Neilreichia **13–14**: 195–226 (2022/2023)

Taraxacum section *Crocea* (= *Taraxacum* section *Fontana*, Asteraceae, Crepidinae) in the European Alps

Ingo Uhlemann

Teichstraße 61, 01778 Liebenau, Germany; e-mail: greta_uhlemann@web.de

A b s t r a c t : *Taraxacum* sect. *Crocea* (the correct name for the taxon formerly called *T.* sect. *Fontana*) comprises putative glacial relicts restricted to the European Alps, possibly the Carpathians (not recorded yet), and south-eastern European mountains. In this paper, six species of this section are recognised in the Alps: *T. absurdum*, *T. fontanosquameum*, *T. fontanum*, *T. insubricum*, *T. jacobianum* spec. nova and *T. pseudoboreigenum*. Four names are relegated to synonymy: *T. cochleatophyllum*, *T. fontanicola*, *T. graiense* and *T. pseudofontanum*. Further names formerly associated with *T.* sect. *Crocea* in the Alps are excluded, synonymisised with species from other sections or treated as nomina dubia or species incertae sedis: *T. aestivum*, *T. aurantellum*, *T. binilobatum*, *T. corsicum*, *T. croceicarpum*, *T. crocellum*, *T. fontaniforme*, *T. magnopyramidophorum*, *T. malyi*, *T. obovatifolium*, *T. peralatum*, *T. pohlii*, *T. pomposum*, *T. renosense*, *T. rufocarpum*, *T. senile* and *T. silvicola*. For each Alpidic *T.* sect. *Crocea*-species, a type is designated (where still necessary) and a detailed description, a comparison with relatives, a list of specimens studied by the author, information on distribution and ecology, and drawings and photographs of relevant characters are given. A determination key for all species of the section in the area under study is provided.

K e y w o r d s : Compositae; Crepidinae; *Taraxacum* sect. *Crocea*; *Taraxacum* sect. *Fontana*; Europe; Alps; taxonomy

Z u s a m m e n f a s s u n g : ***Taraxacum* section *Crocea* (= *Taraxacum* section *Fontana*, Asteraceae, Crepidinae) in den europäischen Alpen**
Taraxacum sect. *Crocea* (der korrekte Name für die bisherige *T.* sect. *Fontana*) umfasst mutmaßliche Glazialrelikte in den Alpen, vermutlich den Karpaten (noch nicht nachgewiesen) und auf der Balkanhalbinsel. In dieser Arbeit werden sechs Arten in den Alpen anerkannt: *T. absurdum*, *T. fontanosquameum*, *T. fontanum*, *T. insubricum*, *T. jacobianum* spec. nova und *T. pseudoboreigenum*. Vier Namen werden als Synonyme angesehen: *T. cochleatophyllum*, *T. fontanicola*, *T. graiense* und *T. pseudofontanum*. Weitere Namen, die oft unter dieser Sektion aufgeführt sind, werden ausgeschlossen, mit anderen Arten synonymisiert oder als nomina dubia oder species incertae sedis behandelt: *T. aestivum*, *T. aurantellum*, *T. binilobatum*, *T. corsicum*, *T. croceicarpum*, *T. crocellum*, *T. fontaniforme*, *T. magnopyramidophorum*, *T. malyi*, *T. obovatifolium*, *T. peralatum*, *T. pohlii*, *T. pomposum*, *T. renosense*, *T. rufocarpum*, *T. senile* und *T. silvicola*. Für jede der sechs derzeit anerkannten Arten wird, sofern notwendig, eine Typisierung vorgenommen und es werden eine Beschreibung, Zeichnungen, zuweilen auch Fotografien, Angaben zum Habitat und zur Verbreitung sowie ein Vergleich mit nahestehenden Arten gegeben und alle vom Autor untersuchten Herbarbelege aufgelistet. Alle sechs Arten werden zudem dichotom verschlüsselt.

Introduction

The cosmopolitan genus *Taraxacum* comprises about 60 sections and approximately 3500 species names (Kirschner & Štěpánek 1997, 2004, 2008, Kirschner & al.

DOI: https://doi.org/10.5281/zenodo.10120059 Original article

2007+, Štěpánek & Kirschner 2021, 2022b). Handel-Mazzetti (1907: 100) characterised *Taraxacum fontanum* as a "species" with glaucous involucre, adpressed to patent outer bracts and 4–5 mm long achenes that possess a cone (in German called "Pyramide"), which makes up one-fifth of the achene, and a rostrum. On basis of the protologue and plate 5, fig. 4 (Handel-Mazzetti 1907), a lectotype was chosen by W. Gutermann (Wien) on February 29th, 1980 (WU 043696, Fig. 1) in schedis, formally published by Kirschner & Štěpánek (1997: 92). Van Soest (1959: 103) established a section for this taxon, *T.* sect. *Fontana*, and mentioned 11 species. In his description, the Dutch author focussed on morphological characters such as sublobate or lobate leaves, broadly winged petioles, adpressed, outer bracts that usually have a white margin, and 3.5–5 mm long achenes with a rostrum about 8 mm long. Ecologically, the species are restricted to bogs, springs and humid habitats in the subalpine and alpine zone. Furthermore, Van Soest (1959) mentioned a "remarkable resemblance" to species of *T.* sect. sect. *Spectabilia* in northern Europe. Later, Van Soest initially described the group corresponding to *T.* sect. *Alpestria* as a subgroup of sect. *Fontana* (Van Soest 1966a), but subsequently as a separate section (Van Soest 1966c) to distinguish it from sect. *Fontana*. Unfortunately, the description is extremely poor and insufficient. Differences between both sections ("subgroups") are not discussed by Van Soest in both papers and those that are mentioned, like deep yellow or orange coloured flowers, occur often in alpine Taraxaca. When comparing both diagnoses and when taking into account the morphology of the type species, *T. reophilum*, which was studied by I. Uhlemann in August 2014 at the locus typicus near Saas Fee (Switzerland, Wallis), sect. *Alpestria* s. str. is distinguished by distinctly lobate leaves, petioles without or with only narrow wings, and an ecological preference for less humid or wet habitats. Outer bracts' position (usually erect to arcuate) and achenes of members of both sections are very similar. The achene bodies (achenes without cone) are longer than 3.0 mm, usually (3.2–)3.5–4.0(–4.5) mm long. Recently, Štěpánek & Kirschner (2022a) synonymisised the sectional names *Alpestria* and *Rhodocarpa* with priority for the latter name. The type, *T. rhodocarpum*, is a close relative of *T. reophilum* and does not change the concept of keeping *T.* sect. *Fontana* and sect. *Rhodocarpa* (= sect. *Alpestria* s. str.) separate.

Taraxacum sect. *Crocea* was described by Christiansen (1942) when studying the *Taraxacum*-flora of Iceland. He established this group within the *T. spectabile*-complex as a distinct section of slender plants with long, small leaves, outer bracts with adpressed, erect to patent position, often with a distinct white margin, and 3.8–5.0(–5.5) mm long achenes (including the cone). Neither the simple lobation pattern nor the broadly winged petioles were mentioned in the original description, but these characters become apparent when studying the 50 species described in his paper. Several papers, which provide descriptions of new species from *T.* sect. *Crocea* in Fennoscandia (e. g., Haglund 1983, Sonck & Øllgaard 1991), support the idea of a well-defined infrageneric group that completely fits to *T.* sect. *Fontana* in the European Alps.

Fig. 1: Lectotype specimen, upper right plant, of *Taraxacum fontanum* (WU 043696). — **Abb. 1:** Lektotypus (Pflanze oben rechts) von *Taraxacum fontanum* (WU 043696).

Lundevall & Øllgaard (1999) mention a total of 98 species of *Taraxacum* sect. *Crocea* in northern Europe. Outside this region, species are known from the Alps (six species recognised in the present paper), from Bulgaria (six species: Štěpánek & Kirschner 2022b) and from Greece (one species: Richards 1991). The first formal synonymisation of *T.* sect. *Fontana* and sect. *Crocea* was by Štěpánek & Kirschner (2021: 282) as a short parenthetical note and then in more detail by Štěpánek & Kirschner (2022b).

Currently, we are far from being able to carry out a revison (in the sense of a complete exploration) of this section on a regional or even a global scale such as the European Alps or south-eastern European mountains (despite an excellent monograph of this section in Bulgaria: Štěpánek & Kirschner 2022b). Based on the author's experience, mainly stemming from numerous excursions to the Alps since 1990, there are, beside the six recognised Alpine species, many local but distinct morphotypes in *T.* sect. *Crocea* known from a few localities. These morphotypes require closer and more extended study of character variation and may turn out to be separate species, as is exemplified by the description of *T. jacobianum* spec. nova in this paper.

Material and methods

All six Alpine species of *Taraxacum* sect. *Crocea* accepted in this paper were studied both on fresh material from the loci classici and on herbarium material (including the type material). This study included the examination of specimens in the herbaria DR, GLM, IB, IBF, L, M, MSB, ROV and WU (Thiers 2018+) as well as in the private collections Hb. C. Argenti, Hb. E. Bona, Hb. W. Diewald, Hb. F. G. Dunkel, Hb. W. Gutermann, Hb. L. Meierott and Hb. I. Uhlemann.

Comparative cultivation experiments were carried out using plant material of all species of *Taraxacum* sect. *Crocea* accepted in this paper collected by the author at type localities in the Alps.

Taxonomic treatment

Taraxacum sect. ***Crocea*** M. P. Christ. in Grøntved & al., Bot. Iceland 3(3): 255 (1942).

≡ *T.* subsect. *Crocea* (M. P. Christ.) A. J. Richards in Bot. J. Linn. Soc. 65: 38 (1972). **Type:** *T. croceum* Dahlst. in Bih. Kongl. Svenska Vetensk. Akad. Handl. 26, Afd. 3, 1: 12 (1900), emend. Dahlst. in Bot. Not. 1905: 150–151, 159–160 and in Ark. Bot. 12 (2): 15 (1912). **Lectotype** (designated by Lundevall & Øllgaard 1999: 74): **Sweden,** Hälsingland, Vänsjö, Vänsjöhammaren, 12.7.1898: M. Östmann (S).

= *Taraxacum* sect. *Fontana* Soest in Acta Bot. Neerl. 8: 103 (1959).
Type: *Taraxacum fontanum* Hand.-Mazz., Monogr. Taraxacum: 100 (1907). Lectotype (designated by Kirschner & Štěpánek 1997: 92, following W. Gutermann, in

sched.): [**Österreich**, Nord-Tirol] An feuchten Stellen zwischen Steinen in der Rinne ober dem Kaserl im Sendersthal by Innsbruck gegen das Pleisenjoch, Schiefer, ca. 1800 m; 23.7.1903: H. Handel-Mazzetti (WU 043696).

≡ *T.* subsect. *Fontana* (Soest) R.Doll in Feddes Repert. 93: 538 (1982).

Description: *Plant* (6–)10–20(–30) cm tall, slender, plant base without remnants of dried leaves. *Leaves* dentate, shallowly lobed or with short indistinct or more rarely short distinct lobes, petioles (in particular those of outer leaves) broadly winged, usually green. *Scapes* bearing a single capitulum, glabrous or moderately araneose. *Involucre* olive green to bluish green, often pruinose; *outer bracts* adpressed, erect to patent, arcuate (erect with recurved tips), rarely (lower outer bracts in *T. pseudoboreigenum*) arcuate-reflexed base erect, tips of upper bracts recurved, tips of lower bracts reflexed touching the scape, (2–)3–4 mm wide, (6–)8–9 mm long, green, with a narrow distinct or an indistinct white margin, sometimes without such margin, not corniculate at the apex. *Flowers* yellow to golden yellow, flat, anthers with pollen or without pollen, styles yellow, yellowish green or dirty greyish green. *Achenes* greyish brown to grey, achene body (3.2–)3.5–4.0(–4.5) mm long, in the upper part spinulose, cone conical to subcylindrical, (0.3–)0.5–1.0 mm long, rostrum (6–)7–9(–10) mm long, pappus white.

Distribution: *Taraxacum* sect. *Crocea* has a disjunct arctic-alpine distribution. It is found in the arctic to boreal zones of Europe, Greenland, Alaska and Canada, in the Alps and in south-eastern European mountain ranges (e. g., Andersson & Hesselmann 1900, Christiansen 1942, Van Soest 1959, 1969, Richards 1991, Lundevall & Øllgaard 1999, Štěpánek & Kirschner 2022b).

Key to species of *Taraxacum* sect. *Crocea* from the European Alps (suitable for herbarium and fresh material)

1 Styles yellow to yellowish green **2**
1* Styles grey to greyish green **4**
2 Outer bracts 14–17, without distinct margin, arcuate to arcuate-reflexed, multiseriate. Leaf blade moderately araneose, dentate, teeth equidistant or very rarely (in cultivation) lobulate or lobate in older (outer) leaves ..... ***T. pseudoboreigenum***
2* Outer bracts 11–15, with a clear white margin, uniseriate. Leaf blade glabrous **3**
3 Outer bracts 11–15, erect to arcuate. Leaf blade dentate or rarely lobulate; stepwise narrowing towards the base, teeth or lobules recurved ..... ***T. insubricum***
3* Outer bracts 11–12, erect. Leaf blade with patent, short triangular or lingulate blunt lobes or lobules, which are equidistant ..... ***T. jacobianum***
4(1) Outer bracts without margin or with an indistinct white margin. Leaf blade glabrous, dentate or lobulate with (3–)4–6(–11) small and short triangular, straight teeth or small triangular recurved lobules per side. Outer bracts 15–16(–18). Achene body 3.5–4.0 mm long, cone 0.5–0.7 mm long ..... ***T. fontanum***
4* Outer bracts with clear white margins **5**
5 Leaf blade glabrous with 2–3 short triangular recurved lobules or lobes per side,

stepwise narrowing towards the base. Outer bracts 14–15. Achene body 3.9–4.1 mm long, cone 0.8–1.0 mm long ..... ***T. absurdum***

5* Leaf blade glabrous with (2–)3–4 small to broad triangular, straight lobules or lobes per side, which are equidistant. Outer bracts 15–19. Achene body 3.5–3.7 mm long, cone 0.5–0.7 mm long ..... ***T. fontanosquameum***

Taraxacum absurdum Soest in Proc. Kon. Ned. Akad. Wetensch. C 69(4): 454 (1966c).
Lectotype (designated here): Italy, Valtelina, Bormio, Vélésiége de Vallecetta; 2200 msm; 18.7.1959: G. Didier (L 0002317; lower plant).

