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## ***Taraxacum* section *Naevosa*, an overlooked group in Russia (*Taraxacum* *Notulae Rossiae Boreali Europaeae* III)**

P. G. Efimov<sup>1,2\*</sup>, E. O. Golovina<sup>1,3</sup>

<sup>1</sup> Komarov Botanical Institute RAS, Prof. Popova St., 2, St. Petersburg, 197022, Russian Federation

<sup>2</sup> E-mail: [efimov@binran.ru](mailto:efimov@binran.ru), [efimov81@mail.ru](mailto:efimov81@mail.ru); ORCID iD: <https://orcid.org/0000-0003-2926-255X>

<sup>3</sup> E-mail: [golovina@binran.ru](mailto:golovina@binran.ru); ORCID iD: <https://orcid.org/0000-0003-2304-4500>

\* Corresponding author

**Keywords:** Barents seashore, flora of Russia, Murmansk Region, Rybachiy Peninsula, *Taraxacum kolaense*, *Taraxacum naevosum*.

**Summary.** A revision of *Taraxacum* sect. *Naevosa*, previously neglected in Russia, is presented. Two species are recognized in Russia: *T. naevosum* and *T. kolaense*, both occurring in Murmansk Region, within Rybachiy and Sredniy Peninsulas. Purple spots more or less evenly covering the leaf surface in the flowering time are a characteristic and easily recognizable feature of this section, which is yet unknown in other *Taraxacum* of Russia (at least in its European part). *Taraxacum naevosum* is reported from Russia for the first time, whereas *T. kolaense* has been reported previously, but only after the type collection dated back to 1909, and it was not represented in Russian herbarium collections. The determination key, morphological descriptions and list of herbarium specimens of all taxa are provided, conservation issues and notes about possible records of further related species are discussed.

## **Секция *Naevosa* рода *Taraxacum* – новая группа во флоре России (*Taraxacum* *Notulae Rossiae Boreali Europaeae* III)**

П. Г. Ефимов, Е. О. Головина

Ботанический институт им. В. Л. Комарова РАН, ул. Проф. Попова, д. 2, г. Санкт-Петербург, 197022, Россия

**Ключевые слова:** Мурманская область, побережье Баренцева моря, полуостров Рыбачий, флора России, *Taraxacum kolaense*, *Taraxacum naevosum*.

**Аннотация.** В статье представлена ревизия секции *Naevosa* рода *Taraxacum* – группы, о которой ранее в отечественной литературе не было почти никакой информации. Секция в России представлена двумя видами – *T. naevosum* и *T. kolaense*, встречающимися в Мурманской области на полуостровах Рыбачий и Средний. Характерным, хорошо заметным признаком секции являются пурпурные пятна, равномерно покрывающие поверхность листовой пластинки во время цветения растений, что на данный момент неизвестно у других одуванчиков России (по крайней мере, в европейской части страны). *Taraxacum naevosum* приводится для России впервые, а *Taraxacum kolaense* был известен и ранее, но только по типовому образцу, собранному в 1909 г. и материал по нему в отечественных гербарных коллекциях представлен не был. В статье приводятся определительный ключ, морфологические описания, перечни гербарных образцов, информация о необходимости охраны представителей секции. Рассмотрен вопрос о возможных находках других видов секции в нашей стране.

## Introduction

*Taraxacum* F. H. Wigg. is a diverse and taxonomically intricate group, with ca. 2500 species classified in about 60 sections (Kirschner et al., 2020). Recently we started a new *Taraxacum* inventory in European Russia, where not only the species-level diversity remains largely unknown (e. g. Efimov, Trávníček, 2022), but also the sectional-level taxonomy has never been brought together to the current level of knowledge.

Information sources having primary importance for the *Taraxacum* inventory in European Russia cover neighboring better-studied areas, first of all Fennoscandia. 14 sections have been reported from there (Lundevall, Øllgaard, 1999; Mossberg, Stenberg, 2018), of which all but four consist of more than 10 taxa. Among those multi-species groups, *T. sect. Spectabilia* (Dahlst.) Dahlst. (s. str.) has never been reported from Russia, and there was only one report of *T. sect. Naevosa* M. P. Christ., the topic of the current contribution.

*Taraxacum* sect. *Naevosa* includes 40–50 species worldwide (Kirschner et al., 2020). It embraces small and medium-sized taxa with simple leaf lobation, flat (rarely shallowly corniculate), bluish-green, more or less patent outer bracts, relatively large capitula; leaves are usually strongly pubescent, with purple midrib, blade greyish-green, more or less rugose and covered by numerous distinct purple spots. From the closely related *T. sect. Celtica* A. J. Richards they differ by rugose spotted leaves with somewhat different kind of pubescence, and from *T. sect. Spectabilia* s. str., another group with spotted leaves, by stronger leaf lobation, narrower (not spatulate) leaf silhouettes and by shorter, more strongly winged petioles.

