

***Orthotrichum pulchellum* (Orthotrichaceae, Musci),  
new to the Czech Republic**

VÍTĚZSLAV PLÁŠEK<sup>1</sup> & IVANA MARKOVÁ<sup>2</sup>

<sup>1</sup>*Department of Biology and Ecology, University of Ostrava, Chittussiho 10, CZ-710 00 Ostrava,  
Czech Republic; e-mail: vitezslav.plasek@osu.cz*

<sup>2</sup>*Bohemian Switzerland National park Administration, Pražská 52, CZ-407 46 Krásná Lípa, Czech Republic;  
e-mail: i.markova@npcs.cz*

PLÁŠEK V. & MARKOVÁ I. 2007: *Orthotrichum pulchellum* (Orthotrichaceae, Musci), new to the Czech Republic. *Acta Musei Moraviae, Scientiae biologicae* (Brno) 92: 223–228. – *Orthotrichum pulchellum* is reported as new for the bryoflora of the Czech Republic. The species was discovered in the České Švýcarsko National Park, the Lužické hory Protected Landscape Area and the Děčínsko region. The localities are described in detail. The species is illustrated by a photograph. Its ecology and diagnostic characters are briefly discussed.

**Keywords.** mosses, bryoflora, *Orthotrichum pulchellum*

#### Introduction

During a bryofloristic survey in the České Švýcarsko National Park a noteworthy moss from the family *Orthotrichaceae* was collected by the second author. The specimen was identified upon microscopic examination by the first author as *Orthotrichum pulchellum*. This finding turned out to be the first record of the taxa in the Czech Republic moss flora. The species was subsequently recorded in the Lužické hory Mts. and near Děčín town as well.

The nomenclature of the moss taxa follows HILL et al. (2006), tree species follow KUBÁT et al. (2002).