Note: The correct date of the collection is 18.7.1959 as the label of the type shows, not 18.7.1957 as Van Soest (1966c: 455) suggested. The type specimen consists of two parts, which are probably not conspecific. The lower and bigger plant is chosen as lectotype.

Description: *Plant* 10–15(–20) cm tall, slender. *Leaves* patent to ascending to suberect, mid green, glabrous, not spotted, leaf lamina usually lobulate or weakly lobate with 2–3 short, broad triangular lobules/lobes with recurved tips per side; stepwise narrowing towards the base, terminal lobe hardly differentiated; petiole, in particular of outer (oldest) leaves broadly winged, green. *Scapes* green to brownish in the upper part, glabrous or loosely araneose. *Involucre* U-shaped at the base, bluish green, pruinose; *outer bracts* 14–15, erect with recurved tips, with a narrow distinct white margin, adaxially pale greyish green, abaxially bluish green, pruinose, without corniculations below the apex, 2–3 mm wide, 7–9 mm long. *Capitulum* 30–35 mm in diameter; ligules deep yellow, flat, outer ones with light brownish-purple stripes abaxially; styles in the upper part dark grey abaxially; pollen absent or rudimentary. *Achenes* greyish brown, achene body 3.9–4.1 mm long, spinulose in the upper part, abruptly tapering into a 0.8–1.0 mm long subcylindrical cone; rostrum (6–)7–8 mm long; pappus white. – Fig. 2.

Chromosome number: Unknown.

Distribution: Until now, *Taraxacum absurdum* is only known from a restricted area in northern Italy, Lombardy, in particular around the Ortler-Gruppe, where it occurs locally frequently.

Habitat: The species grows on wet brookbanks and lakeshores in the alpine zone.

Comments: *Taraxacum absurdum* is a characteristic member of *T.* sect. *Crocea* with weakly lobed leaves, petioles with broad wings and large achenes. The lobation pattern is very distinctive, with lobe-pairs stepwise narrowing towards the base. The outer bracts have a distinct narrow white border. Compared to other species of this section, the rostrum is a bit shorter. *Taraxacum absurdum* is similar to *T. insubricum* with regard to leaf-lobation/dentation, outer bracts possessing a white margin, size and spinulation of achenes, and rostrum length, but it differs by dark grey styles and somewhat (ca. 0.2 mm in both achene body and cone) bigger achenes.

Taraxacum absurdum was rediscovered in August 2015 by the author on its type locality, but in a late state of developement. Additionally, it was found frequently and in characteristic appearance in the neighborhood on Gavia Pass along brooks.

Literature: Van Soest (1966c, 1969).

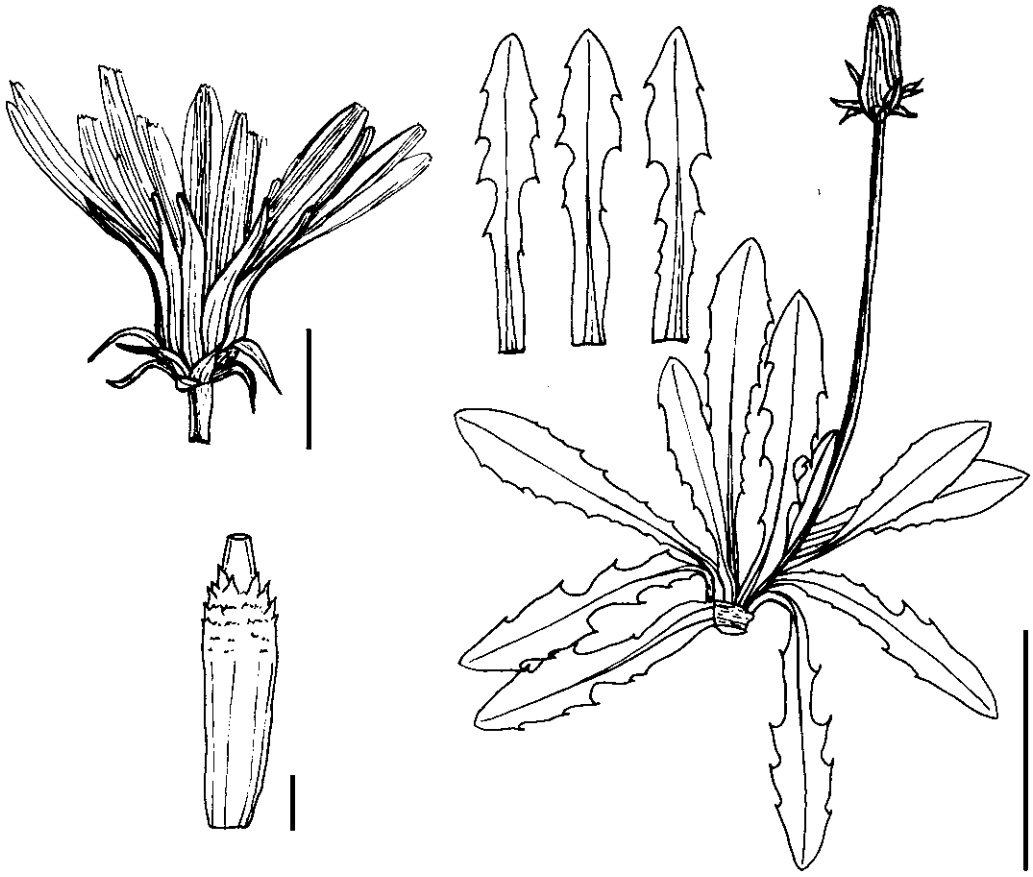


Fig. 2: *Taraxacum absurdum*. Habit and leaves (Passo di Gavia, 2.8.2015, I. Uhlemann; scale bar = 10 cm); capitulum (Passo di Gavia, 2.8.2015, I. Uhlemann; scale bar = 10 mm); achene (Passo di Gavia, 2.8.2015, I. Uhlemann; scale bar = 1 mm). — **Abb. 2:** *Taraxacum absurdum*. Habitus und Blätter (Passo di Gavia, 2.8.2015, I. Uhlemann; Maßstab = 10 cm); Korb (Passo di Gavia, 2.8.2015, I. Uhlemann; Maßstab = 10 mm); Achäne (Passo di Gavia, 2.8.2015, I. Uhlemann; Maßstab = 1 mm).

Specimens studied:
Italy, Lombardy/Lombardia: Alta Val Camonica, Corteno Golgi, pascolo in Valle di Campovecchio lungo la strada per Malga Venet; 1380 msm.; 16.6.2007: E. Bona (Hb. E. Bona). – Oberes Veltlin, Ortler-Gruppe, St. Catarina Valfurva, Passo di Gavia, Bachufer (Verzweigungen des Rio Storzellina), zwischen Rif. Berni und dem Gletscher des Corno dei Tri Signori; ca. 2700 msm; 2.8.2015: I. Uhlemann (IBF, Hb. Uhlemann). – Oberes Veltlin, Ortler-Gruppe, Bormio, Vallecetta, Hauptweg oberhalb "Bormio 2000" (= locus classicus); 2200 msm; 3.8.2015: I. Uhlemann (Hb. Uhlemann).

Taraxacum fontanosquameum Soest in Acta Bot. Neerl. 8: 110 (1959).
Holotype: [**Switzerland,** Grisons/Graubünden, Oberengadin], Bernina Pass (Gr.); 2050–2250 msm; 18.7.1948: J. L. van Soest (L 0002461).

= *T. graiense* Soest in Acta Bot. Neerl. 10: 288 (1961).
Lectotype (designated here): France, [R h ô n e - A l p e s] , Val d'Isere (Savoie), pentes argileuses dans le Bois du Rogoney; 1900 msm; 15.7.1958: B. de Retz (L 0002460); lower plant.

Note: According to original material, original description and fig. 12 in Van Soest (1961: 288, 302), all characters of *Taraxacum graiense* fit very well to those of *T. fontanosquameum*. Even Van Soest himself revised the type to *T. fontanosquameum* in 1964 after labelling it *T. graiense* in 1959 and publishing description 1961 based on the type specimen. Unfortunately, Van Soest (1961) did not mention *T. fontanosquameum* in the discussion of *T. graiense* apparently because of a subsequent decision. The type specimen consists of two plants. The upper one is weakly developed and probably not conspecific with the lower one. Consequently, the well-developed lower plant is chosen as the lectotype.

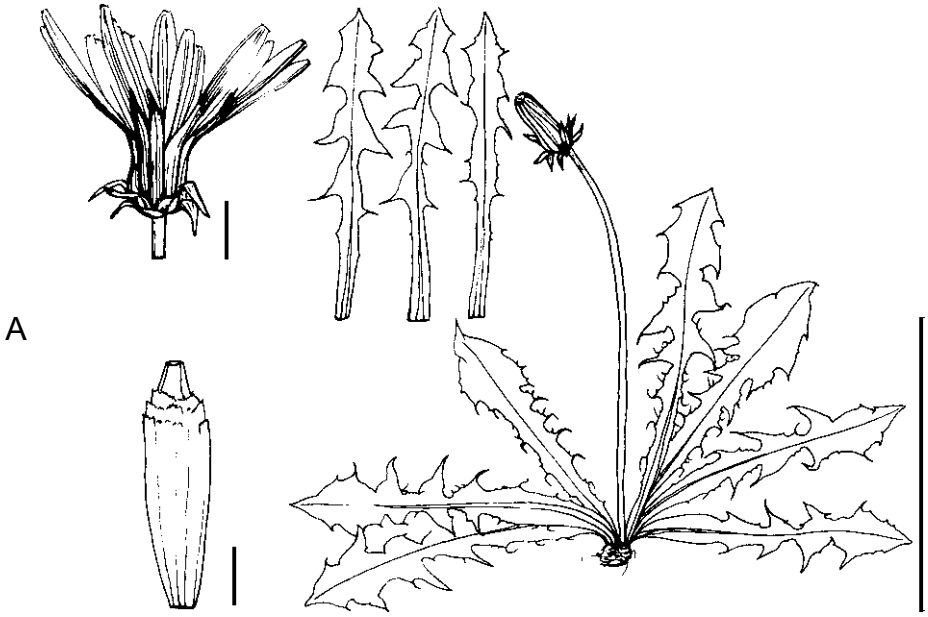
Description: *Plant* 10–15(–20) cm tall, slender. *Leaves* patent to ascending to suberect, light to mid green, completely glabrous, not spotted, leaf lamina usually sublobate or lobate with (2–)3–4 small to broad triangular, straight lobules or lobes per side; terminal lobe not well differentiated, dentate or lobulate; petiole, in particular of outer (oldest) leaves broadly winged, light green. *Scapes* green to brownish, glabrous. *Involucre* U-shaped at the base, light bluish green, pruinose; *outer bracts* (13–)15–17(–19), erect with recurved tips to patent, rarely almost adpressed, with a narrow distinct white or pinkish margin, adaxially and abaxially pale light green, without corniculations below the apex, 2–3(–4) mm wide, (6–)7–8(–9) mm long. *Capitulum* 35–40(–45) mm in diameter; ligules yellow, flat, outer ones with faint light brownish-purple stripes abaxially; styles in the upper part light grey to greyish green abaxially; pollen absent or rarely present, but then rudimentary. *Achenes* greyish brown, achene body 3.5–3.7 mm long, weakly spinulose in the uppermost part, abruptly tapering into a 0.5–0.7 mm long conical cone; rostrum (7–)8–9 mm long; pappus white. – Fig. 3.

Chromosome number: Unknown.

Distribution: Due to the rarity of *Taraxacum fontanosquameum* specimens, it is difficult to delimit a distribution area, which is probably wide ranging from the western Alps ("*T. graiense*") to eastern Switzerland (locus typicus) and to the eastermost part of the Hohe Tauern in Austria (Mallnitz).

Habitat: The species prefers wet subalpine and alpine brookbanks and lakeshores and is also found on moist alpine grasslands.

Comments: Although only a few herbarium specimens are available of *Taraxacum fontanosquameum*, its character combination is distinct. In contrast to the core species of this section, it has a unique leaf lobation pattern with triangular lobules or short and simple lobes, only rarely is the leaf lamina merely dentate. The green petioles are broadly winged as is characteristic in this section. Furthermore, the species has outer bracts with a white margin and a light bluish-green, pruinose involucre. *Taraxacum fontanosquameum* resembles in many characters *T. vile* (Štěpánek & Kirschner 2022b) described from Bulgaria, but the latter species has a slightly deviating leaf shape, purple petioles,



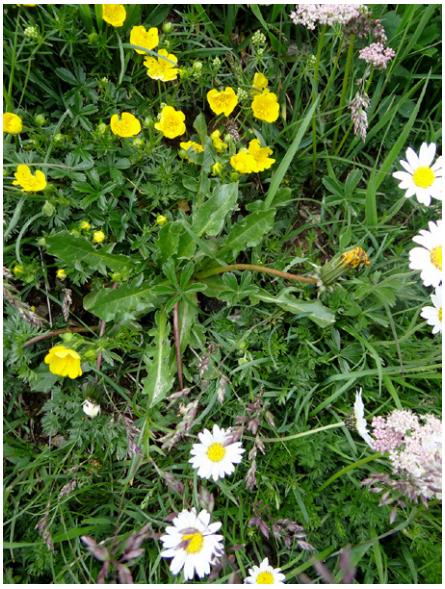


Fig. 3: *Taraxacum fontanosquameum*. A: Habit (Churfirsten, 25.7.2001, I. Uhlemann; scale bar = 10 cm); capitulum (Bernina Pass, 10.8.2017, I. Uhlemann; scale bar = 10 mm); achene (Mallnitz, 27.8.1998, I. Uhlemann; scale bar = 1 mm); single leaves (Mallnitz, 27.8.1998, I. Uhlemann; scale bar = 10 cm). B: Habit (Bernina Pass, 10.8.2017, I. Uhlemann. C: Capitulum (Bernina Pass, 10.8.2017, I. Uhlemann). — **Abb. 3:** *Taraxacum fontanosquameum*. A: Habitus (Churfirsten, 25.7.2001, I. Uhlemann; Maßstab = 10 cm); Korb (Berninapass, 10.8.2017, I. Uhlemann; Maßstab = 10 mm); Achäne (Mallnitz, 27.8.1998, I. Uhlemann; Maßstab = 1 mm); Einzelblätter (Mallnitz, 27.8.1998, I. Uhlemann; Maßstab = 10 cm). B: Habitus (Berninapass, 10.8.2017, I. Uhlemann). C: Korb (Berninapass, 10.8.2017, I. Uhlemann).

achenes with a different coloration and longer cone, and a dirty white pappus. *Taraxacum fontanosquameum* was rediscovered in August 2017 at the locus classicus.
Literature: Van Soest (1959, 1961, 1969), Stöhr (2010), Stöhr & Pilsl (2018).

