

Taraxacum sect. *Palustria* (Compositae) in Bulgaria

Jan Kirschner and Jan Štěpánek

Department of Taxonomy and Biosystematics, Institute of Botany,
Academy of Sciences, 25243 Průhonice 1, Czech Republic

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ABSTRACT: A taxonomic survey of *Taraxacum* WIGG. sect. *Palustria* (Compositae) in Bulgaria is provided. Four species known from Greece were found to occur in Bulgaria as well, viz. *T. scaturiginosum* HAGL., *T. reffectum* SONCK, *T. apiculatoides* MALECKA and *T. insolitum* KIRSCHNER, SONCK et ŠTĚPÁNEK. Four additional species are described: *T. turfosisforme*, a relatively isolated species, *T. glaucolivaceum* and *T. sophiae* of the group of *T. subolivaceum* SONCK and *T. arachmoideum* KIRSCHNER & ŠTĚPÁNEK, and *T. subudum*, a species close to the *T. vindobonense* and *T. scaturiginosum* groups. Chromosome numbers are given for most taxa studied.

KEYWORDS: Taxonomy, *Taraxacum* sect. *Palustria*, Compositae, Bulgaria, Chromosome numbers

Since 1988, we have been concerned with the genus *Taraxacum* in Bulgaria within the framework of the joint project supervised by prof. BOGDAN KUZMANOV of Sofia. However, the untimely death of Bogdan in 1991 interrupted the promising cooperation. It was BOGDAN's intention to prepare preliminary accounts of some critical *Taraxacum* sections before completing the material for *Flora Bulgarica*; the present article is devoted to the memory of our friendly Bulgarian collaborator and outstanding botanist.

Works summarizing the knowledge of the Bulgarian flora are very brief in mentioning the section *Palustria* of the genus *Taraxacum*. VELENOVSKÝ (1891: 646) gives one single locality of '*T. palustre*' (a name covering the whole section in most floras): 'In uliginosis ad radicem m. Vitoša (Šk) [=Škorpil]'. In more recent accounts (e.g., STOJANOV & STEFANOV 1948), the section is hidden under the name of *T. officinale* var. *lividum*.

Our long-termed studies in the section *Palustria* have also dealt with south European material. We have cultivated a number of samples from Greece, mostly collected by prof. C. E. SONCK of Helsinki, and studied his rich material of the section. These studies resulted in some joint publications (KIRSCHNER, SONCK et ŠTĚPÁNEK 1989, 1992), in some other works of C. E. SONCK we have contributed by cultivation or chromosome data. Papers by C. E. SONCK (1985, 1986) and MALECKA (1981) should be mentioned as a source of additional information.

Our field studies in Bulgaria revealed the fact that representatives of the section *Palustria* are not so rare in Bulgaria as suggested in the literature, and the agamospecies diversity of the section is relatively high. We have mostly explored localities in the Sofia vicinity. In particular, two very rich localities should be mentioned: large wet meadows in the northern slopes of the Ljulin planina (not far from the monastery), and a meadow near a spring and along a stream in the summit area of the Lozenska planina above Gorni Lozen. In these two stands, more than four *Palustria* species were found while the other places visited did not harbour more than one or two species. (It should be added that, in C. Europe, there are localities where about ten taxa of the section coexist within a few acres.) Some additional records or samples were received from our colleagues or found in herbaria.

The following key and the brief account does not provide a complete information; descriptions usually are referred to, and morphology is shortly annotated.

A key to the representatives of the sect. *Palustria* in Bulgaria

- 1a Leaves greyish glaucous-green, ± entire; achenes almost smooth, thick (1.1-1.3 mm wide) 3. *T. glaucolivaceum*
- b Leaves mid-green to dark green (never glaucous-green), lobate or deeply lobate, achenes spinulose above, less than 1.2 mm wide 2
- 2a Leaves with elongated, lingulate terminal lobe 3
- b Terminal lobe triangular, narrowly triangular, or not conspicuous, never elongated or lingulate 4
- 3a Achenes large, 5.5-6.3 mm long 1. *T. refectum*
- b Achenes smaller, 4.3-4.8 mm long 6. *T. turfosoforme*
- 4a Leaves deeply lobed 5
- b Leaves dentate to lobulate 6
- 5a Outer bracts imbricate, ovate, with narrow very distinct pale border, broader than (3.5-) 3.7 mm 7. *T. insolitum*
- b Outer bracts not imbricate, ovate-lanceolate or lanceolate, margins not distinct, often washed reddish, narrower than (3.8) 3.5 mm 7

