

***DENDROTHELE GRISEOCANA* (FUNGI, BASIDIOMYCETES), A SPECIES NEW TO POLAND, WITH A KEY TO THE GENUS *DENDROTHELE* IN EUROPE**

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Abstract: *Dendrothele* Höhn. & Litsch. em. Lemke is a little-known genus represented by fungi growing on the bark of living trunks. In Europe 12 species of the genus are known, four of which have been known from Poland. *Dendrothele griseocana* (Bres.) Bourd. & Galz. is now reported as new to the country. The morphology of Polish specimens of *D. griseocana*, its ecology and general distribution are discussed. A key for determination all European species is provided.

Key words: Basidiomycetes, Corticiaceae, *Dendrothele griseocana*, taxonomy, key to European *Dendrothele*, ecology, chorology

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The genus *Dendrothele* Höhn. & Litsch. em. Lemke includes saprobic fungi adapted to grow on the bark of live trunks, resembling crustose lichens. The genus is little known, especially in Northern and Central Europe. Many taxa have been found in North America. A key for determination of all world species of *Dendrothele* was given by Boidin *et al.* (1996). Recently the genus has been included in the order Stereales and family Corticiaceae (Hawksworth *et al.* 1995; Wojewoda 1999), and in the order Aleurodiscales and family Aleurodiscaceae (Knudsen 1995).

In Europe, 12 species of this genus have been reported in the available literature. They can be determined using the key given below. This key was prepared on the basis of some taxonomic papers (Eriksson & Ryvarden 1975; Jülich & Stalpers 1980; Jülich 1984; Domański 1988; Bernichia 1990; Boidin *et al.* 1996; Kotiranta & Saarenoksa 2000), as well as specimens of *Dendrothele acerina*, *D. alliacea* and *D. griseocana* collected by the author and deposited in KRAM.

In Poland, four species of the genus *Dendrothele* have been recorded up to now. *Dendrothele acerina* and *D. alliacea* were reported from a few localities (Wojewoda 1974, 1996, 1998, 1999; Domański *et al.* 1967; Bujakiewicz 1992). *Dendrothele dryina* was found only once at the begin-

ning of the 20th century (Bresadola 1903). *Dendrothele commixta* has been noted only by Scandinavian mycologists but mentioned with no precise locality (Eriksson & Ryvarden 1975).

Recently *D. griseocana* has been found in Poland and is reported here as new to the country. The description of basidiocarp morphology and ecological notes are based on original material. The distribution map is shown using the grid square system following the *Atlas of the geographical distribution of fungi in Poland* (Wojewoda 2000).

***Dendrothele griseocana* (Bres.) Bourd. & Galz.**

Bull. Soc. Mycol. France **28**: 354. 1913.

Corticium griseocanum Bres., Fungi Trident. **2**: 58. 1893. – *Aleurodiscus griseocanus* (Bres.) Höhn. & Litsch., Wiesn. Fetschr. **76**: 1908. – *Aleurocorticium griseocanum* (Bres.) Lemke, Can. J. Bot. **42**: 736. 1964.

Dendrothele papillosa Höhn. & Litsch., Sitzb. Kais. Akad. Wiss. Wien Math.-Nat. Kl. **116**: 820. 1907. – *Corticium papillosum* (Höhn. & Litsch.) Sacc. & Trott. *apud* Sacc., Syll. Fung. **21**: 404. 1912.

Basidiocarps annual or rarely biennial, resupinate, gregarious, sometimes confluent, forming small patches (0.5–2.0 cm²), hymenial surface ochraceous, greyish, violaceous when wet,

usually with scattered sterile papillae, rarely smooth, cracked when old. Hyphal system monomitic, hyphae narrow, 1.0–2.1 μm , thin-walled, without clamps, and with crystals in the context. Dendrohyphidia abundant, rather numerous, richly branched, forming projecting papillae. Pseudocystidia present, clavate or fusoid, the same size as basidia. Basidia clavate, with 2 sterigmata, 6.2–8.3 (–10.4) \times 31.2–41.6 μm (together with sterigmata), without basal clamp. Basidiospores broadly ellipsoid or subglobose, hyaline, with thickened walls and small apiculus, non-amyloid, (6.2–) 7.3–8.3 \times 8.3–10.4 (–11.4) μm (Fig. 1).