Specimens studied:
Austria, Carinthia/Kärnten: Hohe Tauern, Mallnitzer Tauertal, Mallnitz, Weg zur Hagener Hütte [8944/4]; 2200 msm; Bachufer; 27.8.1998: I. Uhlemann (Hb. Uhlemann). – Salzburg: Lungau, zwischen Murtörl und Schmalzscharte [8846/3]; 2329 msm; sickerfeuchtes Rasenband; 25.7.2009: W. Diewald (Hb. Diewald 6614). – Lungau, Murtörl [8846/3]; 2260 msm; Rieselflur; 25.7.2009: W. Diewald (Hb. Diewald 6613). – Tyrol/Tirol: Zillertaler Alpen, vom Schlegeisspeicher zum Friesenberghaus bis zu der Brücke über den Bach [8936/1]; 2150 msm; 15.8.1980: W. Lippert (M 0312132 [wild], M 0312131 und 0312130 [kultiviert]).
Italy, South Tyrol/Alto-Adige/Südtirol: Deferegger Alpen, Gail SSE, St. Magdalena-Obertal, (Gsies): Nordwestflanke [9139/2]; Quellfluren, Silikat; 21.7.1995: W. Gutermann (Hb. Gutermann). – Ortlergruppe, Martelltal, Hotel Schönblick S Zufallsee, Zufallhütte, Martellerhütte (9530/2); 2300 msm; alpine Schwemmfluren, Moränenschutt, Silikat; 13.8.2009: F. G. Dunkel (Hb. Dunkel 24418).
Switzerland, St. Gallen: Churfirsten, Tal zwischen Chäserrug und Gamser Rugg; ca. 2000 msm; feuchte, alpine Rasen; 25.7.2001: I. Uhlemann (Hb. Uhlemann). – Grisons/Graubünden: St. Moritz, Bernina Pass (= locus classicus), feuchte alpine Rasen oberhalb des Ospizio; 2330–2380 msm; 10.8.2017: I. Uhlemann (Hb. Uhlemann). – Raethische Alpen, Albula Alpen, Bergün, Albula-Pass, Schneetälchen unterhalb des Albula Sees; 2250 msm; 26.7.2019: I. Uhlemann (Hb. Uhlemann).

Taraxacum fontanum Hand.-Mazz., Monogr. Taraxacum: 100 (1907).
Lectotype (first-step designated by Kirschner & Štěpánek 1997: 92, following W. Gutermann, in sched., **second-step designated here**): [**Austria**], Nord-Tirol: An feuchten Stellen zwischen Steinen in der Rinne ober dem Kaserl im Sendersthal by Innsbruck gegen das Pleisenjoch [8833/2]; ca. 1800 msm; Schiefer; 23.7.1903: H. Handel-Mazzetti (WU 043696 upper right specimen). Isolectotype: IB 16343.
= *Taraxacum fontanicola* Soest in Acta Bot. Neerl. 8: 108 (1959).
Holotype: [**Switzerland,** Grisons/Graubünden, Rhaetische Alpen], Palpuogna (Albul[l]a), [locus paludosus]; 1900 msm; 13.7.1948: J. L. van Soest (L 0002463). Isotypes: L 0002459, L 0002464, L 0002465, L 0002466.
Note 1: Van Soest (1959) mentioned five specimens under "Typus" without assigning a holotype in the protologue. Among them, the specimen (L 0002463) pictured (Van Soest 1959: 109, fig. 13) is labeled as the holotype. According to the label of the holotype specimen the correct collection date is 13.7.1948; the date given in the protologue (31.7.1948) is incorrect. The isotype collection is homogenous.
Note 2: The epitheton "fontanicolum" used by Van Soest (1959) is grammatically incorrect and must be replaced by "fontanicola" (Turland & al. 2018).
= *Taraxacum cochleatophyllum* Soest in Proc. Kon. Ned. Akad. Wetensch. C 69(4): 455 (1966c).
Holotype: [**Austria**], Carinthia/Kärnten, Ankogelgruppe: zwischen Stern und Wandspitze [8947/3]; 2300 msm; an feuchten Stellen einer Felswand; 19.7.1959: H. Melzer (L 0002406).
Note: According to the original material, original description and fig. 14 in Van Soest

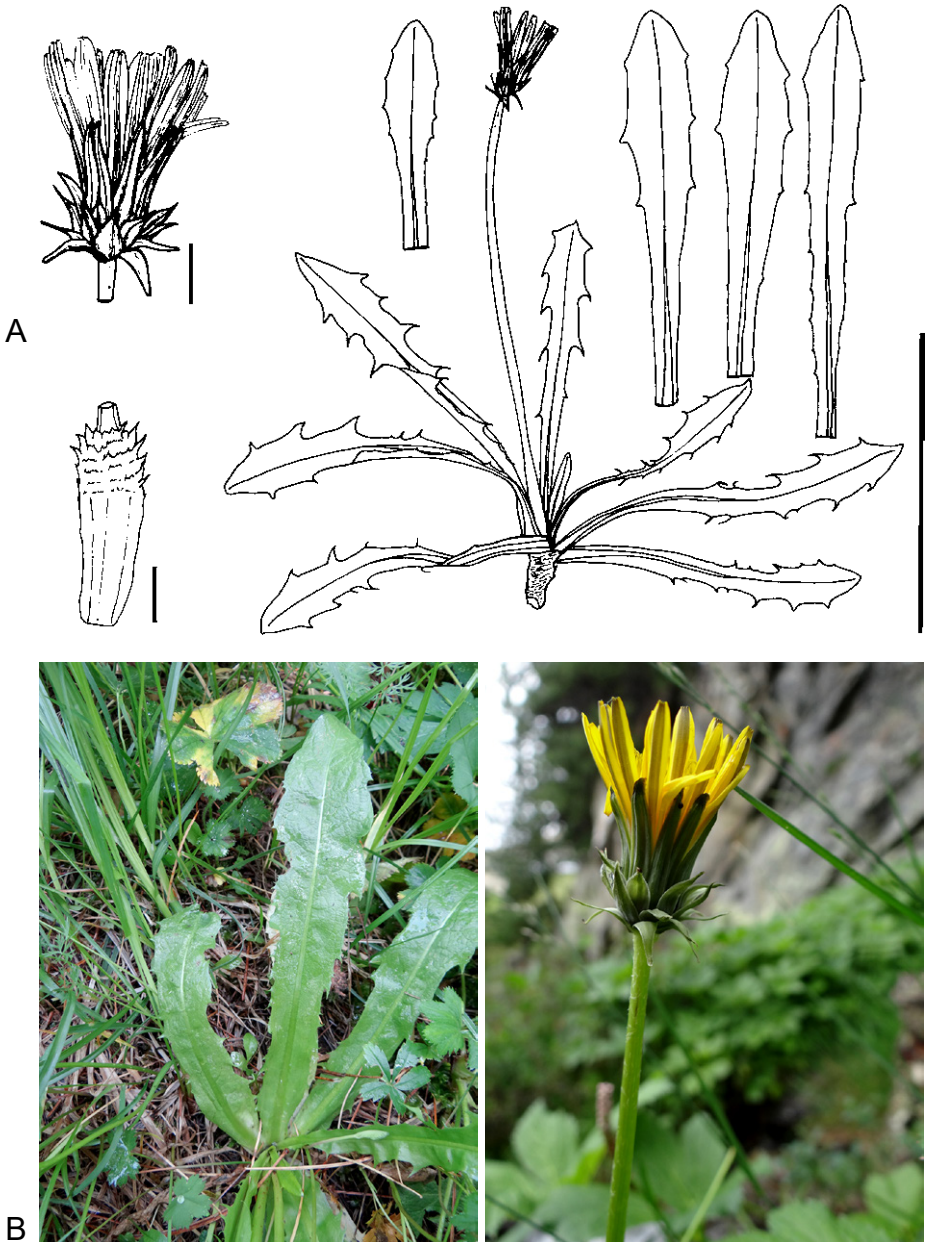


Fig. 4: *Taraxacum fontanum*. A: Habit and leaves (Albula-Pass, 6.8.2008, I. Uhlemann; scale bar = 10 cm); capitulum (Pontresina/Languard, 9.7.2017, I. Uhlemann; scale bar = 10 mm); achene (Palpuogna, 2018, I. Uhlemann; scale bar = 1 mm). B: Habit (Pontresina/Languard, 9.7.2017, I. Uhlemann). C: Capitulum (Pontresina/Languard, 9.7.2017, I. Uhlemann). — **Abb. 4:** *Taraxacum fontanum*. A: Habitus und Blätter (Albula-Pass, 6.8.2008, I. Uhlemann; Maßstab = 10 cm); Korb (Pontresina/Languard, 9.7.2017, I. Uhlemann; Maßstab = 10 mm); Achäne (Palpuogna, 2018, I. Uhlemann; Maßstab = 1 mm). B: Habitus (Pontresina/Languard, 9.7.2017, I. Uhlemann). C: Korb (Pontresina/Languard, 9.7.2017, I. Uhlemann).

(1966c), all characters fit very well to those of *T. fontanum*. The author failed to rediscover this species in July 2002 at the locus classicus.

Description: *Plant* 10–15(–20) cm tall, slender. *Leaves* patent to ascending to suberect, light green to mid green, glabrous, not spotted, leaf lamina usually dentate with (3–)4–6 (–11) small triangular, straight teeth or small triangular recurved lobules per side, less often lobate with short triangular lobes tapering towards the recurved tips, terminal lobe not differentiated; petiole, in particular of outer (oldest) leaves broadly winged, green. *Scapes* green to brownish in the upper part, glabrous or loosely araneose. *Involucre* U-shaped at the base, bluish green, pruinose; *outer bracts* 15–16(–18), erect or outer ones patent, without white margin or with a narrow but indistinct white margin, adaxially pale greyish green, abaxially bluish green, pruinose, without corniculations below the apex, (2–)3.0–4.0 mm wide, 7–9 mm long. *Capitulum* 30–35 mm in diameter; ligules deep yellow, flat, outer ones with light brownish-purple stripes abaxially; styles in the upper part grey abaxially; pollen absent, rarely present and then rudimentary. *Achenes* greyish brown, achene body 3.5–4.0 mm long, coarsely spinulose in the upper part, abruptly tapering into a 0.5–0.7 mm long conical cone; rostrum (7–)8–9 mm long; pappus white. – Figs. 1, 4.

Chromosome number: $2n = 4x = 32$; material from the locus typicus of *T. fontanicola*, counted by I. Uhlemann in June 2002.

Distribution: As far as is known, *Taraxacum fontanum* is widespread in the central and eastern parts of the Alps and is one of the most common species of the section in the Alps. It is documented from the Gurktaler Alpen (Austria) in the east up to the Oberalp-Pass in central Switzerland in the west. The northern border of its distribution range is in the Allgäuer Alpen (Germany), the southern limit is in the Trentino (Italy).

Habitat: The species prefers wet brookbanks and lakeshores in the montane to alpine zone. It is also tolerating taller vegetation.

Comments: Morphologically, *Taraxacum fontanum* stands as an epitome of the whole section, characterised by its dentate or more often lobulate, rarely weakly lobate leaves (Figs. 1, 4), which are light or mid green, glabrous and have wide wings, in particular on the outer petioles, and by its big achenes. These three plants of the type perfectly demonstrate the whole range of morphological variation in leaf blade, varying from dentate to lobulate to weakly lobate. At the locus classicus in Sendersthal in North Tyrol, the species is rare, and it was found only in weakly developed modifications by I. Uhlemann in July 2009. *Taraxacum fontanum* should better be studied at the locus classicus of *T. fontanicola* on Lai de Palpuogna near Albula-Pass in Switzerland where it still occurs frequently about 60 years after publication of the latter name. There, the species prefers banks of small brooks becoming anastomosed before flowing into the lake, accumulating water and forming large wet or moist areas. The shore of Lai de Palpuogna is frequently used by people for spare time activities, causing a continuous weak disturbance of the vegetation. Probably, *T. fontanum* takes benefit from this vegetation management as the large and stable population shows.

Literature: Handel-Mazzetti (1907), Van Soest (1959, 1966c, 1969), Sahlin & Lippert (1983), Stöhr (2010), Stöhr & Pilsl (2018).