*Taraxacum* sect. *Naevosa* has a distinctly European Atlantic type of distribution, with the majority of localities situated in Norway, Denmark, Iceland, Sweden and British Isles; a specific group of four species, related to *T. drucei* Dahlst., has the Franco-Iberian distribution (Mossberg, Stenberg, 2018; Richards, 2021). Solitary occurrences (mostly of species with questionable sectional belonging) are also present in Central Europe, Baltic countries outside Fennoscandia and as alien locally in the New World (Marklund, 1938; Bjork, 2019; Kirschner et al., 2020).

The distribution of *T. sect. Naevosa* closely approaches Russia at the northernmost tip of Fennoscandia, suggesting that it should be present in the north-west of Murmansk Region. Indeed, one species, *T. kolaense* H. Lindb. ex Dahlst., which

was described exactly from that area, was placed in *T. sect. Naevosa* in the account of Fennoscandian *Taraxacum* species (Lundevall, Øllgaard, 1999). At the moment of its description in 1930, *T. kolaense* was assigned to *T. sect. Spectabilia*, which at that time was understood in a broad sense. *Taraxacum* sect. *Naevosa* was established by Christiansen only in 1942 and is currently unanimously accepted (e.g. Kirschner, Štěpánek, 1997; Lundevall, Øllgaard, 1999; Räsänen et al., 2010; Mossberg, Stenberg, 2018; etc.), but is absent from most of the Russian sources. Important Russian revisions (Tzvelev, Yurtzev, 1987; Tzvelev, 1989) placed *T. kolaense* in the broadly defined *T. sect. Taraxacum*, which was understood approximately in the sense of *T. sect. Spectabilia* of the old authors (*T. sect. Spectabilia* s. l. according to the modern nomenclature), and only Sennikov (2007) referred it to *T. sect. Naevosa*, but providing no data that this species is indeed present in the Russian Flora ('expected' in Murmansk Region). In the "Flora of the USSR" (Schischkin, Tzvelev, 1964), *T. kolaense* was omitted.

All previous reports of *T. kolaense* from Russia descend from its type material collected in 1909 and kept in herbaria S and H. We have rediscovered *T. kolaense* in the Rybachiy Peninsula of Murmansk Region in the same area, added several localities nearby, and also discovered another species from the same section, the sectional type *T. naevosum* Dahlst., which has never been reported from Russia before. These findings represent the primary subject of the current contribution.

Whereas *T. kolaense* and *T. naevosum* represent typical members of *T. sect. Naevosa* and are included into it by all modern authors, there exist a number of taxa with questionable sectional belonging, included in this section only by some of the authors. Such species usually do not possess purple spots on the leaf surface, at least during the main flowering season, and(or) other characteristic traits; many of them don't display a prominent Atlantic distribution trend as the taxa from the 'core', and more easily develop secondary distributional areas. Mostly they represent oscillations between *T. sect. Naevosa* and *T. sect. Celtica*, or, more rarely, between *T. sect. Naevosa* and *T. sect. Crocea* M. P. Christ. The following species may be expected in Russia: *T. adpressum* Dahlst., *T. duplidentifrons* Dahlst., *T. excellens* Dahlst. ex Hagl., *T. gelertii* Raunk., *T. praestans* H. Lindb. We have observed plants possibly belonging to *T. gelertii* and *T. excellens*, but as far as we don't include them in *T. sect. Naevosa*, they are not reviewed here. It is worth mentioning that purple spots on the leaf surface may be occasionally present in solitary taxa

from sections other than *T. sect. Naevosa* and *T. sect. Spectabilia*: *Celtica* (British taxa *T. berthae* C. C. Haw. and *T. olgae* A. J. Richards and some of the above-mentioned *Celtica* / *Naevosa* intermediates), *Crocea* (*T. pycnostictum* M. P. Christ.), *Erythrosperma* (H. Lindb.) Dahlst. (*T. inopinatum* C. C. Haw.), *Taraxacum* (sometimes in *T. melanthoides* M. P. Christ. et Wiinst.), and *Borea* Sahlin ex A. J. Richards ('spotted variant' of *T. litorale* Raunk.) (Uhlemann, 2003; Trávníček et al., 2010; Richards, 2021). However, none of them have been reported from Russia yet, except for the latter one.

### Materials and methods

The main method of a *Taraxacum* inventory in European Russia (designed by the first author) is collecting representative amounts of herbarium material directly in the field, including remote places outside civilization. The main routes of the *Taraxacum* research in the last years were shown on the map in Efimov (2023).

