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Taraxacum sect. *Palustria* (Compositae, Cichorieae) in Bulgaria revised, with three new species

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Abstract: Three new species of *Taraxacum* sect. *Palustria* (Compositae, Cichorieae) are described from Bulgaria, viz. *T. abruptilobum*, *T. basilicum* and *T. rumelicum*. The new species, on the basis of detailed, standardized descriptions and illustrations, are compared with similar species of this section. All the seventeen species of *T. sect. Palustria* in Bulgaria are agamospermous. An identification key to the members of *T. sect. Palustria* in Bulgaria is given.

Key words: Mediterranean, Balkan Peninsula, Bulgaria, Asteraceae, Compositae, Cichorieae, *Taraxacum*, *Taraxacum* sect. *Palustria*, taxonomy, new species

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Introduction

The *Taraxacum* flora of Bulgaria and adjacent regions has been dealt with by the present authors since the late 1980s (Kirschner & Štěpánek 1993a, 1999b, 1999a; Štěpánek & Kirschner 2014; Štěpánek & al. 2011; Zeisek & al. 2015), with an ultimate goal of a critical, reasonably complete treatment of *Taraxacum* F. H. Wigg. in the series of *Flora of Bulgaria*. In particular, we focused our study on marsh dandelions, *T. sect. Palustria* (H. Lindb.) Dahlst. Our first expeditions to Bulgaria revealed eight species of this section (four newly described, Kirschner & Štěpánek 1993a). Later on, we monographed *T. sect. Palustria* (Kirschner & Štěpánek 1998) and revealed another six new species in the Bulgarian material. The present contribution completes our knowledge of *T. sect. Palustria* in Bulgaria on the basis of additional and/or newly cultivated material. Another

three new species are described so that 17 taxa referred to *T. sect. Palustria* are now known from Bulgaria, all with agamospermous reproduction (see Material and methods).

Any taxonomic treatment of *Taraxacum* comparable to modern standards should follow several principles. They were summarized by Richards (1973), Kirschner & Štěpánek (1996) and Ge & al. (2011), and reflect the peculiar features and processes known in dandelions, particularly the coexistence of agamospermy and sexuality, complex hybridity and polyploidy, the low level of structural morphological differentiation and the high number of mutually similar and mostly hybridogenous species. The principles derived from the above features include (1) different kinds of species are to be recognized on the basis of the extent of variation and modes of reproduction, (2) distribution of sexuality is to be explored, (3) variation within a family of siblings should be studied for each taxon (to

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detect autonomous aberrants or facultative sexuality), and (4) the study should be started at the lowest variation level (within and among populations). We attempted to follow the above principles in the present paper.

Material and methods

The material for the present study comes from our expeditions to Bulgaria and from achene samples of other collectors. We would like to acknowledge the enormous help of the late Bogdan Kuzmanov during our field and herbarium studies. The material is preserved in the herbarium PRA, of the Institute of Botany, Academy of Sciences, Průhonice, Czech Republic. It represents one of the largest *Taraxacum* collections in the world; duplicates will be deposited in SOM (see Index Herbariorum at <http://sweetgum.nybg.org/science/ih/>). Most of the material was also cultivated at the experimental garden of the Institute of Botany, Academy of Sciences, Průhonice, Czech Republic, following the methods published in Kirschner & Štěpánek (1993b).

All the plants included in the present study have agamosperous reproduction. The mode of reproduction was studied in cultivation using methods described in Kirschner & al. (2006).

As a rule, more than one species grow side by side, up to five species according to our observations. It is therefore important that plants are collected and/or otherwise documented taking this diversity into account. Only well-developed plants are suitable for identification. Ideally, plants in full flower should be evaluated, and their achenes obtained in cultivation. Alternatively, the oldest capitulum in a plant may be collected with its scape and kept in water in a small vessel for up to ten days to get ripe achenes.

Results and Discussion

Taraxacum sect. *Palustria* in Bulgaria

Standard descriptions were published for all the Bulgarian species of *Taraxacum* sect. *Palustria* (Kirschner & Štěpánek 1993a, 1998), with the exception of *T. abruptilobum*, *T. basilicum* and *T. rumelicum*, the three species that are described here as new. We therefore provide a dichotomous identification key for all species, and full descriptions are published for the new species only.

The character diversity of the Bulgarian members of *Taraxacum* sect. *Palustria* is relatively low, and some important character states are missing from that territory (e.g., yellow stigmas, absence of pollen, outer phyllaries all patent). They belong to five species groups only, and *T. sect. Palustria* exhibits a relatively low diversity near its southern limit. The majority of species, according to the monograph of the section (Kirschner &

Štěpánek 1998), belong to the groups centred in Greece and Bulgaria, only rarely extending to other regions: the *T. subalpinum* group (seven species) and the *T. apiculatoides* group (four species). The *T. scaturiginosum* group (represented by two species in Bulgaria) is widespread in the E Mediterranean and the Black Sea region, reaching Iran in the east. *Taraxacum scaturiginosum* is a taxon with one of the largest distribution ranges in this section; it extends from Albania in the west through the Balkan Peninsula, Crimea and Turkey to Armenia, Iraq and Iran in the east. There is another group with higher diversity in the central Mediterranean and extending to the Alps and farther north to Central Europe, the *T. tenuifolium* group, with two species in Bulgaria. The only species with a large geographical range reaching its southern limit in Bulgaria is the variable and widespread (Battjes & al. 1992) *T. vindobonense* s. lat. belonging to the group bearing the same name and diverse in the Pannonian region and the narrower Central Europe.