Specimens studied:
Austria, East Tyrol/Osttirol: Hohe Tauern, Granatspitzgruppe, Dorferbachtal, Kalser Tauernhaus W, Hintere Ochsenalm, Stotzbach unterhalb des Spinewitrol [8941/2]; 2200 msm; Bachufer; 14.7.2003: I. Uhlemann (Hb. Uhlemann). – Salzburg: Hohe Tauern, Fuscher Törl an der Hochalpenstraße [8842/4]; 5.7.1992: I. Uhlemann (WU). – Hohe Tauern, Kaprun, Fuß des Kitzsteinhorns [8742/3]; 2400 msm; 9.8.2011: I. Uhlemann (WU). – Styria/Steiermark: Gurktaler Alpen, Turracher Höhe, Nordhang der Gruft östlich Schoberriegel [9049/3]; 2100 msm; 7.8.1997: F. G. Dunkel (Hb. Dunkel 635). – North Tyrol/Nordtirol: Mulden an der Nordseite des Hirxer im Weerthal [8735/4]; 2300 msm; Schiefer; 3.8.1903: H. Handel-Mazzetti (WU). – Im Schatten eines Felsblockes am Aufstieg zum Mallgrübler im Volderthal; 2200 msm; Schiefer; 20.9.1902: H. Handel-Mazzetti (WU). – Zillertaler Alpen, Hintertux, nördöstlich Tuxer Ferner Haus, 11°40′18.80″E 47°04′41.12″N [8936/1]; 2565 msm; s. a.: K. Pagitz (IB 72943). – Stubaier Alpen, oberstes Gschnitztal, Traul-Alm [8933/4]; 2300 msm; Silikat; 18.8.1967: D. Podlech (MSB 108953). – Stubaier Alpen, Serleskamm, Traulalm, nördlich der Laponesalm im Gschnitztal [8933/4]; Bachufer; 18.8.1967: W. Lippert (M 0312126). – Ötztaler Alpen, Obergurgl, Rotmoostal [9132/3]; 2400 msm; Bachufer; 14.8.2021: I. Uhlemann (WU).
Germany, Bavaria/Bayern: Allgäuer Alpen, Gipfel des Linkerskopfes [8727/2]; 2455 msm; 8.8.1916: F. Vollmann (M 0312129).
Italy, South Tyrol/Alto-Adige/Südtirol: Brennergebiet, Tuxer Hauptkamm, Hühnerspiel, oberhalb der Rif. Gallina; 2200 msm; 28.7.1994: I. Uhlemann (Hb. Uhlemann). – Marteltal, Hotel Schönblick S Zufallsee, Zufallhütte, Martellerhütte (9530/2); 2400 msm; alpine Schwemmfluren; 13.8.2009: F. G. Dunkel (Hb. Dunkel 24499). – Trentino: Val di Fassa, Val di Dona sopra Campestrin, pascolo torboso (9536/1); 2130 msm; 12.6.1996: F. Prosser (ROV). – Lato Ovest del Lago delle Malghette (Gruppo della Presanella) (9730/2); 1890 msm; prateria humido (silice); 25.6.1997: F. Prosser (ROV). – Comune di Brez, Alta Val di Non, zona del M. Sous (SIC M. Sous), 220 m a SE di q. 1849.6, zona umida su silice (9532/1); 1835 msm; 1.7.2010: F. Prosser & A. Bertolli (ROV 56654). – Comune di Brez, Alta Val di Non, 250 m a S della cima del M. Sous, nella torbiera a E di q. 1861.0 (9432/3); 1850 msm; zona umida in pendio con *Carex nigra* (silice); 1.7.2010: F. Prosser & A. Bertolli (ROV 56643). – Comune di Ragoli, Gruppo di Brenta: 450 m a E del Lago Spinale (9731/3); 2085 msm; conca umida con *Carex fusca* etc., su calcare; Datum: F. Prosser & A. Bertolli (ROV). – Comune di Primiero San Martino di Castrozza – Sotto la Tognola verso Malga Tognola di Siror (9736/2); 2312 msm; 7.7.2020: F. Prosser, R. Sibella & M. Salvadori (ROV 79512). – Comune di Peio – Val di Pejo: subito a SE del Baito Cadinel sopra Cellentino (9630/1); 2408 msm; 21.7.2019: F. Prosser (ROV 77193). – Lombardy/Lombardia: Oberes Veltlin, Ortler-Gruppe, Passo di Gavia, Bachufer (Verzweigungen des Rio Storzellina) oberhalb der Rif. Berni; ca. 2500 msm; 15.8.2021: I. Uhlemann (Hb. Uhlemann). – Venetia: Provincia Belluno, Cortina, zona lago di limedes; 2150 msm; 12.8.2021: C. Argenti (Hb. Argenti).
Switzerland, Grisons/Graubünden: Rhaetische Alpen, Silvretta, Davos, Flüela-Pass, Schottensee; 2374 msm; alpine Rasen im Uferbereich; 27.7.2019: A. Uhlemann (Hb. Uhlemann). – Rhaetische Alpen, Davos, Flüela-Pass, Radönt; ca. 2450 msm; nasser, vermoorter Talboden entlang eines Baches; 25.7.2018: I. Uhlemann (IBF). – Rhaetische Alpen, Silvretta, Davos, Flüela-Pass, Schwarzsee; 2384 msm; alpine vernässte Rasen im Uferbereich; 27.7.2019: I. Uhlemann (Hb. Uhlemann). – Silvretta-Gruppe, östl. Klosters Jörital; 2200 msm; Böschung am Wegrand; 24.7.2000: I. Uhlemann (Hb. Uhlemann). – Val Tisch, boven de Alp; 1850–2100 msm; 14.7.1948: J. L. van Soest (L 04111160). – Albula-Alpen, Bergün, Lai de Palpuogna; ca. 1900 msm; Bachufer; 30.7.2001: I. Uhlemann (Hb. Uhlemann); ibid.: 8.8.2005: I. Uhlemann (Hb. Uhlemann); ibid.: 23.7.2018 (Hb. Uhlemann). – Albulapass; 2100–2300 msm; 17.7.1948: J. L. van Soest (L 04111159, L 04111158). – Albula-Pass, ca. 500 m unterhalb des Passes in Richtung Engadin; ca. 2200 msm; Schneetälchen; 6.8.2008: I. Uhlemann (Hb. Uhlemann). – Parpan, Santons, Alp Stätz; 1650–1800 msm; 26.6.1966: J. L. van Soest (L 04111142). – N-Hang Albulapass, am See Prade; ca. 1600 msm; 8.7.2007: L. Meierott (Hb. Meierott). – Oberengadin, sumpfige Wiese am See von St. Moritz; 1770 msm; 22.7.1935: O. Fiedler (DR 000598). – St. Moritz E, Pontresina, Alp Languard, Abstieg nach Pontresina nahe des Ovel da Languard duch Arven-Lärchen-Wald; ca. 1900 msm; Bachufer in der montanen Stufe; 9.7.2017: I. Uhlemann (GLM, IBF, Hb. Uhlemann). – Oberengadin, Bernina-Gruppe, Diavolezza; 2600 msm; Seeufer; 23.8.2007: I. Uhlemann (Hb. Uhlemann). – Berninapass; 2050–2250 msm; 18.7.1948:

J. L. van Soest (L 04111161). – Bernina-Alpen, Bernina-Pass, Lago Bianco, Ostufer, zwischen Bahnhof und Staumauer, am Wanderweg; 2250 msm; sumpfige Senken, alpine Silikat-Magerrasen; 27.7.2008: F. G. Dunkel (Hb. Dunkel). – Oberengadin, Pontresina, Val Reseg, Bachalluvionen der Alpe Prüma, 50 m vor der Brücke der Fahrstrasse über die Ova da Reseg, östlich des Flusses (9525/1); 1910 msm; 3.7.1999: F. G. Dunkel (Hb. Dunkel 2373). – Ortlergruppe, Müstair, Val Muraunza zwischen Müstair und Umbrailpass (9428/2); 2200 msm; kiesige Alluvionen am Bachrand; 13.8.1999: F. G. Dunkel (Hb. Dunkel 02813). – Oberalppass oberhalb Andermatt, Bachlauf oberhalb des Passes; 2250 msm; 10.8.2013: I. Uhlemann (Hb. Uhlemann).

Taraxacum insubricum Soest in Webbia 21: 625 (1966b).

Holotype: Italy, Stelvio parc, Val Rosin (Solda); 2100 msm; 7.8.1965: F. Pedrotti & E. Orsomando (CAME).

Note: Type not yet seen by the author but compare fig. 1 in Van Soest (1966b).

– *Taraxacum pseudofontanum* Soest in Acta Bot. Neerl. 8: 94 (1959), nom inval. (Turland & al. 2018, ICN, Art. 40.1 and 40.2).

Note: Van Soest (1959: 94, 95) mentioned two gatherings as type (Typus): (a) a specimen from Pfossental (Italy, South Tyrol), p. 95 (L 0065681) and (b) another specimen from Silvretta (Switzerland, Grisons), p. 94, fig. 6. (L 002628).

Both names were synonymisised by Uhlemann (2011) after studying living plants in the loci typici.

Description: *Plant* (6–)10–15(–20) cm tall, slender. *Leaves* patent to ascending, light green, glabrous, not spotted, leaf lamina undivided, margins dentate or slightly lobulate with 3–4 recurved teeth or lobules per side, stepwise narrowing towards the base; petiole moderately winged, green. *Scapes* brownish green, glabrous or sparsely araneose below involucre. *Involucre* glaucous, pruinose; *outer bracts* 11–15, erect to arcuate, with a narrow distinct white margin, adaxially pale greyish green, abaxially mid green, without corniculations below the apex, (1.5–)2–3 mm wide, 7–8 mm long. *Capitulum* 30–35 mm in diameter, golden yellow; ligules flat, outer ones with dark grey-purple stripes abaxially; styles in the upper part yellow abaxially; pollen absent, rarely rudimentary. *Achenes* greyish brown, achene body 3.5–3.8 mm long, with a few broad spines in the upper part, abruptly tapering into a (0.5–)0.7–0.8 mm long subcylindrical cone; rostrum 6–8 mm long; pappus white. – Fig. 5.

Chromosome number: $2n = 32$; material from the locus typicus of *T. pseudofontanum*, counted by I. Uhlemann in December 1999.

Distribution: As far as is known, *Taraxacum insubricum* has an eastern Alpine distribution ranging from the central part of Austria across northern Italy to Grisons in eastern Switzerland.

Habitat: *Taraxacum insubricum* grows on moist or wet banks along brooks and in moist or wet grasslands on siliceous soil in the alpine zone.

Comments: *Taraxacum insubricum* is best characterised by dentate or lobulate to weakly lobate leaves with a characteristic dentation pattern (stepwise narrowing towards the base), petioles with moderate wings, pure yellow styles, outer bracts with a distinct narrow white margin and large achenes. In contrast to other species of this section, the rostrum is a bit shorter but varies in length. *Taraxacum insubricum* is very

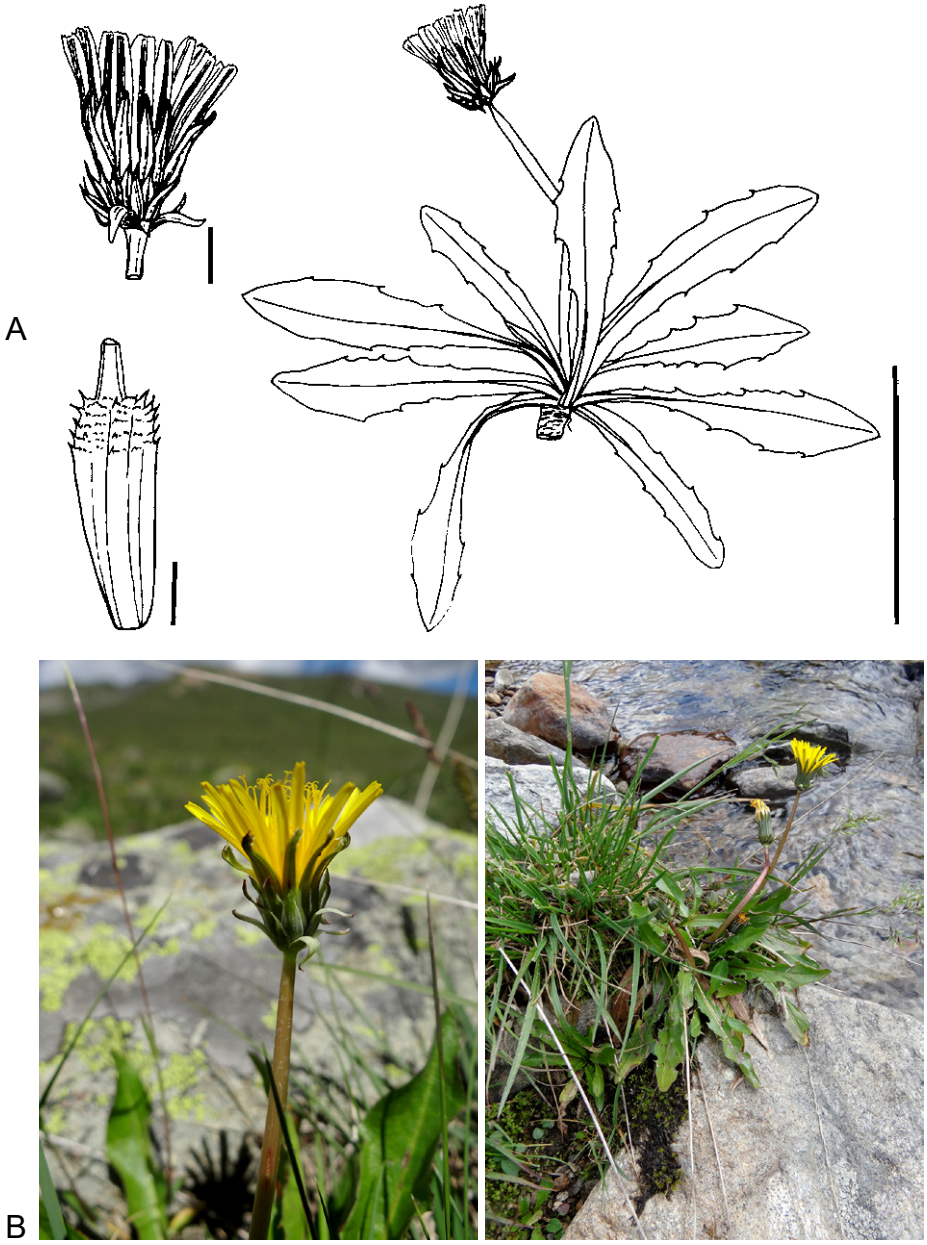


Fig. 5: *Taraxacum insubricum*. A: Habit (scale bar = 10 cm), capitulum (scale bar = 10 mm) and achene (scale bar = 1 mm; all from Pfossental, 16.8.1999, I. Uhlemann). B: Capitulum (Sesvenna-Hütte, 11.7.2016, I. Uhlemann). C: Habit (Passo di Gavia, 15.8.2021, I. Uhlemann). — **Abb. 5:** *Taraxacum insubricum*. A: Habitus (Maßstab = 10 cm), Korb (Maßstab = 10 mm) und Achäne (Maßstab = 1 mm; alle vom Pfossental, 16.8.1999, I. Uhlemann). B: Korb (Sesvenna-Hütte, 11.7.2016, I. Uhlemann). C: Habitus (Passo di Gavia, 15.8.2021, I. Uhlemann).

similar to *T. absurdum* with regard to leaf-lobation/dentation pattern, outer bracts possessing a white margin, size and spinulation pattern of achenes and rostrum length, but *T. absurdum* differs in dark grey styles and somewhat (ca. 0.2 mm in both achene body and cone) bigger achenes. With regard to leaf morphology, *T. insubricum* is also similar to *T. fontanum* due to its usually undivided dentate or lobulate leaf lamina, but in the latter species, the distance between teeth does not decrease towards the leaf base, i. e., the teeth are more or less equidistant. Furthermore, *T. fontanum* is distinguished by grey styles and outer bracts without or with only an indistinct white margin. *Taraxacum pseudofontanum* was assigned to *T.* sect. *Alpina* by Van Soest (1959) because of its relatively short rostrum, but wingend petioles, leaf shape and ecological preferences point to its position in *T.* sect. *Crocea* (Uhlemann 2011).

