

## *Taraxacum umbrosum* (Asteraceae, Cichorieae), a new species intermediate between sect. *Erythrosperma* and sect. *Erythrocarpa*, widespread in the Balkans

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A new, relatively widespread species of *Taraxacum* from the Balkans, intermediate between sect. *Erythrosperma* and sect. *Erythrocarpa*, *T. umbrosum* Sonck, Kirschner & Štěpánek, is described and illustrated. It occurs in Greece, Bulgaria and F.Y.R. Macedonia, and is characterized by numerous, narrowly-triangular leaf lateral segments, numerous, imbricate, ovate to ovate-lanceolate, dark, distinctly narrowly bordered and conspicuously corniculate outer phyllaries, and brown or castaneous-brown, initially also red-brown achenes usually 4–5 mm long. *Taraxacum umbrosum*, an agamosperous taxon, is compared with morphologically similar species in sect. *Erythrosperma* (*T. fragosum* and *T. taraxacoides*) and with those in sect. *Erythrocarpa* (*T. olymphilum*, *T. pindicola*, *T. dorhocarpum*, *T. panhellenicum*, *T. voricola* and *T. gratum*).

One of the regions with the highest diversity of *Taraxacum* is the eastern half of the northern Mediterranean (van Soest 1975, Richards 1991). The exploration of this region, however, is quite uneven, both taxonomically and phytogeographically. Only sect. *Palustris*, sect. *Piesis* (Kirschner & Štěpánek 1994, 1998) and sect. *Erythrosperma* in Greece are reasonably well known, the last section thanks to the expeditions and studies carried out by Sonck (1984, 1985a, 1985b, 1986, 1988, 1989). The section *Erythrocarpa* was studied by us in the adjacent regions (Štěpánek *et al.* 2010, Kirschner & Štěpánek 1985).

To study the genus *Taraxacum* of the Mediterranean, Carl Eric Sonck (1905–2004, *see also* Wallgren 2004) undertook a series of excursions to the Balkan Peninsula, mainly to Greece in

the 1980s. His studies resulted in a number of publications with descriptions of new dandelions from that area (for a revision, *see* Štěpánek & Kirschner 2014). The major part of his excellent herbarium material is deposited in H, minor collections being in other herbaria. He made a selection of duplicates and we had an opportunity to study the ones now deposited in PRA.

In the late 1980s, during several visits C.E. Sonck paid to our Průhonice Institute, we jointly consulted herbarium material of a number of species of sect. *Erythrosperma* from Greece, including our material from the northern parts of the Balkans. Later, we jointly recognized an undescribed species collected by C.E. Sonck in Greece, by the present authors in Bulgaria and by other collectors in the Republic of Macedo-

