

Taraxacum bibulum and *Taraxacum ranunculus*, two species of dandelions of the endangered *Palustria* section new for the Polish flora

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Summary: The paper presents the distribution of *Taraxacum bibulum* and *Taraxacum ranunculus*, two species of sect. *Palustria* new for the Polish flora. The characteristics of the habitat at Polish locations and the taxonomic description and distinguishing features from similar species are given.

Keywords: Carpathians, *Taraxacum* sect. *Palustria*, distribution in Poland, habitats

Taraxacum section *Palustria* has about 137 species in Europe (KIRSCHNER & ŠTĚPÁNEK 1998; SONCK 1998; ŠTĚPÁNEK & KIRSCHNER 2001, 2012, 2017; TIHOMIROV 2003; AQUARO et al. 2008; CARLESI & PERUZZI 2012; MARCINIUK et al. 2012; ŠTĚPÁNEK et al. 2013; ØLLGAARD 2015) and 24 of them have been known in Poland so far (MARCINIUK 2012; MARCINIUK et al. 2012). They are endangered plants throughout their European range, mainly due to their affinity to vanishing natural and semi-natural wet and humid habitats such as lowland bogs, *Caricion davallianae* and *Caricion nigrae* associations, extensively used meadows and grasslands of the Molinietales order and semi-salt and brackish coastal meadows (KIRSCHNER & ŠTĚPÁNEK 1998; SCHMID 2002; MARCINIUK 2012; MARCINIUK et al. 2016; BOSIACKA et al. 2016).

So far, triploid, tetraploid and pentaploid *Taraxacum* sect. *Palustria* species have been found in Poland (MARCINIUK 2012). In this paper, we present two new species of *Palustria* dandelions found in 2015: *T. bibulum* Kirschner & Štěpánek with an unknown number of chromosomes and *T. ranunculus* Kirschner & Štěpánek, one of the two known hexaploid species in the *Palustria* section (ŠTĚPÁNEK & KIRSCHNER 2001).

Materials and methods

In our field research conducted in 2015, particular attention was paid to habitats in which we expected the presence of species of *Taraxacum* sect. *Palustria*. Two sites, with *Taraxacum* sect. *Palustria* species new to Poland were characterized in detail. The geographical coordinates, altitude and slope exposure were determined using GPS. To show the ecological dependences at these sites, phytosociological relevés were taken. Species names follow MIREK et al. (2002), whereas their affinity to syntaxons was determined based on ZAJĄC & ZAJĄC (2009).

Results

Two new *Taraxacum* species of sect. *Palustria* were found in the central part of the Low Beskids (Fig. 1). The general distribution of both species is shown in Figure 2.

The first of them, *Taraxacum bibulum* Kirschner & Štěpánek (Fig. 3), had been described in Slovakia and had been reported at 5 sites in Slovakia, 7 in Austria and 2 in Hungary (KIRSCHNER &

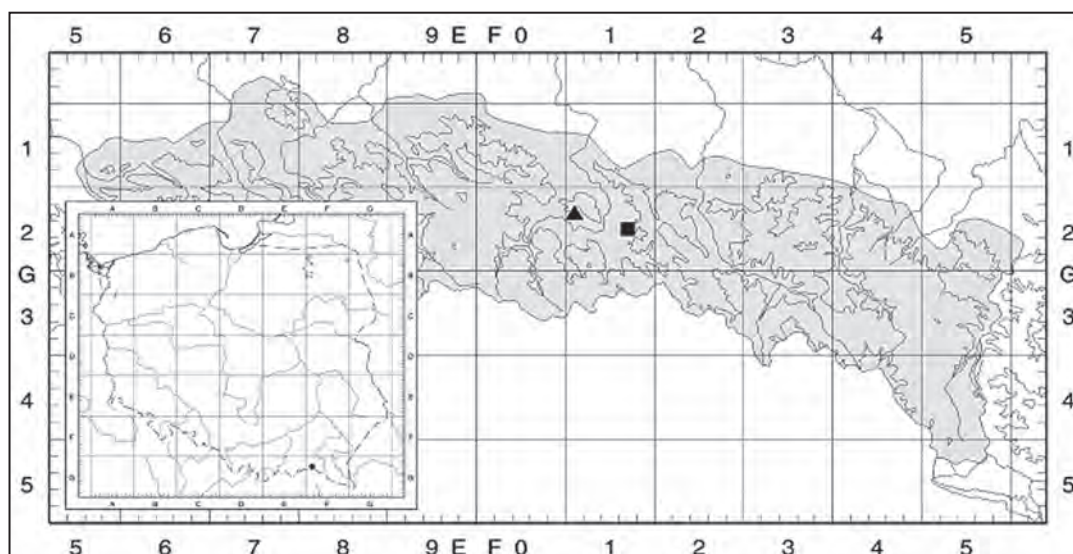


Figure 1. Location of *Taraxacum bibulum* (▲) and *T. ranunculus* (■) sites in the Low Beskids.

