

Dandelions in Central Asia: a revision of *Taraxacum* section *Stenoloba*

Taxonomická revize *Taraxacum* sect. *Stenoloba* v Centrální Asii

Jan Kirschner & Jan Štěpánek

Dedicated to the memory of Leoš Klimeš

Institute of Botany, Academy of Sciences, CZ-25243 Průhonice 1, Czech Republic, e-mail: jan.kirschner@ibot.cas.cz, jan.stepanek@ibot.cas.cz

Kirschner J. & Štěpánek J. (2011): Dandelions in Central Asia: a revision of *Taraxacum* section *Stenoloba*. – Preslia 83: 491–512.

On the basis of rich material from Asia, a recently described group of dandelions, *Taraxacum* sect. *Stenoloba* Kirschner et Štěpánek, is revised taxonomically. Four previously described species are recognized: *T. sinomongolicum*, newly typified, *T. mongoliforme*, with a lectotype replacing the original holotype now not extant, and a new epitype, *T. scariosum*, a new combination of *Leontodon scariosus* Tausch, replacing the frequently confused names, *T. asiaticum*, newly typified, and *T. stenolobum*, and *T. multisectum*, a taxon for the first time compared with other members of the section. Three new species are described: *T. abax* occupies a large range from S Siberia and Mongolia to NE China, *T. abalienatum* and *T. odibile* are known from Mongolia and SE Siberia. *Taraxacum abax* and *T. abalienatum* represent core species of the section *Stenoloba*, whilst *T. odibile* exhibits a mixture of characters of sections *Stenoloba* and *Leucantha*. All the known members of the section *Stenoloba* are agamosperms. *Taraxacum mongoliforme*, *T. abax* and *T. scariosum* proved to be triploid with $2n = 24$. This account includes detailed descriptions and an identification key.

Key words: agamospermy, Altai, *Compositae–Lactuceae*, China, Mongolia, Siberia, *Taraxacum*, taxonomy,

Introduction

Principles for studying *Taraxacum* taxonomy were outlined by Richards (1973), Kirschner et al. (2003) and Kirschner & Štěpánek (1996a). They reflect the peculiar features and processes known in dandelions: coexistence of agamospermy and sexuality, complex hybridity and polyploidy, low level of structural morphological differentiation and the high number of mutually similar and mostly hybridogenous species. The complexity of the genus also requires another taxonomic rank, placed between species and genus in the traditional hierarchy, to make the population and taxonomic structure more easily understandable for non-specialists. The rank of section is usually used in the majority of *Taraxacum* literature. The recognition and application of the above principles and taxonomic tools is needed to describe the dandelion diversity in regional floras. However, there are large territories where the basic exploration has not been completed and where the above principles remain to be observed, one of the most important being North-Central Asia, a region covering S Siberia, Mongolia, the former Soviet Middle Asia and N and W China, a region with an enormous diversity of this genus. A rich material collected by the authors and their collaborators in Siberia, the Altai, Mongolia, Middle Asia, Ladakh, Tibet and China, later also cultivated in the Czech Republic, was used to summarize the diversity of dandelions (*Taraxacum*, *Compositae–Lactuceae*) in the region of North-Central Asia,

and resulted in five publications (Kirschner & Štěpánek 1996b, 2004, 2005, 2008, Kirschner et al. 2006) in which four new sections and 13 new species were described. The present paper is the fifth in the series dealing with the dandelions of steppe and subsaline habitats of that territory. The important older literature that needs to be consulted is cited in the historical introduction of the paper by Kirschner et al. (2006).

Material and methods

Most of the material studied is deposited in the herbarium PRA, Institute of Botany, Academy of Sciences, Průhonice, Czech Republic. It represents the largest collection of extra-European dandelions in the world, a result of expeditions to many regions of the Mediterranean and Middle Asia (the former Soviet Middle Asia, i.e. Kazakhstan, Kyrgyzstan, Tadzhikistan, Turkmenistan, Uzbekistan) and Central Asia (mainly S Siberia, Mongolia and NW and NE China). Cultivation of plants grown from seed obtained from other botanists, seed collected by expeditions and from cultivation of roots also provided plants for herbarium collections. Details of the cultivation methods are given in Kirschner & Štěpánek (1993). The cultivation, especially repeated mass cultivation, reveals the limits of morphological plasticity of individual taxa. Moreover, it provides material for the study of reproduction systems (see below).

This study was supplemented by the examination of numerous herbarium collections. Those most relevant to the present study are BM, E, GAT, GOET, K, LE, MW, NS, PE, PRC, S, TI, UPS, W, WRS�, WU (abbreviation according to Index Herbariorum at <http://sciweb.nybg.org/science2/IndexHerbariorum.asp>). Most of our revision labels are numbered and refer to the specimen to which they are attached (not to the duplicates).

The taxonomic concept of sections and species is documented by a standard exsiccate series edited and distributed by the present authors (Kirschner & Štěpánek 1992, 1997b). In the series, 911 numbers were distributed (which represents more than 20,000 specimens) and copies are deposited in major herbaria with important dandelion collections (e.g. S, H, L, M, PRA, PRC) and in the collections of leading specialists (H. Øllgaard, I. Uhlemann, P. Oosterveld, A. J. Richards etc.).

A knowledge of the mode of reproduction (agamospermy versus sexuality) is crucial for this taxonomic study, and there are numerous ways of identifying it, particularly in live, cultivated plants (emasculation or observation of the variation of leaf rosettes of siblings in cultivation). In herbarium material, pollen presence/absence and variation in the size of pollen were studied (Nijs et al. 1990); a conspicuously variable pollen size is, with certain exceptions, a reliable indicator of dandelion agamospermy. This basic screening of the modes of reproduction was completed with a more detailed observation of the material in cultivation, using the above methods and chromosome counting (triploidy observed in three members of the section is invariably a sign of agamospermy in *Taraxacum*).

Plant nomenclature follows Kirschner & Štěpánek (1997a) and the principles of sectional taxonomy of Kirschner & Štěpánek (1996a).

Achene length in the descriptions includes the cone.

Taxonomic treatment

Taraxacum sect. *Stenoloba* Kirschner et Štěpánek, Folia Geobot. 39: 261 (2004)

Type: *Taraxacum stenolobum* Stehegl.

Description: Plants $\pm$ medium-sized. Leaves usually arachnoid, more densely near their base, deeply lobed to dissected, with narrow, subpatent lobes. Scapes $\pm$ arachnoid. Outer involucre bracts appressed, loosely appressed, erecto-patent to $\pm$ arcuate-patent, numerous (13–24), greenish, usually with narrow but distinct, paler or reddish borders, ovate-lanceolate to linear-lanceolate, corniculate or with horns at the apex. Flowers yellow, outer ligules flat. Achenes pale greyish or stramineous brownish, narrow (less than 0.9–1.0 mm), $\pm$ densely minutely spinulose with acute short straight spinules, $\pm$ gradually narrowing into a narrow (0.2–0.3 mm in diam.), cylindrical or subcylindrical cone usually 0.9–1.2 mm long; rostrum thin, 7–10 mm long, pappus white or yellowish (dirty) white, ca 6–7 mm long. Main flowering time: late May to June, rarely later.

The section *Stenoloba* is relatively close to another three groups: *T.* sect. *Leucantha* Soest differs from sect. *Stenoloba* in having thicker achenes, more abruptly narrowing into a thick cone, usually appressed outer bracts without or with corniculation, and occur in a different, more humid habitat. Two steppe groups that might be confused with the sect. *Stenoloba* are sect. *Suavia* Kirschner et Štěpánek and sect. *Dissecta* Soest. They differ in having well developed tunica at plant base, in achene shape and size (often also colour) and in usually broad outer involucre bracts.

A key to species of the section *Stenoloba*

- 1a Involucre 7–9 mm in diameter; rostrum ca 6 mm long 2
- b Involucre (8–) 9–12 mm in diameter; rostrum 7–9 mm long 3
- 2a Outer bracts $\pm$ flat to slightly corniculate, very numerous (20–24) **1. *T. sinomongolicum***
- b Outer bracts cornute to corniculate, numerous (16–20) **7. *T. odibile***
- 3a Outer bracts 18–23, regularly arcuate **6. *T. abalienatum***
- b Outer bracts 10–18, appressed, erect, erecto-patent, if arcuate then only some of them in an irregular manner ... 4
- 4a Lateral leaf lobes narrowly triangular, 2–4 mm wide near the base; interlobes entire or sparsely dentate **2. *T. mongoliforme***
- b Lateral leaf lobes linear to linear-lingulate, to ca 2 mm wide near the base; interlobes lobulate-dentate 5
- 5a Stigmas yellow to pale greyish yellow **3. *T. scariosum***
- b Stigmas grey-green, dark hairy 6
- 6a Achenes 3.9–4.3 mm long; achene body with short spinules or squamules **5. *T. abax***
- b Achenes 4.6–5.0 mm long; achene body with conspicuously long thin spinules **4. *T. multisectum***

1. *Taraxacum sinomongolicum* Kitagawa, Neo-Lineam. Fl. Manshur. 687 (1979), nom. nov.

