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A new species of Mycoleptodiscus from Australia

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Ando K. (1996): A new species of Mycoleptodiscus from Australia. – Czech Mycol. 49: 1–5

Mycoleptodiscus stellatosporus sp. nov. is described, illustrated and compared with the established species. The new fungus is characteristic in its conidia with the triangular to pentagonal shape and two to four appendages.

Key words: Taxonomy, Hyphomycetes, Mycoleptodiscus stellatosporus sp. nov.

Ando K. (1996): Nový druh rodu Mycoleptodiscus z Austrálie. – Czech Mycol. 49: 1–5

Je popsán Mycoleptodiscus stellatosporus jako nový druh. Je připojeno vyobrazení a porovnání s druhy podobnými. Tato nová houba je charakteristická v obrysu trojúhelníkovitými až pětiúhelníkovitými konidiemi, které mají dva až čtyři přívěsky.

In 1953, Gerdemann established a new genus *Leptodiscus* based on *L. terrestris* Gerdemann from diseased root specimens of red clover (*Trifolium pratense* L.) collected in Illinois. However, the generic name *Leptodiscus* is not valid under the provisions of Article 64 of the International Code of Botanical Nomenclature because it had previously been used for an algal flagellate (Hertwig 1877). Then, Ostazeski (1968) proposed the new generic name *Mycoleptodiscus* to replace *Leptodiscus* Gerdemann with *M. terrestris* (Gerd.) Ostazeski as the type species and an additional species *M. sphaericus* Ostazeski from *Lotus corniculatus*. Later two new combinations, *M. indicus* (Sahni) Sutton (on *Amerodiscosiella indica* Sahni) and *M. minimus* (Berk. et Curt.) Vanev (on *Discosia minima* Berk. et Curt.) were reported by Sutton (1973) and Vanev (1983), respectively. Six new species, *M. brasiliensis* Sutton et Hodges (Sutton and Hodges 1976), *M. lunatus* Sutton et Alcorn (Sutton and Alcorn 1985), *M. taiwanensis* Matsushima (Matsushima 1987), *M. lateralis* Alcorn et Sutton (Sutton and Alcorn 1990), *M. unilateralis* Sutton et Alcorn (Sutton and Alcorn 1990) and *M. disciformis* Matsushima

(Matsushima 1993), have been published since nineteen-seventies. Therefore, ten species are currently accepted in the genus. The conidium characteristics of each are summarized in Table 1.

Table I. Conidium characteristics of 11 species of *Mycoleptodiscus*.

Species	Conidium		Appendage		Reference
	Cell Number	Size (μm)	Number	Length(μm)	
M. taiwanensis	1-celled	12-21×5.5-7	2*	1-3	Matsushima (1987)
M. indicus	1-celled	11-18.5×4.5-7.5	2	1-10	Sutton and Hodges (1976)
M. minimus	1-celled	20-25(-29)×3.5-4	2	-8	Vanev (1983)
M. unilateralis	1-celled	15-20×6-8	2-3	5-12.5	Sutton and Alcorn (1990)
M. lateralis	1-celled	15-18×6-8	3	5-26	Sutton and Alcorn (1990)
M. stellatosporus	1-celled	4.5-7.5×4-5.5	(2-)3-4	-11	this study
M. lunatus	2-celled	24.5-32×3.5-4.5	0		Sutton and Alcorn (1985)
M. brasiliensis	2-celled	17-19×4-4.5	1	19-27	Sutton and Hodges (1976)
M. sphaericus	2(-3)-celled	28.8-43.2×5.0-9.0	1*	0-14.0	Ostazeski (1968)
M. disciformis	2-celled	17.5-25.0×4.0-5.0	2*	5-8	Matsushima (1993)
M. terrestris	2-celled	20-34.8×4.4-7	2*	8.7-18	Gerdemann (1953)

* The authors show the appendages as setae or apical prolongation.

In 1990, Sutton and Alcorn emended the description of the genus *Mycoleptodiscus*. The genus *Mycoleptodiscus* united by the common characteristics of superficial sporodochial conidiomata of one cell thick, constitute mostly of thick-walled, dark brown conidiogenous cells with a prominent circular aperture in the upper wall, and hyaline, cylindrical to fusiform, 0-2 septate, conidia bearing an apical and sometimes a basal cellular unbranched filiform appendage, or sometimes lacking appendages.

Mycoleptodiscus species were observed on plant roots of diseased red clover and birdsfoot trefoil, fruits of *Passiflora edulis*, culms of *Cynodon dactylon* and leaves of many plants (*Ixora parviflora, Cocos yatay, Chlorophytum comosum, Hymenocallis arenicola, Zamia fisheri, Z. integrifolia, Cordyline* sp., *Roupellia grata, Hippeastrum* sp., *Grewia asiatica, Eucalyptus citriodora, Eucalyptus* sp., *Piper nigrum, Ilex opaca, Carpobrotus glaucescens, Alloteropsis semialata, Areca catechu* and *Chlorophytum capense*). They were reported from U.S.A., Brazil, Cuba, Venezuela, Brunei, Nigeria, Australia, Fiji, New Zealand, India, Cambodia, Taiwan and Peru.

During the investigation of micro-fungi from soil samples, a new hyphomycete was found in cultures isolated from a soil collected in Australia. The fungus shows agreement with the characters of the genus *Mycoleptodiscus*, but it differs

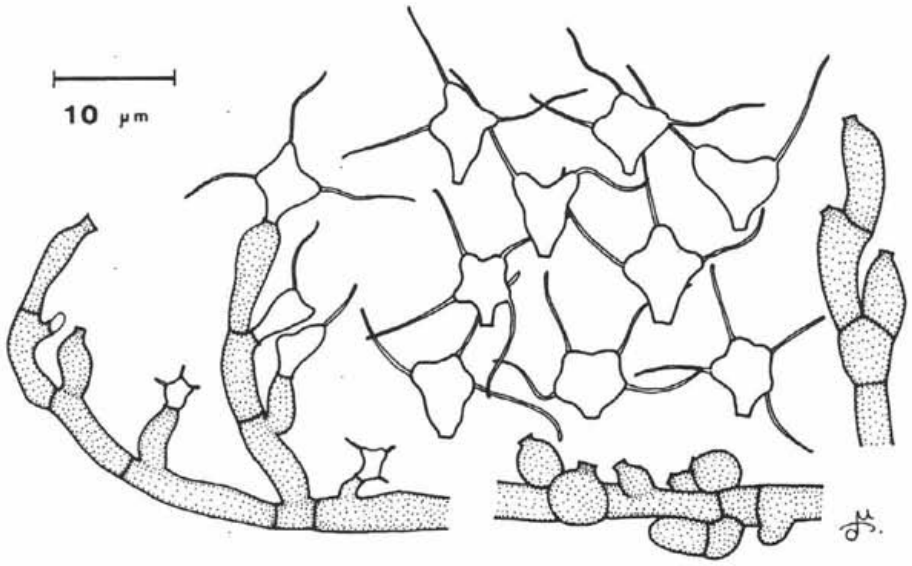

Fig. 1. *Mycoleptodiscus stellatosporus* KY-15338 in pure culture.

from the previously known species mainly in conidial morphology. The purpose of this communication is to describe and illustrate the new species. The culture of the species was preserved in Tokyo Research Laboratories, Kyowa Hakko Kogyo, Tokyo, Japan, as KY-15338.

Mycoleptodiscus stellatosporus Ando sp. nov. figs. 1–7
Etym.: L, *stellatus* (star shaped) and L, *sporus* (spored)

Hyphae septatae, hyalinae vel pallide brunneae, prope conidiomata atro-brunneae, 1.5–4.5 μm diam. Conidiomata medio- vel atro-brunnea, sporodochialia, circularia vel irregularia, e cellulis conidiogenis aggregatis composita. Cellulae conidiogenae enteroblasticae, phialidicae, determinatae, in sporodochiis incorporatae, atro-brunneae, ampulliformes, doliiformes, cylindricae vel deltoideae, laeves, 4–9.5 μm longae, 2.5–5.5 um latae, collo distincto et cum apertura 0.5–1.5 (–2.5) μm diam. Conidia hyalina, aseptata, pentagona, longe isoscelatim triangulata, rhomboidea vel inaequalis formae, apice rotundata, inter apices parum concava, 4.5–7.5 μm longa, 4–5.5 μm lata, basi truncata et ca. 1 μm lata, cum appendicibus in quoque apice extra basin praedita. Appendices simplices, filiformes, ad 11 μm longae, ca. 0.5 μm latae.

Holotypus: TNS-F-180375, colonia exsiccata in cultura ex solo, Kuaranda, Queensland, Australia, 21. X. 1989, a K. Ando isolata.

Hyphae septate, dark brown near the conidiomata, pale brown to hyaline when distant, 1.5–4.5 μm diam. Conidiomata mid to dark brown, varying from a few united conidiogenous cells to large aggregations, sometimes rounded in outline but usually variable in shape and size due to confluence. Conidiogenous cells enteroblastic, phialidic, determinate, ampulliform to doliiform, cylindrical or triangular, aggregated into sporodochial conidiomata, dark brown, smooth, 4–9.5 μm long, 2.5–5.5 μm wide, each with a single distinct circular aperture in the upper wall and a flared collarette 0.5–1.5 (-2.5) μm diam. Conidia hyaline, aseptate, pentagonal, long isosceles triangular, rhomboid or of irregular shape, with rounded apexes whose sides are slightly curved inside, 4.5–7.5 μm long, 4–5.5 μm wide, with a truncate base (ca. 1 μm wide), with single appendages at each distal apex of polygonal conidia. Appendages up to 11 μm long, ca. 0.5 μm wide.

Specimen examined: a dried culture isolated from a soil collected at Kuranda, Queensland, Australia, 21 October 1989.

M. stellatosporus can be distinguished from *M. lunatus, M. brasiliensis, M. sphaericus, M. terrestris* and *M. disciformis* by the cell number of conidia. The former has one-celled conidia and the later have septate, 2- to 3-celled conidia. Among six species of *Mycoleptodiscus* which produce one-celled conidia, *M. stellatosporus* is unique in having four appendages on its conidia. The conidial shape of *M. stellatosporus*, triangular to pentagonal, has also not been observed in any established species of *Mycoleptodiscus*.

ACKNOWLEDGEMENT

The author wishes to offer his thanks to Dr. Ken Katsumoto for his critical reading and valuable suggestions.

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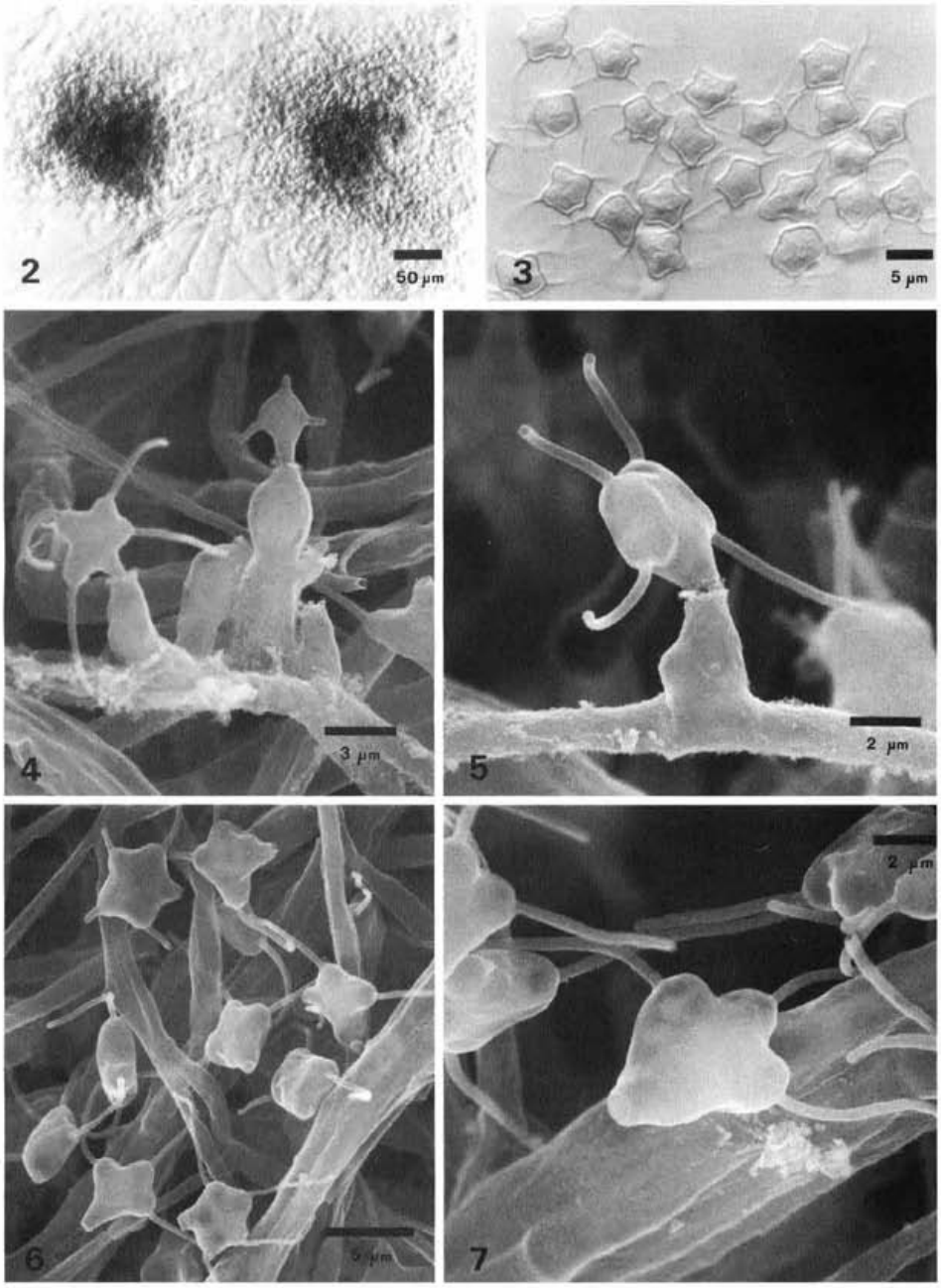

Figs. 2-7. *Mycoleptodiscus stellatosporus* KY-15338 in pure culture. 2. Two sporodochia, 3. Conidia under light microscope, 4, 5. Conidial development from conidiogenous cells under SEM. 6, 7. Conidia under SEM.

CZECH MYCOL. 49 (1), 1996

Concerning Pseudoanguillospora and water-borne Mycocentrospora spp.