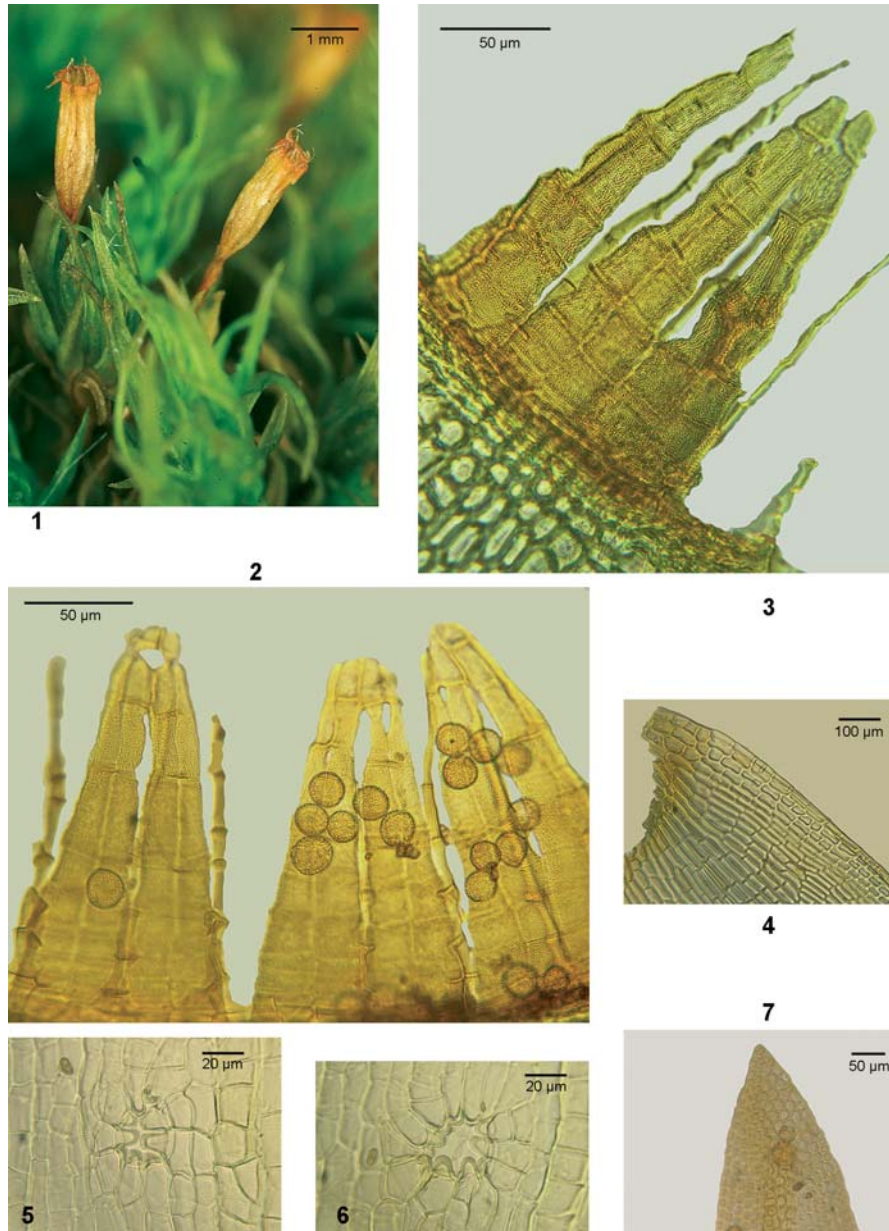
#### Description of the species

***Orthotrichum pulchellum* Brunton in J. E. Smith**

(Figs 1–8)

*Engl. Bot.* 25: (Sept. 1), 1807.

Plants have a height of about 1–1.5 cm. The stem leaves are loosely-twisted and crisped-flexuose when dry, narrowly lanceolate to linear-lanceolate, about 1.6–3.2 mm long, sharply acute. The margins are recurved to near apex, and entire. Distal laminal cells are 8–14 µm wide, unistratose, with small, conical papillae. Basal laminal cells are rectangular, non-nodose. The sexual condition of the species is gonioautoicous. Seta is 1–3 mm long. Capsules are exserted or sometimes 1/2 emergent; urns are oblong-cylindrical, about 0.9–2.1 mm long, strongly 8-ribbed for entire length. Stomates are immersed, situated in middle and distal portion of capsule, about 1/2 to completely covered by strongly differentiated subsidiary cells. Peristome is double; there are 16 endostome



**Figs 1–7.** View of the identification characters of the moss *Orthotrichum pulchellum*: 1 – capsules with conspicuously rubiginous colour of exostome teeth, 2 – peristome (exostome is formed of 8 teeth, later splitting to 16; endostome is formed of 16 segments), 3 – detail of irregularly papillose-striate exostome teeth (papillose structure at base; striate structure at apex), 4 – marginal cells of leaf base, 5–6 – immersed stomates, 7 – leaf apex (illustration by the first author).



**Fig 8.** View of fertile growths of the moss *Orthotrichum pulchellum*. (photo by Michael Lüth)

segments, of 1 row of cells, finely roughened; there are 16 exostome teeth, rarely united into 8 pairs, erect when mature, later reflexed, densely papillose. Calyptra is oblong-conic to conic, naked. Spore size is 12–24  $\mu\text{m}$ .

At first sight, *Orthotrichum pulchellum* appears to conform with species within the genus *Ulota*. It may be distinguished from them particularly by the glabrous calyptra and immersed stomates. The exostome teeth of *Orthotrichum pulchellum* are conspicuously orange to rubiginous in colour (SCHÄFER-VERWIMP 2001, LÜTH 2004). In addition, the marginal cells of the leaf base (thin-walled, hyaline, quadrate), a marked characteristic for *Ulota* species, are lacking in *O. pulchellum*.

#### **Description of the localities**

Details of the new localities of *O. pulchellum* are as follows:

**Loc.1:** České Švýcarsko National Park, 2.5 km WNW of Chřibská village, valley of the Doubický potok stream, loc. “hájenka Saula”, 335 m.a.s.l., GPS coordinates (WGS 84): N= 50°52'21''; E= 14°26'48'', 3.VIII. 2006 leg. I. Marková, det. V. Plášek, priv. herb. Marková # 78/2006 (see map – Fig. 9: loc. 1). Ecology: the moss cushion was recorded growing vertically on bark

of *Fraxinus excelsior* at a height of 205 cm above the ground, exposed ENE. The size of the population was 2 cm<sup>2</sup>. Associated species (alphabetically): *Brachythecium salebrosum*, *Hypnum cupressiforme* and *Orthotrichum pumilum*.

**Loc. 2:** Lužické hory Protected Landscape Area, 4.4 km NE of Česká Kamenice town, 830 m SE of Studenec hill, loc. “Sedlo pod Studencem”, road fork of blue and red tourist paths, 600 m.a.s.l., GPS coordinates (WGS 84): N = 50°49'47”; E = 14°27'52”, 27.V. 2007 leg. I. Marková, teste V. Plášek, priv. herb. Marková # 61/2007 (see map – Fig. 9: loc. 2). Ecology: the moss cushion was recorded growing vertically on bark of *Acer pseudoplatanus* at a height of 130 cm above the ground, exposed WNW. The size of the population was 4 cm. Associated species: *Orthotrichum pumilum*.