- 6a Outer bracts 12-14, achenes densely spinulose above, subabruptly narrowing into the cone, interior bracts elongate after flowering 8. *T. sophiae*
- b Outer bracts 10-12, achenes sparsely to subdensely spinulose above, gradually narrowing into the cone, interior bracts not elongate after flowering 2. *T. apiculatoides*
- 7a Outer bracts lanceolate to ovate-lanceolate, with broad (0.2-0.4 mm wide) margin, lateral leaf lobes often narrowly (linear)-triangular 5. *T. scaturiginosum*
- b Outer bracts ovate-lanceolate, with narrow, not conspicuous, ca 0.2 mm wide margins, lateral leaf lobes triangular to hamate-triangular . . . 4. *T. subudum*

1. *Taraxacum refectum* C. E. SONCK, Ann. Bot. Fenn. 22: 256, 1985.

Typus: Olimbos. C.E. SONCK, H, no. det. 4788 (HT!), PR, no. det. 7195 (IT!)

Exsiccatas: Taraxaca Exsiccata, no 324.

Description: SONCK 1985: 256-258.

Plants from Bulgaria: Lozenska planina, supra pagum Gorni Lozen (KIRSCHNER 29.5.1988, plantae cultae sub no JŠ 2908, PR, no. det. 9623). - Ljulin planina, ad viam turisticam haud procul a monasterio in decl. septentr. montium (KIRSCHNER 28.5. 1988, plantae cultae sub no JŠ 3084, PR, no. det. 9624). - Montes Vitoša: in loco Belite Brezi (Kuzmanov 14.5.1989, plantae cultae sub no JŠ 4735, PR, no det.9639).

Chromosome count from Bulgaria: $2n = 32$ (Plant JŠ 2908, sub no. 15/93).

In addition to green to dark green outer bracts with a rather inconspicuous border, the leaf shape and achenes are diagnostic for this species. Elongated, lingulate terminal lobe to the leaves is a constant feature of *T. refectum*. Achenes are extraordinarily large in Greek material, reaching 6.9 mm in length (incl. the cone). In Bulgarian cultivated material, achenes are up to 6.3 mm long. *T. refectum* is often compared with *T. scaturiginosum* Hagl. (= *T. albanicum* VAN SOEST). Morphologically, the above features safely distinguish the two species. Another difference consists in the chromosome number. MALECKA (1981), according to the picture (op. c., Plate 14, loc. Vodno), gives *T. refectum* under the name of *T. albanicum*, and reports $2n = 32$ for this plant. The holotype of *T. refectum* (see above) proved to be tetraploid, as well, having $2n = 34$ (det. JK under no. 110/85). On the other hand, several specimens of typical *T. scaturiginosum* from Greece (loc. Metsovon, leg. SONCK, PR, no. det. 4793) proved to be triploid ($2n = 24$). In several works (particularly, in those by MALECKA), the chromosome number $2n=32$ is given for *T. scaturiginosum* (*T. albanicum*). However, pictures of voucher specimens of counts given by MALECKA suggest that other taxa than *T. scaturiginosum* were examined by her (this surely concerns the plants from Poland because *T. scaturiginosum* s. l. does not occur in C. Europe; plants from Macedonia represent *T. refectum*).

2. *Taraxacum apiculatooides* MALECKA, Acta Biol. Cracov., ser. bot., 23: 111, 1981.

Typus: Mavrovo, leg. MALECKA, herb. Inst. Cytoembryol. Univ. Cracov. (HT, material lost, see below). **Neotypus hoc loco electus:** Graecia, oppidum Ioannina, ca 1 km situ bor. a Metsovo. leg. C.E. SONCK 21.5. 1985, plantae cultae in Prùhonicè sub no. JŠ 1827, PR, no. det. 9625.

Exsiccatè: *Taraxaca Exsiccata*, no 326.

In 1981, we asked the late doc. J. MALECKA of Kraków to send us her material of the section *Palustria* on loan. After several years it turned out that a parcel containing also three holotype specimens was mailed in 1981 just at the time of the Polish crisis, and mysteriously disappeared (probably representing a suspicious object for a military control). Thus, holotypes of *T. skalinskanum*, *T. polonicum* and *T. apiculatooides* are no longer extant, which unfortunately also holds for the other *Palustria* specimens collected by J. MALECKA. According to the Code (ICBN), there is merely one legal source for the possible new type: a photograph accompanying the original description. However, in such an intricate group as agamospermous *Taraxacum* sect. *Palustria*, typification by means of a picture (of rather low quality) cannot be considered as a method contributing to the nomenclatural stability. The picture (MALECKA, op. c., Plate 15, fig. 4) provides some important morphological information (e.g., leaf shape) but the picture itself, even when the rest of the protologue is taken into account, is not sufficient for unequivocal diagnosing the taxon in comparison with similar species of the *T. vindobonense* or *T. scaturiginosum* groups. Safe interpretation of the name in question can be reached only by typification with a herbarium specimen. Any type other than the specimen would cause interpretation uncertainty, and the name *T. apiculatooides* would have to be considered as ambiguous, and abandoned. Thus (supposing that respective changes of the Code will be done during the next Botanical Congress), we select a neotype from among the rich material of *T. apiculatooides* from Greece.

