THE GENUS DORONICUM L. IN IRAN

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ABSTRACT. The Iranian species of *Doronicum* (Compositae) are listed and mapped, and a key is provided. *D. bracteatum* Edmondson, *D. dolichotrichum* Cavill. and *D. maximum* Boiss. & Huet are reported for the first time from Iran. A new species, *D. wendelboi* Edmondson, is described from the eastern Elburz. The circumscription of subsect. *Macrophylla* Cavill. is discussed, and a new subsection *Isaurica* Edmondson is described.

INTRODUCTION

Five species of *Doronicum* can be recognised in Iran; all belong to sect. *Doronicum* subsect. *Macrophylla* Cavill., as defined here. This group has its centre of distribution in eastern Anatolia; its members are found mainly in Kurdistan and Caucasia, extending to the Anti-Taurus (*D. haussknechtii* Cavill.) and Elburz mountains (*D. wendelboi* Edmondson).

The species of subsect. *Macrophylla* share a number of supposedly primitive features: tall, stout stems arising from a fleshy, ± horizontal rhizome with usually shallow adventitious roots; massive, mesomorphic basal leaves with long, robust petioles, the lamina having a subentire to weakly crenate-dentate margin and a cordate base; and numerous, relatively small, capitula. In comparison to members of other subsections of the genus, they show little adaptation to high light intensity and aridity, and are confined to moist habitats, often with deep forest cover. Their closest relatives outside the subsection grow in central Europe. When the subsection is better known, particularly with respect to breeding systems and the possible occurrence of apomixis, a reduction in rank of its constituent taxa may be justifiable. For the present, I have continued to treat them as species following the convention established by Cavillier (1911).

This revision completes my study of *Doronicum* in SW Asia excluding the USSR; previous accounts were prepared in connection with the Flora of Turkey project (Edmondson, 1973, 1975). I am indebted to Dr P. H. Davis for his continued encouragement, and to the Keepers and Curators of the following institutions for allowing me to study material in their herbaria or on loan: BM, E, G, IRAN, JE, K, LD, LTR, TARI, W. The Flora of Turkey project on which I am currently employed is financed by a grant from the Science Research Council (U.K.), whose support is gratefully acknowledged.

SYSTEMATIC TREATMENT

1. Lowest bract-leaf greatly surpassing the peduncle which it subtends 2

\+ Lowest bract-leaf much shorter than the peduncle which it subtends 3

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2. Basal leaves with triangular-cordate lamina; margins and veins with long multiseriate eglandular hairs and ± dense uniseriate eglandular hairs . . . . . 3. *dolichotrichum*

\+ Basal leaves with reniform to ± rotund lamina; margins with sparse uniseriate eglandular hairs . . . . 4. *bracteatum*

3. Stem subglabrous to glabrous in lower half; margins of involucral bracts with short-stalked glandular hairs; upper part of inflorescence often ± corymbose in well-grown specimens . 5. *maximum*

\+ Stem pilose or glandular-hairy; margins of involucral bracts with long-stalked glandular and/or eglandular hairs; inflorescence not corymbose 4

4. Apex of peduncles distinctly thickened, turbinate; lamina of basal leaf triangular-reniform to ± broadly ovate, margins distinctly sinuate-dentate, ± densely clothed with short- to medium-stalked glandular (rarely eglandular) hairs; involucral bracts lanceolate . 1. *hyrcanum*

\+ Apex of peduncles scarcely thickened; basal leaf lamina suborbicular, margins indistinctly sinuate-dentate to subentire, densely clothed with uniseriate short-stalked eglandular hairs; involucral bracts linear to narrowly lanceolate . . 2. *wendelboi*

1. D. hyrcanum Widder & Rech. fil. in Österr. Bot. Zeitschr. 97:235 (1950). Fig. 1.

Syn.: *D. hakkiaricum* Edmondson in Notes R.B.G. Edinb. 32:255 (1973).

Type: IRAN: E Azerbaijan, Sarichaman [47 km NW of Anar], *Mirdamadi* K. 2381 (holo. W*).

IRAN. E Azerbaijan: near Aliabad, c. 20 km SW of Kaleybar, steep rocks at head of enclosed mountain valley, 2300–2500 m, 20 vii 1971, *Lamond* 4876 (E). Ahar, Kuh-e Hassan, 8 viii 1968, *Termé* 13205 E (W). W Azerbaijan: Maku, Jamal Kandi, 2000 m, 22 vi 1974, *Siami* 3809 (W). Khan Goli-Kalisa-Kandi prope Maku, 2500 m, 1 vii 1973, *Zehzad* 1305 (W). SE Anatolia (Hakkâri), Transcaucasia (Nakhichevan), N Iraq?

