

***Nardia compressa* – a liverwort new to Slovakia found in the Tatra Mountains**

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(Received 21 November 2009, accepted 22 December 2009)

Abstract – *Nardia compressa* has erroneously been reported from Slovakia on several occasions. These data have been published between 1860 and 1960 from the Tatra Mountains (Western Carpathians) area. It has been mistaken for big, flattened aquatic forms of *N. scalaris*. In the Polish part of the Tatra Mts, *N. compressa* has also been reported incorrectly in 1956. This paper presents the first record of *Nardia compressa* in Slovakia (Western Tatra Mts) as well as characteristics of diagnostic features of this species.

***Nardia compressa* / the Tatra Mts / Western Carpathians**

INTRODUCTION

The presence of *Nardia compressa* (Hook.) Gray (Jungermanniales, Solenostomataceae) in Slovakia and Poland has been questionable so far. The localities of this plant in both countries have been reported in the border massif of the Tatra Mountains (Western Carpathians). Those data were mostly gathered during the initial stages of hepaticological studies in the Tatra Mountains (Hazslinszky, 1860, 1865; Limpricht, 1877; Szyszyłowicz, 1885; Krupa, 1888; Kulesza, 1920; Szepesfalvy, 1926). The most recent reports in Slovakia (High Tatra Mountains) are almost 50 years old (Boros *et al.*, 1960). Herbarium material from these localities was later revised (J. Váňa *in* Duda & Váňa, 1971) during studies concerning the distribution of liverworts in the former Czechoslovakia. The only exceptions were inaccessible material from the studies of Krupa (1888) and Szepesfalvy (1926) (Duda & Váňa, 1971; Váňa 1995). Every revised collection contained large forms of *Nardia scalaris* (Duda & Váňa, 1971). In a recent list of the distribution of liverworts in Europe, *Nardia compressa* was excluded from the area of Slovakia (Söderström *et al.*, 2002, 2007) even though it was still present in both the Red List and the checklist of bryophytes in Slovakia (Kubinská *et al.*, 2001a, 2001b).

In Poland, *N. compressa* has been recorded in the Tatra Mountains (Szweykowski, 1956). The same author later corrected the identification to an aquatic, highly-flattened form of *N. scalaris* (Szweykowski, 1960). *Nardia compressa* was excluded from the area of Poland by Szweykowski (2006; see also Söderström *et al.*, 2007) and to the present day there is no information about its

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occurrence in Poland. In the Czech Republic, *Nardia compressa* was found in 1994 (Váňa, 1995) although earlier it had been erroneously reported there three times.

Nardia compressa is a suboceanic-montane species with localities scattered throughout Europe. It has been reported from the mountain areas of Ireland, Britain, Norway, and Sweden (Damsholt, 2002). In Western and Central Europe *N. compressa* has been recorded in Portugal, Spain, France, Belgium, Switzerland, Austria, Germany, and the Czech Republic (Schumacker & Váňa, 2005; Kučera & Váňa, 2005). In the south, the species reaches Italy, Corsica, Serbia, Bulgaria, and North Caucasus (Söderström *et al.*, 2002; Sabovljević & Natcheva, 2006). Outside of Europe it grows in the northern part of North America (Subarctic America, Western Canada, north-western USA), in temperate Asia (Russian Far East, Transcaucasus, Western Asia, China, Mongolia) and in the Indian Subcontinent (Söderström *et al.*, 2002, 2007).

Nardia compressa is not a common species (Váňa, 1976). It is considered an endangered plant in the Czech Republic, Germany and Italy (Söderström *et al.*, 2002, 2007). This work documents the first and so far only locality of *Nardia compressa* in Slovakia.