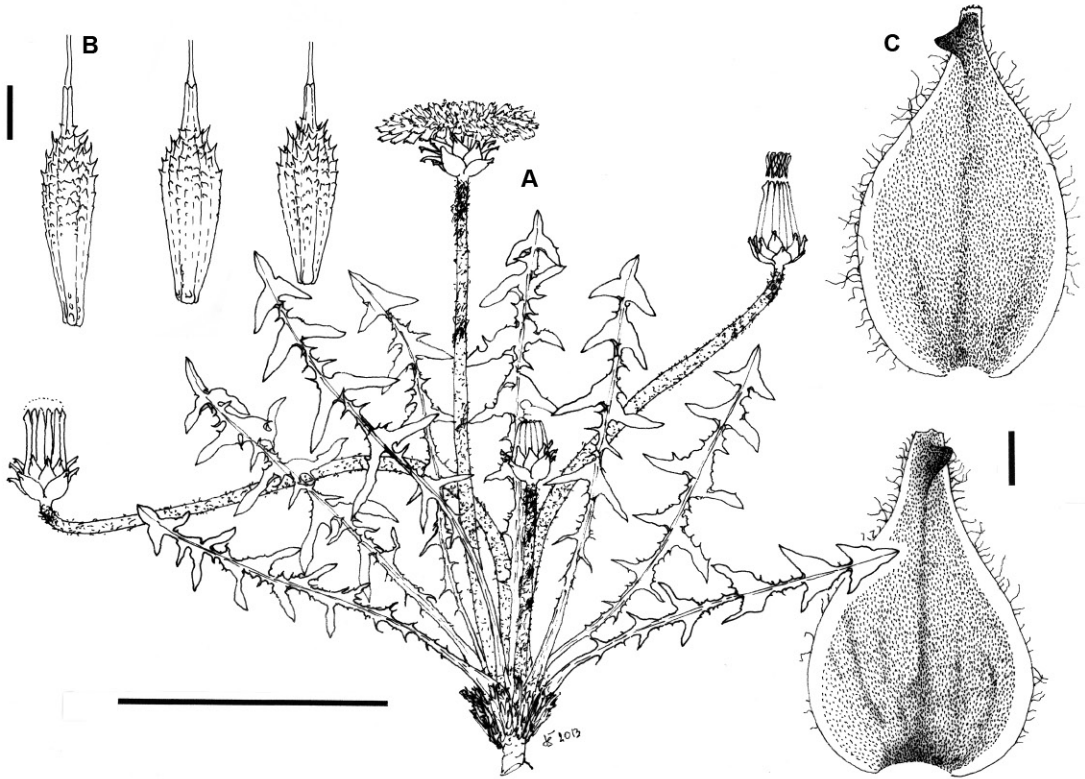


Fig. 1. *Taraxacum umbrosum* (from the holotype). — A: General habit (scale bar = 5 cm). — B: Achenes (scale bar = 1 mm). — C: Outer phyllaries (scale bar = 1 mm).

nia, and coined the name *T. umbrosum* for it. In 1997, we issued herbarium material under that name in our exsiccate series *Taraxaca Exsiccata*.

At present, when we are preparing the *Taraxacum* treatment for volume 12 of *Flora of Bulgaria*, it is necessary to validate the name. The *T. umbrosum* co-authorship of C. E. Sonck is due to the joint preparation of the description in the 1990s, a joint authorship of the name and the rich material gathered and identified by him.

The material used for the study is mainly deposited in H and PRA. As many of the gatherings are relatively recent, there was a possibility to cultivate a number of samples at the Experimental Garden of Institute of Botany, Academy of Sciences, Průhonice, Czech Republic (PRA). The morphological variation and reproduction were studied on living plants (no sexuality detected). Selected duplicates were distributed in the series *Taraxaca Exsiccata*, an exsiccate series edited at PRA, and deposited in several herbaria with major *Taraxacum* collections (such

as H, L, LD, S) or in private collections of I. Uhlemann, B. Trávníček, H. Øilgaard, etc.

The method of mass cultivation and identification of reproduction systems were described by Kirschner and Štěpánek (1993) and Kirschner *et al.* (2006).

***Taraxacum umbrosum* Sonck, Kirschner & Štěpánek, sp. nova (Figs. 1 and 2)**

TYPE: Republic of Macedonia. Galičica Mts., subalpine sites in the pass in Mt. Galičica, along the road between Oteševo and Ohridsko Lake. 1500–1600 m a.s.l., July 1987, R. Bělohávková & D. Fišerová. Cultivated from achenes no. JŠ 2810/5 as no. JŠ 3767 (holotype PRA, no. det. 28031; isotypes distributed as *Taraxaca Exs.*, no. 530, e.g., in herb. H, M, S, BM). Exsiccate: *Taraxaca Exs.*, no. 530, 1002–1004.

*Plantae agamospermae, foliis 4–9 cm longis, 1–2 cm latis, lobis lateralibus (4–)6–8 utrimque, deorsum decrescentibus, saepissime anguste tri-*



Fig. 2. Details of flower heads of *Taraxacum umbrosum*. Photographed by C.E. Sonck.

*angularibus, involucris ca. 5 mm in diametro, squamis exterioribus numero (12) 17–23, imbricatis, subappressis, late ovatis usque ovate lanceolatis, plerumque 6–8 mm longis, (2.5–)3–4 mm latis, margine albido 0.1–0.4 mm lato, sub apice corniculo acuto, ca. 0.5 mm longo obscuro armatis, calathiis parvis, stigmatibus flavo- viridibus, antheris polliniferis, acheniis obscure badiis usque castaneis, (3.7–)4.1–5.0(–5.7) mm longis corpore in tertia parte superiore medio- criter dense et ± breviter spinuloso, 0.8–1.1 mm lata, rostro 8–9(–10.5) mm longo, pappo albo- albido, 5–6.5 mm longo.*

