHUS* L., *Sp. Pl.* 2: 793 (1753)

Annual, biennial or perennial herbs, branching, sometimes glaucous. Hairs simple, glandular and eglandular. Leaves basal and cauline. Inflorescences cymose. Capitula pedunculate; involucre bracts multiseriate, not hardening, reflexed at maturity. Florets: ligules yellow (in Australia). Achenes homomorphic, moderately to strongly compressed, unbeaked. Pappus of bristles, partially persistent; bristles nearly smooth or scabridulous, of two types within a pappus.

A genus of c. 55 species mainly from Africa, but virtually cosmopolitan. Species in Australia have succulent hollow stems and are nearly glabrous or they develop distinctive spreading gland-tipped hairs on upper stems, branches, peduncles and the involucre. A fine caducous wool is sometimes also present on the receptacle. Denticulations and teeth on leaf margins are spine-tipped and sometimes prickly. The multiseriate involucre comprises 25–45 bracts in several gradational series with the longer intermediate bracts almost as long as the inner bracts. Before and at the onset of anthesis the involucre is cylindrical but it soon becomes markedly conical as the receptacle expands and achenes enlarge proximally and the involucre closes on the withered corollas distally. Pappus bristles in Australian species are white and of two types within a pappus, comprising an inner series of several caducous scabridulous bristles and an outer series of numerous persistent downy hair-like bristles.

Sonchus arvensis, a native of Europe, is a rhizomatous perennial with elliptic, transversely rugose achenes. It was collected at Clare in the northern Mt Lofty Ranges, South Australia in 1960, but there is no evidence to suggest that it has become naturalised.

Key to species

- 1 Perennial, rhizomatous; achenes elliptic and transversely rugose***S. arvensis*** (see notes above)
- 1: Annuals or biennial, not rhizomatous; achenes not both elliptic and transversely rugose
 - 2 Achenes ± oblanceolate, 0.5–1 mm wide, with l:w ratio > 3, weakly to strongly transversely wrinkled; leaf-margin with few to numerous denticulations or teeth with spiny tips to c. 1 mm long, or margin entire, generally not prickly; auricles commonly sagittate, sometimes downcurved but not rotated**1. *S. oleraceus***
 - 2: Achenes elliptic or slightly obovate, 0.8–2.0 mm wide, with l:w ratio < 3, without transverse wrinkles; leaf-margin with numerous denticulations or teeth with spiny tips to c. 5 mm long, prickly or not; auricles rounded, generally strongly rotated
 - 3 Mid-stem leaves with l:w ratio 1.5–5(–8); achenes ± elliptic 2.0–3.2 mm long, central ones orange-brown and marginal ones pale yellow**2. *S. asper***
 - 3: Mid-stem leaves with l:w ratio 3–10; achenes oblong-elliptic, 2.8–4.2 mm long, usually all mid to dark chocolate-brown**3. *S. hydrophilus***

1. **Sonchus oleraceus* L., *Sp. Pl.* 2: 794 (1753)

Type: Europe, Herb. Linn. 949.6; lecto: LINN, *fide* L.Boulos, *Bot. Not.* 126: 155 (1973).

[*Sonchus tenerrimus auct. non* L.: D.A.Cooke in J.P.Jessop & H.R.Toelken (eds), *Fl. S. Australia* 4th edn, 3: 1653 (1986), *p.p.*; J.A.Jeanes in N.G.Walsh & T.J.Entwisle (eds), *Fl. Victoria* 4: 684 (1999), *p.p.*]

Annuals or biennials to c. 1.8 m high, with rosette variously developed. Leaves to c. 25 cm long, with l:w ratio commonly c. 2–10, divided or not, thin or slightly coriaceous, always ± pliant along margin; base above mid-stem strongly stem-clasping with auricles usually sagittate, sometimes slightly to strongly downturned, but not arching back toward apex; margin variably denticulate, with spiny tips 0.5–1 mm long, generally not prickly, or margin entire; divided leaves pinnatisect, occasionally almost bipinnatisect, with up to 5 spreading to retrorse primary lateral segments per side; terminal segment often much larger than lateral segments; uppermost leaves variously shaped. Capitula mostly several; involucre 8–13 mm long, 3–6 mm diam.; outer and intermediate bracts ovate–lanceolate. Florets: ligule 5–8 mm long, ± equal to tube; style pubescence dark. Achenes oblanceolate, 2.2–3.2 mm long, 0.5–1.0 mm wide, moderately compressed, not obviously winged, transversely wrinkled; central achenes reddish-brown and marginal ones pale yellow; margin minutely scabridulous. Pappus 5–8 mm long. *Sow Thistle*.

Notes: Native to Europe. Occurs throughout Australia, but more common in the southern half corresponding to the degree of human activity. A widespread weed in many parts of the world. Grows in a wide variety of soils predominantly in disturbed environments. Flowers most of the year, particularly spring to autumn.

This species is extremely variable in leaf shape and its shape may resemble that of *S. asper*. However, unlike in *S. asper*, the auricles are not strongly rotated and are commonly sagittate rather than rounded, and the uppermost leaves sometimes have an entire or nearly entire margin. Some forms of *S. asper* have prickly leaves, whereas *S. oleraceus* is generally not prickly. Forms with lateral leaf-segments somewhat constricted proximally or with linear segments have in recent state floras been identified as *S. tenerrimus* L., a species native to the Mediterranean, but *S. tenerrimus* is a generally more delicate plant with leaves that become abruptly petiole-like distal to the amplexicaul base and with more numerous lateral leaf-segments that are more strongly constricted proximally. Furthermore, the ligules of *S. tenerrimus* are clearly longer than the corolla-tube unlike in *S. oleraceus*, and the receptacle has a more persistent wool.

Sonchus oleraceus commonly occurs with *S. asper* and is likely to hybridise with it.

Representative specimens: WESTERN AUSTRALIA: Mt Lawley Golf Course, Inglewood, *B.J.Lepschi & T.R.Lally 1774* (CANB, PERTH). NORTHERN TERRITORY: Muranji Rockhole, Mt Winter, *B.G.Thomson 1565* (DNA). SOUTH AUSTRALIA: c. Mortlock Expt. Stn, Mintaro, *D.E.Symon 6704* (AD, CANB). QUEENSLAND: side road 6.5 km north of Goondiwindi, *A.R.Bean 17800* (BRI). NEW SOUTH WALES: 53 km west of Nyngan on Cobar road, *G.M.Cunningham 902* (NSW). VICTORIA: Ulupna Is., Murray R., 29 km north of Numurkah P.O., *A.C.Beauglehole 64251* (MEL). TASMANIA: Waterhouse Is., 17 Dec. 2002, *S.Harris & A.Connolly* (HO, MEL).

2. **Sonchus asper* (L.) Hill, *Brit. Herb.* 1: 47 (1769)

Sonchus oleraceus var. *asper* L., *Sp. Pl.* 2: 794 (1753).

Type: Europe; Herb. Burser VI: 14; lecto: UPS, *fide* L.Boulos, *Taxon* 47: 368 (1998)

[*S. asper* subsp. *glaucescens* auct. non (Jord.) Ball (1878): D.A.Cooke in J.P.Jessop & H.R.Toelken (eds), *Fl. S. Australia* 4th edn, 3: 1654 (1986), p.p.; J.A.Jeanes in N.G.Walsh & T.J.Entwisle (eds), *Fl. Victoria* 4: 698 (1999), p.p.]

Annuals to c. 1.2(–2) m high, with rosette variously developed. Leaves to c. 30 cm long, with l:w ratio 1–5 (–8), divided or not, thin to coriaceous, sometimes semi-rigid at margin; base above mid-stem strongly stem-clasping, with auricles rounded basally, strongly downturned and arching back toward apex; margin with frequent denticulations or teeth, with spiny tips 0.5–5 mm long, somewhat prickly or not; divided leaves lobate to subpinnatisect, with up to 8 usually spreading or slightly retrorse lobes or segments per side; terminal segment usually not or hardly larger than lateral segments; uppermost leaves mostly ovate–narrow-ovate. Capitula few to many; involucre 8–13 mm long, 3–8 mm diam.; outer and intermediate bracts ovate–lanceolate. Florets: ligule 4–5 mm long, shorter than tube; style pubescence dark. Achenes elliptic or slightly obovate, 2.0–3.2 mm long, 0.8–1.8 mm wide, strongly compressed, distinctly winged, without transverse wrinkles; central achenes orange-brown and marginal ones pale yellow; margin usually minutely scabridulous. Pappus 7–9 mm long.

Notes: Native to Europe. Occurs in far south-western Western Australia, south-eastern Australia from Brisbane south through eastern New South Wales to Victoria, and from Victoria west to south-eastern South Australia, and in Tasmania. A widespread weed in other parts of the world. Grows mostly in disturbed environments, in urban areas, woodland and forest. Flowers all year, mostly spring–autumn.

Sonchus asper is highly variable in leaf dissection, prickliness and degree of rosette development, with an apparent continuum of variation evident in these characters. At one extreme, there is a form with little or no rosette development and thin, undivided or shallowly divided, non-prickly leaves. At the other extreme there is a robust form with stouter thicker-walled stems, a better developed rosette, and coriaceous prickly leaves. Prickly-leaved forms of *S. asper*, including the form described above, have in recent years been referred to subsp. *glaucescens* (Jord.) Ball. However, according to Boulos (1976), subsp. *glaucescens* is a biennial with dense, recurved spinules on the margins and ribs of the achenes. All Australian plants appear to be annuals, albeit with different degrees of rosette development, and no significant variation in achene morphology has been identified.

Representative specimens: WESTERN AUSTRALIA: c. 50 km SSE of Kojonup on road to Mt Barker township, *B.J.Lepschi & T.R.Lally* 2289 (CANB, PERTH). SOUTH AUSTRALIA: Myponga Conservation Park, *D.E.Murfet* 394 (AD); Cherry Gardens, Frith St, *D.E.Symon* 13387 (AD, CANB). QUEENSLAND: 9 km along Spring Ck Rd towards Killarney from Teviot Falls Lookout, *G.N.Batianoff* 20011123 & *D.Halford* (BRI). NEW SOUTH WALES: Perisher Valley, Kosciuszko area, Aug. 1985, *J.Mallen s.n.* (CANB). AUSTRALIAN CAPITAL TERRITORY: corner of Haydon Drive and Belconnen Way, Bruce, *L.G.Adams* 3313 (CANB). VICTORIA: Yarrowonga Regional Park, *A.C.Beauglehole* 81843 (MEL). TASMANIA: Clarkes Is., Bass Strait, Dec. 1966, *J.Whinray s.n.* (MEL).

3. *Sonchus hydrophilus* Boulos, in Hj.Eichler, *Fl. South Australia*, suppl. 331 (1965)

S. asper f. *hydrophilus* (Boulos) J.Kost., *Blumea* 23(1): 165 (1976).

Type: Fleurieu Peninsula, in watercourse three miles (ca 5 km) north of Victor Harbor, South Australia, 8 Jan. 1945, *J.B.Cleland s.n.*; holo: AD *n.v.*, *vide* L.Boulos, *loc. cit.*

Annuals or ?biennials to c. 1.8 m high, with rosette well-developed. Leaves to c. 40 cm long; stem leaves with l:w ratio c. 3–10, undivided or lobate to deeply lobate, thin to mildly coriaceous; base above mid-stem strongly stem-clasping, with auricles rounded basally, strongly downturned and arching back toward apex; margin usually with frequent denticulations with spiny tips 1–3 mm long, not or slightly prickly; lobate leaves with up to 6 spreading to retrorse lobes per side; uppermost leaves \pm lanceolate. Capitula several to many; involucre 8–12 mm long, c. 4–9 mm diam.; outer and intermediate bracts narrow-ovate or more often lanceolate. Florets: ligule c. 5–7 mm long, shorter than tube; style pubescence dark. Achenes elliptic or oblong-elliptic, 2.8–4.2 mm long, 1.3–2.0 mm wide, strongly compressed, distinctly winged, without transverse wrinkles, generally all mid to dark chocolate-brown; margin smooth or minutely scabridulous. Pappus 7–9 mm long. *Native Sow-thistle*.

