



Four new species of *Ursinia* (Asteraceae, Anthemideae) from South Africa, with an updated key to the genus in Namaqualand

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Abstract

Recent field and herbarium studies of the southern African genus *Ursinia* (Anthemideae, Asteraceae) in Namaqualand, South Africa, have revealed greater morphological variability than currently accommodated and a high percentage of misidentified specimens. In an attempt to remedy this we herein describe four new species (*Ursinia arida*, *U. glandulosa*, *U. kamiesbergensis* and *U. laciniata*) and provide a key to the species in the region, together with illustrations of their involucre bracts and paleae. The species can be distinguished by a combination of their life history, vestiture, presence or absence of appendages on the paleae, and shape of the involucre bracts and their scarious apices.

Key words: Compositae, Gariiep Center of Endemism, Greater Cape Floristic Region, Kamiesberg Center of Endemism

Introduction

Namaqualand is a winter rainfall region within the Succulent Karoo Biome (Mucina *et al.* 2006) of South Africa, extending from the Orange River (ca. 28° S) southwards to the mouth of the Olifants River. Namaqualand is best known for the spectacular mass spring (July–September) flowering of annuals, largely from the Asteraceae. *Ursinia* Gaertner (1791: 462) (Asteraceae) is a prominent component of these spring floral displays. The genus is almost entirely southern African (one species extending to Ethiopia) and currently comprises ca. 39 species (Prassler 1967). They are easily recognized by their often large showy ray florets, paleate involucre, scarious involucre bracts and fruit crowned by a pappus of large, white spreading scales. It is the latter character which gives rise to the rather apt common name, Parachute Daisy. *Ursinia* is a member of tribe Anthemideae which has its origins in southern Africa (Watson *et al.* 2000, Oberprieler 2005, Himmelreich *et al.* 2008) and is placed within the early diverging subtribe Ursineae (Oberprieler *et al.* 2007).

Ongoing field-based studies of *Ursinia* as well as herbarium studies revising the identity of the Namaqualand representatives (especially during the period of preparing the *Ursinia* treatment for Greater Cape Plants II; Magee *et al.* 2013), have revealed a broad spectrum of unaccommodated variability and a high percentage of misidentified specimens. Four unnamed species were discovered, two of which were recognized in Magee *et al.* (2013) as ‘sp. A’ and ‘sp. B’. Herein we formally describe these four species within a broader comparative context of all currently recognised Namaqualand *Ursinia* species and attempt to remedy the identification problems with a key to the species in Namaqualand, together with illustrations of the involucre bracts and paleae.

Materials and Methods

Herbarium material of *Ursinia* species from Namaqualand were studied at NBG and BOL, as well as extensive field collections over several years (2004–2013). Almost all of the taxa were observed in the field, providing crucial additional insight into the species studied. The recorded distributions of the two new species were ascertained and

4. *Ursinia laciniata* Magee & Mucina, **sp. nov.** Type:—SOUTH AFRICA. Northern Cape, Springbok (2917): Steinkopf, Klipfonteinberg (–BA), 5 October 2014, *Winter NGS283* (holotype NBG!, isotypes K!, PRE!).

Woody perennial shrublet, 0.30–0.40 m tall; densely branched, branches lanky, stalked glands absent. *Leaves* cauline, alternate, 6.0–10.0 × 3.0–7.0 mm, 3(5)-lobed, glandular-punctate, glabrescent, polished; stalked gland absent; lobes lanceolate to narrowly lanceolate, 1.0–4.0 × ± 0.5–1.0 mm, mucronate; mucro acute. *Capitula* radiate, heterogamous, ca. 15–20 mm in diam., solitary; peduncle 40–60 mm long at anthesis, glabrescent. *Involucre* hemispherical, 4.0–6.0 × 8.0–11.0 mm, glabrescent; involucre bracts 4- to 5-seriate, brownish along inner margins; outer bracts narrowly ovate, 1.5–2.0 mm long, margins scarious; middle bracts narrowly oblong, 4.0–4.5 mm long, margins scarious; inner bracts narrowly oblong, 5.0–6.0 mm long, apical appendages ovate, obtuse. *Receptacle* paleate. *Paleae* scarious, truncate, closely laciniate. *Ray florets* neuter, 10–14; lamina 4–6 mm long, yellow. *Disc florets* bisexual, numerous, yellow, 5-lobed; lobes cucullate, with sessile glandular trichomes. *Anthers* slightly sagittate at base; apical appendages cordate. *Style* terete; branches linear, truncate, sweeping hairs apically-dorsally. *Pappus* uniseriate, scales 5. *Cypselas* unknown.

Distribution and ecology:—This species is known so far from only a few localities in between the Richtersveld and the Kamiesberg (Fig. 3). Near Steinkopf it grows among large granite (Precambrian gneiss) supporting dense succulent karoo scrub, belonging to the SKr15 Anenous Plateau Shrubland (Mucina *et al.* 2006).

Diagnostic characters:—*Ursinia laciniata* may be confused with the similar but allopatric *U. punctata* which is also a woody perennial with dissected leaves and truncate paleae. However, *U. laciniata* is easily distinguished from the latter by the polished, mostly trifid leaves with acute mucros, the glabrescent leaves and involucral bracts, the narrowly oblong middle involucral bracts with only the innermost bracts apically appendaged (Fig. 2F) and the paleae with prominently laciniate apical margins (Fig. 2F). In *U. pungens* the mature leaves are mostly 5–10 lobed with prominently long acuminate mucros, the leaves and involucral bracts are sparsely pilose, the middle involucral bracts are ovate to narrowly ovate with at least the inner two-most involucral bracts apically appendaged and the apical margins of the paleae are repand to slightly erose. *Ursinia laciniata* may be confused with the closely allied *U. glandulosa* with which it shares the acute leaf mucros and narrowly ovate middle involucral bracts but can be distinguished most prominently by the absence of stalked glands, the glabrescent leaves and involucre, and the laciniate paleae.

