

Contribution to the occurrence of mosses from *Orthotrichum* and *Nyholmiella* genera in Crimean Peninsula (Ukraine)

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Abstract: The paper compares recent and known literature records of mosses from genera *Orthotrichum* and *Nyholmiella* in Crimean Peninsula (Ukraine). Field survey was carried out during botanical expedition to Crimean Peninsula in southern Ukraine in 2012. Total 11 species of the genus *Orthotrichum* and 1 of *Nyholmiella* were recorded. Among the most interesting taxa, *O. lyellii* as new species for Crimean Peninsula and *O. affine* var. *bohemicum* as new species for Ukraine, could be considered.

Key words: *Nyholmiella*, *Orthotrichum*, Crimean Peninsula, Ukraine

Introduction

Recently published check-list of Crimean bryophytes includes 312 species (Partyka 2005). The list was arranged on the base of literature data and recent collection. Orthotrichaceae family is represented by 2 species of genus *Zygodon*, 13 species of genus *Orthotrichum* 2 species of genus *Nyholmiella* and only 1 species of genus *Ulota*. Other literature sources reported different numbers of species but taxonomical value of some of them is questionable (cf. Baczuryna & Melniczuk 1989).

The article is a supplement including new data about the bryoflora of Crimean Peninsula.

Methods

The studied areas are located in the southern part of Ukraine (see map – Fig. 1). The survey focused to epiphytic bryophytes was carried out during botanical expedition to Crimean Peninsula in May 2012. Many different habitats were visited on altitude between 11 m a.s.l. on the seaside area to 1167 m a.s.l. in Ai Petri Mt.

Recent finding were compared with published data, mainly those from the Moss flora of Ukrainian SSR (Bachurina 1989) and Bryoflora of Crimea (Partyka 2005).

The specimens are kept in herbarium of University of Ostrava (OSTR). All samples were collected and subsequently determined by author.

List of localities:

1. 2 km NE from the Rezervne village, greenwood in slope, S of a public road No. H11, 232 m a.s.l., GPS (WGS-84): N44°30'21.6" E33°41'26.0"
2. 2.5 km NE from the Honchame village, greenwood situated 100 m N of a public road No. H19, 232 m a.s.l., GPS (WGS-84): N44°28'06.8" E33°44'27.2"
3. 1.3 km NE from the Foros town, along a public road "Stare Sevastopolske shosse", greenwood in slope, 1.5 NW km of a church, 455 m a.s.l., GPS (WGS-84): N44°24'27.8" E33°47'22.8"
4. Nikita town, 5 km SEE from the Voskhod town, Nikitska Botanical Garden, 60 m of seaside, in Cape Martyan Reserve, 11 m a.s.l., GPS (WGS-84): N44°30'21.6" E34°14'55.5"
5. 2.1 km NNW from the Lavanda village, greenwood near the Angarsk Pass about 250 m N from camp: 846 m a.s.l., GPS (WGS-84): N44°45'09.8" E34°20'11.9"
6. 4.5 km NNW from the Lavanda village, 2.5 km NW from the Angarsk pass, upper edge of greenwood, 2.3 km N from camp, in a forest, 1111 m a.s.l., GPS (WGS-84): N44°44'28.5" E34°19'26.4"
7. 4.3 km NNW from the Lavanda village, 2.3 NW from the Angarsk pass, 2.1 km N from camp, solitary tree in upper part of the greenwood, 1167 m a.s.l., GPS (WGS-84): N44°44'34.8" E34°19'20.6"
8. 500 m SWW from the Shchebetovka village, 1.8 km NEE of the Krasnokam'yanka village, greenwood in slope along public road, 95 m a.s.l., GPS (WGS-84): N44°55'14.5" E35°12'51.1"



Fig. 1: Map of Crimean Peninsula (Ukraine) with marked localities.

A list of recorded species

The taxa are given in alphabetical order. Numbers of localities are written in bold. The phorophyte species on which the moss specimens were recorded is written in italic.

The nomenclature of recorded bryophytes follows Lara et al. 2009 and Plášek et al. 2011.

Nyholmiella obtusifolia

Loc.: **2** (27.V.2012, *Quercus*); **6** (29.V.2012, *Fagus*).

An occurrence of the species is known from Crimean Peninsula (Bachurina et al. 1989, Partyka 2005).