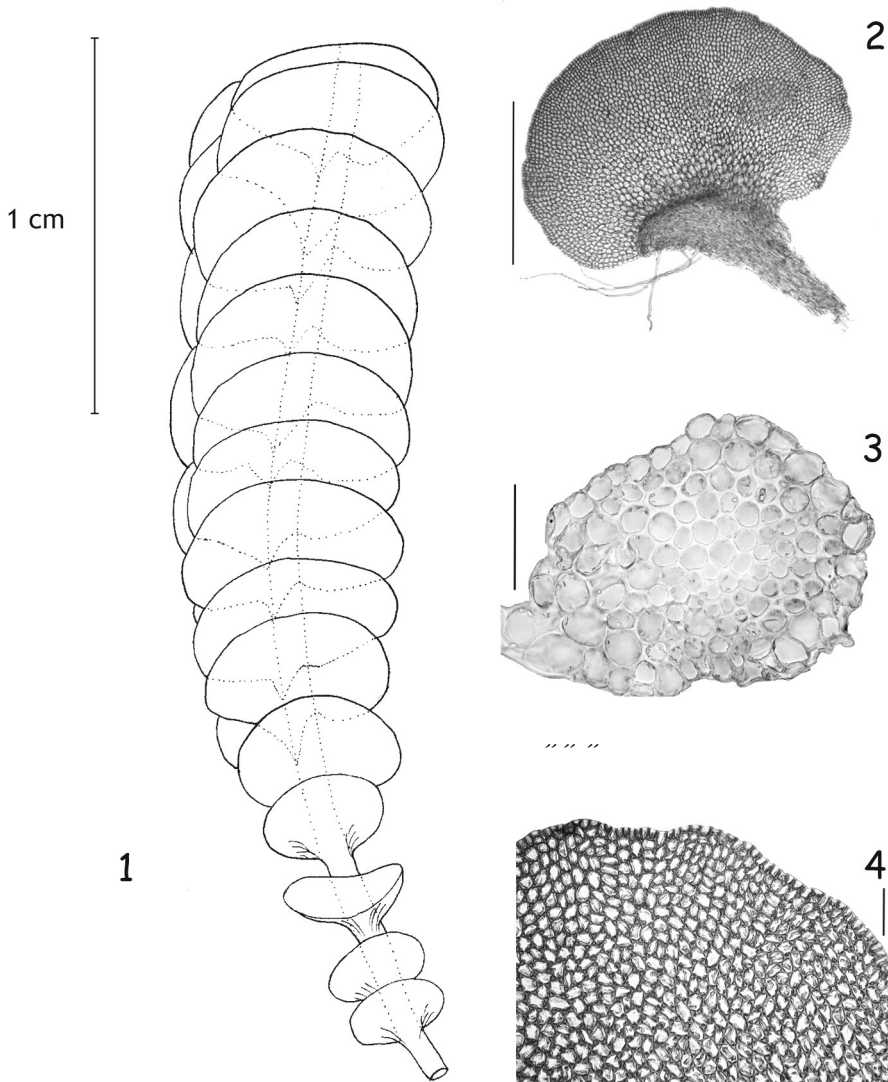
DIAGNOSTIC FEATURES OF *NARDIA COMPRESSA*

Nardia compressa can be mistaken for large aquatic forms of the common *N. scalaris*. The diagnostic feature of *N. compressa* (distinguishing monotype subgenus *Nardia*) is the presence of a hyalodermis in the stem (see Fig. 3). Additional features are: (1) high lateral flattening of the plant (Fig. 1), (2) *Bazzania*-type of intercalary branching, (3) red-brown to purplish pigmented shoots, whereas shoots of *N. scalaris* are green to yellowish-green, (4) leaves dorsally decurrent (see Fig. 2), whereas leaves of *N. scalaris* are only slightly decurrent, (5) almost complete lack of rhizoids (*N. scalaris* has few to many), (6) leaves reniform with cells decreasing distinctly in size from mid-leaf to apex (see Figs 2,4), whereas leaves of *N. scalaris* are orbicular and the cells do not decrease in size from mid-leaf to apex.

DESCRIPTION OF THE NEW LOCALITY

A new locality of *Nardia compressa* was found in the upper part of Kamenistá Dolina Valley (Dolina Kamienista) in the Slovakian part of the Western Tatra Mountains (Fig. 5). The site is located below Pyšné Sedlo (Przełęcz Pyszniańska) in the upper reaches of the Kamenistý Potok River (Kamienisty Potok), at 1665 m a.s.l. The locality is very profuse. *Nardia compressa* creates a complex pillow in a water-filled community with *Nardus stricta*, in a well-head that supplies Kamenistý Potok.

Herbarium material was collected on 30 August 2008 and deposited in the herbarium of the Department of Botany (POZNB 126), University of Life Sciences, Poznań, Poland. Doublets were sent to the following herbariums: SAV (Bratislava, Slovakia), KRAM (Kraków, Poland) and POZW (Poznań, Poland).