Notes: Occurs in south-western Western Australia from south of Geraldton SE to Esperance, in central Australia south to southern South Australia, and in south-eastern Australia from the Carnarvon Ranges in south-eastern Queensland SSW through eastern New South Wales to Victoria, and in Tasmania. Also occurs in New Zealand and New Guinea. Usually associated with streams and lakes in herbfields, woodland, or forest. Flowers mostly spring to autumn.

Similar to *Sonchus asper* in leaf and achene morphology. It can usually be distinguished from this taxon by the leaves which generally have a higher length to width ratio, and by the achenes which are larger, usually all chocolate brown, with broader wings and with shorter asperities on ribs and margins. *Sonchus hydrophilus* is also similar to the coastal species *Actites megalocarpus* in leaf and achenial morphology, but the latter is rhizomatous, its capitula and achenes are longer, and the achenes usually paler and more tapered distally.

Representative specimens: WESTERN AUSTRALIA: 2.3 km south of Reagans Ford on road to Muchea (Brand Hwy), *B.J.Lepschi & T.R.Lally 1713* (CANB, MEL, PERTH). NORTHERN TERRITORY: Churnside Ck Crossing, Petermann Ra., *C.R.Dunlop 1966* (DNA). SOUTH AUSTRALIA: Dalhousie Springs, Far North, *D.E.Symon 13159* (AD, CANB, DNA). QUEENSLAND: c. 4.8 km SE of The Gums, *R.W.Johnson 552* (BRI, CANB). AUSTRALIAN CAPITAL TERRITORY: shores of Lake Burley Griffin, Canberra, *M.Gray 6742* (CANB, NSW). NEW SOUTH WALES: Gerringong, *F.A.Rodway 5209* (NSW). VICTORIA: 1–1.5 km downstream from Kirks Bridge Rd crossing of Little R., *V.Stajsic 871* (MEL). TASMANIA: Hogan Is., Jan. 1968, *per N.Scarlett, McCoy Society* (MEL).

10. ACTITES Lander, *Telopea* 1: 130 (1976)

Perennial herbs, rhizomatous, branching. Hairs simple, glandular and eglandular. Leaves all cauline after first season; marginal teeth spinulose, hardly prickly. Inflorescences cymose. Capitula pedunculate; involucre bracts multiseriate, soft and reflexed at maturity. Florets: ligule narrow-oblong, yellow, sometimes purplish towards base. Achenes homomorphic, strongly compressed, unbeaked. Pappus of bristles, partially persistent; bristles nearly smooth or scabridulous, of two types within a pappus.

A monotypic genus occurring in coastal regions of southern Australia. Closely related to *Sonchus*, but its achene morphology, perennial life history, rhizomatous habit and larger capitula distinguishes it from species of *Sonchus* in Australia. Anecdotally, however, some are dissatisfied with the placement of this species in *Actites*. Cooke (1986) treated it as a *Sonchus* in *Flora of South Australia*; however, more recent floras have retained the genus *Actites*. This issue is further discussed in the notes for the species.

Actites megalocarpus (Hook.f.) Lander, *Teloepa* 1: 129 (1976)

Sonchus asper var. *megalocarpus* Hook.f., *Fl. Tasman.* 1: 227 (1856); *S. megalocarpus* (Hook.f.) J.M.Black, *Fl. S. Australia* 661 (1929); *Embergeria megalocarpa* (Hook.f.) Boulos, in Hj.Eichler, *Fl. S. Australia* 2nd edn, suppl. 333 (1965).

Type: 'near the sea on the north shore of the island', Tasmania, *R.C.Gunn* 845; holo: K *n.v.*

S. asper var. *littoralis* J.M.Black, *Naturalised Fl. S. Australia* 104 (1909), *nom. illeg. non* Kirk (1895). Type: Precise locality unknown, South Australia, *J.M.Black*; neo: NSW; isoneo AD, *fide* N.S.Lander, *op. cit.* 130.

Perennials to c. 0.6 m high. Leaves often crowded, to 26 cm long, with l:w ratio 3–7, undivided or lobate, somewhat coriaceous; base above mid-stem cordate or sagittate; margin entire, denticulate or dentate; lobate leaves with 3–6 spreading to slightly retrorse lobes per side. Capitula few to several; involucre 12–20 mm long, c. 6–12 mm diam.; outer and intermediate bracts narrow-ovate to lanceolate, with hyaline margin very slender, often bearing spine-like hairs along midrib; inner bracts with distinct hyaline margin; receptacle glabrous or pit margin fimbriate. Florets: ligule 6–10 mm long, slightly shorter than tube; style pubescence often dark. Achenes 4.0–8.0 mm long, compressed, pale to dark brown, smooth, except for 3 longitudinal ribs, with these ribs often inflated; margin smooth, rounded. Pappus 7–13 mm long, white. *Dune Thistle*.

Notes: Occurs on the eastern and southern coastlines of mainland Australia from Toorbul in southern Queensland south and then west to Middleton beach in south-western Western Australia, and on the south-eastern coast of Tasmania. Grows on coastal sand dunes and cliffs. Flowers most of year.

Although the best classification for this species is perhaps still a moot point, it is considered best to retain it in *Actites* at this point. Further phylogenetic studies will hopefully elucidate relationships between *Actites*, *Sonchus* and other related genera. Molecular studies by Kim, Lu & Lepschi (2004), although not conclusive, placed *A. megalocarpus* in a separate clade to a clade containing the three Australian species *S. hydrophilus*, *S. asper* and *S. oleraceus*.

Apart from features given in the key, *Actites megalocarpus* tends to have leaf-bases that are less stem-clasping, hairs when developed on the peduncle and outer and intermediate bracts that are always spine-like and more robust, and the margin of the achenes rounded and smooth rather than with a sharp edge and scabridulous. The longitudinal ribs of the achenes often become inflated in this species and this was one of the achenial features Lander (1976) used to distinguish the new genus from *Sonchus*. This inflation of ribs has, however, been seen in *S. hydrophilus*, although to a lesser extent. The pappus of dimorphic bristles corresponds to the morphology seen in *Sonchus*. The distinctive glandular hairs seen in species of *Sonchus* in Australia, particularly on the peduncle, have not been seen in *Actites megalocarpus*.

The epithet has changed from *megalocarpa* due to a recent ICBN decision to treat all genera ending in "ites" as masculine.

Representative specimens: WESTERN AUSTRALIA: west of Dempster Hill, Esperance, 16 Nov. 1950, *J.H.Willis* (MEL). SOUTH AUSTRALIA: Kangaroo Is., West Bay, *R.J.Bates* 30273 (AD, MEL). QUEENSLAND: 0.5 km south of Eurong, Fraser Is., *A.R.Bean* 8066 (BRI). NEW SOUTH WALES: Kioloa Beach, c. 1 km north of Kioloa, South Coast, *I.R.Telford* 10159 (AD, CANB, MEL). VICTORIA: Point Nepean, 27 Nov. 1963, *J.D.M.Pearson* (MEL). TASMANIA: Sanctuary Bay, *A.Moscal* 5631 (AD, HO, MEL).

11. LAUNAEA Cass., *Dict. Sci. Nat.* 2nd edn, 25: 321 (1822)

Annual to perennial, sometimes stoloniferous herbs, branching or not. Hairs \pm lacking. Leaves predominantly basal. Inflorescences solitary or cymose. Capitula pedunculate; involucre bracts multiseriate. Florets: ligule yellow. Achenes homomorphic, not or hardly compressed, unbeaked. Pappus of bristles, ?persistent; bristles, scabridulous, uniform within a pappus.

A genus of 54 species, principally from Africa and south-western Asia, but also in the Mediterranean region. The style-branches in this genus have relatively long hairs, a feature it shares with *Reichardia* according to Bremer (1994).

Launaea sarmentosa (Willd.) Kuntze, *Revis. Gen. Pl.* 1: 350 (1891)

Prenanthes sarmentosa Willd., *Phyt.* 10, t. 6(2) (1794).

Type: India, 1793, *Klein*; holo: B-W 14595.

Herb to c. 0.1 m high, developing stolons to c. 1 m long, rooting at nodes. Leaves all basal, undivided, to 10 cm long, with l:w ratio c. 3–4; margin entire or denticulate; secondary rosettes with much smaller leaves; base attenuate. Capitula solitary at nodes; involucre 4–6 mm diam.; outer bracts c. 8, ovate, c. 3 mm long, with hyaline margin distinct; intermediate bracts c. 6, reaching c. halfway along involucre; inner bracts c. 8, 10–15 mm long. Florets: ligule c. 5 mm long; style pubescence pale or darkened. Achenes narrow-obloid, 4–5 mm long, with ribs prominent, brown, glabrous. Pappus caducous, c. 7 mm long, white; bristles scabridulous.

Notes: Occurs in far western Western Australia predominantly between Exmouth and Karratha and on adjacent islands. Also native to areas abutting the Indian Ocean and South China Sea including countries in Africa and southern Asia. Grows on coastal sands. Flowers most of the year.

A distinctive species with its stoloniferous habit. According to Kilian (1997), who produced a monograph on the genus *Launaea*, the species has been used as a salad vegetable in several countries.

Representative specimens: WESTERN AUSTRALIA: Monte Bello Is., 13 Nov. 1953, *Hill* (CANB); Thevenard Is., *M. White MRW028* (CANB, PERTH).

12. REICHARDIA Roth, *Bot. Abh. Beobacht.* 35 (1787)

Annual or perennial herbs, branching. Hairs \pm lacking. Leaves basal and cauline. Inflorescences solitary or cymose. Capitula pedunculate; involucre bracts multiseriate, soft, not convex, infolded at maturity. Florets: ligule yellow. Achenes homomorphic or inner ones abortive, not compressed, unbeaked. Pappus of bristles, not persistent; bristles \pm smooth, uniform within a pappus.

A genus of 8 species from the Mediterranean region. A feature of the two species in Australia is the relatively broad outer and intermediate involucre bracts that are cordate-based and with a conspicuous hyaline margin.

Key to species

Leaf-margin crowded-denticulate; outer bracts 5–7 mm long; outer and intermediate bracts overlapping, with hyaline margin 1–2 mm wide; ligules purple-red basally..... **1. *R. tingitana***

Leaf-margin entire or nearly so; outer bracts c. 3 mm long; outer and intermediate bracts not or hardly overlapping, with hyaline margin 0.3–0.5 mm wide; ligules not purple-red basally **2. *R. picroides***

1. **Reichardia tingitana* (L.) Roth, *Bot. Abh. Beobacht.* 35 (1787)

Scorzonera tingitana L., *Sp. Pl.* 2: 791 (1753); *Picridium tingitanum* (L.) Desf., *Fl. Atlant.* 2: 220 (1799).

