CZECH MYCOLOGY 70(1): 83–90, JUNE 25, 2018 (ONLINE VERSION, ISSN 1805-1421)

Pseudobaeospora albidula (*Agaricales*) found in the Czech Republic

MARTIN KŘÍŽ

National Museum, Mycological Department, Cirkusová 1740, CZ-193 00 Praha 9, Czech Republic; mmartin.kriz@seznam.cz

Kříž M. (2018): *Pseudobaeospora albidula* (*Agaricales*) found in the Czech Republic. – Czech Mycol. 70(1): 83–90.

The paper reports the probably first collections of *Pseudobaeospora albidula* in the Czech Republic. The author presents a macro- and microscopic description based on material collected at one locality in the Bohemian Karst Protected Landscape Area in Central Bohemia. Characters distinguishing *P. albidula* from similar species of the genus *Pseudobaeospora* are discussed.

Key words: *Tricholomataceae*, description, ecology, Bohemia.

Article history: received 27 May 2018, revised 12 June 2018, accepted 12 June 2018, published online 25 June 2018.

Kříž M. (2018): Penízovka bělavá – *Pseudobaeospora albidula* (*Agaricales*) nalezena v České republice. – Czech Mycol. 70(1): 83–90.

Článek informuje o pravděpodobně prvních sběrech penízovky bělavé – *Pseudobaeospora albidula* v České republice. Autor předkládá makroskopický a mikroskopický popis tohoto druhu založený na studiu materiálu sbíraného na jedné lokalitě na území CHKO Český kras ve středních Čechách. Jsou diskutovány znaky odlišující *P. albidula* od podobných druhů rodu *Pseudobaeospora*.

INTRODUCTION

In autumn 2017, during a mycological survey in Radotínské údolí Nature Reserve (Bohemian Karst), interesting, small, gilled fruitbodies were found. Their conspicuous features were an overall whitish colour and strikingly acrid taste. The collections were particularly compared with two very similar taxa, *Pseudobaeospora albidula* Bas and *P. calcarea* Clémençon & Ayer, and identified as the first one. The aim of this paper is to publish authentic data on the macro- and micromorphology of this species and to describe its ecological conditions at the locality.

MATERIAL AND METHODS

Macroscopic characters were studied on fresh fruitbodies collected in the Bohemian Karst. Microscopic mounts were made from dried material in Melzer's reagent and ammoniacal Congo Red and studied under an Olympus CX21 light microscope with an oil-immersion lens at a magnification of 1000×. Thirty randomly selected spores obtained from two collections were measured (extremely large spores were omitted). Q_{av} is the average value of spore length and width ratios.

Herbarium specimens have been deposited in the Mycological Department, National Museum, Prague (PRM). Data on geological conditions were taken from maps and descriptions at www.geologicke-mapy.cz (Bokr on-line).

RESULTS

Pseudobaeospora albidula Bas, Persoonia 18(1): 119, 2002 Figs. 1–5

Macroscopic characters. Pileus up to 15 mm wide, bell-shaped to convex with an umbo, finally expanded, somewhat concentrically wrinkled; surface dry, whitish, at most greyish whitish in the middle. Lamellae narrowly adnate, rather distant, veined towards the base and sometimes intervenose, creamy whitish, pale brownish when old. Stipe up to 25 × 1.5 mm, at base up to 2 mm wide, cylindrical, sordid whitish to somewhat yellowish, later darkening from the base, whitish pruinose to minutely flocculose at apex and fibrillose below, markedly strigose at base in well-developed specimens. Context thin, fragile, of the same colours as the surface. Smell indistinct; taste after a short while very acrid. Macrochemical reactions: without any reaction to 5% KOH on pileus surface (dried specimen tested).

Microscopic characters. Basidiospores 3.2–5.0 × 2.8–4.0 µm, Q = 1.07–1.41, Q_{av} = 1.23, smooth, dextrinoid, thick-walled, broadly ellipsoid, broadly ovoid to subglobose, with conspicuous hilar appendix, without germ pore. Basidia 18–33 × 5–8 µm, clavate, mostly 4-spored, frequently also 1- and 2-spored. Sclerified basidia and basidiolae present, scarce to abundant, dextrinoid (are all the basidia in a sclerotisation process during maturation analogously to the spore wall thickening process?). Cheilocystidia 20–34 × 6–12 µm, scattered to closely packed but not conspicuous, clavate to almost cylindrical or inflated to subcapitate, sometimes with short obtuse apical projection. Pileipellis consisting of chains of cylindrical to inflated colourless cells, often with narrower terminal elements, 13–66 × 5–19 µm, chains in young fruitbodies often erect, later mostly flattening into a type of cutis; suprapellis of narrow hyphae absent. Clamp connections present.

