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TWO NEW SPECIES OF *TARAXACUM* (ASTERACEAE) FROM EASTERN POLAND

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Abstract: *Taraxacum glowackii* and *T. podlachiacum* (sect. *Ruderalia*), both with an agamospermous reproduction mode, are described as new species, illustrated, and compared with morphologically related species. Voucher specimens are cited.

Key words: *Taraxacum*, sect. *Ruderalia*, taxonomy, new species, distribution

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The agamospermous reproduction mode of the genus *Taraxacum* in northern Europe was detected 100 years ago by C. Raunkiær (1903) after his pollination and emasculation experiments with non-polliniferous dandelion mother plants. The dandelions examined, both pollen-producing and non-polliniferous specimens, were shown to produce germinable fruits which, in the following cultivation, appeared to be exact copies of the respective mother plants. In the ensuing years many *Taraxacum* taxa were described as new species in Northern Europe, many after having been studied in cultivation. The nature, characteristics, and variation of apomictic dandelions is described, for example, in the first part of *Flora of Great Britain and Ireland* (Dudman & Richards 1997).

An ongoing study of dandelions in other parts of Europe has produced further knowledge of the *Taraxacum* flora in other parts of Europe. While the *Taraxacum* species of Northern Europe are more or less stabilized apomictic taxa, this is not the case in several regions in Southern and Southeastern Europe, where diploid sexual dandelions are part of the flora. An updated map showing the distribution of sexual dandelions in Europe is given by Uhlemann (Uhlemann 2001). An uncomplicated way to determine whether a dandelion specimen is an apomict or not, both in herbaria and in nature, is to study pollen diameter: great variation of diameter indicates an apomictically reproducing, stabilized plant, whereas homogenous pollen indicates an unstable taxon. Accordingly, the description of a *Taraxacum* species should include information on pollen characteristics. A slower method is to cultivate the actual plant, observing the fruiting of a flowerhead made inaccessible to insects.

With the above-mentioned conditions for proper evaluation of *Taraxacum* species in mind, study of that genus is proceeding in poorly known regions of Europe, not least to determine the occurrence of already known species. Initiated by Professor Zygmunt Głowacki (Siedlce, Poland), fruitful cooperation between a team of botanists from eastern Poland and the present author started some years ago. A comprehensive exchange of *Taraxacum* specimens between us, and two joint excursions in northern and eastern Poland (Półwysep Helski peninsula in 1997 and the Mazowsze/Podlasie regions in 1998) have yielded several novelties. Most have been published (Białasz & Głowacki 1999; Głowacki & Øllgaard 1999; Øllgaard *et al.* 2000, 2002a, b), and more are to follow. Our investigations have also resulted in finds of two species of *Taraxacum* (sect. *Ruderalia*) unknown to us. After cultivation and closer study of both, as well as comparison of descriptions of morphologically similar species, the present author has decided to describe them as new. Both species are easily recognized in the field, and

usually in herbaria as well. Living plants (cultivated from fruits of the respective holotypes) are still being cultivated in the author's garden, and germinable achenes are kept in the author's herbarium for distribution on request. So far the main distribution area of both species appears to be the one from which they are described, that is, eastern Poland, and they are rare outside that region. One find of *T. podlachiacum* in northwest Poland (Szczecin region) suggests the possible occurrence of that species in eastern Germany.

Taraxacum glowackii H. Øllgaard, *sp. nov*.
(Figs 1–3)

Planta mediae magnitudinis, sat gracilis, foliis saepe patentibus. Folia laete viridia, supra glabrescentia, maculis dispersis nullis. Petioli anguste vel sat late alati, aut exteriores pallidi et intermedii et interiores parum

