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SHORT COMMUNICATION

New records of *Skyttea nitschkei* from the Augustów Forest in Poland

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Abstract

The paper presents data about an interesting lichenicolous fungus *Skyttea nitschkei* (Körb.) Sherwood, D. Hawksw. & Coppins reported for the first time from Poland. Material described was collected by the author in 2014 in the Augustów Forest on thalli of *Thelotrema lepadinum* grown on the bark of *Quercus robur*. The stand was located in moist fertile oak-linden-hornbeam forest *Tilio-Carpinetum* with old *Q. robur*, *Carpinus betulus*, *Alnus glutinosa*, and *Picea abies*. *Skyttea nitschkei* is compared with some other species of the genus *Skyttea*, namely *S. carboneae* and *S. tavaresae*. Diagnostic characters of *Skyttea* species with similar excipular pigments is shown. Additionally, a list of lichenicolous fungi from the Augustów Forest is also presented.

Keywords

primeval forest; lichenicolous fungi; biodiversity

Introduction

The genus *Skyttea* Sherwood, D. Hawksw. & Coppins is characterized by its urceolate ascomata, nonfissitunicate asci, filiform generally simple paraphyses, excipular hairs, and colorless, mostly nonseptate ascospores [1]. Diederich and Etayo [1] accepted 17 species of genus *Skyttea*, including *Skyttea caesii* Diederich & Etayo, *S. carboneae* Diederich & Etayo, *S. lecanorae* Diederich & Etayo, *S. mayrhoferi* Diederich & Etayo, *S. pyrenulae* Diederich, Etayo & Coppins, *S. radiatilis* (Tuck.) R. Sant., Etayo & Diederich, *S. tavaresae* S. Tavaresae R. Sant., Etayo & Diederich, *S. thelotrematis* Diederich & Etayo. Later, two species, *S. richardsonii* Iturr. et D. Hawksw. and *S. anziae* Etayo & Diederich have been described [2,3]. Driscoll et al. [4] noted a new species, *S. insignis* Driscoll, S.R. Clayden & R.C. Harris. In Poland, only one species was recognized, *S. gregaria* Sherwood, D. Hawksw. & Coppins [5].

The Augustów Forest is a large virgin forest complex located in northeastern part of Poland as well as in northern Belarus and southeastern Lithuania. It stretches from the Biebrza valley on Augustów Plain to the southern edges of Eastern Suwałki Lakeland (Sejny region). It covers a total area of about 160 000 ha, of which 114 400 ha belong to Poland. The Augustów Forest was established as a biocenter for lichen diversity and is an important area for old-growth forest indicators in NE Poland and Lithuania [6] as well as an essential center of lichen biodiversity in Poland [7]. At present, about 365 taxa of lichens are known from the Augustów Forest (including Wigry National Park) [7,8]. The lichenicolous fungi from the Forest are still poorly known group of fungi in Polish mycobiota. [7,9–13]. During the study in the Augustów Forest, an interesting, new species of lichenicolous fungi *Skyttea nitschkei* (Körb.) Sherwood, D. Hawksw. & Coppins was recorded.

Material and methods

The present research was based on the material collected by the author in 2014, in the Augustów Forest (Puszcza Augustowska), Augustów Forest District, Kozi Rynek, forest section No. 182 (53°48.931' N, 23°15.468' E).

The specimen was examined using standard methods. Morphology was studied with a stereomicroscope and the following characters were examined: color, shape, and distribution on thallus of ascomata apothecioid. Anatomy of ascomata was studied with a microscope and the following characters were examined: color of exciple, color of excipular hairs, color, size, and number of cells of ascospores. The microscopical measurements (the excipular pigments) were made in 10% KOH (K) and ca. 50% HNO₃.

Specimen was deposited in the lichen herbarium of the Department of Plant Ecology, Institute of Biology, University of Białystok.

Presented list of lichenicolous fungi occurring in the Augustów Forest is based on available literature.

Results and discussion

Skyttea nitschkei (Körb.) Sherwood, D. Hawksw. & Coppins

Sherwood et al., Transactions of the British Mycological Society 75(3): 488 (1980).

Morphological characters. *Skyttea nitschkei* was confined to *Thelotrema lepadinum* (Ach.) Ach. (thallus and thalline margin of the apothecia). *Skyttea nitschkei* covered an area of ca. 4 cm of thallus of *T. lepadinum*. Ascomata being aggregated in some parts of the thallus. Ascomata are dark brown to black, 150–200 µm in diameter. The exciple is bordered with smooth, straight hairs and contains two main pigments. Dark reddish pigment is the most abundant in upper exciple below hairs reacted K+ bright aeruginose green and a brownish pigment. Excipular hairs less than 20–30 µm in length, brownish to hyaline at the tips, smooth. The ascospores are 8–13 × 2–3 µm, hyaline, non-septate, narrowly ellipsoid. All characteristics fit well with the description given in the protologue [1,14].