Type: 'Habitat in Tingide', [north-western Africa]; *n.v.*

[*Reichardia picroides auct. non* (L.) Roth: J.M.Black, *Fl. S. Australia* 2nd edn, 4: 944 (1957)]

Annuals or biennials to c. 0.7 m high, branching, glabrous, often glaucous. Leaves forming a rosette, to 17 cm long, with l:w ratio 3–5, divided or not; margin crowded-denticulate often minutely, also commonly remotely dentate, sometimes weakly spinulose; divided leaves with 2–5 slightly antrorse segments per side; cauline leaves few to several, becoming lanceolate upwards; base becoming cordate-auriculate upwards, somewhat stem-clasping. Capitula solitary or few; peduncle dilating distally; involucre 10–14 mm long, c. 7–10 mm diam.; outer bracts c. 8, broad-ovate, 5–7 mm long, with hyaline margin 1–2 mm wide, with a short black sub-apical spur; longer intermediate bracts extending over half way; inner bracts with hyaline margin distinct but narrower than in outer bracts. Florets: ligule 16–20 mm long, purple-red at base; style pubescence pale or slightly darkened. Achenes broad-obloid, 1.5–4 mm long, not tapering apically, sometimes squarish in transverse section, deeply verrucose or transversely ridged; inner ones pale, outer ones light or dark brown, glabrous. Pappus c. 7–9 mm long, white, detaching as a unit; bristles fine, smooth. *False Sow-thistle, Reichardia.*

Notes: Native to the Mediterranean region. Occurs on the west coast of Western Australia from Shark Bay SSE to Perth, in southern Western Australia NE of Esperance, and in south-eastern Australia from south-central South Australia east to Deniliquin in south-central New South Wales. Grows in various environments, predominantly semi-arid or coastal, particularly in disturbed sites such as roadsides, including coastal dunes, in sand, loams, clays and gypsum, in herbfields, shrubland and woodland. Flowers mostly late winter–early summer, also other times.

Readily recognised by its large capitula, long ligules, and overlapping, broad-margined outer bracts. A very common weed in south-eastern South Australia.

Representative specimens: WESTERN AUSTRALIA: Near Seven Mile Beach north of Dongara, *N.S.Lander 1299* (MEL, PERTH). SOUTH AUSTRALIA: c. 45 m west of upper part of beach, above south side of Dry Ck., Pine Point Foreshore Reserve, *R.V.Smith 86/07* (AD, CANB, HO, MEL, NSW). NEW SOUTH WALES: Near Tori HS remnant, just north of Tori Lake, c. 6 km NE of 'Tylden', c. 35 km NNE of Balranald, *P.G.Kodala 461, G.Chapple, R.G.Coveny & H.McPherson* (AD, BRI, CANB, MEL, NSW). VICTORIA: c. 0.4 km west of Boinka between Underbool & Murrayville, west of Ouyen, *R.V.Smith 69/32* (AD, CANB, HO, MEL, NSW).

2. **Reichardia picroides* (L.) Roth, *Bot. Abh. Beobacht.* 35 (1787)

Scorzonera picroides L., *Sp. Pl.* 1: 792 (1753).

Type: cult., locality unknown, Herb. Linn. 947.11; LINN *n.v.*, *fide* S.A.Alavi in S.M.H.Jafri & A.El-Gadi, *Fl. Libya* 107: 376 (1983).

Similar to *R. tingitana* but differing most markedly in the following (based on limited Australian material): Leaf-margin entire or nearly so. Involucre c. 10 mm long, c. 5–6 mm

diam.; outer bracts c. 3 mm long, with hyaline margin 0.3–0.5 mm wide, with subapical spur very small. Florets: ligule not purple-red basally. Achenes 2–3 mm long, with central ones smooth.

Notes: Native to southern Europe. Recorded once from Mt Melville in far south-western Western Australia where common. Growing on slope in grey gravelly sand over granite in forest. Flowers summer.

This species appears likely to be well established at Mt Melville. A newly recognised naturalised species in Australia.

Representative specimens: WESTERN AUSTRALIA: Mt Melville, *P.Foreman 161* (PERTH).

13. *MICROSERIS* D. Don, *Philos. Mag. Ann. Chem.* 11: 388 (1832)

Perennial herbs, scapose, largely glabrous. Hairs simple, eglandular. Leaves all basal. Inflorescences of solitary capitula. Capitula pedunculate; involucre bracts multiseriate; soft and reflexed at maturity. Florets: ligule yellow. Achenes homomorphic, not compressed, unbeaked. Pappus of scales (sometimes scales hardly widened at base), bristle-like distally, persistent, homomorphic; scales barbellate (bristle part), uniform within a pappus.

Notes: A feature of this genus, in at least Australia taxa, not mentioned in recent state floras is the presence on the scapes and sometimes leaves of minute translucent cupular discs variably elevated on filamentous stalks. Although usually inconspicuous, close inspection usually reveals the presence of at least some of these distinctive structures. There is still uncertainty regarding the taxonomy of *Microseris* in Australia. This genus was not assessed in detail by the author and the reader is referred to recent workers and publications indicated below. Historically a single species has been recognised for Australia, *M. lanceolata* (Walp.) Sch. Bip. However, Sneddon (pers. comm.), who studied the genus in Australia and New Zealand from the late 1970s has indicated the presence of two species in Australia, *M. scapigera*, based on a type from New Zealand, and *M. lanceolata* based on a type from Tasmania. A recent paper by Vijverberg, Lie, & Bachmann (2002) identified four morphological groups among populations in Australian and New Zealand. Although offering several taxonomic possibilities, the authors did not make any taxonomic decisions. Jeanes (1999) had earlier presented an informal classification in *Flora of Victoria* indicating the occurrence of three species of *Microseris* in Victoria based on distinctions in root, cypsela (achene) and pappus morphology. Unfortunately the treatment of Jeanes was not assessed by Vijverberg, Lie, & Bachmann. It appears clear, however, that the “fine-pappus” form of the latter’s study corresponds to *Microseris* sp. 1 *sensu* Jeanes, the “alpine form” corresponds to *Microseris* sp. 2 *sensu* Jeanes, and the “murnong” form corresponds to *Microseris* sp. 3 *sensu* Jeanes. Costin *et al.* (2000) reached the same conclusions regarding the latter two forms. Vijverberg, Lie, & Bachmann collected only four populations of their fourth form “coastal”, all of these from New Zealand.

14. *HIERACIUM* L., *Sp. Pl.* 2: 799 (1753)

Perennial herbs, often with long leafy stolons, branching. Hairs usually of two or more types including glandular, eglandular, stellate, and plumose. Leaves all or mostly basal. Inflorescences solitary, cymose or paniculate. Capitula pedunculate; involucre bracts multiseriate or approaching biseriate, soft and reflexed at maturity. Florets: ligule yellow, rarely orange, green or white. Achenes homomorphic, not compressed, unbeaked. Pappus

of bristles, somewhat persistent, bristles scabrid-barbellate, \pm uniform within a pappus, or length variable.

A complex genus of hundreds of species or up to 5000 taxa if apomictic microspecies are counted. Mostly from temperate regions and mostly Europe. Although four species have been recorded in Australia, all of these also naturalised in New Zealand, only one is considered naturalised at this time.

Hieracium praealtum Vill. ex Gochnat subsp. *bauhinii* (Besser) Petunnikov is known from a single population near Falls Creek in north-eastern Victoria (*N.G. Walsh* 5962 MEL). *Hieracium pilosella* L. has been recorded from the Brindabella Ra. in the Australian Capital Territory (1992, *SGAP s.n.* CANB). and from near Oatlands in south-eastern Tasmania (*A. Woolley* HO). *Hieracium murorum* L. has been recorded from the Blue Mountains in central-eastern New South Wales (*M. Sherring s.n.* 1998 MEL, NSW). Another population of plants, of uncertain identity but probably allied to *H. murorum* has also been recorded from the Blue Mountains (*C.H. Barker* 8 & *J.R. Hosking* CANB, MEL, NSW).

Key to species

- 1 Stolons absent; basal leaves with an abrupt transition from petiole to blade; upper stem and peduncles lacking long non-glandular hairs; achenes > 2.5 mm long, the ribs apically confluent in an obscure ring; pappus-bristles in two rows, the hairs unequal ***H. murorum* (see notes above)**
- 1: Leafy stolons present; basal leaves with tapering gradually to base; achenes < 2.5 mm long, the ribs projecting distally to form a crenulate apex; pappus hairs in 1 row with a few shorter than the rest
 - 2 Capitula solitary; stems to 15 cm high, naked or with scale-like bracts; lower surface of leaves with a moderate to dense tomentum of stellate hairs ***H. pilosella* (see notes above)**
 - 2: Capitula several per stem; stems to 50 cm high, typically with 1 or more leaves; lower surface of leaves not tomentose, stellate hairs absent or rare
 - 3 Leaves green; ligule deep orangish turning purple when dry; spreading hairs on upper stem 4–5 mm long, dark, emerging from a dense tomentum of stellate hairs ***H. aurantiacum***
 - 3: Leaves slightly glaucous; ligule yellow, remaining yellow when dry; spreading hairs on upper stem c. 3 mm long, pale except for base, emerging from a sparse to scattered indumentum of stellate hairs ***H. praealtum* (see notes above)**

**Hieracium aurantiacum* L. subsp. *carpathicola* Nägeli & Peter, *Hierac. Mitt.-Eur.* 1: 290 (1885)

Type: *n.v.*

Hieracium brunneo-croceum Pugsley, *J. Bot.* 59: 67 (1921). Type: Exsicc. Hier. Naegel. nos 17, 80, 122; *E.S. Marshall* 4190; *n.v.*, *fide* P.D. Sell & C. West, in T.G. Tutin *et al.* (eds), *Fl. Europaea* 4: 374 (1976).

Stoloniferous perennials to c. 0.4 m high. Basal leaves with l:w ratio c. 3–6, not petiolate, not divided; margin entire or denticulate; very long eglandular hairs scattered on both surfaces; cauline leaves 1–3, strongly reducing upwards; base not dilated or stem-clasping. Capitula several; peduncle densely hairy with dark eglandular hairs c. 4–5 mm long and short glandular hairs emerging from an indumentum of whitish stellate hairs;

involucre 5–8 mm long; bracts with eglandular hairs and glandular hairs, with stellate hairs few or absent; outer bracts 6–8, narrow-lanceolate, c. 2 mm long. Florets: ligule 5–10 mm long, orange, drying purplish; style pubescence dark. Achenes obloid–obovoid, 1.5–2 mm long, with prominent ribs terminating distally as a projection, purplish. Pappus uniseriate, 4–6 mm long, white; bristles brittle, mostly of similar length. *Orange Hawkweed*.

Notes: Native to northern and central Europe. Occurs in eastern Victoria around Falls Creek and in southern Tasmania. Grows in disturbed environments at alpine and lower altitudes. Flowers summer.

The type subspecies has a longer involucre and does not develop the long, leafy stolons of subsp. *carpathicola*.

Representative specimens: VICTORIA: c. 50 m east of P.O., Falls Ck, *J.R.Hosking 1829* (CANB, MEL, NSW). TASMANIA: Old Village, Butlers Gorge, 23 Jan. 1963, *P.A.Tyler* (HO); Waddamana Rd near Shannon R. Bridge, 18 Dec. 1989, *R.J.Fensham* (HO).

