

One of the northernmost records of *Eleocharis mamillata* subsp. *mamillata* (Cyperaceae) in Europe, and the first discovery in Murmansk Region (Russia)

Ilona V. Blinova & Thomas Gregor

Blinova, I. V., Polar-Alpine Botanical Garden-Institute, Kola Research Centre of Russian Academy of Sciences, Kirovsk, Murmansk Region, Russia. E-mail: ilbli@yahoo.com
Gregor, T., Department of Botany and Molecular Evolution, Senckenberg Research Institute, Senckenberganlage 25, D-60325 Frankfurt am Main; thomas.gregor@senckenberg.de

We report the first locality (67°55'13" N, 33°39'73" E) in Murmansk Region of *Eleocharis mamillata* H. Lindb. f. subsp. *mamillata*. The species distribution range in Europe extends to nearly 68° N attested by one older (1924) record in Finland and two recent ones (2008–2009) in Norway. The new site at a similar latitude in *Laponia Imandrae* in Russia is briefly described. It is proposed to include this species in the next regional Red Data Book in the group "In need of monitoring".

Introduction

Eleocharis mamillata was described by Lindberg (1902) who regarded it as a Scandinavian endemic. Today, it is known from Western Europe through Asia to Western Northern America in the temperate and boreal zone (Egorova 1976, Hultén & Fries 1986, Gregor 2003, Smith & Gregor 2014). Two subspecies occur: in addition to the widespread *E. mamillata* ssp. *mamillata* there is *E. mamillata* ssp. *austriaca* which is largely confined to mountainous areas in Europe and the Urals (Fig. 1).

The species is included in the European Red List of species (Bilz & al. 2011) and in the Red Data Book of Eastern Fennoscandia (Kotiranta & al. 1998). However, it was not included in the actual Fennoscandian Red Lists (Ivanter & Kuznetsov, 2007, Kålås & al. 2010, Rassi & al. 2010). In Central Russia *E. mamillata* is relatively rare and is present in some regional Red Data Books (Azbukina & al. 2010, Bobrov & al. 2013).

E. mamillata tends to grow in wet habitats such as lake shores, wet meadows and mires. It was assumed that *E. mamillata* ssp. *austriaca* occurs in calcareous habitats whereas *E. mamillata* ssp. *mamillata* is typical for peaty pools (Walters 1953, Strandhede & Dahlgren 1968, Kaplan & al. 2015). In Karelia, the species grows in paludal meadows and coastal (alluvial) sites with sedges typical of oligotrophic water pools (Ramenskaja 1983, Kravchenko, pers. comm.). *E. mamillata* ssp. *mamillata* occurs also in secondary habitats, being associated with artificial ponds and water-filled depressions (Gregor 2003, Kaplan & al. 2015, Kravchenko, pers. comm.). The species can be locally abundant throughout its range.

Results and discussion

In September 2016 the species was found by the first author in the center of Murmansk Region (Russia) about 1.8 km south of Apatity