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Marvanová L. (1996): Concerning Pseudoanguillospora and water-borne Mycocentrospora spp. – Czech Mycol. 49: 7–20

Pseudoanguillospora stricta is redescribed from the type, from ex-type culture and from new isolates. Pseudoanguillospora gracilis, Mycocentrospora clavata, and Mycocentrospora varians are illustrated from the type material. The generic concept of Pseudoanguillospora and Mycocentrospora and delimitation of both genera is discussed. Due to the scarcity of specimens, especially of living cultures available for study, no nomenclatural changes are proposed.

Key words: taxonomy, aquatic hyphomycetes, Pseudoanguillospora, Mycocentrospora.

Marvanová L. (1996): K problematice rodu Pseudoanguillospora a druhů rodu Mycocentrospora izolovaných z vody. – Czech Mycol. 49: 7–20

Pseudoanguillospora stricta je znovu popsána na základě typového materiálu, ex-typové kultury a nových izolátů. Druhy Pseudoanguillospora gracilis, Mycocentrospora clavata a Mycocentrospora varians jsou ilustrovány na základě studia typového materiálu. Je diskutována koncepce rodů Pseudoanguillospora a Mycocentrospora a jejich rozlišení. Vzhledem k nedostatku materiálu u většiny druhů, zejména živých kultur, nejsou zatím navrhovány žádné nomenklatorické změny.

PSEUDOANGUILLOSPORA

The anamorph genus *Pseudoanguillospora* Iqbal (1974) was published to accommodate two species: *Pseudoanguillospora stricta* Iqbal (l.c.) (type species) and *Pseudoanguillospora prolifera* Iqbal l.c. Characteristic morphological features are sympodial conidiogenous cells (similar to those of *Mycocentrospora* Deighton (1972), with unthickened, not rigid scars) and long unbranched conidia lacking the parabasal extension typical of *Mycocentrospora acerina* (Hartig) Deighton (type species). Unfortunately the protologues are rather brief and the drawings do not clearly show the distinguishing characters. Therefore, the species have rarely been recognized by other mycologists.

Cultures isolated in 1983 in the U.K. (CCM F-13283 and CCM F-17883) were compared with the type of *Pseudoanguillospora stricta* (IMI 160109), and a piece of the ex-type culture preserved in FAA (solution of Formaldehyde, Acetic acid and Alcohol), received from S.H. Iqbal in 1974. Some important features of the colony not mentioned in the diagnosis, i.e. the rusty brown colour of the substrate mycelium on 2 % MA and mycelial ropes in the aerial mycelium were found both in the ex-type culture and in the more recent isolates as well. The

conidiogenous structures in the former were rather fragmentary probably due to long-time preservation in FAA, but detached conidia and structures recognizable as conidiogenous cells could be found. This allows to make more precise the concept of this taxon. Moreover, a phialidic synanamorph not mentioned in the protologue was present in the ex-type culture (figs. 1 M, 6 E) and in one of the more recent isolates (fig. 2 J,K).

The microscopical characters of both Iqbal's and CCM material are shown in figs. 1 and 2. There is no doubt, that the conidia are identical. Well differentiated conidiophores as seen in CCM F-17883 (fig. 2 A) have been found in Iqbal's material as well (fig. 1 F). Typical for the CCM isolates are the creeping fertile hyphae present at the water level, with perpendicular conidiogenous cells (figs. 2 L, 6 A), protruding into the air. These have not been seen developed in IMI 160109, but they may be recognized in text-fig. 1 of Iqbal (1974). The caducous conidiogenous cells (arrows) bearing a pair of conidia (fig. 1 G) may be also recognized in CCM F-17883 and in CCM F-13283 (fig. 2 D,H).

In order to make identification of this species easier it is redescribed here.

Pseudoanguillospora stricta Iqbal (1974), Biologia (Lahore 20:11)

(figs. 1, 2, 6)

Colony (MA) whitish grey to dark greyish brown with a rusty brown hue in the reverse after submergence, growing moderately fast, substrate hyphae brown with finely roughened thicker walls, aerial mycelium scanty or abundant in fresh cultures, woolly, often funiculose. Sporulation in damp conditions on agar and after submergence on the water level. Conidiophores apical, simple or sparsely branched, up to 170 × 3.5–5.5 μm or lateral, up to 37 μm. Conidiogenous cells apical, lateral or intercalary, up to 42 × 2.5–4.5 μm, later usually with 2–3 secondary septa, polyblastic, sympodial, sometimes concurrent with conidia (figs. 2 A, 6 B), with up to 3 conidiogenous loci, often caducous, after secession sometimes remaining attached to the conidia, scars 1–3, apical and subapical, broad, flat or convex, unthickened, often centrally papillate, rarely on short denticles. Conidia holoblastic, acrogenous, single or in groups of up to 3 per conidiogenous cell, straight or slightly curved, long-fusoid to narrow-obclavate, (20-)100–210 (-275) × 2.5–5.5 μm, sometimes fragmenting in older cultures, apex subulate, base truncate, parabasal extension (fig. 2 E) exceptional, false branching due to secession of conidiogenous cells bearing pairs of conidia occasional.

Synanamorph: microconidial (spermatial), on hyphae. Conidiophores single, apical or lateral, simple or branched, sometimes micronematous, cells often slightly inflated. Conidiogenous cells phialidic, apical or lateral, 5.5–10 × 3.5–4.5 μm, collarette cylindric, 4.5–6.5 × 1–1.5 μm, periclinal thickening more or less distinct. Detached conidia not seen.

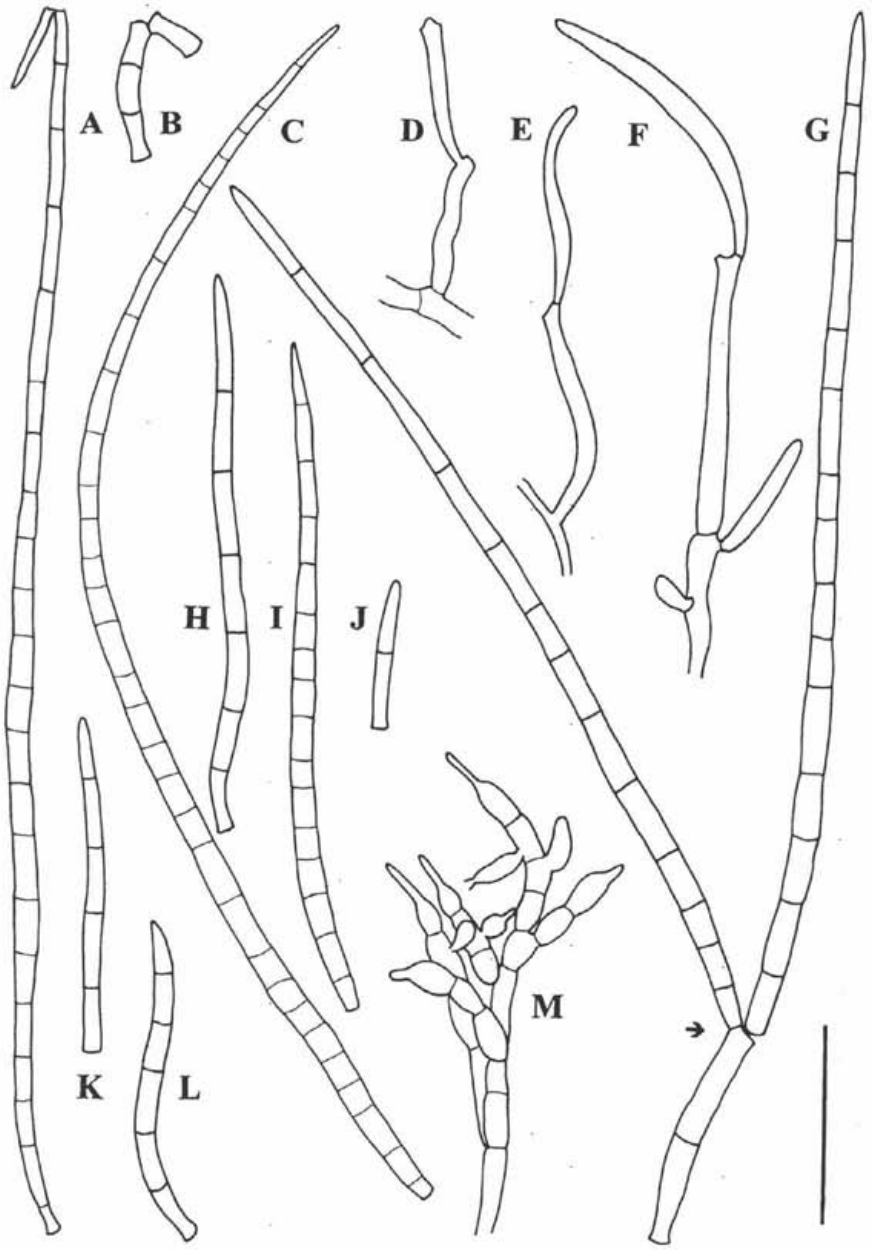

Fig. 1. *Pseudoanguillospora stricta.* A-C, G-L. Conidia and fragmented part-conidia. D. Spent conidiophore. E,F. Developing conidia. M. Microconidial synanamorph. (A,C-G,I,M: from ex-type culture. B,H,J,L: from the type). Scale bar = 30 μm.

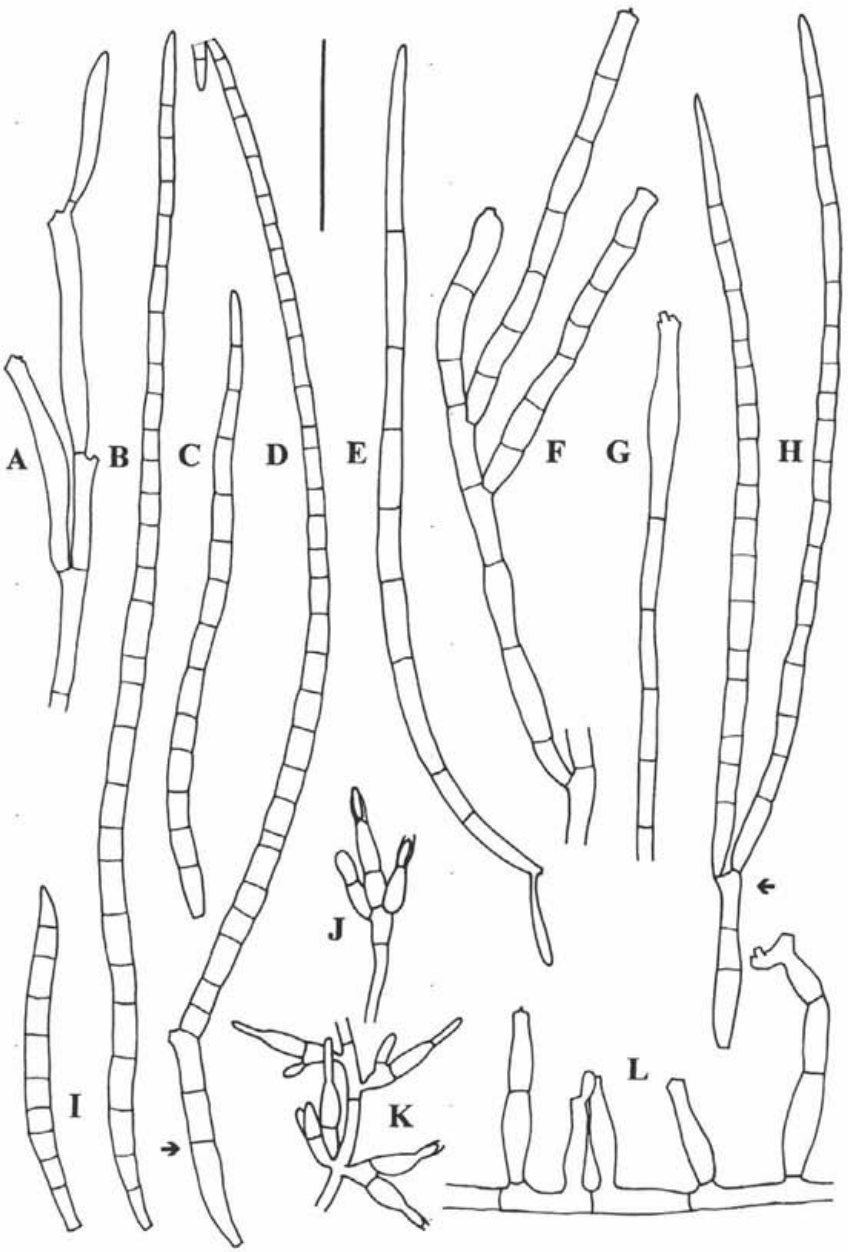

Fig. 2. *Pseudoanguillospora stricta.* A, Conidial development. F, G,L. Spent conidiophores. B-E, H, I. Conidia (H = false branching, arrow indicates a pair of conidia attached to a caducous conidiophore). J.K. Microconidial synanamorph. (A-D,F,G,I-L: from CCM F-17883, E,H: from CCM F-13283).

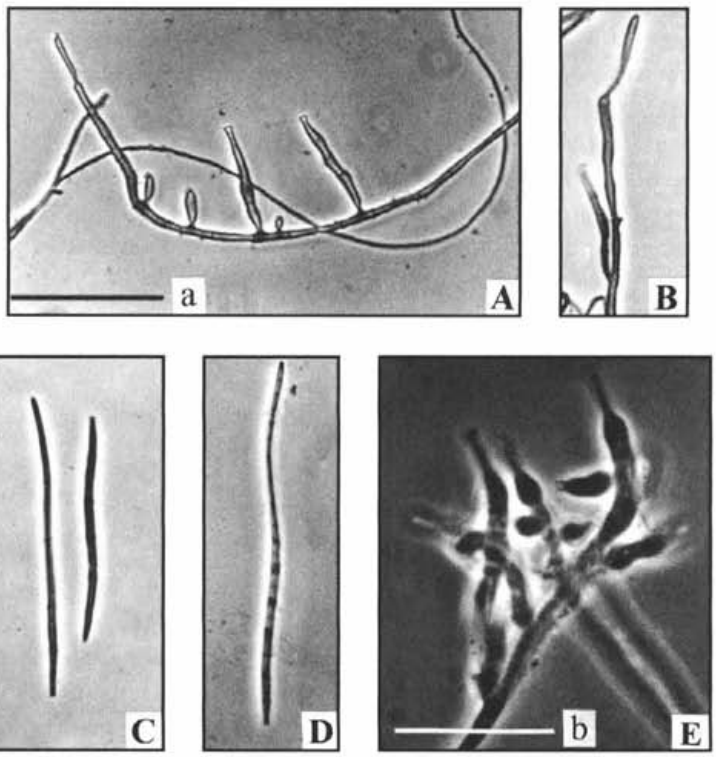

Fig. 6. *Pseudoanguillospora stricta*, A. Spent lateral conidiophores. B. Conidial development. C,D. Detached conidia. E. Microconidial synanamorph. (A-D: from CCM F-17883, E: from ex-type culture). Scale bar a = 50 μm (for A-D), scale bar b = 25 μm (for E).