The members of *Taraxacum* sect. *Palustria* in Bulgaria occupy habitats typical of the section: meadows in the vicinity of springs, wet pastures, subhalophilous sites and flood-meadows. As regards the possible gaps in the knowledge of this section in Bulgaria, we should mention wet meadows along the Danube River and the lower streams of its tributaries in the Danube Lowlands. This lowland region was not properly explored, and some taxa not listed below might occur there.

Bulgarian representatives placed in species groups

Taraxacum subalpinum group

T. abruptilobum Kirschner & Štěpánek, sp. nov.
T. ambitiosum Kirschner & Štěpánek
T. basilicum Kirschner & Štěpánek, sp. nov.
T. melancholicum Kirschner & Štěpánek
T. obuncum Kirschner & Štěpánek
T. strictum Kirschner & Štěpánek
T. suspectum Kirschner & Štěpánek

Taraxacum apiculatoides group

T. apiculatoides Matecka
T. lentum Kirschner & Štěpánek
T. sophiae Kirschner & Štěpánek
T. turfiforme Kirschner & Štěpánek

Taraxacum scaturiginosum group

T. scaturiginosum G. E. Haglund
T. subudum Kirschner & Štěpánek

Taraxacum vindobonense group

T. rumelicum Kirschner & Štěpánek, sp. nov.
T. vindobonense Soest, s. lat.

Taraxacum tenuifolium group

T. glaucolivaceum Kirschner & Štěpánek
T. refectum Sonck

Key to species of *Taraxacum* sect. *Palustria* in Bulgaria

1. Outer phyllaries with abaxial surface ± evenly dark coloured (dark green, blackish green, deep olivaceous green), with a very narrow (usually 0.1–0.3 mm wide) whitish or membranous border **2**
 - Outer phyllaries with abaxial surface broadly (at least 0.5 mm wide) bordered paler green, light greenish or whitish (usually also with a narrow membranous margin) **10**
2. Scapes glabrous or initially with a few araneous hairs and later glabrescent **3**
 - Scapes densely or sparsely araneous with persistent hairs **4**
3. Outer phyllaries broadly ovate to ovate (3.5–5 mm wide); achenes 3.6–4.3 mm long; beak 8–11 mm long
 - ... *T. abruptilobum* Kirschner & Štěpánek, sp. nov.
 - Outer phyllaries lanceolate to ovate-lanceolate (2.8–3.7 mm wide); achenes 4.2–5 mm long; beak 7–8 mm long ... *T. strictum* Kirschner & Štěpánek
4. Achenes sparsely spinulose above; beak 10–12 mm long *T. ambitiosum* Kirschner & Štěpánek
 - Achenes densely spinulose above; beak 7–9(–10) mm long **5**
5. Outer phyllaries 8–15 **6**
 - Outer phyllaries 15–22 **8**
6. Achenes 5–5.6 mm long; cone 1.1–1.5 mm long ...
 - *T. lentum* Kirschner & Štěpánek
 - Achenes 3.7–4.3 mm long; cone 0.7–1 mm long ... **7**
7. Outer phyllaries loosely appressed to erect, imbricate; beak 7.5–9 mm long
 - *T. obuncum* Kirschner & Štěpánek
 - Outer phyllaries tightly to loosely appressed, not imbricate; beak 8.5–10 mm long
 - *T. suspectum* Kirschner & Štěpánek
8. Outer phyllaries loosely appressed to ± patent, 8–11 mm long
 - *T. basilicum* Kirschner & Štěpánek, sp. nov.
 - Outer phyllaries tightly appressed, 5.2–8 mm long ... **9**
9. Achenes 3.7–4 mm long, body abruptly narrowing into cone 0.8–1 mm long; outer phyllaries ± imbricate *T. melancholicum* Kirschner & Štěpánek
 - Achenes 4.5–4.9 mm long, body ± gradually narrowing into cone 1.1–1.2 mm long; outer phyllaries not imbricate *T. subudum* Kirschner & Štěpánek
10. Pappus c. 8.5 mm long
 - *T. rumelicum* Kirschner & Štěpánek, sp. nov.
 - Pappus 5–7 mm long **11**
11. Outer phyllaries variously loosely appressed
 - *T. turfosoforme* Kirschner & Štěpánek
 - Outer phyllaries tightly appressed, rarely some (1 or 2) phyllaries suberect or with arcuate apex **12**
12. Cone 0.7–0.9(–1) mm long
 - *T. vindobonense* Soest, s. lat.
 - Cone 1–1.5 mm long **13**

13. Leaves deeply divided into long, acute triangular segments; distal margins of segments and interlobes usually with several thin, acute teeth
 - *T. scaturiginosum* G. E. Haglund
 - Leaves undivided, subentire or with small, patent teeth, or shallowly lobed, rarely with lateral segments; lobes or segments entire **14**
14. Achenes 5.5–6.9 mm long; cone 1.4–2 mm long ...
 - *T. refectum* Sonck
 - Achenes 4.5–5.2 mm long; cone to 1.5 mm long ... **15**
15. Beak 8–9 mm long
 - *T. sophiae* Kirschner & Štěpánek
 - Beak to 6.5 mm long **16**
16. Leaves grey-green or glaucous green, narrowly linear-oblongate, entire or remotely shallowly sinuate-dentate; outer phyllaries with border 0.8–1.2 mm wide *T. glaucolivaceum* Kirschner & Štěpánek
 - Leaves paler mid-green, narrowly oblongate in outline, usually deeply lobed to sinuate-lobulate; outer phyllaries with border 0.5–0.9 mm wide
 - *T. apiculatoides* Malecka

***Taraxacum abruptilobum* Štěpánek & Kirschner, sp. nov.** – Fig. 1, 2.

Holotype: Bulgaria, Haskovo District, “ad compitum viarum publicarum ca 3 km ad meridiem a pago Poljanovo versus”, 2 May 1990, K. Sutoryý, cultivated as JŠ 6031 (PRA no. det. 28597; isotypes: BRNM, PRA no. det. 28546, distributed also as *Taraxaca* Exs. no. 1016). – Exsiccates: *Taraxaca* Exs. no. 1016.