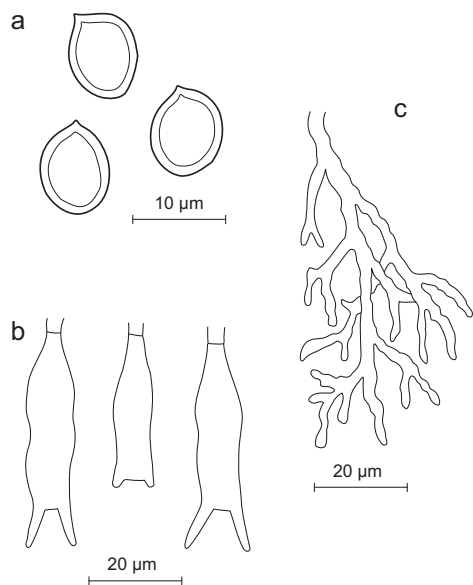


Fig. 1. *Dendrothele griseocana*: a – basidiospores, b – basidia, c – dendrohyphidia.

NOTE. Type of rot – white (Gilbertson & Blackwell 1985), sexuality – heterothallic (Boidin & Lanquetin 1984), for cultural characteristics see Boidin *et al.* (1968).

SPECIMENS EXAMINED. POLAND. SANDOMIERZ BASIN. Płaskowyż Tarnowski (Tarnów Plateau): 1 – Tarnów, at Tuchowska Street near the intersection with Ostrogskich Street, 50°00'10"N, 20°59'30"E, grid square

Fe–77; boulevard, on bark of living *Ulmus laevis* (one individual), 7.08.1997, leg. M. Piątek (KRAM F-39472); 2 – Tarnów, at J. Chrząszcza Street, 50°01'20"N, 20°58'40"E, grid square Fe–67; green belt, on bark of living *Salix alba* 'Tristis' (2 individuals), 19.07.1999, leg. M. Piątek (KRAM F-39786, 39787).

HABITAT AND ECOLOGY. Tarnów is a medium-sized city situated in southern Poland. Near Tarnów are the limits on oceanic influences from the west and on continental influences from the east. Annual mean precipitation is 750 mm, and mean yearly temperature of 8.5 °C makes it the warmest city in Poland.

Both new localities of *Dendrothele griseocana* were found in anthropogenic habitats: a boulevard with a few trees and a green belt. The species grew on *Salix alba* L. 'Tristis' and *Ulmus laevis* Pall. and the basidiocarps occurred in clusters on shaded parts of the trunks, at 1.0–1.8 m height. On one individual of *Salix alba* 'Tristis', *Dendrothele griseocana* coexisted with *D. acerina*.

These observations correspond with observations from other European countries. Bourdot and Galzin (1928) found it on *Salix* L. Boidin *et al.* (1996) recorded it from the following genera: *Ampelopsis* Michx., *Escallonia* Mutis ex L., *Ulmus* L., *Philadelphus* L., *Quercus* L. and *Weigela* Thumb. Jülich (1984) reported that the species occurs on deciduous trees, *Salix* and *Ulmus*. In Italy *Dendrothele griseocana* has been found on *Arbutus unedo* L. and *Erica scoparia* L. (Bernicchia 1990). In North America the fungus occurs on both angiosperms and gymnosperms. Ginns and Lefebvre (1993) mentioned it from 31 host trees.

