New species of *Taraxacum*, sect. *Ruderalia*, found in Central and Northern Europe

Nové druhy rodu *Taraxacum*, sect. *Ruderalia*, ze střední a severní Evropy

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Examples of *Taraxacum* species (sect. *Ruderalia*) that have a well-known main distribution area and a few rather isolated, obviously introduced occurrences, are given. The lack of a long tradition of specific knowledge and collection of *Taraxacum* sect. *Ruderalia* specimens have impeded our understanding of the origin of the present distributions. Some views are presented. *Taraxacum ancistratum*, *T. crassum*, *T. deltoidifrons*, *T. infuscatum*, *T. jugiferum*, and *T. lundense*, all belonging to *Taraxacum* sect. *Ruderalia*, are described as new species. Three or four of these species were first found as introductions far away from their supposed main distribution area.

Keywords: *Taraxacum*, sect. *Ruderalia*, *Asteraceae*, taxonomy, new species, alien species, Central Europe, Nordic countries

Some *Taraxacum* species that are likely to have been introduced into Nordic countries

Several descriptions of *Taraxacum* species from Nordic countries are based on a few plants, collected in a small area sometimes far from their main distribution area. For example, the sect. *Erythrosperma* species *T. plumbeum* Dahlst. and *T. tortilobum* Florstr., described from Sweden, Gotland, Visby harbour, and Finland, Pori, Reposaari, respectively, are isolated occurrences far away from their main areas in Germany and W Germany, Netherlands, Belgium and N France, respectively. While the native distribution of these two species is well known that of many other, evidently introduced, *Taraxacum* species remains unknown. This is also true of species in sect. *Ruderalia* which occur in a greater diversity of habitats than most other *Taraxacum* sections.

In a series of publications (1957, 1960, 1962, 1964a, 1964b, 1967, 1976–1977) A. Railonsala described many *Taraxacum* species (sect. *Ruderalia*) found on former German military camp sites, mostly in northern Finland (e.g. Kalkkimaa and Kaakamo), and assumed to have been introduced, e.g. with the hay for horses. They are also present in another German military camp in Finland, Hymynsalmi, Kangasjärvi, investigated by L. Heikkinen, whose collections were mostly evaluated by B. Saarsoo, Sweden in his papers from 1962.

Out of the 176 supposedly introduced species described by Railonsala only 14 were definitely found outside Finland, eight of them in their probable native regions in Poland, Germany and the Czech Republic where they are more or less common and widespread. They are *T. acervatulum*, *T. chrysophaeum*, *T. corpulentum*, *T. floccosum*, *T. hepaticum*, *T. quadrangulum*, *T. staturale* and *T. violaceinervosum*. A ninth species, *T. horridifrons* Railons., is rare in Finland, but widespread and locally common in the other Scandinavian countries and in Central Europe, and might have come to Finland before the World War II or from the other Nordic countries.
Other species, collected and described by Railonsala from the Finnish camp sites are still not known to occur in Central Europe. They are *T. cumulatum* and *T. cycloides* (both known from Denmark), *T. habile*, (Denmark, Sweden), *T. megalosipteron* (Sweden), and *T. sahlinii* (Sweden, rather common in NE Finland). Their native geographical range is still uncertain. The latter species might, however, be native to the Nordic area, because it thrives and is widely distributed there and is often associated with species regarded as native to the Nordic area.

The former German military camps Kalkkimaa and Kaakamo were visited by J. Räsänен and the present author in 1999. The *Taraxacum* flora of these “classical” Railonsala sites still deviates considerably from that of average north Finnish ruderal sites in the occurrence of a great number of unusual sect. *Ruderalia* species, many of which were probably introduced during World War II. We also visited another former German military camp, Kangasjärvi near Hyrynsalmi in Finland in 1999. Three of the *Taraxacum* species, described by Saarsoo from this location, were still present there, namely *T. heikkinenii*, *T. paucilacerum*, and *T. subserratifrons*. Two of them, *T. heikkinenii* and *T. subserratifrons*, were also present at Kalkkimaa and Kaakamo.

This shows that introduced *Taraxacum* species of sect. *Ruderalia* can survive for many years, even if the climate differs from that in their home region. *T. subserratifrons*, as it is found not only in Germany and Poland, but also in southern Finland, Estonia, Sweden, and Denmark, seems to have a wide native distribution rather than being a recent introduction to Finland.

Two species, also described by Saarsoo from the Hyrnyasalmi region, namely *T. hyrynsalmense* and *T. sanguinicolor*, have recently been identified in collections from eastern Poland, which indicates that this region may be part of their native distribution area.

After excluding Railonsala’s 35 superfluous *Taraxacum* epithets (synonyms) there still remain 141 taxa, the native distribution ranges of which are not known. There is a need to study material in the Oulu and Helsinki herbaria, where the majority of Railonsala’s type specimens are located. Botanists studying the *Taraxacum* sect. *Ruderalia* flora of e.g. Central Germany, Poland and the Czech Republic might find some of their local species in these collections and at Railonsala’s type locations in N Finland.

### Expansion and decrease of species in the *Taraxacum* sect. *Ruderalia*

Due to their different competitive abilities on cultivated or disturbed soil *Taraxacum* species expand or decrease their ranges to different degrees. It is well-known that *Taraxacum* sections with special ecological requirements are influenced dramatically by changes of their preferred habitats (see e.g. Kirschner & Štěpánek 1998). In modern agriculture, the existence of stabilized botanical habitats depends on management regimes. The decrease of specialist *Taraxacum* species is usually caused by sudden habitat changes or vigorous competition.

In section *Ruderalia*, however, the great majority of species are favoured by disturbance, cultivation and high nutrient levels. In such habitats, most species are expected to become more widespread, but not always so. Below examples of decreasing and expanding *Ruderalia* species are cited, with possible explanations for these changes.
When I started collecting and identifying *Taraxacum* about 35 years ago, one of the commonest *Ruderalia* species in the region between Århus, Silkeborg, Herning, Varde, Kolding and Vejle (all in Denmark, Jutland) was *T. acutifidum* M. P. Chr. However, several visits to the same region over the last 5 years have revealed that for unknown reasons this species is now rare.