Plants small, usually 4–12 cm tall. Plant base covered with remnants of old brown petioles (tunic), densely brownish-white aranose among petiole bases. Leaves variously erect-patent, not spotted, sparsely aranose, later glabrescent; leaf blade narrowly elliptical to narrowly oblanceolate, pinnatisect; terminal segment small, usually 6–11 × 6–14 mm, triangular to broadly triangular in outline, often trilobed, usually with apical lobe lingulate and lateral lobes patent to subrecurved, often elongate-lingulate, distally convex, entire or with a single incision and a big tooth, proximally concave to straight, entire or with a single tooth near its base; lateral segments (4)6–8 pairs, usually patent to subrecurved, 4–12 mm long, 3–7 mm wide at base (most proximal segments often reduced to narrow big teeth), triangular to narrowly so in outline, often wing-like, distal margin most often sigmoid, entire or often with an incision and a big tooth parallel to segment axis, proximal margin ± straight or slightly sigmoid or slightly concave, entire or with a single basal patent tooth; interlobes narrow, usually 3–7 × 1–2 mm, with 1–4 filiform teeth, often dark

bordered; midvein adaxially pale or pale brownish; petiole usually 1–2 cm long, not winged, usually faintly greyish brown-purple. Scapes subequalling leaves, faintly purplish at base, densely aranose. Capitulum 2.5–3 cm in diam., flat to slightly convex, deep yellow. Involucre truncate at base, ca. 5 mm wide; outer phyllaries (12)17–23, imbricate, appressed, loosely appressed towards apex, broadly ovate to ovate-lanceolate, usually 6–8 × (2.5–)3–4 mm; abaxially dark olivaceous-green to blackish green (darker towards apex), distinctly pale- to white-bordered, border 0.1–0.4 mm wide, margin distinctly ciliate, with a dark, to 0.5 mm long cornicle below apex; inner phyllaries 11–12 mm long, of equal width. Outer ligules flat, relatively broad, striped purplish deep grey outside, apical teeth greyish or reddish; inner ligules almost flat, apical teeth dirty yellow; stigmas discoloured, yellow-green to greyish green; pollen present, pollen grains variable in size. Achenes brown to dark castaneous-brown (immature dark reddish brown), (3.7–)4.1–5.0(–5.7) mm long, 0.8–1.1 mm wide, achene body medium densely and shortly spinulose in upper 1/3, upper spinules longer, to 0.3 mm long, erect-patent to erect, achene body subabruptly to gradually narrowing into a thin cylindrical to subcylindrical cone (0.6–)0.8–1.0(–1.4) × 0.15–0.25 mm; rostrum 8–9 (–10.5) mm; pappus white, 5–6.5 mm. Agamosperous.

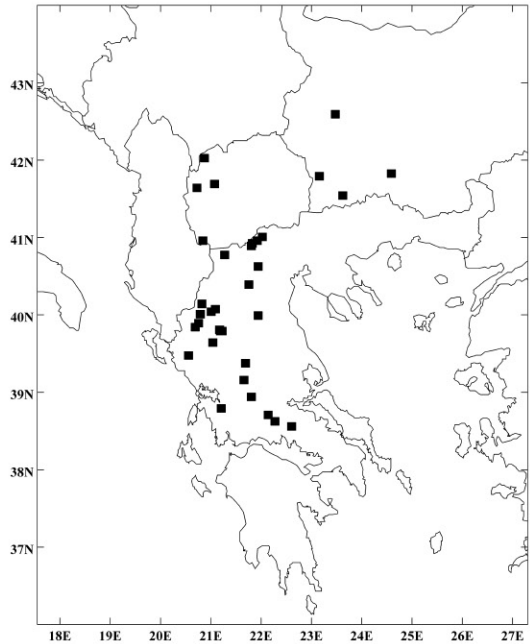
*Taraxacum umbrosum* is intermediate between sect. *Erythrosperma* (plants very small and achenes variable in size, usually medium-sized) and sect. *Erythrocarpa* (relatively big outer phyllaries); there are several similar species placed in either section.

*Taraxacum (Erythrosperma) fragosum* may have a similar leaf shape and a similar shape of the outermost phyllaries but is substantially different in its straw-greyish achenes and conspicuously short interlobes. *Taraxacum taraxacoides* (see also Štěpánek & Kirschner 2013), a species somewhat similar to our new taxon in its outer phyllaries, can be distinguished by red-brown and shorter achenes with longer rostrum, more numerous leaf lateral segments, smaller outer phyllaries, and usually by the absence of pollen. The Greek members of sect. *Erythrosperma* have outer phyllaries patent to arcuate-recurved and usually narrower.

