

Notes on Polish polypores 5. Synopsis of the genus *Spongipellis*

MARCIN PIĄTEK¹, DOMINIKA SETA² and ANDRZEJ SZCZEPKOWSKI¹

¹Department of Mycology, W. Szafer Institute of Botany, Polish Academy of Sciences
Lubicz 46, PL-31-512 Kraków, mpiatek@ib-pan.krakow.pl

²Department of Algology and Mycology, University of Łódź
Banacha 12/16, PL-90-237 Łódź, dominika@biol.uni.lodz.pl

³Department of Mycology and Forest Phytopathology
Warsaw Agricultural University – SGGW

Nowoursynowska 166, PL-02-776 Warszawa, szczepkowski@delta.sggw.waw.pl

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The paper deals with representatives of the genus *Spongipellis* Pat. in Poland. *Spongipellis pachyodon* (Pers.) Kotl. et Pouzar is reported for the first time from Poland and Belarus. Its basidiomes are described and illustrated, and taxonomy, ecology and distribution are reviewed. Two other species, *S. delectans* (Peck) Murrill and *S. spumeus* (Sowerby: Fr.) Pat. are briefly discussed. Distribution maps in Poland for each species are provided, an identification key to the species of *Spongipellis* in Poland is given, and basidiospore dimensions of each species are included based on studied materials.

Key words: polypores, *Spongipellis delectans*, *S. pachyodon*, *S. spumeus*, taxonomy, ecology, distribution in Poland

INTRODUCTION

This paper is continuation of studies devoted to taxonomy, ecology and chorology of polypores occurring in Poland. Previously several species new for this country have been reported and occurrence of many rarities has been discussed (e.g., Piątek 2001, 2003a-c, in press; Piątek and Cabała in press, and literature cited therein). Here we report another species new for Poland, viz. *Spongipellis pachyodon* (Pers.) Kotl. et Pouzar, and briefly discuss two other species from the genus *Spongipellis* Pat. known from the country. In addition, *S. pachyodon* is reported for the first time from Belarus.

The present study is based on herbarium materials preserved in KRAM, KRAM-Domański, LOD and WAML. Abbreviations of herbaria follows Holmgren et al. (1990); the abbreviation WAML means Herbarium of Department of Mycology and Forest Phytopathology of the Warsaw Agricultural University – SGGW. For *Spon-*

gipellis pachyodon we examined all materials from above mentioned herbaria, while for two other species we studied only materials from Poland. Observations, measurements and drawings of microscopic elements were made from slide preparations stained with solution of phloxine in 5% KOH under the light microscope NIKON Eclipse E600 with Nomarski phase contrast. Thirty basidiospores per specimen were measured followed recommendation of Parmasto and Parmasto (1987). In the text the following abbreviations are used: L = mean spore length (arithmetical mean of all spores, in μm), W = mean spore width (arithmetical mean of all spores, in μm), Q = quotient of the mean spore length and the mean spore width (L/W ratio) (after Niemelä 1998). Measurements derive from basidiomes and none of them from spore prints. The measurements for each specimen are given in Tab. 1.

Table 1
Basidiospore dimensions of specimens studies (all dimension in μm)

Collections	Dimensions of basidiospores	L	W	Q
<i>S. delectans</i> KRAM-Domański 546	6.0–7.5 (–8.0) \times 4.0–5.0 (–6.0)	6.9	4.7	1.5
<i>S. pachyodon</i> KRAM F-54101	5.5–6.0 (–6.5) \times 4.5–5.0 (–6.0)	5.9	5.0	1.2
LOD 43218 (Więczyń reserve, 25 Aug. 2003)	5.0–6.0 (–6.5) \times 4.5–5.0 (–5.5)	5.6	4.9	1.1
KRAM-Domański 5974	(5.5–) 6.0–7.0 \times 4.5–5.5 (–6.0)	6.4	5.1	1.2
<i>S. spumeus</i> KRAM-Domański 7122	(6.0–) 6.5–7.0 (–9.0) \times (4.0–) 4.5–5.0 (–6.0)	6.9	4.9	1.4
WAML s.n. (Wieliszew, 17 Sept. 2003)	6.0–8.5 \times 4.5–6.0	7.3	5.2	1.4
WAML s.n. (Warszawa, 23 Sept. 2003)	6.0–7.0 (–8.0) \times (4.5–) 5.0–6.5 (–7.0)	6.6	5.6	1.2

A NOTE ON *SPONGIPELLIS*

The genus *Spongipellis*, typified by *S. spumeus* (Sowerby: Fr.) Pat., is representative of tyromycetoid polypores. It is characterized by white, pileate or semiresupinate basidiomes, duplex consistency of context, monomitic hyphal system, with clamped hyphae, globose to broadly ellipsoid, thick-walled and cyanophilous basidiospores, and causing a white rot in wood. Its close relatives are genera *Abortiporus* Murrill, *Climacocystis* Kotl. et Pouzar, *Oligoporus* Bref. and *Tyromyces* P. Karst. (for details about these genera see Ryvarden 1991).