GENERAL DISTRIBUTION. *Dendrothele griseocana* is widely scattered throughout Western and Southern Europe, and is known from Austria, Denmark, Germany, France and Italy (Bourdot & Galzin 1928; Jülich 1984; Bernicchia 1990; Kreisel 1987). In Europe it shows closer affinity to areas with a Mediterranean climate. In Nordic countries it has been found in only one locality in Denmark (Eriksson & Ryvarden 1975). The two localities in Poland are situated in a region with a warm temperate climate (Fig. 2).

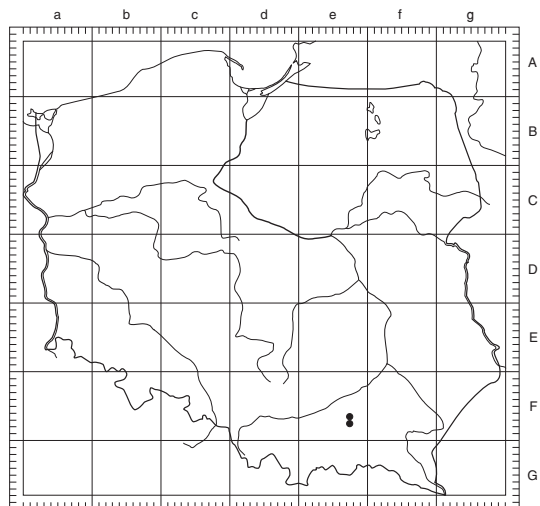


Fig. 2. Distribution map of *Dendrothele griseocana* (Bres.) Bourd. & Galz. in Poland.

The species is also known from North America, where it has been recorded in several states of the United States and Canada (e.g., Lemke 1964; Ginns & Lefebvre 1993). *Dendrothele griseocana* was also found in Mexico (Lemke 1964), Uruguay and Argentina (Gazzano 2000).

Until recently the fungus has been considered to be an Euro-American species. Niemelä *et al.* (1998) reported it for the first time from tropical Africa, where *D. griseocana* has been observed on *Hagenia abyssinica* (Bruce) J. F. Gmel. in the east part of the continent.

Populations of *D. griseocana* from various parts of the world show microscopic differences (number of sterigmata in a basidium, presence /absence of clamp connections). These are as follows:

1. European populations: 2 sterigmata in a basidium, hyphae without clamp connections (Eriksson & Ryvarden 1975; Polish material studied by author), 2–4 sterigmata in a basidium (Bourdodt & Galzin 1928).

2. North American populations: 4 sterigmata, hyphae simple-septate (Lemke 1964; Gilbertson & Blackwell 1985), hyphae with clamp connections (Ginns & Lefebvre 1993).

3. African population: 4 sterigmata, hyphae without clamp connections (Niemelä *et al.* 1998).

Probably further comparative studies of specimens of *D. griseocana* from various populations are necessary to explain these differences. It may be that there are different varieties or species which now are treated as *D. griseocana*.

KEY TO THE EUROPEAN SPECIES OF
DENDROTHELE

1. Hymenium smooth 3
- 1* Hymenium with small papillae 2
2. Basidiospores ellipsoid or subglobose (7.5–) 8.0–10.0 (–11.0) × 6.0–8.0 μm, basidia with 2 sterigmata (in European populations), in Europe usually on *Salix* and *Ulmus* *D. griseocana* (Bres.) Bourd. & Galz.
- 2* Basidiospores globose, 5.8–7.5 μm, basidia with 4 sterigmata, in Europe (Spain) on palms *D. canariensis* (Manj. & Moreno) Hjortst. (except: *D. canariensis* subsp. *bicornis* Boid. & Duhem, that appears on *Buxus* and has 2 sterigmata).
3. Basidiospores with 2 or more apiculi 4
- 3* Basidiospores with 1 apiculus 5
4. Basidiospores with 2 apiculi, 9.0–12.5 × 7.5–10.5 μm *D. citrisporella* Boid. & Duhem
- 4* Basidiospores with 3 or 4 apiculi, 10.5–14.0 × (8.0–)10.0–12.5 μm *D. tetracornis* Boid. & Duhem
5. Basidiocarps white to ochraceous, in Europe usually on *Quercus* 6
- 5* Basidiocarps white, in Europe on other hosts, not on *Quercus* 8
6. Basidiocarps without leptocystidia 7
- 6* Basidiocarps with leptocystidia, basidiospores suballantoid, 22–31 × 8–10 μm *D. maculata* (Coker) Lemke
7. Basidia with 2 or 3 sterigmata, basidiospores ellipsoid, 8.0–11.0 (–12.5) × 5.0–8.0 μm *D. commixta* (Höhn. & Litsch.) Erikss. & Ryv.
- 7* Basidia with 4 sterigmata, basidiospores allantoid, 16–32 × 8–12 μm *D. dryina* (Pers.) Lemke
8. Basidiospores amygdaliform, 8.5–11.0 × 5.0–7.0 μm, in Europe (Finland, Norway) on *Corylus*, *Prunus padus* and *Salix* *D. amygdalispora* Hjortst.
- 8* Basidiospores shape otherwise 9

