

## Contribution to the knowledge of the Central European species of the genus *Antrodiella*

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Vampola P. and Pouzar Z. (1996): Contribution to the knowledge of the Central European species of the genus *Antrodiella*. – *Czech Mycol.* 49: 21–33

Four polypores, viz. *Antrodiella beschidica* Vampola et Pouzar, *Antrodiella faginea* Vampola et Pouzar, *Antrodiella farinacea* Vampola et Pouzar and *Antrodiella thompsonii* Vampola et Pouzar, are described as new species. The genus *Antrodiella* Ryv. et Johansen is emended and a review of all so far known species is added. A short key for identification of Central European species of *Antrodiella* is included.

**Key words:** *Antrodiella*, Polyporaceae, new species, Europe.

Vampola P. a Pouzar Z. (1996): Příspěvek k poznání středoevropských druhů rodu *Antrodiella*. – *Czech Mycol.* 49: 21–33

Čtyři choroše, a to *Antrodiella beschidica* Vampola et Pouzar, *Antrodiella faginea* Vampola et Pouzar, *Antrodiella farinacea* Vampola et Pouzar a *Antrodiella thompsonii* Vampola et Pouzar, jsou popsány jako nové druhy. Rod *Antrodiella* je emendován a rovněž je uveden přehled všech jeho dosud známých druhů. Je připojen stručný klíč k určování středoevropských druhů rodu *Antrodiella*.

Since 1980, when the new genus of polypores *Antrodiella* (*Polyporaceae*) was published by Ryvarden and Johansen, many new discoveries and changes in taxonomy and nomenclature of this group of fungi have been recorded. In the original circumscription the genus *Antrodiella* included 7 species, i. e. *A. hunua* (Cunningh.) Ryv., *A. liebmanii* (Fr.) Ryv., *A. minutispora* (Reid, Thind et Chatr.) Ryv., *A. oleagina* (Overh.) Ryv., *A. semisupina* (Berk. et Curt.) Ryv. (type species), *A. sp.* Ryv. 9046 and *A. straminea* (Bres.) Ryv. et Johan. This genus has been accepted by most mycologists due to well characterized generic features and in the years after many species were newly transferred to *Antrodiella* and also several new species of this genus have been described. At present the genus *Antrodiella* counts already almost forty species and that number is surely not final. We can not give a judgement of the value of all new combinations and newly described species in this paper, because we do not know some of the species from our experience. It is evident, however, that the distinguishing features of some

taxa are not in agreement with the original generic diagnosis and for this reason *Antrodiella* is emended below.

***Antrodiella* Ryv. et Johansen emend. nov.**

Basidiocarps annual to perennial, pileate to resupinate, growing on wood or on carpophores of lignicolous fungi. Pores small and round, rarely larger and angular, exceptionally labyrinthine poroid, irpicoid to dentate, white to cream, yellow to pale orange or ochraceous to brown. Context white to pale brownish. Hyphal system dimitic or trimitic, generative hyphae with clamps or exceptionally simple-septate (*A. onychoides*), skeletal hyphae thin-walled to thick-walled, binding hyphae thin-walled to thick-walled, branched; cystidia present or absent; spores minute, globose to ellipsoid, rarely cylindric, smooth, thin-walled, acyanophilous and negative in Melzer's reagent. White rot fungi.

Species: *A. americana* Ryv. et Gilbn., *A. angulatopora* Ryv., *A. aurantilaeta* (Corner) T. Hattori et Ryv., *A. beschidica* Vampola et Pouz., *A. citrea* (Berk.) Ryv., *A. citrinella* Niemelä et Ryv., *A. faginea* Vampola et Pouz., *A. farinacea* Vampola et Pouz., *A. fissiliformis* (Pil.) Gilbn. et Ryv., *A. foliaceo-dentata* (Nikol.) Gilbn. et Ryv., *A. fragrans* (David et Tortić) David et Tortić, *A. genistae* (Bourd. et Galz.) David, *A. gypsea* (Yasuda) T. Hattori et Ryv., *A. hoehnelii* (Bres. ex Höhn.) Niemelä, *A. hunua* (Cunningh.) Ryv., *A. hydrophila* (Berk. et Curt.) Ryv., *A. incrustans* (Berk. et Curt. ex Cooke) Ryv., *A. induratus* (Berk.) Ryv., *A. liebmanii* (Fr.) Ryv., *A. minutispora* (Reid, Thind et Chatr.) Ryv., *A. multipileata* Leite et Wright, *A. murrillii* (Lloyd) Ryv., *A. oleagina* (Overh.) Ryv., *A. onychoides* (Egel.) Niemelä, *A. overholtsii* Ryv. et Gilbn., *A. parasitica* Vampola, *A. rata* (G.H. Cunn.) Ryv., *A. romellii* (Donk) Niemelä, *A. semisupina* (Berk. et Curt.) Ryv., *A. sp.* Ryv. 9046, *A. straminea* (Bres.) Ryv. et Johan., *A. subcrassa* (Rodw. et Clel.) P. K. Buchanan et Ryv., *A. subundata* (Murrill) Ryv., *A. thompsonii* Vampola et Pouz., *A. versicutis* (Berk. et Curt.) Gilbn. et Ryv. and *A. zonata* (Berk.) Ryv.