The neotype material not only matches the original data in terms of morphology but also its chromosome number answers to the counts given by MALECKA, l.c. In the neotype sample, a tetraploid chromosome number has been ascertained, $2n = 32$ (JŠ, 7/88).

Plants from Bulgaria: Ljulin planina, haud procul a monasterio in decl. septentr. montium. (KIRSCHNER 28.5. 1988, plantae cultae sub no. JŠ 3083, PR, no. det. 9626). - Lozenska planina, in valle angusto ca 0.5 km supra pagum Gorni Lozen. (KIRSCHNER 29.5. 1988, plantae cultae sub no. JK 105, PR, no. det. 9627). - Lozenska planina, locis uliginosis planitiei summit. supra pagum Gorni Lozen. (KIRSCHNER 29.5. 1988, plantae cultae sub no. JK 107, PR, no. det. 9628).

Chromosome count from Bulgaria: $2n = 32$ (Plants JK 105, counted as 14/93; Plants JŠ 3083, counted as 13/93)

Description: Plants medium-sized, leaves erect to erecto-patent, 8-15 cm long, 1.2-1.5 cm wide, pale to mid green, sparsely arancous to subglabrous, deeply lobate, lateral lobes 2-3, entire, triangular, patent to slightly downward pointing, interlobes up to 1.2 cm long, 2-3 mm wide, entire or rarely with very few teeth, terminal lobe 1.1-2.8 cm long, subacute, petiole narrow, purplish at the base. Scapes slightly overtopping the leaves, green to greenish-purplish below the capitulum, subglabrous to sparsely arancous. Involucre 9-12 mm wide, slightly conical at the base, interior bracts up to 15 mm long. Exterior bracts adpressed to loosely adpressed, 10-12, \pm of the same length or subimbricate, the outermost ones often conspicuously narrower than the others, middle ones lanceolate, 5.5-7.5 mm long, 2.5-3.3 mm wide, green to dark green, membranaceous margin almost absent to 0.1-0.2 mm wide, border 0.5-0.9 mm wide, distinct (not contrasting) at the base, otherwise more or less gradually changing into the middle part, ciliate in the upper part. Outer ligules striped greenish-pinkish, stigmas greyish yellow, pollen present. Achenes greyish straw-brown, 4.6-4.9 mm long (incl. the cone), sparsely to densely spinulose above, gradually narrowing into a subcylindrical 1.0-1.1 mm long cone, rostrum 5.5-6.5 mm long, pappus 5-6 mm.

3. *Taraxacum glaucolivaceum* KIRSCHNER & ŠTĚPÁNEK, sp. nov.

Typus: Bulgaria, urbs Sofia, montes Lozenska planina: in angusto cum rivum haud procul a coemeterio supra pagum Gorni Lozen (leg. KIRSCHNER 29.5. 1988, cultae sub no T380, PR, no. det. 9629 (HT), isotypi ibidem. - Paratypi: Lozenska planina: locis uliginosis planitiei summit. supra pagum Gorni Lozen, alt. ca 1000 m s.m. (leg. KIRSCHNER 29.5. 1988, cultae sub no 109, herb. auctorum.)

Exsiccates: Taraxaca Exsiccata, no 323.

Descriptio: Plantae parvae, 10-20 cm altae. Folia glauco-canescenti-viridia, subprostrata vel ascendentia, plerumque integra vel raro remote sinuato-denticulata, 8-13 cm longa, 0.7-1.0 cm lata, lineari-oblancoolata, subglabra, petiolis angustis, griseo-violaccis. Scapi (sub calathio) violacei, sparse araneosi vel subglabri. Involucrum ca 10-12 mm latum, basi \pm rotundatum, squamis interioribus 13-16 mm longis, squamis exterioribus numero 11-13, adpressis, \pm imbricatis (eis extremis non vel raro angustioribus), ovatis, breviter acuminatis, 5-6 (-7) mm longis, 2.8-3.5 mm latis, viridibus vel obscure viridibus apice rubescentibus, marginibus membranaceis angustis (0.1-0.2 mm) inconspicuis plerumque ciliatis necnon marginibus viridibus ad 1.2 mm latis, stria obscura media inconspicua vel ad 1.0 mm lata. Calathium luteum, paulo radians, ad 3.5 cm in diametro, ligulae marginales planae, subtus stria (griseo)violacea notatae, dentes ligularum rubescentes. Stigmata griseo-viridia, antherae polliniferae. Achenium pallide griseo-stramineum, ad basin laeve, superne sublaeve vel sparsissime breviter spinulosum, 4.7-5.0 mm longum (pyramide inclusa), crassum