Orthotrichum affine

Loc.: **1** (27.V.2012, *Acer*); **1** (27.V.2012, *Ulmus*); **2** (27.V.2012, *Fagus*); **2** (27.V.2012, *Quercus*); **1** (27.V.2012, *Quercus*); **2** (27.V.2012, *Quercus*); **2** (27.V.2012, *Quercus*); **2** (27.V.2012, *Fagus*); **2** (27.V.2012, *Fagus*); **2** (27.V.2012, *Cornus*); **2** (27.V.2012, *Ulmus*); **2** (27.V.2012, *Quercus*); **2** (27.V.2012, *Fagus*); **3** (27.V.2012, *Quercus*); **3** (27.V.2012, *Fagus*); **3** (27.V.2012, *Quercus*); **3** (27.V.2012, *Acer*); **4** (28.V.2012, *Quercus*); **5** (29.V.2012, *Crataegus*); **5** (29.V.2012, *Fagus*); **5** (29.V.2012, *Fagus*); **5** (29.V.2012, *Fagus*); **5** (29.V.2012, *Quercus*); **5** (29.V.2012, *Fagus*); **5** (29.V.2012, *Quercus*); **5** (29.V.2012, *Quercus*); **8** (31.V.2012, *Malus*); **8** (1.VI.2012, *Quercus*).

The most common species of the genus *Orthotrichum* there. Rich literature data from the area are presented also in Bachurina et al. (1989) and Partyka (2005).

Orthotrichum affine var. *bohemicum*

Loc.: **5** (29.V.2012, *Quercus*).

New taxa for Crimean Peninsula and whole Ukraine found in a small population growing on bark of *Quercus* sp. in greenwood near Angarsk Pass.

Orthotrichum anomalum

Loc.: 2 (27.V.2012, *Fagus*).

Typically growing on rocks, *O. anomalum* were found only once on the bark of *Fagus*. An occurrence of the taxa in the area is reported in Bachurina et al. 1989 and Partyka 2005.

Orthotrichum diaphanum

Loc.: 1 (27.V.2012, *Quercus*); **2** (27.V.2012, *Acer*); **2** (27.V.2012, *Quercus*); **2** (27.V.2012, *Quercus*).

Species growing in SW peak of Crimean Peninsula were found in its lower parts up to 250 m a.s.l. An occurrence of the taxa in the area is reported in Bachurina et al. (1989) and Partyka (2005).

Orthotrichum lyellii

Loc.: 2 (27.V.2012, *Ulmus*).

New taxa for Crimean Peninsula. Population without capsules was found growing sporadically on bark of *Ulmus* sp. in the greenwood about 100 m from public road.

Orthotrichum palens

Loc.: 1 (27.V.2012, *Ulmus*); **1** (27.V.2012, *Quercus*); **2** (27.V.2012, *Quercus*); **2** (27.V.2012, *Acer*); **2** (27.V.2012, *Quercus*)

Species growing in SW peak of Crimean Peninsula were found in its lower parts up to 250 m a.s.l. (the same localities as *Orthotrichum diaphanum*). An occurrence of the taxa in the area is reported in Bachurina et al. (1989) and Partyka (2005).

Orthotrichum pumilum

Loc.: 1 (27.V.2012, *Ulmus*); **1** (27.V.2012, *Quercus*); **2** (27.V.2012, *Cornus*); **2** (27.V.2012, *Quercus*); **2** (27.V.2012, *Quercus*); **2** (27.V.2012, *Quercus*); **2** (27.V.2012, *Quercus*); **3** (27.V.2012, *Fagus*); **4** (28.V.2012, *Quercus*); **6** (29.V.2012, *Quercus*); **8** (1.VI.2012, *Fagus*).

Common species growing in rich populations especially on second locality; usually on *Quercus* sp. An occurrence of the taxa in the area is reported in Bachurina et al. (1989) and Partyka (2005).

Orthotrichum rupestre

Loc.: 4 (28.V.2012, *Quercus*).

Species found growing only once on locality close to the seaside. Although it is rather epilithic moss, in the studied area was recorded growing on a bark of oak tree. An occurrence of the taxa in the area is reported in Bachurina et al. (1989) and Partyka (2005).

Orthotrichum speciosum

Loc.: 1 (27.V.2012, *Ulmus*); **1** (27.V.2012, *Quercus*); **2** (27.V.2012, *Quercus*); **2** (27.V.2012, *Fagus*); **2** (27.V.2012, *Fagus*); **5** (29.V.2012, *Crataegus*); **5** (29.V.2012, *Fagus*); **5** (29.V.2012, *Fagus*); **8** (1.VI.2012, *Quercus*).

Common species growing in many localities of Crimean Peninsula. An occurrence of the taxa in the area is reported in Bachurina et al. (1989) and Partyka (2005).