All herbarium specimens collected in the field are stored in Herbarium of the Komarov Botanical Institute (LE). Specimens from this collection cited in the present article may be accessed upon their barcode numbers via <https://en.herbariumle.ru/?t=occ>. High-quality herbarium scanning was undertaken by a special device constructed by D. Slastunov.

Morphological descriptions were compiled exclusively on the basis of the Russian material. The sectional morphology describes the overall picture of the whole section, excluding only the taxa with unconfirmed sectional belonging.

The collector names are abbreviated as follows: P. E. – P. G. Efimov, M. L. – M. V. Legchenko, V. K. – V. V. Kuropatkin, V. V. D. – V. V. Domashkina, V. A. D. – V. A. Dudka, G. K. – G. Yu. Konechnaya, M. S. – M. B. Sheludyakova.

## Results

### Taxonomic treatment

*Taraxacum sect. Naevosa* M. P. Christ. in Gröntved et al. 1942, Bot. Iceland 3(3): 303. – *T. subsect. Naevosa* (M. P. Christ.) A. J. Richards, 1972, Bot. J. Linn. Soc. 65: 38.

**Type:** *T. naevosum* Dahlst.

**Description:** **Plants** usually medium-sized to small, occasionally robust, not heterophyllous. **Tunic** absent. **Petioles** purplish, or whitish only at the very

base; usually winged, if unwinged then short. **Leaves** typically lanceolate in outline, gradually narrowing basally, not spatulate; usually pinnatifid with simple lobation. **Midrib** usually purplish. **Leaf blade** typically roughly hairy, somewhat greyish green, usually with purple spots more or less evenly scattered across the leaf surface, rarely without them, but may be blotched at interlobes. **Leaf lateral lobes** differ in number, position and shape, but usually not dissected, without large incisions. **Leaf apical lobe** usually without lingulate apex. **Scapes** moderately pubescent across the whole length, more strongly beneath the inflorescences. **Capitules** medium-sized to relatively large. **Outer phyllaries** relatively small, up to 12 mm lg., bluish-green, usually pruinose on the upper surface; erect to recurved, but most usually patent and more or less omnidirectional; apically flat or shallowly tuberculate; unbordered or narrowly bordered. Outer ligules striped from grey to purplish, apically often purplish too. **Pollen** present or absent. **Achene** (cone included) usually less than 4 mm, subabruptly narrowing into short conical cone less than 0.9 mm lg., of various kinds of brown color. **Pappus** white. **Chromosome number** usually triploid ( $2n = 24$ ), rarely tetraploid ( $2n = 32$ ). **Reproduction mode** apomictic, sexual taxa yet not recorded.

**Ecology:** Prefers maritime dune and grassland habitats, some taxa occur in similar habitat types more distantly from the sea, but avoid areas with more continental regime; few species (mostly of less certain sectional attribution) may inhabit more continental areas, but also prefer less disturbed habitats such as meadows, etc.

**Distribution outside Russia:** Northern Europe, Central Europe, occasionally in South Europe (Portugal), Baltic States, introduced in SW Canada and Argentine.

**Distribution in Russia:** Murmansk Region (currently recorded only in Rybachiy and Sredniy Peninsulas).

### Identification key to the Russian species of *Taraxacum* section *Naevosa*

1. Leaf apical lobe sagittate, larger than the following pair of lobes. Lateral lobe pairs numbering 1–2(3) ..... *T. kolaense*  
+ Leaf apical lobe rhombic or triangular in outline, basally truncate to cuneate, approximately same size as the following pair of lobes. Lateral lobe pairs numbering 2–4 ..... *T. naevosum*

1. *Taraxacum naevosum* Dahlst. in Ostenfeld, 1908, Bot. Faroes: 840. (Fig. 1, 2).

**Lectotype** (designated by Lundevall and Øllgaard in Kirschner, Štěpánek, 1997: 94): “Härjedalen, Storsjö, Tässåsen, Tässåsfället. 27 VII 1906. H. Dahlstedt” (S 10-40322, isolecto – S 10-40321).

