Parmelia barrenoae and *P. pinnatifida*, two lichen species new to some European countries and Turkey

Emilia A. Ossowska

Department of Plant Taxonomy and Nature Conservation, Faculty of Biology, University of Gdansk, Wita Stwosza 59, PL-80-308 Gdansk, Poland.

E-mail: emilia.ossowska@ug.edu.pl

ORCID: 0000-0002-1357-6071

Abstract: The first records of *Parmelia barrenoae* from Hungary, Slovakia and Sweden and *P. pinnatifida* from Denmark, Estonia and Turkey are presented.

Keywords: Lecanoromycetes, lichenized Ascomycota, parmelioid lichens, species distribution.

INTRODUCTION

In Europe and adjacent areas, 13 species of *Parmelia* Ach. have been confirmed based on morphological, chemical and molecular methods (e.g. Feuerer & Thell, 2002; Molina et al., 2004, 2011; Divakar et al., 2005; Hawksworth et al., 2008, 2011; Thell et al., 2008, 2017; Ossowska et al., 2018, 2019; Corsie et al., 2019; Crespo et al., 2020). The revision of material of two species, *Parmelia barrenoae* Divakar et al. and *P. pinnatifida* Kurok., yielded that they have never been reported from some countries in Eurasia, what is supplemented in this paper. Notes on both species, including their distribution are provided below.

MATERIALS AND METHODS

The studied material is housed in B, UGDA, S and TUR herbaria. The secondary lichen compounds were studied by thin-layer chromatography in solvents A and C (Orange et al., 2001). Diagnostic morphological features, important for the identification of *P. barrenoae*

(e.g. the shape of rhizines) and *P. pinnatifida* (e.g. the type of pseudocyphellae) were examined under a stereomicroscope.

THE SPECIES

Parmelia barrenoae Divakar, M. C. Molina & A. Crespo

P. barrenoae can be distinguished from other sorediate *Parmelia* species (*P. sulcata* Taylor and *P. encryptata* A. Crespo et al.) by its simple to furcate rhizines, short and broad (2–7 mm), apically rounded, overlapping lobes with soralia arising from linear pseudocyphellae, which rapidly produce soredia (Divakar et al., 2005; Hodkinson et al., 2010; Ossowska & Kukwa, 2016). This corticolous lichen grows mainly on the bark of deciduous or rarely coniferous trees, and occasionally on rocks (Divakar et al., 2005; Barreno & Herrera-Campos, 2009). Specimens reported here were found on bark of *Quercus* spp. and *Tilia* sp; one specimen was found on rock. Specimens from Hungary and Slovakia were found in oak-hornbeam and oak forests at elevations of c. 260–500 m.

In Europe, *P. barrenoae* has been reported from Belarus, Czech Republic, Italy, Macedonia, Poland, Portugal, Russia and Spain (Divakar et al., 2005; Barreno & Herrera-Campos, 2009; Paz-Bermúdez et al., 2009; Ravera & Genovesi, 2012; Šoun et al., 2015; Ossowska & Kukwa, 2016; Malíček & Mayrhofer, 2017; Yatsyna, 2020). It has also been noted in Africa (Morocco) and North America (USA) (Hodkinson et al., 2010). Here, it is reported for the first time from Hungary, Slovakia and Sweden.