Syn.:

- $\equiv$ *Taraxacum cuspidatum* Dahlst. in H. Smith, Acta Horti Gotob. 2: 171 (1926), nom. illeg. (Art. 53.1), non Marklund, Acta Soc. Fauna Fl. Fenn. 34(7): 19 (1911). – Type: [China, Hebei, Xiao Wutai Shan] Chili: Hsiao-wu-tai-shan, Yang-kia-ping [Yang-hia-p'ing], Hsi-lin, 1900–2000 m, 1 Oct 1921, H. Smith 349 (**lectotype, designated here**: UPS, no. det. 11825).

Description: Plants 12–15 (–30) cm tall. Petiole usually purplish at base or greenish, unwinged; leaf blade mid-green, $\pm$ linear to linear oblanceolate, (8–) 10–12 (–16) $\times$

0.8–1.5 (–2.0) cm, $\pm$ subglabrous, $\pm$ pinnatisect; lateral lobes (3) 4–6 pairs, 3–8 $\times$ 3–4 mm, linear-triangular to narrowly triangular, recurved to $\pm$ patent, usually entire; interlobes 2–3 (–4) mm wide, entire; terminal lobe sometimes elongated, narrowly triangular, sagittate at base, acute, entire. Scapes greenish, sparsely arachnoid, more densely below capitulum. Capitulum ca 2 cm in diameter. Involucre 7–8(–9) mm wide, base $\pm$ rounded; outer bracts 20–24, deep green to pale green, with a distinct whitish-membranous border 0.2–0.3 mm, $\pm$ imbricate, lanceolate to narrowly lanceolate, the outermost ones sometimes linear, 4.0–5.5 (–7.5) $\times$ ca 1–1.5 mm, ca 2/5–1/2 as long as inner ones, loosely appressed, later some or all may be patent-arcuate, margin glabrous to sparsely ciliate, flat; inner bracts 1–1.2 cm long, $\pm$ corniculate. Flowers $\pm$ yellow, outer ligules flat, striped greyish green outside. Stigmas pale greenish. Anthers polliniferous; pollen grains irregular in size. Achenes pale greyish, 3.9–4.2 $\times$ 0.9–1.0 mm, body apically $\pm$ densely spinulose, spinules short, erect-patent, body gradually narrowing into $\pm$ cylindric cone 0.9–1.0 mm long; beak 5–6 mm long, thin; pappus 5–6 mm long, slightly yellowish white. Fl. summer. Agamosperm (Fig. 1H).

Notes on the original material and the selection of the lectotype: Seven original syntypes are cited by Dahlstedt (1926), if the two duplicate specimens of J. G. Andersson 407a (S, no. det. 9239, 18379) are included, and these represent the original material to be considered in the typification procedure. Dahlstedt (1926) also published illustrations of morphological details of this taxon, and his choice of specimens as models for the pictures was important in the selection of the lectotype. The original syntypes are briefly described below (Dahlstedt's mistakes in spelling are corrected).

- a. "Ursola", L. Taczanowski s. n., as *Leontodon collinus* (not traced at W)
- b. "Transbaicalia, Nerczinsk in pratis subsalsis prope stationem viae ferreae Kujenga", 24 Jul 1910, V. Sukaczew & G. Poplavskaia 1451 (WU, no. det. 9594). Determined as *T. cuspidatum* by Dahlstedt. [the label was transcribed by H. Handel Mazzetti]. The plant represents a late summer form of *Taraxacum mongolicum* (see below). Summer heads, when compared with plants flowering in spring, have corniculate (not cornute) and much narrower outer bracts. There is an isosyntype in the herbarium LE (no. det. 6096). It consists of several plants belonging to *T. sinicum* Kitag. and a single plant of *T. abax*. The latter was annotated by N. Tzvelev in 1985 as an isolectotype of *T. cuspidatum*, naturally with no nomenclatural effect.
- c. "Nerczinsk in loco arenoso prope pl. Werchnji Urjum", 1 Apr 1910, V. Sukaczew & G. Poplavskaia 176 (not traced at WU)
- d. "Karakalinsk, Sas Bulak", Jun 1910, Kutscherowskaja 846 (WU, no. det. 9597). Determined as "*T. cuspidatum* Dahlst. modif." by Dahlstedt. [the label was transcribed by H. Handel-Mazzetti]. Most probably, the plant represents *T. sinicum* but no fruit is available to support this conclusion. However, the plant is not eligible as the lectotype of *T. cuspidatum* because of the note "modif." by which Dahlstedt indicates a rather untypical appearance.
- e. "Mongolia: 7 li sept. versus a Tobo-ol, Burte-nor", 4 Aug 1919, J. G. Andersson 407a (S, no. det. 9239). – Later (1936) determined by G. Haglund as *T. asiaticum* Dahlst. The plant represents late summer form of *T. scariosum* Stschegl. There is a certain confusion caused by the fact that there are two sheets with the same date, number and locality in herbarium S. An original syntype.
- f. "Mongolia: 7 li sept. versus a Tobo-ol, Burte-nor", 4 Aug 1919, J. G. Andersson 407a (S, no. det. 18379). – Later (1936) determined by G. Haglund as *T. cuspidatum* Dahlst. The specimen was not annotated by Dahlstedt but it represents the Dahlstedt's *T. cuspidatum*. A leaf of the plant no. det. 18379 was probably a model for an illustration (fig. 10c, Dahlstedt 1926: 172) but the caption to the figure refers to "no 409a" (perhaps mistakenly), and the latter number itself is not quoted in the list of localities by Dahlstedt. Both collections J. G. Andersson 407a may be regarded as original syntypes but only no. det. 18379 is conspecific with the lectotype.
- g. "China: Chili, Hsiao-wu-tai-shan, Yang-kia-ping, Hsi-lin" [Hebei, Xiao Wutai Shan], 1 Oct 1921, H. Smith 349 (UPS, no. det. 11825). A plant that evidently was essential for the compilation of the description and for