Diagnosis — Plantae agamospermae, foliis profunde lobatis, pinnatisectis, lobis lateralibus saepissime patentibus lingulatis, phyllariis exterioribus adpressis, deinde laxe adpressis, numerosis, subimbricatis, obscure brunneo-viridibus marginibus distinctis albo-membranaceis angustissimis, antheris polliniferis, stigmatibus obscure luteo-griseis, acheniis dense spinulosis, in pyramidem tenuem cylindricam 0.8–1(–1.1) mm longam abrupte abeuntibus, rostro 8–11 mm longo.

Description — *Herbs* medium-sized, sometimes quite tall, usually 14–25 cm tall. *Plant base* almost glabrous. *Leaves* variably erect-patent, usually 8–19 × 1.5–4.5 cm, light (brownish) green, unspotted, almost glabrous, sometimes araneous on midvein; *leaf blade* narrowly oblongate to narrowly elliptic in outline, pinnatisect; *terminal segment* variable, usually 1–3 × 1–2.5 cm, narrowly triangular to triangular, often trilobed with ± patent basal lobules and distal subsegment lingulate, acute to subacute, terminal segment with distal margin concave, ± undulate, entire, sometimes with a single incision, proximal margin ± straight, entire; *lateral segments* (3 or) 4–6(or 7) pairs, relatively short, usually 7–20 mm long, 6–12 mm wide at base, ± narrowly deltoid-triangular, usually ± patent, in outer leaves also