Additional specimens examined:—SOUTH AFRICA. Northern Cape Province: **2817 (Violsdrif):** Richtersveld, Kalkfontein (–CC), 23 August 1925, *Marloth 12655* (PRE). **Precise locality unknown:** Kamiesbergen, 10 September 1925, *Marloth 12685* (PRE).

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References

- Aiton, W.T. (1813) *Hortus Kewensis*. Longman, Hurst, Rees, Orme, and Brown, Paternoster Row, London, 568 pp.
- Brown, R. (1887) Plant New or Noteworthy. *The Gardeners' chronicle: a weekly illustrated journal of horticulture and allied subjects* 3(1): 670.
- Candolle, A.P. de (1836) *Prodromus systematis naturalis regni vegetabilis*, vol. 5. Treuttel et Würtz, Paris, 706 pp.
- Edwards, D. & Leistner, O.A. (1971) A degree reference system for citing biological records in southern Africa. *Mitteilungen des Botanische Staatssammlung München* 10: 501–509.
- Gaertner, J. (1791) *De fructibus et seminibus plantarum*, vol. 2. Sumtibus Auctoris, Typis Academiae Carolinae, Stuttgart, 678 pp.

- Harvey, W.H. (1865) Compositae. *In*: Harvey, W.H. & Sonder, O.W. (Eds.) *Flora Capensis*, vol. 3. Hodges, Smith & Co., Dublin, pp. 44–530.
- Himmelreich, S., Källersjö, M., Eldenäs, P. & Oberprieler, C. (2008) Phylogeny of southern hemisphere Compositae-Anthemideae based on nrDNA ITS and cpDNA *ndhF* sequence information. *Plant Systematics and Evolution* 272: 131–153.
<http://dx.doi.org/10.1007/s00606-007-0634-y>
- Jürgens, N., Desmet, P.G., Rutherford, M.C., Mucina, L. & Ward, R.A. (2006) Desert Biome. *In*: Mucina, L. & Rutherford, M.C. (Eds.) *The vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. South African National Biodiversity Institute, Pretoria, pp. 300–323.
- Leistner, O.A. & Morris, J.W. (1976) South African place names. *Annals of the Cape Provincial Museums* 12: 1–565.
- Lessing, C.F. (1832) *Synopsis generum Compositarum*. Black, Young & Young, London, 473 pp.
- Magee, A.R., Mucina, L. & Snijman, D.S. (2013) *Ursinia*. *In*: Snijman, D.S. (Ed.) *Greater Cape Plants II: Namaqualand-southern Namib and Western Karoo*. Strelitzia 29. South African National Biodiversity Institute, Pretoria, pp. 331–332.
- Mucina, L., Jürgens, N., Le Roux, A., Rutherford, M.C., Schmiedel, U., Esler, K., Powrie, L.W., Desmet, P.G., Milton, S.J., Boucher, C., Ellis, F., Lambrechts, J.J.N., Ward, R.A., Manning, J.C. & Midgley, G.F. (2006) Succulent Karoo Biome. *In*: Mucina, L. & Rutherford, M.C. (Eds.) *The vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. South African National Biodiversity Institute, Pretoria, pp. 220–299.
- Oberprieler, C. (2005) Temporal and spatial diversification of Circum-Mediterranean Compositae–Anthemideae. *Taxon* 54: 951–966.
<http://dx.doi.org/10.2307/25065480>
- Oberprieler, C., Himmelreich, S. & Vogt, R. (2007) A new subtribal classification of the tribe Anthemideae (Compositae). *Willdenowia* 37: 89–114.
<http://dx.doi.org/10.3372/wi.37.37104>
- Poiret, J.L.M. (1808) *Encyclopédie Méthodique: Botanique* VIII. Panckoucke, Plomteux, Paris, 881 pp.
- Prassler, M. (1967) Revision der Gattung *Ursinia*. *Mitteilungen der Botanischen Staatssammlung München* 6: 363–478.
- Rebelo, A.G., Boucher, C., Helme, N., Mucina, L., Rutherford, M.C., Smit, W.J., Powrie, L.W., Ellis, F., Lambrechts, J.J., Scott, L., Radloff, F.G.T., Johnson, S.D., Richardson, D.M., Ward, R.A., Procheş, S.M., Oliver, E.G.H., Manning, J.C., Jürgens, N., McDonald, D.J., Janssen, J.A.M., Walton, B.A., Le Roux, A., Skowno, A.L., Todd, S.W. & Hoare, D.B. (2006) Fynbos Biome. *In*: Mucina, L. & Rutherford, M.C. (Eds.) *The vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. South African National Biodiversity Institute, Pretoria, pp. 52–219.
- Swelankomo, N. (2008) *Molecular Phylogeny, Radiation Patterns and Evolution of Life-History Traits in Ursinia (Anthemideae, Asteraceae)*. MSc. dissertation. Stellenbosch University, Stellenbosch, South Africa.
- Van Wyk, A.E. & Smith, G.F. (2001) *Regions of Floristic Endemism in Southern Africa*. Umdaus Press, Hatfield, 199 pp.
- Watson, L., Evans, T.M. & Boluarte, T. (2000) Molecular phylogeny and biogeography of tribe Anthemideae (Asteraceae), based on chloroplast gene *ndhF*. *Molecular Phylogenetics and Evolution* 15: 59–69.
<http://dx.doi.org/10.1006/mpev.1999.0714>