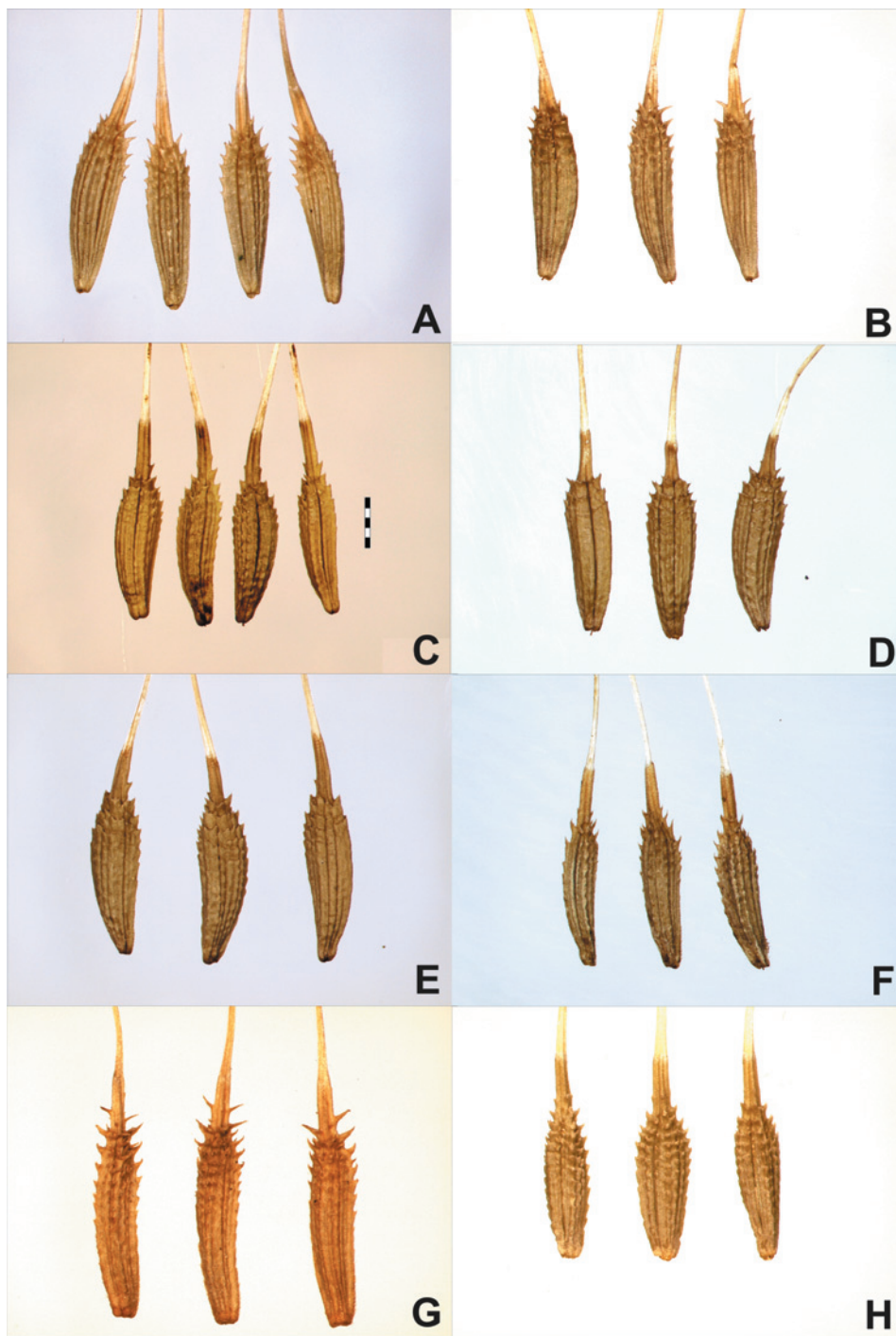


Fig. 1. – Details of achenes of all the taxa included in sect. *Stenoloba*: A – *T. scariosum*, no. det. 15729; B – *T. scariosum*, no. det. 22716; C – *T. abalienatum*, no. det. 22715; D – *T. abax*, no. det. 22713; E – *T. mongoliforme*, no. det. 22717; F – *T. odibile*, no. det. 22712; G – *T. multisectum*, no. det. 15863; H – *T. sinomongolicum*, no. det. 18656. Scale bar = 1 mm.

drawing the figures. The lower plant was used as a model for figures 10a, b (Dahlstedt 1926: 172), a young head of it is depicted on Plate III, fig. 5, and the achene description in the protologue matches achenes of this syntype. These facts qualify the specimen to be the best candidate for the lectotype of the name *T. cuspidatum* Dahlstedt, and in the absence of a better choice it is so designated. The plants were collected in autumn, and have leaves without characteristic features of taxa known in the region. Outer bracts, seemingly well developed, have a typical appearance of those of a number of taxa of this section in autumn: they are narrow, without corniculation or callose. However, a comparison of the type material with plants in PE makes it possible to characterize this rather rare species.

For the time being, the taxonomic conception of the interpretation of the name *T. sinomongolicum* used here is based on two conspecific syntype specimens (collected rather late in the season in Inner Mongolia), another specimen from Inner Mongolia (PRA) and a collection from Hebei in herbarium PE. Further study is therefore needed as many characters observed or measured on this late material may be rather uncertain; there is rich material in cultivation from autumn 2010, collected by the authors at Wutaishan, Shanxi, for that purpose.

Specimens studied: **China:** Hebei, Zhongbei County, near Deng You Fang, 14 Aug 1959, [anonymous] 6067 (PE, no. det. 18656). – Nei Mongol (Inner Mongolia), Xilinhot (Abangar Banner) Xian: Qian Long Dianyutai, near lake Dalai Nur, 1350 m, 7 Aug 1993, D. E. Boufford, E. W. Wood, T. S. Ying & H. Y. Zhang, no. 25939 (PRA, no. det. 24454).

2. *Taraxacum mongoliforme* Doll, Feddes Repert. 86: 514 (1975)

Type: Mongolia, Töv-Aimak, Bornuur, 100 km NNN Ulan-Bator, “Ueberweidete Bergsteppe im Saichny-gol-Weidegebiet, 1200 m s. m.”, 21 Jun 1973, K. Kloss [Paulinenaue, Germany], (original holotype: probably in personal herbarium of K. Kloss, not available for study, probably no longer extant). – **Lectotype, designated here:** [icon in] Doll, Feddes Repert. 86: Plate XXIIIb (1975). – **Epitype, designated here:** Russia, Sibiria centralis, oppidum Irkutsk, lacus Baikal, in declivibus stepposi supra pagum Listvyanka, 26 Oct 1985, J. Štěpánek & J. Kirschner 1575; cultivated as JŠ 1575/36 (epitype: PRA, no. det. 15721; isoeotypes: PRA, G, S, K).

Exsiccates: Taraxaca Exs., no. 747–750.

The original type of *T. mongoliforme* was not found. It is reported to be deposited in a private herbarium; no response was received by us, or by our German colleagues from the owner of the material (K. Kloss). As all the attempts to locate the holotype failed, it is considered to be non extant. The identity of the original type of the taxon described under the name *T. mongoliforme* with our material is highly probable because both the figure in Doll (1975, Plate XXIIIb) and the description match the features of our numerous collections. The only difference is the small size of achenes reported for *T. mongoliforme* in the protologue, a feature that may be attributed to the imperfect development of young fruits of the original material. The above figure (Doll 1975, Plate XXIIIb) is the only extant element of the original material of the name *T. mongoliforme*. It is therefore inevitable that it is selected as the lectotype of this name.

In order to stabilize the nomenclature of the group, an epitype is designated from well developed material preserved in an internationally recognized institutional herbarium (PRA), with duplicate material in other herbaria.

Description: Plants medium-sized. Petiole narrow, unwinged, often narrowly winged in outer leaves, deep purple, mid-rib purple; leaf blade broadly linear in outline, usually 6–9 (–11) × 1 (–1.4) cm, sparsely arachnoid, mid-green, divided into numerous (usually



Fig. 2. – *Taraxacum mongoliforme* Doll (PRA, no. det. 15723).

4–7) pairs of lateral lobes, lobes usually patent to slightly forward-pointing, less often $\pm$ recurved, short, narrowly triangular, 2–4 mm wide near the base, (2–) 4–5 mm long, acute, sometimes leaves undivided, coarsely dentate; interlobes 2–8 mm long, usually 3–6 mm wide, entire or with scattered teeth (or distal base of lobes sparsely toothed or entire). Scapes arachnoid, young ones densely so. Capitulum up to 3.5 cm in diameter. Involucre rounded at the base, 8–10 mm in diameter, inner bracts usually 12–14 mm long, deep green, darker reddish near the apex, distinctly corniculate; outer bracts loosely appressed to $\pm$ erect, later arcuate, $\pm$ numerous, 12–17, slightly imbricate or not so, sparsely ciliate, green, almost always suffused purple, ovate to lanceolate, usually $6.5\text{--}7.5 \times 2\text{--}3$ mm, borders either paler or reddish, (0.1–) 0.3–0.4 mm wide, bracts distinctly horned (horns thick, 0.7–1.5 mm long). Flowers yellow, outer ligules flat, long, striped grey greenish pink outside, ligule teeth faintly reddish or dirty yellow. Stigmas green, pollen present, irregular in size. Achenes greyish, 4.2–4.6 mm long, 0.9 mm wide, gradually narrowing into a thin, subcylindrical cone 1.0–1.2 (–1.3) mm long, achene body shortly spinulose to squamulose above, otherwise $\pm$ smooth to slightly tuberculate. Rostrum thin, usually (7.5–) 8–9 mm long, pappus white, ca 6.5–7 mm long. $2n = 24$ (counted by J. Kirschner under no. 6/93, from Lake Baikal, JŠ 1575/36, see above). Agamosperm (Fig. 1E, 2).

Probably a widely distributed species known from south-central and eastern Siberia and from Mongolia. According to our field observations, this species most often occurs on dry, steppe and secondary steppe slopes.

Specimens studied: **Mongolia:** Suche-Bator, pagus Shamar, in alluvionibus fl. Orchon, 7 Jul 1987, V. Petrovskiy s. n., planta culta sub no. JŠ 3141 et JK 194 (PRA, no. det. 15722; numerous multiplicates in Taraxaca Exs., no. 747). – **Russia:** Transbaicalia, Nerczinsk in pratis subsalsis prope stationem viae ferreae Kuyenga, 24 Jul 1910, V. Sukaczew & G. Poplavskaia 1451 (WU, no. det. 9594, one of the original syntypes of *T. cuspidatum*, see above). – Sibiria centralis, oppidum Irkutsk, lacus Baikal, in declivibus stepposis supra pagum Listvyanka, 26. Oct 1985, J. Štěpánek & J. Kirschner, cultivated from JŠ 1575/35 and as JK 223 (PRA, no. det. 15723); as JŠ 2716 (PRA, no. det. 15724); as JŠ 2534 (PRA, no. det. 15725); as JŠ 2717 (PRA, no. det. 15726, distributed as Taraxaca Exs., no. 748–750).