15. TOLPIS Adans., *Fam. Pl.* 2: 112 (1763)

Annual or perennial herbs, branching. Hairs simple, eglandular. Leaves mostly basal. Inflorescences cymose or paniculate. Capitula pedunculate; involucre bracts ± biseriate; inner bracts hardened, strongly convex and erect at maturity. Florets: ligule yellow or purplish-brown. Achenes dimorphic, not compressed, unbeaked. Pappus of bristles and scales, persistent, dimorphic; bristles and scales scabridulous, sometimes of two types within a pappus.

A genus of c. 20 species from the Mediterranean region, South Africa and America. Apart from characters given in the key to genera, the two species of *Tolpis* in Australia are characterised by being much taller than broad, and with inflorescences where the overtopping of the primary or medial capitulum by the lateral capitula is very marked.

Key to species

Outer involucre bracts longer than the inner bracts, divergent; ligules at least partly purple; pappus with 0 (marginal achenes), 2 or 4 bristles..... **1. *T. barbata***
Outer involucre bracts shorter than the inner bracts, appressed; ligules all yellow (drying greenish); pappus with c. 8 bristles in all achenes **2. *T. virgata***

1. **Tolpis barbata* (L.) Gaertn., *Fruct. Sem. Pl.* 2: 372 (1791)

Crepis barbata L., *Sp. Pl.* 2: 805 (1753).

Type: 'Habitat in Monspelii, Vesuvii, Siciliae, Messanae', western Europe; *n.v.*

Tolpis umbellata Bertol., *Rar. Lig. [Ital.] Pl.* 1: 13 (1803). Type: 'Repitur Sarzanae ad viarum margines circa S. Francisci coenobium; tum in collibus dictis sarzanello, & Montedarmd.', Italy, *coll. unknown; n.v.*

Annuals to c. 0.6 m high, with appressed-cobwebby or woolly indumentum on stems and capitula, glabrescent, with sparse to dense septate hairs on leaves, or leaves ± glabrous. Basal leaves often persistent at anthesis, to c. 11 cm long, with l:w ratio c. 4, undivided or lobate with lobes antrorse; base attenuate; margin entire, denticulate or dentate; cauline leaves 1–4, becoming somewhat narrower upwards, with base attenuate. Capitula 2–7; peduncle of primary capitulum to c. 3 cm long, c. 1 mm diam.; peduncle of lateral capitula to 12 cm long, mostly c. 0.3–0.6 mm diam.; involucre 8–10 mm long, c. 2–4 mm diam.; outer bracts 15–25, linear, 8–10 mm long, setaceous; inner bracts c. 16–22, c. 5 mm long, with midrib often developing tubercles, with hyaline margin distinct

and vestigial in alternate bracts. Florets: ligule c. 2–5 mm long, yellow with a purple band or central-most florets entirely purple; style pubescence pale. Achenes c. obloid, 1.3–1.7 mm long, not tapering distally; marginal achenes housed within concavity of hardened inner bract at maturity, densely brown-hairy; central achenes with numerous close-spaced ribs, glabrous. Pappus white; bristles scabridulous; pappus of marginal achenes c. 0.4 mm long, of scales of varying length; pappus of central achenes 3–5 mm long; bristles 2–4, wider at base; intervening shorter scales more numerous, c. 0.3 mm long. *Yellow Hawkweed*.

Notes: Native to southern Europe. Occurs in far south-western Western Australia mostly south from Perth, far south-eastern Queensland, eastern New South Wales, Victoria, the Mount Lofty Ra. of south-eastern South Australia, and eastern Tasmania. Also recorded once in Alice Springs, Northern Territory. Grows on roadsides and other disturbed sites in woodland and forest. Flowers mid-spring–summer.

The name *Tolpis umbellata* has in the past been applied to Australian collections. Tutin (1976) refers to *T. umbellata* as a variant of *T. barbata* with relatively small capitula and all the florets pale yellow. Australian specimens all appear to have small capitula as in *T. umbellata*, but with pigmentation of the corolla typical of *T. barbata sensu lato* (outer florets yellow with a purple band at the base of the ligule, and the percentage of purple progressively increasing towards the centre of the capitulum).

Representative specimens: WESTERN AUSTRALIA: Bokerup Nature Reserve, *G.J.Keighery & N.Gibson 2433* (PERTH). NORTHERN TERRITORY: Alice Springs, 15 Oct. 1950, *E.Gaub* (CANB). SOUTH AUSTRALIA: Mt Lofty Ra., Crafers, 20 Jan. 1971, *E.H.Ising s.n.* (AD). QUEENSLAND: main picnic area, Girraween Natl Park, 22 km south of Stanthorpe (BRI). NEW SOUTH WALES: Traffic Education Centre, Armidale, *R.G.Coveny 16367 & A.Whalen* (BRI, CANB, NE, NSW). VICTORIA: 9.7 km west from Whitfield on the Mansfield Rd, *I.C.Clarke 2808* (AD, CANB, HO, MEL); Wonnangatta Stn, *E.A.Chesterfield 3593* (BRI, CANB, MEL). TASMANIA: Hill to east of Bonneys Plains Rd, *A.M.Gray 783* (HO, MEL).

2. **Tolpis virgata* (Desf.) Bertol., *Rar. Lig. Pl.* 1: 15 (1803)

Crepis virgata Desf., *Actes Soc. Hist. Nat. Paris* 1: 37, t. 8 (1792).

Type: Tunisia; syn: *n.v.*; Algeria; syn: *n.v.*

Tolpis altissima Pers., *Syn. Pl.* 2: 377 (1807). Type: *n.v.*

Similar to *T. barbata* but differing most markedly in the following: Biennials or perennials to c. 1.0 m high. Involucre 5–8 mm long; outer bracts 1.5–3.5 mm long; inner bracts with midrib not developing tubercles. Florets: ligules not purple basally or throughout. Achenes homomorphic, 1.5–2 mm long, all glabrous. Pappus: bristles c. 8, present in all achenes.

Notes: Native to the Mediterranean region. Occurs in far south-western Western Australia between Jarrahwood and Boyup Brook, SE of Bunbury. Grows in various soils in woodland and forest. Flowers summer–early autumn.

First recorded in 1963, and currently recorded from five different localities. Intraspecific taxa have been described for this species based on the number of pappus bristles. Specimens in Australia appear uniform in this respect and conform to the typical variety or subspecies.

Representative specimens: WESTERN AUSTRALIA: Vasse Hwy, Nannup to Jarrahwood, *G.J.Keighery 14363* (PERTH); KC4, Kingston Forest Block, *E.D.Middleton K339* (PERTH).

16. HEDYPNOIS Mill., *Gard. Dict. Abr.* 4th edn (1754)

Annual herbs, mostly branching. Hairs furcate or simple. Leaves predominantly basal. Inflorescences solitary or cymose. Capitula pedunculate; involucre bracts biseriata; inner bracts hardened, strongly convex and erect at maturity. Florets: ligule slightly oblanceolate, yellow. Achenes \pm homomorphic, not compressed, unbeaked. Pappus of scales and bristles, somewhat persistent, dimorphic; bristles and scales scabridulous, sometimes of two types within a pappus.

A genus of two species from the Mediterranean region and south-western Asia.

**Hedypnois rhagadioloides* (L.) F.W.Schmidt, *Samml. Phys.-ökon. Aufs.* 1: 279 (1795).

Hyoseris rhagadioloides L., *Sp. Pl.* 2: 809 (1753).

Type: Southern Europe, Herb. Linn. 957.9; holo: LINN *n.v.*, *fide* B.Nordenstam, *op. cit.* 139.

Annuals to c. 0.4 m high, often < 0.2 m high. Scattered hairs on leaves, distal peduncle and involucre bracts, non-glandular, with those of leaves and stems minutely bifurcate. Basal leaves variably persistent, to c. 20 cm long, with l:w ratio 3–12, entire, lobate or pinnatisect, with segments somewhat antrorse; margin entire or dentate; cauline leaves (0–)1–4, undivided, with base becoming broad-cuneate, hardly stem-clasping. Capitula solitary or few; involucre c. 3 mm diam.; outer bracts 6–10, linear-lanceolate or lanceolate, 2–3 mm long; inner bracts 10–12, 5–9 mm long, variously bristly, or glabrous, hardened and incurved or erect at maturity; hyaline margin narrow or broad in alternate bracts. Florets: ligule c. 3–6 mm long; style pubescence pale. Achenes narrow-obloid, curved, 4.5–9.0 mm long, with ribs inconspicuous, minutely scaly in lines; marginal achenes housed within concavity of bract at maturity. Pappus of marginal achenes a corona of largely-fused scales, 0.5–1 mm long; pappus of central achenes: bristles usually 5, 3–6 mm long, dilated at base; intervening scales to 0.5 mm long.

Notes: Plants are variable in habit from erect to prostrate, and often become multi-stemmed from the base. The peduncle dilates to a variable extent distally, and the achenes become firmly attached to the receptacle at maturity and are somewhat enclosed by hardened incurved bracts. Two largely sympatric species occur in Australia.

Key to subspecies

- Distal peduncle and lateral parts of inner involucre bracts bearing numerous sometimes minute spreading hairs at anthesis; fruiting peduncle to 7 mm diam., 2–4 times its diam. near base subsp. *rhagadioloides*
- Distal peduncle and lateral parts of inner involucre bracts glabrous at anthesis (robust spreading hairs sometimes present medially on inner involucre bracts and/or on upper stem in a line below peduncular bracts); fruiting peduncle to 5 mm diam., 1.5–2.5 times its diam. near base subsp. *cretica*

**Hedypnois rhagadioloides* (L.) F.W.Schmidt subsp. *rhagadioloides*

Peduncle with spreading hairs distally at anthesis, sometimes minute; fruiting peduncle to 7 mm diam., 2–4 times its diam. near base; sometimes with hairs lost at this stage. Involucre 6–9 mm long, with numerous small hairs distributed over much of the stereome surface, with coarser hairs also present in midline; mature involucre often globular, with

only narrow slits between bracts. Florets: ligule 4–6 mm long, usually exceeding involucre by c. 1–2 mm. Achenes 4.5–7.0 mm long. Pappus bristles of the central achenes mostly 3–5 mm long.

Notes: Native to the Mediterranean region, the Middle East and south-western Asia. Occurs predominantly in south-eastern Australia from far south-eastern Queensland south to south-central Victoria and SW to south-central South Australia; a few occurrences in south-eastern Tasmania, far south-western Western Australia, and central Australia around Alice Springs. Grows predominantly in drier regions in sandy loam or clay soils in grassland and woodland. Flowers spring to summer.

Although sympatric with subsp. *cretica*, there is little evidence of hybridisation between the two forms. At fruiting, the shape of the involucre and degree of dilation of the peduncle helps to identify the subspecies when indumentum characters have been lost.

Representative specimens: WESTERN AUSTRALIA: Cape Leeuwin, south of Augusta, *G.J.Keighery 9200* (CANB, PERTH). NORTHERN TERRITORY: A.I.B. farm, c. 9 km south of Alice Springs, *D.J.Nelson 1968* (DNA, MEL). SOUTH AUSTRALIA: Near Bosanquet Hill, Eyre Penin., *E.N.S.Jackson 5019* (AD, MEL). QUEENSLAND: 2.2 km east of Allora along Forest Plain Rd, *A.R.Bean 10848* (BRI, MEL). NEW SOUTH WALES: Near Tori HS remnant, just north of Tori Lake, c. 6 km NE of ‘Tylden’, c. 35 km NNE of Balranald, *P.G.Kodala 462*, *G.Chapple*, *R.G.Coveny & H.McPherson* (BRI, CANB, MEL, NE, NSW). VICTORIA: c. 4 km south of Sunset Tank, ‘Sunset Country’, far north-west. *M.G.Corrick 6659 & P.S.Short* (MEL). TASMANIA: bank of R. Derwent, c. 3 km west of Plenty R. Bridge, *A.M.Gray 1068* (HO).