ŠTĚPÁNEK 1998). In the Low Beskids, it was found in the northern part of the village of Krempna (N 49°31'26.9", E 21°30'37.4"). We found about ten specimens growing along a muddy path on a meadow, on the S slope of a mountain with about 10 degrees of gradient, at an altitude of 446 m a.s.l. The floristic composition of this place is illustrated by the following phytosociological relevé of a 50 m² patch, 90% coverage.

Taraxacum bibulum +, *T. paucilobum* +; **Molinio-Arrhenatheretea**: *Achillea millefolium* +, *Alchemilla acutiloba* +, *Anthoxanthum odoratum* 3.2, *Cardamine pratensis* +, *Carex flacca* 3.2, *C. hartmanii* 1.2, *C. panicea* 3.1, *C. tomentosa* +, *Cirsium rivulare* +, *Daucus carota* +, *Hypochoeris radicata* +, *Juncus effusus* +, *Leucanthemum vulgare* agg. +, *Lotus corniculatus* +, *Lychnis flos-cuculi* +, *Lysimachia vulgaris* +, *Myosotis palustris* s.l. +, *Prunella vulgaris* +, *Ranunculus acris* +, *R. polyanthemos* +; **Plantaginetea**: *Plantago major* +; **Potentillo-Polygonetea**: *Juncus inflexus* +, *Potentilla anserina* +, *Ranunculus flammula* +, *Trifolium repens* +; **Scheuchzerio-Caricetea nigrae**: *Carex demissa* +, *C. nigra* +; **Nardo-Callunetea**: *Luzula campestris* +, *Potentilla erecta* +; **Trifolio-Geranietea**: *Ononis arvensis* R, *Trifolium medium* +; **Festuco-Brometea**: *Primula veris* 1.1; **Querc-**

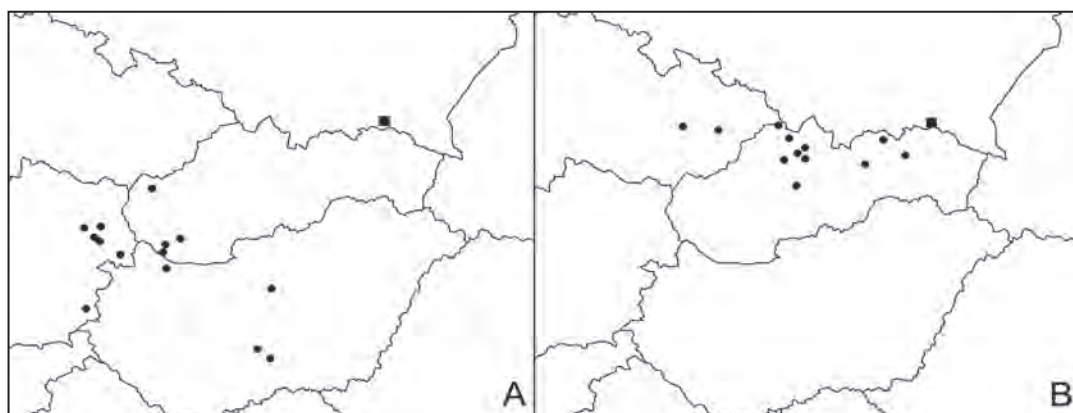


Figure 2. General distribution of *Taraxacum bibulum* (A) and *T. ranunculus* (B).



Figure 3. *Taraxacum bibulum*.

Table 1. Comparison of main features of *Taraxacum bibulum* and similar species.