The microconidial state in CCM F-17883 differs from that in Iqbal's material by lesser complexity. The conidiophores are reduced to short, mostly lateral cells constricted at the point of attachment to the hypha, whereas there are well differentiated branched structures in Iqbal's specimen.

Small differences in the morphology of spermatial synanamorphs are also known in other taxa, e.g. in *Filosporella versimorpha* Marvanová et al. (1992) or in *Anguillospora crassa* Ingold (unpublished observation). This may indicate that the taxon consists of morphologically slightly different populations or that intraspecific taxa are involved. Owing to the low number of isolates available for study, no definite conclusion can be drawn.

Specimens examined: IMI 160109, type. Ex-type culture in FAA labelled CMI 160109, with synanamorph, isolated from decaying stems of *Juncus effusus* in a moorland stream, Dartmoor, U.K., S.H. Iqbal. CCM F-13283, River Teign at Becka Falls, Devon, U.K., Feb. 1983, L. Marvanová. CCM F-17883, with

synanamorph, Afon Colwyn in Bedgelert Forest, North Wales, U.K., Mar. 1983, L. Marvanová. CCM F-25387, right tributary of the roadside ditch along the Trans Canada Highway, near Ogden Mill Cross, Sackville, New Brunswick, Canada, Apr. 1987, L. Marvanová.

This species was also reported from Pakistan (Iqbal 1977, Iqbal et al. 1979 on leaves, Iqbal et al. 1980a, b, on twigs and conifer needles) and Australia (Thomas et al. 1989, conidia in stream water).

Pseudoanguillospora prolifera Iqbal 1974 has been described in rather vague terms. The protologue includes a drawing (text- fig. 2) which, however, does not contribute to a better understanding of the species. The type or other authentic material (preserved at Punjab University under No. 2964) was not made available. As far as I know, the only report published after its description is by Sinclair et al. (1983, fig. 1 C), but the drawing (conidia only) does not show any diagnostic characters.

Pseudoanguillospora gracilis Sinclair et Morgan-Jones (1979) (fig. 3)

Desribed from South Africa. It has not been reported afterwards, as far as I know. The type material sent to me consisted of two slides and a dried agar culture. One slide was labelled "C4 4/12", the other "aerated culture 12/8/78 RC4". The dried agar culture was brown with a dark grey tinge in the centre, paler at the margin, reverse dark, aerial mycelium hairy.

The slide "C4 4/12" contains detached conidia (fig. 3, A–F) and conidiogenous structures (fig. 3, G–I). The latter are rather scanty. They show apical and lateral origins of conidia, sympodial (fig. 3 I) and pseudopercurrent (fig. 3 G) proliferation. Fig. 3 H may be interpreted either as percurrent proliferation or as a polyblastic conidiogenous cell with three conidiogenous loci: two spent and one bearing an immature conidium. Conidia (macroconidia) show greater variation than given in the protologue: they are 28–141 × 2.2–3 μm.

The slide "aerated culture" contains a fungus with phialidic conidiogenesis, which was not mentioned in the protologue. It occurs on hyphae of similar appearance like these on slide "C4 4/12", but direct connection with macroconidiogenous structures was not observed. Bearing in mind that (1) microconidial and macroconidial states do not always appear in the same part of the colony or at the same time and (2) I have not seen a living culture, but a preparation with a limited amount of dead material, I believe that my inerpretation of it being a synanamorph of *P. gracilis* is legitimate.

Description of the microconidial state: Conidiophores micronematous, single, simple, conidiogenous cells phialidic, apical or lateral, venter 9–14 × 2.5–3.5 μm, collarette cylindrical, up to 8.5 μm deep, periclinal thickening distinct. Microconidia bacilliform, 5–6.5 × c. 1.5 μm, both ends rounded or base truncate.

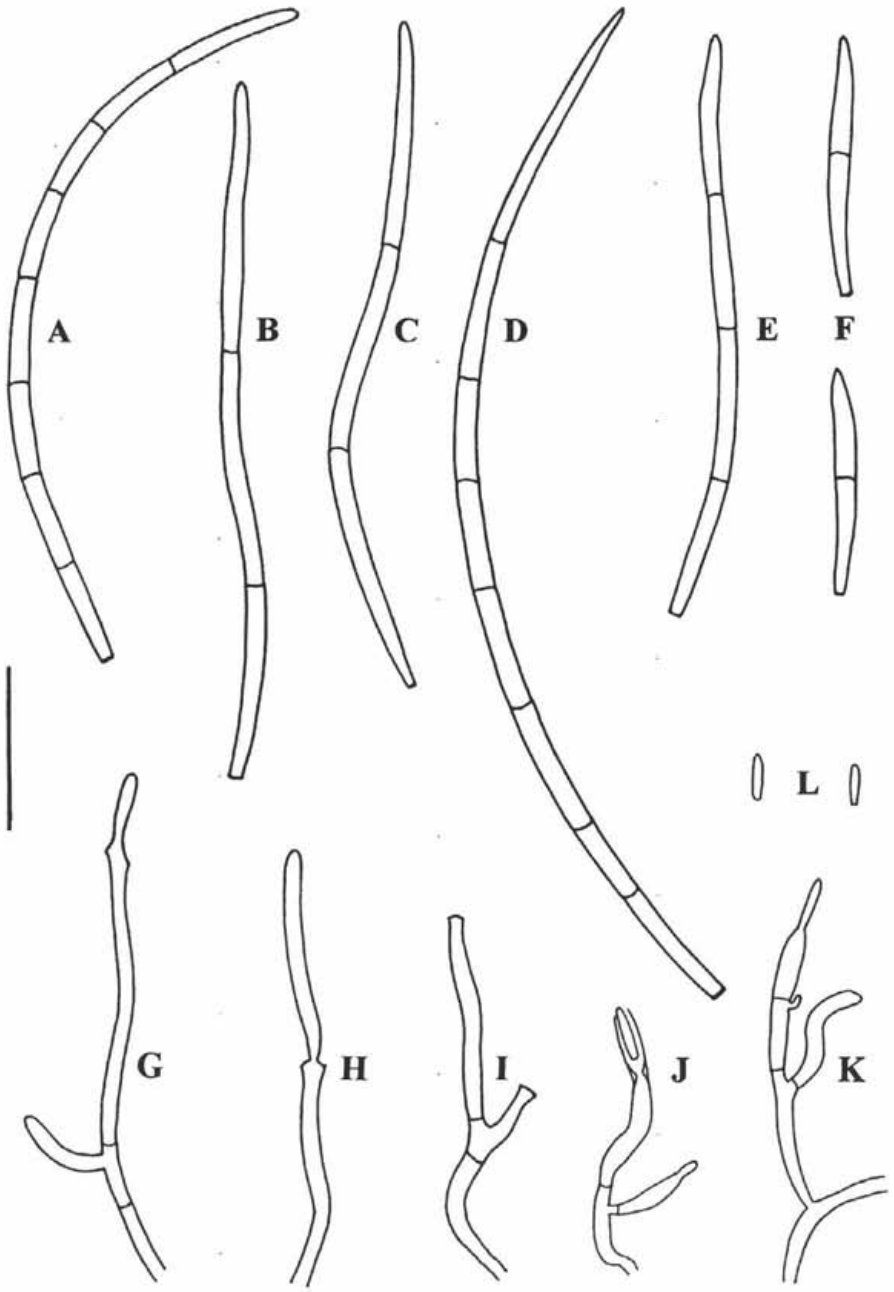

Fig. 3. *Pseudoanguillospora gracilis*, type. A-F. Conidia. G, H. Conidial development. I. Spent conidiophore. J, K. Microconidial (spermatial) synanamorph. L. Spermatia. Scale bar = 20 μm.

Pseudoanguillospora clearly differs from *Anguillospora* Ingold (1942) by the absence of percurrent conidiogenous cells, which are typical of the latter. *Sigmoidea* Crane (1968), a genus with sympodial conidiogenous cells, has typically pale colonies, and a denticulate, mostly distinct conidiiferous rachis on predominantly lateral conidiophores. Conidiogenous cells are not caducous, false branching has not been observed. *Mirandina* Arnaud ex Matsushima (classified as a section of *Dactylaria* Sacc. by de Hoog 1985) is a terrestrial genus similar to *Sigmoidea*, but has rhexolytic conidial secession in some species and macronematous, dark conidiophores with sympodial conidiogenous cells. *Mycocentrospora* also has sympodial conidiogenous cells, but these are neither concurrent with the conidia nor caducous and usually have a number of distinct, rigid scars.

MYCOCENTROSPORA

Braun (1993, 1995) reassessed the genus *Mycocentrospora* (type species *Mycocentrospora acerina*) so, that he suggested to exclude all the "aquatic" (isolated from water) species. He considers all of them improperly classified in *Mycocentrospora*, because "The structure of the conidiophores and conidial scars does not coincide with *M. acerina*. The conidiophores in most of these species are very long, filiform, sometimes branched, without typical zig-zag configuration, and the conidial scars are not thickened and less conspicuous" (Braun 1995). A similar concept of *Mycocentrospora* appeared in the article by Srivastava et al. (1995). In both papers the authors seem to have come to their conclusions without seeing the types of these aquatic *Mycocentrospora* spp. (they are not included in the studied material) and without always being aware of their nomenclatural status (invalid names in several instances).

Braun's redescription of *M. acerina* ignores the fact, that this fungus, known mainly as a biotrophic parasite on *Acer pseudoplatanus* seedlings and many other plants (Braun 1995) and causing rot of parsnip and carrot roots, has saprotrophic populations widespread in lotic waters especially in the temperate climate zone. The capability of water-borne isolates to infect *Acer* seedlings has not been studied, but Iqbal et Webster (1969) proved pathogenicity when inoculating parsnip and carrot roots with a strain isolated from water. The aquatic isolates sporulate freely in standing distilled water and some of them may then form long filamentous conidiophores with remote and unthickened scars usually retaining some rigidity.

Nearly all of the "aquatic" species, i.e. *Mycocentrospora angulata, M. aquatica, M. clavata, M. filiformis* and *M. varians*, are poorly described and illustrated and type material is often lacking or unavailable. Authentic living cultures mostly do not exist. Conidia of some of them have been reported from water or from foam, which confirms the existence of such forms, but critical studies of conidiogenesis which would ensure their proper accommodation have not been carried out.

In order to facilitate further studies possibly leading to nomenclatural changes, I present here information on these taxa gained during the type studies of aquatic hyphomycetes.

Mycocentrospora angulata (R.H. Petersen) Iqbal 1974, Biologia (Lahore) 20:3.

= *Centrospora angulata* R.H. Petersen 1962, Mycologia 54:129

= *Anguillospora angulata* (R.H. Petersen) Wolfe (1977) in Parker et Roane: Distributional History of Biota of the Southern Appalachians. IV. Algae and Fungi: 245, nom inval. (Art. 32.2)

= *Mycocentrospora angulata* (R.H. Petersen) Dudka (1983, *ungulata*), Ukr. Bot. Zhur. 40(5):58, nom inval. (Art. 32.2)

= *Anguillospora angulata* (R.H. Petersen) Readhead et White 1985, Can. J. Bot. 63: 1434.

Type: not deposited in NY (fide K.P. Dumont in litt.)

Colony morphology: not described

This is a badly known species. There is a discrepancy in the protologue, namely between the conidial dimensions as presented in the diagnosis *vs.* those in fig. 4. In the text the conidial width is given as 7.5–11 μm, but according to the scale in fig. 4 it equals c. 2.5–5 μm. Type or authentic material, which could help to solve this problem, does probably not exist.

Mycocentrospora aquatica (Iqbal) Iqbal (1974), Biologia (Lahore) 20:3

= *Centrospora aquatica* Iqbal (1971) Trans. Br. Mycol. Soc. 56: 351

Type: not preserved in HME (J. Webster, pers. communication).

Cultures claimed to have been sent to the Centraalbureau voor Schimmelcultures (Baarn, The Netherlands) and to the Commonwealth Mycological Institute (Egham, U.K.) are not cited in the last catalogues of these culture collections (1994 and 1992, respectively).

Iqbal pointed out the similarity of this species to *Centrospora (= Anguillospora) filiformis*. However, according to the protologue *M. aquatica* is probably a member of the genus *Filosporella* Nawawi. Marvanová et al. (1992) drew attention to its similarity to *Filosporella versimorpha* Marvanová et al. (l.c.), but owing to the lack of any type or authentic material of *Mycocentrospora aquatica*, they preferred not to recombine it in *Filosporella*.