**Description: Plants** 10–35 cm tall during anthesis (including inflorescences). **Leaves** upright, 7–30 × 1.2–3.5 cm (‘middle’ type of leaves). **Petioles** purplish, basally often whitish; 1–5(10) cm lg.; winged; wings narrow, (0.5)1–2(2.5) mm wide from each side of the midrib. **Midrib** purplish almost throughout its length, with more or less striate pattern. **Leaf blade** distinctly hairy, somewhat rugose when alive; narrowly oblanceolate (rarely oblanceolate) in outline, pinnatilobed to pinnatipartite, with 2–4 pairs of later lobes; medium green, with purple spots more or less evenly scattered across the leaf surface. **Leaf lateral lobes** opposite to sub-alternate; 0.5–1.4 mm lg.; narrowly triangular (triangular); mucronate; directed downwards, upper ones sometimes more or less patent. **Upper lobe margin** flat to convex; usually entire but sometimes with 1(3) teeth which are displaced from the interlobe. **Interlobes** with (1)2–5(6) rather small acuminate to cuspidate teeth of comparable size, lower tooth sometimes somewhat larger than the others, some teeth may be very minute. **Leaf apical lobe** triangular to rhombic in outline; usually entire, but sometimes incised or with 1(2) large teeth and in this case unclearly separated from the rest of the leaf surface; roughly of the similar size with the following leaf sector; acute. **Scapes** 1.25–2 times overtopping leaves, usually more or less straight, sparsely pubescent, more densely pubescent under the inflorescence but without distinct tuft of hairs. **Capitules** large, 4–6 cm across in full bloom, in appearance approaching *T. hjeltii*: somewhat convex, light-yellow, loosely-flowered with somewhat untidy appearance. **Outer phyllaries** 14–20; lanceolate to narrowly lanceolate, ca. 8–12 × 2–3 cm; inordinately composed, but mostly spreading (from patent-erect to patent-recurved); with very narrow border or unbordered; more or less medium-green beneath, bluish-green and very strongly white-pruinose on the upper surface, apex distinctly purple and often distinctly callose. **Inner phyllaries** 14–18 mm, apex usually callose. **Outer ligules** flat, striped purplish-grey (alive) or dark-greyish (when dried); apically teeth purplish. **Stigmas** darkish. **Pollen** present. **Achenes** 3.3–3.8 mm (cone included); light brown with slight purple tint; spinulose in upper 1/4, glabrous elsewhere; subabruptly narrowing into short conical cone 0.4–0.5 mm lg.

**Ecology.** Meadows near the seashore.

**Distribution outside Russia:** Iceland, Great Britain, Norway, Sweden (*Taraxacum naevosum*, 2025).

**Distribution in Russia (Fig. 4):** Murmansk Region. Recorded only in Rybachiy Peninsula.

**Specimens examined. Murmansk Region,** “Pechenga District, Rybachiy Peninsula, ca. 100–200 m from the seashore at Laush Bay, meadow tundra with *Salix glauca* used as a pasture for deers, N69°44', E33°03'. 30 VI 2023. P. E., M. L., V. K., V. A. D., V. V. D. № 2023/1183, sheets 1 and 2a” (LE 01256092, LE 01256091); “Pechenga District, Rybachiy Peninsula, Tsyp-Navolok, inside the village, grassland not damaged by deers, N69°44', E33°05'. 30 VI 2023. P. E., M. L., V. K., V. A. D., V. V. D. № 2023/1189, plants 1–3” (LE 01256085, LE 01256084, LE 01256083); “Pechenga District, Rybachiy Peninsula, Tsyp-Navolok, next to the village, grassland on roadside, N69°44', E33°04'. 30 VI 2023. P. E., M. L., V. K., V. A. D., V. V. D. № 2023/1197, plant 1, plant 2 dupl. 1 and plant 2 dupl. 2” (LE 01256072, LE 01256071).

**Less certain determination:** “Pechenga District, N part of the Rybachiy peninsula, near Kekurskiy cape, N69°56', E32°04'. 1 VII 2021. P. E., G. K., M. S., № 2021/675” (LE 01149854). This specimen lacks purple pigmentation of the leaves (no spots and midrib green), which is not typical of *T. naevosum*. It may be either an apochromic individual, or another taxon.

**Note:** For an unknown reason, to the date of preparation of this manuscript (December 2023), *T. naevosum* was treated as later synonym of *T. croceum* in the “Plants of the World Online” (POWO, 2025) database, which is an apparent mistake: those species are drastically different and belong to different sections (at the same time, much more local *T. kolaense* is accepted there).

2. *Taraxacum kolaense* H. Lindb. ex Dahlst. 1930, Kungl. Svenska Vetensk.-Akad. Handl. Ser. 3, 9(2): 7, 62. (Fig. 3).

**Lectotype** (designated by Lundevall, Øllgaard, 1999: 98): “Lapponia Kolaënsis, Penins. Piscatorum [= Peninsula Rybachiy], Vaidaguba. 5 VIII 1909. F. Klingstedt” (S 10-38485, isolecto – H 116225).