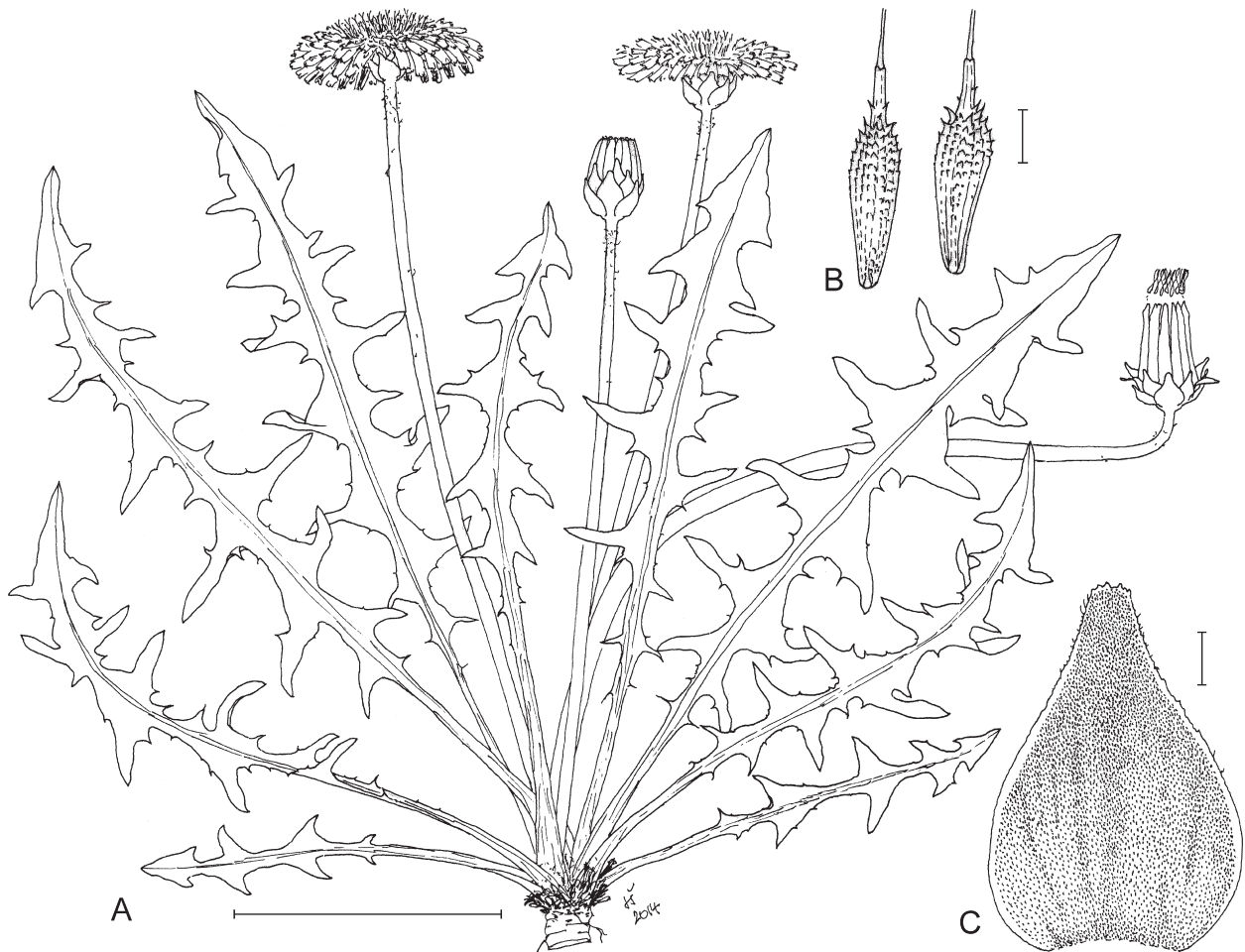


Fig. 1. *Taraxacum abruptilobum* sp. nov. – A: general habit (scale bar = 5 cm); B: achenes (scale bar = 1 mm); C: outer involucre phyllary (scale bar = 1 mm). – Del. J. Štěpánek according to cultivated plants of JŠ 6031.

± recurved, acute, proximal margin slightly concave to straight, often with a distinct tooth at base, distal margin variable, entire or with a single tooth; *interlobes* relatively broad, usually $10\text{--}15 \times 2\text{--}8$ mm, green or faintly brownish to brown-purplish, usually dark-bordered, entire or with a single tooth, rarely dentate; *midvein* green, proximally sometimes slightly purplish; *petiole* narrow or narrowly winged, $2\text{--}5$ (–6) cm long, deep purple. *Scapes* ± equalling leaves, purplish at base, otherwise pale green, glabrous, initially with a few araneous hairs below capitulum, later glabrescent. *Capitulum* 3–4 cm wide, ± slightly convex, deep yellow. *Involucre* c. 8 mm wide, rounded at base. *Outer phyllaries* 14–19, broadly ovate to ovate, with an attenuate and obtuse apex, $6\text{--}7 \times 3.5\text{--}5$ mm, appressed, loosely so after anthesis, slightly imbricate, ± evenly brown-green, blackish when dry, darker distally, with an abrupt transition into whitish membranous border 0.1–0.2 mm wide, margin irregularly ciliate. *Inner phyllaries* 10–11 mm long, dark olivaceous green. *Outer ligules* flat, striped dark olivaceous grey, later also suffused purplish, ligule teeth blackish; *inner ligules* canaliculate, teeth reddish to dark yellow. *Stigmas* discoloured, yellowish grey-green, outer pubescence with apically dark hairs. *Pollen* abundant,

irregular in size. *Achenes* medium light (stramineous) greyish brownish, $3.6\text{--}4.3 \times 0.9\text{--}1.1$ mm, body medium densely to subsparingly spinulose in distal $\frac{1}{3}\text{--}\frac{1}{4}$, otherwise ± smooth, spinules short, ± broad, body ± abruptly narrowing into a thin, cylindric to subcylindric cone 0.8–1 (–1.1) mm long, usually with minute spinules at base; *beak* (8–)10–11 mm long; *pappus* 5.5–6.5 mm long, light brownish white. Agamospermous. Triploid: $2n = 24$ (det. V. Jarolímová, 2000). *Flowering* from April to May; *fruiting* in May.

Ecology and distribution — Wet grasslands and pastures. Thracian plain (Polyanovo). Known from a single macro-locality in Bulgaria only.

Affinities — *Taraxacum abruptilobum* belongs to the group of *T. subalpinum* Hudziok and *T. noterophilum* Kirschner & al. (Kirschner & Štěpánek 1998) and is quite close to *T. ambitiosum*, particularly in outer phyllary features, but the latter has a different character of achenes: much less densely spinulose, with a subgradual transition of body into a longer, usually 1.3–1.5 mm-long cone. Also the leaf shape is useful to tell the two taxa apart. Another taxon similar to *T. abruptilobum* is the Turkish



Fig. 2. *Taraxacum abruptilobum* sp. nov. – Holotype specimen (PRA).

T. pseudopulchrum Kirschner & Štěpánek (Kirschner & Štěpánek 1998). Again, *T. pseudopulchrum* differs from *T. abruptilobum* in its achenes with a very short cone (0.5–0.7 mm long) and shorter beak; its outer phyllaries are indistinctly bordered, and its leaf lateral lobes are much more densely dentate.

Etymology — The adjectival epithet refers to the abruptly incised lateral segments of the leaves.

Specimens examined — BULGARIA: Haskovo District, near the crossroads c. 3 km S of Polyanovo, 2 May 1990, K. Sutory, cultivated as JŠ 4763, collected 1992 (PRA no. det. 28548); *ibid.*, cultivated from achenes of JŠ 4763 as JŠ 6031, collected 1998 (BRNM, PRA no. det. 28546, distributed also as *Taraxaca* Exs. no. 1016).

***Taraxacum basilicum* Štěpánek & Kirschner, sp. nov.** – Fig. 3, 4.

Holotype: Bulgaria, Sofia region, Gorni Lozen, summit grasslands of Lozenska planina, 1000–1100 m, 29 May 1988, J. Kirschner, cultivated as JŠ 3088 (PRA no. det. 28593; isotypes: PRA no. det. 29010, also *Taraxaca* Exs. no. 1012). – Exsiccat: *Taraxaca* Exs. no. 1012–1014.

Diagnosis — Plantae mediocres, primo aspectu *Taraxaco obunco* et *T. copidophyllo* affines, sed phyllariorum exteriorum marginibus pallidis carentibus, acheniis multo longioribus, pappo sordide albido discrepant.