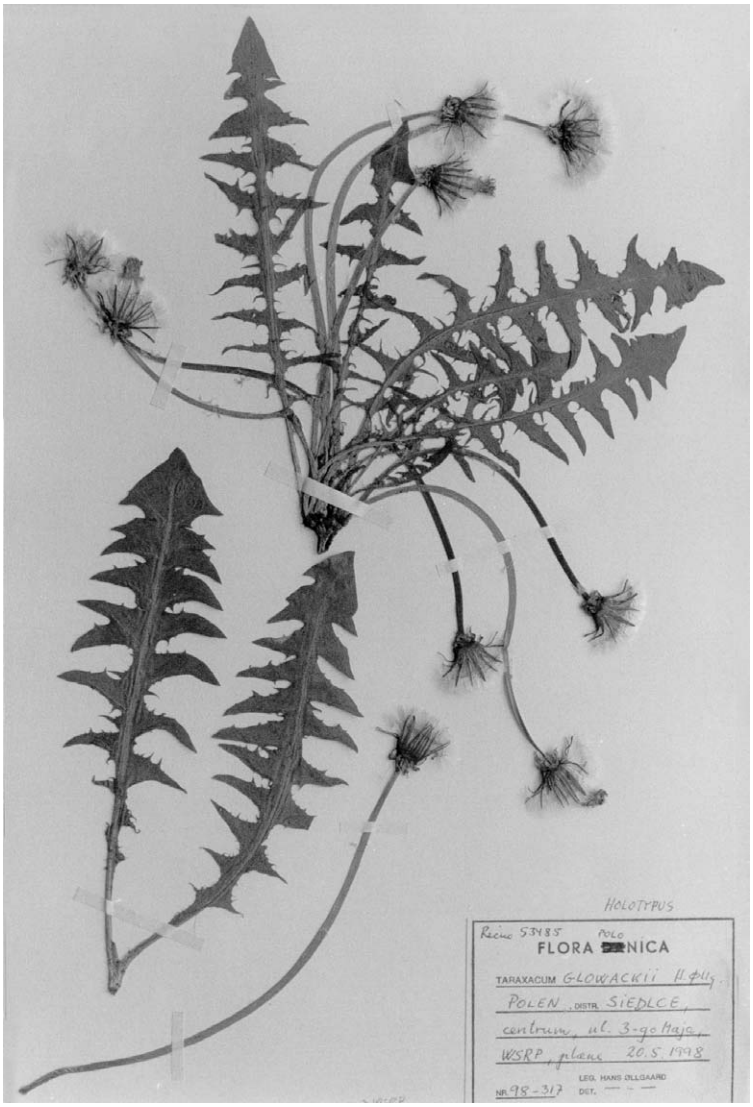

Fig. 1. Holotype of *Taraxacum glowackii* H. Øllgaard, *sp. nov*. (*H. Øllgaard 98–317*, WSRP).