Notes. *Skyttea nitschkei*, which is the type species of the genus *Skyttea*, differs from other species by the particular excipular pigments. Similar pigments are found in the species *Skyttea carboneae* Diederich & Etayo and *S. tavaresae* R. Sant., Etayo & Diederich. These species are mainly characterized by a dark reddish exciple, K+ aeruginose green pigment [1]. The differences between these three species are presented in Tab. 1.

Habitat requirements. In Poland, in the Augustów Forest, *S. nitschkei* grows on thalli of another lichen *T. lepadinum* on the bark of *Quercus robur*. The stand was located in moist fertile oak-linden-hornbeam forest *Tilio-Carpinetum* with old *Q. robur*, *Carpinus betulus*, *Alnus glutinosa*, and *Picea abies*.

In Europe, *S. nitschkei* is found on thallus and thalline margin of *T. lepadinum*, mostly in the old-growth forests being thus as an additional forest-continuity indicator [1,6,7]. This lichenicolous species grows in old, deciduous woodlands, in humid places (e.g., stream valley) [9,15].

Distribution in Poland. The finding of this species in the Augustów Forest is the first record of *S. nitschkei* from Poland.

General distribution. *Skyttea nitschkei* is known from Europe: Austria, Belgium, Denmark, France, Germany, Luxembourg, Spain, Switzerland, Great Britain, Ireland, Estonia, the Canary Islands, and Canada [1,16–18]. This species has also been mentioned in the literature from Norway, Argentina, Chile, and North America [1,19,20].

Tab. 1 Diagnostic characters of *Skyttea* species with similar excipular pigments.

	<i>S. nitschkei</i>	<i>S. carboneae</i>	<i>S. tavaresae</i>
Host	<i>Thelotrema lepadinum</i>	<i>Carbonea montevidensis</i>	<i>Pyrrhospora</i> cf. <i>quernea</i>
Ascomata	150–200 µm	200–275 µm	(100–)200–300 µm
Exciple	Dark reddish, K+ bright aeruginose green; brownish, K+ purplish violet	Dark reddish to blackish, K+ bright aeruginose green; greenish, K+ olivaceous	Hyaline to reddish or violet brown in the inner part, dark grey to grey to brownish grey in the outer part, K+ bright aeruginose green
Excipular hairs	20–30 µm length, brownish to hyaline at the tips	Up to 40 × 2.5–3.5 µm length, greyish brown, K+ brownish or green	15–20 µm length, dark greyish brown
Ascospores	Narrowly ellipsoid, 8–13 × 2–3(–4) µm	Ellipsoid, 6–7.5 × 2.5–3 µm	Elongate, narrowly ellipsoid, 9–12 × 2.5–3 µm

Specimen examined. Gb-31 – Poland: Augustów Plain mesoregion (Równina Augustowska), Augustów Forest (Puszcza Augustowska), Augustów Forest District, Kozi Rynek, forest section No. 182, 53°48.931' N, 23°15.468' E, December 2014, A. Matwiejuk.

List of lichenicolous fungi from the Augustów Forest

- *Arthrorhaphis aeruginosa* R. Sant. & Tønsberg [9,13]
- *Chaenothecopsis pusilla* (Ach.) A.F.W. Schmidt [9,11,13]
- *Clypeococcum hypocenomyces* D. Hawksw. [9,13]
- *Epicladonia sandstedei* (Zopf) D. Hawksw. [9,13]
- *Epicladonia stenospora* (Harm.) D. Hawksw. [9,13]
- *Karsteniomyces peltigerae* (P. Karst.) D. Hawksw. [10]
- *Lichenocodium erodens* M.S. Christ. & D. Hawksw. [9,13]
- *Niesslia cladoniicola* D. Hawksw. & W. Gams [12,13]
- *Phaeopyxis punctum* (A. Massal.) Rambold, Triebel & Coppins [9,13]
- *Skyttea nitschkei* (Körb.) Sherwood, D. Hawksw. & Coppins
- *Taeniolella punctata* M.S. Christ & D. Hawksw. [9,13]
- *Vouauxiomyces santessonii* D. Hawksw. [9,13].

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