3. *Taraxacum scariosum* (Tausch) Kirschner et Štěpánek, **comb. nov.**

Syn.:

- ≡ *Leontodon scariosus* Tausch, Flora, Regensburg, 12/1, Ergänzungsbl., p. 34 (1829). – Type citation: “Habitat in Sibiria ad lacus salsos. Gmelin. Qua varietatem L. Taraxaci Gmelinus habuit in herbario Schmidiano.” – Type: “... ad lacus salsos crescens” [J. G. Gmelin scripsit]. (in Sibiria Gmelin) [F. W. Schmidt scripsit]. *Leontodon scariosus* Tau. E Sibiria [I. F. Tausch scripsit] (holotype: PRC, no. det. 22257). – See also Fig. 3.
- ≡ *Taraxacum stenolobum* Stechgl., Bull. Soc. Imp. Natur. Moscou 27/1: 180 (1854). – Type citation: “In pratis ad rivulum prope Semipalatinsk sub finem Maji 1843”. – Type: Semipalatinsk “nach dem Autor”, herb. Karelín (lectotype: LE, no. det. 7957, selected by Kirschner & Štěpánek, Folia Geobot. 39: 261 (2004). A possible isotype may be LE, no. det. 7956.
- ≡ *Taraxacum printzii* Dahlst. in Printz, Veg. Siber.-Mongol. Front. 439 (1921). – Type: “Sibiria, Prov. Jeniseisk, Distr. Minusinsk, Jenisei nar Ust Abakansk”, 3 Jun 1914, H. Printz (**lectotype, designated here:** S, no. det. 23046).
- ≡ *Taraxacum asiaticum* Dahlst. in H. Smith, Acta Horti Gotob. 2: 173 (1926). – Type: [China, Hebei, Xiao Wutai Shan] Chili, Hsiao-wu-tai-shan, ad ripam torrentis supra Tien-lin-ssü, H. Smith 427 (**lectotype, designated here:** UPS, no. det. 11814).
- ≡ *Taraxacum asiaticum* var. *lonchophyllum* Kitagawa, Bot. Mag., Tokyo, 47: 827. 1933. Type: [China, Liaoning, Zhujiatunzhen] Feng-t’ien: In oppido Chü-chia-t’ien, 1 Jun 1932, M. Kitagawa (**lectotype, designated here:** TI, no. det. 15864; isotypes: TI, no. det. 18716, 18717, 18718, 18719).



Fig. 3. – *Taraxacum scariosum* (Tausch) Kirschner et Štěpánek. A, the holotype plants; B, holotype labels (PRC).

- = *Taraxacum commixtiforme* Soest in P. Hanelt et S. Davažamc, Feddes Repert. 70: 61 (1965). – Type: Mongolia, Südgobi-Aimak, Dund-Sajchan, Bognin-chjar, ca 25 km südl. Bulgan, Trockental, Meereshöhe ca 1500 m [further data on a hand-written original label: N-Kette des Gebirges, nahe einer Wasserlaufs], 28 May 1962, Mongolisch-Deutsche Expedition 2085 (holotype: GAT, no. det. 11812; isotypes: GAT, no. det. 11813; L, no. det. 9317).

Exsiccate: Taraxaca Exs., no. 284.

Description: Plants medium-sized. Petiole narrow, unwinged, usually faintly to deep purple; leaf blades narrowly lanceolate in outline, up to $12\text{--}15 \times 1.3\text{--}2.5$ cm, arachnoid, mid-green to pale green, deeply dissected into 6–10 pairs of $\pm$ linear lobes, these usually narrower in the proximal 1/3, usually $\pm$ patent, often slightly pointing upwards, rarely slightly downwards, straight, sometimes bent upwards or downwards, often wider at the base and base divided into sharp linear lobules or teeth; interlobes usually 0.5–1.2 cm long, very narrow, with numerous, usually patent linear acute lobules and/or teeth (inner leaves more toothed, outer ones simpler); late summer leaves larger, with broad lobes up to 8 mm wide. Scapes arachnoid, especially below the capitulum, rarely subglabrous. Capitulum ca 2.0–2.5 cm in diameter. Involucre rounded at the base, 9–11 mm in diameter; outer bracts appressed, later erect or (some) recurved at the apex, 14–18, yellowish green to deep green, usually suffused pinkish, arachnoid-ciliate, slightly imbricate, the outer of them lanceolate to broadly lanceolate, $5\text{--}7 \times 2.5\text{--}2.8$ mm, middle ones $8.0\text{--}8.5 \times 1.8\text{--}2.5$ mm, pinkish in the upper part, borders whitish, 0.2–0.3 mm wide, usually more distinct in the upper part and often slightly suffused pinkish, ecorniculate or slightly corniculate in first heads, later usually all corniculate; inner bracts deep green, slightly or not glaucous, 12–14 mm long in flower, narrow, corniculate near the apex. Flowers yellow, outer ligules flat, striped grey to grey-pinkish outside; ligule teeth reddish. Stigmas $\pm$ yellow to pale greyish yellow; pollen present, irregular in size. Achenes pale straw-grey, 4.2–4.7 mm long, ca 0.8 mm wide, gradually (less often $\pm$ subabruptly) narrowing into a subcylindrical cone 0.8–1.0 mm long (often with sparse spinules at the base), achene body spinulose above, spinules medium dense to $\pm$ sparse, sharp, narrowly conical, oblique, lower spinules shorter, often blunt, lower 3/5 of achene body usually smooth to slightly tuberculate (ridges distinct). Rostrum thin, usually 8–9 mm long, pappus white, 6–7 mm long. $2n = 24$ (counted by J. Kirschner under no. 21/93, from the Ulan-Bator vicinity, JK 195, see below). Agamosperm. (Fig. 1 A, B, 4).

Taraxacum scariosum is a distinct taxon characterized by $\pm$ pale green leaves, $\pm$ appressed outer bracts of pale colour, yellow stigmas, slender pale straw-grey achenes and a rostrum 8–9 mm long. The species is widely distributed, from east Kazakhstan, through south-central Siberia and Mongolia to north-central and north-east China.

Nomenclatural notes on the names *Taraxacum asiaticum* and *T. scariosum*

Analysis of the original syntypes of Taraxacum asiaticum Dahlst.¹

Five of the eleven original syntypes of the name *T. asiaticum* belong to *T. scariosum*. In the typification procedure, Dahlstedt (1926) choice of plants for illustrations has again been an important factor in the selection of the lectotype.

¹ Dahlstedt's mistakes in spelling are corrected



Fig. 4. – *Taraxacum scariosum* (PRA, no. det. 9932).

- a. “Guv. Tomsk, Kreis Biisk, Kansk, Salzwiesen beim See”, W. L. Nekrassova (WU, no. det. 9600). A poorly developed plant that could not be identified to species. *Taraxacum scariosum* possible.
- b. “Altai”, Gebler 10, “ex herb. Horti Petropol.” (WU, no. det. 9603). A plant belonging to the section *Leucantha* (a syntype of *T. dealbatum*, at the same time).
- c. “Altai”, Ledebour 458 (reported to be deposited at W). No relevant plant with Dahlstedt’s identification label found at W.
- d. “Baikal: Listvics?” [most probably Listvyanka village], O. Lönnbohm (S, no. det. 9236). A fragment that does not allow any identification.
- e. “Irkutsk” (S. J. Enander, 9. Jul 1913, S, no. det. 9233, 9237). Plants collected as summer forms. Comparison with our collections shows that they may be close to the *Taraxacum sinicum* group, section *Leucantha*. The plants are not eligible as a lectotype as their characters do not correspond to the protologue. Another plant annotated by Dahlstedt but not listed among syntypes should be mentioned here: 6 Jul 1913, S. J. Enander (S, no. det. 9238).
- f. “In ripa fluminis Selenga prope stationem viae ferreae Divisionnaja”, 15 Jul 1913, S. J. Enander (S, no. det. 9234). Late summer plants, probably very close to *T. odibile* (see below). Designated as the lectotype in an ineffective way by C. F. Lundevall (in sched.) but not eligible because the fruits differ from the original description.
- g. “Mongolia: 7 li septentrionem versus a Tobo-ol, Burte-nor” (4. Aug 1919, J. G. Andersson 407a, S, no. det. 9239, 11815). These two specimens are rather confusing because Dahlstedt (1926) quotes the localities of both his *T. asiaticum* and *T. cuspidatum*, but neither of the specimens is annotated by him. Thus, the syntype status of the two specimens is doubtful. The no. det. 9239, probably a syntype of *T. cuspidatum* (for discussion, see above), represents *T. scariosum*. We failed to identify the other plant: it resembles an autumn form of *T. sinicum*. The third plant collected, J. G. Andersson 407a, S, no. det. 18379, is conspecific with *T. sino-mongolicum* and discussed above.
- h. “Tibetia: Kuen-lun, oasis Su-tschou, 3700’”, V. I. Roberowski (WU, no. det. 9599). In all likelihood, a young plant of *T. scariosum*.
- i. [Sichuan] “Tibetia: Batang”, G. N. Potanin 27 p.p. [mistakenly given as 257 by Dahlstedt] (WU, no. det. 9598). A well developed *T. scariosum*.
- j. “Chili, Hsiao-wu-tai-shan, ad ripam torrentis supra Tien-lin-ssü”, H. Smith 427 (UPS, no. det. 11814). A late September collection. The only young leaf preserved, the achene and flower characters allow a safe identification of the plant as *T. scariosum*. This plant was used for drawings (Dahlstedt 1926) and corresponds very well to the original description. It is selected as the lectotype of *T. asiaticum* in the present paper.
- k. “Kansu”, Przewalski (WU). A plant of low quality located in WU but without Dahlstedt’s identification label. Not taken into consideration in the lectotypification procedure.