2. D. wendelboi Edmondson, **sp. nov.** Fig. 1.

D. macrophyllo [Fischer ex] Hornem. similis sed humilis (40–45 cm altum), foliis basalibus suborbicularibus, pedunculis dense glanduloso-pilosis, pilis breviter stipitatis ferentibus; involucri bracteis ± lineari-lanceolatis, marginibus breviter glanduloso-ciliatis.

Herba perennis, 40–45 cm alta. *Caulis* erectus, inferne paucicostatus, pilis multiseriatis longis vestitus, sparse vel dense glandulosus, glandulis subsessilibus ferens. *Folia basalia* magna, 16–22 × 14–22 cm, suborbicularia; laminae margine infirme sinuato-dentatae, pilis eglandulosis uniseriatis vel glandulis brevistipitatis crebris, utrinque glandulis stipitatis brevibus dense punctatae. *Petioli* 11–15+ cm longi, pilis multiseriatis sat dense hirti, glandulis brevistipitatis ± dense tomentosi (glanduli longistipitati absunt). *Folia caulinia* (ad medium caulis) sessilia, amplexicaulia, indumento ad eo foliorum basalium simili. *Capitula* pulchra, usque ad 7, c. 3·5–5·5 cm diametro (ligulis inclusis), discus in sicco aureus, ligulae paulo pallidiores.

* All specimens cited have been seen unless otherwise indicated.

Pedunculi plerumque breves, 1–6·5(–11+) cm longi, apice incrassati, glandulis brevistipitatis vel longistipitatis dense vestiti. *Involucri bracteae* lineares vel lineari-lanceolatae, pagina externa glandulis subsessilibus dense punctata, ad marginem breviter glanduloso-ciliati. *Achaenia* (insulse cypselae) heteromorpha, marginalia glabra, centralia ad costos pilis acutis ferentia. *Floret* Junio-Julio.

Type: IRAN: Damghan-Semnan, Kuh-e Ghatri, Kuh-e Abr [c. 40 km N of Shahrud], north slope in *Quercus macranthera* forest, 2300–2500 m, 23 vi 1974, *Wendelbo & Foroughi* 12899 (holo. TARI).

IRAN. Mazanderan: Sang Deh, 30 km SE of Pol-e Sefid, in forest, 2000–2500 m, 11 vii 1974, *Renz & Iranshahr* 16613 (W). Gorgan: Dimelo, sommet du versant caspien, peu au-dessous de la crête, forêt humide et clairsemée, 2600 m, 4 vi 1956, *Schmid* 5859 (G). Ketul (Aliabad) [between Gorgan and Gonbad-e Qabus], vi 1948, *Sharif* 224 (W).

Endemic to Iran.

FIG. 1. Distribution of *Doronicum* species in Iran. ● *D. hyrcanum*, ■ *D. wendelboi*, ◆ *D. dolichotrichum*, ▼ *D. bracteatum* (total distribution), □ *D. maximum*, × "*D. macrophyllum* var. *psilocarpum*".

Sharif 224 is a scrappy specimen which although now considered to belong to *D. wendelboi* was formerly assigned to *D. hyrcanum*, having been cited in the original description of that species. Material of the latter species from SE Turkey was described by me as a new species, *D. hakkiaricum*, but subsequent study of type and other material of *D. hyrcanum* (cited above) convinced me that the Turkish material can be accommodated within *D. hyrcanum* sensu stricto.

D. wendelboi is closely allied to *D. hyrcanum*, and to *D. macrophyllum* [Fischer ex] Hornem. As with other very local species such as the Turkish *D. balansae* Cavill. and *D. tobeyi* Edmondson, it seems to be one of the remnants of a once widespread mesophytic flora whose range is becoming increasingly fragmented and isolated. Strong local selection effects, akin to the 'founder effect' which gives rise to distinctive island populations, could have produced the morphological changes which characterise this series of vicarious species.

The name of the species is dedicated to Professor P. Wendelbo (Göteborg), in recognition of his notable contributions to the botanical exploration of Iran and to the taxonomic revision of some of the most critical groups of its flora.

The above description is partly based on achenes collected from Kuh-e Ghatri by Mrs Ann Ala in August 1974 and kept with the holotype.

3. D. dolichotrichum Cavill. in Annu. Cons. Jard. Bot. Genève 13–14:345 (1911). Fig. 1.

Syntypes: versant transcaucasien du Caucase: Perwal [= pass] im Schar près Alastumann (Abastumani), *Wirchow* (once at B, now destroyed?); descente du Mont Khino au défilé Goghieti, 2000 m [1893], *Alboff* (G); in jugo Adzharo-Imeretico [1893], *Ardazenow* (G).

IRAN. E Azerbaijan: Arasbaran Protected Region, western part of Makidi, beside brooklet, 2000 m, 8 vi 1976, *Assadi & Masoumi* 20234 (TARI).