**Description: Plants** 12–35(55) cm tall during anthesis (including inflorescences). **Leaves** upright, 6–35(40) × 2.4–4.0(5.0) cm (‘middle’ type of leaves). **Petioles** purplish, basally often whitish; 1–5(10) cm lg.; basally unwinged or with very narrow wings up to 0.5 mm wide from each side of the midrib. **Midrib** purplish almost throughout its length, sometimes except apical lobe, striate pattern present but

not very clear. **Leaf blade** distinctly hairy, somewhat rugose when alive; oblanceolate in outline, pinnatifid (sometimes pinnatilobed), with 1–2(3) pairs of later lobes; medium green, with purple spots more or less evenly scattered across the leaf surface. **Leaf lateral lobes** opposite to sub-alternate; (0.3)0.5–2 cm long; narrowly triangular (triangular); acute to mucronate; patent or directed downwards. **Upper lobe margin** concave, rarely convex; entire but very rarely with 1 small tooth which is displaced from the interlobe. **Interlobes** entire or with 1–2(4) small cuspidate teeth. **Leaf apical lobe** distinctly sagittate, always entire and distinctly separated from the rest of the leaf surface; 1–3(6) times larger than the following leaf sector; acute or shortly acute. **Scapes** 1.25–1.5 times overtopping leaves, usually more or less straight, sparsely pubescent, more densely pubescent under the inflorescence, often with a distinct tuft of hairs. **Capitules** large, 4–6 cm across in full bloom, in appearance approaching *T. hjeltii*: somewhat convex, light-yellow, loosely-flowered with somewhat untidy appearance. **Outer phyllaries** 15–20; lanceolate, ca. 7–12 × 2.5–4 cm; inordinately composed, but mostly spreading (from patent-erect to patent-recurved); with narrow but distinct border (visible without a lens); light-green beneath, bluish-green and strongly white-pruinose on the upper surface, apex distinctly purple and very often callose to minutely corniculate. **Inner phyllaries** 14–20 mm, apex usually callose. **Outer ligules** flat, striped purple (alive) or purplish-grey (when dried); apically teeth purplish. **Stigmas** darkish. **Pollen** present. **Achenes** 4.0–4.5 mm (cone included); light brown, sometimes with slight purple tint; spinulose in upper 1/4–1/5, glabrous elsewhere; subabruptly narrowing into short conical cone 0.5–0.9 mm lg.

**Ecology:** Sandy and rocky seashore, dunes with sparse vegetation, occasionally on sandy roadsides not far from the seashore.

**Distribution outside Russia:** Norway, several localities in Finnmark Province along the seashore in a limited area ca. 300 km long (*Taraxacum naevosum*, 2025).

**Distribution in Russia (Fig. 4):** Murmansk Region. Recorded only in Rybachiy and Sredniy Peninsulas. Reports from another place in Murmansk Region, Tuloma River Basin (Tzvelev, Yurtzev, 1987; Tzvelev, 1989), which is situated rather distantly from the sea, is a misinterpretation based on the name of the floristic province ‘Lapponia Tulomensis’.

**Specimens examined:** Murmansk Region, “Pechenga District, Pummanki (situated at the NE

coast of Sredniy Peninsula), meadow vegetation on the roadside, N69°47', E31°57' 29 VI 2023. P. E., M. L., V. K., V. A. D., V. V. D. № 2023/1146, plants 1–4” (LE 01256149, LE 01256148, LE 01256147, LE 01256146); “Pechenga District, Rybachiy Peninsula, N from Koroviy Cap, roadside, N69°50', E32°00'. 29 VI 2023. P. E., M. L., V. K., V. A. D., V. V. D. № 2023/1154a” (LE 01256136); “Pechenga District, Rybachiy Peninsula, N from Koroviy Cap, sandstone surface at the seashore, covered with rather sparse vegetation, N69°52', E31°59'. 29 VI 2023. P. E., M. L., V. K., V. A. D., V. V. D. № 2023/1155” (LE 01256134); “Pechenga District, W coast of the Rybachiy Peninsula, at the road junction to Mys Skorbeevskiy, Vayda-Guba and Bol'shoye Ozerko former settlements [= N from Koroviy Cap], tundra-like communities near the seashore and/or sandy seashore with sparse vegetation, N69°52', E31°59'. 1 VII 2021. P. E., G. K., M. S. №№ 2021/669 – 2021/672” (LE 01149848, LE 01149849, LE 01149850, LE 01149851); “Pechenga District, Rybachiy Peninsula, Mys Skorbeevskiy abandoned settlement, dry sandy roadside, ruderal environment, N69°54', E32°10'. 30 VI 2023. P. E., M. L., V. K., V. A. D., V. V. D. № 2023/1177” (LE 01256104); “Pechenga District, N part of the Rybachiy peninsula, near Skorbeevskiy cape, sandy seashore with sparse vegetation near the trail, N69°53', E32°17'. 2 VII 2021. P. E., G. K., M. S. № 2021/681, plant 1 and plant 2” (LE 01149861, LE 01149862); “Pechenga District, Rybachiy Peninsula, ca. 100–200 m from the seashore at Laush Bay, meadow tundra with *Salix glauca* used as a pasture for deers, N69°44', E33°03'. 30 VI 2023. P. E., M. L., V. K., V. A. D., V. V. D. № 2023/1183, sheet 2b” (LE 01209312); “Pechenga District, Rybachiy Peninsula, near Tsypp-Navolok, local sandy place on the roadside, disturbed ground, N69°44', E33°04'. 30 VI 2023. P. E., M. L., V. K., V. A. D., V. V. D. № 2023/1194” (LE 01256077); “Pechenga District, Rybachiy Peninsula, at the mouth of Eyna River, grassy road, N69°38', E32°25' 2 VII 2023. P. E., M. L., V. K., V. A. D., V. V. D. № 2023/1214” (LE 01256049); “Pechenga District, S coast of the Rybachiy peninsula, at the Eyna bay, sandy seashore with sparse vegetation, N69°38', E32°26'. 3 VII 2021. P. E., G. K., M. S. № 2021/702 and № 2021/703” (LE 01149887, LE 01149888); “Pechenga District, Rybachiy Peninsula, ca. 2–3 km SE of the Bol'shoye Ozerko abandoned military base, the seashore of Bol'shaya Motka Bay, meadow on roadside, N69°42', E32°12'. 2 VII 2023. P. E., M. L., V. K., V. A. D., V. V. D. № 2023/1233” (LE 01256026); “Pechenga District, SW coast of the

