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

Authors: Jan Štěpánek, and Jan Kirschner
Source: Willdenowia, 47(2) : 155-165
Published By: Botanic Garden and Botanical Museum Berlin (BGBM)
URL: https://doi.org/10.3372/wi.47.47207
Jan Štěpánek1 & Jan Kirschner1*

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

Version of record first published online on 13 July 2017 ahead of inclusion in August 2017 issue.

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

Article history: Received 22 December 2016; peer-review completed 28 March 2017; received in revised form 9 June 2017; accepted for publication 14 June 2017.

Citation: Štěpánek J. & Kirschner J. 2017: Taraxacum sect. Palustria (Compositae, Cichorieae) in Bulgaria revised, with three new species. – Willdenowia 47: 155–165. doi: https://doi.org/10.3372/wi.47.47207

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...
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 apospermous 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. apiculatooides* 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 apiculatooides* group

*T. apiculatooides* Maleckova
*T. lentum* Kirschner & Štěpánek
*T. sophiae* Kirschner & Štěpánek
*T. turfosiforme* 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. reflectum* 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 ........................................... T. obuncan Kirschner & Štěpánek

5. Outer phyllaries 8–15 ........................................... T. arbuscula Kirschner & Štěpánek
   – Outer phyllaries 15–22 ........................................... 8

6. Achenes 5–5.6 mm long; cone 1.1–1.5 mm long ........................................................................ 6
   – Achenes 3.7–4.3 mm long; cone 0.7–1 mm long ........................................... T.StackNavigator Kirschner & Štěpánek

7. Outer phyllaries loosely appressed to erect, imbricate; beak 7.5–9 mm long ........................................... T. obovata Kirschner & Štěpánek
   – Outer phyllaries tightly to loosely appressed, not imbricate; beak 8.5–10 mm long ........................................... T. suspicata Kirschner & Štěpánek

8. Outer phyllaries loosely appressed to ± patent, 8–11 mm long ........................................... T. basilicata 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. melanocholicum 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. subumbrella Kirschner & Štěpánek

10. Pappus < 8.5 mm long ........................................... T. rumelicum Kirschner & Štěpánek, sp. nov.
    – Pappus 5–7 mm long ........................................... 11

11. Outer phyllaries variously loosely appressed ........................................... T. turcosiforme 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 Šoest, 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. Hagen
   – 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 Sonn
   – Achenes 4.5–5.2 mm long; cone to 1.5 mm long ........................................... T. sophiae Kirschner & Štěpánek

15. Beak 8–9 mm long ........................................... T. incarnatum Kirschner & Štěpánek
   – Beak to 6.5 mm long ........................................... 16

16. Leaves grey-green or glaucous green, narrowly linear-oblancoate, entire or remotely shallowly sinu-destenata; outer phyllaries with border 0.8–1.2 mm wide ........................................... T. glaucolivaceum Kirschner & Štěpánek
   – Leaves paler mid-green, narrowly oblancoate in outline, usually deeply lobed to sinuate-lobulate; outer phyllaries with border 0.5–0.9 mm wide ........................................... T. acicularoides Maleck

Taraxacum abruptilobum Štěpánek & Kirschner, sp. nov. – Fig. 1, 2.
Holotype: Bulgaria, Haskovo District, “ad compitum vi-rum publicarum ca 3 km ad meridiem a pago Poljanovo versus”, 2 May 1990, K. Sutorö, cultivated as JS 6031 (PRA no. det. 28597; isotypes: BRNM, PRA no. det. 28546, distributed also as Taraxaca Exs. no. 1016). – Ex-siccates: Taraxaca Exs. no. 1016.