Another such example is *T. speciosum* Raunk. In an unpublished manuscript (1967, in the author’s possession) the Danish taraxacologist M. P. Christiansen records this conspicuous *Ruderalia* species as common in NE Sjælland (Zealand). Although *T. speciosum*, with its dark yellow and large flowerheads, is difficult to overlook by any taraxacologist, it has only been seen a few times during the latest 20 years.

Any conclusions regarding the reasons for changes in species frequency are premature without thorough investigations. However, further examples of *Ruderalia* species that have recently suffered a reduction in distribution area can be mentioned. G. Marklund (1940) in his survey of the *Taraxacum* flora in Nyland (S Finland) records two well-known and conspicuous *Taraxacum* species as common in the Helsinki region, namely *T. crispifolium* and *T. reflexilobum* [= *T. gibbiferum* (Brenner) Brenner]. During an international *Taraxacum* excursion in Helsinki and surroundings in 1998 neither of these two species were seen, although several potential habitats for them were visited and thoroughly investigated.

It may be that species with apomictic reproduction are eventually outcompeted by genetically more flexible competitors.

In the same period of time a remarkable expansion of some *Ruderalia* species was observed. Since the description of *T. distinctilobum* H. Øllg. (1978) this species has recorded from 33 botanical districts in Denmark and Sweden (1978: 9 districts in Denmark only). It is a fact that the presence of a well-known new species is more likely to be recorded than that of an unknown species, but this fact cannot be the only reason for the many new observations. *T. distinctilobum* in its main distribution area (Denmark, Little Belt and Funen) is usually a very common species, which often grows in hundreds in its locations. M. P. Christiansen during his excursions in 1954–1961 investigated about 45 localities, which were the core of the *T. distinctilobum* area when the species was described in 1978. Despite a thorough search of the collections in Botanical Museum, Copenhagen, not one specimen of *T. distinctilobum*, collected by M. P. Christiansen before 1978, was found. It is likely that *T. distinctilobum* was rare when Christiansen made his excursions and has later expanded dramatically, because he is unlikely to have missed such a distinctive species.

Another species that is probably expanding its range is *T. ruptifolium* H. Øllg. (1978), a very conspicuous species, difficult to overlook by any taraxacologist. When this species was described in 1978 it was known only from 5 Danish botanical districts. Now it is known from sites in Germany, Rügen (3 loc.), Sweden, Lund and Malmö (several loc.), and Denmark (16 bot. districts). Neither M. P. Christiansen (in Denmark) or G. Haglund (Lund and Rügen) have collected *T. ruptifolium* during their excursions, and probably not seen it either. Even on this weak evidence it is tempting to assume that *T. ruptifolium* is a strongly expanding species.

In a moment of fantasy one could imagine that these two species and other quickly expanding *Ruderalia* species have an intense but brief existence in local floras. However, this cannot be confirmed or rejected without published *Taraxacum* flora reports from as many regions as possible. As the history of the *Taraxacum* species concept is less than a hundred
years old there is still much work to do in this genus, especially with respect to frequent changes in the section *Ruderalia*.

Long-term investigations are dependent on well-kept *Taraxacum* collections, which should reflect not only the identity of the respective species, but also their frequency. However, the future of *Taraxacum* collections in public herbaria appears uncertain and financial constraints impede the acquisition of new material and regular revision.

**Six new *Taraxacum* species of sect. *Ruderalia***

The following text contains descriptions of six new species of *Taraxacum*, all members of sect. *Ruderalia*, which the author has known and studied for several years without being able to identify them as previously described species. They are all either locally very common or have a distinct and attractive appearance.

*Taraxacum crassum* is described jointly with B. Trávníček. Both of us independently determined that this species was an undescribed species. We have agreed to the name *T. crassum* with two authors. *Taraxacum lundense* was first detected and given a preliminary name by H. Wittzell, who showed the species to the present author and kindly suggested a joint description.

*T. ancistratum* and *T. jugiferum* both have a strongly disjunct distribution areas involving an isolated introduction to Denmark, together with their supposed area of origin, a more continuous areas of distribution in the Czech Republic and Germany. One single plant of *T. ancistratum*, found in North America, confirms the suggestion that several introduced species, especially members of sect. *Ruderalia*, can be expected to occur in eastern parts of that continent. *T. crassum* and *T. lundense* also seem to have their main distribution area in Central Europe, where *T. crassum* at least is very common. Both are thought to be rather recent additions to the Nordic *Taraxacum* flora, *T. crassum* because of its widely separated locations in Denmark and southern Sweden, and *T. lundense* because of its rather limited area of distribution around Lund, and one single Danish occurrence, a few specimens in a park.


**Taraxacum ancistratum** H. Øllg., spec. nova

*Holotype* [C, HØ 92-161 (Fig. 1)] *Isotypes* [AAU, HØ 92-161 (part of holotype individual); L, HØ 92-160; WSRP, HØ 92-162; PRA, HØ 92-163]: Denmark, Ø. Jylland (E Jutland), TBU-distr. 25, Fredericia, Nørrre Voldgade, between “Landsoldaten” and Krudtårnet (“Det hvide vandtårn”) (pos.: 55°34’08” N 9°45’18” E), on the old embankment, grassy slope, 6. 5. 1992 H. Øllgaard. Achene (Fig. 2) from paratype: HØ 96-272 (2 parts, see below) (HØ)

Capitulum ca. 50 mm in diameter, medium yellow, medium dense to rather lax, profile ± convex. Ligules flat or canaliculate. Ligule stripe narrower than ligule, greyish. Ligule teeth of inner flowers yellow. Pollen present, grains of varying diameter. Stigmas yellow (to faintly discoloured).

Achene (of a cultivated specimen – No. HØ 96-272) of the original collection (see Fig. 2) straw-coloured or greyish brown, 3.9–4.1 mm long (incl. cone). Achene spinules medium long, medium strong, straight. Achene cone cylindrical, smooth, 0.7–0.8 mm long. Rostrum length 10–11 mm.

