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New localities and new host of *Ganoderma pfeifferi* in Poland

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New localities and a new host of *Ganoderma pfeifferi* Bres. in Pat. in Poland have been presented. Also, fruitbodies and spores, as well as ecology of the species have been described.

Key words: *Basidiomycetes*, *Ganoderma pfeifferi*, mycogeography, forest pathology, Poland

INTRODUCTION

The family of *Ganodermataceae* comprises 77 species of lignicolous fungi found mainly in the tropical climate (Kirk et al. 2001). There are 8 species in Europe, in Poland this important systematic group is represented by 6 species (Sokół 2000). Due to the unique structure of the crust and characteristic spores with a double wall they were classified into a separate order of *Ganodermatales* (Hawksworth et al. 1995). According to the latest edition of the Dictionary of the Fungi, the family of *Ganodermataceae* is placed within the order *Polyporales* in the class *Basidiomycetes* (Kirk et al. 2001). Fungi from the genus *Ganoderma* are very important saprotrophs taking part in the decomposition of dead wood. Some of them are of economic importance as parasites of woody plants causing white rot of weakened, damaged or dying, as well as healthy trees. The most popular and most common species in many regions of Poland is *Ganoderma applanatum* (= *G. lipsiense*). The rarest species in our country is *Ganoderma pfeifferi* Bres. in Pat. This fungus can be found in most of European countries; however, it is very rare in the entire region of its occurrence.

In Poland, only 3 localities can be found in the Małopolska Province. The ever first documented locality on a living beech (*Fagus sylvatica*) in Bobrek near Oświęcim comes from the year 1994 (Sokół 2000). Piątek (1999) reports two localities in Tarnów where fruit bodies appeared on the trunk of a living elm (*Ulmus laevis*) and stumps of beeches (*Fagus sylvatica*).

NEW LOCALITIES AND DESCRIPTION OF THE FRUITBODIES

Recently, two new localities of *G. pfeifferi* have been found in Poland. The first of them is in the central part of Warsaw (Mokotów district, Rakowiecka street), in the Warsaw Agricultural University Park founded in the beginning of the 20th century. The fungus was found in September 2001 on the stump of a silver maple *Acer saccharinum*. Two fruitbodies grew near the ground level, inside the hollow stump. It is worth noticing that the first author observed the fruitbodies of the discussed species on the same stump already in the mid-1990ies. Unfortunately they could not be collected because they had been destroyed during their development. The basidiocarps were sessile and broadly attached, semicircular 9 and 13 cm long, 6 and 10 cm wide, and 2 and 3 cm thick. At present this is the furthest north locality observed in Poland.

The second locality is in Strzelin, Dolnośląska Province. The fungus was found in November 2001 on two living silver maple growing near the railway station (Fig. 1). The trees were about 15 m high and 90 and 95 cm DBH. Seventy five fruitbodies of *G. pfeifferi* were found all together on these two trees. The lowest located specimen grew at the base of the stem and the highest was at 3.5 m. Some fruitbodies were damaged or almost completely destroyed. The approximate size of fruitbodies measured in situ varied within the range: length 3-40 cm, width 2-20 cm, thickness 2-15 cm. The Strzelin locality is the furthest west locality of *G. pfeifferi* in our country. The basidiocarps were perennial, sessile and broadly attached, semicircular, ungulate, shapeless, singular or concrescent. Upper surface of pileus flat to convex, wrinkled with weakly marked wide zoning, copper-red, often glossy, later brown to black, covered with resin substance. The resinous layer on the upper surface forms a well defined venation (Fig. 2). Margin of pileus blunt, roundish, lighter than the upper surface (Fig. 3), at first white buff, yellowish, later reddish-orange. Hymenophor stratified. Pore surface whitish to cream, from autumn to spring becomes golden-yellow. Context corky, chestnut-brown, in older fruitbodies is indistinctly zonate. Tube layer of 0.3 to 2.5 cm slightly lighter that the colour of the context. Pores circular, small, 0.1 to 0.2 mm diam (4-5 pores/mm). Spores ellipsoid, egg-shaped and cut flat at the top with a double wall, light-brown, (9) 10-12 µm x 6-8 µm.

Among the Polish species of *Ganoderma* the greatest similarity to *G. pfeifferi* can be observed in *Ganoderma resinaceum,* which differs among others in the size of its pores (3-4 pores/mm on the average), with light-brown colour of the context, lack of veining in the resinous layer on the upper surface of the fruitbody (Piątek 2000, Sokół 2000). *G. pfeifferi* may be also mistaken for the common *Fomitopsis pinicola,* from which it differs by darker context and tubes, as well as by the structure of spores.

LOCALITIES IN POLAND

Distribution of the all so far known localities of *G. pfeifferi* in Poland is presented on the map (Fig. 4).