This is the first gathering in Iran of this mainly Transcaucasian species whose distribution extends into NE Anatolia. Though matching Turkish material in most respects, this specimen differs by having the outer surface of the involucral bracts densely clothed with long eglandular (not glandular) hairs.

4. D. bracteatum Edmondson in Notes R.B.G. Edinb. 32:257 (1973). Fig. 1.

Type: IRAQ, Arl Gird Dagh (Algurd Dagh) near Rust (Rost), by a stream, 2300 m, 24 vii 1932, *Guest & Ludlow-Hewitt* 2928 (holo. K). According to Blakelock (1949), a duplicate specimen exists in the Rustam Herbarium (BAG).

IRAN. Hamadan: pentes S du Mt Elvend (Kuh-e Alvand), près de sources et neige, 3100–3300 m, 10 vi 1959, *Pabot* 1717 (G).

This record establishes a notable extension in the range of this species, which was hitherto known only from N Iraq. In the type specimen the lower

part of the stem is glabrous; the Iranian material, by contrast, is quite densely clothed with long-stalked multiseriate eglandular hairs.

Pabot's gathering includes the lower leaves, allowing me to amplify the original description:

Basal leaves with reniform-suborbicular lamina, 6·5–8 × 6·5–9 cm, rounded at the apex, surfaces ± glabrous, margins weakly dentate, sparsely clothed with uniseriate short-stalked eglandular hairs, underside with prominent pale principal veins; petiole 6–9·5 cm. *Lower cauline leaves* broadly ovate, lamina 11–12 × 9·5–10·5 cm, obtuse at the apex, margins more distinctly dentate to sinuate-dentate; petiole 17–20 cm.

5. D. maximum Boiss. & Huet in Boiss., Diagn. ser. 2, 3:31 (1856). Fig. 1. Type: TURKEY, prov. Erzurum: in monte Tech Dagh (Palandöken Dağ) prope Erzurum, ad rivulos, 2100–2450 m, *Huet du Pavillon* s.n. (holo. G).
IRAN. W Azerbaijan: Chalil Kuh, in montibus supra Selvana, in glarea torrentis, 1800–2600 m, 4 vii 1974, *Renz* 48989 (W). Rezaiyeh, Selvana, 1580–2500 m, 26 vi 1970, *Termé* 13776 E (W).
Scattered in N & E Anatolia.

These records are the first from Iran. The locality is close to a previously known station on Cilo Dağ in the Turkish province of Hakkâri.

D. macrophyllum [Fischer ex] Hornem. var. *psilocarpum* Boiss., Fl. Or. 3:380 (1875). Fig. 1.
IRAN. W Azerbaijan: Ssahendgebirge (Kuh-e Sahand) bei Schah-Jordi, c. 2500 m, '20 vi' [2 vii] 1847, *Buhse* 579 (not seen).

Besides being the earliest record of *Doronicum* from Iran, Buhse's plant was one of two gatherings cited as syntypes of var. *psilocarpum* Boiss. The other specimen was later chosen as the type of *D. balansae* Cavill. I hesitate to equate the Iranian record with this species on such slender evidence, the more so as I have been unable to trace the specimen. The sole character mentioned by Boissier, glabrescent disc achenes, is of no help in its identification.

No other gatherings of *Doronicum* from Kuh-e Sahand are known. On Buhse's map the site 'Schah-Jordi' appears to lie to the SE of the main summits of the extinct volcano (Buhse, 1850), but cannot be traced on modern maps. Professor K. H. Rechinger visited the northern side in June 1977, but no *Doronicum* was seen (and it is not a plant easily overlooked!). Future collectors should look out for this plant in order to establish its identity or confirm its extinction. *D. hyrcanum* would seem the likeliest species to occur on Kuh-e Sahand.

A second record of *D. macrophyllum* var. *psilocarpum*, whose identity is equally uncertain, is cited in vol. 3 of Parsa's *Flore de l'Iran* (1949): 'Forêts de Kalar Dasht, 2000 m, 30 v 1939, *Parsa*'. The area is in Mazanderan province, on the NE side of Takht-e Sulaiman c. 40 km SW of Chalus. It is not known where Parsa's specimens are kept (Lamond, 1977) nor even if they still exist, so it is not possible to check the identification. On distributional grounds it seems likely that the record refers to *D. wendelboi* (see fig. 1).

Scope of subsection Macrophylla Cavill.