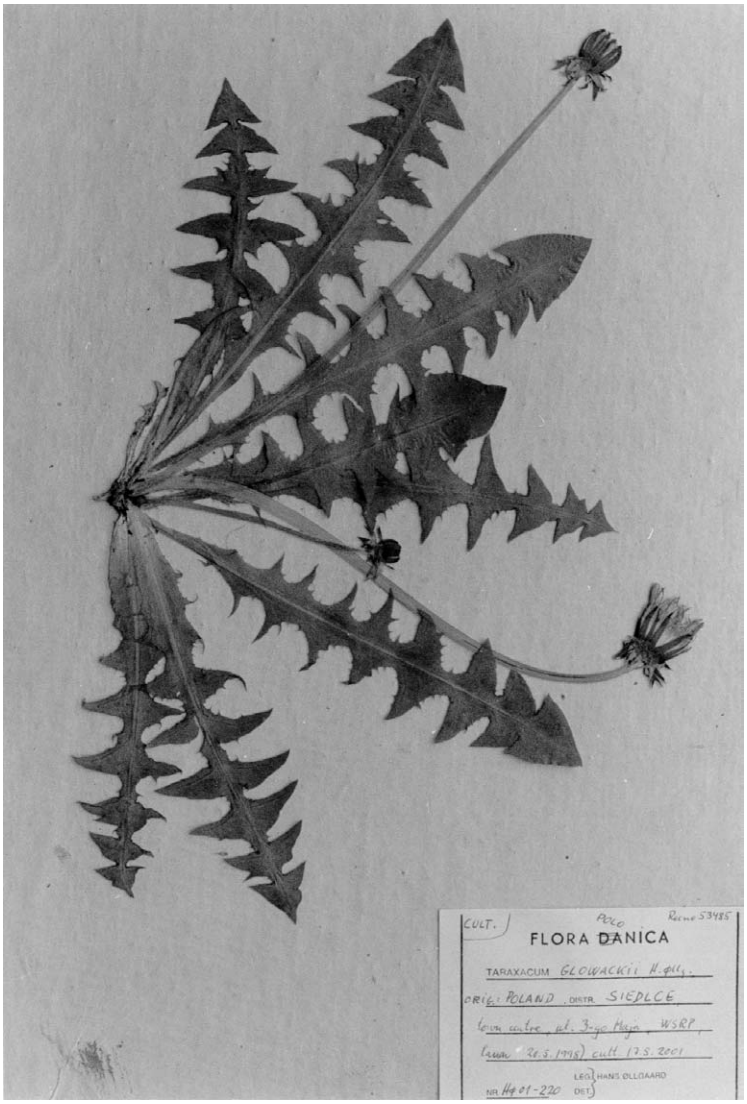

Fig. 2. Specimen cultivated from holotype achenes of *Taraxacum glowackii* H. Øllgaard, *sp. nov*. (hb. Øllgaard).

rubescentibus, aut omnes ± rubescentes, nervo mediano supra plerumque pallido rarius squalide brunnescente, non striatulo. Folia saepe multilobata, lobis lateralibus patentibusvel saepius parum recurvis et deltoideis, integris, margine superiore ± convexo integro vel dentibus magnitudine variis munito, margine inferiore ± concavo vel fere recto integro-subulato-dentato vel (interdum) dente conspicuo instructo, apice loborum lateralium subacuto. Lobus terminalis magnitudine mediocris, obtusus vel subacutus, interdum apice ipso mucrone bene definito paulo protracto. Interlobia bene definita saepe angulata, plana vel parum plicata, viridia. Scapi sub involucro araneosi, ceterum glabrescentes. Involucrum laete ad sat obscure viride, parce pruinosum. Squamae exteriores lanceolatae, 12–13 mm longae, circa 3.5 mm latae, sat regulares, ± curvato-reflexae vel retroflexae, ad marginem planae non hyalinae, ad apicem laeves vel parum corniculatae. Squamae interiores latitudine subconformes. Calathium circa 45 mm diametro, densitate media, convexum, mediocriter luteum. Ligulae margi-

nales planae vel subcanaliculatae, subtus stria quam ligula angustiore cano-violacea ornatae, denticulis apicalibus florum intermediorum et interiorum luteis. Antherae polliniferae, granis pollinis diametro variis. Stigmata virescentia. Achenium stramineum, 4.2–4.4 mm longum (pyramide inclusa), pyramide subcylindrica 0.8–1.0 mm longa laevi ornatum, superne spinulosum, spinulis mediae longitudinis vel longioribus robustiuculis rectis. Rostrum 10–11 mm longum, pappo albo coronatum.