**Hedypnois rhagadioloides* subsp. *cretica* (L.) Hayek, in F.K.G.Fedde, *Rep. Sp. Nov. Beihefte* 2: 807 (1931)

Hyoseris cretica L., *Sp. Pl.* 2: 810 (1753); *Hedypnois cretica* (L.) Dum.Cours., *Bot. Cult.* 2: 339 (1802).

Type: Crete, Herb. Linn. 957.11; holo: LINN *n.v.*, *fide* B.Nordenstam, *op. cit.* 139 (1977).

Peduncle without spreading hairs (occasionally spreading hairs may be present on stem in a line below peduncular bracts); fruiting peduncle to 5 mm diam., 1.5–2.5 times its diam. near base. Involucre 7–11 mm long, glabrous or more often with robust hairs confined to medial zone; mature involucre hardly globular, with bracts well-spaced. Florets: ligule 5–8 mm long, usually exceeding involucre by c. 2–4 mm. Achenes (5.0–) 6.0–9.0 mm long. Pappus bristles of the central achenes 4–6 mm long.

Notes: Native to the Mediterranean region, the Middle East and south-western Asia. Occurs in western Western Australia south from the Murchison River area, and in south-eastern Australia from far south-eastern Queensland south to south-central Victoria and SE to south-central South Australia; also recorded from south-eastern Tasmania around Hobart. Grows predominantly in drier regions in sandy loam or clay soils in grassland and woodland. Flowers spring–summer.

The involucre bracts of subsp. *cretica* have robust hairs confined to the midline in one or two rows, or are glabrous. The distal peduncle may be transiently cobwebby prior to anthesis. Although less reliable for discriminating subspecies, the ligules, achenes and pappus bristles are generally longer in this subspecies and the peduncle generally does not dilate distally to the same extent. Nordenstam (1977) indicates that subsp. *rhagadioloides* is characterised by a chromosome number of $2n = 16$, whereas subsp. *cretica* has a number of $2n = 13$. A few specimens from north-western Victoria are atypical in having more viscid involucre bracts with hairs slightly more diffuse.

Representative specimens: WESTERN AUSTRALIA: Murchison R., *H.Demarz 11437* (CANB, PERTH). SOUTH AUSTRALIA: Gawler Ras, Yardea Stn, c. 1.6 km east of the HS, *C.R.Alcock 3989* (AD, CANB). QUEENSLAND: 2.2. km east along Allora along Forest Plain Rd, *A.R.Bean 10848* (BRI, MEL). NEW SOUTH WALES: Hillston, bank of Lachlan R., near sewerage treatment works, *R.Medd 161177* (NSW). VICTORIA: Yarrara forest, adjacent to Millewa main channel, ± 15 km south of Werrimull, *S.J.Forbes 3136*, *D.E.Albrecht & J.H.Browne* (MEL). TASMANIA: Henry St Cemetery, Sorell, *A.M.Buchanan 13511* (HO).

17. UROSPERMUM Scop., *Intr. Hist. Nat.* 122 (1777)

Annual or perennial herbs, branching. Hairs simple, eglandular. Leaves basal and cauline. Inflorescences solitary or cymose. Capitula pedunculate; involucre bracts uniseriate, soft and reflexed at maturity. Florets: ligule yellow. Achenes homomorphic, not compressed, beaked. Pappus of bristles, not persistent; bristles plumose, uniform within a pappus.

A genus of two species from the Mediterranean region. Capitula are moderately large and are borne on a long peduncle that gradually dilates distally. Spreading hairs are numerous and variable in size; on or near the margin of leaves they are minute and very densely packed, whereas on lower stems and leaf-midribs they are often larger. A distinctive feature of the mature receptacle is the ciliate pit margins.

Key to species

Involucre bracts with spreading setose hairs **1. *U. picroides***
 Involucre bracts with appressed silky hairs **2. *U. dalechampii***

1. **Urospermum picroides* (L.) Scop. ex F.W.Schmidt, *Samml. Phys.-ökon. Aufs.* 1: 275 (1795)

Tragopogon picroides L., *Sp. Pl.* 2: 790 (1753); *Arnopogon picroides* (L.) Willd., *Sp. Pl.* 3: 1496 (1803).

Type: Crete, Southern France; *n.v.*

Annuals to c. 0.5 m high, with spreading to retrorse setose hairs scattered on all parts, with minute hairs on margin of leaves. Basal leaves few to several, variably persistent; cauline leaves few to several, to c. 25 cm long, with l:w ratio 3–6; undivided, or lobate to pinnatisect; base becoming truncate, cordate or sagittate, somewhat stem-clasping upwards; margin dentate or denticulate. Capitula solitary or 2; involucre 12–22 mm long, c. 5–8 mm diam.; bracts 7–10, with long setose hairs, with hyaline margin slender and usually grey or broad and pale on alternate bracts, finally reflexed. Florets: ligule c. 15 mm long; style pubescence pale. Achenes 10–15 mm long, somewhat sigmoidal overall, brown, comprising two distinct portions: basal portion flattened-obloid, 3–5 mm long with numerous long tubercles on faces; apical portion c. 7–10 mm long, comprising a dilated part 3.5–5 mm long bearing transverse wrinkles, tapering gradually into beak; beak c. as long as dilated part of apical portion. Pappus 8–12 mm long, detaching as a unit, white. *False Hawkbit*.

Notes: Native to the Mediterranean region. Occurs in western Western Australia mostly south from Carnarvon, and southern South Australia east from Eyre Peninsula, with isolated occurrences in north-western and south-central New South Wales and western Victoria. Grows in a range of soils, often on rocky slopes and outcrops, in shrubland, including chenopod shrublands. Flowers late winter to spring.

A distinctive species with its bristly involucre lacking outer bracts, and its peculiar achenial morphology.

Representative specimens: SOUTH AUSTRALIA: Moralana Stn, northern end where powerline crosses 'Little Brachina Ck', *D.E.Symon 14931* (AD, BRI); 6 km NNW of Mongolata on Whitehill Rd, *N.N.Donner 8353* (AD, MEL). QUEENSLAND: Lake Perseverance NNE of Toowoomba, 15 Oct. 1995, *M.E.Ballingall s.n.* (BRI). NEW SOUTH WALES: Mootwingee Natl Park, 4.5 km SE of 'Mootwingee' HS, *A.N.Rodd 5804*, *P.G.Wilson & J.Gentle* (AD, MEL, NSW). VICTORIA: west of PMG tower, Callistemon Gorge, Mt Arapiles, *A.C.Beauglehole 29647* (MEL).

2. **Urospermum dalechampii* (L.) Scop. ex F.W.Schmidt, *Samml. Phys.-ökon. Aufsb.* 1: 275 (1795)

Tragopogon dalechampii L., *Sp. Pl.* 2: 790 (1753).

Type: Spain; *n.v.*

Annuals to c. 0.5 m high. Spreading to slightly retrorse setose hairs scattered on stems and leaves. Unbranched or branches few. Basal leaves several, persistent at anthesis, to c. 16 cm long, with l:w ratio 3–6; lyrate-pinnatifid; margin entire or denticulate; cauline leaves few–several, becoming undivided; base truncate to cordate, stem-clasping. Capitula solitary or 2; involucre 12–15 mm long, c. 8–10 mm diam.; bracts 7–10, with appressed silky hair scattered on surface, with hyaline margin slender and grey or broad and pale on alternate bracts. Florets: ligule c. 15 mm long; style pubescence pale. Achenes c. 15 mm long, curved; basal portion flattened-obovoid, c. 4 mm long, verrucose; apical portion plumper than basal portion at base, obscurely wrinkled, tapering into a long, ciliolate beak c. 10 mm long. Pappus c. 10 mm long, cream, falling as a unit.

Notes: Occurs in Hobart in south-eastern Tasmania. Flowers spring–summer.

Representative specimens: TASMANIA: northern edge of Queens Domain, Cornelian Bay, *A.M.Buchanan 14338* (HO).

18. HYPOCHAERIS L., *Sp. Pl.* 2: 810 (1753)

Annuals, biennial or perennial herbs, usually branching. Hairs simple, eglandular. Leaves all or mostly basal. Inflorescences solitary or cymose. Capitula pedunculate; involucre bracts multiseriate, soft and reflexed at maturity; receptacular paleae linear, membranous, with apex filamentous, not enclosing or falling with achene. Florets: ligule yellow or white. Achenes homomorphic or dimorphic, not compressed, beaked or not. Pappus of bristles, persistent (in Australia), homomorphic or slightly dimorphic; bristles plumose or scabridulous; sometimes of two types within a pappus.

A genus of c. 60 species mostly from temperate South America or from the Mediterranean region, but also from other parts of Europe and Asia. The involucre bracts of species occurring in Australia have a slender hyaline margin becoming broader in inner series. The longest intermediate bracts are more than half the length of the inner bracts. Achenes are brown with ribs ornamented with transverse sometimes scale-like ridges and taper into a scabridulous beak.

This genus has been spelt *Hypochoeris* in many Australian references. According to article 13.4 of the ICBN, St Louis 2000, *Hypochoeris* is the correct spelling.

Key to species

- 1 Stems usually with 2 or more leaves (defined as more than 1/4 of length of basal leaves); longest peduncular bracts commonly > 5 mm long; ligule white or cream; pappus uniseriate, all bristles plumose, of similar length **3. *H. microcephala***
- 1: Stems leafless or occasionally with 1 leaf (defined as more than 1/4 of length of basal leaves); longest peduncular bracts < 5 mm long; ligule yellow; pappus biseriate, the outer series scabridulous, finer and much shorter than inner series

- 2 Marginal florets not exceeding involucre or only by up to 2 mm; inner involucre bracts elongating by 60–100% post anthesis, equal to or longer than receptacular paleae in fruit; outer achenes not beaked, sometimes briefly tapering distally **1. *H. glabra***
- 2: Marginal florets usually exceeding involucre by more than 5 mm; inner involucre bracts elongating by < 50% post anthesis, markedly shorter than receptacular paleae in fruit; outer achenes beaked..... **2. *H. radicata***

1. **Hypochaeris glabra* L., *Sp. Pl.* 2: 811 (1753)

Type: Belgium, Herb. Linn. 959.4; lecto: LINN, *vide* S.A.Alavi in S.M.H.Jafri & A.El-Gadi (eds), *Fl. Libya* 107: 347 (1983).

Annuals to c. 0.4 m high, with spreading hairs often on leaves and occasionally on stems. Basal leaves with l:w ratio (1–)2–6, undivided or with spreading lobes; cauline leaves absent. Capitula solitary or few to several, not cobwebby; involucre 7–10 mm long at anthesis, subsequently lengthening by 60–100%, c. 1–3 mm diam.; bracts mostly smooth, occasionally with a few spine-like hairs, with those of outer series narrow-ovate, 2–3 mm long; receptacular paleae to 17 mm long, shorter than mature inner bracts. Florets: ligule c. 2–5 mm long, not or shortly exceeding involucre, yellow; style pubescence pale. Achenes dimorphic, 3–12 mm long; body 3–5 mm long, with numerous ribs; marginal achenes mostly few to several, rarely lacking, with body narrow-obconical or occasionally fusiform, dark red-brown, unbeaked or less often with beak to 2 mm long; central achenes with body narrow-fusiform, red-brown, with glaucous grooves with beak longer than body. Pappus biseriate, 6–10 mm long, cream; bristles of inner series plumose, with those on marginal achenes more densely plumose proximally; bristles of outer series much shorter, scabridulous. *Smooth Cats-ear*.

