

ASTERACEAE

A KEY TO *DICOMA* TAXA (DICOMEAE) IN SOUTHERN AFRICA

Recent molecular phylogenetic studies of the family Asteraceae suggest that the genus *Dicoma* Cass. belongs to the tribe Dicomeae, closely related to the tribe Cardueae (Panero & Funk 2002). Harvey (1865) revised the southern African species of *Dicoma*. In 1923, Wilson revised the whole genus including seventeen southern African species. Since the publication of Wilson's monograph, many new species have been described, and some taxonomic changes have been made to the genus. Ortiz (2000) made a phylogenetic analysis of *Dicoma* and related genera. Following this analysis he reinstated the

genus *Macledium*, which was first described by Cassini (1825). The species that previously belonged to sections *Macledium* (Cass.) DC. and *Pterocoma* DC. of *Dicoma* (as they were delimited by De Candolle in 1838 and Harvey in 1865) were transferred to the genus *Macledium* (Ortiz 2001). Netnou (2001) revised the genus *Dicoma* in southern Africa and during the course of this study, various herbaria were visited. Due to large numbers of incorrectly identified and unidentified species of this genus in some herbaria, it became apparent that a key to the species of *Dicoma* in southern Africa is much needed.

Key to southern African taxa of *Dicoma* Cass.

- 1a Heads radiate; rays neuter; disc floret pappus isomorphic of barbellate bristles; rigid shrublets:
 - 2a Leaves many, bright green, narrowly obovate or oblong-spathulate; midrib inconspicuous; heads cylindrical in shape; involucre bracts often reddish, gland-dotted *D. fruticosa* Compton
 - 2b Leaves few, dull grey-green, upper ones minute, basal ones often absent from herbarium specimens, if present broader than upper ones; midrib conspicuous at least on abaxial surface; heads obconic or campanulate; involucre bracts not gland-dotted:
 - 3a Heads distinctly obconic, cuneate at base; involucre bracts in (5)6(7) rows; pappus 9–11 mm long; leaves linear-elliptic *D. obconica* S.Ortiz & Pulgar
 - 3b Heads campanulate to subglobose, rounded at base; involucre bracts in 7 or 8(9) rows; pappus < 9 mm long; leaves oblanceolate to spathulate *D. picta* (Thunb.) Druce
- 1b Heads discoid or disciform; disc floret pappus isomorphic or dimorphic; shrubs, prostrate or erect herbs:
 - 4a Heads discoid; disc floret pappus dimorphic or isomorphic; plants erect or prostrate:
 - 5a Pappus dimorphic, outer rows of barbellate bristles, innermost row of membranous scales becoming barbellate toward apex:
 - 6a Erect annual herb, leaves discolorous, linear, narrowly elliptic or spathulate, margins serrate, base attenuate; involucre bracts purplish, spiny; inner pappus of membranous scales with barbellate tips *D. tomentosa* Cass.
 - 6b Prostrate perennial herb; leaves concolorous, elliptic or obovate, margins entire, distinctly petiolate; involucre bracts straw-coloured, not spiny; inner pappus with lower half scale-like, apex barbellate *D. cuneneensis* Wild
 - 5b Pappus isomorphic, of barbellate bristles, inner row not of membranous scales:
 - 7a Shrubs; leaves spathulate or broadly elliptic to suborbicular, both surfaces greyish white-felted:
 - 8a Leaves broadly elliptic to suborbicular, (10–)15–25 × (4–)7–10 mm; heads with 2(–5) subtending leaves; heads 13–16 mm long *D. kurumanii* S.Ortiz & Netnou
 - 8b Leaves spathulate, 8–12(–15) × 4–6(–8) mm; heads covered with at least 20 subtending leaves; heads less than 12 mm long *D. nachtigallii* O.Hoffm.
 - 7b Herbs or shrubs; leaves linear, elliptic, oblanceolate or ovate, upper surface tomentose, glabrous or subglabrous, lower surface greyish white-felted:
 - 9a Leaves linear, several times longer than wide:
 - 10a Shrub; leaves (5–)20–25 × 2–4 mm, upper surface dull greyish green, tomentose; involucre bracts erect with aristate apices, often sericeous on either side of midvein *D. dinteri* S.Moore
 - 10b Erect or prostrate herbs; leaves often longer than 30 mm:
 - 11a Plants erect:
 - 12a Heads solitary; leaves flexuous, upper surface glabrous to glabrescent, often with yellowish glands; heads broadly obconic, 30–32 mm wide; involucre bracts ovate-deltate, glabrous *D. swazilandica* S.Ortiz, Rodr.Oubiña & Pulgar
 - 12b Heads solitary or 3–5 corymbosely arranged at end of branches; leaves not flexuous, upper surface greenish black, gland-pitted; heads subcylindric to campanulate, relatively small, less than 30 mm wide; involucre bracts lanceolate, glabrescent *D. anomala* Sond. subsp. *gerrardii* (Harv. ex F.C.Wilson) S.Ortiz & Rodr.Oubiña
 - 11b Plants prostrate:
 - 13a Heads broadly campanulate; involucre bracts finely araneose-lanate or glabrescent, margins scarious, tips often recurved; leaves not fascicled, upper surface gland-pitted, greenish black *D. anomala* Sond. subsp. *anomala* (narrow-leaved form)
 - 13b Heads subcylindric; involucre bracts glabrous, ± entirely scarious, often not recurved; leaves often fascicled, upper surface dull greyish green with black glands *D. prostrata* Schweick.
 - 9b Leaves elliptic, lanceolate, oblanceolate, ovate or obovate:
 - 14a Prostrate herbs; leaves lanceolate to elliptic; heads sessile up to 40 mm wide; pappus of fine barbellate bristles, 10 mm or more long *D. anomala* Sond. subsp. *anomala* (broad-leaved form)
 - 14b Erect herbs or subshrubs; leaves oblanceolate, obovate or narrowly ovate; heads pedunculate, up to 25 mm wide; pappus ciliolate, if barbellate up to 7 mm long:
 - 15a Bushy herbs or subshrubs; leaves oblanceolate to obovate, often fascicled on axils, lower ones usually larger, upper surface bright green, glabrous at maturity, conspicuously gland-dotted; heads up to 25 mm wide; involucre bracts glabrous, outer often recurved, with sharp pointed apices; pappus ciliolate up to 9 mm long *D. galpinii* F.C.Wilson
 - 15b Shrubs; leaves lanceolate or narrowly ovate, not fascicled, upper surface of leaves gland-dotted, visible through tomentose indumentum; heads up to 20 mm wide; outer involucre bracts pilose, often recurved, apices acuminate-pungent; pappus barbellate, up to 7 mm long *D. montana* Schweick.
 - 4b Heads disciform; disc floret pappus dimorphic; prostrate herbs:
 - 16a Disc florets distinctly shorter than pappus; base of inner row of pappus broad, membranous with undulate margins, upper part ciliolate:
 - 17a Leaves concolorous, elliptic, up to 20 mm wide, distinctly petiolate, margins serrulate; disc floret pappus 7–12 mm long *D. schinzii* O.Hoffm.
 - 17b Leaves discolorous, oblong-lanceolate, up to 15 mm wide, subsessile, margins subentire; disc floret pappus 21–24(–30) mm long *D. macrocephala* DC.
 - 16b Disc florets ± equal to pappus; base of inner pappus of disc florets with basal part scale-like, upper part barbellate:

- 18a Leaves discolorous, ovate to orbicular; inner pappus of disc florets with basal part scale-like for more than $\frac{1}{2}$ length, tip barbelate *D. arenaria* Bremek.
 18b Leaves concolorous, narrowly oblong-lanceolate; inner pappus of disc florets with basal part scale-like for $\frac{1}{3}$ length, tip plumose *D. capensis* Less.

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REFERENCES

- CASSINI, A.H. DE. 1825. *Macleodium*. In G. Cuvier, *Dictionnaire des sciences naturelles* 34: 39. Paris.
- DE CANDOLLE, A.P. 1838. *Prodromus systematis naturalis regni vegetabilis* 7. Treuttel & Würtz, Paris.
- HARVEY, W.H. 1865. Compositae. In W.H. Harvey & O.W. Sonder, *Flora capensis* 3: 44–530. Hodges, Smith, Dublin.
- NETNOU, N.C. 2001. *A revision of the genera Dicoma Cass. and Macledium Cass. (Asteraceae, Mutisieae) in southern Africa*. M.Sc. thesis, Rand Afrikaans University, Johannesburg.
- ORTÍZ, S. 2000. A phylogenetic analysis of *Dicoma* Cass. and related genera (Asteraceae: Cichorioideae: Mutisieae) based on morphological and anatomic characters. *Annals of the Missouri Botanical Garden* 87: 459–481.
- ORTÍZ, S. 2001. The reinstatement of the genus *Macleodium* Cass. (Asteraceae, Mutisieae): morphological and phylogenetic arguments. *Taxon* 50: 733–744.
- PANERO, J.L. & FUNK, V.A. 2002. Toward a phylogenetic subfamilial classification for the Compositae (Asteraceae). *Proceedings of the Biological Society of Washington* 115: 909–922.
- WILSON, F.C. 1923. Revision of the genus *Dicoma*. *Bulletin of Miscellaneous Information* 1923: 377–388. Royal Botanic Gardens, Kew.
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