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CHECKLIST

Contribution to the Knowledge of Fungi of the Kampinos National Park (Central Poland): Part 5 – With Particular Emphasis on the Species Occurring on Windthrown Trees

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Abstract

The paper presents eleven species of fungi new to the Kampinos National Park. They were found during the studies on wind-damaged areas after the forest was damaged in 2017. Two species new to Poland were described and illustrated (*Nectria nigrescens* and *Strossmayeria basitricha*). The current number of macromycetes taxa known from the Kampinos National Park has reached 1,637.

Keywords

Ascomycota; Basidiomycota; fungal biota; ecological disturbance; windfall

1. Introduction

Kampinos National Park (KNP) is located in central Poland, to the west of Warsaw. At the beginning of summer 2017, two strong winds have damaged a few forest fragments in the KNP. This windthrown-incident enabled study on post-disturbance mycobiota of the Park, with particular emphasis on the fungi occurring on different parts of windthrown trees. Detailed information on the study area, methods, and results from the first 2 years (2018–2019) have been published previously (Szczepkowski et al., 2021; Zaniewski et al., 2019).

The aim of this paper is to present the species of fungi new to KNP found in the windthrow areas during the third year of study (2020) and give a condensed information on their distribution in Poland.

2. Material and Methods

The collected specimens were identified using standard mycotaxonomical methods (Clemençon, 2009). Specimens were identified using the following monographs: *Amphisphaeria* (Wergen, 2018), corticioid fungi (Bernicchia & Gorjón, 2010), *Corynespora* (Voglmayr & Jaklitsch, 2017), *Gremmeniella* (Ellis & Ellis, 1997), *Helicogloea* (Wojewoda, 1977), *Hyphomyces* (Rogerson & Samuels, 1993), *Nectria* (Hirooka et al., 2011), *Psathyrella* (Östradius & Knudsen, 2012), *Strossmayeria* (Iturriaga & Korf, 1990), *Ramaria* (Christan, 2008). The nomenclature was used according to MycoBank Database (<http://www.mycobank.org/>). Forest compartment numbers were given after the Forest Data Bank

(<https://www.bdl.lasy.gov.pl/>). Dried specimens were deposited in the fungarium of the Department Forest Protection of the Warsaw University of Life Sciences – SGGW (WAML) and the private fungaria of Błażej Gierczyk (BGF) and Tomasz Ślusarczyk (TŚF). Each number represents a different collection.

3. Results – List of the Species

In the course of the study, a total of 177 taxa (Ascomycota – 26, Basidiomycota – 151) were collected (identified to the level of species, forms, varieties, and in a few cases, genera), including eleven new species to the KNP, which are presented below.

Abbreviations: AK – Anna Kujawa; AS – Andrzej Szczepkowski; BG – Błażej Gierczyk, TŚ – Tomasz Ślusarczyk; FD – forest district, KNP – Kampinos National Park, LP – landscape park, NP – national park; PD – protective district / forest district; PSD – protective sub-district/forest subdistrict; res. – nature reserve.

3.1. Ascomycota

Amphisphaeria bufonia (Berk. & Broome) Ces. & De Not. **Specimen examined:** KNP, Zaborówek, 1.5 km NNW, Leszno municipality, Kampinos PD, Rózin PSD, forest compartment No.: 258b; numerous stromata on branches of the fallen *Quercus petraea*; 2020-06-01; leg., det. TŚ; TŚF 182/2020. **Notes:** It is a very rare or overlooked species inhabiting dead twigs and branches of *Quercus* spp. It is known from Brynica (Brinnitz) near Opole (Oppeln) (Schroeter, 1908, as *Phorcys bufonia*).

Corynespora cespitosa (Ellis & Barthol.) M. B. Ellis. **Specimen examined:** KNP, Zaborówek, 1.5 km NNW, Leszno municipality, Kampinos PD, Rózin PSD, forest compartment No.: 258b; only anamorph stage [*Helminthosporium caespitosum* (Ellis & Barthol.) M. B. Ellis] on twigs of the fallen *Betula pendula*; 2020-06-01; leg., det. TŚ; TŚF 183/2020. **Notes:** This species inhabits dead twigs of *Betula* spp. In Poland, it was reported from Masurian Lakeland, in the vicinity of Ruciane-Nida (Voglmayr & Jaklitsch, 2017), and Puszcza Knyszyńska Forest (Gryc, 2020).