Rybachiy peninsula, ca. 2 km to the SSE from the Bol'shoye Ozerko former village, sandy seashore with sparse vegetation on the roadside, N69°43', E32°11'. 3 VII 2021. P. E., G. K., M. S. № 2021/709-1 and 709-2" (LE 01149894, LE 01149895).

**Less certain determination:** "Pechenga District, central part of the NE coast of the Rybachiy peninsula at the Zubovskaya bay, ca. 1 km SE from the ford over Pyayva river, sandy seashore with sparse vegetation near the trail, N69°47', E32°31'. 3 VII 2021. P. E., G. K., M. S. № 2021/690, plants 1, 2-1, 2-2" (LE 01149872, LE 01149873, LE 01149874). Those three specimens, collected from one population, almost lack purple pigmentation of the leaves (no spots and midrib green), which is not typical of *T. kolaense*, and the leaf proportions are also different (endlobe smaller than in typical specimens). Additional fieldwork and more collections are required for its determination.

**Notes:** There is one important morphological feature which deviates in our material from the character state which is considered typical of *T. kolaense* and *T. naevosum* (e. g. Dahlstedt, 1930; Bjork, 2019). In our material, both taxa often had apically tuberculate (and even shortly corniculate) outer bracts. Maybe there is a certain trend for stronger corniculate forms in the Northern areas. Thus, we also noticed that *T. pectinatiforme* Lindb. f., a widely known species from *T. sect. Taraxacum*, regularly had tuberculate to shortly corniculate outer bracts in Murmansk Region, whereas its outer phyllaries were always flat in Leningrad, Pskov and Novgorod Regions.

Also, *T. kolaense* is described in the protologue with only 'sometimes spotted leaves', and spots are described to be sparse. This is probably because in old herbarium material (type material was collected 21 year prior to the publication of the protologue) the spots have a tendency to disappear with time, especially when the conditions for herbarium drying were not ideal. And if leaves become brown upon drying (e.g. this occurred several times in our material), then the spots become indistinguishable at all.

### Discussion

**General.** *Taraxacum naevosum* is added to the Flora of Russia, and *T. kolaense* was rediscovered in Russia after the long time interval. If a broader treatment is desirable, *T. naevosum* and *T. kolaense* may be combined under *T. naevosum* s. l. (or *T. naevosum* agg.). Importantly, this species even in a very broad

circumscription cannot be considered close to *T. officinale* agg. Both 'microspecies' in our material are easily identifiable, probably only one leaf would be enough for correct determination. No signs of specimens with intermediate morphology were traced, including the locality at Tzyp-Navolok, where both were growing side-by-side. However, several untypical specimens of both taxa were found, suggesting that there may be additional taxa in this group.

The reported localities of *T. naevosum* and *T. kolaense* provide more detailed data about distributional limits of *T. sect. Naevosa* on the east of their native range. In fact, there may exist more localities along the shore of the Barents Sea east from the Rybachiy Peninsula, which may be discovered later. Unfortunately, the Barents Sea shore is easily accessible only in few places. Apart from Rybachiy and Sredniy Peninsulas, we studied the seashore in 2023 in two other places, near Teriberka and Dal'niye Zelentzy villages, but no *T. sect. Naevosa* species were found, despite habitats were looking generally appropriate.