*Taraxacum olimpophilum* is the morphologically closest, and partly sympatric, member of sect. *Erythrocarpa*. It differs from *T. umbrosum* in having longer outer phyllaries with much wider borders. Also *T. pindicola* is similar to *T. umbrosum* and sometimes grows together with it. However, *T. pindicola* has less toothed and incised leaves, shorter interlobes, broader petioles, yellow stigmas, regular pollen and usually red-brown achenes with cones only 0.4–0.7 mm long. *Taraxacum voricola*, another member of sect. *Erythrocarpa* from Greece, has a broadly winged pale-green petiole, broadly bordered outer phyllaries and dark-reddish-purple achenes. As regards the other, rather remotely similar members of this section, *T. dorchocarpum* has greyish achenes, winged petioles and longer outer phyllaries, *T. panhellenicum* is characterized by a frequent absence of pollen and by dark green stigmas, and *T. gratum* (see also Štěpánek *et al.* 2010) has more broadly bordered outer phyllaries and lacks pollen.

*Taraxacum umbrosum* most frequently grows in dry grasslands, stony slopes and open woodlands, usually on calcium-rich substrates from the lower montane to the subalpine belt. It is documented from the western and southern Republic of Macedonia, the SW Bulgaria and NW and central Greece (Fig. 3).

**SPECIMENS EXAMINED** (paratypes unless otherwise indicated): — **Bulgaria**. Sofia, Lozenska planina Mts., ca. 0.5 km above Gorni Lozen., 1988, *J. Kirschner*. Cultivated as JK 91 (PRA, no. det. 13611). • Pirin Mts., Mt. Beli Rid above Popovi Livadi, 5 May 1993, *O. Šída* (herb. *O. Šída*, no. det. 13529). • Rodopi Mts., Černatica, Čudnite Mostove, 30 May 2000, *M. Marek* (PR, no. det. 16223). • 7 km situ N of Kresna village, valley of Struma, 3 May 1993, *O. Šída*. Cultivated as JŠ 5429/A (PRA, no. det. 25876). — **Greece**. Macedonia Province, Mt. Varnous, Nom. Florinis, Ep. Florinis, above the pass of Pisoderi, 1800–1900 m a.s.l., 1998, *H. M. Christophersen et al.* 46695 (C, no. det. 25969). • Mt. Voras, Nom. Florinis/Pellis, along road to the ski centre, 1600 m a.s.l., 1999, *Strid et al.* 48918 (C, no. det. 15047). • Mt. Voras, Nom. Florinis/Pellis, Ep. Almopias/Florinis, just below the ski centre, 1900–2000 m a.s.l., 1999, *Strid et al.* 48854 (C, no. det. 15050). • Kotsanis, Ep. Kotsanis, SW of Mavrodhendhri, 760 m a.s.l., 2003, *R. Willing & E. Willing* 116304 (B, no. det. 25906). • Pella, Ep. Aridheas, SSW of Promahi, 185 m a.s.l., 2003, *R. Willing & E. Willing* 109497 (B, no. det. 25911). • Pella, Ep. Aridheas, NW of Orma, 350 m a.s.l., 2003, *R. Willing & E. Willing* 109437 (B, no. det. 25907). • Nom. Imathia, Vermion Massif, summit of Mt. Tsanakis and Grammeni Petra, 1900–2070 m a.s.l., 1990,



**Fig. 3.** Geographical distribution of *Taraxacum umbrosum*.

*E. Willing* 9617 (B, no. det. 25904). • Prov. of Macedonia/Ípiros: Mt. Vasilitsa, Nom. Grevenon/Ioanninon, Ep. Grevenon/Konitsis, around the ski centre, 1750–1800 m a.s.l., 1999, *Strid et al.* 48273 (C, no. det. 15042). • Prov. of Ípiros: Nom. Thesprotia, Ep. Souliou, 1.6–1.8 km S of Aj. Kiriaki, 1990, *E. Willing* 8353b (B, no. det. 25909). • Nom. Ioanninon, Ep. Dodonis, near the Vikos balcony, 1300 m a.s.l., 1999, *Strid et al.* 48095 (C, no. det. 25963). • Nom. Ioanninon, Ep. Dodonis, by the monument to Zagori women on road to Monodendri, 1000 m a.s.l., 1999, *Strid et al.* 48065 (C, no. det. 25962). • Nom. Ioanninon, Ep. Konitsis, 1.5 km W of Distrato, 950 m a.s.l., 1999, *Strid et al.* 48196 (C, no. det. 15045). • *Ibidem*: *Strid et al.* 48199 (C, no. det. 14348). • Mt. Timfi, Nom. Ioanninon, Ep. Dodonis, SW of Drakolimni, 1800–2000 m a.s.l., 1999, *Strid et al.* 49363 (C, no. det. 15043). • Nomos Ioanninon, Pindhos Mts., 2 km W of the Katara Pass 1600 m a.s.l., 1995, *H. Wittzell* 4365 (PRA, no. det. 25899). • Ioannina, Ep. Konitsis, W Aj. Paraskevi, 620 m a.s.l., 2003, *R. Willing & E. Willing* 108331 (B, no. det. 27893). • Prov. of Ípiros/Thessalia: Epeiros, Katara, NE of Metsovo, 25 Apr 1983, *C. E. Sonck* (H, no. det. 25875). • Pindos, Katara Pass, dry serpentine, 1500–1700 m a.s.l., 26 May 1994, *A. J. Richards*. Cultivated as JK 4096 (PRA, no. det. 25914); cultivated as JK 4098 (PRA, no. det. 25913). • Prov. of Thessalia: Trikala, E of Katara, 1550–1600 m a.s.l., 21 May 1985, *C. E. Sonck* (PRA, no. det. 25878). • Karditsa, Kerasea, Gura region, 850 m a.s.l., 19 May 1985, *C. E. Sonck* (H, no. det. 13608; PRA, no. det. 13609, 13610). • Nom. Larisa, Ep. Ellassonos, 2.1 km NE of Loutro, 950–990 m a.s.l., 1993, *E. Willing* 27989 (B, no. det. 25905). • Chaliki, near the summit of Mt. Peristeri., 2 Jul. 1896,

