

***NODULISPORIUM CECIDIOGENES* – A MYCOPARASITE OF *CONIOPHORA PUTEANA* FOUND IN POLAND**

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Abstract. *Nodulisporium cecidiogenes* Jørg. Koch, a gall-forming mycoparasite of *Coniophora puteana* (Schumach.) P. Karst., is reported for the first time from Poland. This species was hitherto known only from Belgium, Denmark, England, and Wales – thus the three localities in Poland extend its range to Central Europe. The macro- and micromorphological characters of Polish specimens of *Nodulisporium cecidiogenes* are described and illustrated. The distribution of the species in Poland is mapped.

Key words: biodiversity, *Coniophora*, mycoparasite, *Nodulisporium*, Poland

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INTRODUCTION

Coniophora puteana (Schumach.) P. Karst. is a common resupinate basidiomycete occurring in natural forests on coniferous and deciduous trees, especially dead ones. It is also a widespread and dangerous decay fungus of structural timber (Ginns 1982). More than a decade ago, Koch (1994) found that basidiomes of *Coniophora puteana* in Denmark are sometimes covered by a gall-forming mycoparasite, which he described as a new species *Nodulisporium cecidiogenes* Jørg. Koch. This species was observed only on basidiomes of *C. puteana*, and artificial inoculations of other aphyllorphoroid fungi by Koch (1994) were unsuccessful, suggesting that *Nodulisporium cecidiogenes* may be host-specific. A revision of herbarium material of *Coniophora puteana* in KRAM revealed three collections infected by this mycoparasite, found in 1963, 1982 and 1989 in Ojców National Park and Lipówka Reserve in Niepołomice Forest. Additionally, a fresh specimen was collected during field studies in the Magura National Park in late autumn 2008. These collections represent the first findings of *Nodulisporium cecidiogenes* in Poland.

MATERIAL AND METHODS

The specimens examined for the present study are cited in the text and are deposited in the mycological

herbarium of W. Szafer Institute of Botany (KRAM). Examination of material was made by standard light microscopy (LM). The spores were mounted on slide preparations in 5% KOH and then observed under a NIKON Eclipse 600 light microscope equipped with Nomarski interference contrast. Micrographs were taken with a Nikon DS-Fi1 camera. At least 30 spores were measured from each collection. The following abbreviations are used in the description: L^m = mean length of all measurements from all collections, W^m = mean width of all measurements from all collections, $Q^m = L^m$ to W^m ratio, Q = length to width range ratio.