Notes: Native to Europe and western Asia. Occurs in south-western Western Australia mostly south and SE from Carnarvon, in South Australia, from far south-eastern Queensland SSW through New South Wales to Victoria, and in eastern Tasmania. Isolated occurrences in central Queensland and southern Northern Territory. Naturalised in New Zealand. Grows in disturbed or relatively intact sites, often in rocky and/or poor soils. Flowers mostly winter to summer.

Occasional specimens, e.g. from the Wimmera in north-western Victoria and the Deniliquin area in south-central New South Wales, are unusual in having setose stems and peduncles. When in flower the narrower capitula with fewer bracts and shorter ligules which barely exceed the bracts readily distinguishes *H. glabra* from *H. radicata*. Post-anthesis, the involucre of *H. glabra* elongates markedly post-anthesis and the longer inner bracts typically exceed the receptacular paleae. In contrast, the involucre of *H. radicata* elongates less markedly post-anthesis and its inner bracts are much exceeded by the often pigment-tipped receptacular paleae. The unbeaked marginal achenes of *H. glabra* also usually distinguishes it from *H. radicata*, although in occasional specimens the marginal achenes are short-beaked or absent. Beaked achenes differ from short-beaked achenes of *H. radicata* in the absence of bristles on the beak. Depauperate specimens are fairly common and these have very narrow capitula.

Representative specimens: WESTERN AUSTRALIA: 5 km south of Tamala Stn HS, Tamala, 1993, *G.J.Keighery & J.J.Alford* (CANB, DNA, PERTH). NORTHERN TERRITORY: Maggie Springs, Ayers Rock, *P.K.Latz* 8485 (DNA). SOUTH AUSTRALIA: Kolendo, Dawes Dam, 30 km west of HS, *H.R.Toelken* 7490 (AD, HO). QUEENSLAND: 2 km north of Killarney, road to Warwick, *G.N.Batianoff* 2010330 & *C.Appelman* (BRI, DNA, NSW). NEW SOUTH WALES:

Park Beach, Coffs Harbour, *R.G.Coveny 12763, Z.Donabauer & C.Dunn* (BRI, MEL, NSW). VICTORIA: Three Jacks Reserve, Stawell, *A.C.Beauglehole 22143* (MEL). TASMANIA: Little Musselroe Bay, *A.Moscal 2925* (HO).

2. **Hypochaeris radicata* L., *Sp. Pl.* 2: 811 (1753)

Type: Europe, Herb. Clifford; ?LINN, *fide* S.A.Alavi in S.M.H.Jafri & A.El-Gadi (eds), *Fl. Libya* 107: 348 (1983).

Perennials to c. 1 m high. Spreading hairs usually present on leaves. Basal leaves with l:w ratio 3–6, undivided or with spreading to retrorse lobes; cauline leaves absent or occasionally solitary, with small bracts subtending branches. Capitula usually few to several, not cobwebby; involucre at anthesis 10–15 mm long subsequently lengthening by c. 20%, c. 3–7 mm diam.; bracts with midrib setose distally or throughout, occasionally \pm smooth, with those of outer series narrow-ovate to lanceolate, 2–3 mm long; receptacular paleae to 26 mm long, exceeding mature inner bracts. Florets: ligule c. 8–16 mm long, usually exceeding involucre by c. 5–10 mm, yellow; style pubescence pale. Achenes homomorphic or dimorphic, 7–14 mm long; body fusiform, 4–5 mm long, with numerous ribs; marginal achenes several or absent, red-brown, with beak shorter than body; central achenes red-brown, with glaucous grooves, with beak longer than body. Pappus biseriate, 9–15 mm long, cream; bristles of inner series plumose, with those on marginal achenes not or hardly more densely plumose proximally; bristles of outer series much shorter, scabridulous. *Cats-ear, Flat-weed.*

Notes: Native to Europe. Occurs in far south-western Western Australia, in far eastern Australia from Cairns in northern Queensland south through eastern New South Wales to Victoria, in south-eastern South Australia, and in Tasmania. Also naturalised in New Zealand. Grows in a wide range of natural and disturbed habitats, mostly in areas of moderate to high rainfall. Flowers all year but mostly spring–autumn.

Extremely common and widespread weed in areas with moderate to high rainfall or in watered sites. Peduncles and inflorescence branches are often long and can arise from below mid-stem. Readily distinguishable in flower from the other two species of *Hypochaeris*. After flowering it can be distinguished in most cases by the marginal achenes and otherwise by the receptacular paleae which greatly exceed the involucre and are more commonly pigmented than in *H. glabra*.

Representative specimens: WESTERN AUSTRALIA: Kings Park, Perth, 1 Aug. 1934, *R.Roe s.n.* (CANB). NORTHERN TERRITORY: 27 km north of Alice Springs, *D.J.Nelson 2371* (CANB, DNA). SOUTH AUSTRALIA: Mt Crawford Forest Reserve, *H.P.Vonow 134* (AD, HO). QUEENSLAND: Kilcoy Lane near entrance to Crystal Waters Village, c. 13 km west of Maleny, *G.N.Batianoff 201209, T.P.Boyle, & D.Blewett* (BRI, NSW). NEW SOUTH WALES: Bega Swamp, 30 Jan. 1985, *G.Singh s.n.* (CANB). VICTORIA: Cranbourne, Royal Botanic Gardens Annexe, *J.H.Ross 2648 & M.G.Corrick* (AD, MEL). TASMANIA: Ile du Nord, off Maria Is., 20 Dec. 1983, *N.P.Brothers* (HO).

3. **Hypochaeris microcephala* var. *albiflora* (Kuntze) Cabrera, *Notas Mus. La Plata, Bot.* 16: 201 (1937)

H. brasiliensis var. *albiflora* Kuntze, *Revis Gen. Pl.* 3(2): 159 (1898)

Type: Bolivia, *s.d., Mandon 219*; holo: B *n.v.*, *fide* J.Solomon (2006b)

Perennials to c. 0.4 m high. Spreading hairs on stems and leaves. Basal leaves with l:w ratio 3–6, undivided or with antrorse to retrorse lobes; cauline leaves 2 or 3, mostly linear to narrow-linear, with l:w ratio to c. 20, not dilated basally, reducing to bracts

upwards. Capitula few to several, transiently cobwebby; involucre at anthesis 8–12 mm long, subsequently lengthening by c. 50–80%, c. 2–4 mm diam.; bracts smooth, with those of outer series lanceolate, c. 3 mm long; receptacular paleae to 15 mm long, slightly shorter than mature inner bracts. Florets: ligule c. 2–3 mm long, white or cream; style pubescence pale. Achenes homomorphic, 6–10 mm long, beaked; body narrow-obloid, 4–7 mm long, with c. 5 broad transversely ridged ribs and narrow non-glaucous grooves, with beak slightly shorter than body. Pappus uniseriate, 5–8 mm long, pale yellow-brown proximally, white distally; bristles all plumose. *White Flatweed*

Notes: Native to South America. Occurs in eastern Australia from Maryborough in south-eastern Queensland south to the Sydney region in central-eastern New South Wales. Also naturalised in South Africa. Grows mostly in disturbed sites, in various soils, in urban environments or in grassland, woodland and forest. Flowers mostly late winter to summer.

Hypochaeris microcephala var. *albiflora* is in section *Achyrophorus*, a section that has its greatest diversity in South America. In contrast, *Hypochaeris glabra* and *H. radicata* are in section *Hypochaeris*, a section that has its greatest diversity in Europe and Asia. A suite of characters distinguish *H. microcephala* var. *albiflora* from the other two species. Apart from differences given in the key, it can be distinguished by its longer peduncular bracts, and the achenes with fewer, much broader ribs, non-glaucous grooves, and with a more gradual taper to a shorter beak. *Hypochaeris microcephala* var. *albiflora* and *H. glabra* are similar in that they both have short ligules and the involucre of the two taxa elongate to a similar extent post-anthesis.

Representative specimens: QUEENSLAND: Bunya Mtns Natl Park, *R. Belcher 809* (BRI, MEL); Indooroopilly, Brisbane, *L. Pedley 4410* (BRI, CANB, NSW). NEW SOUTH WALES: Below Callawajune Mtn, (The Beehive or South Obelisk), c. 5.5 km SSW of Urbenville, *R. G. Coveny 12795*, *Z. Donabauer & C. Dunn* (AD, BRI, CANB, MEL, NSW, PERTH); Blackett, *R. Coveny 11299* (BRI, NSW).

19. LEONTODON L., *Sp. Pl.* 2: 798 (1753)

Annual or perennial herbs, not branching. Hairs furcate, with prongs straight. Leaves all basal. Inflorescences solitary. Capitula pedunculate; involucre bracts multiseriate; inner bracts ± soft, strongly convex and reflexed at maturity. Florets: ligule yellow. Achenes dimorphic; not compressed, beaked or unbeaked. Pappus of bristles and scales, persistent, dimorphic; bristles plumose or scabridulous, sometimes of two types within a pappus.

A genus of c. 50 species from Europe, northern Africa and south-western Asia, mainly in the Mediterranean region.

**Leontodon taraxacoides* (Vill.) Mérat, *Ann. Sci. Nat. (Paris)* 22: 108 (1831) subsp. *taraxacoides*

Hyoseris taraxacoides Vill., *Prosp. Hist. Pl. Dauphiné* 33 (1779); *Leontodon nudicaulis* subsp. *taraxacoides* (Vill.) Schinz & Thell., *Bull. Herb. Boissier* sér. 2, 7: 389 (1907).

Type: *n.v.*

[*L. leysseri* auct. non (Wallr.) Beck; W.M. Curtis, *Student's Fl. Tasmania* 2: 386 (1963).]

[*L. hirtus* auct. non L.; J.M. Black, *Fl. S. Australia* 659 (1929); A. Ewart, *Fl. Victoria* 1197 (1931).]

Scapose perennials to c. 0.4 m high. Bifurcate hairs c. 1 mm long sparse to scattered on leaves and lower stems and sometimes on involucre. Leaves to c. 30 cm long, with

l:w ratio 4–15, undivided or lobate to subpinnatisect; margin entire or remotely sinuate dentate; divided leaves with 3–6 ± spreading lobes or segments per side. Capitulum solitary, nodding in bud; involucre 6–11 mm long, c. 3–5 mm diam.; bracts glabrous or occasionally moderately hairy; bracts of outer series c. 6–8, narrow-lanceolate, 1–2 mm long; intermediate bracts not reaching to half way; inner bracts with a grey hyaline margin. Florets: ligule c. 7–10 mm long; style pubescence pale. Achenes 3–5 mm long, dimorphic; marginal achenes curved-fusiform, tapering into a short neck, ± smooth, housed within adjacent inner bract at maturity; central achenes short-beaked; body narrow-fusiform, transversely ridged or scaly, with beak 0.5–1 mm long. Pappus cream; pappus of marginal achenes of fused scales 0.5–1 mm long; pappus of central achenes 6–9 mm long, biseriate; inner series c. 10, sparsely plumose, much wider at base; outer series 0.5–3 mm long, scabridulous. *Hairy Hawkbit*.