Gremmeniella abietina (Lagerb.) M. Morelet. **Specimen examined:** KNP, Łubiec, 2.5 km NW, Leszno municipality, Kampinos PD, Grabina PSD, forest compartment No.: 125a; only anamorph stage [*Brunchorstia pinea* (Karst.) Höhn.] on branches of the fallen *Pinus sylvestris*; 2020-05-31; leg., det. TŚ; TŚF 184/2020. **Notes:** It is a pathogen that causes a widespread and serious disease known as Brunchorstia dieback of conifers. In Poland's forests, *G. abietina* is a common species (e.g., Kowalski, 1997; Sierota, 2011; Sierota et al., 2019).

Hypomyces rosellus (Alb. & Schwein.) Tul. & C. Tul. **Specimen examined:** KNP, Łubiec, 2.5 km NW, Leszno municipality, Kampinos PD, Grabina PSD, forest compartment No.: 125a; only anamorph stage [*Cladobotryum dendroides* (Bull.) W. Gams & Hooz.] on old basidiomata of *Ischnoderma benzoinum* growing on a trunk of the fallen *Pinus sylvestris*; 2020-05-31; leg., det. TŚ; TŚF 185/2020. **Notes:** It is not rare, known from the vicinity of Międzyrzecz (Bresadola, 1903; Eichler, 1902), Brynica (Brinnitz), Pokój (Carlsruhe), Oborniki Śląskie (Obiernigk), Wrocław (Breslau) (Schroeter, 1908), Sołacz-Poznań (Dominik, 1936), Biebrza NP (Ruszkiewicz-Michalska et al., 2015), Pieniny NP (Chachuła et al., 2018), the Western Sudety Mts (Gierczyk et al., 2018), and Puszcza Knyszyńska Forest (Kujawa et al., 2019).

Nectria nigrescens Cooke. **Specimen examined:** KNP, Zaborówek, 1.5 km NNW, Leszno municipality, Kampinos PD, Rózin PSD, forest compartment No.: 258b; 2020-11-06; numerous sporodochia and perithecia on branches of the fallen *Quercus petraea*; leg. AS & AK, det. BG; BGF0006294. **Species description:** Perithecia dark red to brownish-red with darker apical part, caespitose, subglobose, ca. 0.4 mm in diameter, seated on pale brownish stromata, often close to sporodochia. Asci cylindrical to subcylindrical, eight-spored, 75–115 × 8–10.5 μm. Spores ellipsoid to fusiform with obtuse ends, (1)–2–3–(4) celled, sometimes slightly constricted at septa, smooth, hyaline, 14–19 × 4–6 μm. Sporodochia shortly stipitate, superficial on stromata, pustulate, with a smooth or slightly rugose surface, solitary or in small clusters, yellowish-brown, 1–2 mm in diameter. Conidiophores acropleurogenous,