Specimens examined: HUNGARY. Central Hungary, Pest County, Nagymaros, Pilis Mountains, Hegyes-tető, alt. c. 470 m, 47°47'02.8"N, 18°56'01.4"E, oak-hornbeam forest, on *Quercus* sp., 3 May 2019, leg. U. Schiefelbein 5280 (UGDA L-26591). SLOVAKIA. Banská Bystrica region, Rimavská Sobota district, Hajnáčka, Cerová vrchovina, Ragáč, W of Hajnáčka, alt. c. 500 m, 48°13'22.5"N, 19°58'54.8"E, Turkey oak forest, on *Quercus cerris*, 30 Apr. 2019, leg. U. Schiefelbein 5268 (UGDA L-26579); Nitra region, Nové Zámky district, Štúrovo, Burda, Chľaba, northern part of the Burda mountains, E of Lela, alt. c. 260 m, 47°51'22.4"N, 18°47'34.4"E, oak-hornbeam forest, on *Quercus* sp., 1 May 2019, leg. U. Schiefelbein 5271 (UGDA L-26587). SWEDEN. Gästrikland: Högbo parish, Sandviken, 500 m S of Sandviken church, 60°36.999'N, 16°47.137'E, on bark of *Tilia* sp., 25 Dec. 2016, leg. G. Odelvik 16–723, (S F-316263); Pite Lappmark: Arjeplog parish, Tjidtják, S of Davnastjårro, 66°56.583'N, 16°49.629'E, saxicolous, 26 Aug. 2017, leg. G. Odelvik 17-152, L. Hedenäs & M. Westberg (S F-316315); Södermanland: Huddinge parish, Fållan, 450 m E–

NE of Tacksägelsekyrkan (Trångsund) church, 150 m S–SW of house (Solvik), E of Magelungen, 59°13.644'N, 18°07.386'E, on bark of *Tilia* sp., 28 Apr. 2017, leg. G. Odelvik 17-79 (S F-316235).

Parmelia pinnatifida Kurokawa

The following characters distinguish *P. pinnatifida* from other *Parmelia* species without vegetative propagules (*P. discordans* Nyl. and *P. omphalodes* (L.) Ach): narrow, sublinear lobes (1–2 mm broad) with narrow lobules; pseudocyphellae marginal or marginal and laminal, laminal pseudocyphellae mainly connected with the marginal ones (Ossowska et al., 2019). It also differs from *P. discordans* in the production of salazinic acid (protocetraric acid present in the latter) (Ossowska et al., 2019). *Parmelia pinnatifida* is a saxicolous species mainly inhabiting siliceous rocks, but rarely growing also on bark of trees (Thell et al., 2011; Ossowska & Kukwa, 2016). Specimens studied here were collected from rocks.

The species is widely distributed in Europe and known from Austria, Czech Republic, Finland, France, Germany, Iceland, Italy, Norway, Poland, Romania, Russia, Slovakia, Spain and Sweden (Hawksworth et al., 2008; Liška et al., 2008; Wirth et al., 2010; Heiðmarsson et al., 2012; Guttová et al., 2013; Ossowska & Kukwa, 2016; Nimis et al., 2018; Gheza, 2019). Outside Europe, it has been reported from Canada, Greenland and USA (Hawksworth et al., 2008; Esslinger, 2015). The first records of *P. pinnatifida* from Denmark, Estonia and Turkey are presented here. According to recent new data on its morphology and chemistry (especially the type of pseudocyphellae and presence of lobaric acid in some specimens), *P. pinnatifida* would appear to have a wider geographical distribution than current data indicate, as it was not always distinguished from *P. omphalodes* (see also Ossowska et al. 2019).

Specimens examined: ESTONIA. Saaremaa, Kuressaare, NW of Muratsi, 58°14'45.20"N, 22°30'37.39"E, *Juniperus* and *Corylus* alvar, saxicolous, 14 June 1935, leg. E. Häyrén (H). DENMARK. Bornholm, Randkløve Skår, saxicolous, 3 July 1987, leg. H. Skult (TUR 69426); Bornholm: Christiansø, maritime rock, 2 July 1987, leg. H. Skult (TUR 69270). TURKEY. Anatolia, north-exposed gneiss rock, near Milas, between Narhisar and Cukurköy, alt. 850 m, 37°29'45.29"N, 27°42'55.27"E, 25 March 1983, leg. V. John (B 600160982).

ACKNOWLEDGEMENTS

I am greatly indebted to Ulf Schiefelbein (Rostock, Germany) and the curators of B, TUR and S herbaria for sending material for the study, Martin Kukwa (Gdansk, Poland) and two reviewers for reviewing the first version of this manuscript.

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