Fig. 1. - *T. glaucolivaceum* K. & Š. The holotype.

(1.1-1.3 mm latum), in pyramidem subcylindricam 1.1-1.5 mm longam subsensim abiens. Rostrum 5.5-6.0 mm, pappus 5-5.5 mm longi.

Chromosomatum numerus somaticus $2n = 32$ (ex-isotipo, sub no. 18/93).

Taraxacum glaucolivaceum clearly belongs to the group of species discussed in SONCK (1986), viz. *T. olivaceum*, *T. arachnoideum* and *T. subolivaceum*. It is distinct in having subprostrate to ascending grey-green leaves, dark stigmas and thick, almost smooth achenes with very short rostrum. *T. subolivaceum* possesses achenes thinner, with sparse but conspicuous spinules above, and longer rostrum. Leaf colour and posture, and the characters of outer bracts are also diagnostic. *T. olivaceum* has different achenes and much paler stigmas. *T. arachnoideum* differs from *T. glaucolivaceum* by thinner achenes with shorter cone (0.9-1.0 mm), leaf shape and outer bract colour.

4. *Taraxacum subudum* KIRSCHNER et ŠTĚPÁNEK, sp. nov.

Typus: Lozenska planina, in valle angusto ca 0.5 km supra pagum Gorni Lozen (KIRSCHNER 29.5.1988, cultae sub no T104) HT: no.det. 9638. Isotypi ibidem. - Paratypi: Bulgaria, urbs Sofia, montes Lozenska planina: in angusto cum rivum haud procul a coemeterio supra pagum Gorni Lozen (leg. KIRSCHNER 29.5.1988, culta sub no. T382, PR, no. det. 9630). - Sofia, montes Ljulin planina, in decl. udis non procul a monasterio (KIRSCHNER 28.5.1988, cultae sub no. T97, herb. auct.). - Urbs Sofia, montes Vitoša, in prato subudo in parte occid. montium, non procul a "TV transmission tower". (KIRSCHNER 1990, cultae sub no. T700, herb. auct., no. det. 9637). - Urbs Sofia, montes Vitoša, in loco Belite Brezi. (KUZMANOV 1989, cultae sub no JŠ 4734, herb. auct., no det. 10556).

Descriptio: Planta mediocris, subrobusta. Folia suberecta, profunde divisa, plerumque 11-14 cm longa et 1.7-2.3 cm lata, gramineo vel subobscure viridia, sparse araneosa (nervo mediano araneoso, ad basin sublanuginosa), lobus terminalis elongate triangularis vel subsagittatus, acutus vel subobtusus, 1.2-2.5 cm longus, 1.5-2.2 cm latus, lobi laterales numero 3-4 (5), \pm triangulares, paulo deorsum vergentes, raro patentes, integerrimi vel sparsissime denticulati, marginibus distalibus saepe convexis. Interlobia angusta, ad 2-3 mm lata, brevina (2-6 mm), saepe paulo canaliculata, violacee marginata, integra vel sparse denticulata. Petiolus angustus, araneosus, violaceus. Scapus viridis vel brunneo-violaceus, araneosus. Involucrum basi rotundatum, 11-12 mm latum, squamis interioribus sub anthesi ad 15 mm longis, squamis exterioribus numero 11-13 (-17), \pm aequilongis (non imbricatis), adpressis, lanceolatis, 7-8 mm longis, (2.5-) 3.1-3.8 mm latis, obscure viridibus vel atroviridibus, saepe paulo rubescentibus, marginibus membranaceis inconspicuis ad 0.2 mm latis, non ciliatis, raro ad basin zona viridis praeditis. Calathium radians, ad 3.5 cm in diametro, ligulae marginales planae, extus stria atro-viridi notatae. Stigmata \pm viridia vel pallide viridia, antherae polliniferae. Achenium griseo-brunneum, 4.5-4.9 mm longum, ad 0.9 mm latum, ad basin laeve, superne acute spinulosum, in pyramidem