As has already been mentioned by some other mycologists and as we can confirm on the basis of our own study of ample fresh as well as herbarium material, the type species of *Antrodiella*, viz. *A. semisupina*, represents in fact a complex of several mutually very similar species which are hard to distinguish. Some species of this complex have been described before, others, however, are not well known so far. Four new species of the complex are now described below, the distinguishing features of which enable us a relatively easy identification. The problems of the *A. semisupina* complex, however, are not quite elaborated and some further research, especially of species growing on carpophores of other lignicolous fungi, should follow.

**Antrodiella beschidica** Vampola et Pouzar sp. nov.

Carposomata annua, semiresupinata, cremea ad brunnea; pori rotundati, parvi 5 - 7 per 1 mm; systema hypharum trimiticum, cum hyphis generativis hyalinis, tenuiter seu crasse tunicatis, fibulatis; hyphis skeleticis crasse tunicatis, non ramificatis; hyphis ligativis copiosis; crasse tunicatis, ramificatis; hymenium solum e basidiis et basidiolis constat; basidiosporae  $3-3,8 \times 1,2-2 \mu\text{m}$ , ellipsoideae, hyalinae. Ad ligna arborum coniferarum.

Holotypus: Moravia, Montes Moravskoslezské Beskydy, area tuta "Mionší" prope Jablunkov, *Abies alba* - ad truncum iacentem, 7. IX. 1969, leg. Z. Pouzar, in herbario Musei Nationalis Pragae asservatur (PRM 682 098).

Basidiocarp annual, effused-reflexed, with max. 5 mm wide individual pilei, imbricate or coalescing in several centimetres long rows. Pilei up to 3 mm thick at the base, with a sharp, mostly undulate bent or sometimes even an involute margin (on dried material). The pilei are glabrous on the upper surface, here and there slightly concentrically furrowed.

Tubes are thin-walled, 1-3 mm long, with entire and on young carpophores finely pubescent edges, on oblique parts of the carpophores with a rather open mouth.

Pores small, rounded to angular, 5-8 per mm.

The carpophores are entirely coloured cream to pale ochraceous, rather darker in resinous parts, macroscopically identical with *A. semisupina* - perhaps only the pores are slightly smaller.

Hyphal system trimitic, generative hyphae thin-walled or rarely thick-walled, clamped,  $2-5 \mu\text{m}$  wide, skeletal hyphae thick-walled,  $3-6 \mu\text{m}$  wide, binding hyphae thick-walled, branched,  $3-4 \mu\text{m}$  wide. All types of hyphae can here and there be finely encrusted.

Hymenium made up of only basidia and basidioles, other hymenial elements absent. Basidia tetrasterigmatic, clavate,  $7-13 \times 3.5-4.5 \mu\text{m}$ , with basal clamps.

Basidiospores very small, ellipsoid, smooth, hyaline, negative in Melzer's reagent,  $3-3.8 \times 1.5-2 \mu\text{m}$ .

As mentioned above, *A. beschidica* is macroscopically identical with *A. semisupina*, but differs in growing on coniferous trees and has a different distribution area. While *A. semisupina* is for example widespread in Europe in all regions, *A. beschidica* seems to be more common only in North Europe and very rare elsewhere. Slight differences can be found in micromorphology; besides, *A. beschidica* has slightly narrower spores and more common and well perceptible binding hyphae.