Analysis of the name Leontodon scariosus Tausch

It is normally not advisable to restore historical names that have not been used for a long time. The reason for the rather exceptional approach adopted here is that the two equally widely used names for this taxon, *T. stenolobum* and *T. asiaticum*, cover a wide range of morphotypes and taxa in all the major floras (Schischkin & Tzvelev 1964, Orazova 1975, Vainberg 1991, Ge et al. 1999). The descriptions and sectional classification of *T. stenolobum* sometimes raise doubts about whether the concept covers the type of this name (in Tzvelev 1987, *T. stenolobum* was classified as a member of the sect. *Mongolica*). Thus, in order to remove this confusion over the interpretation of the older names, it was decided to “clean” the nomenclature and taxonomy by using the old *Leontodon scariosus* Tausch (1829) and creating a new combination in *Taraxacum*.

The name *Leontodon scariosus* Tausch (missing from IPNI, <http://www.ipni.org/>) was published on the basis of a herbarium specimen with two plantlets undoubtedly belonging to what used to be called *Taraxacum stenolobum*. The specimen was originally collected by J. G. Gmelin and then sent to F. W. Schmidt (1764–1796; for information on this early author, see Kirschner 1988, 2009). The name *Leontodon scariosus*, as a basionym for

a possible combination in *Taraxacum*, has priority over the epithet *stenolobum* (1829 versus 1854).

Selected specimens studied: **Kazakhstan:** Semipalatinskii uyezd, K. K. Kosinskiy 417 (LE, no. det. 7958). – Semipalatinskaya oblast', Karkal. u., Dzharla, 26 Jun 1890, S. Korzhinskiy (LE, no. det. 7943). – Semipalatinskii uyezd, Sulu-Cheku, po beregu r. Sarchalovka, 1914, K. K. Kosinskiy (LE, no. det. 7941). – Semipalatinskii uyezd, Chingiz, 25 May 1914, Schipczinsky 325 (LE, no. det. 7938). – Semipalatinskii uyezd, gory Chingiz, raion r. Namal', 28 May 1914, K. K. Kosinskiy 482 (LE, no. det. 7939). – **Russia:** Altai, distr. Ongudai, in valle fl. Katun non procul a confl. cum fl. Bol'shoi Yaloman, 30 Jun 1988, J. Kirschner, cultivated as JK 3347 (PRA, no. det. 15729). – Altai, okr. Teletzkogo oz. [vicinity of Lake Teletzkoe Ozero] bliz s. Kamyrtuk, dolina Chulyshmana, 2 Jun 1909, Sychinskiy (LE, no. det. 8203). – Baikal, zapadnoe poberezh'e mezhdy 53° i 55° s. sh., Onguren, 8 Jul 1928, K. A. Rassadina (LE, no. det. 7950). – Irkustskaya guberniya, na pr. beregy r. Ushakovki, 24 Jun 1874, collector illegible (LE, no. det. 7940). – Irkutskii uyezd, Ordvinskaya inorodnaya uprava, 10 Jun 1902, Sorokin (LE, no. det. 7960, p.p.). – Transbaicalia, mezhdy Nerchei i Kuengoi [between rivers Nercha and Kuenga], Sukhoi Baigul', na stepi Kochevnogo Khrebtu, 17 Jun 1911, V. Sukaczew & G. Poplavskaya, no. 743 (LE). – **Mongolia:** Ulan-Bator, in alluvionibus rivi ad pontem trans fl. Tola, 25 Jul 1987, V. Petrovkiy, cultivated from JŠ 3147 as JK 195 (PRA, no. det. 9932, also distributed as *Taraxaca* *Exsiccata*, no. 284, e.g. H, S, L, K). – **China:** [Shanxi] Young Mong Shan, Shansi N, 29 Jul 1914, Licent 1064 (BM, no. det. 8438). – [Heilongjiang] Mandschurei, gegend von Harbin, Auwiese, feuchter Lehmboden, 26 May 1926, Jettmar (W, no. det. 8983). – Tibet, Kuen-lun, oasis Su-tschou, 3700', V. I. Roborowski (WU, no. det. 9599). – [W Sichuan] Tibet, Batang, G. N. Potanin 27 p.p. (WU, no. det. 9598).

4. *Taraxacum multisectum* Kitagawa, Rep. Inst. Sci. Res. Manchoukuo 2(7): 310 (1938)

Type: [China, Jilin Province, Changchun] Prov. Chi-lin: Circa Hsin-ching, 25 May 1938, M. Kitagawa (**lectotype, designated here:** TI, no. det. 15863; isotype: TI, no. det. 18713).

Description: Herbs 11–20 cm tall. Petiole unwinged, pale green or purplish, sparsely arachnoid at the very base, otherwise glabrous; leaf blades mid-green, narrowly oblong, 7–16 × 1.2–2.4 cm, sparsely arachnoid, pinnatipartite; lateral lobes 3–5 pairs, ± linear, ca 8–16 × 1.2–2.3 mm, ± patent, acute, ± entire; interlobes narrow, ca 3–12 × 1–2 mm, filiform-dentate or lobulate; terminal lobe 3-partite, segments entire, acute. Scapes brownish green, arachnoid, ± overtopping leaves. Capitulum ca 3–3.5 cm wide. Involucre 9–11 mm wide, rounded at base; outer bracts 10–14, dark green, margins and apical part often purple, with a gradual transition into a paler border and sharply delimited whitish border ca 0.3 mm wide, not imbricate, usually broadly lanceolate to narrowly ovate, (6.0–) 7.0–9.0 × (2.0–) 2.5–4 mm, ca 1/2 as long as inner ones, appressed, later to erect-patent, margins ± glabrous or sparsely ciliate, ± callose, rarely flat; inner bracts 14–16 mm, ± flat to corniculate. Flowers yellow, outer ligules ± flat, striped grey outside. Stigmas greyish green. Anthers polliniferous; pollen grains irregular in size. Achenes light greyish straw-brown, 4.6–5.0 × 0.8–0.9 mm, body subsparingly spinulose above, spinules long, longest 0.5 mm, thin, acute, erect-patent, some also on conical base, body gradually narrowing into ± cylindric cone 0.9–1 mm long; beak thin, 10–11 mm long; pappus ± white, ca 7 mm long. Fl. spring. Agamosperm (Fig. 1G).

Recorded growing in steppe grasslands and pastures at altitudes of between 50–300 m. According to the material available, it is confined to E China, province of Jilin. This species most probably also occurs in Liaoning, Heilongjiang and Inner Mongolia but this needs to be confirmed by further study. It is similar to *T. abax* but differs substantially in having conspicuously long spinules on achenes, longer beak, not horned and seldom corniculate outer bracts.

Specimens studied: **China**, [Jilin Province, Changchun] Prov. Chi-lin: Circa Hsin-ching, 24 May 1938, M. Kitagawa (TI, no. det. 18714, 18715).

New species in the section *Stenoloba*

A detailed examination of material from Siberia, the Altai, Transbaicalia and Mongolia revealed two agamospermous species closely related to *T. scariosum*. Both are characterized by flowering late, darker leaves, distinctly cornute and less appressed outer bracts (similar to those of *T. mongoliforme*). Another new taxon, superficially similar to *T. sinicum* of the sect. *Leucantha*, was identified in material from Mongolia. The new species are described below.

5. *Taraxacum abax* Kirschner et Štěpánek, *spec. nova*

Type: Irkutsk, lacus Baikal, Listvyanka, pascuis ad ripam lacus Baikal, prope ostium amnis Angara, 26 Oct 1985, J. Kirschner & J. Štěpánek, cultivated from 1574/42 as JŠ 2711 (holotype: PRA, no. det. 15737; isotypes: PRA, no. det. 22713, G, S, K).

Exsiccates: Taraxaca Exs., no. 906–910.