Fig. 1. *Pseudobaeospora albidula*, Radotínské údolí Nature Reserve, Zadní Kopanina, Bohemian Karst, Czech Republic, 8 Oct. 2017 (PRM 946721). Photo M. Kříž.

Fig. 2. *Pseudobaeospora albidula*, Radotínské údolí Nature Reserve, Zadní Kopanina, Bohemian Karst, Czech Republic, 8 Oct. 2017 (PRM 946721). Photo M. Kříž.

Fig. 3. *Pseudobaeospora albidula*, Radotínské údolí Nature Reserve, Zadní Kopanina, Bohemian Karst, Czech Republic, 28 Oct. 2017 (PRM 946722). Photo M. Kříž.

Fig. 4. *Pseudobaeospora albidula*, Radotínské údolí Nature Reserve, Zadní Kopanina, Bohemian Karst, Czech Republic, 26 Nov. 2017 (PRM 946723). Photo M. Kříž.

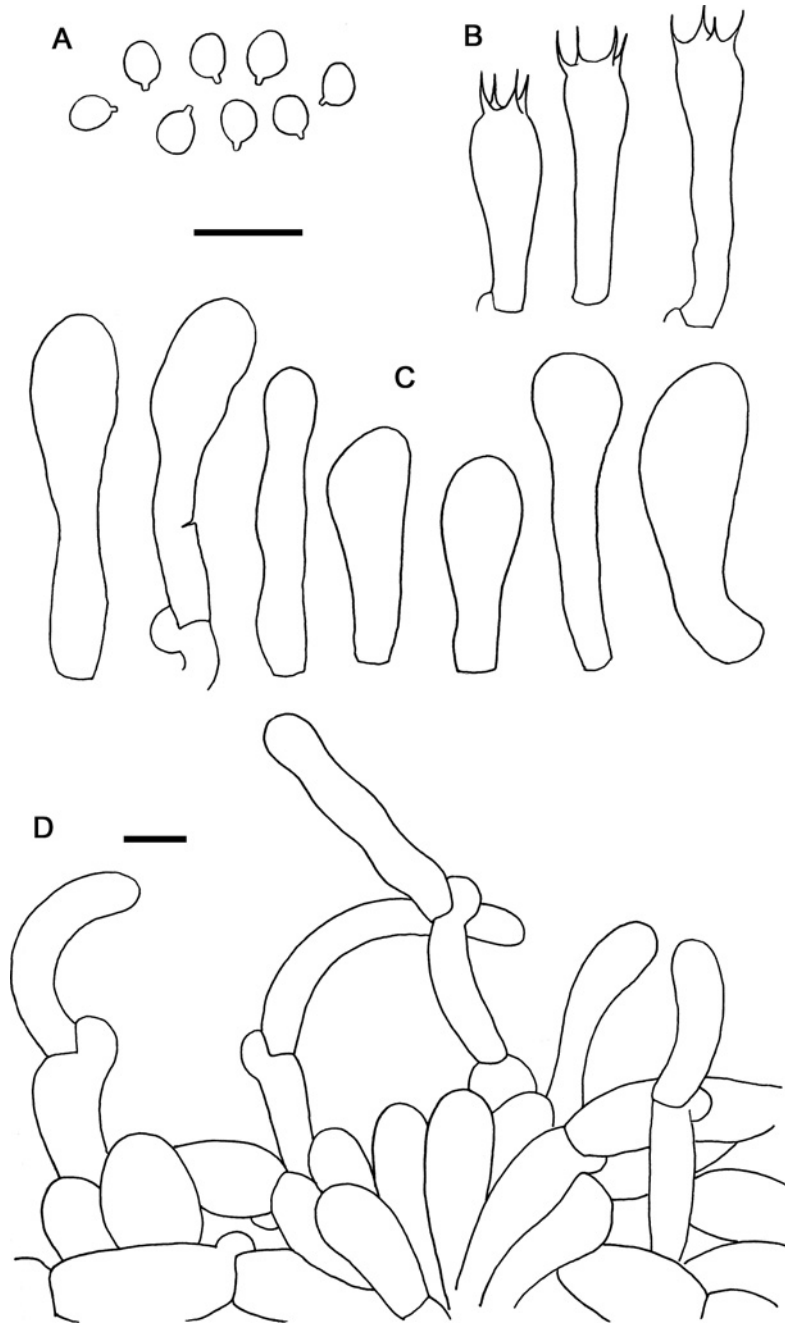

Fig. 5. *Pseudobaeospora albidula* (PRM 946722, PRM 946723). **A** – basidiospores, **B** – basidia, **C** – cheilocystidia, **D** – pileipellis of young fruitbody. Scale bars = 10 µm. Del. M. Kříž.