Mycocentrospora clavata Iqbal (1974), Biologia (Lahore) 20: 2 (fig. 4)

Type: IMI 160108

The type material sent to me contained two pieces of dried culture and three slides. The culture was dark brown, with abundant aerial mycelium, in one case

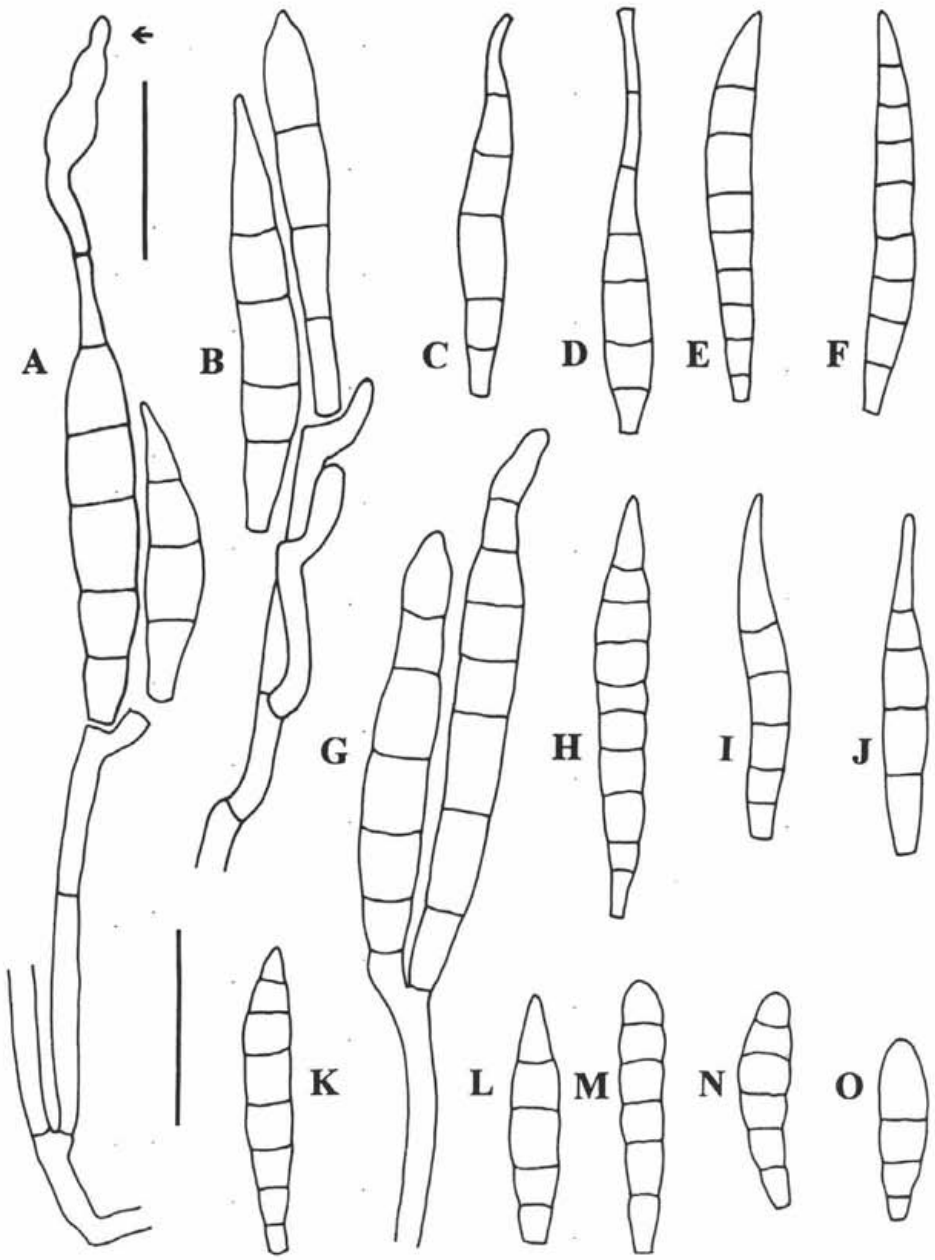

Fig. 4. *Mycocentrospora clavata*, type. A,B. Conidiophores with detached conidia. Note the secondary conidium (?) in A (arrow). G. Developing conidia. C-F, H-J,K,L-0. Conidia. (C,D: conidia with apical scar). Scale bar a = 20 μm (for A,B,G). Scale bar b = 40 μm (for C-F,K,L-O).

with minute blackish sclerotia at the colony margin. The slides contained free conidia and a few conidiophores with developing or just detached conidia. Even though the conidia are similar to those of other species of *Mycocentrospora* and the conidiophores are capable of sympodial elongation, they differ from other members of this genus by bearing closely adpressed branches and conidia occasionally producing a secondary conidium (?) at the apex (fig. 4 A). The detachment scars are few, unthickened, not rigid. The conidia are also similar to *Colispora* Marvanová (1988), but the conidiogenesis there is typically repeatedly percurrent, even though sometimes the newly grown apex is moved to one side of the scar.

Mycocentrospora filiformis (Greathead) Iqbal (1974), Biologia (Lahore) 20: 3 nom. inval. (Art. 37.1)

= *Anguillospora filiformis* Greathead (1961) J. South Afr. Bot. 27: 202 nom. inval. (Art. 37.1)

= *Centrospora filiformis* (Greathead) R.H. Petersen (1962) Mycologia 54: 584 nom. inval. (Art. 37.1)

= *Mycocentrospora filiformis* (Greathead) Dudka (1984) Mikologiya i Fitopatologiya 18: 373 nom. inval. (Art. 37.1, Art. 32.2)

Type: not designated

This species has whitish colonies and percurrently proliferating conidiogenous cells. The excentric basal extension appears typically before secession. Both characters clearly exclude this species from *Mycocentrospora* or *Anguillospora*. A new genus will therefore be established for it in a separate publication.

Mycocentrospora varians Sinclair et Morgan-Jones (1979), Mycotaxon 9: 472 (fig. 5)

Type: AUAM 2284

According to Braun (1995) this species should be the nearest to his concept of *Mycocentrospora* among the aquatic species. Contrary to this, Srivastava *et al.* (1995) point out the absence of multiple sympodial elongations of conidiogenous cells in this species, and are prone to consider *Anguillospora* a better accommodation. However, *Anguillospora* has percurrent conidiogenous cells.

The type material sent to me contained two slides and a piece of dried culture. The culture was brown greyish, hairy, blackish at the margin.

The slide labelled "New plate, aerated culture" contained a mycelial mat without fertile structures. The slide "Old plate spores" showed a few conidiogenous structures and detached conidia. The conidiophores in the type material were discrete, apical, often curved, with relatively long sympodial elongations, rarely branched, or lateral, simple. The conidia were mostly broken or germinating.

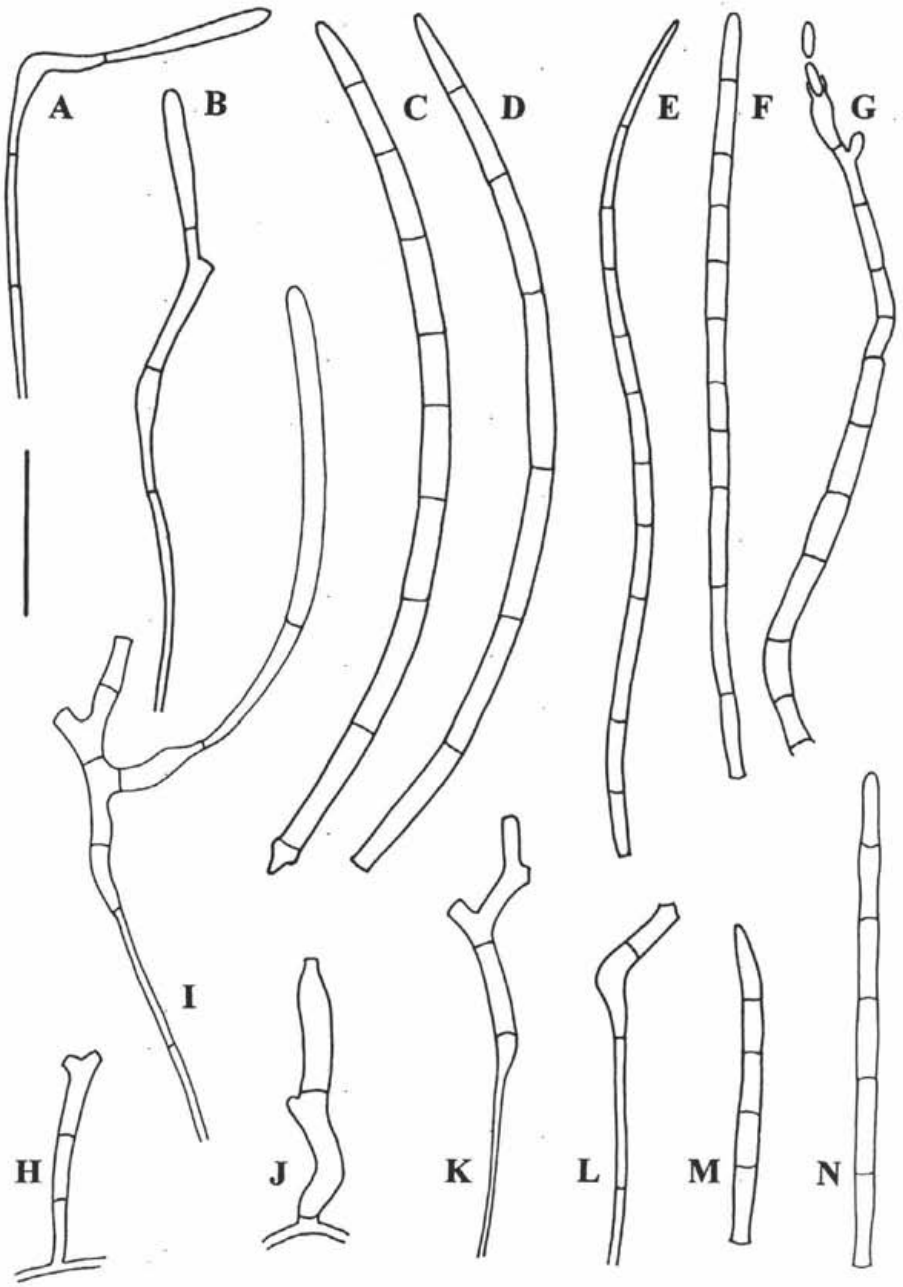

Fig. 5. *Mycocentrospora varians*, type. A,B,I. Conidial development. C-F,M,N. Conidia. G. Microconidial (spermatial) synanamorph on one conidial end. H,J-L. Spent conidiophores. Scale bar = 20 μm.

Some conidia bore a phialidic microconidial state either on the basal extension or at the apex (fig. 5 G). In my opinion this fungus possesses some similarity to *Pseudoanguillospora gracilis,* and its accommodation in this genus may be more approppriate. Nevertheless, without more material, preferably living cultures, any redisposition is precarious.

SURVEY OF GENERIC CHARACTERS OF THE RELEVANT TAXA

Pseudoanguillospora: aquatic, saprotrophic, caducous conidiogenous cells, few, often indistinct sympodial elongations of conidiogenous cells, false branching of conidia, basal extension exceptional, excentric.

Mycocentrospora: terrestrial and aquatic, bio- or saprotrophic, distinct, multiple sympodial elongations of the conidiogenous cells, no false branching of conidia, basal extension in some species well developed, appearing before secession.

Anguillospora: aquatic, saprotrophic, percurrent elongations of conidiogenous cells, no false branching of conidia, basal extension typically after secession, percurrent.

Sigmoidea: aquatic, saprotrophic, multiple sympodial elongation of the conidiogenous cells, no false branching of conidia, basal extension exceptional, excentric.

Dactylaria: terrestrial, saprotrophic, distinct, multiple sympodial elongations of the conidiogenous cells, no false branching of conidia, basal extension lacking.

ACKNOWLEDGEMENTS

Sincere thanks are expressed to the IMI Herbarium for providing the type material of *Pseudoanguillospora stricta* and *Mycocentrospora clavata*, to Prof. S.H. Iqbal for sending the ex-type culture of *Pseudoanguillospora stricta* and to Prof. Morgan-Jones for poroviding the type material of *Pseudoanguillospora gracilis* and *Mycocentrospora varians.*

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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 fourty 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 × 1,2–2 μm, 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).

Basidiocarps 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 resinosus 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 μm wide, skeletal hyphae thick-walled, 3–6 μm wide, binding hyphae thick-walled, branched, 3–4 μm 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 × 3.5–4.5 μm, with basal clamps.

Basidiospores very small, ellipsoid, smooth, hyaline, negative in Melzer's reagent, 3–3.8 × 1.5–2 μm.

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

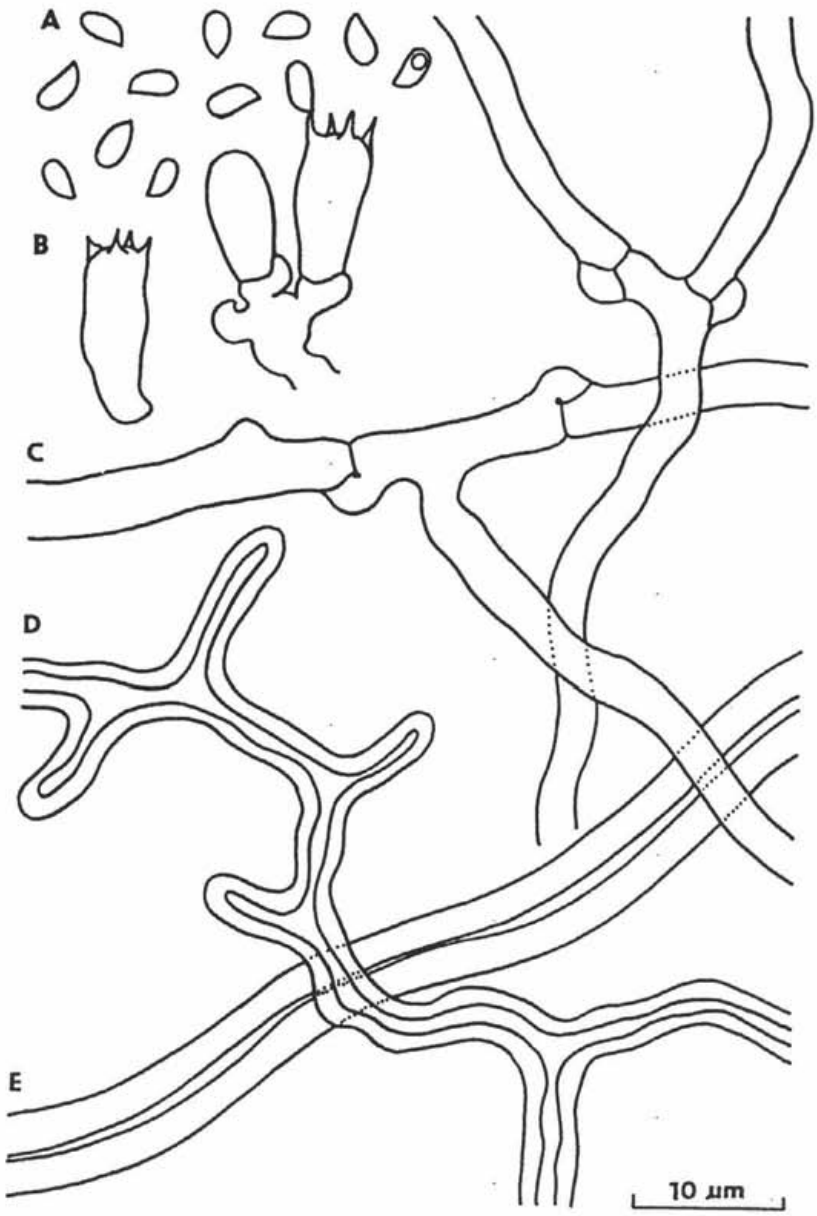

Fig. 1. *Antrodiella beschidica* Vampola et Pouz.
A) basidiospores, B) basidia, C) generative hyphae, D) binding hypha, E) skeletal hypha.
Del. P. Vampola