List of localities:

1. Bobrek (Małopolska Province); old mansion park, living *F. sylvatica*, 1994, leg. et det. Szczepka (Sokół 2000).

Fig. 1. Basidiocarps of *G. pfeifferi* and galls on the stem of living *Acer saccharinum* in Strzelin. Phot. A. Szczepkowski.

Fig. 2. Upper surface of a fruitbody of *G. pfeifferi* covered with resin substance with distinct venation. Phot. J. Piętka.

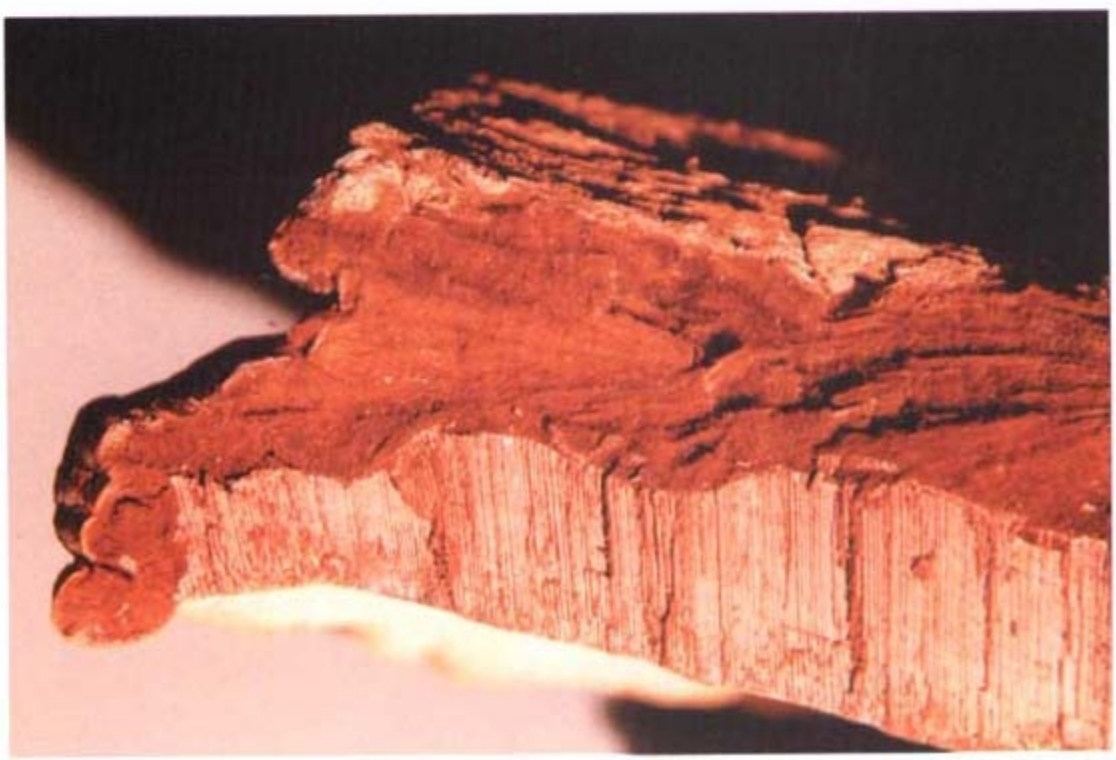

Fig. 3. Cross section through a fruitbody of *G. pfeifferi*. Phot. J. Piętka.

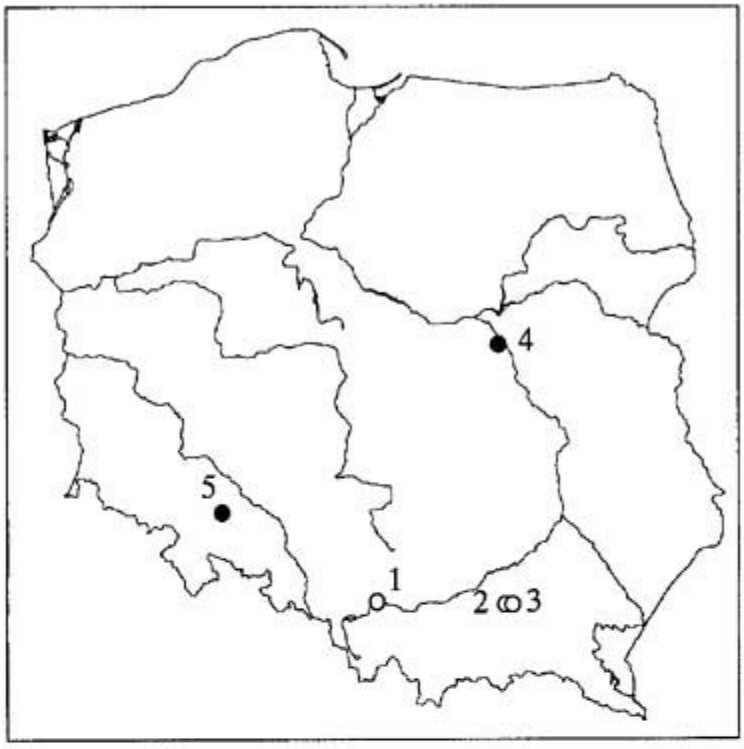

Fig. 4. Distribution of *Ganoderma pfeifferi* in Poland.
○ – localities known from literature
● – new localities.