*Taraxacum ancistratum* is best compared with the well-known and widely distributed species *T. ancistrolobum* Dahlst., which has the same hamate leaf lobes, obtuse endlobes, pallid leaf petioles, and size and direction of the outer bracts. From this latter species it is easily separated by its fresh green leaves (not dark, greyish to faintly bluish green as in *T. ancistrolobum*), endlobes of inner leaves with more incurved side lobule apices and with faint, rounded, incisions on one or both sides. The stigmas of *T. ancistratum* are yellowish, not discoloured as in *T. ancistrolobum*.

Cultivation of a transplanted specimen of the original collection in my garden for several years has confirmed the constancy of the specific features of *T. ancistratum*. 

**Fig. 2.** – *Taraxacum ancistratum*, achene from cultivated specimen of the original collection (HØ 96-272).
Habitat and distribution: *Taraxacum ancistratum* was found on ± disturbed roadsides and verges near forest and cultivated meadows in Europe: Czech Republic, apparently widespread but scarce in E Moravia; Denmark, E Jutland, rare, district 25, Fredericia; North America: USA, Washington DC.

Voucher specimens: Czech Republic: E Moravia (all specimens, quoted here, were collected by P. Lustyk, BT and HØ): Moravskoslezské Beskydy, Morávka 6 km tds. SSE, Přísloup (520 m), roadside at forest, 13. 5. 1998 HØ 98-377, -378 (HØ); Slezské Beskydy, Trinec, Nýdek 2 km tds. E, Střelma, roadside in forest, 13. 5. 1998 HØ 98-360, -361 (HØ). – Denmark: E Jutland (Ø. Jylland): TBU-distr. 25, Fredericia, Nørre Voldgade betw. “Land-soldaten” and Krudttårnet (“Det hvide vandtårn”), grassy embankment, 6. 5. 1992 HØ (type collection, see above); specimens collected from a transplanted specimen (root) of the original collection: HØ 93-223 (HØ), and 96-272 (Paratype with described achenes (2 parts) (HØ). – North America, USA: Washington DC, Memorial Park, grassy verge, 27. 4. 1950 C. E. Sonck.

*Taraxacum crassum* H. Øllg. et Trávníček, spec. nova

[T. crassum H. Øllg. et Trávníček, nomen, in Meierott (2001: 116)]

H o l o t y p e [PRA, HØ 92-155 (Fig. 3)] I s o t y p e s [C, HØ 92-156; AAU, HØ 92-157; H, HØ 92-158; S, HØ 92-159]: Denmark, Ø. Jylland (E Jutland), TBU-distr. 25, Fredericia, Nørre Voldgade, old embankment betw. “Landsoldaten” and “Det hvide vandtårn” (55°34'08" N 9°45'18" E) lawn, 6. 5. 1992 H. Øllgaard.

D e s c r i p t i o n: Sectio Ruderalia Planta magnitudine mediocris ad sat robusta, 30–45 cm alta vel altior. Folia late lanceolata ad oblonga, sat multilobata (lobis 5–6 utrimque), laete flavescenti-vel canescenti-viridia, glabrescentia. Lobi laterales deltoidei parum recurvi, integri, margine proximali fere recto ad concaviore, apicibus omnibus acutis vel subacutis. Interlobia rotundata ad angulata, plerumque subundulata et plicata, viridia. Lobus terminalis mediocriter magnus, acutus ad obtusus vel in apicem brevem plus vel minus abrupte protractus. Petioli anguste alati, foliorum exteriorum pallidi et parum rosei, intermediorum et interiorum rubri vel rosei, nervo medio pallido vel parce brunnescente striatulo. Scapi s ub involucris valde araneosi, ceterum glabrescentes. Involucrum subobscure viride, parce pruinosum. Squamae exteriores numerosi (18–25), 15–16 (–18) mm longae, plerumque circa 5 (interdum ad 7) mm latae, valde curvato-reflexae vel retroflexae, bene ordinatae, cano-virides et plus vel minus pruinosae, marginibus planis emarginatis, ad apicem virides, interiores latitudine inter se fere similis. Capitulum luteum, 45–60 mm diametro, convexum, mediocriter densum. Ligulae marginales 2.2–2.6 mm latae, parum canaliculatae, subtus stria cano-violacea quam ligula angustior ornatae, denticulis apicalibus luteis. Antherae polliniferae, granis pollinis diametro variis. Stigmata virescentia. Achenium stramineum, 3.5–3.9 (–4.1) mm longum (pyramide inclusa), superne spinulosum, spinulis mediocriter longis, mediocriter validis, rectis, pyramide 0.4–0.6 mm longa, fere cylindrica, levi ad levissime spinulosa. Rostrum 13–15 mm longum.

D e s c r i p t i o n: Section Ruderalia. Plant medium sized to rather tall and robust, 30–45 cm or taller. Leaves broadly lanceolate to oblong, rather multilobate (5–6 lobes on both sides), light green, faintly glabrescent above, unspotted. Sidelobes slightly recurved (shaped deltoid), undivided, entire (or almost), lower lobe edge almost straight or somewhat concave, lobe apices (in upper leaf half) all medium acute. Inter-lobes (in upper leaf half) broadly rounded to angular, usually somewhat undulate and plicate, green. Terminal lobe usually not distinctly larger than lateral lobes, obtuse to acute, without or with a rather short lingulate tip. Petiole wings narrow to broad. Petiole colour on outer leaves greenish, on inner leaves red, sometimes with all petioles pink to red. Midrib usually pallid to faintly brownish. Scapes rather glabrous, under buds hairy. Bud darkish green, faintly pruinose. Outer bracts numerous (18–25), 15–16 (–18) mm long, about 5.0 mm broad (sometimes 6–7 mm), curved-reflexed with tips bent outwards, rather regularly arranged, light green and whitish pruinose, not with red tip, margins flat and without hyaline border. Inner bracts almost equally wide, not coalescent. Capitulum 45–60 mm in diameter, medium
Fig. 1. – *Taraxacum ancistratum*, holotype.
Fig. 3. – *Taraxacum crassum*, holotype.
dense, with a convex profile. Outer ligules narrow (2.2–2.6 mm broad), slightly canaliculatae, on the underside with a greyish stripe which is narrower than the ligule. The apical teeth are yellow. Pollen present, heterogenous. Stigmas discoloured. Achene straw-coloured, 3.5–3.9 (–4.1) mm long (incl. cone). Achene spinules medium long, medium strong, straight, cone almost cylindrical, smooth, rarely faintly spinulose, 0.4–0.6 mm long. Rostrum 13–15 mm long.