A plant of normal size for a member of Taraxacum sect. *Ruderalia*, but with an elegant and slender appearance due to its rather patent leaves with narrow midribs. Leaf color strikingly light green; this, together with the rather uniformly many-lobed, glabrescent leaves, attracts the attention of the student. Petiole wings narrow to broad. Petiole color mostly pale, but on inner petioles and sometimes all petioles can be ± reddish, especially late in flowering season. Midrib green to faintly brownish. Leaf lobes typically patent, narrow and long, or recurved (deltoid shaped) especially in younger specimens, usually undivided (rarely dissected by deep incisions), usually with a distinctly convex upper edge which is often entire, but also with teeth here and there. Lobe apices uniformly medium acute to very acute. Lower lobe edge ± concave to almost straight, usually entire to subulate-dentate, but sometimes with a conspicuous tooth. Terminal lobe small to medium-sized, obtuse to acute, mostly without distinct tip, sometimes with faintly differentiated tip. Interlobes well differentiated, angular, flat to faintly or irregularly plicate, green. Scapes glabrescent but hairy under buds. Flower bud light to dark green, not (or faintly) pruinose. Outer bracts 12–13 mm long, 3.0–3.9 mm broad, greyish green, rather regularly arranged, ± curved-reflexed or deflexed to vertical position. Margin of outer bracts flat, without hyaline border. Bract corniculations absent or casual and faint. Inner involucral bracts mostly equally wide, not coalescent. Fully flowering capitulum *ca* 45 mm in diameter, medium dense, with ± convex profile, medium yellow. Ligules flat or slightly canaliculate, with yellow ligule teeth. Outermost ligules striped beneath; stripe narrower than total ligule width, greyish. Pollen present, with pollen grains of varying diameter. Stigmas discolored but not blackish. Achenes straw-colored to greyish brown, 4.2–4.4 mm long (incl. cylindrical, smooth cone 0.8–1.0 mm long). Achene spinules medium long to very long, medium strong, straight. Rostrum length 10–11 mm.

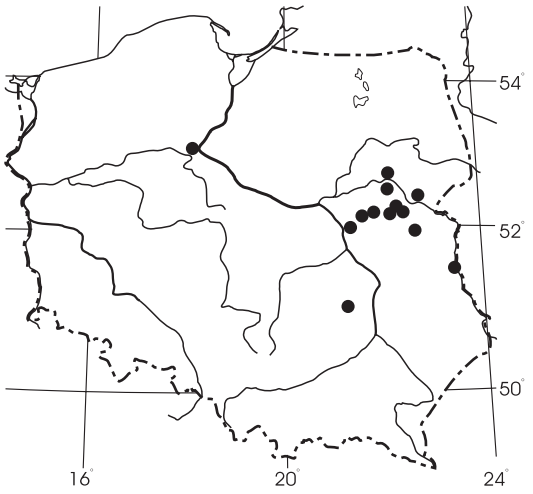

Fig. 3. Distribution map of *Taraxacum glowackii* H. Øllgaard, *sp. nov*. in Poland.

HOLOTYPE: POLAND, Siedlce, town center, 3-go Maja St., at University of Podlasie, lawn (52°09′52″N 22°16′24″E), 20 May 1998, *H. Øllgaard 98–317* (WSRP). – ISOTYPES: *H. Øllgaard 98–316* (C); *H. Øllgaard 98–318* (DR); *H. Øllgaard 98–319* (PRA); *H. Øllgaard 98–315* (hb. Øllgaard). – CULTIVATED SPECIMENS (offspring from holotype, cultivated in Birgittelyst, Denmark, 17 May 2001) in WSRP (Fig. 2), PRA, and hb. Øllgaard.

ETYMOLOGY. *Taraxacum glowackii* is named after the eminent Professor Zygmunt Głowacki, Siedlce, whose thorough investigations of the flora of eastern Poland also included a successful study of the genus *Taraxacum* in that region, increasing knowledge of *Taraxacum* flora in eastern Poland from almost nil to a remarkable level in the course of a few years.

Taraxacum glowackii is a rather conspicuous species which has proved its stability in cultiva-

tion. Superficially, and mostly in herbaria, it recalls *T. quadrangulum* Railons. which shows the same strange type of leaf lobation – patent, rather dense, long and narrow, acute lobes with some tendency to produce downwards-pointing conspicuous teeth on the lower edges, and also with ± pale petioles. However, *T. quadrangulum* is a larger species with stronger leaves with broader petiole wings, and larger flowerheads (about 60 mm in diameter) with broader (*ca* 4.5 mm) and longer (16–17 mm) outer bracts, shorter achene spinules and cone, and longer achenes (*ca* 5 mm).

