

Occurrence of the vegetative propagules in the moss *Orthotrichum stramineum* Hornsch. - a new piece of knowledge

Vítězslav Plášek, Sylwia Wierzcholska & Eva Mikulášková

Occurrence of the vegetative propagules in the moss *Orthotrichum stramineum* Hornsch. - a new piece of knowledge.- Čas. Slez. Muz. Opava (A), 56: 43-47, 2007.

Abstract: Arising of vegetative propagules in the moss *Orthotrichum stramineum* Hornsch. hasn't been described till the present. Description of the phenomenon together with the report of six recent findings from the Czech Republic and Poland is given by authors.

Keywords: Bryophytes, mosses, *Orthotrichum stramineum*, gemmae, vegetative propagules, Rychlebské hory Mts., Šumava Mts., Góry Białskie Mts., Czech Republic, Poland

Introduction

The genus *Orthotrichum* is represented in both, Czech Republic and Poland by 20 taxa. Distribution of *Orthotrichum stramineum* Hornsch. in the Czech Republic was described by Vondráček (1993). There are about 125 known localities, especially in the area of border mountain ranges. Precise distribution of the species in Poland is still insufficiently known. But in some of Polish regions the moss is surprisingly considered as endangered or extinct (Jędrzejko 1997).

Producing of gemmae as the vegetative propagules is well known in some taxa within *Orthotrichum* genus (Lewinsky 1995, Nyholm 1998). Some species with superficial stomata, e.g. *Orthotrichum lyellii*, *O. obtusifolium*, even make the preference of the vegetative reproduction.

In European *Orthotrichum* species with immersed stomata, especially within section *Diaphana* (sensu Lewinsky 1995) is arising of the gemmae only an alternate way of the reproduction. There were known a number of occasionally gemmiferous species – e.g. *Orthotrichum alpestre*, *O. diaphanum*, *O. flowersi*, *O. macrocephalum*, *O. philibertii*, *O. pumilum*, *O. stellatum* and *O. tenellum* till this time (c.f. Lewinsky 1995, Nyholm 1998, Vondráček 1993). But there isn't any known literature information about observing of the moss *Orthotrichum stramineum* with created vegetative propagules. Authors recently found the gemmiferous plants of the species on six localities in Rychlebské hory Mts., Šumava Mts. (Czech Republic) and Góry Białskie Mts. (Poland) – see description of the localities and map.

Description of gemmiferous plants

The collected plants are autoicous, 0.5 – 1.4 cm high. Sporogones are richly presented. Dark green protonema-like filamentous gemmae are numerously produced in leaf axils or leaf surface. They are variable in length, branched or not, uniseriate, mostly created by 8 to 11 cells. The cells of the gemmae are isodiametric (18) – 20 – (22) μm wide, smooth - see Fig. 4-6. The vegetative propagules were arisen mostly on older plants particularly after their capsules became mature. On young plants the gemmae were observed rarely.

Description of the localities

The subsequent list of the recent localities where the gemmiferous plants of the moss *O. stramineum* were observed is arranged by date of findings:

1) **Czech Republic, Rychlebské hory Mts.**, 750 m NNE of Lázně Jeseník spa, 920 m SSE of Jehlan Mt., GPS position (WGS 84): N=50°14'55" & E=017°11'27", 600 m a.s.l., edge of mixed forest, bark of *Acer pseudoplatanus*, leg. V. Plášek 27.V.1995. The herbarium specimen is placed in herbarium of Silesian museum in Opava (OP #185456).

The gemmiferous plants grew on NW side of the tree at the height of about ca. 150 cm above ground. The population was small not larger than 10 cm². Production of sporogones was observed.

2) **Poland, Góry Bialskie Mts.**, valley of Jedlnik brook, ca. 200 m W of confluence with Biała Łądecka stream, 1395 m NNE of Dział Mt. & 1115 m WNW of Smrecznik Mt., 850 m a.s.l., GPS position (WGS 84): N=50°14'18" & E=017°00'04", bark of *Acer pseudoplatanus*, leg. S. Wierzcholska & V. Plášek 13.VIII.2003. The herbarium specimen is placed in herbarium of Silesian museum in Opava (OP #185455).

The gemmiferous plants grew on N side of the tree, at the height of 180-250 cm above ground. The population appeared to be vital and currently covered about 80 square centimeters. Furthermore gemmiferous plants arising of sporogones were in plenty.

3) **Poland, Góry Bialskie Mts.**, Puszcza Snieżnej Białki Reserve, edge of a primeval forest, ca. 950 m E of Rudawiec Mt. & 1740 m NNE of Dział Mt., 1009 m a.s.l., GPS position (WGS 84): N=50°14'58" & E=016°59'38", bark of *Acer pseudoplatanus*, leg. S. Wierzcholska & V. Plášek 8.VII.2004. The herbarium specimen is placed in private herbarium of the second author.

The gemmiferous plants grew on SW side of the tree, at the height of 300-310 cm above ground. The vital population covered about 60 square centimeters. The plants produced a lot of sporogones. Accessories species: *Ulota bruchii*, *Brachythecium reflexum* and *Hypnum cupressiforme*.