Literature: Van Soest (1959, 1966b, 1969), Stöhr (2010), Stöhr & Pilsl (2018).

Specimens studied:

Austria, Carinthia/Kärnten: Tauerntal, Geiselkopf [Geißlkopf] [8944/3]; 1870–2000 msm; 1.8.1957: J. L. van Soest (L 0065661, L 0065662, L 0065670, L 0065671, L 0065672, L 0065673, L 0065707, L 0065709, L 0065710); ibid.: 18.7.1957: J. L. van Soest (L 0065679, L 0065683, L 0065684, L 0065685, L 0065706, L 0065708). – Salzburg: Pinzgau, Krimmler Achental, Weißkar (8838/2); 2125 msm; Niedermoor, Silikat; 3.7.2005: O. Stöhr (Hb. Stöhr 5574). – Pinzgau, Goldberggruppe, hinteres Raurisertal, Rittekar (8943/2); 2195 msm; alluviales Niedermoor am Kargrund, Mischgestein; 26.7.2008: O. Stöhr (Hb. Stöhr 6628). – North Tyrol / Nordtirol: Stubaier Alpen, Kühtai, Drei-Seen-Hütte (8732/3); ca. 2200 msm; Bachlauf unterhalb der Hütte; 7.7.2009: I. Uhlemann (IBF, Hb. Uhlemann). – Ötztaler Alpen, Ötztal, Hochgurgl, Hinterer Wurmkogel, Schwartlasbachtal (9132/2); ca. 2500 msm; alpine Rasen; 1.7.2016: I. Uhlemann (WU).

Italy, South Tyrol/Alto-Adige/Südtirol: locus classicus (topotypi): Ötztaler Alpen, Obervintschgau, Pfossental (Seitental des Schnalstals); 2200–2400 msm; 19.7.1956: J. L. van Soest (L 0065658, L 0065692, L 0065693, L 0065705); ibid.: 2200 msm; 16.8.1999: I. Uhlemann (Hb. Uhlemann, DR, IBF). – Obervintschgau, Martelltal; 2350 msm; 21.7.1956: J. L. van Soest (L 0065666). – Vintschgau, Sesvenna-Gruppe, Schlinig, Watles, Weg von der Planapatsch-Hütte zur Sesvenna-Hütte; 2200 msm; 11.7.2016: I. Uhlemann (IBF, Hb. Uhlemann). – Ortler-Gruppe, Sulden, Rosimtal; 2500 msm; entlang eines Baches; zahlreich; 26.7.2008: I. Uhlemann (Hb. Uhlemann). – Lombardy / Lombardia: Oberes Veltlin, Ortler-Gruppe, Passo di Gavia, Bachufer (Verzweigungen des Rio Storzellina) oberhalb der Rif. Berni; ca. 2500 msm; 15.8.2021: I. Uhlemann (GLM, Hb. Uhlemann).

Switzerland, Grisons/Graubünden: Silvretta-Gruppe, oberes Fimbertal, am Weg von der Heidelberger Hütte zum Großen Fimberpass (9127/2); 2500 msm; 15.7.1953: D. Podlech (L 0065668). – Silvretta, Süsertal; 2100 msm; 18.7.1954: J. L. van Soest (L 0002628, L 0002627, L 0065691). – Silvretta, Vernelatal; 2000–2200 msm; 20.7.1954: J. L. van Soest (L 0065676, L 0065699); ibid.: 18.7.1954: J. L. van Soest L (0065701, L 0065702); ibid.: 2000 msm; 25.7.2000: I. Uhlemann (Hb. Uhlemann). – Silvretta, Vernelatal, Vernelabach bei Vereinahaus; 1950 msm; Datum: J. L. van Soest (L 0065698). – Silvretta, Alp Sardasca; 1650 msm; s. a.: L. van Soest (L 0065697). – Avers, Val Bregalga; ca. 2000 msm; 15.8.1938: J. L. van Soest (L 0065704).

Taraxacum jacobianum Uhlemann, sp. nov.

Holotype: Switzerland, Grisons/Graubünden: Rhaetische Alpen, Davos, Flüela-Pass, Radönt; 2450 msm; nasser, vermoorter Talboden entlang eines Baches; 25.7.2018: I. Uhlemann (WU 0154185). Isotypes: GLM, PRA, Hb. Uhlemann.

Descriptio: *Planta* 6–10(–15) cm alta, gracilis. *Folia* medio-viridia, glabra, immaculata. *Petioli* late alati, pallidi. *Nervus medianus* viridis vel parce brunnescens. *Lamina*

foliorum distincte lobata vel lobulata; *lobi laterales* 2 vel 3 utrimque, patentes, anguste deltoidei vel lingulati, obtusi, integri; *lobus terminalis* obtusus, parvus, triangularis; *interlobia* bene evoluta, glabra, viridia. *Scapi* glabri, rubro-brunneo-virides. *Involucrum* olivaceo-viride, leviter pruinosum. *Squamae exteriores* numero 11–12, supra pallide griseo virides, subtus olivaceo-virides, leviter pruinosae, erectae, (1.5–)2.0–3.0 mm latae, (6–)7–8 mm longae, anguste albido marginatae, non corniculatae. *Calathium* 30–35 mm in diametro, aureo-luteum, radians. *Ligulae marginales* planae, subtus stria pallide canoviolacea instructae. *Antherae* polliniferae, granis pollinum diametro variabili vel raro polline carentes. *Stylus* superne luteus. *Achenium* fusco stramineum, 3.2–3.5 mm longum (pyramide exclusa), superne spinulosum, spinulis validis, in pyramidem subcylindricam, (0.6–)0.7–0.8(–0.9) mm longam abrupte abiens, rostrum 7–8 mm longum. *Pappus* albus.

Description: *Plant* 6–10(–15) cm tall, slender. *Leaves* patent to ascending, mid green, shining, glabrous, not spotted, leaf lamina lobed or lobulate, terminal lobe short triangular, blunt, lateral lobes/lobules 2–3 per side, short triangular to lingulate; petiole, in particular on outer (oldest) leaves broadly winged, green. *Scapes* brownish red, glabrous. *Involucre* olivaceous green, faintly pruinose; *outer bracts* 11–12, erect to loosely adpresssed, with a narrow white margin, adaxially pale greyish green, abaxially mid green, faintly pruinose, with a dark median stripe, without corniculations below the apex, (1.5–)2.0–3.0 mm wide, (6–)7–8 mm long. *Capitulum* 30–35 mm in diameter; ligules golden yellow, flat, outer ones with light brownish-purple stripes abaxially, tips with yellow teeth; styles in the upper part yellow abaxially (in dried condition yellowish green); pollen present or rarely absent, variable in diameter. *Achenes* greyish brown, achene body 3.2–3.5 mm long, coarsly spinulose in their upper third, abruptly tapering into a (0.6–)0.7–0.8(–0.9) mm long subcylindrical cone; rostrum 7–8 mm long; pappus white. – Figs. 6, 7.

Chromosome number: Unknown.

Distribution: *Taraxacum jacobianum* is so far known only from a small area in Switzerland, Graubünden, Rätikon, ranging from Davos (Silvretta) to the Albula Alps on the border to Upper Engadin.

Habitat: The species prefers wet, peaty, siliceous soils and is usually growing between stones along brooks without any taller vegetation or more rarely on grassy wet slopes in the alpine zone.

Epitheton: The epitheton (eponym) is dedicated to Mr. Jacob Uhlemann, who continuously collected *Taraxacum* in the European Alps and supported our studies.

Comments: *Taraxacum jacobianum* is characterised by its glossy and completely glabrous leaves with few small triangular or lingulate lateral lobes/lobules, faintly pruinose involucre, 11–12 small, erect outer bracts, which have a white margin, yellow styles, and relatively small achenes with coarse spines in their upper third. With regard to leaf shape and outer bracts possessing a white margin, this species seems to be related to *T. fontanosquameum*, but the latter species has acute leaf lobes, a pruinose involucre, grey styles, arcuate outer bracts and achenes with a few small spines in the uppermost part.

Fig. 6: Holotype specimen of *Taraxacum jacobianum*. — **Abb. 6:** Holotypus-Beleg von *Taraxacum jacobianum*.

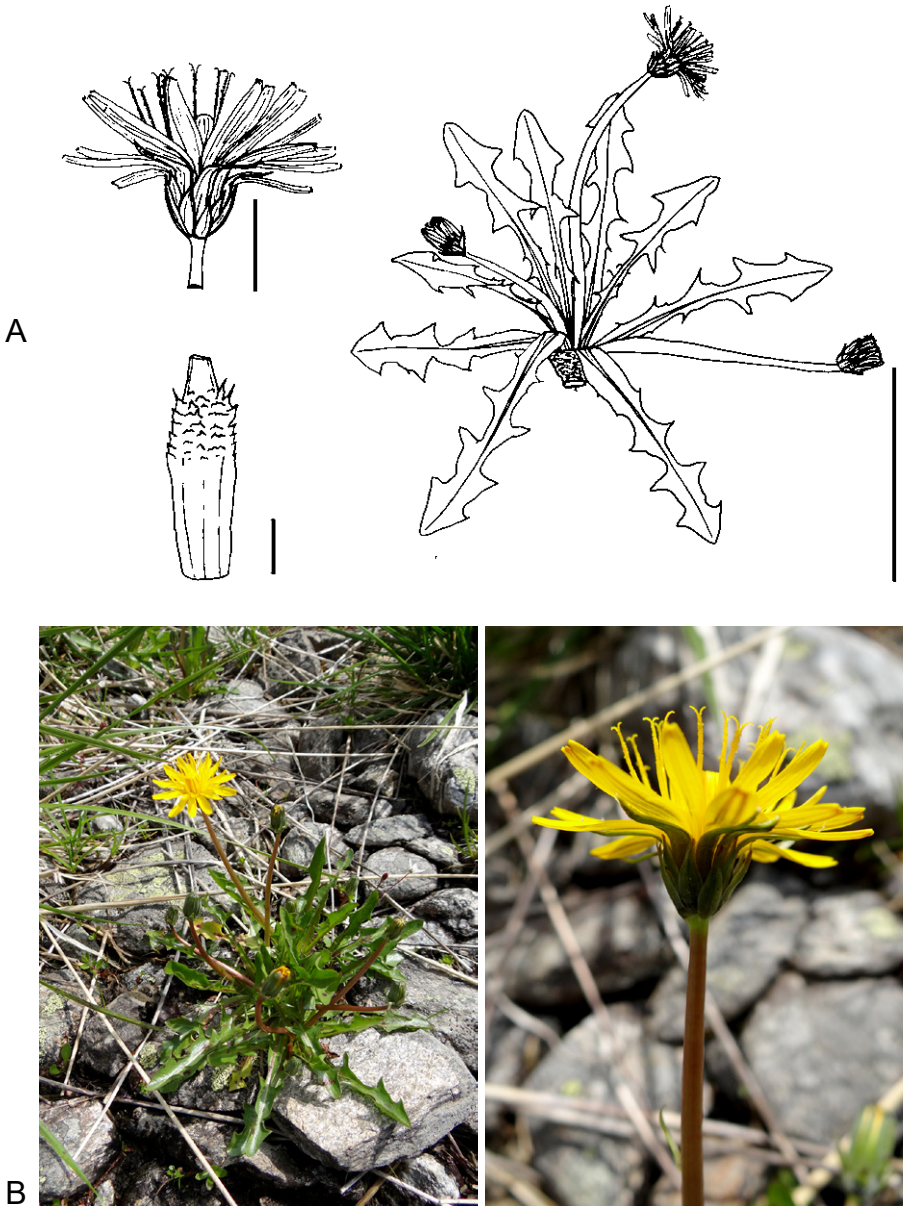


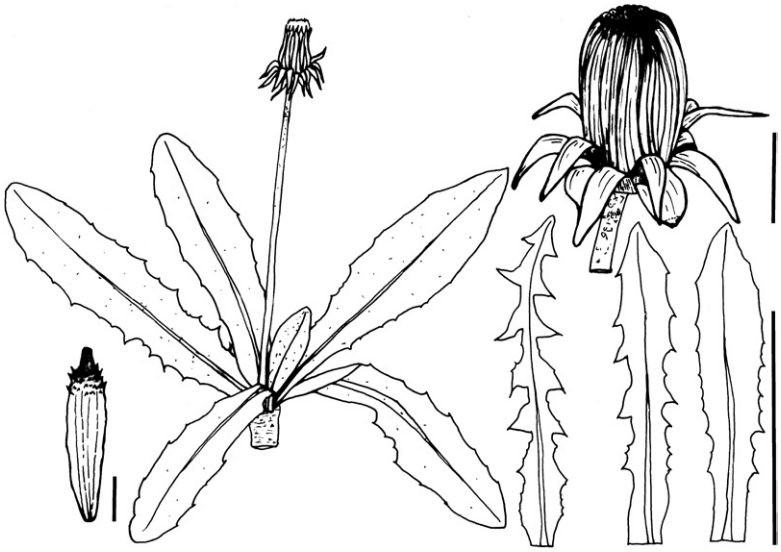
Fig. 7: *Taraxacum jacobianum*. A – Habit (Radönt, 25.7.2018, I. Uhlemann; scale bar = 6 cm); capitulum (Radönt, 25.7.2018, I. Uhlemann; scale bar = 10 mm); achene (from a cultivated plant grown from seeds collected 25.7.2018 from Radönt, I. Uhlemann 5/2019; scale bar = 1 mm). B – habit (Radönt, 25.7.2018, *I. Uhlemann*). C – capitulum (Radönt, 25.7.2018, I. Uhlemann). — **Abb. 7:** *Taraxacum jacobianum*. A – Habitus (Radönt, 25.7.2018, I. Uhlemann; Maßstrich = 6 cm); Korb (Radönt, 25.7.2018, I. Uhlemann; Maßstrich = 10 mm); Achäne (von einer kultivierten Pflanze gezogen aus am 25.7.2018 in Radönt gesammelten Samen, I. Uhlemann 5/2019; Maßstrich = 1 mm). B – Habitus (Radönt, 25.7.2018, I. Uhlemann). C – Korb (Radönt, 25.7.2018, I. Uhlemann).