Description: Plantae agamospermae foliis ambitu anguste lanceolatis araneosis saturate viridibus dissectis, lobis lateralibus utrinque 6–9 linearibus vel lineari-lingulatis patentibus vel paulo assurgentibus interlobiis perangustis sparse lobulatis vel dentatis, interlobiis foliorum interiorum saepissime integerrimis, lobo terminali lineari vel lineari-lingulato. Involucrum basi rotundatum squamis interioribus corniculatis, squamis exterioribus numero 13–17, laxe adpressis usque erectis vel erecto-patentibus, raro apice paulo recurvatis, cornutis. Antherae polliniferae, stigmata obscura, griseo-viridia, dense obscure pilosa. Achenium griseo-stramineum 3.9–4.3 mm longum 0.8–0.9 mm latum superne dense breviter spinulosum, in pyramidem cylindricam tenuam 0.9–1.2 mm longam subsensim usque subabrupte transiens, rostro 7–9 mm, pappo 6.5–7 mm longis.

Description: Plants medium-sized. Petioles narrow, unwinged, deep purple; leaf blades narrowly lanceolate in outline, usually 7–10 × 1.5–2.8 cm, arachnoid, dull to deep green, deeply dissected into 6–9 pairs of linear to linear-lingulate, patent or often forward pointing (less often slightly recurved) lateral lobes 0.8–1.4 (–2.0) cm × 1.0–2.0 (–2.5) mm; interlobes narrow, 6–10 × 1–2 mm wide, usually with a few lobules or teeth, usually near the base of distal edge of lobes, interlobes often entire on inner leaves; terminal lobe ± linear to linear-lingulate, 10–15 × 1.5 (–3.0) mm. Scapes arachnoid, later sparsely arachnoid. Involucre ± rounded at the base, usually 10–12 mm in diameter; outer bracts loosely appressed to ± erect (to ± erecto-patent), some of them slightly recurved at the apex, 13–17, dark green and ± glaucous, often suffused reddish (usually at least on the upper half), slightly imbricate, ± lanceolate, 7–9 (–10) × (2.2–) 2.6–3.0 (–3.1) mm, distinctly cornute, borders whitish membranous, 0.3 mm wide; inner bracts ± dark green, distinctly corniculate, usually 12–15 mm long and narrow (1.2–2.0 mm wide). Flowers deep yellow, numerous, outer ligules flat, striped greyish-greenish-pinkish outside, inner ligules ± flat, ligule teeth reddish, stigmas dark, greyish-greenish with dense dark hairs, pollen present, irregular. Achenes grey straw-brown, 3.9–4.3 mm long, ca 0.8–0.9 mm wide, ± subgradually to subabruptly narrowing in a 0.9–1.2 mm long, thin, cylindrical cone, achene body densely shortly spinulose, spinules ± thin, rostrum thin ca 7–9 mm long, pappus yellowish white, 6.5–7.0 mm long. 2n = 24 (counted by J. Kirschner under no. 7/93, from the Altai, JK 85, see below). Agamosperm. (Fig. 1D, 5).



Fig. 5. – *Taraxacum abax* Kirschner et Štěpánek. Holotype (PRA, no. det. 22713).

A species characterized primarily by its erect, comparatively broad outer bracts, dark stigmas and achenes with a body not so gradually narrowing into a cone as in the other members of this section. In its outer bracts, it is similar to *T. multisectum* but differs in fruit morphology (see Fig. 1), which makes it possible to distinguish the two taxa. It is a widely distributed taxon, its range extending from the Siberian Altai to Transbaicalia in the north and from Xinjiang through Mongolia to Hebei in the south.

Specimens studied: **Russia:** Altai, distr. Ongudai, secundum viam publicam ca 15 km situ occid. a pago Iodro, 1 Jul 1988, J. Kirschner, cultivated as 3351 (PRA, no. det. 15738; JK 85, PRA, no. det. 15740). – Zabaikalskaya oblast', Chitinskiy trakt, Otokhay [?], 26 Jun 1913, G. Poplavskaya, M. Poplavskiy & E. Ditmer, no. 1124 (LE, no. det. 18207). – Zabaikalskaya oblast', bassin r. Barguzina. ... [illegible], 19 Jun 1911, A. Zhukova, no. 64 (LE, no. det. 18208). – Baikal, 17 Jun 1915, V. Sukaczew & G. Poplavskaya, no. 816 (LE, no. det. 18210). – Baikal, Kultuk, 5 Jun 1915, G. Poplavskaya & Yu. Tsenserling, no. 5 (LE, no. det. 18212); 6 Jun 1915, G. Poplavskaya & Yu. Tsenserling, no. 39 (LE, no. det. 18211); 12 Jun 1915, V. Sukaczew & G. Poplavskaya, no. 415 (LE, no. det. 18213). – Irkutsk, lacus Baikal, Listvyanka, pascuis ad ripam lacus Baikal, prope ostium amnis Angara, 26 Oct 1985, J. Kirschner & J. Štěpánek, cultivated from 1574/36 as JŠ 2710 (PRA, no. det. 15727). – Irkutsk, lacus Baikal, Listvyanka, in decl. stepposi supra portum in pago Listvyanka, 26 Oct 1985, J. Kirschner & J. Štěpánek, cultivated as JŠ 2533 (PRA, no. det. 25200). – **Mongolia:** Suche-Bator, pagus Shamar, in alluvionibus fl. Orchon, 21 Jul 1987, V. Petrovskiy, cultivated as JŠ 3144 (PRA, no. det. 15739). – Ulan-Bator, in collibus siccis ad pedem montis Bogd-úl, Aug 1990, J. Soják, cultivated as JK 734 (PRA, no. det. 15741; JK 714, PRA, no. det. 25196; JK 719, PRA, no. det. 25195; JK 731, PRA, no. det. 15742; JK 733, PRA, no. det. 15743; JK 737, PRA, no. det. 25197; JK 741, PRA, no. det. 25198; JK 742, PRA, no. det. 25199). – Mongolia, along the main road ca 30 km ESE of Ulan-Bator, 47°50'N, 107°09'E, ca 1570 m, 16 Sep 2006, J. Kirschner & I. Staňa, cultivated as JK 5070 (PRA, no. det. 25194; JK 5069, PRA, no. det. 25193; JK 5071, PRA, no. det. 25192). – Mongolia, Ulan-Bator, at the foot of the Bogd-ul Mts, Tuul River, grasslands, S of the river, 47°53'N, 106°55'E, ca 1300 m, 10 Sep 2006, J. Kirschner & I. Staňa, cultivated as JK 5061 (PRA, no. det. 25191). – Mongolia, ca 40 km E of Ulan-Bator, near the bridge S of Terelj National Park, 47°49'N, 107°20'E, ca 1550 m, 16 Sep 2006, J. Kirschner & I. Staňa, cultivated as JK 5067 (PRA, no. det. 25190). – **China:** Hebei, Niang Niang Wa Gou, Ying Liu 15309 (PE, no. det. 18613, 18612). – China, prope limitem provinciarum Hebei et Beijing: situ boreo-orientali ab oppido Miyun, ad radicem borealem montis Wuling Shan, 700 m s. m., 40°40'N, 117°27'E, 1 Aug 1995, R. Businský, cultivated as JŠ 5863 (PRA, no. det. 24455). – Xinjiang, the Tian Shan, above Glacial Station II, mountain steppe pastures at 2000 m, 43°06'00"N 87°00'59"E, 4 Oct 2003, P. Sekerka 3/8 (PRA).

6. *Taraxacum abalienatum* Kirschner et Štěpánek, spec. nova

Type: Mongolia centr.-boreale., urbs Ulan-Bator, in collibus siccis ad pedem montis Bogd-úl, Aug 1990, J. Soják s.n., cultivated as JK 725 (holotype: PRA, no. det. 15719; isotypes: PRA, no. det. 25201, K, G, S).

Exsiccates: Taraxaca Exs., no. 911.

Descriptio: Plantae mediocriter altae, notabile araneosae, foliis ambitu lineari-lanceolatis usque anguste lanceolatis, saturate viridibus, ± dense araneosis, profunde pinnatisectis lobis lateralibus numero 7–10 utrobique, ± patentibus, non raro arcuatis, interlobiis angustis, ad 2 mm latis, acute lobulatis dentatisve, lobo terminali lingulato, petiolo angusto subinde anguste alato, saturate purpureo. Involucrum basi rotundatum squamis exterioribus numero 18–23, regulariter arcuatis, lanceolatis, 6.5–9 mm longis et fere 1.8–2.3 mm latis, glauci-viridibus, sub apice corniculatis vel cornutis et purpuree coloratis, margine albo membranaceo 0.2–0.3 mm lato. Antherae polliniferae; stigmata sublutea usque griseo-lutea, sparse obscure pilosa. Achenia grisea usque griseo-straminea, 3.7–4 mm longa, 0.8–0.9 mm lata, in pyramidem cylindricam, 0.9–1 mm longam subabrupte abeuntia, rostro 7–8 mm longo, pappo albedo 6–7 mm longo.