4) **Czech Republic, Šumava Mts.**, 1.7 km E of Popelná village, beechwood on NE slope of valley of nameless affluent of Losenice stream, 928 m a.s.l., GPS position (WGS 84): N= 49°06'18" & E= 013°35'11", bark of *Fagus sylvatica*, leg. O. Peksa 5.IV.2005, det. Eva Loskotová, rev. V. Plášek. The herbarium specimen is placed in private herbarium of the third author - #1033.

Accessories species: *Amblystegium serpens*, *Brachythecium velutinum*, *Brachythecium rutabulum*, *Dicranum montanum*, *Frullania dilatata*, *Hypnum cupressiforme*, *Isoetium alopecuroides*, *Leucodon sciuroides*, *Metzgeria furcata*, *Neckera complanata*, *Plagiochila porelloides*, *Radula complanata*, *Ulota sp. /steril./*, *Lobaria pulmonaria*.

5) **Czech Republic, Šumava Mts.**, SW slope of Jelení Kaliště Mt. towards Lišák Mt., alley near a forest path, 1120 m a.s.l., GPS position (WGS 84): N=49°03'58" & E=013°32'05", bark of *Acer pseudoplatanus*, 30.IX.2005 leg. E. Loskotová, teste V. Plášek. The herbarium specimen is placed in private herbarium of the third author - #1048.

Accessories species: *Amblystegium serpens*, *Brachythecium velutinum*, *Dicranum montanum*, *Dicranum scoparium*, *Hypnum cupressiforme*, *Orthotrichum obtusifolium*, *Plagiothecium nemorale*, *Ptilidium pulcherrimum*.

6) **Czech Republic, Šumava Mts.**, Smrkový vrch Mt., close to road, 420m and 190° from top of hill, 1105 m a.s.l., GPS position (WGS-84): N= 49°01'36" & E= 013°25'27", bark of *Acer pseudoplatanus*, 26.X.2005 leg. Eva Loskotová, teste V. Plášek. The herbarium specimen is placed in private herbarium of the third author - #1062.

Accessories species: *Lobaria pulmonaria*, *Orthotrichum obtusifolium*.



Map. 1. The Central Europe area with marking of six localities on which gemmiferous plants of the moss *Orthotrichum stramineum* were observed. Numbers of the localities correspond with the list above.

Discussion

The paper shows the way of vegetative reproduction in the moss *Orthotrichum stramineum* which has not been known till the present. Authors are in the conviction that the exhaustive field survey or study of herbarium specimens would fetch new data about the occurrence of the vegetative propagules in the moss species from other European countries.

References

- Jędrzejko, K. (1997): Czerwona lista mchów Górnego Śląska [Red list of Upper Silesian Mosses]. – Raporty Opinie. 2:18-37.
- Lewinsky-Haapassari, J. (1995): Illustrierter Bestimmungsschüssel zu den europäischen *Orthotrichum*-Arten. – Meylania. 9:1-57.
- Nyholm, E. (1998): *Orthotrichum*. In: Illustrated Flora of Nordic Mosses. Fasc.4. Nordic Bryological Society. 377-401.
- Vondráček, M. (1993): Revize a rozšíření druhů rodu *Orthotrichum* Hedw. v České a Slovenské republice [A revision and distribution of the moss genus *Orthotrichum* Hedw. for Czech and Slovak Republic]. – Sborn. Západočes. Muz., Plzeň, Přír. 85:1-76.

Pozorování výskytu vegetativního rozmnožování u mechu *Orthotrichum stramineum* Hornsch.

Studiem a revizí herbářových dokladů z území střední Evropy byla zaznamenána produkce vegetativních rozmnožovacích částic u 6 dokladů druhu *Orthotrichum stramineum* Hornsch. Druh se velmi často rozmnožuje pomocí spór, nicméně produkce gem nebyla dosud v literatuře popisována. Autoři přikládají popis těchto rozmnožovacích částic, seznam lokalit i barevnou fotodokumentaci.

Authors' addresses: Vítězslav Plášek, University of Ostrava, Dept. of Biology and Ecology, Chittussiho 10, CZ-710 00 Ostrava, Czech Republic & Silesian Museum in Opava, Dept. of Botany, Tyršova 1, CZ-746 01 OPAVA, Czech Republic, e-mail: vitezslav.plasek@osu.cz.
Sylvia Wiercholska, University of Wrocław, Dept. of Biodiversity and Plant Cover Protection, Institute of Plant Biology, Kanonia 6/8, PL-50 328 Wrocław, Poland, e-mail: sylvia_wiercholska@op.pl.
Eva Mikulášková, Administration of NP and PLA Šumava, Sušická 399, CZ-341 92 Kašperské Hory, Czech Republic & Charles University in Prague, Dept. of Botany, Benátská 2, CZ-128 01 Praha, Czech Republic, e-mail: loskotova@centrum.cz.



Fig. 1-7. Picture of gemmiferous moss *Orthotrichum stramineum* with detail views of the gemmae. 1- view on the gemmiferous plants; 2- habitat (bark of *Acer pseudoplatanus* with the moss cushions); 3 the capsules of *Orthotrichum stramineum*; 4-7- the detail views on the vegetation propagules.