As regards to another possible confusion, *A. citrinella* Niemelä et Ryv. makes effused-reflexed carpophores on coniferous trees as well. The young carpophores of *A. citrinella*, however, are lemon yellow when fresh and its spores are shortly

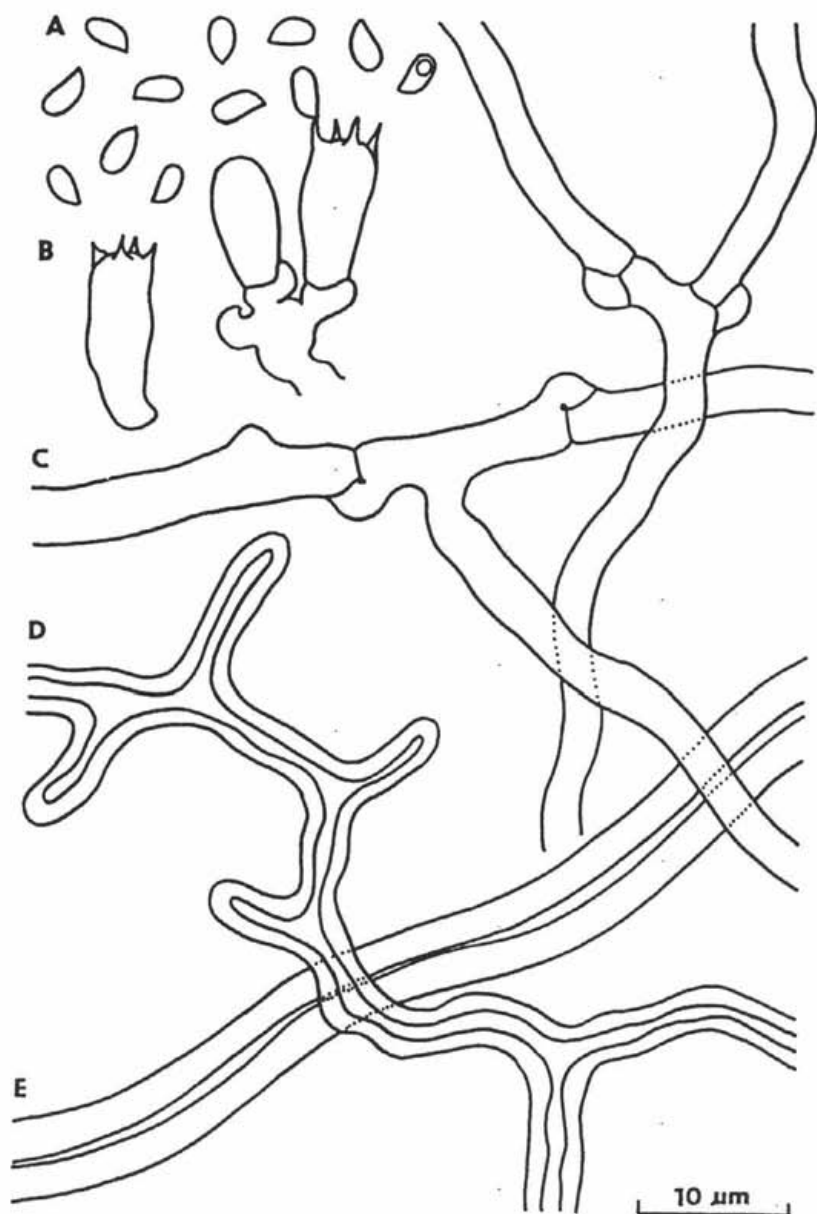


Fig. 1. *Antrodiella beschidica* Vampola et Pouz.  
A) basidiospores, B) basidia, C) generative hyphae, D) binding hypha, E) skeletal hypha.  
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ellipsoid. On coniferous trees *A. parasitica* Vampola grows as well, but its carpophores are always quite resupinate and grow only on or close to carpophores of species of the genus *Trichaptum*.

***Antrodiella faginea* Vampola et Pouzar spec. nov.**

Carposomata annua, semiresupinata seu resupinata, albida, cremea ad ochraceo brunnea; pori rotundati, parvi, 4–6 per 1 mm; systema hypharum trimiticum, cum hyphis generativis hyalinis, tenuiter tunicatis, fibulatis; hyphis skeleticis crasse tunicatis, non ramificatis; hyphis ligativis crasse tunicatis, ramificatis; hymenium e basidiis et cystidiis constat; basidiosporae 3–3,7 × 1,9–2,2 μm, ellipsoideae, hyalinae. Ad ligna arborum frondosarum, praecipue *Fagi sylvaticae*.