*Taraxacum crassum* is a typical member of sect. *Ruderalia*, recognized by its pale leaf colour, equally sized and equally shaped side lobes, and reflexed, sigmoid, broad outer bracts. The closest morphological relative of *T. crassum* is *T. heptaticum* Railons., which has a similar leaf morphology, yet usually with a darker leaf colour and frequently tar-coloured interlobes (Fig. 5). The interlobes of typically developed outer (sometimes also middle) leaves of *T. heptaticum* are well-defined, angular, sometimes with a conspicuous tooth, not undulate and plicate, whereas those of *T. crassum*, when well-defined, are entire or only rarely more than subulate-toothed, often distinctly undulate and plicate (see Fig. 4). The outer involucral bracts of *T. crassum* are numerous (18–25), moderately reflexed with their tips bent outwards, whereas the bracts of *T. heptaticum* are usually 16–20 in number, retroflexed with their tips usually touching the scape under the bud. The outer flower ligules of *T. heptaticum* are wider (2.5–2.9 mm) than those of *T. crassum*. *T. crassum* somewhat resembles *T. rhamphodes* Hagl., but the latter species has mid-green leaves with the terminal lobes often rounded at the base. Besides, the outer involucral bracts of *T. rhamphodes* are bordered and red-tipped. Weakly developed specimens also look like *T. lingulatum* Markl., but have a different (lighter) leaf colour, more regularly arranged leaf lobes and different position of outer bracts (strongly retroflexed in *T. lingulatum*). When fully developed *T. lingulatum*, unlike *T. crassum*, often has some leaves with one or two lobe apices quite obtuse, and distant lobe pairs shaped more or less like birds’ wings.

**Habitat and distribution:** *Taraxacum crassum* is found in typical sect. *Ruderalia* habitats, such as roadsides, cultivated grass fields, lawns, and on ± disturbed soil in gardens and parks. The known distribution area is as follows:

Fig. 5. – Outer (a) and middle (b) leaf of Taraxacum hepaticum (left) and T. crassum (right) (T. hepaticum: Denmark, S Jutland, Højer, specimen HØ 01-156 (HØ), T. crassum: original collection).
The centre of distribution of *Taraxacum crassum* is seemingly the Czech Republic and Central Germany, where it is one of the commonest species, often abundant. In Denmark and Sweden it is seemingly a recent introduction. In Denmark, Jutland, Thorning, it is found growing together with some very rare, partly undescribed, species of sect. *Ruderalia*. However, in the Danish *T. crassum* localities, seen by the Danish author, including the type locality, it is abundant.

**Voucher specimens:**

- **Bulgaria:** Stara planina Mts., Šipka near Kazanlák, road margin near Bezludža Mt. (1441 m), ca. 1200–1300 m a.s.l. (ca. 42°45' N 25°23' E) (OL) – the plant collected in nature as radix (by R. Bělohlávková, 22. 7. 1998), cultivated and collected in botanical garden Průhonice in 1999 sub no. JS 6815. – **Czech Republic:** Central Bohemia: Zdice 4 km tds. W, Strouplínky Mlyn, meadow in forest, 8. 5. 1998 HÔ et al. HÔ 98-117 (H). W Bohemia: Konstantinovy Lázne 100 m E of hotel Jiřičenka, lawn, 14. 5. 1992 HÔ 92-199 (AAU, OL); do., in the town park, lawn, 14. 5. 1992 BT as *T. pilleus-napoleoni* ined. (HÔ); distr. phytogeogr. 28d.