Another morphological relative of *T. glowackii* is *T. demotes* Sahlin, described from Bavaria, Germany (Sahlin 1979). However, the latter species is described as having purely yellow stigmas and a shorter achene cone. Besides, *T. demotes* should be regarded as a diploid plant (Sackwitz *et al*. in Wisskirchen & Haeupler 1998). *T. glowackii* is a triploid species and in cultivation has been shown to be a stable species with rich fruiting, also in isolated capitula. The irregular pollen diameter also indicates triploidy.

ADDITIONAL MATERIAL SEEN. POLAND. Mińsk Mazowiecki, Stankowizna, forest road, 28 May 1999, *Z. Głowacki s.n*. (WSRP). – Siemiatycze, bus stop 6.5 km SE of Siemiatycze railway station, ruderal ground, 21 May 1998, *Z. Głowacki*, *J. Krechowski & H. Øllgaard 98–324* (hb. H. Øllgaard), *Z. Głowacki 98* (WSRP); *ca* 1 km SSE of Siemiatycze railway station, roadside, 21 May 1998, *Z. Głowacki*, *J. Krechowski & H. Øllgaard 98–326 & 327* (hb. H. Øllgaard). – Kosów Lacki, rich meadow, 24 Apr. 2000, *J. Krechowski 153/2000* (WSRP); M. Curie-Skłodowskiej St., roadside, 01 May 2000, *J. Krechowski 192/2000* (WSRP); Cetynia valley, 01 May 2000, *J. Krechowski s.n*. (WSRP). – Siedlce, Żytnia St., lawn, 11 May 1999, *M. Falkowski s.n*. (WSRP); ground adjoining a fence at Koszarowa St., 21 May 1999, *Z. Głowacki s.n*. (WSRP); at Artyleryjska St., grassy area, 21 May 1999, *Z. Głowacki s.n*. (WSRP); – Mordy, grassy roadside, 22 May 1999, *Z. Głowacki s.n*. (WSRP); secondary road, 22 May 1999, *Z. Głowacki s.n*. (WSRP); town center, 22 Apr. 2000, *leg. J. Krechowski s.n*. (WSRP); Rynkowa St., lawn, 17 Apr. 2000, *J. Krechowski 151/2000* (WSRP); lawn, 18 Apr. 2000, *J. Krechowski 154/2000* (WSRP); lawn 12 Apr. 2000, *J. Krechowski 308 & 309/2000* (WSRP); – Czubaki, between Stasin and Strusy, side of road through forest, 20 May 1998, *Z. Głowacki*, *J. Krechowski & H. Øllgaard 98–320 & 321* (hb. H. Øllgaard); N of Siedlce, at ponds, grassy dam, 27 Apr. 1999, *M. Falkowski s.n*. (WSRP). – Gąsiorowo, slope of Bug River valley, 02 May 2000, *M. Falkowski s.n*. (WSRP). – Międzyrzec Podlaski, at PKS bus station, lawn, 10 May 2000, *J. Krechowski s.n*. (WSRP). – Kałuszyn, bus station near railway station at Warszawska St., 21 Apr. 2000, *J. Krechowski 80/2000* (WSRP). – Regut near Celestynów, at secondary road, 12 May 1994, *Z. Głowacki 36569* (WSRP). – Kolonia Jedlanka, S of Radom, at secondary road, 27 Apr. 2000, *Z. Głowacki 100/2000* (WSRP); – Włodawa, Czerwonego Krzyża St., grassy area, 26 Apr. 2000, *M. Falkowski s.n*. (WSRP). – Toruń, park at edge of Vistula River valley, 07 May 2001, *Z. Głowacki 01–102* (WSRP).