Description — Herbs medium-sized, usually 12–18 cm tall. Plant base densely brownish arachnoid. Leaves erect-patent, usually 6–14 × 1.3–4.5 cm, light olivaceous green, adaxially often suffused bronze, unspotted, sparsely araneous to glabrate; leaf blade elliptic to narrowly oblanceolate in outline, pinnatisect; terminal segment dominant, usually 1.3–3 × 1.5–4 cm, triangular to narrowly so, approaching helmet-shaped, apex subacute, distal margin ± concave to slightly sigmoid, entire, basal lobules subrecurved, acute, proximal margin convex to sigmoid, entire, whole terminal segment ± sagittate; lateral segments 2 or 3 (or 4) pairs, proximal ones smaller, slightly recurved, deltoid-triangular, sometimes bird-wing-shaped, acuminate, distal margin ± convex to ± sigmoid, entire, or with a few minute teeth, proximal margin sigmoid to ± concave, entire; interlobes long, relatively narrow, usually 3–11 × 2–4 mm, not darker coloured, entire, less often with a single thin, long, acute tooth or several filiform teeth, margin ± brown-purple; midvein dis-

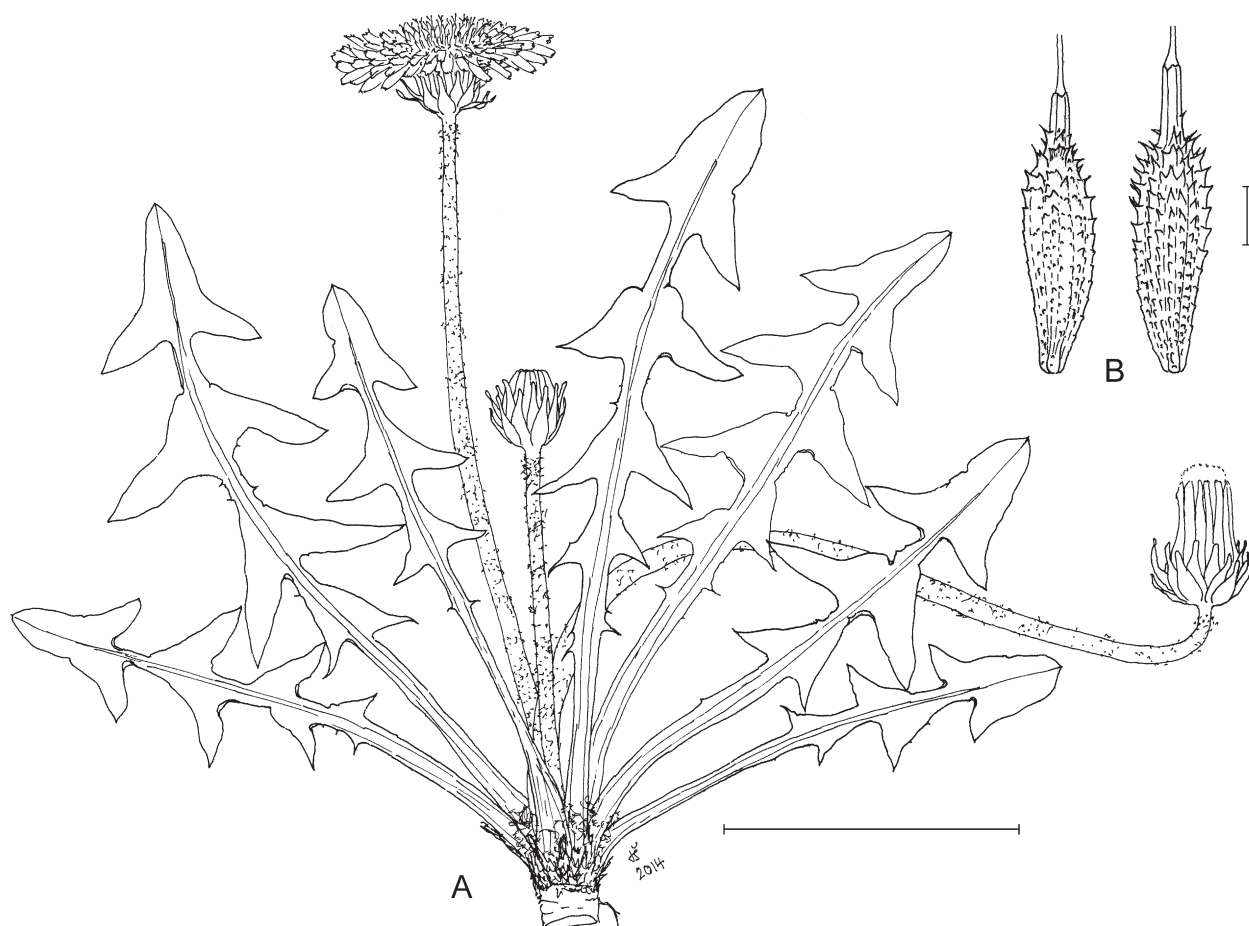


Fig. 3. *Taraxacum basilicum* sp. nov. – A: general habit (scale bar = 5 cm); B: achenes (scale bar = 1 mm). – Del. J. Štěpánek according to cultivated plants of JŠ 3088.