- **Denmark:** (Baden-Württemberg, Bayern, Hessen, Mecklenburg-Vorpommern, Niedersachsen, Rheinland-Pfalz, Sachsen, Schleswig-Holstein). – **Poland** (Kielce, Warszawa). – **Slovakia** (W part). – **Sweden** (Skåne).
s. m. (49°34'06" N 17°29'54" E), 4. 5. 1994 BT (OL); distr. phytogeogr. 77b. Litenčické vrchy: Trouby (near Morkovice), meadow at brook near the road in the eastern part of the village (49°13'38" N 17°16'44" E), 3. 5. 1997 BT (OL); W Moravia: Drahanská plšina: Holštejn (near Błansko), 0.6 km NE of the village, meadow in the valley of Bílá voda River (49°24'33" N 16°47'06" E), 9. 5. 1990 BT T690/90 (HÖ); distr. phytogeogr. 68. Moravské podhůlí Vysočiny: Svítávka, meadow between road and railway ca. 0.5 km NW from the railway station (49°30'19" N 16°35'15" E), 18. 5. 1996 BT (OL); distr. phytogeogr. 71b. Drahanská plšina: Křtiny, meadows in brook valley near the arboretum ca. 2.5 km N of the village, ca. 470 ms. s. m. (49°19'12" N 16°44'39" E), 12. 5. 1994 BT (OL); distr. phytogeogr. 71c. Drahanské podhůlí: Křtiny, meadows along the road Křtiny-Jedovnice near N margin of the village, ca. 440 m s. m. (49°18'20" N 16°44'46" E), 12. 5. 1994 BT (OL), S Moravia: distr. phytogeogr. 18a. Dyjsko-svratecký úval: Kostice, meadows ca. 1.5 km SE of the village, ca. 160 ms. m. (48°44'17" N 16°59'39" E), 30. 4. 1995 BT (OL); distr. phytogeogr. 20a. Bučovická pahorkatina: Nesovice, wet meadow along Litava Brook in the village (49°09'03" N 17°05'16" E), 3. 5. 1997 BT (OL); distr. phytogeogr. 68. Břilé Karpaty lesní: Vyškovce, marsh at brook ca. 1.3 km SE from the Príslop Hill (711 m), nature reserve “Chmelinec”, ca. 450 m s. m. (48°56'26" N 17°51'10" E), 10. 5. 1994 BT (OL). E Moravia: Moravskoslezské Beskidy, Prostřední Bečva, S of the village, 0.5 km N of the hill Hákovský vrch (671 m), pasture, ca. 550 m.s.m., 16. 5. 1993 BT as T. pilleus-napoleoni ined. (distributed by J. Kirschner & J. Štěpánek: Taraxaca Exsiccata, fasc. IX (1995–1996), No. 395); Distr. phytogeogr. 79. Zlínské vrchy, Bílovice, grassy area in the arboretum of the village, 8. 5. 1996 BT (distributed by J. Kirschner & J. Štěpánek: Taraxaca Exsiccata, fasc. XI (1998), No. 547); Rožnov pod Radhošťem, 4 km tds. Vsetínské Vrchy, Hutisko, 1 km sds. dolsá, meadow, 12. 5. 1998 HÖ & BT HÖ-98-333 (H); Rožnov pod Radhošťem, 5 km tds. Vsetínské Vrchy, Vašlava Bystřice, in the village, ruderal ground, 12. 5. 1998 HÖ & BT HÖ-98-347 (OL); distr. phytogeogr. 82. Javorníky: Karolinka, meadows in the Stanovnice Brook valley, ca. 3–4 km SE of the railway station (near settlement Stanovnice), ca. 600 m s. m. (49°19'48" N 18°17'63" E), 14. 5. 1994 BT (OL); distr. phytogeogr. 82. Javorníky: Velké Karlovice, small meadow at road near SW margin of the village (49°07'34" N 17°16'18" E), 6. 5. 1997 BT (OL); distr. phytogeogr. 78. Břilé Karpaty: Buchlovice, meadow at brook ca. 1 km SW of the village (49°17'55" N 17°18'02" E), 3. 5. 1997 BT (OL); distr. phytogeogr. 77c. Chřiby: Stanovice: Brook valley, ca. 3-4 km SE of the railway station (near settlement Stanovice), ca. 600 m s. m. (49°19'04" N 17°16'09" E), 3. 5. 1997 BT (OL); distr. phytogeogr. 71c. Chřiby: Taraxaca Exsiccata, fasc. XI (1998), No. 533); Leun tds. N, Leuner Bachtal, meadow, 10. 4. 1999 KJ 320.13 (distributed by J. Kirschner & J. Štěpánek: Taraxaca Exsiccata, fasc. XI (1998), No. 547); do., 16. 5. 1994 KJ 152/94, 153/94 (KJ); do., 17. 5. 1994 KJ 166/94, 167/94, 170/94 (KJ); Niederweidbach, Mudersbacher Str. 3, lawn, 8. 5. 1994 KJ 102/94 (KJ); do., 14. 5. 1994 KJ 143/94 (KJ); do., outsk. tds. SE, ruderal vaste area, 17. 5. 1999 HÖ et al. HÖ-98-404 (C).
**D** **e** **s** **c** **r** **i** **p** **t** **i** **o** **n**: Sectio *Ruderalia*. Folia mediocriter viridia ad sat obscure canoviridia, plerumque araneosa, maculis dispersis nullis. Petioli anguste ad late alati, ± purpurei. Nervus medianus viridis ad parce rubescens vel brunnescens, colore non striatulo. Lobi laterales deltoidei integri, foliorum exteriorum parte apicali saepe subclavata, apicibus loborum lateralis in parte exteriore foliorum plerumque mediocriter acutus, margine superiore loborum recto ad sinuoso, in foliis exterioribus saepissime uno dente conspicuo instructo, in foliis intermediis magis et varie dentato, margine inferiori loborum fere recto vel vario, plerumque fere integro, raro dente conspicuo. Lobus terminalis plerumque parvus, tamen interdum in foliis interioribus magis lobulato apicali subobtuso ad acute, mucrone bene definito nullo. Interlobia partis exterioris folii acutangula vel angulata et bene definita, plana ad parum plicata, viridia vel subpiceata, ad nervum medianum saepe striata fuscus snugastissima instructa. Scapi sub involucro valde, ceterum minus, araneosis. Involucrum laete ad obscure viride, parce pruinose. Squamae exteriores 16–17 mm longae, 4.0–4.9 mm latae, sordide rubescens-viridia ad ± obscure rubescentes, regulares, retroflexae, marginibus planis non hyalinae, apice laevi. Squamae interiores latitudine inter se similes. Capitulum luteum, apertissime florens 50–55 mm diametro, mediocriter densum, convexum. Ligulae planae, denticulis apicalibus rubris, subus quam ligula angustior pallide canorubescente ornatae. Antherae polliniferae, granis pollinis diametro variis. Stigmata virescentia. Achenium (vide Fig. 7) paratypis fructiferi) fusco-stramineum, 3.9–4.1 mm longum (pyramide inclusa), pyramide 0.6–0.7 mm longa sub-cylindrica laevi vel interdum subspinosula, superne spinulosum, spinulis mediocriter longis, perrobustis, rectis. Rostrum 12 mm longum vel longius. Pappus sordide albus.
Taraxacum deltoidifrons is intermediate between the two relatively well-known species T. laciniosifrons Winst. et M. P. Chr. and T. stenoglossum Brenner (syn.: T. dahlistedtii Lindb.f.). In some cases T. deltoidifrons is difficult to separate from both with certainty, especially if the number of specimens at a locality is small. Drawings of the leaves of typical specimens of the 3 species (Fig. 8) together with the comparison of the morphological differences between them (Table 1) might help in the identification.

All three species were cultivated to confirm stability of their characters.

Habitat and distribution: Taraxacum deltoidifrons is a typical representative of sect. Ruderalia, growing in disturbed and cultivated soil such as roadsides, fallow fields, gardens, parks, lawns, waste sites etc. It has been found in the Czech Republic, Germany, and Denmark.