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

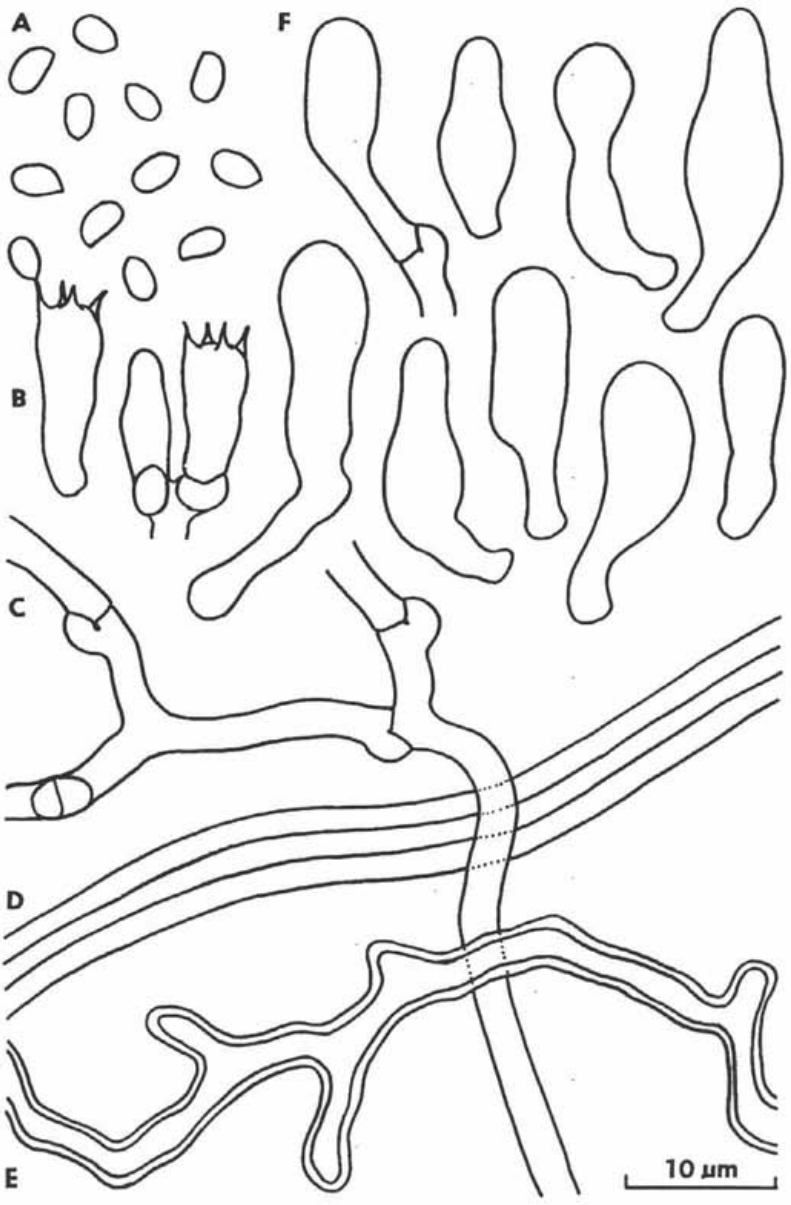

Fig. 2. *Antrodiella faginea* Vampola et Pouz.
A) basidiospores, B) basidia, C) generative hyphae, D) skeletal hypha, E) binding hypha, F) gloeocystidia. Del. P. Vampola

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 gloeocystidia 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 resinosus. 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 gloeocystidia. Basidia tetrasterigmatic, broadly clavate, 8–13 × 3.7–5.2 μm, with basal clamps. Sterigmata relatively thick, up to 4–5 μm long. Gloeocystidia 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 resinosus basidiocarps *A. thompsonii* comes close to *Antrodiella romellii* (Donk) Niemelä but differs in smaller pores, smaller and narrower spores and in the presence of gloeocystidia 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.

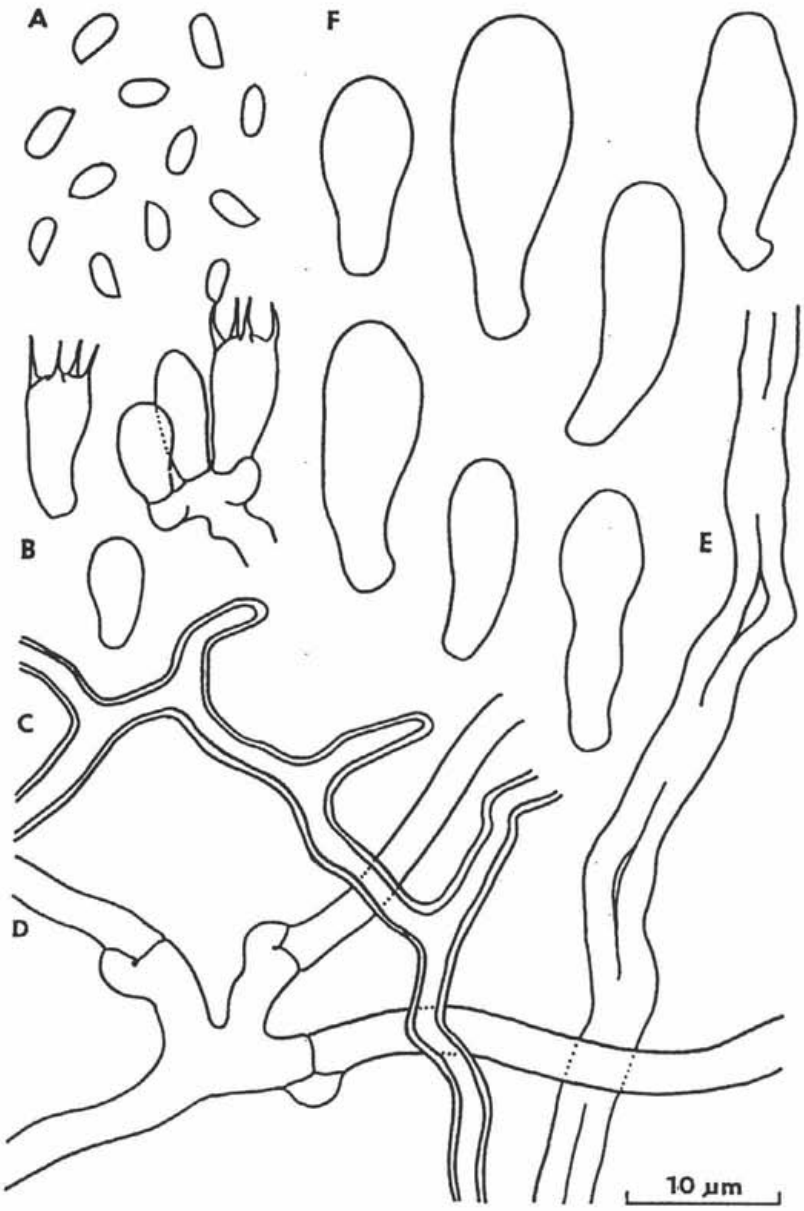

Fig. 3. *Antrodiella thompsonii* Vampola et Pouz.
A) basidiospores, B) basidia, C) binding hypha, D) generative hyphae, E) skeletal hypha, F) gloeocystidia. Del. P. Vampola

Junghuhnia luteoalba, however, grows on coniferous trees, its spores are larger and cylindric and its thick-walled cystidia are mostly strikingly incrusted.

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.

Carposomata annua, semiresupinata, cremea, 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 incrusted 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 distincly cylindrical spores and in the presence of fusoid cystidioles in the hymenium.

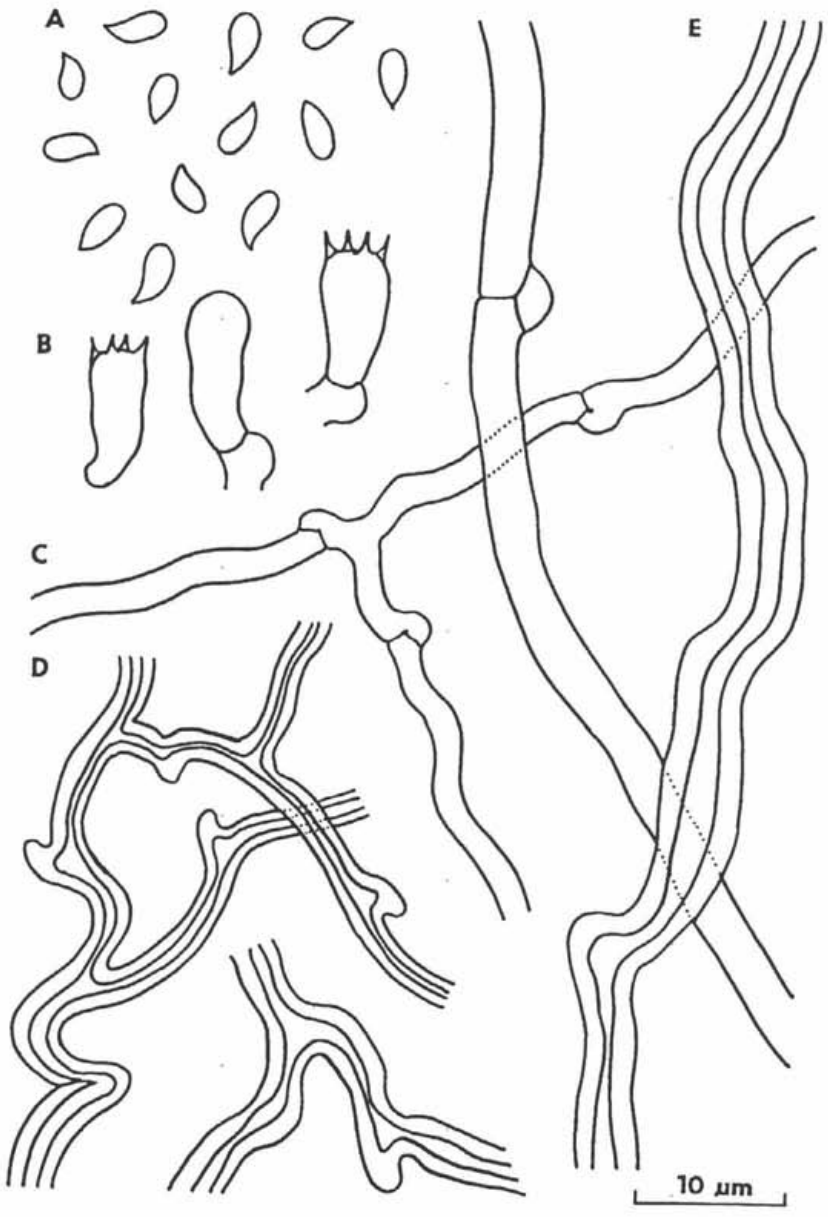

Fig. 4. *Antrodiella farinacea* Vampola et Pouz.
A) basidiospores, B) basidia, C) generative hyphae, D) binding hyphae, E) skeletal hypha.
Del. P. Vampola

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 hydnoid ... *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 μm 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 ± yellow ... 8
8. a – carpophores with a ± 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 ± 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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CZECH MYCOL. 49 (1), 1996

Notes on two hydnums – Bankera violascens and Sarcodon versipellis

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Hrouda P. (1996): Notes on two hydnums – Bankera violascens and Sarcodon versipellis. – Czech Mycol. 49: 35–39

This article deals with two questions concerning to hydnaceous fungi. I do not accept the name Bankera cinerea (Bull.: Fr.) Rauschert for Bankera violascens (Alb. et Schw.: Fr.) Pouz. The reason is that Bulliard's illustration of Hydnum cinereum, on which Rauschert based his combination, in my opinion does not show a species of the genus Bankera. The characters, on which this statement is based, are given.

The specimens of Sarcodon balsamiodorus Pouz. in schaedis from herbaria (PRM, BRA) belong, also according to the description of fresh material, to Sarcodon versipellis (Fr.) Quél.

Key words: Combination, Bankera cinerea, Bulliard's illustration, exsiccates, Sarcodon balsamiodorus.

Hrouda P. (1996): Poznámky ke dvěma lošákům – bělozubu nafialovělému a lošáku balzámovému. – Czech Mycol. 49: 35–39

Článek komentuje dva otazníky vyvstavší při studiu lošáků. Neakceptuji jméno Bankera cinerea (Bull.: Fr.) Rauschert pro Bankera violascens (Alb. et Schw.: Fr.) Pouz., neboť exempláře Hydnum cinereum na Bulliardově ilustraci, na kterých Rauschert zakládá svou kombinaci, podle mého názoru nejsou jedinci rodu Bankera. Podávám popis znaků, na kterých zakládám své tvrzení.

Položky Sarcodon balsamiodorus Pouz. in schaedis, uložené v pražském (PRM) a bratislavském (BRA) herbáři, patří podle popisu čerstvého materiálu k Sarcodon versipellis (Fr.) Quél. [Vycházeje z uvedeného synonymního jména, navrhuji pro tento druh české jméno masozub (nebo lošák) balzámový namísto dříve užitého lošák šedý (Veselý 1925) – toto jméno natolik neodpovídá skutečnosti, že by nemělo být používáno.]

During the study of some genera of hydnaceous fungi, some problems arose. The results (or maybe a contribution to discussion) of two of them are presented here.

Bankera cinerea or *Bankera violascens*?

Rauschert (1988) has proposed the new combination *Bankera cinerea* (Bull.: Fr.) Rauschert instead of the so far used *Bankera violascens* (Alb. et Schw.: Fr.) Pouz. He does so in accordance with Bulliard's illustration (Bulliard 1789; Latin description in Bulliard 1791: 309), in which he recognized this species. In

Fig. 1. The reproduction of Bulliard's illustration of *Hyndum cinereum*. The irregular outgrowths in the centre of pileus are well visible at the upper right specimens, the overgrown branchlet at the lower left ones.

this case the description of *Hydnum cinereum* Bull. relating to the mentioned illustration would be the first description of this species, because Albertini and Schweinitz described *Hydnum violascens* Alb. et Schw. in the year 1805 (Albertini and Schweinitz 1805).