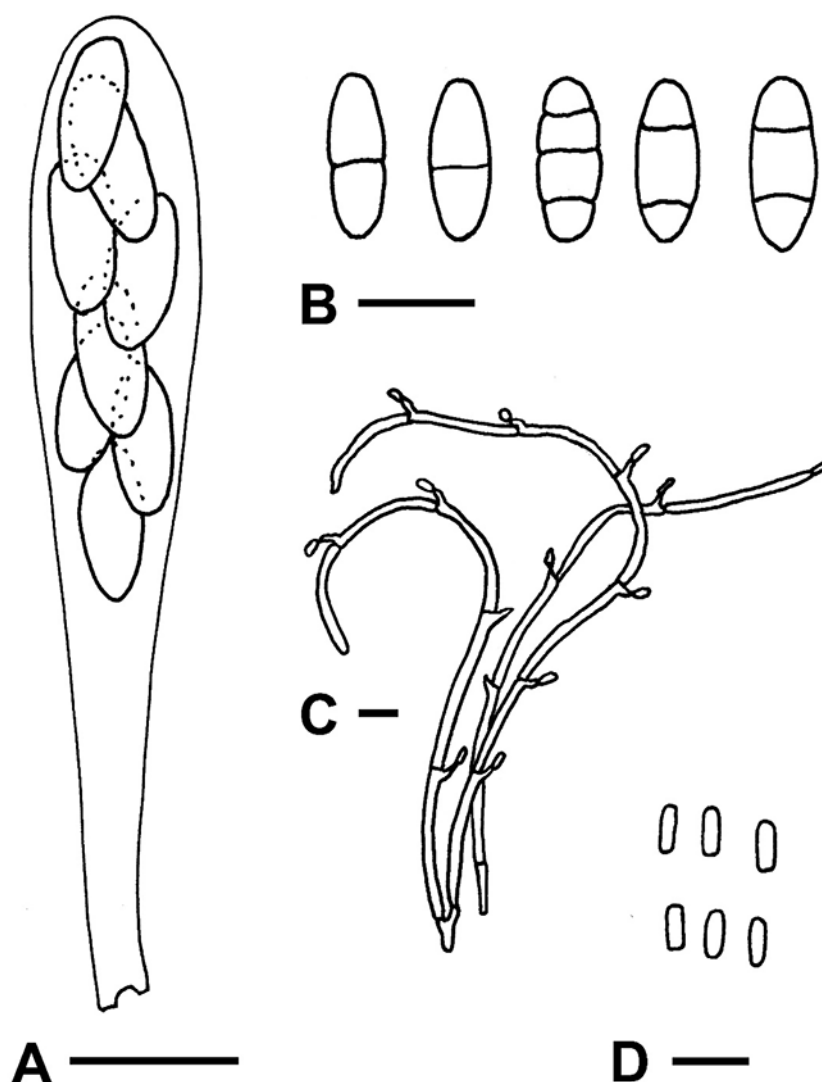


Figure 1 Microcharacters of *Nectria nigrescens*: (A) Ascus (with immature spores); (B) Ascospores; (C) Conidiophores; (D) Conidia. Scale bars: 10 μ m. Drawing by B. Gierczyk.

monoverticillate, up to 120 μ m long, straight, curved, or coiled. Conidia hyaline, cylindrical, non-septate, 6–7 \times 2–3 μ m (Figure 1). **Notes:** Teleomorphic state similar to that of *N. cinnabarina* (Tode) Fr. and *N. dematiosa* (Schwein.) Berk., differing by presence of three-septate spores and higher contribution of two-septate ones (5% vs. 2%–3%). Anamorph similar to *N. cinnabarina*, from which it differs by shorter stipe and presence of coiled conidiophores. Species known from Europe (France, Germany, United Kingdom), North America (USA, Canada), and Asia (China). It grows on wood of various deciduous hosts (*Acer* sp., *Betula lutea*, *Celtis occidentalis*, *Elaeagnus angustifolia*, *Fagus sylvatica*, *Gleditsia triacanthos* var. *inermis*, *Tilia* sp., and *Ulmus pumila*) (Hirooka et al., 2011; Ma et al., 2020).

Strossmayeria basitricha (Sacc.) Dennis. **Specimen examined:** KNP, Zaborówek, 1.5 km NNW, Leszno municipality, Kampinos PD, Rózin PSD, forest compartment No.: 258b; 2020-09-19; numerous apothecia on log (probably *Pinus sylvestris*) in *Robinia pseudoacacia* shrubs in oak forest; leg., det. BG; BGF0006029.

Species description: Apothecia small, up to 0.7 mm in diameter, almost white, greyish or dirty brownish-white, sessile, discoid with flat to convex hymenium, without delimitate margin. Ectal excipulum of *textura porrecta* type, composed of hyaline, amyloid, elongate elements (at the apothecium base the elements are brownish) with somewhat glassy walls; terminal elements with obtuse apices.