Specimens studied:
Switzerland, Grisons / Graubünden: Rhaetische Alpen, Davos, Flüela-Pass, Radönt; 2400 msm; nasser, vermoorter Talboden entlang eines Baches; 25.7.2018: I. Uhlemann (GLM, Hb. Uhlemann). – Rhaetische Alpen, Silvretta, Davos, Flüela-Pass, Schottensee; 2374 msm; alpine Rasen im Uferbereich; 27.7.2019: A. Uhlemann (Hb. Uhlemann). – Rhaetische Alpen, Silvretta, Davos, Flüela-Pass, Schwarzsee; 2384 msm; alpine Rasen im Uferbereich; 27.7.2019: I. Uhlemann (GLM, Hb. Uhlemann). – Rhaetische Alpen, Silvretta, Davos, unterhalb des Flüela-Pass nach Davos, Wägerhus; 2207 msm; alpine Rasen im Uferbereich des Flüela Baches; 27.7.2019: A. Uhlemann (Hb. Uhlemann). – Oberengadin, Rhaetische Alpen, Albula-Pass, ca. 500 m unterhalb in Richtung Engadin, 2200 msm; Schneetälchen; 6.8.2008: I. Uhlemann (Hb. Uhlemann). – Rhaetische Alpen, Albula Alpen, Bergün, Albula Pass; ca. 2250 msm; Schneetälchen unterhalb des Albula Sees; 26.7.2019: I. Uhlemann (GLM).

Taraxacum pseudoboreigenum Soest in: Acta Bot. Neerl. 8: 115 (1959).
Holotype (designated by Van Soest 1959: 116, as "Typus"): [**Switzerland,** Grisons / Graubünden], Rhaetische Alpen: Albula, between Palpuogna and Preda; 1800–1900 msm; in silvis; 13.7.1948: J. L. van Soest (L 0002621).
Description: *Plant* (10–)15–20(–25) cm tall, slender. *Leaves* erect, mid green, glabrous or moderately hairy, not spotted, leaf lamina on inner (younger) leaves undivided, margins dentate (as seen on the type specimen) or very rarely simply lobate (only cultivated plants) with short triangular lobules/lobes; petiole broadly winged, green, midrib brownish red. *Scapes* green, glabrous, but brownish and araneose below involucre. *Involucre* glaucous, pruinose; *outer bracts* 14–17, arcuate to arcuate-reflexed (base erect, tips of upper bracts recurved, tips of lower bracts reflexed touching the scape), multiseriate, without white margin or more rarely with an indistinct narrow white margin, adaxially pale greyish green, abaxially mid green, without corniculations below the apex, (2–)3–4 mm wide, (9–)10–12 mm long. *Capitulum* 30–35 mm in diameter, golden yellow; ligules flat, outer ones with dark grey-purple stripes abaxially; styles in the upper part yellow to yellowish green abaxially; pollen present, variable in diameter.

Fig. 8: *Taraxacum pseudoboreigenum*. A: Habit (Preda-Palpuogna, 23.7.2018, A. Uhlemann) and leaves (plants cultivated from seeds collected 23.7.2018 from Preda-Palpuogna, I. Uhlemann, 30.5.2019; scale bar = 10 cm); capitulum (plant cultivated from seeds collected 23.7.2018 from Preda-Palpuogna, I. Uhlemann, 30.5.2019; scale bar = 10 mm); achene (Preda-Palpuogna, 23.7.2018, A. Uhlemann; scale bar = 1 mm). B: Capitulum (plant cultivated from seeds collected 23.7.2018 from Preda-Palpuogna, photographed on 30.5.2019 by I. Uhlemann). C: Capitulum, holotype specimen (L 0002621). D: Styles and stigmata (plant cultivated from seeds collected 23.7.2018 from Preda-Palpuogna, photographed on 30.5.2019 by I. Uhlemann). E: Mitotic metaphase plate, prepared from seedling root tips (seeds obtained from cultivated plants collected at the type locality Preda-Palpuogna, 23.7.2018, A. Uhlemann; scale bar = 4 µm). — **Abb. 8:** *Taraxacum pseudoboreigenum*. A: Habitus (Preda-Palpuogna, 23.7.2018, A. Uhlemann) und Blätter (von kultivierten Pflanzen gezogen aus am 23.7.2018 in Preda-Palpuogna gesammelten Samen, I. Uhlemann, 30.5.2019; Maßstab = 10 cm); Korb (einer kultivierten Pflanzen gezogen aus am 23.7.2018 in Preda-Palpuogna gesammelten Samen, I. Uhlemann 30.5.2019; Maßstab = 10 mm); Achäne (Preda-Palpuogna, 23.7.2018, A. Uhlemann; Maßstab = 1 mm). B: Korb (einer kultivierten Pflanze gezogen aus am 23.7.2018 in Preda-Palpuogna gesammelten Samen, fotografiert von I. Uhlemann am 30.5.2019). C: Korb des Holotypus (L 0002621). D: Griffel und Narben (einer kultivierten Pflanze gezogen aus am 23.7.2018 in Preda-Palpuogna gesammelten Samen, fotografiert von I. Uhlemann am 30.5.2019). E: Mitotische Metaphasenplatte, präpariert an einer Keimlingswurzelspitze (gezogen aus Samen von kultivierten Pflanzen gesammelt an der Typuslokalität Preda-Palpuogna, 23.7.2018, A. Uhlemann; Maßstab = 4 µm).

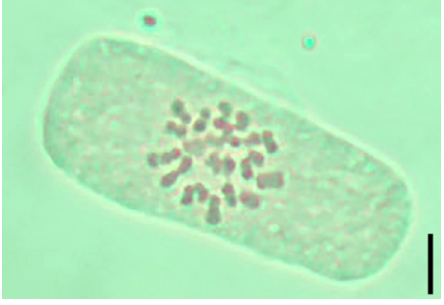
A



B

C

D



E

Achenes grey, achene body 3.6–4.0 mm long, densely spinulose in the uppermost part, abruptly tapering into a 0.3–0.4 mm long subcylindrical cone; rostrum 10 mm long; pappus white. – Fig. 8.

Chromosome number: $2n = 3x = 24$; material from the locus classicus Preda-Palpuogna, counted by I. Uhlemann in December 2022 (Fig. 8E).

Distribution: Until now, *Taraxacum pseudoboreigenum* is only known from the vicinity of lake Palpuogna below Albula Pass in Switzerland (Grisons).

Comments: Until recently, *Taraxacum pseudoboreigenum* was only known from the type locality from a single herbarium specimen of low quality (Van Soest 1959: 115, fig. 17). Its type locality is very close to that of the well-known *T. fontanum* (actually from the type locality of *T. fontanicola*, now a synonym of *T. fontanum*) around the lake Palpuogna below Albula Pass in Grisons (Switzerland), where the latter species occurs frequently still today in community with mainly *T. panalpinum* and, less frequently, *T. schroeterianum* and *T. vernelense*. Therefore, it was supposed by the author for a long time after repeated but failed visits to several habitats around lake Palpuogna that *T. pseudoboreigenum* were nothing more than a modification of *T. fontanum* as suggested by similar leaf shapes of both taxa. In the summer of 2018, Annette Uhlemann discovered a few fruiting plants of a member of *T.* sect. *Crocea* on the side of a pathway close to a brook in woods below lake Palpuogna. In cultivation it turned out that these plants have yellow styles. They further differ from *T. fontanum*, which has erect to arcuate uniseriate outer bracts, by a very rare arrangement and position of the outer bracts: erect to arcuate to arcuate reflexed and bracts in multiseriate arrangement (like in *T. polyodon* of sect. *Taraxacum*). An additional difference concerns the moderately hairy leaf-lamina, in particular on inner leaves of *T. pseudoboreigenum*, versus glabrous leaves in *T. fontanum*. Although, with respect to the leaf shape, both the type specimen and the collected plants are similar (undivided, dentate lamina), in cultivation a wider morphological plasticity was observed ranging to lobulate/simply lobate lamina.

With regard to the arrangement of the outer bracts, the length of the outer bracts and the moderate indumentum on the leaves *Taraxacum pseudoboreigenum* somewhat (not substantially) differs from other species of this section and takes a rather peripheral position, but with respect to achene size, leaf shape, slender habit and habitat it fits very well to *T.* sect. *Crocea*.

Nevertheless, its taxonomic integrity and interpretation in a modern sense is based on two spontaneous individuals only (the holotype and another collected fruiting plant) and the cultivated offspring. This and the occurrence at a single microlocality (endemism?) are a weak basis for a safe interpretation of the species and its status as a species.

Specimens studied:

Switzerland, Grisons/Graubünden: Albula-Alpen, Bergün, Waldweg zwischen Preda und dem Lai da Palpuogna; ca. 1800 msm; Bachufer; 23.7.2018: A. Uhlemann (Hb. Uhlemann). – Rhaetische Alpen: Albula, between Palpuogna and Preda; 1800–1900 msm; in silvis; 13.7.1948: J. L. van Soest (L 0002621) = holotype.

Literature: Van Soest (1959, 1969).

Excluded names and species incertae sedis

The following taxa have been associated with *Taraxacum* sect. *Crocea* but do not belong here.

Taraxacum aestivum Soest in Acta Bot. Neerl. 8: 117 (1959).

Type: [**Switzerland,** Graubünden/Grisons], Alp Languard pr. Pontresina (Graub.); in silvis; 25.7.1933: J. L. van Soest (L 0043113).

On July 10th, 2017 the author studied the type locality of *Taraxacum aestivum*, a montane forest with *Larix decidua* and *Pinus cembra* between Alp Languard and Pontresina in Grisons (Switzerland) near St. Moritz. *Taraxacum fontanum* and *T. panalpinum* (*T.* sect. *Alpina*) frequently occurred there mainly along brooks. Above the timberline, in open alpine meadows, *T. panalpinum* was developed in its characteristic morphotype having numerous distinct triangular lateral leaf lobes. In forest habitats, under shadowy conditions, the lateral lobes tended to get closer to each other, became less distinct and the whole plant was more compact – similar to specimens pictured in Van Soest (1959: 118, fig. 19). Cultivation experiments with these plants resulted in well-developed *T. panalpinum* having achenes with a short, 5 mm long rostrum (unknown in the original description of *T. aestivum*) characteristic for members of *T.* sect. *Alpina*. Therefore, we relegate the name *T. aestivum* to the synonymy of *T. panalpinum* described in the same paper (Van Soest 1959: 88), thus removing it from *T.* sect. *Crocea*.

Taraxacum aurantellum Soest in Acta Bot. Neerl. 8: 105 (1959).

Holotype: [**Italy,** South Tyrol/Alto-Adige/Südtirol]: Obervintschgau, Matschertal boven Matsch; 1600–1650 msm; 9.7.1956: J. L. van Soest (L 0002350).

Due to the profound lobation of leaves, petioles with moderate wings and large achenes with a long rostrum, this species should be removed from *Taraxacum* sect. *Crocea* and be better placed in *T.* sect. *Rhodocarpa*, close to *T. reophilum* and *T. rhodocarpum*.

Taraxacum binilobatum Sahlin in Bull. Jard. Bot. Natl. Belg. 52: 388 (1982).

Holotype: France, Flora Gallica: Dep. Savoie, Val-d'Isère, vall söder om kyrkan invid byn. 44-46° N, 4-8° E, med rik flora t.ex. *Polygonum bistorta*, *Ranunculus acris*, *Anthyllis*, *Geum*. Regio subalpine; 13.7.1969: C. I. Sahlin (S 69751).

Although this species superficially resembles members of *Taraxacum* sect. *Crocea* and was collected at an altitude of 1850 msm, the presence of 15 mm long outer bracts are characteristic for *T.* sect. *Taraxacum*. This species cannot be assigned safely to a section because of lacking achenes.

Taraxacum corsicum Soest in Acta Bot. Neerl. 8: 107 (1959).

This species has been already transfered to *Taraxacum* sect. *Rhodocarpa* (= sect. *Alpestria* s. str.) and is now treated as a synonym of *T. cucullatiforme* Soest (Štěpánek

& Kirschner 2013). Because Van Soest (1959) mentioned this species as member of the newly described *T.* sect. *Fontana*, it is still listed here.

Taraxacum croceicarpum Soest in Veröff. Geobot. Inst. E. T. H. Siftung Rübel Zürich 42: 118 (1969).

Holotype: [**Switzerland**], Grisons/Graubünden: Oberengadin, Val Roseg, Moräne des Tschierva-Gletschers, gegen Piz Umur; ca. 2600 msm; 16.8.1906: C. J. Schröter (ZT-00008054).