Taraxacum podlachiacum H. Øllgaard, *sp. nov*. (Fig. 4 & 6)

Planta mediae magnitudinis. Folia mediocriter viridia, supra glabrescentia, maculis dispersis nullis. Petioli anguste alati, aut exteriores pallidi, intermedii et interiores rubescentes, aut omnes ± rubescentes, nervo mediano plerumque pallido vel saepe parum brunnescente, non striatulo. Folia lobata, lobis lateralibus deltoideis, saepe incisis, margine superiore irregulariter subrecto, plerumque dentibus saepe grossis instructo, margine inferiore fere recto, integro, apice loborum lateralium subobtuso vel subacuto. Lobus terminalis sat parvus, obtusus vel subacutus, apice bene definito ± protracto. Interlobia late rotundata vel bene definita et angulata, plana vel parum plicata, plerumque ± subpiceata. Scapi sub involucro araneosi, ceterum glabrescentes. Involucrum laete viride vel sat obscure viride, ± pruinosum. Squamae exteriores 14–15 mm longae, 5–6 mm latae, plerumque squalide violascentes, regulares, arcuato-recurvae, margine planae non hyalinae, apice laeves. Squamae interiores latitudine subconformes. Calathium circa 50 mm diametro, densitate media, convexum, mediocriter luteum. Ligulae marginales planae vel subcanaliculatae, subtus stria angusta cano-rubescente ornatae, denticulis apicalibus florum intermediorum et interiorum luteis. Antherae polliniferae, granis pollinis diametro variis. Stigmata virescentia. Achenium fusco-stramineum, 4.2–4.4 mm longum (pyramide inclusa), pyramide subcylindrica 0.6–0.7 mm longa laevi ornatum, superne spinulosum, spinulis mediae longitudinis, robustiuculis, rectis. Rostrum 10–11 mm longum, pappo albo coronatum.

In size and robustness this species is a typical member of Taraxacum section *Ruderalia*. Leaves

Fig. 4. Holotype of *Taraxacum podlachiacum* H. Øllgaard, *sp. nov*. (*Z. Głowacki, J. Krechowski & H. Øllgaard 98–322*, WSRP).

mid-green to somewhat dirty green, glabrous or only faintly hairy adaxially. Petiole wings narrow. Outer leaves normally have pale (greenish white) petioles, later developed leaves have ± reddish petioles, but plants with all petioles red are not rare. Midrib green to dirty green or brownish, without striatulate pattern. Leaf lobes recurved (deltoid), often dissected by deep incisions, with straight or irregular upper edge often bearing one or more robust teeth of irregular size. Lower lobe edges straight or irregular, usually entire. Lobe apices blunt to medium acute. Terminal lobes rather small, with well-differentiated, blunt tip. Interlobes in upper leaf half broadly rounded to well

differentiated and angular, only faintly plicate, ± tar-colored, especially when exposed to full daylight. Scapes glabrescent but more hairy under buds. Flower buds light to dark green, ± pruinose, sometimes strongly. Outer bracts 14–15 mm long, 5–6 mm broad (or more), conspicuously purplish to dirty dark violet, rather regularly arranged, ± curved-reflexed, with flat, unbordered margins. Bract corniculations usually absent. Inner bracts almost equally wide, not coalescent. Fully flowering capitulum is *ca* 50 mm in diameter, medium dense, with ± convex profile, medium yellow.