Abortiporus has similar duplex context, monomitic hyphal system, slightly thick-walled basidiospores, and causes white rot in wood. It differs from *Spongipellis* mainly by stipitate basidiomes. The type species of *Abortiporus*, *A. biennis* (Bull.: Fr.) Singer has gloecystidia which are absent in the generitype of *Spongipellis*, but this character is variably observed in other species of *Abortiporus*.

Climacocystis has also context with duplex consistency, monomitic hyphal system, and causes white rot in wood, but it has thin-walled, ellipsoid basidiospores, and above all, characteristic cystidia, which are ventricose, acute and thick-walled towards the apex. Such cystidia are absent in *Spongipellis*, as well as in *Abortiporus*, *Oligoporus* and *Tyromyces*.

Oligoporus has monomitic hyphal system, but the context is homogeneous, basidiospores are thin-walled, allantoid or ellipsoid and the species cause a brown rot in wood.

Tyromyces has similar white, sappy, pileate or semiresupinate basidiomes, mostly monomitic hyphal system (a few species have dimitic hyphal system), and causes white rot in wood, but it differs from *Spongipellis* by homogeneous context, and thin-walled, allantoid to ovoid basidiospores.

Nine species are currently accepted in the genus *Spongipellis*: *S. caseosus* (Pat.) Ryvarden, *S. chubutensis* J. E. Wright et J. R. Deschamps, *S. cretaceus* (Lloyd) Ryvarden, *S. delectans* (Peck) Murrill, *S. malicola* (Lloyd) Ginns, *S. pachyodon*, *S. sibirica* (Penzina et Ryvarden) Penzina et Kotir., *S. spumeus* and *S. unicolor* (Schwein.) Murrill. (Wright and Deschamps 1972; Ryvarden 1983, 1990; Ginns 1984; Gilbertson and Ryvarden 1987; Ryvarden and Gilbertson 1994; Kotiranta and Penzina 2001; Stalpers and Stegehuis 2004).

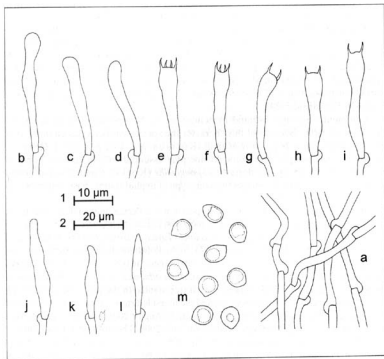


Fig. 1. *Spongipellis pachyodon* (Pers.) Kotl. et Pouzar (drawn from KRAM F-54101 by J. Cabala): a - generative hyphae, b-i - basidia, j-l - cystidioles, m - basidiospores. Scale bars: 1 for m, 2 for a-l.

TAXONOMIC DESCRIPTION

Spongipellis pachyodon (Pers.) Kotl. et Pouzar, *Česká Mykol.* 19: 77. 1965.

Basidiomes annual, pileate to semiresupinate, broadly attached to the substrate, single or in imbricate groups, coriaceous in fresh conditions, hard when dry; pileus up to 5 cm long and 1 cm wide, upper surface white to cream or slightly ochraceous, azonate, finely tomentose when young but smooth in older specimens; hymenophore white when fresh, becoming ochraceous during drying, irpicoid near the margin, and strongly hydroid in the most part of the area, teeth cylindrical, up to 10 mm long, in dry specimens covered by resinous substance; context white, up to 5 mm long, with weakly differentiated duplex consistency. Hyphal system monomitic, generative hyphae with clamps, hyaline, slightly thick-walled, in the context up to 5 μm wide, in the trama up to 2 μm wide, agglutinated and with numerous oil drops; cystidia or gloeocystidia absent, cystidioles fusoid, with basal clamp, 30-40 \times 4-6 μm ; basidia narrowly clavate, elongated at the base, with basal clamp and (2-)4 sterigmata, 35-40 \times 5-7 μm ; basidiospores globose to broadly ellipsoid, hyaline, smooth, thick-walled, non amyloid, with oil drop, 5.5-6.0(-6.5) \times 4.5-5.0(-6.0) μm (Fig. 1).