tally pale, proximally pinkish to purplish (brown); *petiole* narrowly to medium broadly winged, usually 2–3.5 cm long, greyish purple. *Scapes* equalling to \pm overtopping leaves, scattered floccose-araneous, densely so below capitulum, light green. *Capitulum* relatively large, 3–4 cm wide, slightly convex, (dirty) yellow. *Involucre* dark olivaceous, flat to \pm truncate at base, c. 8 mm wide. *Outer phyllaries* 16–20, loosely appressed to almost patent (appressed at base, distally arcuate to sigmoid-patent), not imbricate, narrowly lanceolate to lanceolate, 8–11 \times 2–3.3 mm, lowermost ones with margin at base with 1–3 narrow, fimbriate teeth to 0.4 mm long, adaxially paler green and often suffused bluish purplish, abaxially dark blackish olivaceous green (brownish black-green when dry), often suffused violet in distal $\frac{1}{2}$, border not developed or border only in proximal part, reduced to a very narrow (to 0.1 mm wide), dark membranous fringe, apex ciliate, flat to callose. *Inner phyllaries* 12–13 mm long, dark olivaceous green. *Outer ligules* slightly canalliculate, more distinctly so near apex, striped dark purplish grey-black outside, apical teeth black-purple; *inner ligule* teeth light purple. *Stigmas* dark, grey-green, with black pubescence outside. *Anthems* polliniferous; *pollen* irregular in size. *Achenes* light grey-brownish to light olivaceous grey-brown, 4.4–5.3 \times 1–1.1 mm, body coarsely

spinulose and ribbed, either throughout (outer achenes) or in distal $\frac{1}{3}$ (inner ones), spinules short, longest ones (to 0.4 mm long) just below cone, these sometimes coalescing in squamules, erect-patent, body subgradually narrowing into a \pm thick, subcylindric cone 0.8–1.4 mm long, often with a few spinules at base; *beak* (6–)7–9 mm long; *pappus* light brownish white, 6.5–7.5 mm long. Agamospermous. *Flowering* from April to May; *fruiting* from May to June.

Ecology and distribution — At most of its sites, *Taraxacum basilicum* grows in temporarily wet meadows (vernal spring patches in meadows); the only known exception is the Vitosha locality with a slope permanently soaked with spring water. It is apparently, so far as the material goes, quite common in mountain ranges S of Sofia (from Vitosha to Golo Bardo).

Affinities — *Taraxacum basilicum*, when compared with the other members of *T.* sect. *Palustria* in Bulgaria, apparently approaches the group of *T. subalpinum* (represented by seven species), and *T. obuncum* in particular. *T. basilicum* differs from the latter in having substantially longer achenes, much longer and pale brownish white pappus, and longer outer phyllaries with almost absent



Fig. 4. *Taraxacum basilicum* sp. nov. – Holotype specimen (PRA).

borders. *Taraxacum basilicum* may be compared with the group of *T. copidophyllum* Dahlst. of *T. sect. Taraxacum*. The closest species, *T. copidophyllum* is characterized by much shorter achenes with short cone, different leaf shape (particularly the terminal segment and denticulate distal margins to proximal leaf lateral segments).

Etymology — The epithet is a Latin adjective, *basilicus* (-a, -um), meaning kingly or noble.

Specimens examined — BULGARIA: Golo Bardo Mts, along path between alpine chalets of Orlite and Slavej, 19 May 1989, B. Kuzmanov 89109, cultivated as T 221 (PRA no. det. 26015, distributed also as Taraxaca Exs. no. 1014); Sofia, Ljulin planina, near the monastery, 29 May 1988, J. Kirschner (PRA no. det. 26014); Sofia, Gorni Lozen, summit part of Lozenska planina, 1000–1100 m, 29 May 1988, J. Kirschner, cultivated as JŠ 3087 (PRA no. det. 26013, distributed also as Taraxaca Exs. no. 1013); *ibid.*, cultivated as JŠ 3088 (PRA no. det. 26010, distributed also as Taraxaca Exs. no. 1012); *ibid.*, cultivated as JŠ 3089 (PRA no. det. 26009, distributed also as Taraxaca Exs. no. 1013); Sofia, Lozenska Planina, wet slopes above Gorni Lozen, May 1990, J. Kirschner, cultivated as JK 1071 (PRA no. det. 26012); Sofia, Vitoša Mts, meadows along path SW of alpine chalet of Aleko, 1600 m, 3 Jun 1988, J. Kirschner, cultivated as T102 (PRA no. det. 26011).

***Taraxacum rumelicum* Štěpánek & Kirschner, sp. nov.** – Fig. 5, 6.

Holotype: Bulgaria (southern), Rodopi Mts, Čepelare, Mursalica (= E part of Perelik Mts), Široka Lăka, wet meadows at W foot of Mt Goljam Sněžnik (2188 m), between Lednicata and Mugla, c. 2 km NE of Mugla, 41°37'N, 24°31'E, 1700 m, 23 Jul 1998, J. Štěpánek, R. Bělohávková, V. D. Vladimirov & D. Petkova, cultivated from root sample no. 41 as JŠ 6829/C (PRA no. det. 28595; isotypes: PRA no. det. 28555, and 15 duplicates distributed as Taraxaca Exs. no. 1015). – Exsiccates: Taraxaca Exs. no. 1015.

Diagnosis — Plantae mediocres vel subrobustae, primo adspectu *Taraxaco subudo* et *T. vindobonensi* similes, sed acheniis et pyramide longioribus, pappo multo longiore, phyllariis involucribus exterioribus latioribus discrepant.