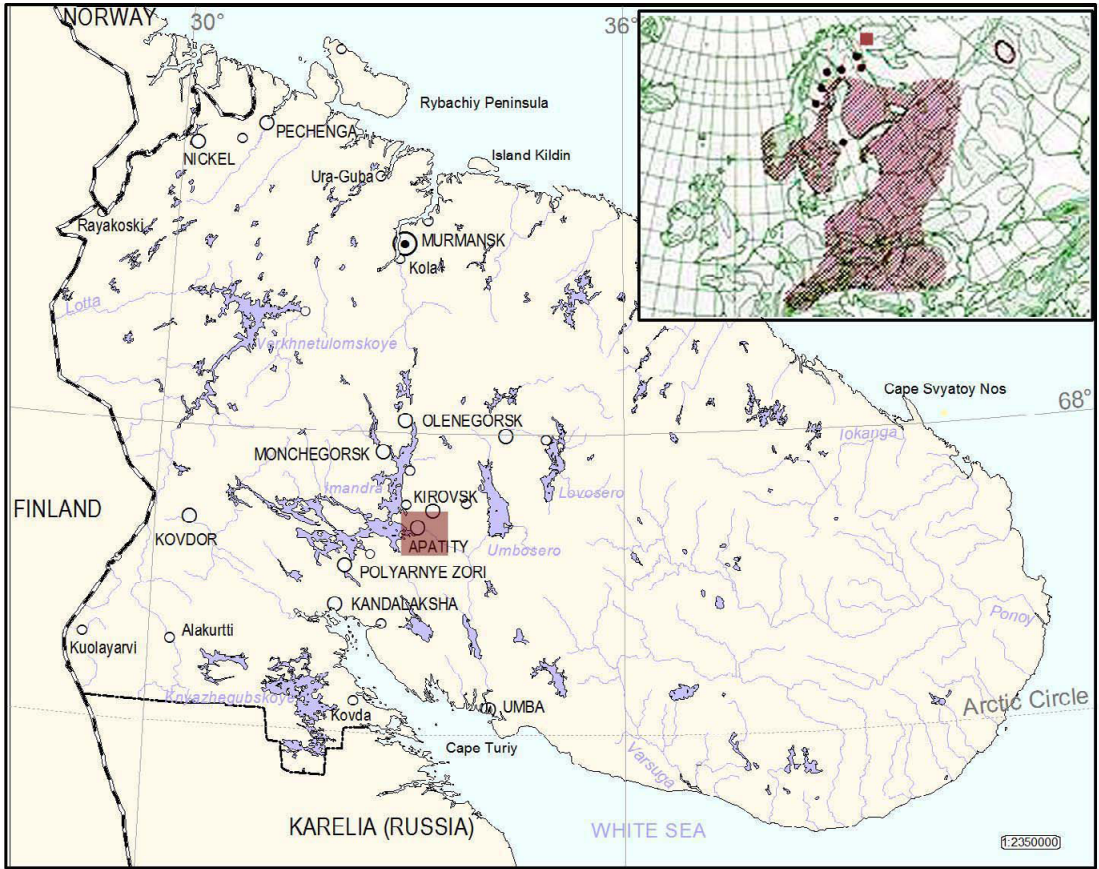


Fig. 1. The locality of *Eleocharis mamillata* near the town of Apatity (Murmansk Region, Russia) on the east side of Lake Imandra Ekostrovskaja. Top right: part of the map in Hultén & Fries (1986) showing the European range of *Eleocharis mamillata*. The new site is indicated by the square.

(67°55'13" N, 33°39'73" E). It was observed by the southern part of a small lake (about 4 800 m² and 70 m in diameter) in the valley of the river Nivastrovskaja which flows into Lake Imandra Ekostrovskaja on its eastern side (Fig. 1). The species grew along the edge of the lake with *Comarum palustre*, *Menyanthes trifoliata*, *Carex rostrata*, *C. lasiocarpa*, and *Epilobium* sp., and in shallow water (pH = 7.4, conductivity 55 µS/cm) with *Hippuris vulgaris*, *Utricularia minor*, *U. intermedia*, *Potamogeton berchtoldii*, *Nitella flexilis / opaca* and *Chara virgata*. *E. mamillata* is dominant in this vegetation (Figs. 2 & 3). The shoots vary in height from 16–29 cm at the water's edge to 38–48 cm in shallow water. Several voucher specimens were collected by I. Blinova on 19.09.2016 and deposited in the Herbari-

um of the Polar-Alpine Botanical Garden-Institute (KPABG) (Fig. 4). The area of the valley Nivastrovskaja is rich in calcium rocks; Blinova & Petrovskij (2014) and Blinova (2015) described base-rich fens with many rare species of Orchidaceae and Cyperaceae.

The nearest recorded sites of *E. mamillata* are 140–210 km to the south-west and to the south of the Apatity population. They are situated in small lakes of Salla municipality in Finland (Kallunkijärvi, 66°38'41.16" N 28°58'19.14" E, Lehmilampi, 67°4'16.81" N 28°52'30.92" E, Iso Sarvilampi, 67°17'0.31" N 28°11'37.10" E) (Lampinen & Lahti 2016) and on Srednij Island (66°17'13.94" N 33°38'26.78" E) in the White Sea (Bakin & Sitnikov 2014), which belongs to the Republic of Karelia in Russia. In *Re-*



Fig. 2. Habitat of *Eleocharis mamillata* near Apatity (Murmansk Region, Russia) in a wetland ecosystem with fens and shallow lakes surrounded by northern-taiga forest in the valley of the river Nivostrovskaja. Photo I. Blinova, 19 September 2016.



Fig. 3. *Eleocharis mamillata* forms dense stands at the water's edge along with *Comarum palustre* near Apatity (Murmansk Region, Russia). The individual plants bend easily, unlike *E. palustris*. Photo I. Blinova, 19 September 2016.



Fig. 4. Two herbarium specimens of *Eleocharis mamillata* collected by I. Blinova on 19 September 2016 and deposited at KPABG in November 2016.

gio kuusamoënsis it is present in Oulanka National Park in Finland (Lampinen & Lahti 2016) and in Paanajarvi National Park (Kravchenko 2007).