**Conservation.** *Taraxacum kolaense* and *T. naevosum* are evidently native in discovered localities, and represent important additions to the aboriginal Flora of Murmansk Region. The majority of observed populations included 100–400 individuals, making an impression of good and stable state. Distributional changes of both taxa currently were not evidenced. Their future is not easy to predict: on one hand, populations at the seashore may suffer from anthropogenic disturbance because of the increasing touristic pressure in the area, but on the other hand, plants exhibited some limited dispersal along the roads in the nearest vicinities of the main populations, evidencing that certain anthropogenic disturbance may have a positive effect on the populations. One locality of *T. kolaense* which we discovered was wholly secondary, because it was situated in a strongly disturbed locality on the place of a former military camp. This population was the smallest one, consisted of only ca. 5 individuals and was the only one situated at a distance from the sea.

However, we consider that both taxa have a certain conservational importance because they have very limited distributions within the country. Our proposal is to establish their regional protection, either as two separate taxa, or as '*T. naevosum* s. l.'. Both deserve classifying in the VU category (IUCN. Standards..., 2022) because of to their very restricted area of occupancy which is less than 20 sq. km for both species, and *T. naevosum* additionally has probably less than 1000 individuals with all pres-

ently known plants situated in one location (*T. kolaense*: D2; *T. naevosum*: D1+2). This category estimate doesn't involve category changes proposed for regional IUCN assessments (Guidelines for Application ..., 2012), because studied population has no significant immigration of propagules from outside. Criteria which take into account actual or projected decline are not employed, because to the date of this revision we have no idea about possible changes in the number of plants with time.

The (re)discovery of *T. kolaense* and *T. naevosum* in the Rybachiy and Sredniy Peninsulas confirms an important conservational value of this land, which is yet only partially transformed by human activities (mainly in the places of former settlements, within military zones and along communication routes). For many years during the Soviet Era, Rybachiy and Sredniy Peninsulas were closed for public visitors, which, on one hand, was favorable for the long-term preservation of local nature, but, on the other hand, prevented any management of the biodiversity there. Since 2014, a major part of the Sredniy and Rybachiy Peninsulas became legally protected as a Regional Nature Park. Apart from our finding of *T. kolaense*, which was made 112 years after its previous record, another rare species, *Erythrichium villosum* Bunge, was recently rediscovered here after 105 years after its last find (Borovichev et al., 2020) and other similar findings can be expected in the future.

An important conservational issue significant for the long-term survival of *T. kolaense* and *T. naevosum* is a management regime of the land. The whole territory of the Sredniy and the Rybachiy Peninsulas for centuries, and up to the present time was continuously used as a pasture for domesticated deers (*Rangifer tarandus*), which are kept in semi-wild condition, mostly in the eastern part of the territory. It is well-known fact that moderate reindeer grazing has a positive effect on preservation of biodiversity (Stark et al., 2023). We also found that the meadows on the seashore grazed by deers harbored a much higher *Taraxacum* diversity comparing to those where grazing is absent, with up to 7 species from 6 sections persisting simultaneously in the one place (for example, in the locality of *T. naevosum* at Tzyp-

Navolok). In such situations, *Taraxacum* plants were always seriously damaged by grazing, but the populations were vigorous and stable due to the higher soil fertility, higher variability of microniches and numerous locally disturbed sites, suitable for plant renewal from seeds. Therefore, keeping traditional farming methods in this territory is important for the long-term preservation of local biodiversity which inhabits meadows and similar open habitats, same as observed for meadows in the warmer climate of Central Europe (e. g. Štípková, Kindlmann, 2015; Timmermann et al., 2015). Herbivory by large mammals in tundra zone was also shown to partially compensate biodiversity losses which follow modern climate change (Post et al., 2023).

**Further perspectives.** More taxa from *T. sect. Naevosa* are expected to be found in Russia in the future. The first reason is that the *Taraxacum* diversity of European Russia is largely unknown and the easternmost limit of many species is yet not understood. For example, a very peculiar species *T. montellii* H. Lindb. ex Sonck, was described not long ago (Sonck, 1998) from continental North Finland, not far from the Russia (*T. montellii* has an untypical distribution pattern in the section).

Last but not least, although *T. sect. Naevosa* plants are generally not so weedy as plants from *T. sect. Taraxacum*, they may sometimes behave as aliens; thus, in Canada in maritime areas of British Columbia, Bjork (2009) recorded 3 taxa of this group, of them one (*T. naevosiforme* Dahlst.) is an unequivocal member of the section and other two represent taxa with questionable sectional belonging. Therefore, alien localities of this group may be expected in Russia as well.