9. Basidiospores ellipsoid or subcylindrical, in Europe on deciduous trees 10
- 9*. Basidiospores globose or subglobose, in Europe on coniferous trees 11
10. Basidiospores ellipsoid, (9–) 10–12 (–15) × (6–) 7–8 (–11) μm, the length less than twice the width, in Europe usually (not always) on *Acer*, but also on *Salix* and *Ulmus*
..... *D. acerina* (Pers.: Fr.) Lemke
- 10*. Basidiospores subcylindrical, (11–) 12–15 (–18) × (5–) 6–7 (–9) μm, the length at least twice the width, in Europe usually (not always) on *Ulmus*, but also on *Acer*
..... *D. alliacea* (Quél.) Lemke
11. Basidiospores subglobose, finely echinulate, 16–26 × 14–19 μm, in Europe (France, Italy) on *Juniperus*
..... *D. nivosa* (Berk. & Curt.) Lemke
- 11*. Basidiospores globose or subglobose, 10.0–12.5 × 8.0–9.0 μm, in Europe (Italy) on *Taxus*
..... *D. incrustans* (Lemke) Lemke

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REFERENCES

- BERNICCHIA A. 1990. The genus *Dendrothele* Höhn. & Litsch. in Italy. *Nova Hedwigia* **51**(3–4): 453–458.
- BOIDIN J. & LANQUETIN P. 1984. Répertoire des données utiles pour effectuer les tests d'intercompatibilité chez les Basidiomycètes. III. Aphyllophorales non porées. *Cryptog. Mykol.* **5**: 193–245.
- BOIDIN J., TERRA P. & LANQUETIN P. 1968. Contribution a la connaissance des caractères mycéliens et sexuels des genres *Aleurodiscus*, *Dendrothele*, *Laeticorticium* et *Vuilleminia* (Basidiomycètes Corticiaceae). *Bull. Soc. Mycol. France* **84**(1): 53–84.
- BOIDIN J., LANQUETIN P. & DUHEM B. 1996. Contribution a la connaissance du genre *Dendrothele* (Basidiomycotina, Aphyllophorales). *Bull. Soc. Mycol. France* **112**: 87–126.
- BOURDOT H. & GALZIN A. 1928. Hymenomycetes de France. P. Lechevalier, Paris.
- BRESADOLA J. 1903. Fungi polonici a cl. Viro B. Eichler lecti. *Ann. Mycol.* **1**(2): 65–131.
- BUJAKIEWICZ A. 1992. Mycosociological research in the *Ficario-Ulmetum campestris* association in the Wielka Kępa Ostromecka reserve on the Vistula River. *Acta Mycol.* **27**(1991–1992): 277–290 (in Polish with English summary).
- DOMAŃSKI S. 1988. Mała flora grzybów. **1**(5). Corticiaceae. *Acanthobasidium-Irpicondon*. Państwowe Wydawnictwo Naukowe, Warszawa–Kraków.
- DOMAŃSKI S., GUMIŃSKA B., LISIEWSKA M., NESPIAK A., SKIRGIELLO A. & TRUSZKOWSKA W. 1967. Mycoflora of West Bieszczady. III. *Acta Mycol.* **3**: 63–114 (in Polish with English summary).
- ERIKSSON J. & RYVARDEN L. 1975. The Corticiaceae of North Europe. **3**. *Coronicium-Hyphoderma*. Fungiflora, Oslo.