The subsection is now considered to contain ten species. The five which occur in Iran are asterisked:

D. balansae Cavill.
**D. bracteatum* Edmondson
**D. dolichotrichum* Cavill.
D. haussknechtii Cavill.
**D. hyrcanum* Widder & Rech. fil.
D. macrolepis Freyn & Sint.
D. macrophyllum [Fischer ex] Hornem.
**D. maximum* Boiss. & Huet
D. tobeyi Edmondson
**D. wendelboi* Edmondson

D. cataractarum Widder was originally assigned to this subsection, but having studied material in cultivation I believe this to be incorrect. Seed was supplied by Graz Botanical Garden, and was grown in the Botanical Garden of Leicester University, where it was compared with a stock of *D. macrolepis* Freyn & Sint. from NE Turkey. There were marked differences in habit and leaf-shape. Widder (1925) tabulated the differences between *D. cataractarum* and various species of subsect. *Macrophylla* known at the time, but appears to have overlooked its affinities with subsect. *Cardiophylla*. A marker character is the woolly tuft at the apex of the rhizome known in no other member of subsect. *Macrophylla* as circumscribed here.

Cavillier (1911) included *D. cacaliifolium* Boiss. & Heldr. in subsect. *Macrophylla*, but with reservations. This species is a distinctive endemic of Isauria, S Turkey, and in view of the following important differences between it and the other members of subsect. *Macrophylla*, it is assigned here to a new subsection.

D. cacaliifolium	Subsect. *Macrophylla*
Rhizome moniliform, not fleshy, lanate at apex	Rhizome not repeatedly constricted, fleshy, glabrous at apex
Leaves membranous, dullish bottle-green *in sicco*; margins of lamina markedly crenate-dentate, resembling those of *D. columnae* Ten. but with a much longer petiole	Leaves opaque, generally bright green *in sicco*; margins of lamina ± obscurely sinuate-dentate to subentire (or the cauline sometimes more deeply indented)
Capitula rather small, up to 14 in each inflorescence.	Capitula of medium size, seldom more than 12 per inflorescence.

Doronicum L. sect. Doronicum
[Syn.: sect. *Doronicastrum* Cavill.]
Subsect. **Isaurica** Edmondson, **subsect. nov.**

Ab omnibus subsectionibus *Doronici* sect. *Doronicum* rhizomate moniliformi differt; a subsect. *Macrophyllo* rhizomate ad collum lanato distinguitur.
Type: *D. cacaliifolium* Boiss. & Heldr. in Boiss., Diagn. ser. 1(11): 31 (1849). Cavillier, op. cit. 266–269 (1911).
S Turkey: Isaurian Taurus, c. 32°–c. 33° E.

The species grows on shady north-facing cliff ledges from 1500–2300 m altitude. Its habitat is clearly a relict one, far removed from the humid forests and moist places by streams where members of subsect. *Macrophylla*

are found. The affinities of subsect. *Isaurica* are obscure, though the leaf-shape and the woolly apex of the rhizome suggest a connection with subsect. *Cardiophylla*.

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Book Review

The Flora of Cyprus vol. 1. Somewhat surprisingly considering the relatively small size of its flora and the large number of botanists that have been attracted to its shores, one of the earliest being Sibthorp in 1787, Cyprus has never had anything approaching what could be called a Flora. The Austrian Theodor Kotschy who collected extensively in the middle of the last century published in 1865 *Die Insel Cypern*, a general account of the island and its vegetation and, in the early part of this century, the Norwegian Jens Holmboe brought together his knowledge of its plants in *Studies on the vegetation of Cyprus* (1914). Useful as these two works are, neither was intended as a guide to naming all the plants of the island. For that purpose, more often than not, one had to rely on Boissier's wide-ranging *Flora Orientalis* (1867–88).

Desmond Meikle, with a very wide experience of the European and Mediterranean flora, first started working on a proposed Flora of the island as long ago as the late 1950s. The appearance of the first volume (of two) of the definitive Flora* was therefore a particularly welcome event to all concerned with the floras of south-west Asia and the E Mediterranean. The first volume covers in Bentham & Hooker *Genera Plantarum* sequence the families Pinaceae to Rubiaceae, and Theligonaceae. About 700 native species are dealt with in c. 800 pages, including the 52 full page line drawings. It is not a rich flora in comparison with that of many nearby Mediterranean countries and in the first volume there are remarkably few genera of any size or complexity—*Silene* with 26 species, *Trifolium* 31, *Medicago* 20, *Vicia* 20 are apparently the only ones with 20 species or more. *Astragalus*, the monster genus of Turkey, Iran and Afghanistan, has only 12 species in Cyprus. The format of the Flora is conventional, giving keys to genera and species (but not families), species synonymy, relevant references, indication of types, full species descriptions,

* Flora of Cyprus vol. 1 by R. D. Meikle. 832 pages, 52 figs. 25 November, 1977. Published by the Bentham-Moxon Trust, Kew. Printed by Robert MacLehose, Glasgow. Price £20.