Habitat. Among mosses and on adjacent litter under *Fraxinus*, *Sambucus*, *Corylus* and *Picea* in ash-alder alluvial forest bordering Mlýnský potok stream, but also higher above the stream in ravine forest with man-influenced tree composition (*Acer*, *Robinia*, *Quercus*, *Pinus*, *Picea* and *Corylus*). The fruitbodies grew in small groups in October and November. The geological subsoil consists of limestone with hornstone of the Barrandian Palaeozoic. Altitudes are in the range of ca. 260 to 280 m a.s.l.

Material examined

Czech Republic. Bohemia. Zadní Kopanina (Central Bohemia, Pražská plošina plateau), Bohemian Karst, Radotínské údolí Nature Reserve, valley of Mlýnský potok stream, under *Fraxinus excelsior*, *Sambucus nigra*, *Corylus avellana* and *Picea abies*, among mosses, 8 Oct. 2017, leg. & det. M. Kříž (PRM 946721); ibid., 28. Oct. 2017, leg. & det. M. Kříž (PRM 946722); ibid., under *Acer* sp., *Robinia pseudoacacia*, *Quercus* sp., *Pinus* sp., *Picea abies* and *Corylus avellana*, 26 Nov. 2017, leg. & det. M. Kříž (PRM 946723).

DISCUSSION

Taxonomic position and similar taxa

The genus *Pseudobaeospora* Singer emend. Bas contains small, mycenoid to collybioid white-spored agarics of the family *Tricholomataceae* with small spores that are dextrinoid and thick-walled at maturity. Whitish fruitbodies within the genus naturally indicate the informal group *Albidula* as circumscribed by Bas (2003), the acrid taste then leads to the species *P. calcarea*, for which it is one of the typical characters (Clémençon & Ayer 2007). However, Bas (2003) unfortunately does not mention the taste of three other species included in the group *Albidula* in his work, thus all of these should be the subject of greater focus: *P. albidula* Bas, *P. paulochroma* Bas and *P. bavariae* Bas nom. prov. *Pseudobaeospora calcarea* was described more recently by Clémençon & Ayer (2007) and the fifth European species of this group is *P. terrayi* Adamčík & Jančovičová, described from Slovakia several years ago (Adamčík & Jančovičová 2011). Bas (2003) mentions the following common features for the *Albidula* group: whitish coloured fruitbodies, presence of clamp connections, absence of cheilocystidia (but see Adamčík & Jančovičová 2011, Arauzo 2011 and description above) and pileipellis not hymenidermoid. Voto (2009) proposed an altered infrageneric systematic organisation, combining the discussed whitish species with coloured ones in section *Pseudobaeospora*, subsections *Holocutis* and *Pseudobaeospora*.

Pseudobaeospora paulochroma and *P. bavariae* differ from *P. albidula* and *P. calcarea* in a positive (i.e. yellow or pale sordid yellowish) reaction of the pileus surface with KOH. *Pseudobaeospora terrayi* has a mild taste and also differs by a pale yellowish greenish reaction of the pileus surface with KOH and by the presence of well-developed suprapellis. Clémençon & Ayer (2007) separate

P. calcarea from *P. albidula* primarily based on the presence of a suprapellis, a highly irregular pileipellis and a different ecology: *P. calcarea* is described from a rather dry *Pinus sylvestris* forest. Furthermore, the authors mention e.g. the absence of sclerified basidia and a larger size of fruitbodies. On the contrary, Bas (2002, 2003) states smaller fruitbodies in *P. albidula* compared with the Czech collections (pileus up to 8 mm wide, stipe at most 1.0 mm thick), but Vila (2007) gives a larger size (pileus up to 13 mm wide, stipe up to 25 × 2 mm), very well fitting with the description in this paper (pileus 15 mm wide, stipe identical). Also the description of *P. albidula* by Arauzo (2011) reports larger dimensions of fruitbodies with a pileus of up to 15 mm wide and a stipe of up to 33 × 2 mm. This size already approaches the dimensions of fruitbodies of *P. calcarea* as given by Clémençon & Ayer (2007): pileus up to 20 mm wide, stipe up to 35 × 4 mm. Some other possible or alleged features distinguishing these two species are problematic: *P. calcarea* has an acrid taste, but in *P. albidula* this information is missing; reportedly only *P. albidula* has metachromatic spores, but while in *P. albidula* this feature was checked in cresyl blue, *P. calcarea* was studied in toluidine blue. However, the structure of the pileipellis is reported to be a crucial character to distinguish these two species in this paper. Because no suprapellis typical of *P. calcarea* was observed in any specimen examined, *P. albidula* remains as the only solution. Also the Q value of the spores in the Czech collections (1.07–1.41) agrees more with *P. albidula* (Q = 1.05–1.35; Bas 2002). The spores of *P. calcarea* seem to be a little narrower (Q = 1.15–1.55; Clémençon & Ayer 2007). However, the presence of cheilocystidia is mentioned neither in the diagnosis of *P. calcarea* nor in the diagnosis of *P. albidula*, which makes the problem even more complicated, thus further comparative study of these whitish species including molecular data is strongly desirable. There remains a question concerning the status of the terminal cells at the lamellar edge: “basidioloïdes cellules” in the description of Vila (2007) or true cheilocystidia according to Arauzo (2011) and this article.