Holotypus: Moravia, Zborná, in clivo collis "Ptačí vrch" (637 m), 6,5 km sept. versus Jihlava, *Fagus sylvatica* – ad ramum iacentem, 5. VII. 1990, leg. P. Vampola, in herbario Musei Nationalis Pragae asservatur (PRM 842925).

Basidiocarps annual, effused-reflexed or quite resupinate, whitish, cream to ochraceous brownish, macroscopically identical with *A. semisupina*.

Hyphal system trimitic, generative hyphae thin-walled, with abundant clamps, 2–4.5 μm wide, skeletal hyphae thick-walled, 2.5–4.5 μm wide, binding hyphae thick-walled, branched, 2–3 μm wide.

Hymenium consisting of basidia, basidioles and gloeocystidia filled with a refractive substance. Basidia tetrasterigmatic, clavate, 9–15 × 4–4.7 μm, with basal clamps. Gloeocystidia very variable in form, clavate, fusiform or lageniform, sometimes contracted or capitate, thin-walled, 12–25 × 4–7 μm; very abundant in some carpophores, they can already be found in a first preparation, sometimes however, they are very rare and finding them is more difficult. According to our own experience the gloeocystidia are well perceptible especially at the bottom of the tubes. Spores minute, ellipsoid, smooth, hyaline, negative in Melzer's reagent, 3–3.7 × 1.9–2.2 μm.

The new species is described on the basis of a detailed study of 40 specimens, from which 36 were collected on *Fagus sylvatica* and only 4 specimens on other hosts (*Carpinus betulus* – 2 specimens, *Quercus cerris* – 1, *Quercus sp.* – 1).

By its presence of striking gloeocystidia in the hymenium *A. faginea* has a special position among the Central European species of the genus *Antrodiella*. From North Europe, however, *A. americana* Ryv. et Gilbn. has recently been reported (Ryvarden and Gilbertson 1993), a species having gloeocystidia in the hymenium as well. In regard of our opportunity to study the type of *A. americana* (*Poria aestivale* Overh.) as well as some other specimens of that species from North America, we suppose the collections from North Europe could represent another species. Besides the long cylindrical cystidia, the large pores (1–2 per 1 mm) are very characteristic for *A. americana*. This feature has not been observed by