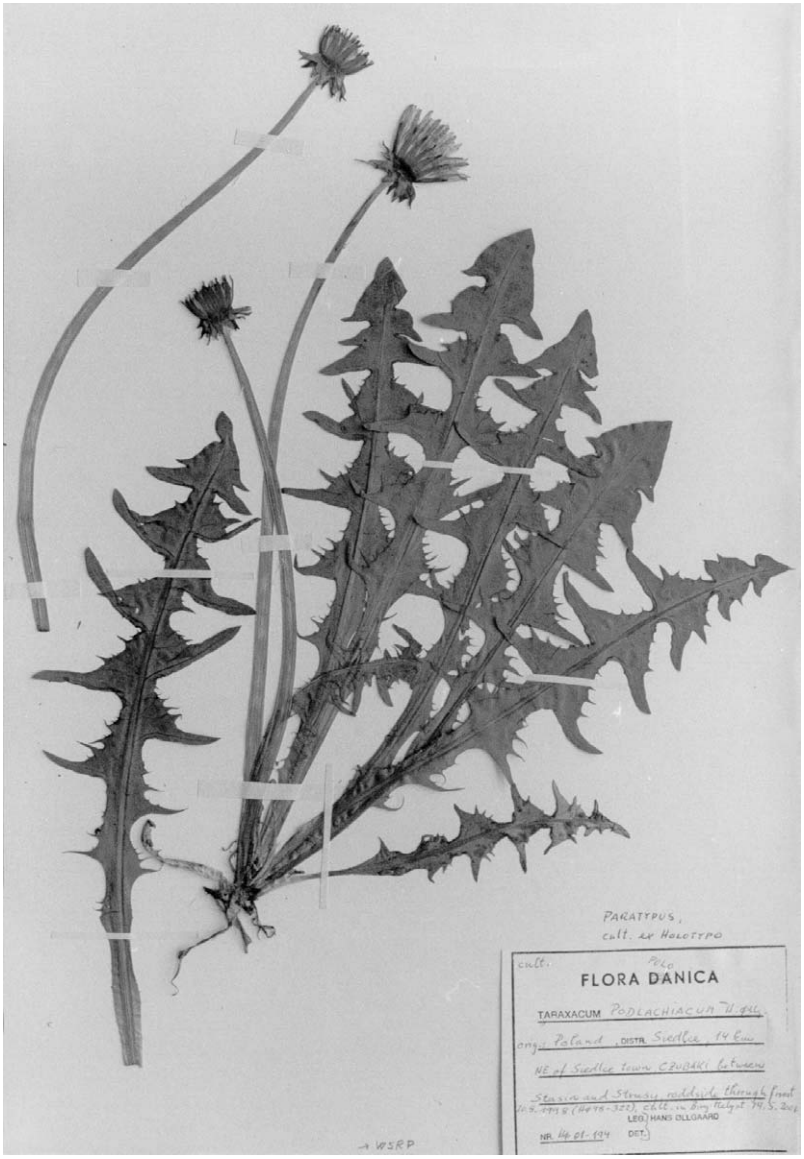

Fig. 5. Specimen cultivated from holotype achenes of *Taraxacum podlachiacum* H. Øllgaard, *sp. nov*. (*H. Øllgaard 194b*, hb. Øllgaard).

Flower ligules flat to somewhat canaliculate, with yellow apical teeth. Outer ligules striped beneath, stripe narrower than ligule, faintly reddish grey. Pollen present, pollen diameter varying. Stigmas discolored. Achenes straw-colored to greyish brown, *ca* 4.2 mm long (incl. 0.6–0.7 mm long, almost cylindrical, smooth cone). Achene spinules medium long, medium strong, straight. Rostrum *ca* 10–11 mm long, pappus white.

HOLOTYPE:[1] POLAND. SIEDLCE PROVINCE, Czubaki district between Stasin and Strusy, (14 km NE of Siedlce), side of road through forest (52°15′40″N; 22°24′03″E), 20 May 1998, *Z. Głowacki, J. Krechowski & H. Øllgaard 98–322* (WSRP); – PARATYPE: specimens cultivated from holotype achenes in Birgittelyst, Denmark, by the author, 14 May 2000, *H. Øllgaard 01–194a* (WSRP), *H. Øllgaard 194b* (hb. Øllgaard).

ETYMOLOGY. *Taraxacum podlachiacum* is named after the Polish Podlasie region (Latin: *Podlachia*) where apparently it has its main distribution area.

Taraxacum podlachiacum belongs to a series of *Ruderalia* species morphologically related to *T. cordatum* Palmgr. (= *T. paucisquameum* Palmgr.), *T. pannucium* Dahlst., *T. macrolobum* Dahlst. and others. *T. podlachiacum* is easily distinguished from them by its somewhat tar-colored interlobes and the ± pruinose involucres with ± dark brownish purplish outer bracts. *T. sellandii* Dahlst. has another lobe shape and ± patent outer bracts.