About 33 occurrences of *E. mamillata* are known north of the Arctic Circle (Lampinen & Lahti 2016, internet resources for O, UiT, LD, NTNU, NMBU, NBIC) most of which are new (especially in Norway) and not indicated on the map of Hultén & Fries (1986). The three northernmost records are near to 68° N¹: 1) *Lapponia kittilensis*

by J. Montell in 1924 in Muonio (67°57'20.24" N 23°40'9.36" E), and two recent ones made in 2008–2009 in the Norwegian district of Ofoten; 2) Mannfjorden (67°58'39" N 16°31'46" E); 3) Tysfjord (67°58'36" N 16°32'21" E). The Apatity record in *Lapponia Imandrae* in Russia will extend this list.

The study material has the typical characters of *Eleocharis mamillata* ssp. *mamillata* (see Lindberg 1902, Strandhede & Dahlgren 1968, Gregor & Barth 1998): wide obovate fruits, wide nipple-like stylopodia, mostly 5 long perianth bristles (much longer than fruits), and a weak stem with about 12 vascular bundles (Fig. 5). The identification was confirmed by H. Väre (16.11.2016).

Of the IUCN-criteria *Eleocharis mamillata* could be considered as "Critically Endangered" for the region. However, based on the facts that the species is a good colonizer in various parts of its distribution area and could be dispersed by migratory waterfowl, the group "In need of moni-

¹During preparation of this paper four new specimens have been found in the Herbarium of the Botanical Museum in Helsinki (H) by R. Lampinen in unsorted collections, including among them one of the oldest (1905) collected in a brook near Lake Inari (68°53'48.60" N 27°20'32.43" E) in *Lapponia inarensis*. This specimen identification needs to be confirmed. It might be another close species *Eleocharis palustris* which occurs at more northern latitudes than does *E. mamillata*, and indeed was noted in Inary Lake during detailed lake studies in northern Finland by Rintanen (1982).



Fig. 5. Fruits of *Eleocharis mamillata* from the population near Apatity (Murmansk Region, Russia) with wide obovate, nipple-like (wider than tall) stylopodia and mostly 5 perianth bristles much longer than the fruit. Photo I. Blinova

toring” is more appropriate in the next Red Data Book of Murmansk Region. Additional field research is required to study the northernmost Russian population of this species.

Acknowledgements. We are grateful to A. Kravchenko (Karelian Sci. Center), R. Lampinen (Helsinki Bot. Museum) for information about the records of the species in Karelia and Finland and H. Väre (Helsinki Bot. Museum) for confirmation of the species identification. Many thanks go to the Swedish Museum of Natural History and A. Anderberg for permission to use Hultén’s map (1986). We are obliged to G. H. Harper (Hereford, UK) for checking the quality of our English.