Orthotrichum stramineum

Loc.: 2 (27.V.2012, *Fagus*); **2** (27.V.2012, *Quercus*); **3** (27.V.2012, *Quercus*); **5** (29.V.2012, *Fagus*); **5** (29.V.2012, *Fagus*); **5** (29.V.2012, *Quercus*); **5** (29.V.2012, *Fagus*); **6** (29.V.2012, *Fagus*);

Species growing mostly on *Fagus* sp. and *Quercus* sp. in a various localities all around the Crimean Peninsula. An occurrence of the taxa in the area is reported in Bachurina et al. (1989) and Partyka (2005).

Orthotrichum striatum

Loc.: **1** (27.V.2012, *Acer*) ; **1** (27.V.2012, *Ulmus*) ; **2** (27.V.2012, *Fagus*) ; **2** (27.V.2012, *Acer*) ; **2** (27.V.2012, *Fagus*) ; **2** (27.V.2012, *Cornus*) ; **2** (27.V.2012, *Ulmus*) ; **2** (27.V.2012, *Quercus*) ; **2** (27.V.2012, *Fagus*) ; **3** (27.V.2012, *Quercus*) ; **3** (27.V.2012, *Fagus*) ; **3** (27.V.2012, *Acer*) ; **5** (29.V.2012, *Fagus*) ; **5** (29.V.2012, *Fagus*) ; **5** (29.V.2012, *Fagus*) ; **5** (29.V.2012, *Quercus*) ; **5** (29.V.2012, *Quercus*) ; **5** (29.V.2012, *Fagus*) ; **7** (29.V.2012, *Fagus*) ; **8** (1.VI.2012, *Fagus*).

A common species in the Crimean peninsula growing mostly on bark of *Fagus* sp. and *Quercus* sp. An occurrence of the taxa in the area is reported in Bachurina et al. (1989) and Partyka (2005).

Ulota crispa

Loc.: **2** (27.V.2012, *Quercus*).

Only one species of genus *Ulota* was found growing on *Quercus* sp. in small population in SW part of Crimean peninsula. An occurrence of the taxa in the area is reported in Bachurina et al. (1989) and Partyka (2005).

Taxa non confirmed in the field recently

Nyholmiella gymnostoma

Lit.: Bachurina et al. (1989), Partyka (2005).

Orthotrichum cupulatum

Lit.: Bachurina et al. (1989), Partyka (2005).

Orthotrichum cupulatum* var. *riparium

Lit.: Bachurina et al. (1989), Partyka (2005).

Orthotrichum tenellum

Lit.: Bachurina et al. (1989), Partyka (2005).

Discussion

A total of 12 species have been recently found in the studied areas: *Nyholmiella obtusifolia*, *Orthotrichum affine*, *O. affine* var. *bohemicum*, *O. anomalum*, *O. diaphanum*, *O. lyellii*, *O. diaphanum*, *O. pumilum*, *O. rupestre*, *O. speciosum*, *O. stramineum* and *O. striatum*. Previously reported *Nyholmiella gymnostoma*, *Orthotrichum cupulatum*, *O. cupulatum* var. *riparium*, and *O. tenellum* were not found in the field recently.

Among the most interesting taxa recorded in the studied area are *O. lyellii* and *O. affine* var. *bohemicum*. The first one, *Orthotrichum lyellii* is usually growing on deciduous trees, less often on rocks and coniferous trees. Species is known from Ukraine, but it was first found in the Crimean Peninsula, growing as one population on the bark of *Ulmus* sp. in the greenwood. Plants were sterile, but typical gemmae on leafs were present.

The moss *Orthotrichum affine* var. *bohemicum*, was described recently from the Czech Republic by Plášek et al. (2011). In many features *Orthotrichum affine* var. *bohemicum* is similar to the type variety, but it can be easily distinguished by its 16 endostome segments. It appears that this variety is widespread geographically. However, until now it was reported only from the Czech Republic (Plášek et al. 2011, Plášek & Benešová 2013, Halfar & Plášek 2014), USA (Ellis et al. 2012a), Poland (Ellis et al. 2012b) and Sweden (Ellis et al. 2013).

Acknowledgement: The study has been carried out in connection with the project of the Institute of Environmental Technologies, reg. no. CZ.1.05/2.1.00/03.0100 supported by the Research and Development for Innovations Operational Program, financed by Structural Funds of the European Union and the state budget of the Czech Republic and Project LO1208 of the National Feasibility Programme I of the Czech Republic.

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