ADDITIONAL MATERIAL SEEN. POLAND. Mińsk Mazowiecki, Stankowizna, forest road, 28 May 1999, *Z. Głowacki 99–119* (WSRP); roadside, 28 May 1999, *Z. Głowacki 99–110* (WSRP). – Zaręby Kościelne, roadside and meadow, 02 May 2000, *M. Falkowski s.n.* (WSRP; hb. H. Øllgaard). – Biała Podlaska, in town at railway station, lawn, 10 May 2000, *J. Krechowski 155/2000* (WSRP). – Kołodziąż near Stoczek Łukowski, moist meadow, 05 May 2000, *J. Krechowski 163/2000* (WSRP). – Niemojki near Łosice, railway station, ruderal ground, 22 Apr. 2000, *J. Krechowski 210/2000* (WSRP). – Siedlce, at Iwaszkiewicza St., roadside, 11 May 2000, *J. Krechowski s.n.* (WSRP, hb. Øllgaard); Podsekuły, glade, 21 May 1999, *Z. Głowacki 99–144* (WSRP); at Warszawska St., 18 Apr. 2000, *J. Krechowski 159/2000* (WSRP); at Piłsudskiego St., roadside, 25 Apr. 2000, *J. Krechowski 107/2000* (WSRP); Białki, 5 km S of town, roadside, 26 May 1999, *M. Falkowski & J. Krechowski s.n.* (WSRP). – Pruszyn Pieńki, ditch at road, 22 Apr. 2000, *J. Krechowski s.n.* (WSRP). – Mokobody, in center, ruderal ground, 25 Apr. 2000, *J. Krechowski 187/2000* (WSRP). – Kałuszyn, at Warszawska St., 21 Apr. 2000, *J. Krechowski s.n.* (WSRP). – Treblinka, rich meadow, 24 May 1999, *Z. Głowacki s.n.* (WSRP). – Wyszków, roadside, 15 Apr. 2000, *J. Krechowski s.n.* (WSRP); ruderal ground, 25 Apr. 2000, *leg. J. Krechowski s.n.* (WSRP). – Zwoleń, meadow, 28 Apr. 2000, *Z. Głowacki 30/2000* (WSRP); Zwolenka River valley, meadow, 28 Apr. 2000, *Z. Głowacki 37/2000* (hb. Øllgaard). – Warsaw, Plac Na Rozdrożu square, verge, 22 Apr. 2000, *Z. Głowacki 1/2000* (WSRP). – Toruń, roadside, 07 May 2001, *Z. Głowacki 01–149* (WSRP). – Kobylanka near Stargard Szczeciński, Jęczydół, meadow, 22 May 2000, *Z. Głowacki 180/2000* (WSRP).

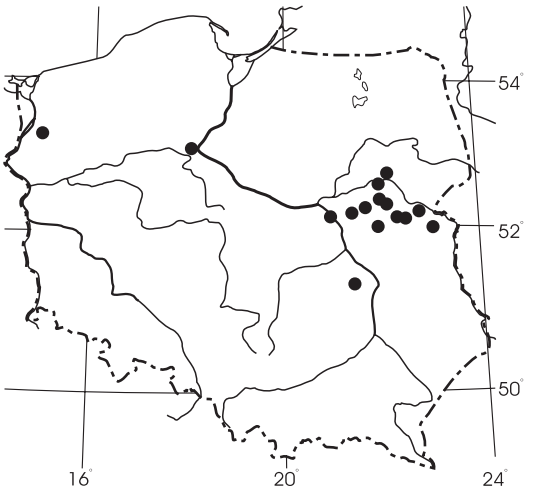

Fig. 6. Distribution map of *Taraxacum podlachiacum* H. Øllgaard, *sp. nov*. in Poland.

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[1] Note: Unfortunately, the holotype specimen has been partly damaged by insects. The cultivated paratype specimens are better suited for morphological study of flower characters (Fig. 5).

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