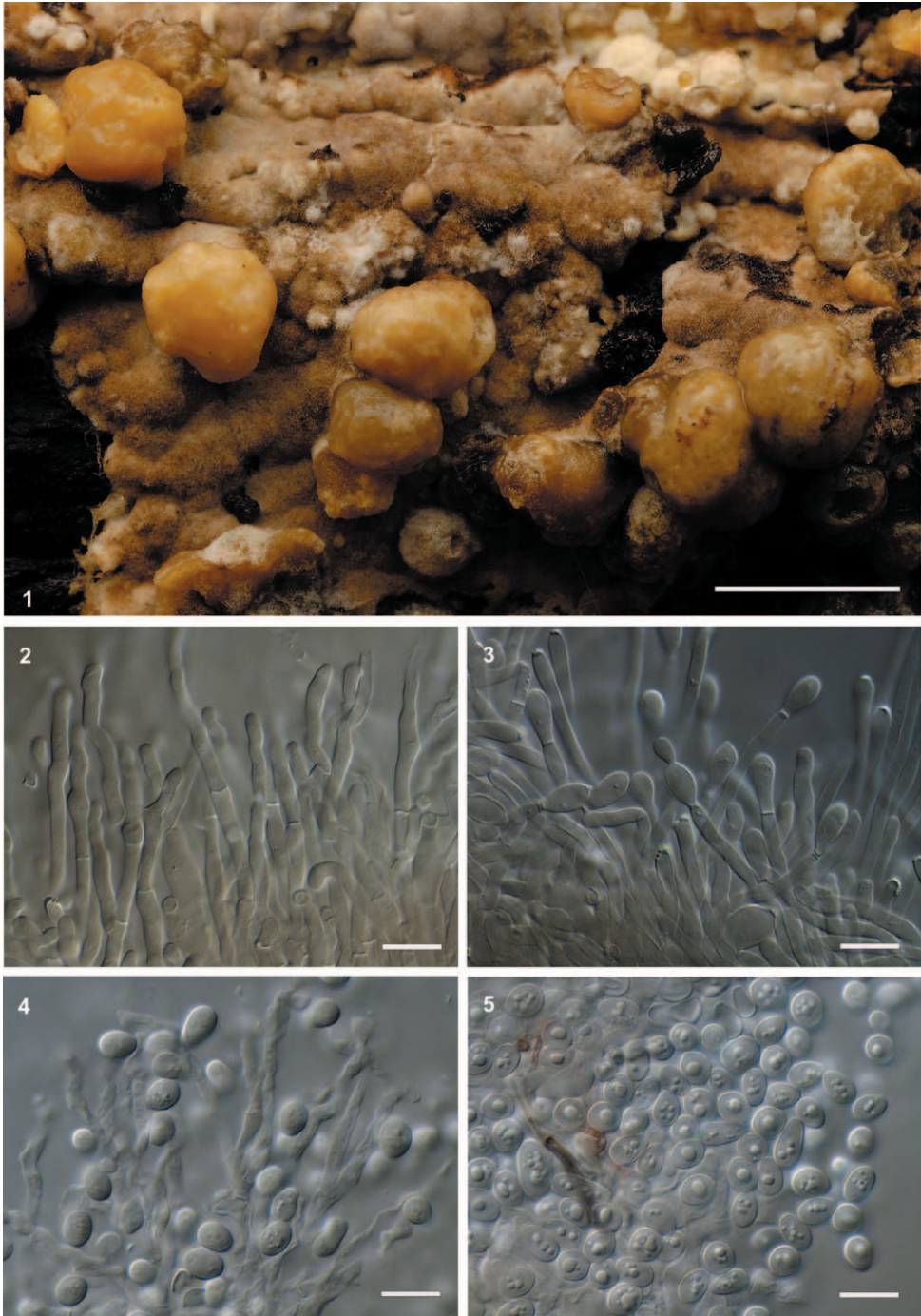
RESULTS AND DISCUSSION

Nodulisporium cecidiogenes Jørg. Koch

Figs 1–6

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The mycelium of the fungus induced the formation of galls on the basidiomes of *Coniophora puteana*. Galls were scattered on the host hymenium. They at first appeared as small, whitish, effuse and pruinose patches within the hymenium, later becoming larger, whitish, downy, hemispherical, up to 3 mm in diameter, finally up to 5 mm, yellowish to buff. The surface in dried specimens was cerebriform. The hyaline conidiophores were



Figs 1–5. *Nodulisporium cecidiogenes* Jørg. Koch: 1. Mature galls growing on *Coniophora puteana* fruit body (KRAM F-46930). Scale bar = 5 mm. 2 – Loose palisade of young conidiophores (KRAM F-34341). 3 – Young conidiophores with conidia (KRAM F-34341). 4 – Old, collapsed conidiophores and mature conidia (KRAM F-12718). 5 – Conidia (KRAM F-46930). Scale bars for LM = 10 µm (Figs 2–5)

hyphal, up to 3 µm wide, erect, septate, usually not branched, but sometimes sparsely branched and somewhat swollen. The old conidiophores were sinuous and collapsed. The holoblastic conidia were produced sympodially on conidiophores. Conidia were hyaline, thin-walled, one-celled, variable in shape and size, subglobose, ovoid, oblong, cylindrical, or occasionally irregularly triangular, 6.0–13.5 × 4.5–7.0 µm, $L^m = 8.92$ µm, $W^m = 5.68$ µm, $Q^m = 1.65$ µm, $Q = 1.04$ –2.60 µm. The content of conidia was not homogeneous and often had several easily visible oil drops in the cytoplasm.

SPECIMENS EXAMINED. POLAND. KRAKÓW-CZĘSTOCHOWA UPLAND. Ojców National Park, Ojców, on slopes of Złota Góra Mt., mixed forest, on basidiomes of *Coniophora puteana* growing on fallen trunk of *Abies alba*, 23 Nov. 1963, leg. W. Wojewoda (KRAM F-52188); SANDOMIERZ BASIN. Niepołomice Forest, Lipówka Reserve, ca 20 km NE from Kraków, *Tilio-Carpinetum*, on basidiomes of *Coniophora puteana* growing on fallen branch, 29 Apr. 1982, leg. H. Komorowska (KRAM F-34288), the same locality, on basidiomes of *Coniophora puteana* growing on dead trunk of deciduous tree, 20 Oct. 1989, leg. W. Wojewoda (KRAM F-34341); BESKID NISKI MOUNTAINS. Magura National Park, ca 3 km NE of Krempna, on bank of the Wisłoka river, slope of the Kamień Mt., ca 380 m a.s.l., mixed forest with *Abies alba*, on basidiomes of *Coniophora puteana* growing on *Alnus incana* log, 2 Nov. 2008, leg. D. Karasiński 2568 (KRAM F-46930).

As pointed out by Koch (1994), the *Nodulisporium cecidiogenes*/*Coniophora puteana* gall system is similar to that in *Tremella encephala* Pers./*Stereum sanguinolentum* (Alb. & Schwein.: Fr.) Fr. Moreover, older galls of *N. cecidiogenes* are macroscopically similar to basidiomes of *T. encephala*. In the Kew Herbarium (K), for example, there is a specimen of the former species originally named as '*Naematelia encephala*' (Roberts & Spooner 2000), which is a synonym of *T. encephala*.

The morphological characters of Polish specimens are more or less similar to those given in the protologue of *Nodulisporium cecidiogenes* by Koch (1994), although we did not observe the macrospores described by this author. Because Koch

(1994) described this species based on a specimen growing in culture, it is possible that macrospores are formed only *in vitro*. The conidia measured by Roberts and Spooner (2000) from British specimens are somewhat larger (6–18 × 3.5–6.5 µm), but otherwise their collections are very similar to those found in Poland.



Fig. 6. Known stations of *Nodulisporium cecidiogenes* Jørg. Koch in Poland.

The present findings have increased the known distribution of *Nodulisporium cecidiogenes* to Central Europe. Earlier it was known only from Denmark, from where it was originally described as a new species (Koch 1994), from England (Roberts & Spooner 2000), Wales (P. Roberts, pers. comm.), and Belgium (Walley & Vandeven 2006). However, it is important to point out that, when specifically searched for, it is easy to find *N. cecidiogenes* and the species is very likely to be frequent in populations of *Coniophora puteana*. Apart from field studies, a revision of the herbarium holdings of *C. puteana* would be the best way to find new localities for this mycoparasite.

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