Specimens examined (selected). Poland. Niziny Środkowopolskie, Wzniesienia Łódzkie: Wiączyń reserve (Brzeziny forestry), forest division 170c, mixed forest, on fallen trunk of *Fagus sylvatica*, 20 Nov. 2002, leg. D. Seta (KRAM F-54101, LOD 43217), 25 Aug. 2003, leg. D. Seta (LOD 43218); Belarus. Wysoczyzny Podlasko-Białoruskie, Równina Bielska: Białowieża Primeval Forest, forest division 807, oak forest, on fallen trunk of *Quercus petraea*, 23 Sept. 1969, leg. M. K. Michalewicz (KRAM-Domański 5974).

Comments. Strongly hydroid hymenophore is characteristic feature for *Spongipellis pachyodon*. Because of this character the species has been placed in the past in a separate genus *Irpiciporus* Murrill (Kotlaba and Pouzar 1957). However, since the macroscopic characters do not play essential role in the taxonomy of polypores it was finally transferred to *Spongipellis* (Kotlaba and Pouzar 1965) with generitype of which it shares the same type of hyphal system, basidiospores, and duplex consistency of the cortex.

Spongipellis pachyodon has wide host spectrum, but occurs only on deciduous trees, both living and dead ones. The most common host in Europe is *Quercus*, but it was also collected on further trees: *Ailanthus*, *Castanea*, *Fagus*, *Fraxinus*, *Juglans*, *Platanus* and *Salix* (Ryvarden and Gilbertson 1994). In the Polish locality it was found on fallen trunk of *Fagus sylvatica*. Olaczek (1962) determined the type of forest in the Wiączyń reserve as mixed forest with *Fagus sylvatica*, *Abies alba* and *Acer pseudoplatanus*, with numerous fragments of 300 years old beech tree-stands. In the place where the trunk with basidiomes of *S. pachyodon* was found the forest is almost exclusively composed of beech trees. Since the first finding of the fungus in August 2001 it occurred regularly in the spring, summer and autumn months until July 2004. Therefore, it is very probable that the fungus can survive in the reserve in the next years, but because this is the only locality in Poland it should be considered as threatened species, and probably included in the "CR" category in revised "red list" classification (IUCN 2001).

Spongipellis pachyodon is an almost cosmopolitan species, widely distributed worldwide but rather rarely reported. Most localities are known from eastern United

States and Canada (Gilbertson and Ryvarden 1987), and from Europe (Ryvarden and Gilbertson 1994). It occurs also in Africa: Morocco, Tanzania (Kotlaba 1984; Renvall and Niemelä 1993), Asia: Caucasus, India (Kotlaba 1984; Rattan 1977), Australia (May et al. 2003), and South America: Uruguay, Brazil (Gazzano 1998; Ryvarden and de Meijer 2002).

In Europe *Spongipellis pachyodon* is restricted mostly to southern and central part of the continent, the northernmost localities are in Denmark and southern

Sweden. In this latter country it was known from one locality near Stockholm but now is probably extinct because it has not been rediscovered since 1913 (Anonymous 2004). In their map Ryvarden and Gilbertson (1993) reported this species also from Poland but the source of their information is unknown. Hence, the finding published here (Fig. 2) is the first fully documented record of *S. pachyodon* in the country. This fungus is also for the first time reported from Belarus, where it was found in the Białowieża Primeval Forest. It is the second polypore, published recently, which is known from Belarusian part of this virgin forest and absent in Polish part. Previously *Haploporus tuberculosis* (Fr.) Niemelä et Y. C. Dai has been recorded based on specimen found in herbarium of late Professor Stanisław Domański (Piątek 2003d).



Fig. 2. *Spongipellis pachyodon* (●) and *Spongipellis delectans* (▲) in Poland.

BRIEF NOTES ON TWO OTHER SPECIES

Spongipellis delectans (Peck) Murrill, North Am. Flora 9: 38. 1907.

Specimens examined. Poland. Wysoczyzny Podlasko-Białoruskie, Równina Bielska: Białowieża Primeval Forest, mixed forest, on fallen trunk of deciduous tree, 25 Oct. 1959, leg. S. Domański (KRAM-Domański 546), same location and habitat, on fallen trunk of *Carpinus betulus*, 20 Oct. 1963, leg. S. Domański (KRAM-Domański 3442).

Comments. This species is known only from the virgin forest of the Białowieża National Park in NE Poland (Fig. 2). Domański et al. (1967) mentioned only three collections of *Spongipellis delectans*, two from September 1956 and 1957 collected by Professor Henryk Orłoś and one from October 1963 found by Professor Stanisław Domański (cited above). In KRAM-Domański we located the fourth collection, determined previously as "*Spongipellis litschaueri* Lohw." (cited above as No. 546). This

name is however synonymous with *S. delectans* (Ryvarden and Gilbertson 1994). The specimen from this collection has smaller pores but microscopically matches well with the concept of the latter species: it has thick-walled, broadly ellipsoid to subglobose basidiospores and distinctly thick-walled hyphae in the context.