Feature	<i>T. bibulum</i>	<i>T. domabile</i>	<i>T. geminidentatum</i>	<i>T. brandenburgicum</i>
Leaves	grayish green, suffused with purple, shallowly lobed, lateral lobes triangular, usually entire, terminal lobe narrowly triangular	pale to deep green, shallowly lobed, lateral lobes very broadly triangular, often with 1–2 teeth, terminal lobe narrowly triangular, sometimes elongated	grayish green, wholly suffused with red, undivided, dentate	grayish green, suffused with dark purple, shallowly lobed or unlobed, lateral lobes triangular, usually entire, terminal lobe narrowly triangular, sometimes elongated
Scapes	distinctly araneous below capitulum	sparsely araneous	sparsely araneous or subglabrous	very sparse hairs below the capitulum
Stigmas	pale yellowish-green	pale yellowish green or greenish	yellow	yellow
Pollen	absent or sometimes present	present	absent	absent
Outer bracts	10–13; borders very distinct, yellowish-greenish, suffused with pale purple above. 0.7–1.2 mm wide (without membranaceous margin)	11–13; borders distinct, whitish green or whitish 0.9–1.2 mm wide (without membranaceous margin)	9–10; borders distinct, whitish or suffused with pink. 0.7–1.2 mm wide (without membranaceous margin)	8–9; borders distinct, whitish or whitish-coppery, 1.0–2.0 mm wide (without membranaceous margin)
Fruits	slender, 4.7–5.3 mm long, achene body shortly spinulose, cone cylindrical, 1.0–1.2 mm long, pappus yellowish	4.6–5.0 mm long, achene body subsparingly or very sparsely spinulose, cone subcylindrical, 0.8–1.0 mm long, pappus white	4.4–4.8 mm long, achene body shortly spinulose, cone subconical, 0.9–1.0 mm long, pappus white	3.8–4.2 mm long, achene body very sparsely and very shortly spinulose, cone subcylindrical 0.8–1.0 mm long, pappus white

Fagetea: *Ajuga reptans* +, *Cruciata glabra* +, *Equisetum arvense* +; **Salicetea purpureae:** *Salix purpurea* B +; **Epilobietea angustifoliae:** *Salix caprea* B +.

The most important diagnostic features: Plants medium-sized, slender. Leaves grayish green, suffused with purple, sinuate-lobulate or shallowly lobed, usually with 2–3(–4) pairs of $\pm$ patent, short and entire lateral lobes, terminal lobe narrowly triangular, often elongate; petioles narrow, dark purple. Scapes pale brownish or copper coloured, distinctly araneous below the capitulum. Outer bracts 10–13, adpressed, blackish, ovate, usually 6.5–8.5 mm long and 3.1–4.5 mm wide, abruptly narrowing into their upper part, borders very distinct: yellowish-greenish below, suffused with pale purple above, 0.7–1.2 mm wide (together with a distinct membranaceous margin 0.2–0.4 mm wide). Capitulum deep yellow, 2.5–3.5 cm in diameter; stigmas pale yellowish grey-green, pollen absent or present. Achenes slender, 4.7–5.3 mm long, achene body shortly spinulose above, gradually narrowing to a cylindrical, 1.0–1.2 mm long cone, pappus yellowish.

Similar species: in the monograph of the section *Palustria* (KIRSCHNER & ŠTĚPÁNEK 1998), *Taraxacum bibulum* has been assigned to one group from *T. domabile* Kirschner & Štěpánek, *T. geminidentatum* Hudziok and *T. brandenburgicum* Hudziok. The main features that distinguish the species of this group are listed in Table 1.

The second species, *Taraxacum ranunculus* Kirschner & Štěpánek (Fig. 4) has been known so far from numerous sites in Slovakia and several in Moravia (KIRSCHNER & ŠTĚPÁNEK 1998). These authors considered an occurrence of *T. ranunculus* to be very likely also in Poland and in the western part of Ukraine. The new position found by us is located in the eastern part of the village



Figure 4. *Taraxacum ranunculus*.

of Polany (N 49°29'49.7", E 21°34'21.5") on an extensively grazed meadow at 390–395 m a.s.l., on a mountain slope with about 15 degrees of gradient. Several specimens of this species were found growing together with *T. bavaricum* Soest in meadow vegetation. The floristic composition of this place is illustrated by the following phytosociological relevé: 100 m², 100% coverage.