The type collection comprises one specimen that consists of two conspecific very small plants difficult to interpret and assign to a section. They surely do not belong to *Taraxacum* sect. *Crocea* because of the small, unwinged petioles, very small outer bracts and a relatively short rostrum. This character combination points to *T.* sect. *Alpina* (see also determination by Handel-Mazzetti on the revison label), but the species requires rediscovery at the locus classicus for a save interpretation based on comparative cultivation. Because in the original paper no image was shown, this is provided here (Fig. 9).

Taraxacum crocellum Soest in Acta Bot. Neerl. 8: 119 (1959).

Lectotype (designated here): [**Switzerland**, Grisons/Graubünden]: Silvretta, Vernelatal; 2150 msm; 18.7.1954: J. L. van Soest (L 0002421). Isolectotypes: L.

This species cannot be assigned safely to a section because of lacking achenes. However, it certainly does not belong to *Taraxacum* sect. *Crocea* because of its extremely thin petioles. It requires rediscovery at the locus classicus for interpretation.

Taraxacum fontaniforme Soest in Acta Bot. Neerl. 8: 122 (1959).

Holotype: [**Switzerland,** Grisons/Graubünden]: onder Piz Languard; 2550 msm; 25.7.1933: J. L. van Soest (L 0797374).

The name *Taraxacum fontaniforme* is based on a single small specimen without achenes and a strange coloration of ligules that might have been caused by late frost. Superficially, it resembles members of *T.* sect. *Crocea*, whereas Van Soest (1959: 123) assigned it to *T.* sect. *Cucullata* because of the pale yellow, involute ligules. The author failed to rediscover it at the locus classicus on July 10th, 2017. For the time being, it should be treated as a nomen dubium.

Taraxacum magnopyramidophorum Soest in Veröff. Geobot. Inst. E. T. H. Siftung Rübel Zürich 42: 118 (1969).

Lectotype (designated here): [**Switzerland,** Valais/Wallis]: Saas Fee, onder Mittaghorn; 1800 msm; 14.7.1952: J. L. van Soest (L 0002555).

Due to its profound leaf lobation, unwinged petioles and large achenes, this species should be better placed in *Taraxacum* sect. *Rhodocarpa*, close to *T. rhodocarpum* and *T. reophilum*.

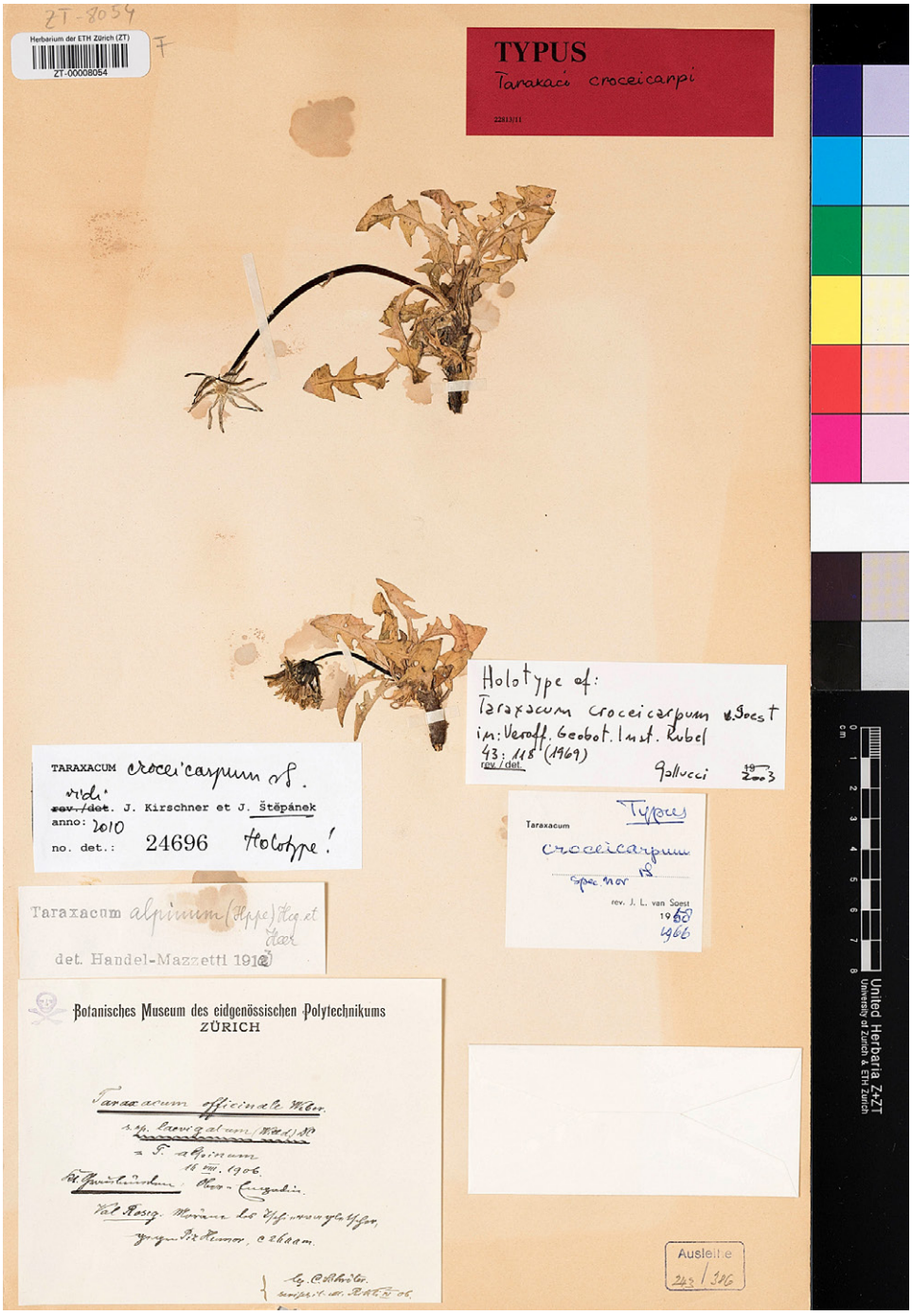


Fig. 9: Holotype of *Taraxacum croceicarpum* (ZT-00008054 by United Herbaria Z+ZT/CC BY 4.0). — **Abb. 9:** Holotypus von *Taraxacum croceicarpum* (ZT-00008054 by United Herbaria Z+ZT/CC BY 4.0).

Taraxacum malyi Soest in Proc. Kon. Ned. Akad. Wetensch. C 69(4): 456 (1966c).

Holotype: [**Bosnia and Herzegovina**], B o s n i a : Miljačkatal pr. Sarajevo; 19.5.1900: K. Maly (W).

Note: Type not yet seen by the author, but compare Van Soest (1966c: 456, fig. 15).

Taraxacum malyi belongs to the numerous singular biotypes (individual taxa) in genus *Taraxacum* described superficially and incompletely based on a single specimen without ripe achenes, without any discussion of related species, but assigned by Van Soest (1966c) to *T.* sect. *Crocea* supposedly due to its leaf shape. *Taraxacum malyi* should be treated as a nomen dubium.

Taraxacum obovatifolium Soest in Proc. Kon. Ned. Akad. Wetensch. C 69(4): 457 (1966c).

Holotype: [**Bosnia and Herzegovina**], B o s n i a : Bjelašnica, infra cacumen Vlakinja, 1700 msm; 19.8.1919: K. Maly (W).

Note: Type not yet seen by the author, but compare Van Soest (1966c: 457, fig. 16).

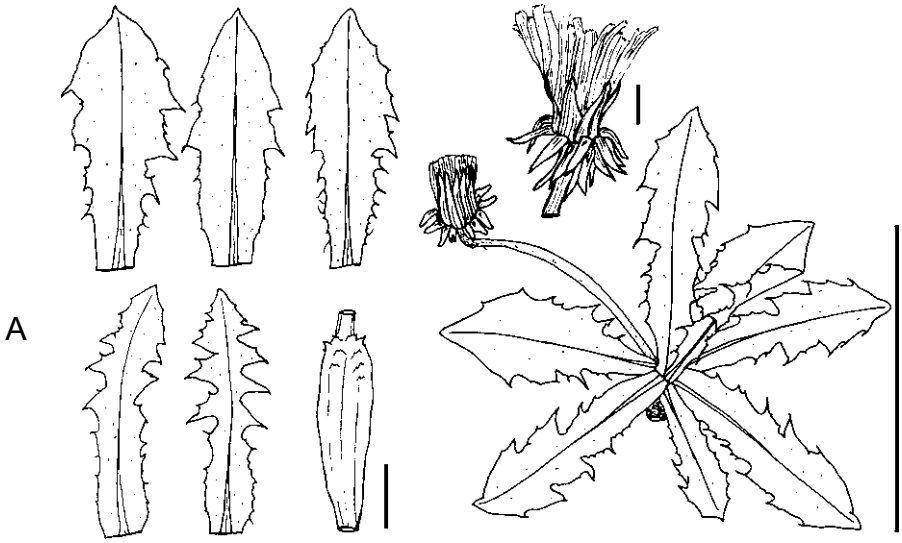
The comments made on *Taraxacum malyi* can also be applied to *T. obovatifolium*, but in contrast to the former species, the latter can be safely excluded from *T.* sect. *Crocea* because of its unwinged, thin petioles. Superficially, it resembles *T. cucullatum* in leaf shape, characters of outer involucral bracts and the colour of the ligules as suggested in the note "Calathium […], pallide (?) luteum" by Van Soest (1966c: 457).

Taraxacum peralatum Soest in Acta Bot. Neerl. 8: 111 (1959).

Holotype [**Switzerland,** G r i s o n s / G r a u b ü n d e n : Rhaetische Alpen, near Bergün], Cuolm da Latsch; 2100 msm; Gneis, 12.7.1948: J. L. van Soest (L 0002606).

Description: *Plant* (8–)10–15(–20) cm tall, subrobust to robust. *Leaves* erect, grey-green, moderately araneose (in particular inner leaves), not spotted, leaf lamina varying from lobate with short, broad triangular patent lobes, dentate on distal margin (outer leaves) or dentate to lobulate with very short and broad triangular lobules (inner leaves/type material); petiole very broadly winged, green. *Scapes* brownish green, glabrous or little araneose below involucre. *Involucre* olive green, faintly pruinose; *outer bracts* 18–20, multiseriate, recurved, flat to incurved to slightly tortuose, with a distinct margin, adaxially pale greyish green, abaxially bluish green, without corniculations below

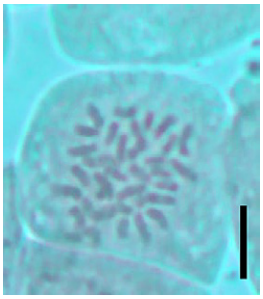
Fig. 10: *Taraxacum peralatum*. A: Habit (Val Tisch, 25.6.2006, I. Uhlemann; scale bar = 10 cm) and leaves (from cultivated plants collected August 2020 from Albula Pass; scale bar = 10 cm); capitulum (from a cultivated plant collected August 2020 from Albula Pass; scale bar = 10 mm); achene (from a cultivated plant collected August 2020 from Albula Pass; scale bar = 1 mm). B: Capitulum (from a cultivated plant collected August 2020 from Albula Pass, photographed on 29.5.2021 by I. Uhlemann). C: Leaf indumentum (from cultivated plants collected August 2020 from Albula Pass, photographed on 29.5.2021 by I. Uhlemann). D: Mitotic metaphase plate, prepared from seedling root tips (seeds obtained from cultivated plants collected August 2020 from Albula Pass; scale bar = 4 µm). — **Abb. 10:** *Taraxacum peralatum*. A: Habitus (Val Tisch, 25.6.2006, I. Uhlemann; Maßstab = 10 cm) und Blätter (von kultivierten Pflanzen gesammelt im August 2020 am Albula-Pass; Maßstab = 10 cm); Korb (von einer kultivierten Pflanze gesammelt



A

B

C



D

im August 2020 am Albula-Pass; Maßstab = 10 mm); Achäne (von einer kultivierten Pflanze gesammelt im August 2020 am Albula-Pass; Maßstab = 1 mm). B: Korb (von einer kultivierten Pflanze gesammelt im August 2020 am Albula-Pass, fotografiert am 29.5.2021 von I. Uhlemann). C: Blattbehaarung (von einer kultivierten Pflanze gesammelt im August 2020 am Albula-Pass, fotografiert am 29.5.2021 von I. Uhlemann). D: Mitotische Metaphasenplatte, präpariert an einer Keimlingswurzelspitze (gezogen aus Samen von kultivierten Pflanzen gesammelt im August 2020 am Albula-Pass; Maßstab = 4 µm).

the apex, 2.0–3.0 mm wide, 13–15 mm long. *Capitulum* 35–40(–45) mm in diameter, yellow; ligules flat, outer ones with dark grey-purple stripes abaxially; styles in the upper part light grey abaxially; pollen present. *Achenes* grey, achene body 2.8–3.0 mm long, spinulose in the uppermost part, abruptly tapering into a 0.3–0.5 mm long subcylindrical cone; rostrum 9–10 mm long; pappus white. – Fig. 10.

Chromosome number (Fig. 10D): $2n = 4x = 32$; material collected 2020 from Albula Pass and cultivated in Liebenau, counted by I. Uhlemann in March 2022.

Habitat: The species grows on wet brookbanks on siliceous soil in the subalpine and alpine zone and is also found in less moist alpine grasslands.

Comments: *Taraxacum peralatum* is a very distinct species with regard to its robust habit, broad greyish-green and hairy leaves with dentate or shortly lobate lamina and very broadly winged green petioles. The outer bracts are relatively long, recurved, numerous and have a distinct white margin. Achenes (body plus cone) are 3.1–3.5 mm long and thus relatively small. This species was classified by Van Soest (1959: 113) within *T.* sect. *Fontana*, but provided with a note "[…] habitum speciorum sectionis Boreigeniae Dahlstedt imitans." *Taraxacum peralatum* differs from species of *T.* sect. *Crocea* in habit, outer bracts, size of achenes and leaf indument. Its position in *T.* sect. *Boreigena* G. E. Hagl. (in Nytt Mag. Naturvidensk. 82: 94 [1941]; see also Kirschner & Štěpánek 1997: 89), which comprises about 20 species with boreal distribution (Lundevall & Øllgaard 1999), seems most likely but requires a more detailed study in Fennoscandia. Nevertheless, relationships to *T.* sect. *Crocea* exist, in particular to *T. pseudoboreigenum* (slender habit, large achenes), with which it shares the high number of outer bracts, which are multiseriate (but their position differs), leaf indument and distribution range. Until these hypotheses are tested, *T. peralatum* is treated as a species incertae sedis.