Notes: Native to Europe. Occurs in far south-western Western Australia, south-eastern Australia from south-eastern Queensland south to Victoria, in south-eastern South Australia, and in Tasmania. Occurs mostly nearer the coast associated with human habitation. Naturalised in New Zealand. Grows in waste land and on nature strips, predominantly in urban environments with moderate rainfall and/or irrigation. Flowers mainly late winter–spring, also other times.

A common weed of disturbed areas and of lawns in southern Australia. The involucre is either glabrous or moderately hairy with little evidence of intermediate forms. However, no correlation has been identified between this and other characters in Australian collections.

Although the involucre is multiseriate, the outer and intermediate bracts are relatively small, and the intermediate bracts generally do not reach halfway along the involucre. This is one of several characters distinguishing *L. taraxacoides* from the superficially similar and often co-occurring *Hypochaeris radicata*. Other characters of *L. taraxacoides* distinguishing it from *H. radicata* include stems unbranched, hairs on leaves minutely bifurcate, paleae absent, involucre bracts all smooth, and inner involucre bracts with a grey hyaline margin. The subspecies of *L. taraxacoides* in Australia differs from subsp. *longirostris* Finch & P.D.Sell, of southern Europe, in having a much shorter achenial beak.

Representative specimens: WESTERN AUSTRALIA: 100 m WSW of Albany Hwy on Mondurup Rd, Mt Barker, *B.J.Lepschi 2574* & *T.R.Lally* (AD, CANB, PERTH). SOUTH AUSTRALIA: Jupiter Ck, Southern Lofty, *R.J.Bates 26810* (AD). QUEENSLAND: Quarry Rd, Sherwood, *A.R.Bean 17107* (BRI, MEL, NSW). NEW SOUTH WALES: southern end of town, Glen Innes, *R.Coveny 12372*, *W.Bishop* & *L.Murray* (BRI, NSW). VICTORIA: arboretum in SW corner of Royal Botanic Gardens Annexe, Cranbourne, *P.C.Jobson 3486* (BRI, CANB, MEL, NSW). TASMANIA: Balfour, *A.Moscal 4800* (HO, MEL).

20. HELMINTHOTHECA Zinn, *Cat. Pl. Hort. Gott.* 430 (1757)

Annual, biennial or perennial herbs, branching. Hairs simple, eglandular, or furcate with recurved prongs. Leaves basal and cauline. Inflorescences cymose or paniculate. Capitula pedunculate; involucre bracts biseriate but also surrounded by a series of large leafy bracts inserted at base of capitulum; inner bracts hardened, strongly convex and erect at maturity. Florets: ligule yellow. Achenes dimorphic, not compressed, transversely ridged. Pappus of bristles, not persistent, dimorphic; bristles plumose or scabridulous, uniform within a pappus.

A genus of four species from Europe, northern Africa and south-western Asia.

**Helminthotheca echioides* (L.) Holub, *Folia Geobot. Phytotax. Bohemoslov.* 8: 176 (1973)

Picris echioides L., *Sp. Pl.* 2: 792 (1753); *Helminthia echioides* (L.) Gaertn., *Fruct. Sem. Pl.* 2: 368 (1791).

Type: Locality unknown, Herb. Linn. 984.1, lecto: LINN, *vide* H.W.Lack, *op. cit.* 113 (1975).

Annuals to perennials to c. 1.0 m high, with spreading hairs and spines, mostly minutely 2–5-furcate. Leaves with l:w ratio 4–12, usually not divided, usually with some robust tubercle-based hairs. Stem leaves few to several; base cordate, stem-clasping; margin entire or sinuate. Capitula few to several, with 4–6 erect, ovate to lanceolate foliaceous bracts 5–22 mm long arising from base; involucre 8–12 mm long excluding spurs; outer bracts lanceolate, 2–3 mm long; inner bracts with spreading hairs and a branched sub-apical spur 2–8 mm long. Florets: ligule c. 8–10 mm long; style pubescence black. Achenes 5.5–9 mm long, beaked, dimorphic; marginal achenes; body pilose; beak equal to or shorter than body, housed in concavity of hardened inner bracts at maturity; central achenes; body with numerous shallow transverse ridges, glabrous; beak as long as or up to 1.5 times longer than body. Pappus 6–7 mm long, or 2–4 mm long on marginal achenes, white, detaching as a unit; bristles of marginal achenes scabridulous; those of central achenes plumose. *Ox-tongue*.

Notes: Native to Europe, Asia and Africa. Occurs predominantly in south-eastern Australia from Manilla in north-eastern New South Wales south to Victoria, and SW to the Eyre Peninsula in south-central South Australia. Isolated occurrences in south-eastern Queensland, northern and far south-eastern Tasmania, and far south-western Western Australia. Grows on roadsides and wasteland, often beside streams. Flowers most of the year, mostly late spring–summer.

Distinctive features of this readily recognisable species include the tuberculate spines on the leaves and the large foliaceous bracts surrounding capitula. The inflorescence bracts are also relatively large. The dimorphism of the achenes follows the pattern seen in several other genera in this tribe, including *Crepis*, *Hedypnois* and *Tolpis*. Also similar to these genera is the placement of the marginal achenes within the strong concavities of alternating inner bracts.

The hyaline margin of inner bracts are well-developed, and appressed-silky. Similar to *Picris* in which it was once included in terms of the forked hairs with recurved prongs. The beak is capillary and often is crumpled in herbarium specimens. Holzapfel (1994) contrasts the black style-hairs of this species with the pale yellow ones of species of *Picris* in Australia.

Representative specimens: WESTERN AUSTRALIA: Cunderdin, 14 Dec. 1981, *E.H.Harris s.n.* (PERTH). SOUTH AUSTRALIA: Morialta Falls Reserve, *R.L.Correll 65* (AD, MEL). QUEENSLAND: Mulgowie, 6.4 km south of Laidley, 31 Oct. 1974, *I.K.Hughes* (BRI). NEW SOUTH WALES: Barham district, 19 Mar. 1956, *C.A.Hare* (NSW). VICTORIA: Just east of Vinifera, *H.I.Aston 2727* (BRI, CANB, DNA, MEL). TASMANIA: New Town, *L.Rodway 450a* (HO).

21. PICRIS L., *Sp. Pl.* 2: 792 (1753)

Annual, biennial or perennial herbs, branching. Hairs simple, eglandular, or furcate with recurved prongs. Leaves basal and cauline. Inflorescences solitary, cymose or paniculate. Capitula pedunculate; involucre bracts multiseriate; inner bracts hardened, strongly convex and erect at maturity. Florets: ligule yellow. Achenes homomorphic, not

compressed, transversely ridged. Pappus of bristles, not persistent, sometimes dimorphic; bristles plumose or scabridulous, dimorphic within a pappus.

This genus was not examined in detail by the author. The reader is referred to Holzapfel (1994) and recent stated floras for details of species. Below is a list of species in Australia as recognised by Holzapfel; these names are all currently in use. Holzapfel indicated that non-native species *P. altissima* Delile, and *P. hieracioides* L. have been collected in Australia but have not become established.

List of species (alphabetical)

1. *Picris angustifolia* DC., *Prodr.* 7:130 (1838)
 - a. *Picris angustifolia* DC., *Prodr.* 7:130 (1838) subsp. *angustifolia*
 - b. *Picris angustifolia* subsp. *carolorum-henricum* (Lack) S.Holzapfel, *Willdenowia* 24: 144 (1994)
 - c. *Picris angustifolia* subsp. *merxmulleri* Lack & S.Holzapfel, *Willdenowia* 23: 190 (1993)
2. *Picris barbarorum* Lindl. in *Edwards's, Bot. Reg.* 24:58 (1838)
3. *Picris burbridgei* S.Holzapfel, *Willdenowia* 23: 183 (1993)
4. *Picris compacta* S.Holzapfel, *Willdenowia* 23: 185 (1993)
5. *Picris conyzoides* S.Holzapfel, *Willdenowia* 23: 185 (1993)
6. *Picris drummondii* S.Holzapfel, *Willdenowia* 23: 187 (1993)
7. *Picris eichleri* Lack & S.Holzapfel, *Willdenowia* 23: 188 (1993)
8. *Picris evae* Lack, *Phytologia* 42: 210 (1979)
9. *Picris squarrosa* Steetz, in J.G.C.Lehmann, *Pl. Preiss.* 1:488 (1845)
10. *Picris wagenitzii* Lack, *Bot. Jahrb. Syst.* 108: 189 (1987).

22. SCORZONERA L., *Sp. Pl.* 2: 790 (1753)

Annual, biennial or perennial herbs, branching or not. Hairs simple, eglandular. Leaves mostly basal. Inflorescences solitary, cymose or (not in Australia) paniculate. Capitula pedunculate; involucre bracts multiseriate, soft and reflexed at maturity. Florets: ligule yellow (in Australia), violet, or purple. Achenes homomorphic, hardly compressed, unbeaked. Pappus of bristles, persistent, bristles plumose, uniform within a pappus.

A genus of c. 175 species from Europe, Asia and northern Africa.

**Scorzonera laciniata* L., *Sp. Pl.* 2: 791 (1753)

Podospermum laciniatum (L.) DC., *Fl. Franç.* 3rd edn, 4: 62 (1805).

Type: 'Habitat in Germania, Gallia', Europe; *n.v.*

Biennials to c. 0.4 m high. Indumentum appressed-woolly, glabrescent or nearly glabrous. Basal leaves many, ± persistent, to c. 18 cm long, with l:w ratio 4–40 undivided or more commonly deeply pinnatisect; base weakly sheathing; margin entire; divided leaves with 1–several segments per side, with shape various; cauline leaves 1–several, similar to basal leaves but smaller, with base not clasping stem. Capitula solitary or few, 8–15 mm long, subsequently elongating to 12–35 mm long, c. 2–7 mm diam.; bracts glabrous or variably appressed woolly; outer bracts 4–8, 3–8 mm long, with or without subapical spur; intermediate bracts extending over halfway at anthesis; inner bracts

alternately long with broad margin, short with narrow margin. Florets: ligule 8–12 mm long; style pubescence pale. Achenes 8–15 mm long, glabrous, comprising two distinct portions; basal portion elliptic, c. 3–5 mm long, with pale prominent ribs, darker between ribs; apical portion narrower than basal portion, narrow obloid, c. 6–10 mm long, not tapered apically, pale purplish. Pappus 8–20 mm long, cream. *Scorzonera*.

Notes: This species is included in Sect. *Podospermum* (DC.) Boiss. of *Scorzonera* based on its pinnatisect leaves and its achenes with a relatively large basal enlargement. A feature of this species is the massive taproot.

Key to varieties

Segments of leaves or distal 4 centimetres of undivided leaves with l:w ratio mostly > 10; involucre 8–12 mm long at onset of anthesis elongating to up to 27 mm long at maturity; outer bracts usually unspurred..... var. *laciniata*

Segments of leaves or distal 4 centimetres of undivided leaves with l:w ratio mostly < 10; involucre 10–15 mm long at onset of anthesis elongating to up to 35 mm long at maturity; outer bracts with a subapical spur..... var. *calcitrapifolia*

**Scorzonera laciniata* L. var. *laciniata*

Rachis of leaf less than twice as broad in distal quarter as it is midleaf, 1–4 mm wide; lateral segments with l:w ratio mostly > 10. Involucre 8–12 mm long at onset of anthesis, elongating to up to 27 mm long at maturity; bracts glabrous or sparsely appressed-woolly at anthesis, unspurred or spur to 0.8 mm long. Achenes 8–12 mm long. Pappus c. 8–14 mm long.