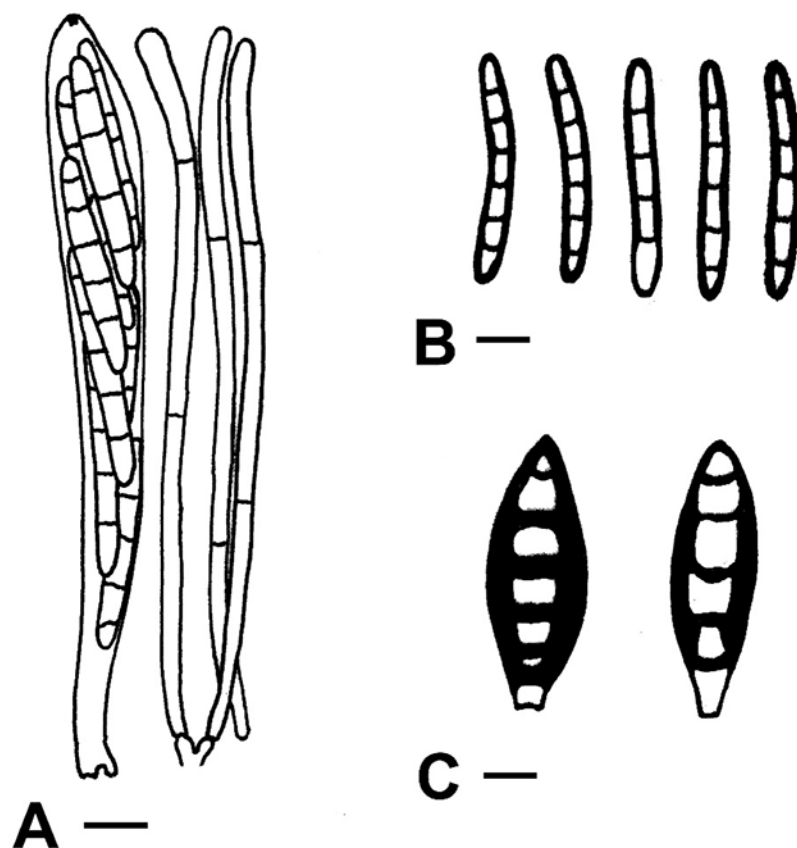


Figure 2 Microcharacters of *Strossmayeria basitricha*: (A) Ascus and paraphyses; (B) ascospores; (C) conidia. Scale bars: 10 μ m. Drawing by B. Gierczyk.

Asci clavate, with croziers, eight-spored, 95–160 \times 10–20 μ m. Apical apparatus inamyloid. Spores cylindrical, straight or slightly curved or S-shaped, five–eight-septate composed of uniform cells, with smooth to verrucose gel sheath (up to 1.5 μ m thick), hyaline, amyloid, 35–45 \times 3–5 μ m. Paraphyses filiform, cylindrical to somewhat clavate, ca. 2–4 μ m at apexes, multiseptate, with yellowish content, thin-walled. Conidiophores numerous between apothecia, erect, dark brown, septate, flexuous. Conidiogenous cells terminal, sympodial, paler than the lower part of conidiophore. Conidia broadly fusiform, truncate at base, thick-walled, brown to dark brown often with darker terminal parts, 5–12-septate, 30–60 \times 8–20 μ m (Figure 2). **Notes:** It differs from other white *Strossmayeria* species by clavate asci and hyaline ascospores covered with thin gel sheath. Most similar taxa are *S. bakeriana* producing longer spores and *S. alba* having shorter asci and less numerous septa in conidia. Current observations indicate that the morphological characters of European species of *Strossmayeria* often overlap, making its identification difficult and uncertain (Quijada et al., 2017). The genus needs revision using modern taxonomic tools. *Strossmayeria basitricha* is known from numerous localities, mainly in the northern hemisphere: Austria, Belgium, Canada, Croatia, Denmark, France, Germany, Italy, Japan, Mexico, New Zealand, Norway, Slovakia, Spain, Switzerland, Ukraine, United Kingdom, USA, Azores and Canary Isles. It grows on wood of various trees (Iturriaga & Korf, 1990; Landry & Labbé, n.d.; Quijada et al., 2017).