Fig. 8. – Outer leaf (1), middle leaf (2), and inner leaf (3) of A: *Taraxacum stenoglossum* (HØ 00-136 in herb. HØ), B: *T. deltoidifrons* (HØ 01-23 in herb. HØ), and C: *T. laciniosifrons* (HØ 546 in herb. HØ).
Table 1. – Morphological differences between three species of *Taraxacum*. Characters of living plants are described.

<table>
<thead>
<tr>
<th>Character</th>
<th><em>T. deltoidifrons</em></th>
<th><em>T. stenoglossum</em></th>
<th><em>T. laciniosifrons</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaves habit</td>
<td>± prostrate</td>
<td>± erect</td>
<td>± prostrate</td>
</tr>
<tr>
<td>Leaf colour</td>
<td>dull grey green</td>
<td>bluish green</td>
<td>yellowish green</td>
</tr>
<tr>
<td>Petiole wings</td>
<td>present</td>
<td>absent</td>
<td>present</td>
</tr>
<tr>
<td>Petiole colour</td>
<td>medium red</td>
<td>strongly red</td>
<td>medium red</td>
</tr>
<tr>
<td>Interlobes habit</td>
<td>flat</td>
<td>flat</td>
<td>crispate</td>
</tr>
<tr>
<td>Tar stripes along midrib</td>
<td>often present</td>
<td>absent</td>
<td>usually present</td>
</tr>
<tr>
<td>Lobes density resp. direction</td>
<td>normal, recurved</td>
<td>normal, recurved</td>
<td>crowded, patent</td>
</tr>
<tr>
<td>Outer leaves lobe apex</td>
<td>± club-shaped</td>
<td>normal</td>
<td>normal</td>
</tr>
<tr>
<td>Outer bracts colour</td>
<td>± dirty purplish</td>
<td>green</td>
<td>green</td>
</tr>
<tr>
<td>Ligule teeth</td>
<td>red</td>
<td>yellow</td>
<td>yellow</td>
</tr>
</tbody>
</table>

*Taraxacum infuscatum* H. Óllg., *spec. nova*

**Holotype**: [C, HØ 90-101 (Fig. 9)] 
**Isotypes**: [L, HØ 90-98; AAU and PRA, HØ 90-99; S, HØ 90-100]: Denmark, N Jutland, TBU-distr. 9, Skive, Krabbesholm Skov, at Havnegaden (pos.: 56°34'32" N 9°02'46" E), grassy verge, 23. 4. 1990 H. Óllgaard

Fig. 6. – *Taraxacum deltoidifrons*, holotype.
Fig. 9. – Taraxacum infuscatum, holotype.
perlongis (18–20 mm vel etiam longioribus), ca. 3.7 mm latis, retroflexis, ± irregularibus, apicibus tenuibus, levibus, interioribus latitudine inter se fere paribus. Calathium luteum, convexum, mediocriter densum, diametro ca. 55 mm. Ligulae marginales planae, denticulis apicalibus florum siccorum rubris, subitus stria cano-rubescente angusta ornatae. Antherae pollini-nerae, granis pollinis diametro variis. Stigmata virescentia. Achenium (holotypi) stramineum, ca. 4.1 mm longum (pyramide inclusa), spinulis mediocriter longis, mediocriter robustis, rectis ad parum recurvis. Pyramis cylindrica, levis, 0.6–0.7 mm longa, rostro ca. 12 mm longo.

Description: Section Ruderalia. Plant medium-sized to rather large, forming rosettes of 25–30 cm long, ascending leaves. All leaves with many distinct leaf lobes, greyish green to mid-green, faintly glabrescent above, without scattered spots. Leaf lobes recurved, deltoid, sometimes slightly falcate, undivided, with straight to somewhat irregularly shaped upper edge, with robust teeth of irregular size. Lower lobe edge straight (or almost so), entire. Lobe apices medium acute. Interlobes (in upper leaf half) well differentiated, angular, flat to somewhat plicate, ± blotched ("tar coloured"). Terminal lobe not larger than lateral lobes, medium acute or with gradually elongate or linguide apex. Petiole wings narrow to broad. Petiole colour green to white in all leaves, or with age ± reddish in inner leaves. Midrib green to faintly brownish, not with striatulate pattern. Scapes arachnoid under the buds, elsewhere scarcely araneose. Involucre light to dark green, only faintly pruinose. Outer bracts 18–20 mm long (or more), about 3.7 mm broad, deflexed, ± irregular, coloured whitish or greenish, rarely faintly reddish. Margin of outer bracts flat to recurved, without hyaline border. Bracts tips thin, without corniculations. Inner bracts almost equally wide, not coalescent. Capitulum medium dense, ca. 55 mm in diameter, profile ± convex. Outer ligules flat, with a narrow, reddish grey stripe. Ligule teeth red, at least in dried material. Pollen present, the pollen grains of varying diameter. Stigmas discoloured, but not blackish. Achene (of holotype, Fig. 10) straw-coloured, about 4.1 mm long (incl. cone). Achene spinules medium long, medium strong, straight to slightly recurved. Achene cone cylindrical, smooth, 0.6–0.7 mm long. Rostrum length about 12 mm.

_**Taraxacum infuscatum**_ is recognized by its pallid petioles and uniform, multilobed, lustreless leaves of a rather pallid green colour, which emphasize the occurrence of ± tar-coloured interlobes. The endlobes are small (also on inner leaves). Another specific character is the extremely long outer involucral bracts, which are mainly strongly deflexed, some of them, however, deviating in being irregularly twisted or less strongly reflexed. The tips of the outer involucral bracts are thin and irregularly bent, without corniculations.

