

TETRAPLODON MNOIODES (BRYOPSIDA, SPLACHNACEAE) IN THE TATRA NATIONAL PARK (POLAND)

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Abstract. Six new records of the coprophilous altimontane moss species *Tetraplodon mnioides* (Sw. ex Hedw.) Bruch & Schimp. are provided for the Polish Tatra Mts in the Western Carpathians. The ecology and current distribution of the species in the Tatras National Park is described.

Key words: mosses, *Tetraplodon mnioides*, distribution, ecology, Tatra National Park, Tatra Mts, Carpathians, Poland

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INTRODUCTION

An interesting altimontane coprophilous moss was discovered at six localities in the Polish part of the Tatras, Western Carpathians in 2003–2005. *Tetraplodon mnioides* (Sw. ex Hedw.) Bruch & Schimp. is one of six *Tetraplodon* species in Europe (Corley *et al.* 1981) and one of two species of the genus in Poland (Ochyra *et al.* 2003).

The global distribution of *Tetraplodon mnioides* is discussed in detail and mapped by Szmajda *et al.* (1991). It is an Arctic-boreal-montane species with a continuous distribution in the Arctic and boreal zones, with isolated localities in the mountains in the southern Holarctic. Additionally, it occurs at altimontane elevations in tropical mountains of Central and South America, East Africa and Malesia. It is a rare component of the montane moss flora of Poland and hitherto has been only recorded from the Sudetes and the Tatra Mts in the Western Carpathians. All records, but one, of *T. mnioides* in the Sudetes date back to the 19th century, whereas in the Tatras it was recorded once in the 19th century and twice in the second half of the 20th century. Because of its scarce occurrence in Poland, *T. mnioides* has been placed in the group of rare species (R category) of the Red List of Polish mosses (Żarnowiec *et al.* 2004).

This account provides six new records of *Tetraplodon mnioides* in the Tatra Mts, presents

the current distribution of the species in the Tatras and discusses its ecology. The herbarium material is deposited in the Bryological Herbarium of the W. Szafer Institute of Botany, Polish Academy of Sciences in Kraków (KRAM).

ECOLOGY

Tetraplodon mnioides is an altimontane coprophilous and nitrophilous moss, growing on animal droppings, bird pellets, decaying carcasses of animal and on soil or humus enriched with nitrogen (Cameron & Wyatt 1986; Diersen 2001). It occurs at well-illuminated, mesic and dry sites with, moderately acid to neutral soils with pH 5.7–7.0(–7.5). It adapted to cold microsites (Diersen 2001). In Europe, *Tetraplodon mnioides* is a dominant species in coprophilous communities belonging to the association *Tetraplodontietum* Gams 1927 in the order *Splachnometalia lutei* Hadač & Klika in Klika & Hadač *ex v.* Hübschm. 1957 and class *Funarietea hygrometricae* v. Hübschm. 1957 (Diersen 2001). It is an entomophilous species which produces abundant sporophytes and spores, which are dispersed by dipterans (Cameron & Wyatt 1986). All the new collections in the Polish Tatra Mts reported on here had sporophytes. They were found on animal droppings, bird pellets, a mouse carcass

and humus. At the highest locality it occurred on wet calcareous soil on mylonite and was associated with *Andreaea rupestris*, *Bartramia ithyphylla*, *Distichum capillaceum*, *Ditrichum flexicaule*, *Encalypta alpina*, *Polytrichastrum alpinum*, *Racomitrium lanuginosum*, *Tayloria froelichiana* and vascular plants (*Primula minima*, *Saxifraga oppositifolia*, *S. panniculata*, *S. retusa*, *Soldanella carpatica*).

DISTRIBUTION IN THE TATRA NATIONAL PARK

In Poland, *Tetraplodon mnioides* occurs only in the Tatra Mountains in the Western Carpathians (Krupa 1888; Lisowski 1959; Szmajda *et al.* 1991), in the Sudetes (Limpricht 1867, 1876; Milde 1866, 1869; Limpricht 1930) and Pogórze Sudeckie foothills (Milde 1859; Limpricht 1876; Szmajda *et al.* 1991). In the Tatra National Park, *T. mnioides* was previously known from only three localities (Krupa 1888; Lisowski 1959; Szmajda *et al.* 1991). It was first reported from Mt. Małolączniak in the

West Tatra Mts more than hundred years ago, by Krupa (1888). In the High Tatra Mts, *T. mnioides* was found growing on humus on the north slope of Mt. Opalony Wierch, by Lisowski in 1956 (Lisowski 1959). It was also found by Ochyra in 1981 on northern slope Mt. Żółta Turnia (the so-called 'Dubrawiska'; Szmajda *et al.* 1991). Currently, *T. mnioides* is known from 9 sites in the Tatra National Park (Fig. 1).