*P. Sintenis*, Sintenis, Iter Thessal. 1896, no. 735 (JE, no. det. 28532). • Prov. of Stereá Ellas: Nom. Evrytania, Timfristos, SW slopes of summit of Timfristos, 1850–2100 m a.s.l., 1991, *E. Willing 13732* (B, no. det. 25908). • Nom. Fthiotis, Ep. Fthiotidhos, Iti, E of Neohor, W of Mt. Petrotos, 1370–1750 m a.s.l., 1991, *E. Willing 14731* (B, no. det. 25910). • Mt. Vardousia, Nom. Fokidos, Ep. Parnassidos, 1900–2100 m a.s.l., 1998, *H. M. Christophersen et al. 46127* (C, no. det. 25968). • Fokis, Giona, Proftis Ilias, 2100–2300 m a.s.l., 4 Jun. 1982, *F. Krendl* (W, no. det. 27901). • Boeotia, Parnassos, NE of Arachova, 8 Jun. 1982, *F. Krendl* (W, no. det. 27904). • Agrapha (Dolopia veterum), summit of Mt. Karáva, 1–3 Jul. 1885, *C. Haussknecht* (JE, no. det. 28534). — **Republic of Macedonia**. Popova Šapka chalet to Mt. Popova Šapka, 1500–1700 m a.s.l., 30 Jun. 1976, *F. Krendl* (W, no. det. 27899). • Šar Planina, Tetovo, Popova Šapka: Mt. Ceripašina planina, 1 km WNW of Popova Šapka Ski Resort, 1900–2100 m a.s.l., 2011, *M. Štěpánek 220 & J. Hadinec*. Cultivated as JŠ 9882 (PRA, no. det. 28936), distributed as *Taraxaca* Exs., no. 1004. • Bistra Planina, above Mavrovo, 1800 m a.s.l., 1969, *G. H. Leute 511* (W, no. det. 27895). • Skopje, mountain region between Tuin and Rasteš, ca. 1.5 km N of Mt. Dobra Voda, 1700 m a.s.l., 19 Jun. 1988, *H. Koblíhová*. Cultivated as JŠ 3791 (PRA, no. det. 25901). • Skopje, mountain region between Tuin and Rasteš, above Tuin, 1800 m a.s.l., 18 Jun. 1988, *H. Koblíhová*. Cultivated as JŠ 4727 (PRA, no. det. 25900); cultivated as JŠ 4726 (PRA, no. det. 25898); cultivated as JŠ 3794 (PRA, no. det. 25897), distributed as *Taraxaca* Exs., no. 1002. • Galičica Mts., Mt. Galičica, road between Oteševo and Ohridsko Lake, 1500–1600 m a.s.l., Jul. 1987, *R. Bělohávková & D. Fišerová*. Cultivated as JŠ 2810/1, 2, 3, 5, 6 (PRA, no. det. 25877); cultivated as JŠ 3767 (PRA, no. det. 13612), distributed as *Taraxaca* Exs., no. 530 (isotypes). • Pelister Mts., near Golemo and Malko ezero, 1800–1900 m a.s.l., 1987, *R. Bělohávková & D. Fišerová*. Cultivated as JŠ 3765 (PRA, no. det. 25896); cultivated as JŠ 2811/1, 2, 3, 4 (PRA, no. det. 25895), distributed as *Taraxaca* Exs., no. 1003.

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