_**Taraxacum infuscatum**_ is a morphological relative of _T. planum_ Raunk. emend. H. Øllg., _T. planoides_ Hagend., v. Soest et Zevenb., _T. trilobatum_ Palmgr., and of several still unsat-
isfactorily known (and undescribed) species of that group in the Netherlands and Germany. The group is characterized by reflexed, often irregular outer involucral bracts, winged petioles, ± patent habit, and ± alternate lateral lobes. The type of *T. planoides* has much shorter outer bracts, about 11 mm long. The lateral lobes are less dentate with very acute tips, not subfalcate and the petioles are red. The interlobes are green. The outer bracts of *T. trilobatum* are almost regular. *T. planum*, which shows the greatest variation in leaf shape of all 4 species, in its typical appearance is separated from *T. infuscatum*, e.g., by more plicate, pink-petioled, somewhat glossy, yellowish pure green leaves with large endlobes on inner leaves. Again, the interlobes are green. When less typically developed, *T. planum* produces fewer, more irregularly shaped, lateral lobes with longer apical processes.

*T. infuscatum* is often abundant, which enables collectors to observe the uniform lobation in tar colour and intensity, petiole colour, bract length etc. The specific epithet reflects the pronounced tendency of the leaves to have dirty, somewhat tar-coloured interlobes.

Habitat and distribution: *Taraxacum infuscatum* occurs on ± disturbed soil in parks and gardens, on roadsides, grass fields, etc., showing no differences in ecology from the great majority of species in sect. *Ruderalia*. It is not a common species, but it is widely distributed and usually abundant where it occurs. *T. infuscatum* has been found in the following European countries: Czech Republic, Denmark, Finland, France, Germany, Netherlands, Poland, and Sweden.


**Taraxacum jugiferum** H. Öllg., *spec. nova*

*[Taraxacum jugiferum* H.Öllg., nomen in Meierott (2001: 116)]

**Holotype** [C, HØ 83-101 (Fig. 11)] **Isotype** [PRA, HØ 83-102]: Denmark, Funen, TBU-distr. 29, Bogense, outskirts tds. Odense, (pos.: 55°33′08″ N 9°29′14″ E), grass field, 7.5.1983 H. Öllgaard. Paratype for achene description from the type locality, collected 14.5.1977 (HØ 77-111, in herb. HØ).


**Description:** Section *Ruderalia*. Plant rather tall (30–50 cm) and slender. Leaves light yellowish grey-green, usually glabrescent, without dispersed spots. The petioles of the outer leaves are narrowly winged, usually faintly rose-coloured, those of middle and inner leaves are unwinged and intensely rose-coloured. The midrib is green to faintly brownish, without striatulate pattern. The lateral leaf lobes are deltoid and undivided, ± falcate or with a distinctly convex upper edge, which is entire or with many thin and small teeth. The lower lobe edge is ± concave, often with both tiny and bigger tooth. The
sidelobe apices are medium acute in the upper leaf half. The endlobe is often conspicuously larger than the side lobes, at least on inner leaves, with a medium acute, sometimes well-differentiated tip on the apical lobule. The interlobes are broadly rounded, flat, green.

The scapes are arachnoid under the buds, elsewhere glabrescent. The buds are light to dark green, not (or faintly) pruinose. The outer bracts are 13–15 mm long, about 4.3 mm broad, light green, sometimes with a pink hue. They are regularly arranged, ± horizontal to ± curved-reflexed, with flat margins and usually with a very narrow hyaline border. Bracts corniculations are absent. The inner bracts are almost equally wide, not coalescent. The fully flowering capitulum is 50–55 mm in diameter, lax to medium dense, and with a ± convex profile. The flower colour is medium yellow. The ligules are flat or faintly canaliculate, with yellow apical teeth, and a reddish grey stripe beneath. Pollen present, irregular as to size. The stigmas are only slightly discoloured.

The achenes (Fig. 12) are straw-coloured to greyish brown, usually ca. 4.5 mm long (incl. cone). The achene cone is ca. 0.8 mm long, cylindrical (or almost so), ± spinulose. The achene spinules are present in upper half of the achene, they are medium long to very long, medium strong, straight. The rostrum length is about 10–11 mm.

*Taraxacum jugiferum* is an elegant, tall, light green species, which cannot be confused with other species. Because of its leaf colour and habit it can be compared with the well-known and widely distributed species *T. amplum* Markl., but the lobe edges of the former usually are densely toothed with tiny subulate-teeth, at least on some leaves. Plants from W Bohemia and Denmark have been in comparative cultivation. A common modification of *T. jugiferum* has lobes shaped like a yoke, which accounts for its Latin name.

**Habitat and distribution:** *Taraxacum jugiferum* seems to prefer habitats similar to those of most other species of section *Ruderalia*, i.e. grass fields, meadows, waste areas near cities and villages, roadsides, gardens, parks, etc. Like the other *Ruderalia* species it is dependent on disturbance. Repeated visits to the Danish location of this species has shown that it is able to spread abundantly from an old cultivated meadow to a new road-side, with both perennial and annual vegetation.

The native distribution area of *Taraxacum jugiferum* is Bohemia and Central Germany, where the species is commonly found. The Danish location is isolated, but the growth there is abundant. *T. jugiferum* was first found there about 25 years ago, but was probably introduced to the site several years before, maybe with German troops during World War II, when there was a German camp in the vicinity.
Fig. 11. – *Taraxacum jugiferum*, holotype.
Fig. 13. – *Taraxacum lundense*, holotype.

Fig. 14. – Taraxacum lundense, achene of isotype (HW 4767).