SPECIMENS EXAMINED. SOUTHERN POLAND, WESTERN CARPATIANS, High Tatra Mts: Hińczowa Przełęcz pass, alt. 2323 m, 49°11'15"N/20°03'19"E, the subnival belt, S slope, on wet calcareous soil on mylonite area, c. spor., ATMOS grid square Ge-60, 1 August 2003, *leg. B. Cykowska 665* (KRAM); Zadni Mnichowy Piarg scree in Dolina za Mnichem valley, alt. 1950 m, 49°11'48"N/20°03'10"E, the alpine belt, S slope, on wet humus in granite scree, c. spor., ATMOS grid square Ge-60, 5 August 2003, *leg. B. Cykowska 765* (KRAM); Dolina Rybiego Potoku valley, alt. 1365 m, 49°13'19"N/20°03'08"E, the upper forest belt, on bird pellets in spruce forest, c. spor., ATMOS grid square Ge-60, 23 August 2004, *leg. B. Cykowska 2859* (KRAM);

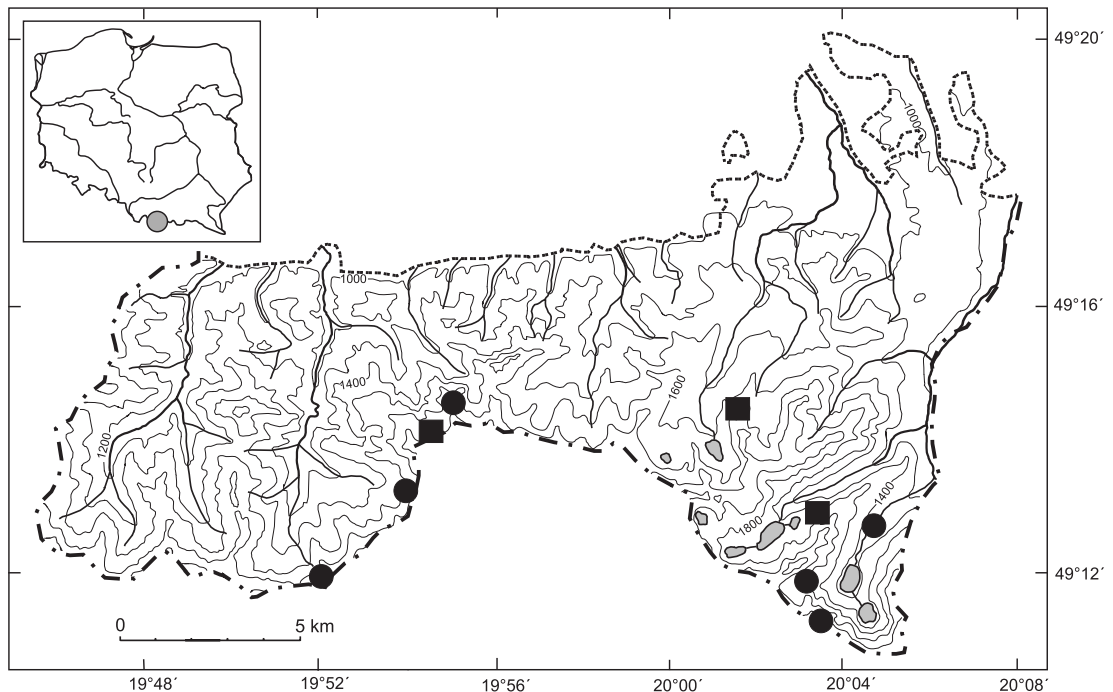


Fig. 1. Distribution of *Tetraplodon mnioides* in the Tatra National Park ■ – former stations; ● – new localities

West Tatra Mts: Mt. Kopa Kondracka, alt. 1935 m, 49°14'15"N/19°56'05"E, the alpine belt, N aspect, on a mouse carcass, c. spor., ATMOS grid square Gd-59, 17 July 2004, *leg. B. Cykowska 1519* (KRAM); Mt. Suchy Wierch Tomanowy, alt. 1860 m, 49°12'59"N/19°54'07"E, the alpine belt, E aspect, on animal dropping, c. spor., ATMOS grid square Gd-69, 29 July 2005, *leg. B. Cykowska 3814* (KRAM); Mt. Kamienista, alt. 2120 m, 49°11'45"N/19°52'10"E, the alpine belt, W aspect, on animal dropping, c. spor., ATMOS grid square Gd-69, 28 July 2005, *leg. B. Cykowska 3647* (KRAM).

CONCLUSIONS

In the Polish Carpathians *Tetraplodon mnioides* is listed as a rare (R category) species (Żarnowiec *et al.* 2004), but in the adjacent territory of Slovakia it is considered a vulnerable (V category) species (Kubinská & Janovicová 1996). Most of its stations in Poland are known since the 19th century. The discovery of new localities reported here suggests that it may be more common in the Tatra Mts and future field work should discover even more localities (cf. Szmajda *et al.* 1991). The Hińczowa Przełęcz pass, at an altitude of 2323 m a.s.l., is the highest locality that *T. mnioides* has been found in Poland and represents the first record of the species in the subnival belt.

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