- GAZZANO S. 2000. Notas sobre Basidiomycetes xilófilos del Uruguay. IX. Nuevos registros de hongos corticioides y poroides (Aphyllophorales). *Comun. Bot. Mus. Hist. Nat. Montevideo* **114**(6): 1–7.
- GILBERTSON R. L. & BLACKWELL M. 1985. Notes on wood-rotting fungi on junipers in the Gulf Coast region. *Mycotaxon* **24**: 325–348.
- GINNS J. & LEFEBVRE M. N. L. 1993. Lignicolous Corticioid Fungi (Basidiomycota) of North America. Systematics, Distribution and Ecology. *Mycol. Mem.* **19**: 1–247.
- HAWKSWORTH D. L., KIRK P. M., SUTTON B. C. & PEGLER D. N. 1995. Ainsworth & Bisby's dictionary of the Fungi. Ed. 8. University Press, Cambridge.
- JÜLICH W. 1984. Die Nichtblätterpilze, Gallertpilze und Bauchpilze (Aphyllophorales, Heterobasidiomycetes, Gymnomyces). – In: H. GAMS, *Kleine Kryptogamenflora* 2b/1. Basidiomyceten 1. VEB G. Fischer Verlag, Jena.
- JÜLICH W. & STALPERS J. A. 1980. The resupinate non-poroid Aphyllophorales of the temperate Northern Hemisphere. North-Holland Publishing Company, Amsterdam, Oxford, New York.
- KNUDSEN H. 1995. Taxonomy of the basidiomycetes in Nordic Macromycetes. *Symb. Bot. Ups.* **30**(3): 169–208.
- KOTIRANTA H. & SAARENOKSA R. 2000. Corticioid fungi (Aphyllophorales, Basidiomycetes) in Finland. *Acta Bot. Fennica* **168**: 1–55.
- KREISEL H. (ed.) 1987. Pilzflora der Deutschen Demokratischen Republik. Basidiomycetes (Gallert-, Hut- und Bauchpilze). VEB G. Fischer Verlag, Jena.
- LEMKE P. 1964. The genus *Aleurodiscus* (sensu lato) in North America. *Can. J. Bot.* **42**: 723–768.
- NIEMELÄ T., RENVALL P. & HJORTSTAM K. 1998. *Hagenia abysinica* and its fungal decayers in natural stands. *Edinb. J. Bot.* **55**(3): 473–484.

- WOJEWODA W. 1974. Macromycetes of the Ojców National Park. I. The flora. *Acta Mycol.* **10**(2): 181–265 (in Polish with English summary).
- WOJEWODA W. 1996. Fungi of Cracow during the years 1883–1994 with particular interest in macrofungi. *Stud. Ośrod. Dokument. Fizjogr.* **24**: 75–111 (in Polish with English summary).
- WOJEWODA W. 1998. The macrofungi (Basidiomycotina) of the Beskid Niski Mts. (the Polish Carpathians). Part I. The Heterobasidiomycetes and Aphyllophorales. *Stud. Ośrod. Dokument. Fizjogr.* **25**(1997–1998): 295–334 (in Polish with English summary).
- WOJEWODA W. 1999. The corticioid fungi of the Polish Carpathians. *Wiad. Bot.* **43**(3/4): 19–30 (in Polish with English summary).
- WOJEWODA W. (ed.). 2000. Atlas of the geographical distribution of fungi in Poland. **1**. W. Szafer Institute of Botany of the Polish Academy of Sciences, Kraków.

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