Description: Plants medium-sized. Petioles narrow, usually narrowly winged, deep purple; leaf blades linear-lanceolate to narrowly lanceolate in outline, usually 7–11 cm long, 1.5–2.5 cm wide, arachnoid to ± densely arachnoid, mid-green to deep green, deeply dissected into 7–10 pairs of dense patent (or slightly forward-pointing) linear to linear-



Fig. 6. – *Taraxacum abalienatum* Kirschner et Štěpánek. Holotype (PRA).

lingulate lateral lobes $5\text{--}12 \times 1.5\text{--}2.5$ mm; outer leaves usually have shorter and denser lobes, inner ones have long, broader and more remote lobes; interlobes narrow and usually short, (2–) $4\text{--}7$ mm long, usually up to 2 mm wide, proximal edge of lobe base and interlobes often with acute lobules and/or dentate; terminal lobe $\pm$ lingulate, usually ca 1 cm long and ca 3 mm wide, with small lobules at the base. Scapes densely arachnoid to arachnoid. Capitulum 2–3 cm in diameter. Involucre $\pm$ rounded at the base, usually up to 10 mm in diameter; outer bracts regularly arcuate, 18–23, glaucous dull green, distinctly corniculate to cornute, usually suffused reddish near the apex, $\pm$ not imbricate, $\pm$ linear lanceolate, $6.5\text{--}9.0 \times (1.6\text{--}) 1.8\text{--}2.3$ mm, borders whitish membranaceous, $\pm$ distinct, 0.2–0.3 mm wide; inner bracts deep green to slightly glaucous green, distinctly corniculate, 10–13 mm long, usually up to 2 mm wide. Flowers yellow, outer ligules $\pm$ flat, striped grey pinkish (or greenish) outside, inner ligule teeth reddish. Stigmas yellow to greyish yellow, with sparse darker hairs (overall appearance of stigmas: dirty yellow to greyish). Pollen present, irregular in size. Achenes grey to grey straw-brown, $3.7\text{--}4.0$ mm long, $0.8\text{--}0.9$ mm wide, $\pm$ subabruptly narrowing in a $0.9\text{--}1.0$ mm long, thin, $\pm$ cylindrical cone, often with 1–2 spinules at the cone base, achene body $\pm$ densely spinulose above, otherwise smooth, spinules short, broad-based, rostrum thin, 7–8 mm long, pappus white, 6–7 mm long. Agamosperm. (Fig. 1C, 6).

Taraxacum abalienatum is characterized by numerous, regularly arcuate outer bracts with subapical horns. The closest species, *T. abax*, has fewer, broader, straight, loosely appressed to erect outer bracts. Known from a series of steppe hills in the Bogd-úl group near Ulan Bator, Mongolia and from Transbaicalia.

Specimens studied: **Mongolia** centr.-boreal., urbs Ulan-Bator, in collibus siccis ad pedem montis Bogd-úl, Aug 1990, J. Soják, cultivated as JK 721 (PRA, no. det. 15734; JK 736B, PRA, no. det. 15735; JK 715, no. det. 15736; JK 729, PRA, no. det. 15720). – **Russia**, Transbaicalia, mezhdú Nerchei i Kuengoi, okr. s. Nov. Olova, 13 Jul 1911, V. Sukaczew & G. Poplavskaya, no. 1095 (LE).

7. *Taraxacum odibile* Kirschner et Štěpánek, spec. nova

Type: Mongolia centr.-boreal., urbs Ulan-Bator, in collibus siccis ad pedem montis Bogd-úl, Aug 1990, J. Soják s.n., cultivated as JK 726 (holotype: PRA, no. det. 15718; isotypes: PRA, no. det. 22712, K, G, S).

Descriptio: Plantae mediocriter altae, plerumque tenuae, foliis ambitu linearibus usque lanceolatis, mediocriter vel subdilate viridibus, sparse arachnoideis, pinnatisectis lobis lateralibus utrinque 6–8, linearibus, patentibus vel paulum recurvatis, aliquando sursum exigue arcuatis, interlobiis ad 2.5 mm latis, subinde integerrimis, lobo terminali $\pm$ late lineari, petiolo angusto, purpureo. Involucrum basi subrotundatum squamis exterioribus numero 16–20, subimbricatis, lanceolatis usque late lanceolatis, 5.5–7 mm longis, 1.7–2.4 mm latis, subappressis, $\pm$ saturate viridibus subglaucisve, sub apice cornutis usque corniculatis, margine inconspicuo albide viridi 0.3–0.4 mm lato. Antherae polliniferae; stigmata grisea, nigripilosa. Achenia griseo-straminea, 3.8–4.0 mm longa, ca 0.8 mm lata, in pyramidem angustam cylindricam 0.9–1.1 mm longam sensim abeuntia, rostro ca 6–7 mm longo, pappo albido 6–8 mm longo.

Description: Plants medium-sized. Petiole narrow, unwinged, purplish; leaf blade $\pm$ linear to $\pm$ lanceolate in outline, usually 8–12 cm long, usually 1.5–2.0, later to 4.0 cm wide, medium green to paler green, sparsely arachnoid to $\pm$ arachnoid (mainly beneath), deeply divided into 6–8 pairs of acute, linear, $\pm$ patent or usually slightly downward-pointing, straight to sometimes upward-curved and entire lateral lobes $6\text{--}19 \times 1.0\text{--}2.5$ mm; interlobes narrow, usually $4\text{--}12 \times 1.5\text{--}2.5$ mm, usually with 1–2 lobules and a few thin teeth (on outer leaves), often entire (chiefly on inner leaves); terminal lobe $\pm$ linear to broadly linear, acute,



Fig. 7. – *Taraxacum odibile* Kirschner et Štěpánek (PRA, cultiv. no. JK720).

usually up to 2 cm long and 2–4 mm wide. Scapes arachnoid (densely so below the capitulum), later sparsely arachnoid. Capitulum ca 2 cm in diameter. Involucre rounded to slightly subconical at the base, 7–8 mm in diameter; outer bracts loosely appressed, $\pm$ glabrous (very sparsely ciliate near the apex), slightly imbricate, cornute to corniculate, 16–20, lanceolate to broadly lanceolate, $5.5\text{--}7.0 \times 1.7\text{--}2.4$ mm, mid-green to deep green, $\pm$ glaucous, darker and suffused pinkish at the apex, with indistinct whitish-greenish borders ca 0.3–0.4 mm wide; inner bracts mid-green, darker and suffused pinkish at the apex, corniculate, usually $12\text{--}14 \times 1\text{--}2$ mm. Flowers numerous, yellow, outer ligules flat, striped dark grey with pinkish tinge, inner ligules $\pm$ flat, apical teeth pinkish-reddish. Pollen present, irregular, stigmas greyish, dark hairy. Achenes greyish straw-brown, 3.8–4.0 mm long, ca 0.8 mm wide, gradually narrowing into a $\pm$ thin cylindrical cone 0.9–1.1 mm long, achene body $\pm$ densely spinulose, spinules thin, acute, erect, straight, rostrum ca 6–7 mm long, pappus white, ca 6 mm long. Agamosperm. (Fig. 1F, 7).

Taraxacum odibile is known from the vicinity of Ulan-Bator, Mongolia, where it occurs on steppe or substeppe slopes. The other specimens less safely belonging to this species come from southern Siberia and another region of Mongolia (see list of specimens below). Its position in the sect. *Stenoloba* is based on the thin, sparsely spinulose achene body with thin erect spinules, gradually narrowing into a thin long cone, and the deeply dissected leaves with linear lobes. Outer bracts of *T. odibile* are slightly imbricate, usually appressed, and in some specimens have an appearance similar to that of *T. sinicum* (more greenish, tightly appressed, subimbricate). The latter, however, has substantially different achenes.

Specimens studied: **Mongolia** centr.-boreal., urbs Ulan-Bator, in collibus siccis ad pedem montis Bogd-úl, Aug. 1990, J. Soják, cultivated as JK 720 (PRA, no. det. 15730; JK 739, PRA, no. det. 15731; JK 738, PRA, no. det. 15732; JK 716, PRA, no. det. 15733). – Less safe identifications: **Russia**, Siberia: “Divisionnaja”, J. S. Enander (S, no. det. 9234). – **Mongolia**: Töv-Aimak, Chutzutu-gol [R. Doll (1975, plate 24b, under the name *T. cuspidatum*)].

Nomina excludenda

Taraxacum yinshanicum Z. Xu et H. C. Fu in Y.-C. Ma, Fl. Intramongol. 6: 330 (1982).