Literature: Van Soest (1959, 1969).

Specimens studied:

Switzerland, Grisons/Grisons: Albula Alpen: Bergün, Val Tisch, wenig oberhalb der Alm; ca. 2100 msm; 25.6.2006: I. Uhlemann (Hb. Uhlemann). – Albula Alpen, Bergün, Albulapass; ca. 2300 msm; 30.7.2001: I. Uhlemann (Hb. Uhlemann), ibid. 7.8.2005 (Hb. Uhlemann). – Bergün, Albulapass, Schneetälchen unterhalb des Albula Sees; ca. 2250 msm; 26.7.2019: I. Uhlemann (Hb. Uhlemann). – Aufstieg zur Chna. dÉscha, Tal der Ova Pischa, ausgedehnter plateauartiger Bereich oberhalb des Weges; 2500 msm; Bachufer; 17.8.2021: I. Uhlemann (Hb. Uhlemann).

Taraxacum pohlii Soest in Acta Bot. Neerl. 8: 113 (1959).

Holotype: [**Italy**], Obervintschgau, Martelltal; 2350 msm; 21.7.1956: [J. L.] van Soest (L 0002616).

The author failed to rediscover *Taraxacum pohlii* at its type locality in August 1999. Leaves with broadly winged petioles and a lamina with a few weakly differentiated lateral lobes point to its position in *T.* sect. *Crocea*, whereas the reflexed outer bracts are uncharacteristic for this section as already pointed out by Van Soest (1959: 114). Missing achenes prevent assigning this name safely to a section.

Taraxacum pomposum Štěpánek & Kirschner in Candollea 68: 35 (2013).

This species was described from Corse and is probably endemic there. It is very distinct, characterised by small capitula, very dark stigmas, anthers without pollen and numerous narrow, erect outer bracts with a white margin. It was placed within *Taraxacum* sect. *Crocea* by Štěpánek & Kirschner (2013), but fits better to *T.* sect. *Rhodocarpa* and to its type species, *T. rhodocarpum*, due to its habitat, distinctly lobed leaf lamina and narrowly to moderately winged petioles.

Taraxacum renosense Soest in Acta Bot. Neerl. 6: 418 (1957).

Another endemic species from Corse, *Taraxacum renosense*, typified and synonymisised with *T. gamisansii* Soest (Van Soest 1974) by Štěpánek & Kirschner (2013), is assigned to *T.* sect. *Crocea* by the Czech authors but, like the previous species, better fits in *T.* sect. *Rhodocarpa* because of its deeply lobed leaf lamina and narrowly winged petioles.

Taraxacum rufocarpum Soest in Acta Bot. Neerl. 8: 124 (1959).

Lectotype (designated here): [**Austria,** C a r i n t h i a / K ä r n t e n]: Hohe Tauern: Hochalmblick below Schönbretterspitze [8945/3]; 2000 msm; 25.7.1957: [J. L.] van Soest (L 0002667, upper plant).

As already pointed out by Van Soest (1959: 125), *Taraxacum rufocarpum* is difficult to assign to a section. The short rostrum (5 mm long according to the original description) points to *T.* sect. *Alpina*, but this seems to be an extreme data point. After the rediscovery of this species at the locus typicus on August 3rd, 2022 by the author, the rostrum length was determined to be on average about 7 mm, but habit (simple but deeply lobed leaves) and habitat (alpine grassland) render *T.* sect. *Crocea* (though petioles are moderately winged) unlikely. It should provisionally be placed in *T.* sect. *Rhodocarpa* as the reddish-brown (rare colour) achenes (achene body plus cone) of 4.6–4.8 mm length indicate. A comparative cultivation, which already has started, will probably provide more evidence for classification.

Taraxacum senile Soest in Proc. Kon. Ned. Akad. Wetensch. C 69(4): 458 (1966c).

Potential lectotype material: Austria, S a l z b u r g , L u n g a u : Preberkessel, ca. 1900 msm; an einem Bachufer; 21.9.1958: [H.] Melzer.

Note: The author failed to find the type specimen pictured in Van Soest (1966c: 458, fig. 17), but an isotype is in the Leiden herbarium (L 0002680).

As pointed out by Uhlemann (2011), due to its short rostrum and the length of the outer bracts, *Taraxacum senile* belongs to *T.* sect. *Alpina*, similar to (broadly winged petioles, few lateral leaf lobes, large terminal leaf lobe), but distinct from, *T. mattmarkense*. Up to its rediscovery by I. Uhlemann at the locus typicus on July 18th, 2002, it was one of numerous singular biotypes (individual taxa) in the genus *Taraxacum* only known from the type locality and usually documented by a single, often poorly developed and preparated specimen and therefore difficult to interpret. In addition, *T. senile*

was collected very late in the flowering season (21.9.1958, H. Melzer) with an uncharacteristic appearance.

Taraxacum silvicola Soest in Acta Bot. Neerl. 8: 116 (1959).

Potential type material: [**Switzerland**], R h a e t i s c h e A l p . : Val Tisch near Bergün; 1800 msm; 8.7.1948: J. L. van Soest (L 0002681).

Note: The author failed to find the type specimen in L, but compare Van Soest (1959: 117, fig. 18).

This name is difficult to interpret. The weakly developed leaf-lobation and the very large achenes with a long rostrum point to *Taraxacum* sect. *Crocea*, but the narrowly winged petioles suggest its position in *T.* sect. *Rhodocarpa*. The author failed to find this species at the locus classicus in June 2006.

Acknowledgements

The author thanks the keepers of herbarium collections for loaned specimens of *Taraxacum.* I am grateful to Dr. J. Štěpánek and Dr. Jan Kirschner (Czech Republic, Průhonice) for valuable discussions and comments on the taxonomy of *Taraxacum* and nomenclatural notes. The author expresses his gratitude to Dr. O. Stöhr for his review and Dr. G. M. Schneeweiss (Austria, Vienna) for linguistic revision of the manuscript.

References

Andersson G. & Hesselmann H. (1900): Bidrag till kännedomen om Spetsbergens och Beeren Eilands kärlväxtflora. – Bih. Kongl. Svenska Vetensk.-Akad. Handl. 26(1): 1–88.

Christiansen M. P. (1942): The *Taraxacum*-flora of Iceland. – In Grøntved J., Paulsen O. & Sørensen T. (Eds.): The Botany of Iceland **3**: 229–343. – Copenhagen: Einar Munksgaard.

Dahlstedt H. (1905): Om skandinaviska *Taraxacum* former. – Bot. Not. **1905**: 145–172. https://doi.org/10.1007/978-3-642-99512-5_23

Dahlstedt H. (1912): Nordsvenska Taraxaca. – Ark. Bot. **12** (2): 1–122.

Doll R. (1982): Grundriss der Evolution der Gattung *Taraxacum* Zinn. – Feddes Repert. **93**: 481–624. https://doi.org/10.1002/fedr.19820930702

Haglund G. E. (1983): New species of *Taraxacum*, section *Spectabilia*, from Swedish Lapland. – Ann. Bot. Fenn. **20**: 245–257.

Haglund G. E. & Lillieroth C. G. (1941): Beiträge zur *Taraxacum*-Flora der Inselgruppe Lofoten. – Nytt Mag. Naturvidensk. **82**: 83–99.

Handel-Mazzetti H. (1907): Monographie der Gattung *Taraxacum*. – Leipzig & Wien: Franz Deuticke.

Kirschner J. & Štěpánek J. (1997): A nomenclatural checklist of supraspecific names in *Taraxacum*. – Taxon **46**: 87–97. https://doi.org/10.2307/1224294

Kirschner J. & Štěpánek J. (2004): New sections in *Taraxacum*. – Folia Geobot. **39**: 259–274. https://doi.org/10.1007/BF02804781

Kirschner J. & Štěpánek J. (2008): The most common dandelions in Middle Asia: The problem of *Taraxacum* sect. *Macrocornuta*, *T.* sect. *Ceratoidea* sect. nova, and the identity of *T. halophilum*. – Phyton (Horn) **48**: 61–78.

Kirschner J., Štěpánek J. & Greuter W. (2007+): *Taraxacum*. – In Greuter W. & Raab-Straube E.

von (Eds.): Compositae. – In Euro+Med Plantbase – the information resource for Euro-Mediterranean plant diversity. https://www.emplantbase.org/home.html [accessed 20 Aug 2022]

Lundevall C.-F. & Øllgaard H. (1999): The genus *Taraxacum* in the Nordic and Baltic coutries: Types of all specific, subspecific and varietal taxa, including type locations and sectional belonging. – Preslia **71**: 43–171.

Richards A. J. (1972): Taxonomic and nomenclatural notes on *Taraxacum* (Compositae). – Bot. J. Linn. Soc. **65**: 37–45. https://doi.org/10.1111/j.1095-8339.1972.tb00922.x

Richards A. J. (1991): 35. *Taraxacum* Wiggers. – In Strid A. & Tan K. (Eds.): Mountain Flora of Greece **2**: 541–572. – Edinburgh: Edinburgh University Press.

Sahlin C. I. (1982): *Taraxacum* species new to Switzerland. – Bull. Jard. Bot. Natl. Belg. **52**: 387–396. https://doi.org/10.2307/3667891

Sahlin C. I. & Lippert W. (1983): Die *Taraxacum*-Flora der bayerischen Alpen. – Ber. Bayer. Bot. Ges. **54**: 23–45.

Sonck C. E. & Øllgaard H. (1991): Two new *Taraxacum* species from Finnish Lapland. – Ann. Bot. Fenn. **28**: 303–307.

Štěpánek J. & Kirschner J. (2013): A revision of mountain species of the genus *Taraxacum* F. H. Wiggers (Compositae) in Corsica. – Candollea **68**: 29–39. https://doi.org/10.15553/c2013v681a2

Štěpánek J. & Kirschner J. (2021): *Taraxacum* sect. *Austropaludosa*, a new section allied to *T.* sect. *Palustria* (Compositae, Crepidinae). – Feddes Repert. **132**: 279–286. https://doi.org/10.11646/phytotaxa.569.1.1

Štěpánek J. & Kirschner J. (2022a): *Taraxacum rhodocarpum* and *T. schroeterianum* (Asteraceae, Crepidinae) are not synonyms, and *T.* sect. *Rhodocarpa* is the correct name for *T.* sect. *Alpestria*. – Phytotaxa **548**: 295–300. https://doi.org/10.11646/phytotaxa.548.2.12

Štěpánek J. & Kirschner J. (2022b): A hotspot of endemism: Oreophytic *Taraxacum* species (Compositae, Crepidinae) in the mountains of Bulgaria. – Phytotaxa **569**: 1–139. https://doi.org/10.11646/phytotaxa.569.1.1

Stöhr O. (2010): Beiträge zur Flora von Oberkärnten (Kärnten, Österreich). – Mitt. Haus Natur Salzburg **18**: 73–85.

Stöhr O. & Pilsl P. (2018): Vorarbeiten an einer Liste der Gefäßpflanzen des Bundeslandes Salzburg, Teil 2: Übersicht der im Land Salzburg bisher nachgewiesenen *Taraxacum*-Arten mit neuen Fundmeldungen. – Neilreichia **9**: 11–48. https://doi.org/10.5281/zenodo.1196130

Thiers B. (2018+): Index Herbariorum. A global directory of public herbaria and associated staff. New York Botanical Garden´s Virtual Herbarium. http://sweetgum.nybg.org/science/ih/ [accessed 19 July 2022)

Turland N. J., Wiersema J. H., Barrie F. R., Greuter W., Hawksworth D. L., Herendeen P. S., Knapp S., Kusber W.-H., Li D.-Z., Marhold K., May T. W., McNeill J., Monro A. M., Prado J., Price M. J. & Smith G. F. (Eds.) (2018): International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by Nineteenth International Botanical Congress Shenzhen, China, July 2017. – Regnum Veg. **159**. – Glashütten: Koeltz Botanical Books. https://doi.org/10.12705/Code.2018

Uhlemann I. (2011): Notizen zur *Taraxacum*-Flora Österreichs und Südtirols. – Neilreichia **6**: 27–53.

Van Soest J. L. (1957): Contribution á l´étude des *Taraxacum* de Corse. – Acta Bot. Neerl. **6**: 407–419. https://doi.org/10.1111/j.1438-8677.1957.tb00588.x

Van Soest J. L. (1959): Alpine species of *Taraxacum*. – Acta Bot. Neerl. **8**: 77–138. https://doi.org/10.1111/j.1438-8677.1959.tb00013.x

Van Soest J. L. (1961): Quelques nouvelles espéces de *Taraxacum*, natives d'Europe. – Acta Bot. Neerl. **10**: 280–306. https://doi.org/10.1111/j.1438-8677.1961.tb00055.x

Van Soest J. L. (1966a): *Taraxacum lanjouwii* v. Soest, a new species from Switzerland. – Acta Bot. Neerl. **15**: 34–35. https://doi.org/10.1111/j.1438-8677.1966.tb00208.x

Van Soest J. L. (1966b): Three new *Taraxacum* species from Stelvio parc (Central Alps). – Webbia **21**: 625–627. https://doi.org/10.1080/00837792.1966.10669847

Van Soest J. L. (1966c): New *Taraxacum* species from Europe. II. – Proc. Kon. Ned. Akad. Wetensch. C **69**: 447–463.
Van Soest J. L. (1969): Die *Taraxacum*-Arten der Schweiz. – Veröff. Geobot. Inst. E. T. H. Stiftung Rübel Zürich **42**: 1–250.
Van Soest J. L. (1974): *Taraxacum*. – In Gamisans J. (Ed.): Contribution á l´étude de la flore de la Corse. VI. – Candollea **29**: 53–54.

Received 25 August 2022
Revision received 2 November 2022
Accepted 23 December 2022
Published 20 December 2023