***Taraxacum ranunculus* +, *T. bavaricum* +; Molinio-Arrhenatheretea:** *Achillea millefolium* 1.1, *Agrostis capillaris* +, *Alchemilla acutiloba* +, *A. monticola* +, *Angelica sylvestris* +, *Anthoxanthum odoratum* 1.1, *Betonica officinalis* 3.1, *Briza media* 2.1, *Carex flacca* +, *C. panicea* +, *C. tomentosa* 3.1, *Cerastium holosteoides* +, *Cirsium rivulare* 2.1, *Colchicum autumnale* +, *Crepis biennis* +, *Cynosurus cristatus* +, *Daucus carota* 4.1, *Deschampsia cespitosa* 1.2, *Euphorbia esula* +, *Festuca pratensis* +, *Galium mollugo* +, *G. verum* +, *Heracleum sphondylium* +, *Holcus lanatus* +, *Leontodon hispidus* +, *Leucanthemum vulgare* 1.1, *Linum catharticum* +, *Lotus corniculatus* 1.1, *Ophioglossum vulgatum* 1.1, *Phleum pratense* +, *Prunella vulgaris* +, *Ranunculus acris* 1.1, *Rhinanthus serotinus* +, *Rumex acetosa* +, *Tragopogon pratensis* +, *Vicia cracca* +; **Nardo-Callunetea:** *Carex pallescens* +, *Cuscuta epithymum* +, *Luzula campestris* +, *Polygala vulgaris* +, *Potentilla erecta* +; **Trifolio-Geranietea:** *Agrimonia eupatoria* 2.1, *Centaurea jacea* agg. 2.1, *Clinopodium vulgare* +, *Lathyrus pratensis* +, *Ononis arvensis* +, *Trifolium medium* 2.2, *Veronica chamaedrys* +; **Festuco-Brometea:** *Filipendula vulgaris* 1.2; **Sedo-Scleranthetea:** *Plantago lanceolata* 2.1; **Agropyretea intermedio-repentis:** *Poa pratensis* 1.1; **Epilobietea angustifoliae:** *Centaureum erythraea* +; **Quercu-Fagetea:** *Cruciata glabra* 1.2, *Pimpinella saxifraga* +; **Alnetea glutinosae:** *Salix aurita* +.

The most important diagnostic features: Plants medium-sized, often somewhat robust. Leaves mid-green, distinctly lobed, or rarely undivided; lateral lobes in 2–3 pairs, triangular, ± patent, usually entire, terminal lobe elongated, triangular to broadly lingulate; petioles narrow, green to purple. Scapes greenish suffused with brownish-reddish above, densely araneous below the capitulum. Outer bracts 11–16, adpressed, broadly ovate, ovate-lanceolate or lanceolate (the outermost ones sometimes much narrower) 6.5–8.0 mm long, 2.8–4.2 mm wide, pale green or deep green, border often not distinct, paler green, up to 1.5–2.0 mm wide (including a pinkish, 0.3–0.5 mm wide, membranaceous margin), with gradual to distinct transition to the dark green median strip. Capitulum mid-yellow, 3.0–4.0 in diameter; stigmas deep green, pollen present. Achenes 4.4–4.8 mm long, achene body shortly subsparingly spinulose above, subgradually narrowing to a cylindrical, 1.0–1.2 mm long cone.

Taraxacum ranunculus is morphologically very similar to *T. mendax* Kirschner & Štěpánek, quite widely distributed in the Western Carpathians. The most important features that differentiate these two species are listed in Table 2.

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Table 2. Comparison of main features of *Taraxacum ranunculus* and *T. mendax*.

Feature	<i>T. ranunculus</i>	<i>T. mendax</i>
Chromosome number	2n=48	2n=40
Plant habit	medium-sized, often somewhat robust plants	small to medium-sized, usually slender plants
Leaves	mid-wide, narrowly oblanceolate in outline, mid-green; lateral lobes usually in 2–3 pairs, triangular, usually entire, terminal lobe somewhat elongated, triangular to broadly lingulate	narrow, linear in outline, greyish to bluish green; lateral lobes in 1–3 pairs, shortly triangular, terminal lobe often (especially in outer leaves) very elongated, narrowly spatulate
Calathium size and stigmas	calathium up to 3 cm in diameter; stigmas deep green	calathium 3–4 cm in diameter; stigmas pale greenish
Outer bracts	11–16; 6.5–8.0 mm long, 2.8–4.2 mm wide, pale or deep green, border often not distinct, only 1.5–2.0 mm wide (including a pinkish membranaceous margin), with gradual to distinct transition to the dark green, 0.8–1.3 mm wide median strip	14–19; 5.0–7.0 mm long, 2.5–4.0 mm wide, pale to vivid green, border 0.3–0.4 mm wide, with darker, 0.3–0.5 mm wide median strip
Fruits	4.4–4.8 mm long, achene body shortly spinulose above, cone 1.0–1.2 mm long, rostrum 7.5–8.5 mm long, pappus 6.5–7.5 mm long	4.0–4.2 mm long, achene body very shortly spinulose above, cone 0.9–1.1 mm long, rostrum 6.0–7.5 mm long, pappus 6.0–6.5 mm long

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