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Sparganium angustifolium (Sparganiaceae) – a new locality in the Carpathians

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Sparganium angustifolium (= *S. affine* SCHNIZL.) is a circumpolar taxon. Its distribution centre in Europe is in the Scandinavian Peninsula and in the northern part of the European continent. The species reaches its southern limits in the Pyrenees Peninsula, in Alps, and in the east – up to Macedonia. Its patchy occurrence was recorded in the Bohemian Forest (the Czech Republic), in the West Carpathians and in the Balkan Peninsula (MEUSEL, JÄGER & WEINERT, 1965; MÜLLER-DOBLIES & MÜLER-DOBLIES, 1980).

In the Carpathian Range, *S. angustifolium* was recorded in four localities of the Tatra Mts in the West Carpathians – two in Slovakia and two in Poland.

In Slovakia, the species was discovered by KOTULA (1890) in two glacial lakes: the 2nd and the 3rd Roháčske pleso in the Západné Tatry Mts. The details on the taxon occurrence in the mentioned localities were given by DOSTÁL (1929). The lakes, which are close to each other (with some dozen meters in between them), are situated in the altitude 1650 and 1653 m a.s.l. The lower one, the 2nd Roháčske pleso, has an area of 0.21 ha with max. depth of 1.2 m. *S. angustifolium* stand covers over two thirds of the lake's bottom with approximately 90% cover. In the upper, the 3rd Roháčske pleso, with the area of 0.61 ha and maximum depth 3.7 m, the two large stands of *S. angustifolium* were found. The stand nearby the northern lakeshore was larger, occupying up to 140 m^2 (20 × 6–7 m), though the plant cover was lower there (only about 40%). Outside the continuous stand, the plants were occurring in smaller fragmented colonies. In the second stand of the size 10 m^2 (2.5 m × 4 m), which was close to the southern shore, the cover of *S. angustifolium* exceeded 90%.

In Poland, *S. angustifolium* was found in two neighbouring glacial lakes: Nižny and Vyšny Toporowy staw. These lakes are situated in the altitude 1105 and 1130 m a.s.l., respectively. The lower one, Nižny Toporowy staw, has an area of 0.62 ha and max. depth of 5.9 m. Vyšny Toporowy staw occupies 0.03 ha having the max. depth of 1.1 m. In Nižny Toporowy staw, the species was discovered in 1951, however, only sterile specimens were found (RADWANSKA-PARYSKA, 1981). Unfortunately, since 1976 the species has not been confirmed any more in this locality, and it is considered to be extinct (PIĘKŚ-MIRKOWA, in verb.). In Vyšny Toporowy Lake, growing sterile plants of *S. angustifolium* were found in the area of about 20 m^2 (PIĘKOŚ-MIRKOWA, 1982). In 2001 and 2002 no specimen was found in this site. It will be seen in the future, whether

this phenomenon was caused by natural fluctuation or was due to the species extinction in this locality (PĘKOŚ-MIRKOWA, in verb.).

In August 2003, we have discovered a new locality of the species *S. angustifolium*. The locality is situated in the NW part of glacial lake Nižné Žabie pleso in the Žabia Bielovodská dolina Valley in the Vysoké Tatry Mts in Slovakia, at the altitude of 1674 m a.s.l. The stand covers the area up to 50 m^2 being separated by boulders from the rest of the lake. The granite boulders on the lake bottom are covered with thick layer (more than half a meter) of fine black sediment. Apart from the main colony, there are three other small colonies of *S. angustifolium* of about 1 m^2 in size.

Slovakia, the West Carpathians, the Vysoké Tatry Mts, glacial lake Nižné Žabie Bielovodské pleso (49°12′03″; 20°06′37″), depth 0.4–0.6 m, sample area 16 m^2, 1674 m a.s.l., pH 5.52, conductivity 20.6 μS/cm.E_1: 95%, E_0: 0%, August 14, 2003, (sampled by Dítě, Pukajová), E_1: *Sparganium angustifolium* 5.

Note: Except the conventional habitat variables, pH and conductivity were measured directly in the groundwater using CyperScan PC 300 device. The conductivity values related to the temperature 20 °C, subtracting the hydrogen ions conductivity (SJÖRS, 1950). pH values were re-calculated according to DU RIETZ (sec. SJÖRS, 1950).

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