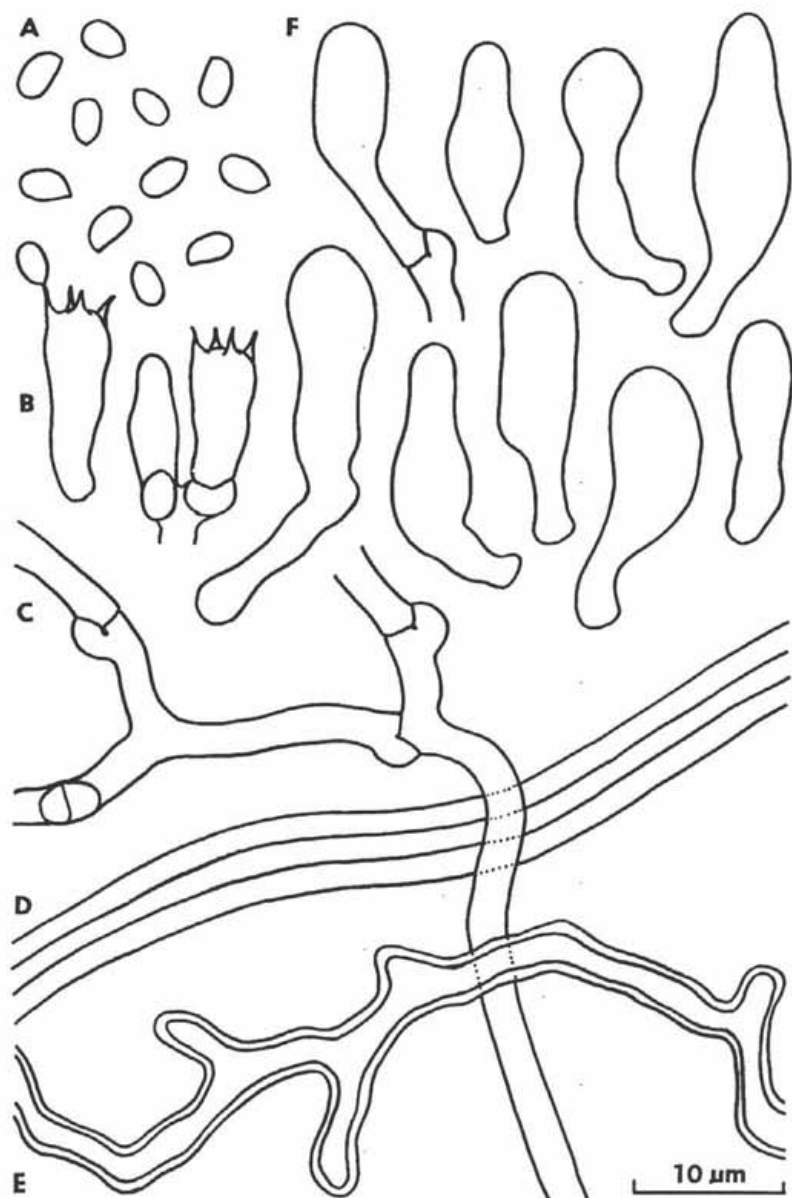


Fig. 2. *Antrodiella faginea* Vampola et Pouz.  
A) basidiospores, B) basidia, C) generative hyphae, D) skeletal hypha, E) binding hypha, F) gloeocystidia.  
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us on any other European material of this group. Its growing on carpophores of *Hymenochaete* does not seem to be the most important feature, as we collected *A. genistae*, *A. romellii* and *A. semisupina* s. s. on *Hymenochaete* as well.

However, we have studied another *Antrodiella* from North America, which has also large gloecystidia in the hymenium, but differs from *A. faginea* in rather darker and quite resupinate carpophores with very minute pores. This fungus is described as a new species below.

***Antrodiella thompsonii* Vampola et Pouzar spec. nov.**

Carposomata annua, resupinata, cremea ad ochraceo brunnea; pori rotundati, parvi, 6–8 per 1 mm; systema hypharum trimiticum, cum hyphis generativis hyalinis, tenuiter tunicatis, fibulatis; hyphis skeleticis crasse tunicatis, non ramificatis, hyphis ligativis tenuiter seu crasse tunicatis, ramificatis; hymenium e basidiis, basidiolis et cystidiis constat; basidiosporae 3–3,7 × 1,5–2 μm, ellipsoideae, hyalinae. Habitat a ligna frondosarum.

Holotypus: Canada, Ontario, Lake Temagami, *Populus grandidentata*, 26. VIII. 1930, leg. G. E. Thompson, in herbario Musei Nationalis Pragae asservatur (PRM 810 111 – dupl. ex herb. L. O. Overholts no. 13097).

Basidiocarp annual, quite resupinate, forming a thin, ochraceous coloured irregular coating of several square cms on wood. Tubes very short, c. 1 mm long, thin-walled, with entire or irregularly dentate edges, here and there resinous. Pores very minute, angular, 6–8 per mm. Subiculum white, very thin, only c. 250 μm thick.

Hyphal system trimitic, generative hyphae thin-walled, clamped, 2–4 μm wide, skeletal hyphae thick-walled, 2.5–6 μm wide, binding hyphae thin-walled to thick-walled, branched, 2–4 μm wide.

Hymenium consisting of basidia, basidioles and gloecystidia. Basidia tetraspermatid, broadly clavate, 8–13 × 3.7–5.2 μm, with basal clamps. Sterigmata relatively thick, up to 4–5 μm long. Gloecystidia mostly clavate, sometimes somewhat contracted in upper part, filled with a refractive substance, 12–22 × 5–8.5 μm. Spores very minute, ellipsoid to oblong ellipsoid, smooth, hyaline, negative in Melzer's reagent, 3–3.7 × 1.5–2 μm.

By the quite resupinate and here and there resinous basidiocarps *A. thompsonii* comes close to *Antrodiella romellii* (Donk) Niemelä but differs in smaller pores, smaller and narrower spores and in the presence of gloecystidia in the hymenium. This North American species is similar to resupinate forms of *A. faginea* as well, but differs in smaller pores and in rather narrower spores. Older carpophores of *Junghuhnia luteoalba* (Karst.) Ryv. are sometimes macroscopically very similar and some cystidia of that species can be filled with a refractive substance as well.