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**Fig. 1.** *Taraxacum kolaense* in nature: 1 – plants in the native habitat at the seashore; 2 – small individual in oligotrophic conditions at the stony seashore; 3 – tall plants in dense herb stand on fertile ground at the roadside, secondary habitat; 4 – detail of inflorescence; 5 – detail of the leaf surface. 1, 2 – Cap Koroviy, natural habitat at the seashore; 3, 4, 5 – Pummanki, secondary habitat on the roadside.





Fig. 2. Variability of leaf shape in *Taraxacum kolaense* (after herbarium specimens collected in Russia in 2023).



Fig. 3. *Taraxacum naevosum*: representative herbarium specimen and a picture of inflorescence from nature.

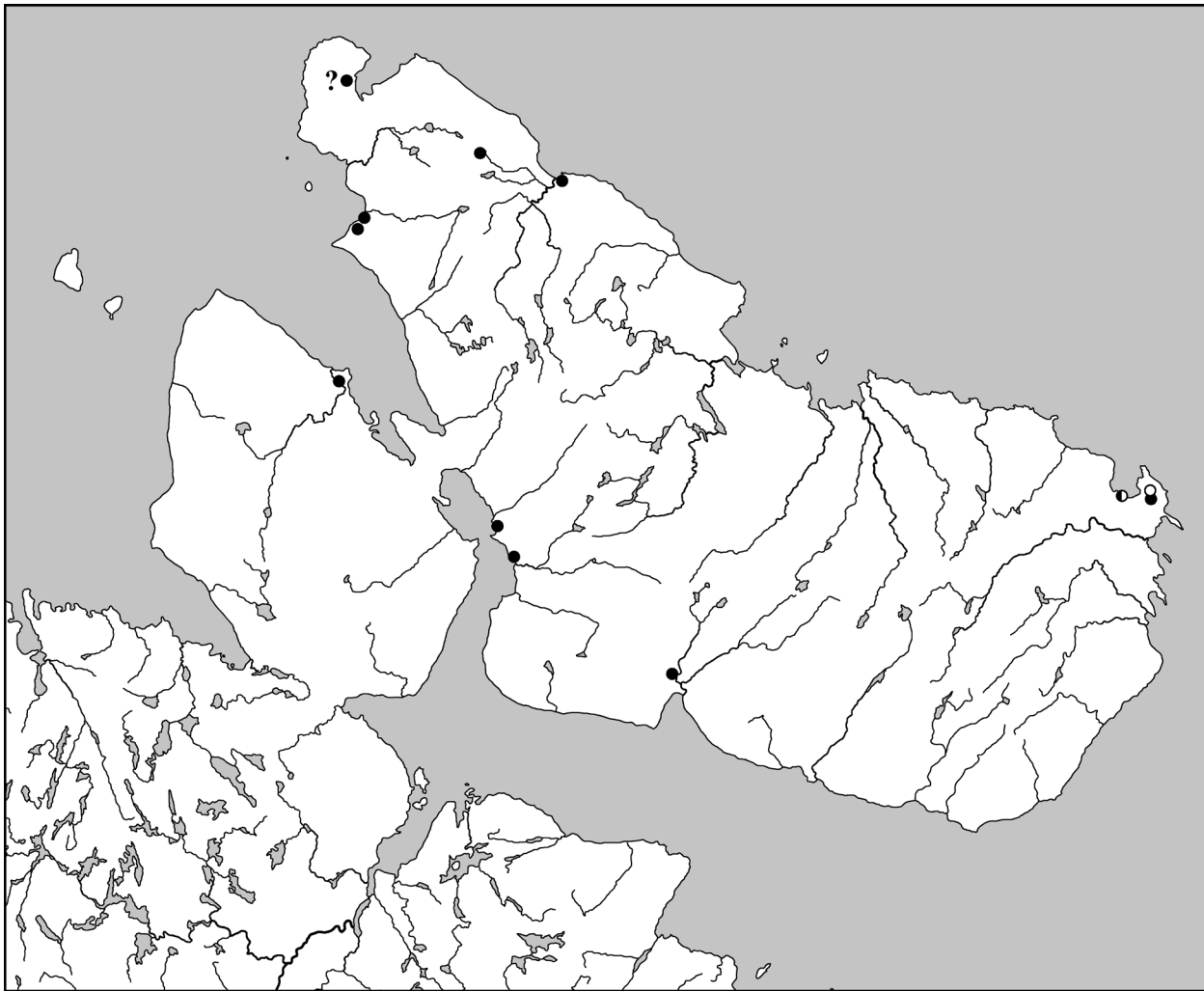


Fig. 4. Distribution of *Taraxacum kolaense* (black dots) and *T. naevosum* (white dots) in Russia (Rybachiy and Sredniy Peninsulas, Murmansk Region). The place of type gathering localized approximately (marked by '?').

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