Maas Geesteranus (1958) has discussed the possible identity of *Hydnum cinereum* Bull. with *Bankera violascens* (Alb. et Schw.: Fr.) Pouz. in reaction to Lundell's opinion that Bulliard's fungus could be *Hydnum nigrum* var. *melilotinum* (Quél.) Lundell (= *Phellodon niger* (Fr.: Fr.) P. Karst.; Lundell 1947: 3) or *Hydnum amicum* Quél. (= *Phellodon confluens* (Pers.) Pouz.; Lundell 1947: 1). Maas Geesteranus mentions characters which are corresponding to the genus *Bankera* or directly to the species *Bankera violascens* (Alb. et Schw.: Fr.) Pouz. as depicted in Bulliard's illustration:

- the smooth stipe, with at the most a thin layer of a superficial tomentum ("quelquefois aussi sa surface est pubescente...") which may bind vegetable debris;

- the cut specimen suggests that the context is homogeneous;
- the clustered growth;
- the general colouring of the carpophore;
- the pronounced funnelled shape of the full-grown pileus in some of the specimens;
- the radial striation;
- the concentrical zones or rugosities in the centre of the pileus;
- the long stipe, which is unknown in *Phellodon confluens*, and
- the colour of its context, which excludes *Phellodon niger*.

Maas Geesteranus stresses the spiny "cap" in young stages, which he considers characteristic of the genus *Phellodon*, as the only character which could raise doubts about the identity of Bulliard's fungus.

It is however not *Phellodon confluens* (Pers.) Pouz. and even less *Phellodon niger* (Fr.: Fr.) P.Karst. (nobody really ever saw *Phellodon niger* with pale brown context at all). But it is not a *Bankera* species either.

This statement is based on the following facts:

- The branchlet which is passing through the basidiome is overgrown by the basidiome (picture down left) – this never occurs in the genus *Bankera* and is characteristic of the genera *Phellodon* and *Hydnellum* on the other hand.
- The stipe swelling in the lower part is characteristic of *Hydnellum* (the stipe of *Bankera violascens* is conically tapering in the lower part).
- The spiny "cap" when young, which is characteristic of the genus *Phellodon*, can be characteristic of some species of the genus *Hydnellum* as well.
- The centre of the pileus is covered by irregular outgrowths evidently accompanied by irregularity of its growth, while the scales of the genera *Sarcodon* and *Bankera* are the result of breaking up the originally smooth cuticle.

These are the reasons why it is not possible to consider the fungi in Bulliard's illustration as representatives of the genus *Bankera*. This is also why it is not possible to accept Rauschert's combination *Bankera cinerea* (Bull.: Fr.) Rauschert and it is necessary to preserve the name *Bankera violascens* (Alb. et Schw.: Fr.) Pouz. for this species.

The identity of *Sarcodon balsamiodorus*

There are some specimens in the herbaria Prague (PRM) and Bratislava (BRA) named *Hydnum* (*Sarcodon*) *balsamiodorus* Pouz. in schaedis or *Hydnum* (*Sarcodon*) *balsamiolens* Pouz. in schaedis. The description of fresh type material (collected 20. VII. 1969 at Raková near Čadca, Slovakia), kindly offered to me by Z. Pouzar, is adduced here in comparison with the appearance of the same fungus more than 20 years later, as there is the opportunity to see it personally in Prague herbarium.

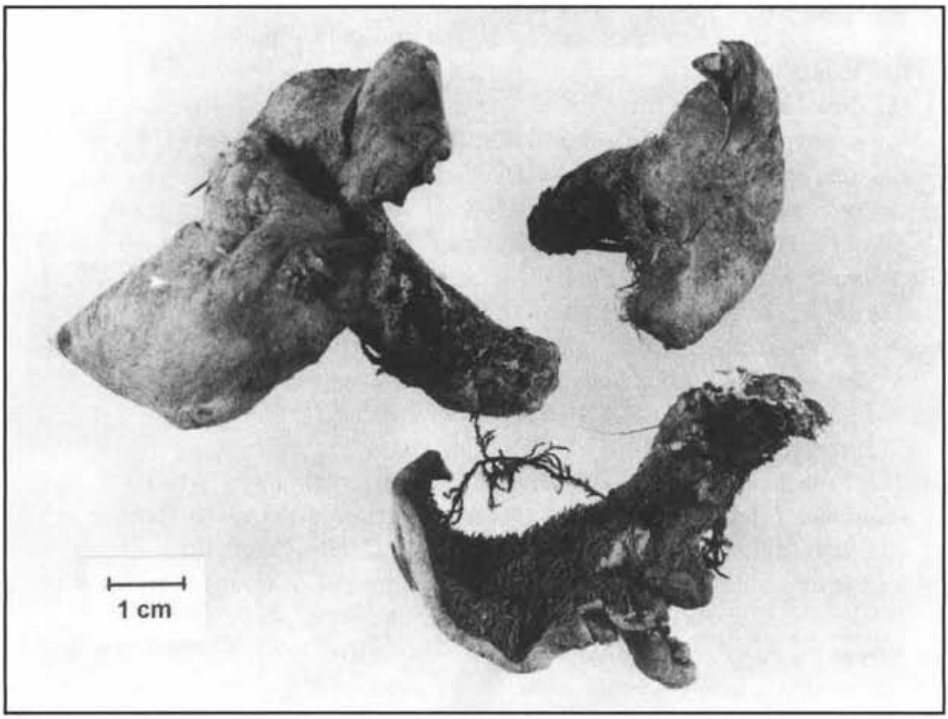

Fig. 2. Macroscopical view on specimens documented in PRM as *Sarcodon balsamiolens* Pouz. (ined.) cropped at Raková near Čadca (Slovakia), in mixed wood (*Picea abies, Abies alba, Pinus sylvestris* etc.), 15. VII. 1967, leg. J. Kuthan, det Z. Pouzar.

The fresh pileus is about 80 mm wide, early flatly infundibuliform, mostly obvolutely bent, even split, coloured ochreous-orange, its surface is smooth with innate squamules; the pileus of the exsiccate is beige, ochraceous to light brown, quite smooth, the squamules can only be seen, not touched. The fresh stipe is 40–50 mm long, 18–28 mm thick, cylindrical, peak prolonged in the lower part, the colour of its surface is orange-brown; the stipe of the exsiccate changed its colour like the pileus and is smooth. The spines are not silvery in the fresh material (in contrast to *Sarcodon fennicus* (P. Karst.) P. Karst.), there is a strange odour from the fresh spines, somewhat like camphor (different from the odour of *Hydnellum suaveolens* (Scop.: Fr.) P. Karst., not so sweet – compared with fresh material); the spines of the exsiccate are brown to purple-brown, decurrent to the stipe. The

fresh context is light white-greenish on cutting; the context of exsiccate is beige to nearly white (distinctly lighter than the surface of the pileus), the green hue has disappeared; it does not change its colour by reaction with a KOH solution (examined only on the exsiccate).

If we add the microscopic characters of our specimens to this description, oblately tuberculiform, 4–5 μm large spores and the presence of clamp-connections on the hyphae, it is evident that specimens preserved in the mentioned herbaria under the name of *Sarcodon balsamiodorus* (or *S. balsamiolens*) belong to the species *Sarcodon versipellis* (Fr.) Quél.

ACKNOWLEDGEMENTS

I thank to Mgr. Jan Holec for the preparation of photographies, Zdeněk Pouzar, CSc. for the lending of original description and literature.

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Book review

CYPRIÁN PAULECH:

Mycota (Huby), Ascomycetes (Vreckaté), Múčnatkotvaré (Erysiphales).

– in Flóra Slovenska (10), 1, 292 p., 121 figs., Veda, Bratislava, 1995.

In the first part of the monograph of Slovak powdery mildews principles of morphology and ecological physiology of genera and species are shortly presented including the importance of both aspects and their variability for the taxonomy of the order. Recent classification systems which has had great influence on the investigation of Erysiphales in the whole world are shortly discussed. The first part also contains the main methods in the study of these economically very important plant pathogens. Tabular reviews present a survey of the members of powdery mildew genera and data on the occurrence on host plants of various families of the Slovak flora. A list of Slovak plant families illustrates their relation to individual species and genera of powdery mildews. The geographical distribution of individual fungus species is demonstrated in the table listing the plant geographical regions of Slovakia. The history of investigation and the recent state of study of Erysiphales in Slovakia concludes the first, general part.

The specific part contains descriptions of 108 species parasitizing on about 700 plant hosts. In Slovakia most species are known in perfect state (teleomorphs), as imperfect species (anamorphs) only seven species are known (genera *Oidium* and *Oidiopsis*). The perfect state is produced by the following genera: *Sphaerotheca, Podosphaera, Erysiphe, Blumeria, Arthrocladiella, Microsphaera, Sawadaea, Uncinula, Leveillula* and *Phyllactinia*. Each species of powdery mildews is characterized by the morphology of its conidia, conidiophores, appressoria, cleistothecia, peridial cells and appendices. The shape, size and variability of asci and ascospores is recorded. All organs mentioned are illustrated by sketches. The occurrence of individual species is presented as in previous volumes of the Flóra, viz. according to their presence in plant geographical regions; thus the comparison of the geographical distribution of powdery mildews with that of their host plants is facilitated. I consider the comparison of the distribution of both fungus and its host very important as powdery mildews are obligate (biotrophic) parasites. The keys for the identification of the species are presented in each genus. An Englisch and German summary and a register of scientific names of host plants and their mildew species are given at the end of the monograph. Particularly for national use is the proposal for Slovak names of genera and species.

The present monograph is a very valuable contribution to the knowledge of Slovak Erysiphales and very useful to the investigation and study of these plant pathogens in Europe, especially Central Europe. It will find its use in routine practice as well as scientific work at various experiment institutes for agriculture and forestry, at institutions for nature and plant protection and at universities for the education of biologists and scientific workers.

The book is written in Slovak.

Zdeněk Urban

CZECH MYCOL. 49 (1), 1996

Discharge of basidiospores from Fistulina hepatica fruitbodies in the natural environment

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Gáper J. (1996): Discharge of basidiospores from Fistulina hepatica fruitbodies in the natural environment. – Czech Mycol. 49: 41–48

Airborne basidiospores released from naturally produced basidiocarps of the beefsteak fungus Fistulina hepatica (Schaeff.): Fr. were collected by placing simple spore samplers below the centres of developing basidiocarps at two localities in Central Slovakia. This fungus liberates its basidiospores from the beginning of July to the first half of November. From 1 mm^2 of hymenophore with tubes $2.4 \times 10^1 - 5.04 \times 10^4$ basidiospores were discharged in the course of 24 hours. Basidiospore counts were the highest from orange-red and orange-red to bruising reddish brown pore surfaces. The course of spore discharge in relation to rainfall data is ambiguous.

Key words: Spore discharge, Fistulina hepatica, sporulation, airborne basidiospores.

Gáper J. (1996): Uvoľňovanie bazídiospór z plodníc trúdnika Fistulina hepatica v prirodzených podmienkach – Czech Mycol. 49: 41–48

Uvoľňovanie bazídiospór z dobre vyvinutých plodníc pečeňovca dubového Fistulina hepatica (Schaeff.): Fr. sa sledovalo v r. 1991 a 1992 na dvoch lokalitách na strednom Slovensku. Spóry vypadávali na krycie sklíčka uložené na stojane, ktoré boli umiestnené pod plodnicami v teréne. Vypadávanie spór sa hodnotilo kvalitatívne a kvantitatívne počítaním v Bürkerovej komôrke.

Spóry sa uvoľňovali od začiatku júla do polovice novembra.

Z 1 mm^2 hymenoforu sa za 24 hodín uvoľnilo 2,4 . 10^1 až 5,04 . 10^4 bazídiospór. Spóry sa najintenzívnejšie uvoľňovali z plodníc s oranžovočervenými až červenkastohnedými ústiami rúrok.

INTRODUCTION

The beefsteak fungus, *Fistulina hepatica* (Schaeff.): Fr., causes a brown staining and then sometimes decay of living or dead oaks (*Quercus* sp. div.) or sweet chestnut (*Castanea sativa* Mill.) and commonly forms tongue or bracket-like fruitbodies, usually near the base of standing trees, but on trunks, branches and stumps too (Černý 1982, Kotlaba 1984).

Nuss (1975) reported that fructification attained maturity after nearly two weeks and fruitbodies sporulated under favourable conditions during nearly five weeks. Decomposition and insect consumption of older basidiocarps proceeded very quickly. Analysis of basidiospore discharge in relation to natural climatic factors showed that autumn sporulation finished at average temperatures above +15 °C. Nuss (1975) concluded that beefsteak fungus basidiocarps liberate their spores from the end of August to October. As fruitbodies had been produced during

this period, Nuss (1975) could not gain information on sporulation of this species during a larger period of the year. In our conditions namely, as pointed out by Kotlaba (1984), fructification of this fungus was observed from June to November. Generally, basidiocarp creation slowly increases, peaks in August and then steadily declines (Kotlaba 1984).

Up to the present day we know little or nothing about basidiospore discharge (of a statistically sufficient number) of the beefsteak fungus fruitbodies during the whole fructification period. There are even no satisfactory quantitative data available. This paper reports on our investigations of quantitative spore release of this fungus during its fructification period. The work is part of a study on the sporulation of wood-destroying fungi in both natural and urban stands.

MATERIAL AND METHODS

Simple samplers were placed below naturally produced basidiocarps. The sampler consists of three covering glass slides on a holder placed c. 2 mm below the pore surface centre of a developing basidiocarp. The spore deposition samplers were left in the field for 24 hours to have the basidiospores discharged. If spore deposit on rates were very high, it was impossible to count the spores, and therefore the covering glass slides were changed several times over a 24-hour period.

In 1991 fruitbody presence was recorded from 5 June to 29 October (Table 1), in 1992 from 9 June to 14 November (Table 2), by investigating the localities 11 times each year. Spore samples were taken 1–2 times in a month from July to November. Basidiospores were counted on a 1 mm^2 large part of the surface in a Burger chamber. Five various 1 mm^2 large areas of every covering glass slide were estimated. In case the basidiospore release reached its peak and basidiospores could not be counted one by one, spore numbers were rounded to 50.

In 1991 24-hour spore deposition patterns of *Fistulina hepatica* were determined in a c. 40-year old mixed forest stand 3 km west of Zvolen, Central Slovakia. Fruitbodies of *Fistulina hepatica* were found on dead standing oak trees and oak stumps. In 1992 release of basidiospores was observed in a c. 50-years old mixed stand 3.5 km southwest of Zvolen. Sporophores there grew on living trunks of the *Quercus dalechampii* Ten.

Rainfall data were obtained from the Meteorological Station of Sliač near Zvolen.

Table 1. Basidiospores collected from *Fistulina hepatica* fruitbodies under 1991 field conditions (No.= number of the fruitbodies).

