



TOLYPELLA CANADENSIS SAWA (CHARALES), A CHAROPHYTE NEW TO THE FLORA OF RUSSIA, WITH REMARKS ON ITS ECOLOGY AND DISTRIBUTION

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Abstract. The charophyte *Tolypella canadensis* is reported from Russia. The species is found in three lakes in northwestern part of Arkhangelsk region. The finds give support to a circumpolar distribution of the species. The ecology of the Russian waters is very similar to the localities known in Scandinavia. A few new localities are added from Sweden and Norway.

■ Charophytes, *Tolypella canadensis*, Russia

INTRODUCTION

Tolypella canadensis was described as a new species for science in 1973, based on the finds in Lake Superior in Canada (Sawa 1973). The taxon was known from Sweden, where it was described by Hasslow (1939) as a new form of *Nitella mucronata* A. BRAUN, f. *haplophylla* HASSLOW. The redetermination has been done by the Norwegian author.

In Fennoscandia the species was first reported from Norway, in Lake Glomdalsvatnet in Nordland region close to the Arctic Circle (Langangen 1993). Langangen (1999) gives an updated distribution map for the species, and at the same time he suggests that the species should be looked for in Russia. In October 1999 the Norwegian author achieved a chance to visit St. Petersburg in Russia, and the Botanical Museum of the Russian Academy of Sciences (LE).

RESULTS

The new finds in Russia

Tolypella canadensis has now been determined in the material from three lakes in Russia,

Arkhangelsk province, Nenetskii national district, Bolshezemelskaia tundra, pool of the river Bolskaia Rogovaia (Large Horn) (c. 45 km west of the town Vorkuta).

Lake Padimeitry, 25.8.1966 coll. B.M. Katahckaja.

Lake Lola-Kuliga, 19.8.1966 coll. B.M. Katahckaja.

Lake Bolshoi Kharbei, 5.8.1983 coll. M. V. Getsen.

Specimens are deposited in herb. LE, from Lake Padimeitry also in herb. O.

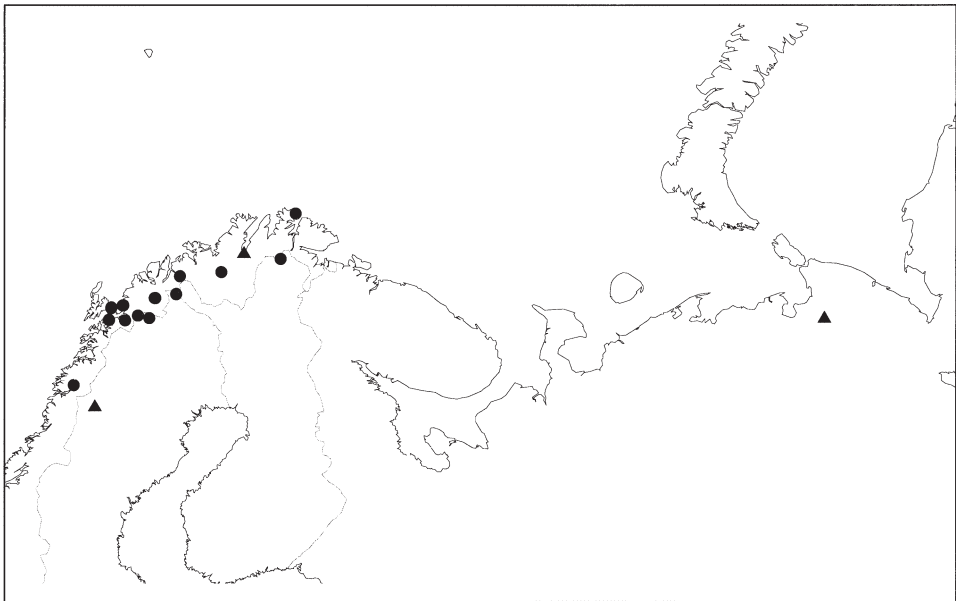


Fig. 1. Known distribution of *Tolypella canadensis* in Fennoscandia and Russia. ▲ the new finds reported in this article.