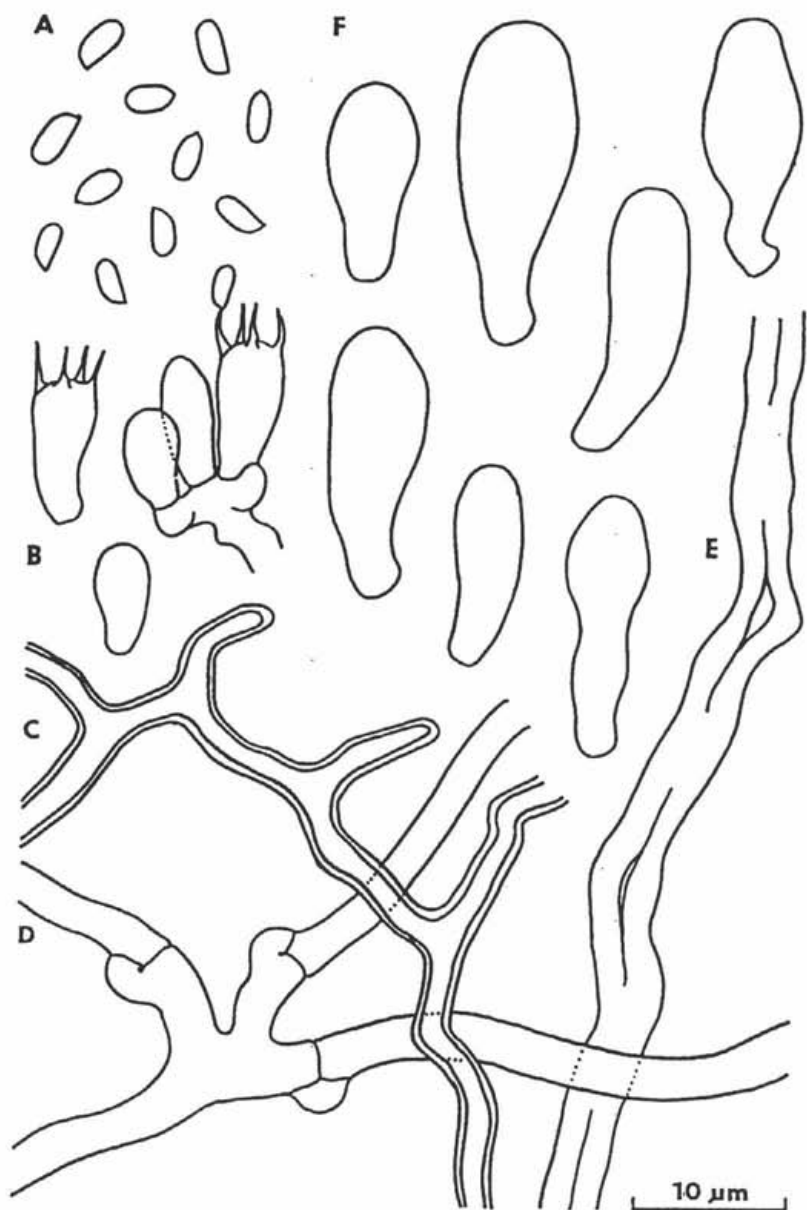


Fig. 3. *Antrodiella thompsonii* Vampola et Pouz.  
A) basidiospores, B) basidia, C) binding hypha, D) generative hyphae, E) skeletal hypha, F) gloeocystidia.  
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*Junghuhnina luteoalba*, however, grows on coniferous trees, its spores are larger and cylindrical and its thick-walled cystidia are mostly strikingly incrustated.

Another macroscopically and microscopically different species of the *A. semisupina* complex is described below. It seems that this species is very rare. In spite of its striking features, which facilitate identification already in the field, we know this species from only two localities.

***Antrodiella farinacea* Vampola et Pouzar spec. nov.**

Carpus annua, semiresupinata, crenea, superficies pilei velutina, griseola vel ochracea; pori rotundati, parvi, 6 – 8 per 1 mm; odor farinaceus; systema hypharum trimiticum; cum hyphis generativis hyalinis, tenuiter tunicatis, fibulatis, hyphis skeleticis tenuiter seu crasse tunicatis, non ramificatis, hyphis ligativis crasse tunicatis, ramificatis; hymenium solum e basidiis et basidiolis constat; basidiosporae 3–4,2 × 1,7–2,1 μm, ellipsoideae, ad apiculum celeriter contractae fere lacrimiformes, hyalinae. Ad ligna arborum frondosarum.

Holotypus: Slovakia, Badín (distr. Banská Bystrica), area tuta "Badínsky prales", s. m. ca 700 m, *Ulmus glabra* – ad truncum emortuum, 30. IX. 1994, leg. P. Vampola, in herbario Musei Nationalis Pragae asservatur (PRM 842927).