Notes: Native to Europe and western Asia. Occurs in far south-eastern South Australia, with isolated records from western Victoria, and south-eastern Tasmania around Tunbridge. Grows in disturbed or semi-intact native vegetation in heavy soils in grassland and woodland. Flowers spring–summer.

Representative specimens: SOUTH AUSTRALIA: Flinders Ras, Walloway, ca. 10 km north of Ororoo, *C.R.Alcock 8394* (AD, CANB, MEL); Environs of Loxton, *C.R.Alcock 6170* (AD). VICTORIA: Benjeroop State Forest, *A.C.Beaglehole 83169* (MEL). TASMANIA: White Lagoon, *L.Gilfedder 5* (HO).

**Scorzonera laciniata* var. *calcitrapifolia* (Vahl) Bisch. ex Boiss., *Fl. Orient.* 3: 757 (1875)

Scorzonera calcitrapifolia Vahl, *Symb. Bot.* 2: 87 (1791).

Type: ‘Legi passim in regno Tunetano’, [northern Africa]; *n.v.*

Podospermum resedifolium DC., *Fl. Franç.* 3rd edn, 4: 61 (1805). Type: *n.v.*, *fide* P.E.Boissier, *loc. cit.*

Rachis of leaves commonly at least twice as broad in distal quarter as it is midleaf, 2–15 mm wide; lateral segments with a l:w ratio < 10; Involucre 10–15 mm long at onset of anthesis, elongating to up to 35 mm long at maturity; bracts glabrous or sparsely to densely appressed-woolly at anthesis, with outer and usually intermediate involucral bracts bearing a subapical spur to c. 2 mm long. Achenes 10–15 mm long. Pappus c. 12–20 mm long.

Notes: Native to Europe and Asia. Occurs in far south-eastern South Australia, north-western and central Victoria and south-western New South Wales, with an outlying

collection from the Liverpool plains in central-eastern New South Wales. Grows in disturbed or near intact sites, in loam or clay soils in grassland or woodland. Flowers spring.

Distinguished from the typical variety by its broader leaf segments, longer capitula and fruit, and the subapical spur on its involucre bracts.

Representative specimens: SOUTH AUSTRALIA: Wolseley, *R.J.Bates* 25997 (AD). NEW SOUTH WALES: Barham, 13 Oct. 1949, *J.W.Vickery* (NSW); alongside road between Premier and Colly Blue, Liverpool Plains, *J.R.Hosking* 1929 (CANB, MEL, NSW). VICTORIA: Eynesbury Estate, about 8 km south from Melton P.O., *V.Stajsic* 605 (MEL); Cocklin Ave, Red Cliffs, *J.H.Browne* 937 (MEL).

23. TRAGOPOGON L., *Sp. Pl.* 2: 789 (1753)

Annual, biennial or perennial herbs, branching or not. Hairs simple, eglandular or lacking. Leaves basal and cauline. Inflorescences solitary. Capitula pedunculate; involucre bracts uniseriate, soft and reflexed at maturity. Florets: ligule yellow or purple. Achenes homomorphic or slightly dimorphic in terms of ornamentation of the body, not compressed, beaked. Pappus of bristles, persistent, homomorphic, or in *T. hybridus* dimorphic, bristles plumose or rarely scabridulous, sometimes slightly dimorphic within a pappus.

A genus of c. 50 species from temperate Europe, Asia and Africa. Distinctive features of this genus include the linear, entire, sheathing leaves with parallel venation and the solitary capitula lacking outer and intermediate involucre bracts borne on long distally dilated peduncles. The pappus is biseriate and the inner series typically comprises longer bristles that are distally non-plumose.

Tragopogon brevirostris subsp. *longifolius* (Heldr. & Sart. ex Boiss.) I.Richardson has been collected from a roadside on the road to Ironbark near Adelaide in south-eastern South Australia (*R.Bates* 52318 AD, MEL). There is currently no indication that it has become naturalised. The capitula and achenes of this taxon are considerably smaller than in the three naturalised species.

Key to species

- 1 Capitula glabrous; ligules pinkish or purplish
 - 2 Biennials to 1.3 m high, not or sparingly branched; ligules as long as bracts or nearly so; pappus of all achenes with numerous plumose bristles **1. *T. porrifolius***
 - 2: Annuals to 0.5 m high, typically branching; ligules much shorter than bracts; pappus of outer achenes comprising 5 unequal rigid non-plumose bristles; pappus of inner achenes with more numerous plumose bristles **2. *T. hybridus***
- 1: Capitula or base of capitula woolly, sometimes somewhat transiently; ligules yellow
 - 3 Mature involucre > 20 mm long, with wool developed only at very base; ligules much shorter than bracts; achenes > 20 mm long, with beak c. as long as body **3. *T. dubius***
 - 3: Mature involucre < 20 mm long, woolly; ligules longer than bracts; achenes < 20 mm long, with beak shorter than body ***T. brevirostris* (see notes above)**

1. **Tragopogon porrifolius* L., *Sp. Pl.* 2: 789 (1753) subsp. *porrifolius*

Type: Europe, Herb. Burser XV(2): 69, central plant; lecto: UPS *n.v.*, *fide* C.D. de la Guardia & G.Blanca, *Taxon* 41: 549 (1992).

Biennials to c. 1.3 m high, glabrous, sometimes glaucous. Capitula: involucre 25–35 mm long, increasing to up to 60 mm long at maturity, c. 5–12 mm diam.; bracts 5–8, with hyaline margin vestigial or distinct proximally in alternate bracts, finally reflexed. Florets: ligule as long as or slightly shorter than bracts, lilac to deep violet; style pubescence pale. Achenes 20–40 mm long, homomorphic except for rib ornamentation; body fusiform, 10–15 mm long, light to mid brown, with crowded scale-like tubercles on ribs, with tubercle size reducing to nearly smooth inwards, with transition into beak fairly abrupt; beak slightly longer than body, with a sub-terminal dilation 1–2 mm long. Pappus 15–25 mm long, cream to golden-brown, homomorphic. *Salsify, Oyster Plant.*

Notes: Native to the Mediterranean. Occurs in far south-western Western Australia, in south-eastern mainland Australia from south-eastern Queensland south to Victoria and extending west from Victoria to south-eastern South Australia, and in Tasmania. Widely cultivated and naturalised in other parts of the world. Grows in sandy-loam soils in disturbed environments, particularly roadsides. Flowers spring–summer.

The non-plumose tips of the longer pappus bristles are usually purplish unlike in the other species of *Tragopogon* in Australia. The beak of the achenes is dilated in the distal few millimetres then abruptly constricted below a hairy pappus ring. This beak morphology is also present in *T. dubius* except that the dilated portion is shorter. Flowers of these two species apparently open only in the morning.

Representative specimens: WESTERN AUSTRALIA: c. 40 km NE of Albany on Chester Pass Rd, *B.J.Lepschi & T.R.Lally 2322* (AD, CANB, PERTH). SOUTH AUSTRALIA: Mt Lofty Ra., Angaston, c. 70 km NE of Adelaide, *H.Amsberg 5* (AD). QUEENSLAND: roadside, Warwick, *G.N.Batianoff 2010349 & C.Appelman* (BRI, CANB, NSW). NEW SOUTH WALES: Moss Vale Unanderra rly crossing, Sheepwash Bridge Rd, c. 10 km due east of Moss Vale, *P.G.Kodala 217 & S.L.Kodala* (CANB, MEL, NSW). VICTORIA: 0.8 km NE of Laverton, c. 20 km WSW of Melbourne, *H.I.Aston 845* (MEL). TASMANIA: Tasman Hwy at ‘Ardross’, *A.M.Buchanan 15647* (HO).

2. **Tragopogon hybridus* L., *Sp. Pl.* 2: 789 (1753)

Type: Italy; *n.v.*

Annuals to c. 0.8 m high, glabrous, not glaucous. Capitula: involucre c. 30 mm long, increasing to c. 50 mm long at maturity, 3–5 mm diam.; bracts 5–8, with hyaline margin vestigial or very slender, not becoming hardened, finally reflexed. Florets: ligule less than half the length of the bracts, pinkish-lilac; style pubescence pale. Achenes slightly dimorphic; marginal achenes 35–50 mm long; body narrow-cylindrical, 25–40 mm long, light brown, smooth except for minutely scabridulous ribs, with transition into beak very gradual; beak shorter than body, not dilated sub-terminally; central achenes with body slightly shorter. Pappus 10–20 mm long, cream, dimorphic; pappus of marginal achenes comprising 5 rigid scabrid bristles of unequal length; pappus of central achenes comprising numerous plumose bristles.

Notes: Native to southern Europe. Occurs in the Mt Lofty Ranges NE of Adelaide in south-eastern South Australia. Ecological preferences unknown. Flowers spring–summer.

Tragopogon hybridus has been recorded from two different localities in the Northern Lofty Ranges and has probably become naturalised. It is readily distinguished post-

anthesis by the pappus of its marginal achenes. It is typically more branched than *T. porrifolius* and *T. dubius*.

Representative specimens: SOUTH AUSTRALIA: P.Smyth's property, Salter Springs, 6 Jan. 1987, *J.Hannay* (AD); northern approach to Wasley, Northern Lofty, 17 Nov. 1994, *D.McQuinn s.n.* (AD).

3. **Tragopogon dubius* Scop., *Fl. Carniol.* 2nd edn, 2: 95 (1772)

Type: 'Habitat circa Tergestum, et Schenoschetz' [central Europe]; *n.v.*

Annuals or biennials to c. 0.8 m high, newer growth transiently woolly, not glaucous. Capitula with a region of caducous wool at the very base, with a minute stubble persisting; involucre c. 25–35 mm long, increasing to up to 60 mm long at maturity, c. 6–12 mm diam.; bracts mostly 8–12, with hyaline margin vestigial or distinct proximally in alternate bracts, not becoming hardened, finally reflexed. Florets: ligule c. half as long as bracts, yellow; style pubescence pale. Achenes 25–35 mm long, homomorphic except for rib ornamentation; body fusiform, 10–15 mm long, light to mid brown, with coarse tubercles on ribs, with tubercle size reducing inwards, with transition into beak gradual; beak slightly longer than body, with a sub-terminal dilation 0.5–1 mm long. Pappus 25–35 mm long, cream, or grey-cream, homomorphic.

Notes: Native to Europe. Occurs predominantly in south-eastern New South Wales with isolated records from far north-eastern New South Wales and eastern Victoria near Orbost. Grows in loam or clay soils in disturbed sites such as roadsides. Flowers spring–summer.

Although the distinctive wool at the base of the capitulum tends to be lost after anthesis, close inspection usually reveals a persistent stubble of hair bases.

Representative specimens: NEW SOUTH WALES: North Cooma, Mar. 1963, *M.Gray s.n.* (AD, CANB); Warri Bridge Reserve, Shoalhaven R., c. 12.5 km NNW of Braidwood, *B.J.Lepschi 928* (AD, CANB, MEL, NSW). AUSTRALIAN CAPITAL TERRITORY: Grounds of Australian National Herbarium, CSIRO Black Mtn Site, *B.J.Lepschi 3940* (AD, CANB). VICTORIA: Orbost region, Delegate R., 12 Jan. 1987, *D.Allan* (CANB, MEL).

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