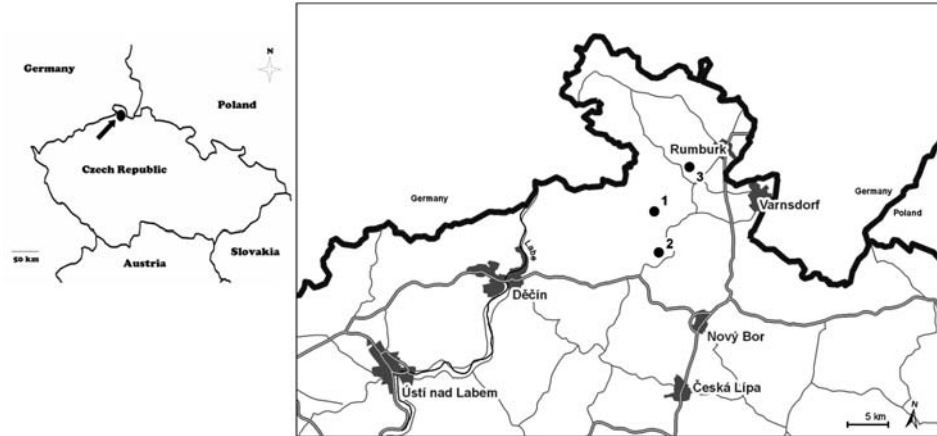
**Loc. 3:** Děčín district, Krásná Lípa town (5 km SW Rumburk town), small forest by local railway 1.7 km NW Krásná Lípa town, 455 m.a.s.l., GPS coordinates (WGS 84): N = 50°55'38”; E = 14°29'42”, 15.VIII.2007 leg. I. Marková, teste V. Plášek, priv. herb. Marková # 111/2007 and # 113a/2007 (see map – Fig. 9: loc. 3). Ecology: Two moss cushions were recorded growing on the bark of an inclined trunk of *Salix viminalis*. The first population grew at a height of 70 cm above ground, exposed SWW. The size of this population was 4 cm<sup>2</sup>. Associated species (alphabetically): *Brachythecium salebrosum* and *Hypnum cupressiforme*. The second population occurred at a height of 150 cm above the ground, exposed SWW. The size of the population was 0.5 cm<sup>2</sup>. Associated species (alphabetically): *Amblystegium serpens*, *Hypnum cupressiforme* and *Orthotrichum diaphanum*.

All three populations were found to produce a large quantity of sporogones and appeared to be vital and unthreatened.

### Discussion

The epiphytic moss *Orthotrichum pulchellum* is considered an oceanic species (cf. SCHÄFER-VERWIMP 2001, FRAHM 2002). Its occurrence is known on the west coast of North America (from southern Alaska to Oregon) and similarly along European sea-coasts (from southern Scandinavia to northern Spain). The results of a recent survey in Germany showed the number of localities has increased and it appears that the moss is spreading east (FRAHM 2002). For example, in Saxony the species was found for the first time in 2002 and is known today in more than 20 localities (MUELLER 2004). It was therefore only a matter of time before the species was recorded on the territory of the Czech Republic.

The spread of such an oceanic species inland appears to be associated with both climate changes and improvements in air quality. Among climate elements, the effects of mild winter temperatures and higher precipitation may be considered significant. Such



**Fig. 9.** Single-line map of central Europe marking the area of occurrence of *Orthotrichum pulchellum* (top left) and detailed view of the territory with dotted marking of the recorded localities.

climate changes have recently been confirmed by climatologists in Europe (HOUGHTON et al. 2007). Likewise, new restrictions on coal-burning power stations have markedly helped to improve of the air quality in localities where the species has recently established itself. All the above changes facilitate the spread of the moss into central Europe.

*Orthotrichum pulchellum* is an epiphytic species. In the Czech Republic it was recorded on trees of *Fraxinus excelsior*, *Acer pseudoplatanus* and *Salix viminalis*. Its host specificity in Germany is a little different. Most of them were found on *Sambucus nigra*, *Salix* sp.div., and *Populus* sp.div. there (FRAHM 2002).

In consideration of the actual spread of *O. pulchellum* in Saxony, it is reasonable to assume that the number of localities will increase in the near future, not only in the region studied but in all the territory of north-western Bohemia.

#### Acknowledgements

We are obliged to Michael Lüth (Freiburg, Germany) for giving us the photo of the species. Thanks are also due to Leon Sverdlin for first language correction. The survey was partially supported by grant No. 206/07/0811 from the Grant Agency of the Czech Republic.

### Souhrn

V průběhu bryologického výzkumu v Národním parku České Švýcarsko byl v roce 2006 poprvé v České republice nalezen mech *Orthotrichum pulchellum*. Autorka nálezů tento druh zaznamenala o rok později také v Lužických horách a na Děčínsku. Vzhledem k tomu, že se tento epifyt prokazatelně rozšiřuje směrem na východ, můžeme v budoucnu očekávat v ČR nárůst počtu nových lokalit.

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