Description — Herbs usually medium-sized, ± subrobust, most often 12–25 cm tall. *Plant base* medium densely brownish arachnoid. *Leaves* variably erect-patent, usually 9–16 × 1.5–3 cm, light subglaucous green, not spotted, glabrous or subglabrous; *leaf blade* linear-oblong to linear-oblong in outline, pinnatifid to pinnatisect; *terminal segment* medium-sized to ± large, usually 1.2–4 × 1–3 cm, triangular or narrowly so, acute to subacuminate, distal margin slightly convex to ± sigmoid, entire,

or with a single shallow acute incision, basal lobules subrecurved or patent, quite often asymmetric, whole terminal segment therefore sometimes ± sagittate; proximal margin ± straight or subconcave, entire; *lateral segments* 3 or 4 pairs, deltoid-triangular to narrowly triangular, recurved, acute, usually 5–19 mm long, 7–15 mm wide at base, from a very broad base ± gradually narrowing into a long, narrowly triangular, acuminate apex, distal margin ± straight or subconvex or subsigmoid, ± entire, proximal margin similar, entire; *interlobes* long and relatively narrow, usually 5–12 × 3–4(–6) mm, green or distally with narrowly bordered brownish purple, with ± raised margins, entire or with a few small, narrow teeth; *mid-vein* proximally pinkish, distally light green; *petiole* narrowly winged, greyish light purple. *Scapes* overtopping leaves, usually 10–22 cm long, slightly suffused purplish at base, distally green, purple to bronze below capitulum, very sparsely araneous to floccose-araneous. *Capitulum* large, 3.5–4.5 cm wide, ± flat, deep yellow. *Involucre* rounded at base, c. 9 mm wide, not pruinose. *Outer phyllaries* 20–26, slightly imbricate, loosely appressed with erect apex, outermost (1 or 2) ones linear, middle ones ovate to ovate-lanceolate, uppermost ones ± lanceolate, 7–8 × (2–)3.5–5 mm, often with an elongated obtuse apex, flat, suffused purple in distal 1/3, with a variably broad, dark green to black-green middle part (0.3–2 mm wide), with a gradual transition into variably broad, pale olivaceous to whitish green marginal part bordered by a 0.1–0.4 mm-wide, pale membranous, distally ciliate margin. *Inner phyllaries* 13–14 mm long, of equal width, ± dark olivaceous green, apex suffused pink-brown. *Outer ligules* flat, striped dark olivaceous grey outside, apical teeth grey-black; *inner ligules* subcanaliculate, with apical teeth dirty yellow. *Stigmas* exerted, relatively dark, yellowish grey-green, with a black pubescence outside. *Pollen* abundant, irregular in size. *Achenes* light greyish stramineous-brown, 5.1–5.8 × 1.2–1.3 mm, achene body medium densely and shortly spinulose in distal 1/4, ± gradually narrowing into a cylindric to subcylindric, narrow cone 1–1.5 mm long; *beak* 7.5–9 mm long; *pappus* conspicuously long, c. 8.5 mm long, pale yellowish white. Agamospermous. *Flowering* from April to May; *fruiting* from May to June.

Ecology and distribution — *Taraxacum rumelicum* grows in wet meadows around mountain springs. It is known from a rich population at the type locality only.

Affinities — *Taraxacum rumelicum* is a quite robust plant, relatively close to *T. subudum*, but differing from it primarily in darker, more numerous outer phyllaries and longer achenes with much longer pappus. Also the group of *T. paucilobum* Hudziok and *T. vindobonense* Soest (as defined in Kirschner & Štěpánek 1998) is to be compared with *T. rumelicum*. If we disregard the small, slender plants of *T. paucilobum* and its allies, *T. vindobonense* and a few taxa closely related to it have much shorter