Figs 1-4. *Nardia compressa* (Hook.) Gray – **1.** Habit of sterile plant in lateral view (from POZNB 126, leg. P. Górski, 30 August 2008; drawn by A. Czarna). **2.** Leaf; note part of leaf decurrent dorsally (bar = 1 mm). **3.** Stem cross-section; note the hyalodermis (bar = 100 µm). **4.** Leaf with cells indicated; note cells decreasing distinctly in size from mid-leaf to apex (bar = 100 µm). (All from POZNB 126).

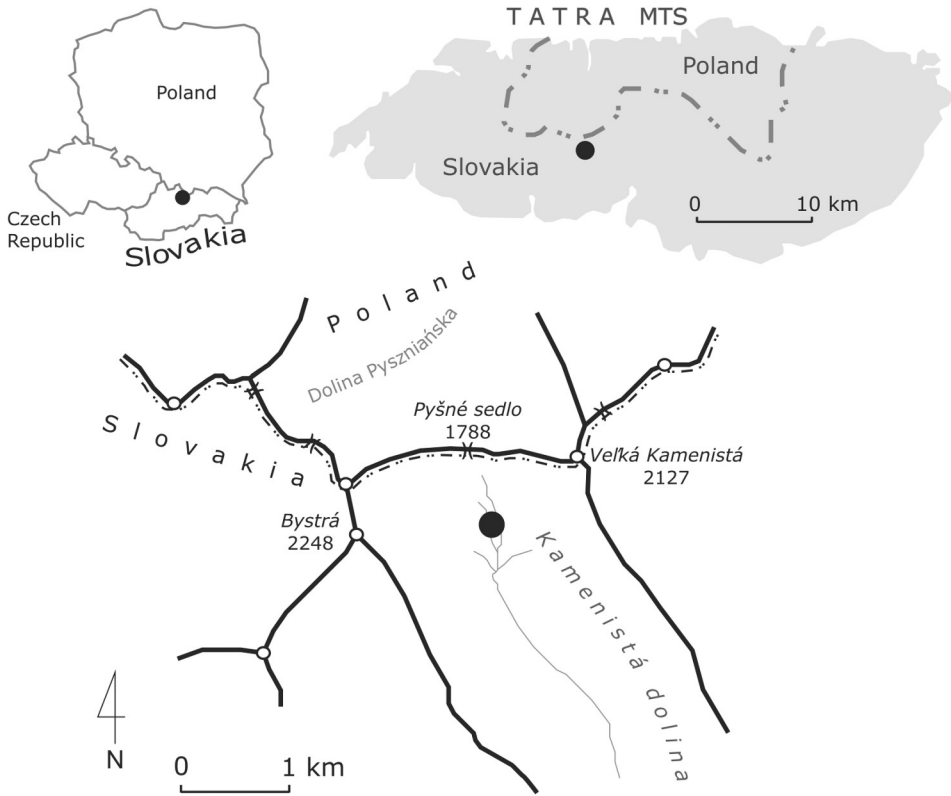


Fig. 5. Locality of *Nardia compressa* (Hook.) Gray in the Slovakian part of the Tatra Mountains.

FINAL REMARKS

Whilst the Slovakian Western Tatra Mountain region is a very interesting area when it comes to geobotanics, it is still being poorly scrutinized. An 11,000-record database was compiled concerning the occurrence of liverworts in the Tatra Mountains from the years 1814-2009. This showed that in the Slovakian Western Tatra Mountain region there are only 1,092 records compared to 4,395 records in the Slovakian High Tatra Mountain region. In the Polish side of the massif there are only a few more records in the High Tatra Mountains (1923 vs. 1563). In the Slovakian Western Tatra Mountains there are localities of the most rare species of liverworts on the massif: *Anastrophyllum donnianum* and *A. saxicola* (Krupa, 1882, 1888; Szweykowski, 1960; Górski, 2009). A profuse, although sole, locality of *Nardia compressa* indicates that there is a possibility that this plant can also occur in the Polish Tatra Mountains.

Acknowledgements. I am grateful to Prof. Jiří Váňa (Charles University, Prague, Czech Republic) for revision of herbarium specimens. I am also grateful to Dr Anna Rusińska (Adam Mickiewicz University, Poznań) for taking microphotographs.

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