2. Tarnów (Małopolska Province); elm alley, close to Piaskowa Street, living *U. laevis*, 1997, 1999, leg. et det. Piątek (Piątek 1999).
3. Tarnów (Małopolska Province); city park of culture and recreation, on the northern slope of St. Martin mountain, on two stumps of *F. sylvatica*, 1998, leg. et det. Piątek (Piątek 1999).
4. Warsaw (Mazowiecka Province), Warsaw Agricultural University Park in Rakowiecka 26/30, on the stump of *A. saccharinum*, 2001, leg. Szczepkowski and Piętka, det. Piątek.
5. Strzelin (Dolnośląska Province), next to the railway station building, two living *A. saccharinum*, 2001, 2002, leg. M. Konsencjusz and A. Szczepkowski, det. A. Szczepkowski.

ECOLOGY

G. pfeifferi seems to inhabit many species of deciduous trees in synanthropic localities. According to the literature, the species is considered a parasite of weakness of the following host trees: most often *Fagus*, then *Abies, Acer, Aesculus, Fraxinus, Ulmus, Prunus, Salix* and *Quercus* (Ryvarden and Gilbertson 1993; Kreisel 1987; Kotlaba 1984; Jahn 1979; Marchand 1976). The Polish localities – old parks and afforested urban areas, as well as the host trees recorded, confirm the ecology of the species.

According to Kreisel (1987), *G. pfeifferi* inhabits broad-leaved forest stands, belonging to *Fraxino-Ulmetum* and *Fraxino-Fagetum* associations. This fungus may also appear in beech woods (*Fagus orientalis*) in the northern Caucasus Mountains where it most often inhabits trees damaged by wind (Kuzmichev et al. 2001).

In Poland, this fungus had been known to appear on beeches and elms. The authors found it on *A. saccharinum*, which is a new host in the Polish population of this species. The infected maples in Strzelin besides etiological symptoms (fruitbodies) had galls on the stems. No other symptoms of disease were found which may prove that *G. pfeifferi* can affect trees in good health. The fungus develops as a parasite or saprotroph causing white rot of wood, both heartwood and sapwood. The decaying wood changes its colour to light yellow just like older mycelium cultivated by the authors on Malt Agar. According to Schwarze et al. (2000) *G. pfeifferi* unevenly decomposes particular wood elements, the first to degrade is lignin and hemicellulose and only later cellulose.

In most mycological and phytopathological papers (Kreisel 1987; Jahn 1979; Černý 1976) it is stated that the fungus produces fruitbodies almost at the base of the stem or at a low height. Finding fruitbodies at the height of 3.5 m proves that *G. pfeifferi* decomposes wood not only in the butt end part but also the central part of the trunk may undergo the decay. After the death of the tree the process of wood decay continuous and the fungus develops as a saprotroph. Because of its rarity *G. pfeifferi* cannot be at present considered economically important. The fungus seems to spread continuously and it may be supposed that its actual distribution in our country is wider than the documented one.

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Nowe stanowiska i nowy gospodarz *Ganoderma pfeifferii* w Polsce

Streszczenie

Do tej pory lakownica czerwonawa (*Ganoderma pfeifferi* Bres. in Pat.) znana była w Polsce z 3 stanowisk na południu kraju. W pracy podano informacje o nowych krajowych stanowiskach. Pierwsze z nich, w Warszawie, jest obecnie najdalej na północ znanym miejscem występowania tego gatunku w Polsce. Owocniki wyrosły wewnątrz mocno rozłożonego pniaka klonu srebrzystego (*Acer saccharinum*) w parku SGGW, zajmującym powierzchnie ok. 1 ha przy ul. Rakowieckiej 26/30. Natomiast drugie - w Strzelinie, to najbardziej na zachód wysunięte krajowe stanowisko tego gatunku. Tutaj grzyb opanował dwa żywe klony srebrzyste rosnące w pobliżu stacji PKP. *A. saccharinum* jest nowym, po buku i wiązie, żywicielem w polskiej populacji *G. pfeifferi*. Ponadto przedstawiono opis owocników i zarodników. Praca zawiera również informacje o ekologii i rozmieszczeniu geograficznym tej najrzadszej spośród naszych lakownic. Wydaje się, że gatunek ten może występować w dużym rozproszeniu na terenie całego kraju, jako pasożyt lub saprotrof i nie stanowi obecnie zagrożenia gospodarczego.