References

- Azbukina R. E., Vakhromeev I. V. & Seregin P. A. 2010: *Eleocharis mamillata* Lind. f. — In: Red Data Book of Vladimir Region. Vladimir: Transit-Iks. 2nd Ed. (in Russian).
- Bakin O. V. & Sitnikov A. P. 2014: Notes on plants of the Srednij Isle (White Sea, Kandalaksha Bay). — Vestnik St. Petersburg State University. Biological Series. 1: 49–54. (in Russian with English summary)
- Bilz, M., Kell, S. P., Maxted, N. & Lansdown, R. V. 2011: European Red List of Vascular Plants. — 130 pp. Luxembourg: Publications Office of the European Union.
- Blinova, I. 2015: Base-rich fens in the Southern part of Murmansk Region, and the case for their protection). — Herald of the Kola Science Centre of the Russian Academy of Sciences 22(3): 102–114, 152–153. (in Russian with English summary)
- Blinova, I. & Petrovskij, M. 2014. Base-rich fens in the central part of Murmansk Region, and the case for their protection). — Herald of the Kola Science Centre of the Russian Academy of Sciences 18(3): 38–55. (in Russian with English summary)
- Bobrov, A. A., Chemeris, E. V. & D. A. Philippov. 2013: Materials on the flora of Vologda Region. — Proceedings of Karelian Scientific Center RAS 2:39–45. (In Russian with English summary.)
- Chernov, E.G. 1954: *Eleocharis* — In: Pojarkova, A. I. (ed.), Flora of the Murmansk Region 2: 36–48. Nauka, Moscow & St.-Petersburg. (In Russian.)
- Egorova, T. V. 1976: *Cyperaceae* Juss. — In: Egorova, T. V. (ed.), Flora partis Europaeae URSS 2: 83–219. Nauka, St.-Petersburg. (In Russian.)
- Gregor, T. 2003: *Eleocharis mamillata* – distribution and infraspecific differentiation). — Folia Geobotanica 38: 49–64.
- Gregor, T. & Barth, U. 1998: Die Weichstengelige Sumpfbinsse *Eleocharis mamillata* in Hessen. — Natur und Museum 128: 113–124.
- Hultén, E. & Fries, M. 1986: Atlas of North European vascular plants north of the Tropic of Cancer. — 1172 pp. Koeltz, Königstein.
- Ivanter, E. V. & Kuznetsov, O. L. (eds.), 2007: Red Data Book of Republic Karelia. Ministry of Agriculture, Fishing and Ecology, Karelian Science Centre of Russian Academy of Sciences & University of Petrozavodsk, Petrozavodsk. (In Russian.)
- Kålås, J. A., Viken, Å., Henriksen, S. & Skjelseth, S. (eds.) 2010: The 2010 Norwegian Red List for Species. — 480 pp. Artsdatabanken, Norwegian Biodiversity Information Centre. Trondheim.
- Kaplan Z., Danihelka J., Štěpánková J., Bureš P., Zázvorka J., Hroudová Z., Ducháček M., Grulich V., Řepka R., Dančák M., Pranč J., Šumberová K., Wild J. & Trávníček, B. 2015. Distributions of vascular plants in the Czech Republic. Part 1. — Preslia 87: 417–500.
- Kotiranta, H., Uotila, P., Sulkava, S. & Peltonen, S.-L. (eds.) 1998: Red Data Book of East Fennoscandia. — 351 pp. Ministry of the Environment, Finnish Environment Institute & Botanical Museum, Finnish Museum of Natural History. Helsinki.
- Kravchenko A. V. 2007: A compendium of Karelian flora (vascular plants). Petrozavodsk. 403 S. (In Russian.)
- Lindberg, H. 1902: Die nordeuropäischen Formen von *Scirpus* (*Heleocharis*) *paluster*. — Acta Soc. Pro Fauna et Flora Fennica 23(7): 3–16, + 2 Tafeln.
- Ramenskaya, M. L. 1983: Analysis of the flora of Murmansk Region and Karelia. — 216 pp. Nauka, Leningrad. (In Russian.)
- Rassi, P., Hyvärinen, E., Juslén, A. & Mannerkoski, I. (eds.) 2010: The 2010 Red List of Finnish Species. — 685 pp. Helsinki: Ministry of the Environment, Finnish Environment Institute, Helsinki.
- Rintanen, T. 1982: Botanical lake types in Finnish Lapland. — Ann. Bot. Fennici 19: 247–274.
- Strandhede, S.-O. & Dahlgren, R. 1968: Drawings of Scandinavian plants 9–10. *Eleocharis* R. Br. — Botaniska Notiser 121: 1–10.

- Smith, S. G. & Gregor, T. 2014: North American distribution of *Eleocharis mamillata* (Cyperaceae) and confusion with *E. macrostachya* and *E. palustris*. — *Rhodora* 116: 163–186, Cambridge, Mass.
- Walters, S. M. 1953: *Eleocharis mamillata* Lindb. fil. and allied species. — *Bericht der Schweizerischen Botanischen Gesellschaft* 63: 271–286.

Internet resources

- Natural History Museum, University of Oslo: Vascular Plant Herbarium, Oslo (O). doi:10.15468/wtlymk. Accessed via <http://www.gbif.org/dataset/e45c7d91-81c6-4455-86e3-2965a5739b1f> on 2016–11–23.
- UiT The Arctic University of Norway: Vascular plant herbarium, Tromsø Museum. doi:10.15468/14epds. Accessed via <http://www.gbif.org/dataset/d0aa984e-c6d3-45ee-8fc0-df1df8f4126b> on 2016–11–23.
- Lampinen, R. & Lahti, T. 2016: *Kasviatlas 2015*. — *Helsingin yliopisto, Luonnontieteellinen keskusmuseo, Helsinki*. Levinneisyyskartat osoitteessa <http://www.luomus.fi/kasviatlas>.
- Lund Botanical Museum (LD): Lund Botanical Museum (LD). doi:10.15468/c4w4co. Accessed via <http://www.gbif.org/dataset/aab0cf80-0c64-11dd-84d1-b8a03c50a862> on 2016–11–23.
- NTNU University Museum: Vascular plant herbarium, NTNU University Museum. doi:10.15468/zrlqok. Accessed via <http://www.gbif.org/dataset/d29d79fd-2dc4-4ef5-89b8-cdf66994de0d> on 2016–11–23.
- Department of Ecology and Natural Resource Management at Norwegian University of Life Sciences: Vascular Herbarium, NMBU. doi:10.15468/mbhmmt. Accessed via <http://www.gbif.org/dataset/a17ad49c-1861-40ab-b571-a15f92793a3f> on 2016–11–23.
- The Norwegian Biodiversity Information Centre (NBIC): Norwegian Species Observation Service, 2016–10–16. Accessed via <http://www.gbif.org/occurrence/1239020637> on 2016–11–23.