Diagnosis — Plantae agamospermae, foliiis profunde lobatis, pinnaeae, lobis lateraibus saepissime paten-tibus lingulatis, phyllariis exterioribus adpressis, deinde laxe adpressis, numerosis, subimbricatis, obscure brunneo-viridibus marginibus distinctis albo-membranaceis angustissimis, antheris polleniferis, stigmatisibus obscure luteo-griseis, acheniis dense spinulosis, in pyramidem tenuem cylindricum 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 glau-brous. Leaves variably erect-patent, usually 8–19 × 1.5–4.5 cm, light (brownish) green, unsotted, almost glabrous, sometimes araneous on midvein; leaf blade narrowly oblancoate to narrowly elliptic in outline, pinnaeaeae; terminal segment variable, usually 1–3 × 1–2.5 cm, narrowly triangular to triangular, often trim-blobed 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, usu-ally 7–20 mm long, 6–12 mm wide at base, ± narrowly deltoid-triangular, usually ± patent, in outer leaves also

Downloaded From: https://bioone.org/journals/Willdenowia on 27 Apr 2019
Terms of Use: https://bioone.org/terms-of-use
± 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 10–15 × 2–8 mm, green or faintly brownish to brown-purplish, usually dark-sided, entire or with a single tooth, rarely denticate; midvein green, proximally sometimes slightly purplish; petiole narrow or narrowly winged, 2–5(–6) cm long, deep purple. Scapes ± equalling leaves, purplish at base, otherwise pale green, glabrous, initially with a few araneous hairs below capitolium, 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, 6–7 × 3.5–5 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 canalicate, 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, 3.6–4.3 × 0.9–1.1 mm, body medium densely to subsparsely spinulose in distal ⅓–¼, 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...
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. Sutorý, 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). – Exsiccates: 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 birdwing-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-
tally pale, proximally pinkish to purplish (brown); petiole narrowly to medium broadly winged, usually 2–3.5 cm long, greyish purple. Scapes equaling to ± 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 ± 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 × 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 ½, 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 canalicate, 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. Anthers polliniferous; pollen irregular in size. Achenes light grey-brownish to light olivaceous grey-brown, 4.4–5.3 × 1–1.1 mm, body coarsely spinulose and ribbed, either throughout (outer achenes) or in distal ½ (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 ± 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).
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 Ortlite 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, 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 Lïka, 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. Bělohlávková, 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 subrubrostae, primo adspectu Taraxaco subudo et T. vindobonensi similis, sed achenis et pyramidie longioribus, pappo multo longiore, phyllarisi involucralibus exterioribus latioribus discrepant.

**Description** — Herbs usually medium-sized, ± subrostb, most often 12–25 cm tall. Plant base medium densely brownish arachnoid. Leaves variably erect-patent, usually 9–16 × 1.5–3 cm, light subglaucescent green, not spotted, glabrous or subglabrous; leaf blade linear-oblongate 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 subcurved 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, acuminated apex, distal margin ± straight or subconvex or subsigmoïd, ± 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 ⅓, 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 exserted, 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 ⅓, ± gradually narrowing into a cylindrical to subcylindrical, 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; fructifying 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...
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. 5. *Taraxacum rumelicum* sp. nov. – A: general habit (scale bar = 5 cm); B: achene (scale bar = 1 mm); C: outer involucral phyllaries (scale bar = 1 mm). – Del. J. Štěpánek according to cultivated plants of JS 6829/C.
Fig. 6. *Taraxacum rumelicum* sp. nov. – Holotype specimen (PRA).
Acknowledgements

We are grateful to the late B. Kuzmanov and to K. Sutory for plant material. Thanks are due to V. D. Vladimirov and D. Petkova for the organization of the expedition in Bulgaria, and to R. Bělohlávková for field assistance. The work was supported by the long-term research and development project of the Institute of Botany, Academy of Sciences, Průhonice, Czech Republic, no. RVO 67985939, and the Flora of Bulgaria project. In addition, Bohumil Trávníček (Olomouc, Czech Republic) and an anonymous reviewer are thanked for their comments on an earlier version of this paper.

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 Newslett. 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. Alpestria: 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.