Spore-collection day	No.	Pore surface colour	Estimated pore surface area [cm^2]	24-hour spore release per mm^2 $\bar{x}$	Sd	max	min
June 5	no fruitbodies						
June 20	no fruitbodies						
June 28	cushion-like fruitbodies without tubes						
July 9	1	white-yellowish	15	343	89.5	413	199
				176	36.1	197	112
				355	34.0	399	304
	2	white-yellowish to yellow-brownish	30	269	36.3	307	222
				229	10.0	241	214
				336	29.1	369	294
August 5	1	white-yellowish to yellow-brownish	40	2645	128.2	2761	2435
				2687	284.1	2948	2321
				2847	151.9	3002	2683
	2	white-yellowish to yellow-brownish	20	229	22.5	251	191
				229	17.6	246	210
				204	14.5	221	184
	3	orange-red to bruising reddish brown	50	870	37.2	904	813
				906	33.8	932	869
				934	46.5	988	878
August 21	1	reddish brown	60	146	21.8	162	111
				109	11.1	126	98
				135	14.2	156	122
	2	reddish brown	40	133	7.9	141	124
				160	3.3	165	152
				138	6.5	144	128
September 4	1	reddish brown	50	94	21.3	122	69
				87	9.7	98	77
				75	5.4	83	69
September 18	1	reddish brown	6	664	430.7	1405	307
				578	63.6	641	492
				459	33.8	492	414
	2	reddish brown	8	2736	249.1	3004	2431
				719	998.6	2504	239
				83	6.3	92	76
October 2	no fruitbodies						
October 13	no fruitbodies						
October 29	no fruitbodies						

Table 2. Basidiospores collected from *Fistulina hepatica* fruitbodies under 1992 field conditions (No.= number of the fruitbodies).

Spore-collection day	No.	Pore surface colour	Estimated pore surface area [cm^2]	24-hour spore release per mm^2 $\bar{x}$	Sd	max	min
June 9	no fruitbodies						
June 25	no fruitbodies						
July 8	cushion-like fruitbodies without tubes only						
July 23	1	yellow-brownish	30	123	18.8	145	95
				145	30.6	173	98
				228	25.1	261	196
August 6	1	yellow-brownish	40	4026	310.4	4422	3642
				3553	189.8	3756	3268
				3379	355.6	3722	2989
	2	yellow-brownish	90	5742	279.8	6040	5410
				4968	67.2	5030	4860
				4598	384.8	4920	4120
	3	orange-red	120	41900	3382.8	47500	38950
				39540	2229.5	42350	36850
				43616	11856.1	44680	41650
August 22	1	white-yellowish to yellow-brownish	80	691	101.2	786	544
				599	90.8	723	477
				283	37.4	324	233
	2	orange-red to bruising reddish brown	50	24660	4121.8	29450	19600
				23220	2534.9	26950	20850
				24510	2613.3	27350	21650
	3	reddish brown	130	78	17.1	108	66
				110	44.0	178	67
				103	24.3	135	68
	4	reddish brown	20	39	7.9	47	30
				35	7.8	44	24
				79	9.1	92	68
September 10	1	white-yellowish	20	184	40.5	235	131
				164	21.5	192	142
				198	11.6	216	185
	2	reddish brown	100	616	91.4	745	495
				715	18.7	743	698
				647	46.6	698	596
	3	reddish brown	10	73	4.6	78	67
				101	9.2	111	87
				115	17.2	141	98

Table 2. Continuation.

Spore-collection day	No.	Pore surface colour	Estimated pore surface area [cm^2]	24-hour spore release per mm^2 $\bar{x}$	Sd	max	min
September 27	1	white-yellowish	30	185	27.2	230	158
				120	11.8	141	111
				45	34.6	24	86
	2	white-yellowish to yellow-brownish	150	2520	457.8	3300	2090
				3338	435.9	4030	2860
				2828	111.0	3050	2630
	3	yellow-brownish	15	134	54.2	185	67
				153	54.2	211	101
				215	48.6	296	169
	4	yellow-brownish to orange-red	60	7010	623.5	7930	6240
				6113	740.8	6820	5175
				6140	563.6	6750	5500
	5	orange-red to bruising reddish brown	50	47760	3654.6	50400	42600
				38280	1644.5	40050	35850
				43260	2610.1	47400	40950
October 14	1	white-yellowish	40	176	52.9	261	128
				105	20.3	135	81
				151	27.8	186	122
	2	yellow-brownish	120	4592	931.0	5790	3290
				5597	730.4	6640	4950
				6062	151.7	6220	5870
	3	orange-red to bruising reddish brown	180	37440	1448.1	39150	35700
				41070	2991.3	46650	36750
				40290	1561.3	42500	38550
October 27	1	reddish brown	160	200	30.0	253	183
				102	27.7	127	59
				135	46.5	217	102
	2	reddish brown	190	2692	2417.2	5401	183
				3478	683.2	4500	2980
				2115	1713.9	3845	214
November 14	1	reddish brown	70	159	24.0	194	133
				98	30.6	147	67
				82	31.1	120	40

RESULTS AND DISCUSSION

The basidiocarps varied greatly in pore surface area and total number of basidiospores produced (Tables 1, 2). The beefsteak fungus pore surface was at first white-yellowish to yellow-brownish, then orange-red to bruising reddish brown and finally reddish brown. Basidiospore counts were the highest from orange-red and orange-red to bruising reddish brown pore surfaces (Table 2). However, some irregularities in spore density on glass were observed (see for instance spore deposition data from 18 September in Table 1 and from 27 October in Table 2). Similarly, Gay et al. (1959) observed some irregularities in spore density in *Trametes gibbosa*. Taggart et al. (1964) supposed that this phenomenon is caused by air currents in the spore collection apparatus used. In contrast, we agree with the opinion of Gay et al. (1959) that these spore deposition differences are real.

24 hours spore deposition data are shown in Tables 1 and 2. These data generally represent high and low periods of spore deposition. From the beginning of June to the beginning of July no fruitbodies with tubes and, of course, no spores were produced. In 1991 the highest deposition rates occurred in August with a maximum on 5th August (3002 basidiospores per mm^2) and in September with a maximum on 18th September (3004 basidiospores per mm^2). In 1992 the highest deposition rates occurred irregularly from the beginning of August to October with a maximum on 27th September (50,400 basidiospores per mm^2). The lowest was in both July and November with the lowest count on 14th November (40 basidiospores per mm^2). Generally, sporulation in 1991 was much less intensive than in 1992.

Figs. 1 and 2 illustrate the course of rainfall in 1991 and 1992. Correlations are, of course, ambiguous.

We agree with the opinion of Nuss (1975) that the fruitbody consistency of the beefsteak fungus is relatively soft and therefore its decomposition goes very fast. As pointed out by Gáper (1994), the time of basidiospore release from such sporocarps is much shorter than of those polypores with tougher fruitbodies. On the other hand, our results definitely confirm the opinions that soft fruitbodies sporulate already a few weeks after primordium creation (Nuss 1975, Soukup 1987).

ACKNOWLEDGEMENT

This work was partially supported by the grants No. 2/0230 and GE-3000 from both the Slovak Grant Agency and the Institute of Forest Ecology of the Slovak Academy of Sciences in Zvolen, Slovakia.

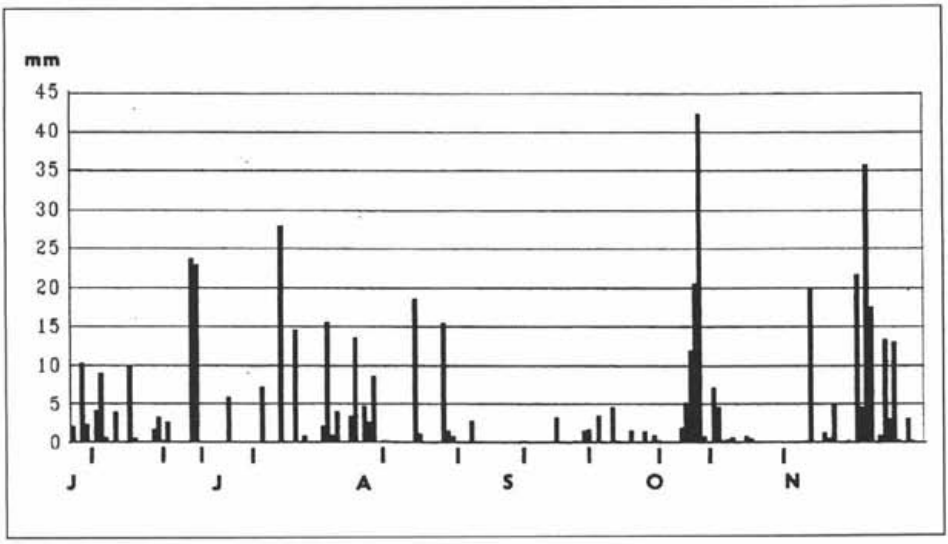

Fig. 1. Daily precipitation depths under 1991 field conditions from June 1st to November 30th with spore-collection days marked.

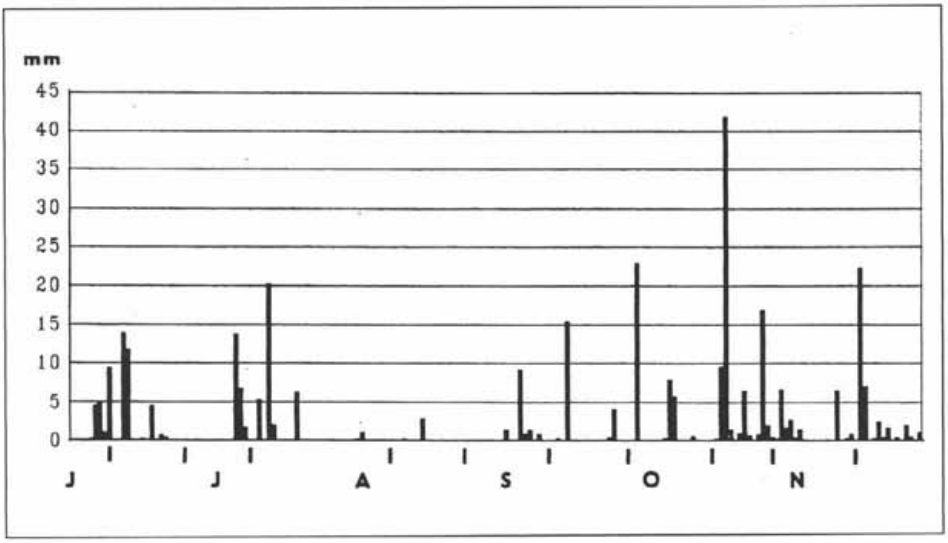

Fig. 2. Daily precipitation depths under 1992 field conditions from June 1st to November 30th with spore-collection days.

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CZECH MYCOL. 49 (1), 1996

Aspergillus viridinutans and Stilbella aciculosa – new records from Czech Republic

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Bečvář K. (1996): Aspergillus viridinutans and Stilbella aciculosa – new records from Czech Republic. – Czech Mycol. 49: 49–52

Two species of micromycetes were isolated from coal-mine dumps near Kladno. The species were found in the Czech Republic for the first time. This paper describes their appearance and distribution.

Key words: Micromycetes, Aspergillus viridinutans, Stilbella aciculosa, Czech Republic.

Bečvář K. (1996): Aspergillus viridinutans a Stilbella aciculosa – nové nálezy z České republiky. – Czech Mycol. 49: 49–52

Z půdy odvalů kladenských černouhelných dolů byly izolovány dvě mikroskopické houby, jejichž nálezy v České republice nebyly dosud publikovány. Článek přináší jejich popis, vyobrazení a rozšíření.

Both strains were obtained within the frame of my diploma work and they are maintained in the Culture Collection of Fungi, CCF, Department of Botany, Charles University, Prague.

Aspergillus viridinutans Ducker et Thrower 1954

This strain was isolated from the soil of the coal-mine dump "Vítek" near Kladno – Vrapice, Central Bohemia, altitude c. 340 m, in April 1993 as No. V2E and is maintained under No. CCF 2937.

Description

Colonies on CYA reach 54 mm in diameter after 7 days of cultivation at 25 °C and min. 90 mm (full Petri dish) at 37 °C , at first the colonies are white, later they form dark green conidia, revers colorless, no exudate, no soluble pigment. Colonies on MEA 68 mm in diam. after 7 days at 25 °C and min. 90 mm (full Petri dish) at 37 °C. Appearance is the same as on CYA. Hyphae hyaline, 1.9–3.6 μm in diam., conidiophores on MEA 19–84 (-112) μm in length, with smooth walls, conidial heads columnar, uniseriate, vesicles subglobose, 8–15 μm, they usually grow on the conidiophore at an angle (occasionally straight up), often with a nodding

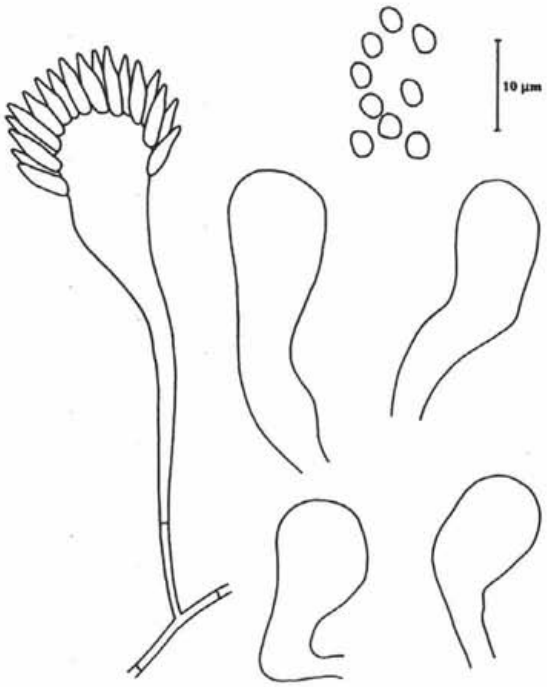

Fig. 1. *Aspergillus viridinutans* – conidiophore, shapes of conidial heads, conidia Del. K. Bečvář

appearance. Phialides 4.9–6.0 × 1.4–2.1 µm,conidia subglobose, globose, smooth-walled, 1.9–2.5 µm.

Habitat and distribution

Kozakiewicz (1989) remarks, that *A. viridinutans* has been isolated mainly from soil, but also from rabbit dung and from *Pinus caribaea*. This species has been found in Australia, Sri Lanka, U.S.S.R. and Zambia.