3.2. Basidiomycota

Athelia pyriformis (M. P. Christ.) Jülich. **Specimen examined:** KNP, Łubiec, 2.5 km NW, Leszno municipality, Kampinos PD, Grabina PSD, forest compartment No.: 125a; 2020-11-07; a few basidiomata on branches of the fallen *Pinus sylvestris*;

leg. AS & AK, det. BG; BGF0006319. **Notes:** It is very rare in Poland, known only from Kaszubski LP (Karasiński, 2016) and Mszar Rosiczkowy koło Rokitna res. in the Lubuskie region (Ślusarczyk, 2020).

Helicogloea lagerheimii Pat. **Specimen examined:** KNP, Łubiec, 2.5 km NW, Leszno municipality, Kampinos PD, Grabina PSD, forest compartment No.: 125a; 2020-11-07; numerous basidiomata on trunk of the fallen *Pinus sylvestris*; leg. AS & AK, det. BG; BGF0006336. **Notes:** In Poland, it was reported from Puszcza Knyszyńska Forest (Kujawa et al., 2019) and Wielkopolska region (Gierczyk & Kujawa, 2020; Gierczyk & Ślusarczyk, 2020).

Lawrynomycetes capitatus (J. Erikss. & Å. Strid) Karasiński (= *Hyphoderma capitatum* J. Erikss. & Å. Strid.). **Specimen examined:** KNP, Łubiec, 2.5 km NW, Leszno municipality, Kampinos PD, Grabina PSD, forest compartment No.: 125a; 2020-11-07; a few basidiomata on trunk of the fallen *Pinus sylvestris*; leg. AS & AK, det. BG; BGF0006311. **Notes:** It is very rare in Poland, known from a few localities, e.g., Kurze Grzędy res. located in the Kaszubski LP (Karasiński, 2013, 2016), Bendoszka Wielka in the Beskid Żywiecki Mts, vicinity of Jaworzno (Wojewoda, 2003), Kielce (Sieje) and Białe Ługi res. (Łuszczynski, 1997, 2004, 2007, 2008).

Psathyrella fibrillosa (Pers.: Fr.) Maire. **Specimen examined:** KNP, Zaborówek, 1.5 km NNW, Leszno municipality, Kampinos PD, Rózin PSD, forest compartment No.: 258b; 2020-30-05; a few basidiomata on the bottom surface of the rootball of fallen *Quercus petraea*; leg., det. BG; BGF0005214. **Notes:** Its current distribution in Poland is uncertain, because of frequent synonymization with *P. friesii* Kits van Wav. (Wojewoda, 2003). It was reported from the Babia Góra Mts (Bujakiewicz, 2004), Jelonka res. (Kałucka, 2009), the Bieszczady Mts (Gierczyk, Kujawa, et al., 2019), Białowieża Primeval Forest (Gierczyk, Ślusarczyk, et al., 2019), Puszcza Knyszyńska Forest (Kujawa et al., 2019), Gryżyna LP (Ślusarczyk, 2019) and Wielkopolska NP (Gierczyk & Kujawa, 2020).

Ramaria subbotrytis (Coker) Corner (Figure 3). **Specimen examined:** KNP, Zaborówek, 1.5 km NNW, Leszno municipality, Kampinos PD, Rózin PSD, forest



Figure 3 Basidiomata of *Ramaria subbotrytis* from the Kampinos National Park; September 19, 2020. Photography by A. Szczepkowski.

compartment No.: 258b; 2020-09-19; a few basidiomata on soil in an oak forest; leg. AS, det. BG; BGF0006028. **Notes:** It is very rare in Poland, known from a few localities, e.g., Kaszubski LP (Karasiński, 2016), Puszcza Knyszyńska Forest (Kujawa et al., 2019), Wielkopolska region (Gierczyk & Ślusarczyk, 2020).

4. Conclusions

The third year of the study on the post-windthrow mycobiota of Kampinos National Park revealed little new data. A drought lasting for almost the entire vegetation season led to unfavorable conditions for fungal sporomata formation. In 2020, 10 saprobic/parasite and one mycorrhizal species were collected that had not yet been reported from the KNP (six Ascomycota and five Basidiomycota). Most of them are very rare in Poland, hitherto mentioned from single localities. Among them, two species (*Nectria nigricans* and *Strossmayeria basitricha*) are new to Poland. The current number of macromycetes taxa known from the KNP is 1,637 (1,413 Basidiomycota and 224 Ascomycota).

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