Spongipellis spumeus (Sowerby: Fr.) Pat., Ess. Tax.: 84. 1900.

Specimens examined. Poland. Niziny Środkowopolskie, Równina Warszawska: Warszawa, Lasek Bielański, on trunk of *Populus*, Oct. 1973, leg. P. Wierchowski (KRAM-Domański 7122); Warszawa, at Rakowiecka Str., on trunk of living *Populus x petrowskiana*, 23 Sept. 2003, leg. A. Szczepkowski (WAML s.n.); Niziny Środkowopolskie, Kotlina Warszawska: Wieliszew near Legionowo, 17 Sept. 2003, leg. K. Felczak (WAML s.n.).



Fig. 3. *Spongipellis spumeus* in Poland.

et al. 1967), in Wieliszew near Legionowo and on two locations in Warszawa (this paper). The most common host for *S. spumeus* in Poland is *Malus domestica*, but single reports are also from *Betula*, *Populus* and *Populus x petrowskiana*. *Populus x petrowskiana*, reported here, is new host in Polish population of *Spongipellis spumeus*. *Malus domestica* is also a host for similar macroscopically and more common *Tyromyces fissilis* (Berk. et M. A. Curtis) Donk (Piątek 1999). It can be easily distinguished from *S. spumeus* by homogeneous context, smaller basidiospores, presence of chlamydospores and changing colour to pinkish or pale umber after drying.

Comments. *Spongipellis spumeus* is evidently a rare species in Poland, but the most common species within the genus *Spongipellis*. To our best knowledge it was found in the country nine times (Fig. 3). The oldest known localities are in the Lower Silesia: Wrocław-Osobowice, Kamień Śląski near Strzelce Opolskie and Niemodlin (Schröter 1888). Further it was found near Manie in the neighbourhood of Międzyrzec Podlaski (Eichler 1900), in Kolibki near Orłowo (Teodorowicz 1936), in Białowieża (Domański

KEY TO THE GENUS *SPONGIPELLIS* IN POLAND

The species of *Spongipellis* occurring in Poland and Europe may be identified using the key given below. The references in the key indicate where recent descriptions of the species can be found. Two references for each species are given: the first includes the monograph with description based on materials from outside of Poland, and the second includes the work with description based on Polish specimens.

1. Hymenophore distinctly hydroid, basidiospores globose to broadly ellipsoid, $5.5-7.0 \times 4.5-5.5 \mu\text{m}$ *S. pachyodon*
(Ryvarden and Gilbertson 1994: 645; this paper).
- 1*. Hymenophore poroid, or sometimes sinuous to daedaleoid, basidiospores subglobose to broadly ellipsoid 2
2. Hymenophore circular, angular or deadaleoid, pores 1-2 per mm, contextual hyphae distinctly thick-walled, basidiospores subglobose to broadly ellipsoid, $6.0-7.5 \times 4.0-5.0 \mu\text{m}$ *S. delectans*
(Ryvarden and Gilbertson 1994: 643; Domański et al. 1967: 96, as *S. bredecelesensis*).
- 2*. Hymenophore circular, rather regular, pores 1-3 per mm, contextual hyphae thin-walled or slightly thick-walled, basidiospores subglobose to broadly ellipsoid, $6.0-8.5 \times 4.5-6.0 \mu\text{m}$ *S. spumeus*
(Ryvarden and Gilbertson 1994: 646; Domański et al. 1967: 95).

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Badania nad grzybami poliporoidalnymi w Polsce 5. Rodzaj *Spongipellis*

Streszczenie

W artykule uwzględniono grzyby z rodzaju *Spongipellis* Pat. występujące w Polsce. *Spongipellis pachyodon* (Pers.) Kotl. et Pouzar podano po raz pierwszy z Polski i Białorusi. Owocniki tego gatunku szczegółowo opisano i zilustrowano. Ponadto omówiono jego taksonomię, ekologię oraz rozmieszczenie geograficzne. Krótko przedyskutowano także dwa dalsze gatunki znane z naszego kraju, mianowicie *S. delectans* (Peck) Murrill oraz *S. spumens* (Sowerby: Fr.) Pat. Rozmieszczenie każdego gatunku w Polsce przedstawiono na mapach, dołączono klucz do oznaczania wszystkich gatunków z rodzaju *Spongipellis* w Polsce oraz w oparciu o badane materiały zielnikowe podano wymiary zarodników dla każdego gatunku.