Basidiocarps annual, effused-reflexed, cream to pale ochraceous, macroscopically similar to those of *A. semisupina* from which they differ in a velutinous and in some places greyish surface of the pilei, slightly smaller pores (6 – 8 per mm) and a distinct smell of meal.

Hyphal system trimitic, generative hyphae thin-walled, 2–5 μm wide, skeletal hyphae thin-walled to thick-walled, 2–7 μm wide, binding hyphae thick-walled, branched, 2–4 μm wide. There is sometimes infrequent incrustation of irregular coarse-grained crystals on hyphae of the context.

The hymenium is made up of only basidia and basidioles. Basidia tetrasterigmatic, clavate, 8–13 × 3.9–4.6 μm, with basal clamps. Spores ellipsoid to almost lacrymoid with a strikingly sharply pointed apiculus and close to it slightly curved, smooth, hyaline, negative in Melzer's reagent, 3–4.2 × 1.7–2.1 μm.

The striking, almost lacrymoid shape of spores is the most important microfeature. Among the European species *A. hoehnelii* (Bres.) Niemelä has slightly but constantly curved spores the arcuation being, however, more centrally situated. It differs, also, in more robust and more yellowish carpophores and in often growing on or near carpophores of *Inonotus*. The incrustated hyphae of the context can be seen in preparations of *A. genistae* (Bourd. et Galz.) David as well. This species, however, differs in long ellipsoid to distinctly cylindrical spores and in the presence of fusoid cystidioles in the hymenium.

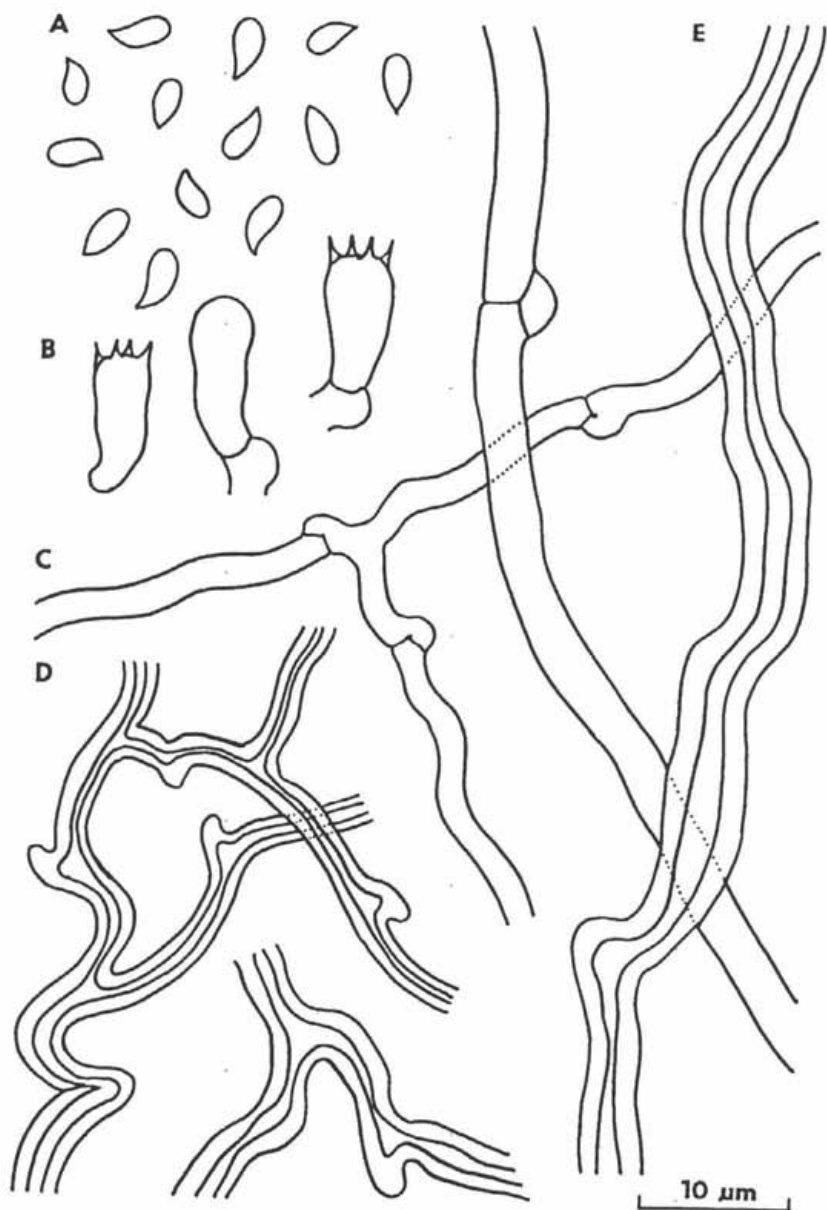


Fig. 4. *Antrodiella farinacea* Vampola et Pouz.  
A) basidiospores, B) basidia, C) generative hyphae, D) binding hyphae, E) skeletal hypha.  
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## KEY TO CENTRAL EUROPEAN SPECIES OF ANTRODIELLA