Holotype: [China, Inner Mongolia] Daqinshan, Baichazigou, 16 Jul 1973, Ma Yu-chuan 103 (NMU, photograph).

There is a discrepancy between the figure of *T. yinshanicum* (Plate 113, figs. 1, 2 in Y.-C. Ma, op. cit.) and the type specimen. While the picture shows a plant with characters that do not exclude sect. *Stenoloba*, the type specimen undoubtedly is a rather late collected member of the sect. *Ruderalia*.

The name *Taraxacum heterolepis* Nakai et Koidzumi ex Kitagawa, Bot. Mag., Tokyo, 47: 829 (1933), is based on the holotype specimen (TI) that lacks important characters and cannot be safely classified, not even to this section. It is accepted in Ge et al. (1999) as a correct name for *T. multisectum* (see below) but differs from the latter in the shape and posture of the outer phyllaries and in important achene features.

Type material of the name *T. falcilobum* Kitagawa, also referred to this group by Ge et al. (1999), was not traced and the protologue does not give relevant information on its tax-

onomic position. The description does not point to the sect. *Stenoloba* and its sectional position is uncertain; further study is needed.

Acknowledgements

The study was funded by the following grants: National Grant Agency grant no. GA206/07/1555, Ministry of Education grant (Czech-Chinese Collaboration Scheme KONTAKT), no. ME10143, and the Research Plan Grant of the Institute of Botany, Academy of Sciences, no. AV0Z 60050516. We are grateful to the collectors listed in the text who provided plant material and/or achenes. Thanks are due to the curators of the following herbaria: TI, KYO, G, GAT, K, BM, LE, PE, PRC, S, UPS, LD, W, WU etc., for loans of herbarium material and/or help and assistance during studies at their institutions. The authors are grateful for valuable remarks of reviewers.

Souhrn

Na základě studia rozsáhlého materiálu z Centrální Asie, zejména z jižní Sibíře, včetně Altaje a Zabajkalí, Mongolska a severní až severovýchodní Číny, byla taxonomicky revidována nedávno popsaná sekce *Taraxacum* sect. *Stenoloba* Kirschner et Štěpánek. Kromě herbářů leží těžiště materiálu v kultivovaných rostlinách z vlastních expedic a ze zorků dalších cestovatelů. Pozornost byla věnována přesné interpretaci a náležitě typifikaci použitých jmen. Pro nejrozšířenější druh sekce bylo nalezeno jméno *Leontodon scariosus* Tausch, nově kombinováno do rodu *Taraxacum*, aby nahradilo značně různorodě a nepřesně interpretovaná jména *T. stenolobum* a zvl. *T. asiaticum* (pro které byl vybrán lektotyp). Typifikováno bylo i jméno *T. sinomongolicum* Kitagawa a omezeno tak na rostliny ze severovýchodní Číny. Rozšířený mongolsko-jihosiibiřský druh *T. mongoliforme* Doll byl nově interpretován; typ jména měl být uložen v soukromém herbáři, nyní s neznámou lokalizací a tedy zcela nedostupný. Proto je pro jméno vybrán lektotyp (fotografie holotypu) a tento interpretován epitypem. Druh *T. multisectum* Kitagawa byl poprvé srovnán s ostatními příslušníky sekce a náležitě charakterizován; je nejspíš omezen svým výskytem na severovýchodní Čínu. Nově jsou popsány tři agamospermní druhy: *Taraxacum abax*, široce rozšířený od Altaje po Zabajkalí a na jih přes Mongolsko až do severní Číny; je blízký druhu *T. multisectum*, ale liší se podstatně svými plody (Fig. 1). *Taraxacum abalienatum* je známé z hojného materiálu z pahorků Bogd-úl u Ulan-Batoru v Mongolsku a z jednoho vzorku ze Zabajkalí; je to druh s nápadně rohatými a obloukem zahnutými vnějšími zákrovními listy. Poslední popsáný druh, *T. odibile*, je svými listy a plody charakteristickým členem sekce *Stenoloba*, avšak svými zákrovy se poněkud blíží skupině *T. sinicum* ze sekce *Leucantha*.

References

- Dahlstedt H. (1926): *Plantae sinenses a Dre. H. Smith annis 1921–22 lectae*. XIV. Die Gattung *Taraxacum*. – Meddel. Göteborg. Bot. Trädgård. 2: 143–184.
- Doll R. (1975): Zur *Taraxacum*-Flora der Mongolischen Volksrepublik. – Feddes Repert. 86: 511–519.
- Ge X.-J., Ling Y. & Zhai D. (1999): *Taraxacum*. – In: Ling Y. & Ge X.-J. (eds), *Flora Reipublicae popularis sinicae*, Vol. 80 (2) *Angiospermae, Dicotyledoneae, Compositae* (11), *Cichorieae*, p. 1–94, Science Press, Beijing.
- Kirschner J. (1988): A preliminary report on the plants collected by F. W. Schmidt. – Preslia 60: 85–88.
- Kirschner J. (2009): Typification of *Zaluzyanskya villosa* F. W. Schmidt (*Scrophulariaceae–Manuleae*). – S. Afr. J. Bot. 75: 588–590.
- Kirschner J. & Štěpánek J. (1992): Notes on the series of *Taraxaca Exsuccata*, Fasc. I–IV. – Preslia 64: 17–33.
- Kirschner J. & Štěpánek J. (1993): The genus *Taraxacum* in the Caucasus. 1, Introduction. 2, The section *Porphyrantha*. – Folia Geobot. Phytotax. 28: 295–320.
- Kirschner J. & Štěpánek J. (1996a): Modes of speciation and evolution of sections in *Taraxacum*. – Folia Geobot. Phytotax. 31: 415–426.
- Kirschner J. & Štěpánek J. (1996b): Interpretation of some older *Taraxacum* names from Asia. – Edinb. J. Bot. 53: 215–221.
- Kirschner J. & Štěpánek J. (1997a): A nomenclatural checklist of supraspecific names in *Taraxacum*. – Taxon 46: 87–98.
- Kirschner J. & Štěpánek J. (1997b): Notes on the series of *Taraxaca Exsuccata*, Fasc. I–IV. – Preslia 69: 35–38.
- Kirschner J. & Štěpánek J. (2004): New sections in *Taraxacum*. – Folia Geobot. 39: 259–274.
- Kirschner J. & Štěpánek J. (2005): Dandelions in Central Asia: *Taraxacum* sect. *Suavia*. – Preslia 77: 263–276.

- 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* 48: 61–78.
- Kirschner J., Štěpánek J. & Klimeš L. (2006): Dandelions in Central Asia: a taxonomic revision of *Taraxacum* section *Leucantha*. – *Preslia* 78: 27–65.
- Kirschner J., Štěpánek J., Mes T. H. M., Nijs J. C. M. den, Oosterveld P., Štorchová H. & Kuperus P. (2003): Principal features of the cpDNA evolution in *Taraxacum* (*Asteraceae*, *Lactuceae*): a conflict with taxonomy. – *Pl. Syst. Evol.* 239: 231–255.
- Nijs J. C. M. den, Kirschner J., Štěpánek J. & Van der Hulst A. (1990): Distribution of diploid sexual plants of *Taraxacum* sect. *Ruderalia* in east-central Europe, with special reference to Czechoslovakia. – *Pl. Syst. Evol.* 170: 71–84.
- Orazova A. O. (1975): Oduvančiki Kazachstana i Srednei Azii (Rod. *Taraxacum* Wigg.) [Dandelions of Kazakhstan and Middle Asia]. – Nauka, Alma-Ata.
- Richards A. J. (1973): The origin of *Taraxacum* agamospecies. – *Bot. J. Linn. Soc.* 66: 189–211.
- Schischkin B. K. [& Tzvelev N. N., ed.] (1964): Rod 1667. Oduvančik – *Taraxacum* Wigg. – In: Komarov V. L. (ed.), *Flora SSSR* 29: 405–560, 728–754, Moskva & Leningrad.
- Tausch J. F. (1829): *Descriptiones plantarum minus cognitarum*. – *Flora*, 12/1, p. 33–51, *Ergänzungsbl.*, Regensburg.
- Tzvelev N. N. (1987): Rod *Taraxacum* Wigg. (*Asteraceae*) v Central'noj Azii [*Taraxacum* in Central Asia]. – *Nov. Sist. Vyssh. Rast.* 24: 205–222.
- Vajnberg T. I. (1991): Rod 977 (127). Oduvančik, Kokuch, Koku (tadzh.) – *Taraxacum* Wigg. – In: *Flora Tadzhikskoi SSR* 10: 353–413, 462–469, Nauka, Leningrad.

Received 30 November 2010

Revision received 16 February 2011

Accepted 3 March 2011