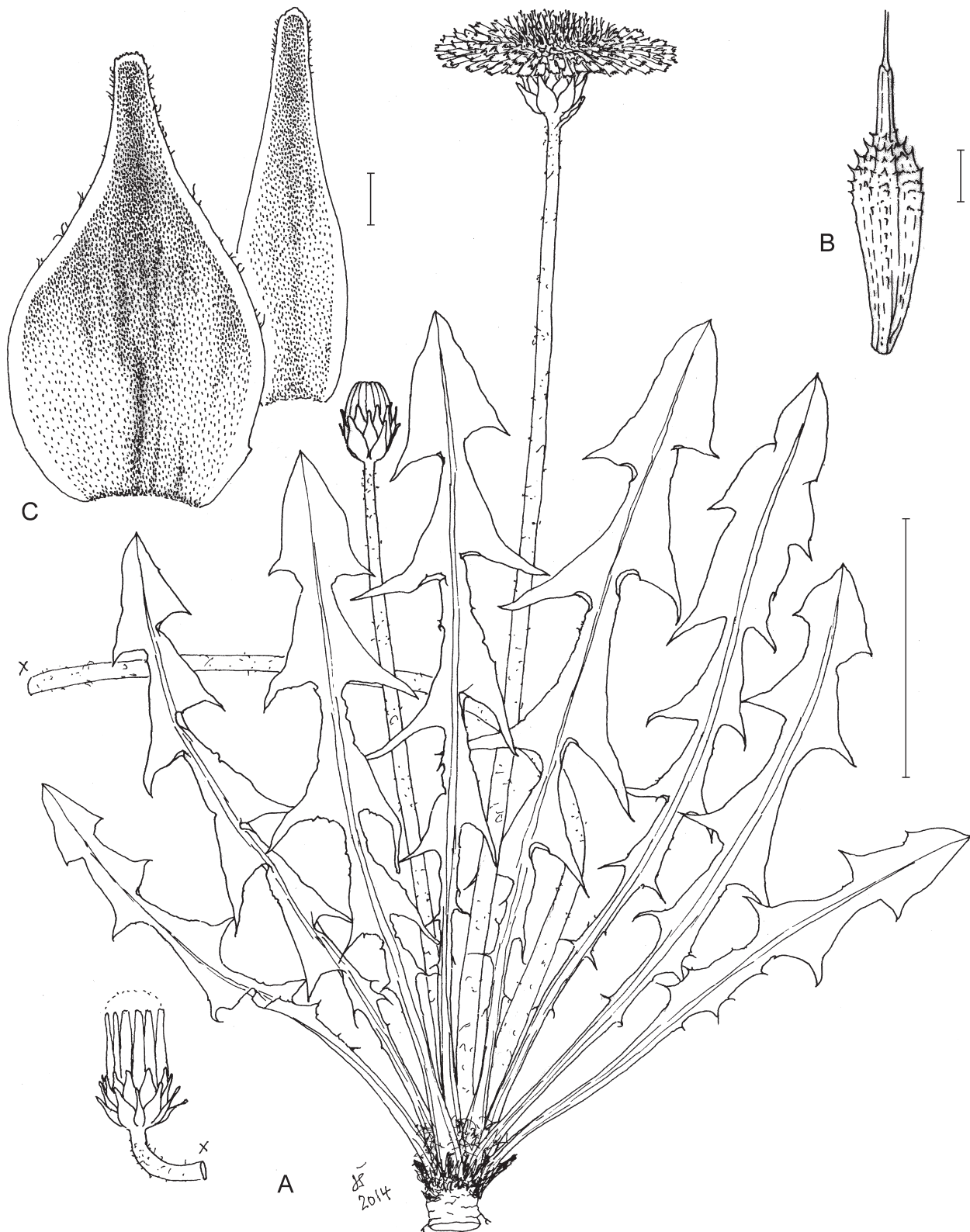


Fig. 5. *Taraxacum rumelicum* sp. nov. – A: general habit (scale bar = 5 cm); B: achene (scale bar = 1 mm); C: outer involucre phyllaries (scale bar = 1 mm). – Del. J. Štěpánek according to cultivated plants of JŠ 6829/C.

achenes and cones, substantially shorter pappus, and a narrower shape of middle outer phyllaries.

Etymology — The epithet derives from Eastern Rumelia, the historical Balkan region where the species occurs.



Fig. 6. *Taraxacum rumelicum* sp. nov. – Holotype specimen (PRA).

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References

- Battjes J., Menken S. B. J. & Nijs J. C. M. den 1992: Clonal diversity in some microspecies of *Taraxacum* sect. *Palustria* (Lindb. fil.) Dahlst. from Czechoslovakia. – *Bot. Jahrb. Syst.* **114**: 315–328.
- Ge X.-J., Kirschner J. & Štěpánek J. 2011: *Taraxacum* F. H. Wiggers. – Pp. 270–325 in: Wu Z.-Y., Raven P. H. & Hong D.-Y. (ed.), *Flora of China* **20–21** (Asteraceae). – St. Louis: Missouri Botanical Garden Press; Beijing: Science Press.
- Kirschner J. & Štěpánek J. 1993a: *Taraxacum* sect. *Palustria* (Compositae) in Bulgaria. – *Thaiszia* **3**: 13–29.
- Kirschner J. & Štěpánek J. 1993b: The genus *Taraxacum* in the Caucasus 1. Introduction, 2. The section *Porphyrantha*. – *Folia Geobot. Phytotax.* **28**: 295–320.
- Kirschner J. & Štěpánek J. 1996: Modes of speciation and evolution of the sections in *Taraxacum*. – *Folia Geobot. Phytotax.* **31**: 415–426.
- Kirschner J. & Štěpánek J. 1998: A monograph of *Taraxacum* sect. *Palustria*. – Průhonice: Institute of Botany, Academy of Sciences, Czech Republic.
- Kirschner J. & Štěpánek J. 1999a: A revision of *Taraxacum* sect. *Piesis* (Compositae). – *Folia Geobot.* **33**: 391–414.
- Kirschner J. & Štěpánek J. 1999b: A preliminary list of *Taraxacum* species in Bulgaria. – *Taraxacum Newsletter.* **21**: 31–32.
- Kirschner J., Štěpánek J. & Klimeš L. 2006: Dandelions in Central Asia: A revision of *Taraxacum* section *Leucantha*. – *Preslia* **78**: 27–65.
- Richards A. J. 1973: The origin of *Taraxacum* agamospecies. – *Bot. J. Linn. Soc.* **66**: 189–211.
- Štěpánek J. & Kirschner J. 2014: A revision of names in *Taraxacum* sect. *Erythrocarpa* and *T.* sect. *Erythrosperma* (Asteraceae: Cichorieae) published by C. E. Sonck from Greece, with nomenclatural comments. – *Willdenowia* **44**: 137–144.
- Štěpánek J., Kirschner J., Jarolímová V. & Kirschnerová L. 2011: *Taraxacum nigricans*, *T. alpestre* and allies in the *Taraxacum* sect. *Alpestris*: taxonomy, geography and conservation status. – *Preslia* **83**: 537–564.
- Zeisek V., Kirschner J., Štěpánek J. & Amini Rad M. 2015: Microsatellite variation, sexual reproduction and taxonomic revision of *Taraxacum* sect. *Dioszegia*: relationships at a large spatial scale. – *Preslia* **87**: 87–117.

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