In the following key all species of the genus *Antrodiella* so far known from Central Europe are included. Only *A. overholtsii* Ryv. et Gilbn. is intentionally omitted as its classification within *Tyromyces* seems more correct (Niemelä 1985, Niemelä et al. 1992). For detailed study a selection of literature and exsiccate collections is added.

1. a – generative hyphae simple-septate ... *A. onychoides* (Bernicchia and Furia 1982, Grosse-Brauckman and Jahn 1983, Vampola 1991 b)  
b – generative hyphae with clamps ... 2
2. a – hymenophore labyrinthic, dentate, irpicoid to hydroid ... *A. foliaceo-dentata* (Nikolajeva 1949, 1953, Domański 1970 b, Ryvaren and Gilbertson 1993)  
b – hymenophore poroid, only rarely during new growth of older carpophores labyrinthiform ... 3
3. a – carpophores always strictly resupinate ... 4  
b – carpophores pileate, effused-reflexed or resupinate ... 5
4. a – always growing on or near carpophores of *Trichaptum*, mainly on conifers ... *A. parasitica* (Niemelä and al. 1992, Ryvarden and Gilbertson 1993, Vampola 1991 a, Vampola 1992)  
b – growing on hardwoods, sterile margin of carpophores often strikingly broad, spores broadly ellipsoid (1.8–2.5  $\mu\text{m}$  wide) ... *A. romellii* (Eriksson 1949, Donk 1967, Niemelä 1982)
5. a – growing on carpophores of other lignicolous fungi; except for some species mentioned in other parts of this key this group probably represents several unknown and undescribed taxa ... *Antrodiella* sp.  
b – fungi growing on wood ... 6
6. a – carpophores with a strong scent of coumarin, context pale brownish ... *A. fragrans* (David and Tortić 1979, 1986, Šebek 1980, Vampola 1995)  
b – carpophores without a striking scent or with a distinct smell of meal, context white or pale yellowish ... 7
7. a – carpophores whitish, cream to ochraceous, exceptionally on the surface of pilei greyish ... 10  
b – carpophores  $\pm$  yellow ... 8
8. a – carpophores with a  $\pm$  yellow to yellowish orange pileus surface, thin-walled or thick-walled generative hyphae dominating, skeletal hyphae very rare, cystidia present in the hymenium ... *A. fissiliformis* (Bernicchia 1995, Kotlaba and Pouzar 1988, Pilát 1940, Vampola 1991 c)  
b – skeletal hyphae dominating over other hyphae in the context ... 9

9. a – growing on conifers (together with *Fomitopsis pinicola*), young carpophores lemon yellow when fresh ... *A. citrinella* (Niemelä and Ryvarden 1983, David and Tortić 1986, Vampola 1995, Vlasák 1990)  
 b – growing on hardwoods, together with or on carpophores of *Inonotus* ... *A. hoehnelii* (Domański 1970 a, Vampola 1991 c)
10. a – spores long ellipsoid to distinctly cylindrical ... *A. genistae* (Bernicchia 1995, David and Lecot 1990, Bourdot and Galzin 1925, 1928, Ryvarden and Gilbertson 1993, Vampola and Pouzar 1994)  
 b – spores  $\pm$  ellipsoid ... 11
11. a – cystidia present in the hymenium, mainly growing on *Fagus sylvatica* ... *A. faginea*  
 b – cystidia absent in the hymenium ... 12
12. a – growing on hardwoods, binding hyphae scarce ... 13  
 b – growing on conifers, binding hyphae more common and well perceptible ... *A. beschidica*
13. a – spores with a strikingly sharply pointed apiculus, almost lacrymoid, carpophores with a distinct smell of meal when fresh ... *A. farinacea*  
 b – spores ellipsoid, carpophores without a distinct smell ... *A. semisupina* (Niemelä and al. 1992, Ryvarden and Gilbertson 1993, Vampola 1992)

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