Description of specimens from Lake Padimeitry

Plants to 13 cm high. Axis diameter 0.5 mm, unincrusted. Internodes to 2.5 cm long. Sterile specimens have whorls with 4–6 sterile, simple branchlets, to 10 mm long. Each branchlet consists of 2–3 long cells and 1–2 short cells forming a mucro. Fertility of the studied specimens is very low. A few specimens with stalked antheridia at the whorl bases are found. Diameter of antheridium is 0.35 mm.

Material from Lake Lola-Kuliga is sterile.

Material from Bolshoi Kharbei has antheridia.

No oogonia are found in any of the localities.

Some ecological information about the lakes

According to Vlasova et al. (1973) the charophyte have been found at depths from 1 to 6 m in the lakes. The bottoms of these lakes are clay-sandy with silt and stones, or silt and silt-clay soil.

The lakes are all oligotrophic of the lagune type. The content of salt is low (20–42 mg/l) and pH has been measured to 6.5–7.2. The content of calcium is low (no exact values are given). In the ground around the lake the concentration of phosphorous is high (no exact values are given), but it does not affect the productivity in full scale, most probably because of the low water temperature.

New finds in Fennoscandia

1. Sweden

Torne Lappmark, Jukkasjärvi, Torneträsk, Aboskosuolo 24.8.1949 Gunnar Lohammar (UPS)

Lycksele Lappmark, Tärna, Gardvik in Gardiken 22.8.1960 Gunnar Lohammar (UPS)
2. Norway

Lebesby, Øvre Mardas, the Adamselv watercourse, depth of 4.5 m 15.9.1971 Karl-Dag
Vorren (TROM)

Distribution of *Tolypella canadensis*

Tolypella canadensis can be easily overlooked, because it is found together with, and has a superficial similarity to *Nitella flexilis* (L.) Ag. and *N. opaca* Ag. A re-determination of these species collected in Northern Norway, gave several new localities for *T. canadensis* (Langangen et Blindow 1995). Later the species was found in several more localities in Northern Norway (Mjelde et Edvardsen 1996; Langangen 1999).

Even more finds are reported from Sweden by Langangen et Blindow (1995) and by Langangen (1999).

The first report from Finland was published by Langangen et al. (1997), and a second find was published by Langangen (1999).

Two finds are reported from Greenland by Langangen *et al.* (1996).

The Canadian finds which are reported by Langangen & Blindow (1995) are according to Sawa (1973) and Langangen (1993). Professor Henry Mann at Memorial University of Newfoundland found two new localities from Canada in the National Herbarium in Ottawa (herb. CANA). Finds from Alaska (in herb. ALA) are reported by Langangen (1999).

A map showing the known distribution of *T. canadensis* can be seen in Langangen (1999).

Tolypella canadensis has a circumpolar distribution. The new finds in Russia support this view. The Russian locality is marked in the map in figure 1.

The taxon found there has been published in a Russian journal (Zhakova 1995), but under the name of *Tolypella spicata* (R. D. Wood) R. D. Wood.

Ecology of *Tolypella canadensis*

Tolypella canadensis is found in oligotrophic lakes and rivers with relatively low water temperatures. Many of the lakes are of the lagune type, often with streaming water. Lake Kjerkhauvatnet (Evenes, Norway) has a slightly increased content of nutrition compared to other oligotrophic lakes (Mjelde & Edvardsen 1996). Artificial inorganic enrichment of a locality with *T. canadensis* has shown that the species is heavily affected, and nearly disappeared in the actual lake (NIVA-rapport 1998).

Localities with *Tolypella canadensis* are clear water lakes, and the species is found down to 9–13 m both in Kilpisjärvi and Torneträsk (Sweden).

Tolypella canadensis is often found in mixed populations with *Nitella opaca* or *N. flexilis* which can be the reason why the species has been overlooked.

Tolypella canadensis is perennial and is often found sterile. Ripe oospores are not common, but are nevertheless found in several localities.

We suggest that *T. canadensis* should be investigated in more detail, as it is probably one of the very few charophytes adapted to polar environments.

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