Ecology and distribution

All species of the genus *Pseudobaeospora* are very rare (Ludwig 2001). Some of them are only known from the type locality. However, due to the small size of the fruitbodies of all representatives they are easily overlooked. Only one member of this genus from the *Pillodii* group has been published from the Czech Republic (unidentified species, see Adamčík & Ripková 2004). Bas (2003) describes the occurrence of *P. albidula* on calcareous loam, forest litter and on calcareous heath in England, Germany and the Netherlands. *Pseudobaeospora albidula* was later published from Spain: in Catalonia under *Corylus avellana* at an altitude of 1435 m a.s.l. (Vila 2007), in the Basque Country under *Pinus radiata* and *Salix* sp. at an altitude of 135 m a.s.l. (Arauzo 2011). Hagara (2014) presents a photo of *P. calcarea* made by J.-M. Moingeon from an *Alnetum* in the Rhône-Alpes in

France at an altitude of 1200 m a.s.l., the fruitbodies of which are suspiciously similar to those of *P. albidula*. The Czech locality of the present specimens lies in a thermophytic region at an altitude of ca. 260–280 m a.s.l. In this case the colder microclimate at the bottom of the gorge (climatic inversion) may be an important factor – along the stream there are steep slopes and limestone rocks with vertical walls. As Clémençon & Ayer (2007) already suggest in the case of *P. calcarea*, there may be some connection with the presence of moss, which could be typical of more representatives of the genus. The Czech fruitbodies also grew directly among mosses or nearby.

I propose including *P. albidula* into the next edition of the Red list of macromycetes of the Czech Republic and classifying it in the Critically Endangered (CR) category.

ACKNOWLEDGEMENTS

The author thanks two anonymous reviewers for their valuable comments. The Nature Conservation Agency of the Czech Republic is acknowledged for financing the mycological survey of the Radotínské údolí Nature Reserve from the Landscape Management Programme of the Ministry of the Environment of the Czech Republic. This work was financially supported by the Ministry of Culture of the Czech Republic (DKRVO 2018/08, National Museum, 00023272).

REFERENCES

ADAMČÍK S., JANČOVIČOVÁ S. (2011): *Pseudobaeospora terrayi*, a new species from Slovakia. – Sydowia 63(2): 131–140.

ADAMČÍK S., RIPKOVÁ S. (2004): First record of a *Pseudobaeospora* species from the Czech Republic. – Czech Mycol. 56(3–4): 239–246.

ARAUZO S. (2011): Estudios en el género *Pseudobaeospora*. – Errotari 8: 14–37.

BAS C. (2002): A reconnaissance of the genus *Pseudobaeospora* in Europe I. – Persoonia 18(1): 115–122.

BAS C. (2003): A reconnaissance of the genus *Pseudobaeospora* in Europe II. – Persoonia 18(2): 163–199.

BOKR P. (on-line): Geologické a geovědní mapy [Geological and geoscience maps]. – http://www.geologicke-mapy.cz. [accessed May 2018; in Czech]

CLÉMENÇON H., AYER F. (2007): *Pseudobaeospora calcarea*, a new species of agaricoid hymenomycetes. – Persoonia 19(2): 281–287.

HAGARA L. (2014) [2015]: Ottova encyklopedie hub [Otto's encyclopaedia of fungi]. – 1152 p., Ottovo nakladatelství, Praha. [in Czech]

LUDWIG E. (2001): Pilzkompendium, Band 1. Beschreibungen. – 758 p., IHW-Verlag, Eching.

VILA J. (2007): *Pseudobaeospora albidula*, une espèce peu fréquente, trouvée en Catalogne (Péninsule Ibérique). – Bull. trimest. Soc. Mycol. Fr. 123(3–4): 243–249.

VOTO P. (2009): Proposta di una sistematica infragenerica del Genere *Pseudobaeospora*, fondata su basi morfologiche, e note su due specie non ancora descritte. – Rivista di Micologia 52(4): 291–311.