**Taraxacum lundense** H. Öllg. et Wittzell, spec. nova

[Taraxacum lundense H. Öllg. et Wittzell, nomen in Svensk Bot. Tidskr. 95: 79, Fig. 1 (2001)]

**Holotype** [LD, HW 4771, Fig. 13] **Isotypes** [HW, HW 4767, 4768, 4769, 4770, 4772]; isotypes will furthermore be represented in several herbaria, distributed through Kirschner & Štěpáněk: Taraxaca exsiccata, fasc. XIII, No. 601]: Sweden, Scania (Skåne), Borgeby parish, 1.4 km SW of the church, (pos.: 55°44.4' N 13°02.0' E) (RUBIN 2C6f 2507), grassland, 15.5.1997 H. Wittzell

**Description:** Section *Ruderalia*. Plant medium-sized to rather tall (20–50 cm). Leaves ± erect and robust, dark green to bluish green, faintly or (in inner leaves) obviously hairy, and without scattered spots. All leaves have red to dark pruripish petioles. Especially on the inner leaves the midribs tend to become brownish to puprlish brown throughout, without striatulate pattern. The petioles are narrowly winged. All leaves have distinct, recurved, deltoid, medium acute, undivided leaf lobes with ± patent tips, and with straight to irregular, entire to (rarely) toothed, upper edge and straight to irregularly convex, entire or subulate-dentate, lower lobe edge. The terminal lobes are medium-sized with differentiated tip, in the inner leaves they are usually conspicuously larger than the side lobes. The interlobes are well differentiated, angular, flat to faintly or irregularly plicate, very often with faint interlobe blots ("tar colour"). The scapes are arachnoid under the buds, elsewhere faintly to distinctly arachnoid. The buds are medium green to dark green, not pruinose (or faintly so). The outer bracts are 12–13 mm long, 3.0–3.9 mm broad, greenish to irregularly dirty reddish to brownish on upper (inner) surface, rather regularly arranged, horizontal to slightly recurved, with flat margins and without a distinct hyaline border. The tips of the involucral bracts have no corniculations. The inner bracts are almost equally wide, not coalescent. The fully flowering capitulum is medium yellow, ca. 55 mm in diameter, medium dense, with a ± convex profile. The ligules are flat, beneath with a greyish ligule stripe which is narrower than the ligule. The apical ligule teeth of the inner flowers are yellow. Pollen is produced, the pollen grains are heterogenous as to size. The stigmas are discoloured, but not blackish. The achenes (of the isotype specimen HW 4767, Fig. 14) are straw-coloured to greyish brown, 4.3–4.6 mm long (incl. the 0.8–1.0 mm long, cylindrical, ± spinulose, cone). The achene spinules are short to medium long, medium strong, incurved. Rostrum is 12 mm long or longer, with a dirty white pappus.

*Taraxacum lundense* is easily distinguished from other *Taraxacum* species of section *Ruderalia* by its leaf characters: the ± purplish midribs, the rather dark faintly bluish leaf colour, and the large almost entire sidelobes, which are patent in the outer part and are only moderately acute. The almost entire and angular interlobes and the large endlobes of the inner leaves further contribute to the characteristics of this seemingly rather invariable species. *T. lundense* is shown as a photo in Svensk. Bot. Tidskrift 95: 2 (2001), p. 79, Fig. 1.

When *Taraxacum lundense* was first collected in Lund (S Sweden), after which it is named, it was preliminarily concluded that it was a strongly coloured modification of *T. huelphersianum* Dahlst. ex Hagl., with which *T. lundense* shares relatively small, only little recurved outer bracts, and large endlobes on the inner leaves. However, several new records of *T. lundense* from around Lund, and cultivation of this species for several years convinced us that the characteristic dark midrib and petiole colour of this species is stable. *T. lundense* is far less “dusty” in appearance than the greyish *T. huelphersianum*. In addition, the lateral lobes of *T. huelphersianum* are far more acute than those of *T. lundense*.

*T. crassum* and *T. hepaticum* (resp. described and illustrated above) share several leaf characters with *T. lundense*, but the former 2 species only rarely have purplish midribs and large endlobes on inner leaves, and both have far more recurved outer bracts. Furthermore, as to leaf shape, *T. lundense* might have a slight resemblance to young *T. aequilobum*, but the greenish midrib and the longer, irregularly twisted outer bracts of the latter species are good characters for separating these species.
Habitat and distribution: *Taraxacum lundense* is found growing, often abundantly, in habitats that are typical for members of section *Ruderalia*, i.e. on soil more or less influenced by human activity, such as roadsides, fallow fields, lawns, disturbed areas near towns and villages, etc. The distribution area, disjunct (Czech Republic, Denmark, Sweden) at present, is expected to also include at least Germany and Poland.

Voucher specimens: Czech Republic: N Bohemia: Krásná Lípa, 2 km tds. Mikulášovice, Krásný Buk, meadow 9. 5. 1998 L. Drábková et al. HØ 98-137 (HØ); do., Varnsdorf W outskirts, 1 km tds. Studánka, fallow field 9. 5. 1998 L. Drábková et al. HØ 98-135, -136 (HØ); do., Varnsdorf W outskirts, 1 km tds. Studánka, fallow field 9. 5. 1998 L. Drábková et al. HØ 98-157 (HØ). – Sweden: Scania (Skåne): Lund, Klosterkyrkan (= S:t. Peters kapell), verge 1990 and later, HW (HW); do, 12. 5. 1995 HW & HØ HØ 95-100 (HØ); Eslöv E outskirts, Pär Håkanssonväg, roadside 12. 5. 1995 HW & HØ HØ 95-99 (HØ); do., Trehäradsvägen, at a bicycle-track, grassy slope 12. 5. 1995 HW & HØ HØ 95-95, -96 (HØ), HW 4212-4217 (HW); root of parallel specimen planted for cult. in Birgittelyst. Offspring coll. 2. 5. 2000 HØ 00-77, -78, -79, -80 (HØ); Stora Råby parish, Råbytorp, fallow field to the west of the farm 16. 5. 1996 HW 4475 (HW); Borgeby parish, 1.4 km SW of the church, grassland 15. 5. 1997 HW (type collection, see above); Kävlinge parish, 300 m W of the sports ground, tree-planted former field, abundant 9. 5. 1998 HW 5085 (HW); Lund, Norra Nöbbelöv parish, Gunnesbo, 100 m NNE of the railway station, roadside 27. 4. 2000 HW 5600 (HW). – Denmark: E Jylland (E Jutland): Hinnerup, Rrånbækcentret, between bushes 3. 5. 1998 HØ & TBP TBP 98-456 (TBP); do., at a cycle path, road slope 3. 5. 1998 HØ & TBP HØ 98-101, -102, -103 (HØ).

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Souhrn


References


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