Notes

This fungus was identified after Raper and Fennell (1965) and Kozakiewicz (1989). *A. viridinutans* is distinguished from most other species of the *Aspergillus fumigatus* group by the vesicles, which are borne at an angle with the conidiophores. It differs from *A. brevipes* G. Smith by the vegetative hyphae, which are not reacting in lactophenol (hyphae of *A. brevipes* acquire a rose-pink shade) and

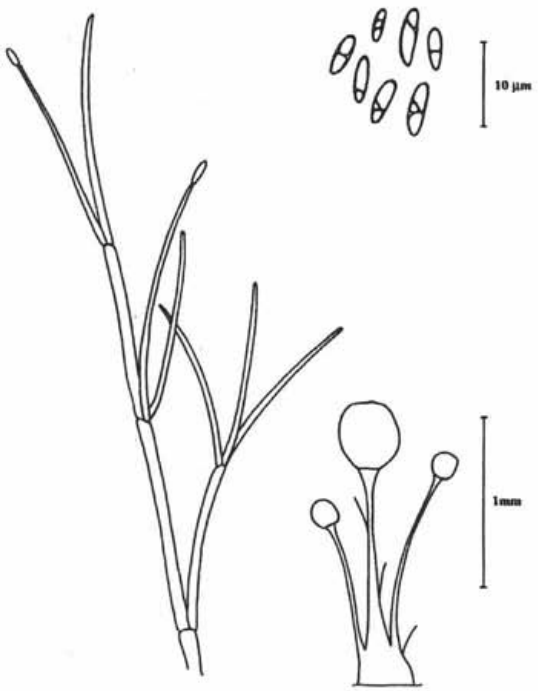

Fig. 2. *Stilbella aciculosa* – conidiophore, conidia, synnemata Del. K. Bečvář

from *A. unilateralis* shape of the conidial heads (the phialides of *A. unilateralis* are borne on the vesicles in lateral clusters).

Stilbella aciculosa (Ellis et Everhart) Seifert 1985

Syn.: *Stilbum aciculosum* Ellis et Everhart 1885 =
=*Botryonipha aciculosa* (Ellis et Everhart) O. Kuntze 1891
Stilbum citrinellum Cooke et Massee 1887
Stilbum pallidulum Penz. et Sacc. 1901
Stilbella bulbicola Henn. 1905 =
= *Stilbum bulbicola* (Henn.) Litvinov 1967
Stilbella flavescens Estey 1977

This strain was isolated from the soil of the coal-mine dump "Wanieck" ("Nejedlý II"), near Kamenné Žehrovice close to Kladno, Central Bohemia, altitude c. 380 m in October 1994 as No. W2A. At present this strain is maintained under No. CCF 2940.

Description

Colonies on MEA after 7 days at 25 °C reached 19 mm in diam. and 35 mm after 14 days, mycelium white, revers light purple with concentric rings. Synnemata formed after 4–5 weeks, caespitose, up to 2 mm tall, stipes white, in aerial mycelium mononematous conidiphores are *Acremonium*-like, phialides cylindrical to subulate, smooth-walled, 15–31 × 0.8–1.2 μm, conidial mass orange, up to 720 mm in diam. Conidia ellipsoidal, 4.2–7.9 × 1.8–2.2 μm, often guttulate.

Habitat and distribution

Seifert (1985) reports, that *S. aciculosa* was found in soil, roots, dung of a rabbit and a dog, wood, bark and fruits. This fungus is known from the U.S.A., Canada, Costa Rica, Panama, England, France, the Netherlands, Germany, the former Yugoslavia, Turkey, Nepal, Indonesia and Japan.

Notes

Seifert (1985) observed, that *S. aciculosa* is characterised by its slender white synnemata, yellow conidial mass, ellipsoidal conidia, purple reverse, verrucose subapical marginal hyphae of the synnemata (nevertheless the now described strain has smooth ones). This species is relatively well-determined, although partial resemblance exist to other species, for instance to *S. albocitrina* (Ellis et Everhart) Seifert, which differs in the lobed marginal hyphae and the growth on the woody substrates.

ACKNOWLEDGEMENTS

I thank Dr. A. Kubátová for revising the identification of both strains.

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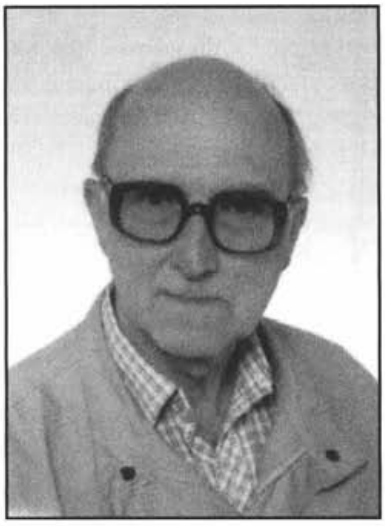
CZECH MYCOL. 49 (1), 1996

To the 70th birthday of RNDr. Mirko Svrček, CSc.

Z. URBAN and K. PRÁŠIL



It is not easy to commemorate important jubilee of an almost universal floristic and taxonomic mycologist, whose life and scientific work have been described in details in former commemorative articles (Kubička J., Čes. Mykol. 29: 219-228, 1975; Pouzar Z. et Urban Z., Čes. Mykol. 39: 243-249, 1985; Šebek S., Preslia 57: 378-379, 1985, and others) in a way that does not repeat what has already been written and at the same time not creating the impression that an unsufficient enumeration of dates might mean our lack of respect for Mirko Svrček. For that reason, we will mention only his day of birth, the 11th of October 1925 in Prague, where he graduated at the Faculty of Science, Charles University, in 1949, defended his thesis in 1964 and consequently obtained the scientific degree of "candidate of biological sciences". In 1946 he joined the staff of the Department of Botany in the National Museum in Prague, where he has regularly been working since, though he officially retired in the autumn of 1992.

The elder of the authors of this article, Z. Urban, remembers anarranged, but never realized a meeting with Dr. Svrček in the sombre times of the Nazi occupation in 1944. At that time, both secondary school students, fond of nature, knew about their common interest in fungi although they lived in different towns (Prague and Pardubice). After all, Svrček published his first articles about *Volvariella* and *Entoloma rhodopolium* as early as 1942 and 1943 in Časopis českých houbařů (Journal of Czech mycologists) and in the same time Urban published his first articles on rust fungi in the Pardubice region in Věda Přírodní (Natural Science). In that time, both of the initially universal botanists were more interested in fungi and that was not merely fortuitous, as mainly Svrček was influenced by two serious mycologists – the amateurs Ing. Stanislav Havlena and Václav Vacek, the latter working on discomycetes at that time.

However, Dr. Svrček was not only a botanist but he was interested also in different groups of fungi, including lichens. This was probably also due to the fact that he worked in an institute involved in collecting products of nature (in his case fungi), in their exact identification and further study. For that reason

his publication work has since the beginning included articles about new finds in Czechoslovakia and new species of Basidiomycetes. To his larger works belong the monography on the subfamily Tomentelloideae (Thelephoraceae) published in 1960 and that on the orders Hymenogastrales, Hysterangiales and Melanogastrales for the first volume of Flora ČSR, Gasteromycetes (1958). It seems like it were the large collections of lichens in the National Museum that first drew Dr. Svrček's attention to these dual organisms, now systematically classified as fungi. This is proved by his contribution on lichens of the Vltava and the Central Bohemia region (1956). In the same time, he was interested in coloured and through their shape and life interesting Myxomycetes that he obtained from different substrates cultivated in damp chambers. Many Pyrenomycetes, mainly those growing on animal excrements, were equally obtained by cultivation in damp chambers. Other Pyrenomycetes and their conidial states, for instance those growing on herbs and wood were also in the centre of Dr. Svrček's interest and information on remarkable findings was published in Česká mykologie (Czech Mycology), mainly in the series on new finds of fungi in Czechoslovakia.

This large interest in almost all groups of fungi was certainly stimulated by his profession but from the beginning probably also by his understandable fascination by the incredible variability of apparently uniform organisms, the diversity of which becomes clear only through microscopical study of structures and through discovering fungi in the most diverse ecotopes. This fascination then became the motivating power of his floristic and taxomomic work, but at the same time the necessary condition for his ecologically oriented mycological research on nature reserves, national parks and protected landscape areas. Nowadays, similar projects are carried out by teams of mycologists. Dr. Svrček is probably our last mycologist who, from the beginning of his field work, has registered and taxonomically and ecologically evaluated the maximal quantity of Basidiomycetes and Ascomycetes from different substrates, ecotopes and plant communities. The list of Dr. Svrček's papers would be long, so let us mention only some localities and regions as an illustration: the Klíčava River Valley in the Protected Landscape Area of Křivoklátsko, the Milešovka Mountain and its surroundings in the Landscape Protected Area of České středohoří, the region of Třeboň and the Novohradské hory Mountains in the South-Bohemian Biosphere Reserve, the Valley of Seven Sources in the High Tatra Mountains, the Low Tatras National Park, etc. Of the running projects let us mention the systematical mycological research in the Krkonoše Mountains National Park carried out since 1986, the first results being published in Česká mykologie in 1990, and his several years' collaboration with the Prague Centre of Nature Protection in the mycological research of Prague Nature Reserves, which, unfortunately, was stopped in 1994. Partial results of his research on macromycetes there were nevertheless published in 1985.

When stressing the universality of the mycological personality of Dr. Svrček, we should in no case forget the field in which he has become a world-wide known and respected mycologist, the taxonomy of the rich group of Discomycetes. Very early, under the influence of the already mentioned Václav Vacek, he learned the method of searching, collecting and identifying small cup fungi on both dead and living parts of different plant substrates and he published the first part of the Study on Czech Ascomycetes (in total six parts) in Česká mykologie as soon as 1947. In the meantime, he published a large monography on Czech species of the subfamily Lachneoideae, family Pezizaceae in 1948, and later we can find one or more taxonomic and floristic papers on Discomycetes in every volume of Česká mykologie. Among the later papers published in the years 1974 – 1992, the series on New or less known Discomycetes is worthly mentioning.

Dr. Svrček's early interest in fungi, and especially in Discomycetes, was probably motivated by the fact that he was living in the country where J. Velenovský had published České houby (Czech fungi) in the years 1920 – 1922, Monographia Discomycetum Bohemiae in 1934 and two other large works on his latest findings in 1939 and 1947. Already the first mentioned paper caused astonishment abroad, mixed with doubts about the incredible quantity of newly described species and genera of fungi in Bohemia. For that reason, Dr. Svrček considered it absolutely indispensable to review Velenovský's taxa of the Czech Discomycetes and published revision of *Orbilia* in 1954, *Peziza* in 1976, operculate Discomycetes in 1979 and inoperculate Discomycetes in 1985. This meticulous work, as well as his long-year experience and notes on ecology, gathered during his collection activities, enabled him to compile the Catalogue of operculate Discomycetes (Pezizales) of Czechoslovakia (1981) including short ecological notes and a classification of all species according to their ecotopes. A similar catalogue of inoperculate Discomycetes is now being prepared by him. In this short commemoration of Dr. Svrček's anniversary, we will not go into details of his work for the Czechoslovak Scientific Society for Mycology, his being an honorary member of it and member of its commitee or his long-year activities (since 1957) as chief editor of Česká mykologie. We mention only shortly Dr. Svrček's work during excursions, mycological meetings and conferences organized by the Czechoslovak Scientific Society for Mycology. He is also chairman of the Division of Micromycetes that has organized several seminars during the past years and published three volumes of proceedings.

One of the important activities of Dr. Svrček has always been his help to young mycologists and students of mycology. Many years after he had graduated from University he returned back to the place where he had started his scientific career as an opponent to dissertations and theses. In the National Museum he provides valuable consultations to students and postgraduate students not only from Prague University, but also from the Universities of České Budějovice, Brno

and Bratislava. The basic manual for students on excursions, but also for a larger public interested in the matter, is the Key for identification of nonvascular plants compiled by a team of specialists and edited by Dr. Svrček.

As has been mentioned earlier, Dr. Svrček, although retired, comes regularily to the National Museum to continue his work on Czech and Slovak Discomycetes. These fungi, as well as gilled fungi, were objects of a number of papers he published in the past years in international journals as Sydowia or Zeitschrift für Pilzkunde. Large papers on Discomycetes were published together with H. Engel in the series Beiträge zur Pilzflora der NW Oberfranken (since 1983). In 1987, he spent four weeks in Finland, where he had been invited to by the University of Turku. This time was also used for studying herbaria at the University of Helsinki and for a short stay at Kevo biological station, situated as far as within the polar circle. In 1992, he was invited by English mycologists to take part in the 11th Congress of European Mycologists in Kew, where he read a paper on Czechoslovak Discomycetes. Since 1981, he has regularly took part in excursions organized by the Group of Mycology of the House of Culture in Plzeň in order to study the mycoflora of Western Bohemia, and mainly of its numerous nature reserves. In 1994, he was one of the leaders of the excursion organized at the occasion of a visit of two leading world mycologists, Prof. D. L. Hawksworth and Prof. O. E. Eriksson.

In this brief retrospective of Dr. Svrček's important life jubilee, we have tried to present him as a mycologist interested in collecting and the laboratory study of many groups of fungi during his entire professional life. Dr. Svrček's universality, together with his kindness and modesty, have made him an pleasant and popular companion on all botanical and mycological excursions. He has become a well-known personality also among mycologists grouped around the Časopis českých a slovenských houbařů (Journal of Czech and Slovak Mycologists) and in the Czech Mycological Society. For that reason, he was elected honorary member of this Society in 1989 with the right to carry the distinction of the Golden Cantharellus.

In the beginning, the elder of the authors of this paper mentioned the remote beginnings of his contacts with Dr. Svrček. These contacts were developed only after the Liberation in 1945 during common studies, common excursions and in the Czechoslovak Scientific Society for Mycology founded at that time. The welding link of their relation was their common enthusiasm for mycological research and their mutual respect and consideration based on the friendly characters of both partners. The mentioned characters helped their friendship to deepen in favour of both of them and of mycology as well. Therefore, thanks for the common moments full of comprehension. All of us who know Dr. Svrček wish him further joyful years with the fungi!

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CZECH MYCOL. 49 (1), 1996

To commemorate the seventieth birthday of Jan Nečásek

PETR PIKÁLEK

Last year the famous Czech geneticist and mycologist Jan Nečásek celebrated his seventieth birthday. He was born on 12 May 1925 in Prague. Graduated from Charles University, at its Faculty of Science, in 1948, he took an essencial part in the development of Czechoslovak biology, especially in the field of genetics and mycology, in the second half of the twentieth century.

He started as assistant professor at the Institute of Genetics at Charles University, Faculty of Science. As the successor of prof.Karel Hrubý, the founder of the Czechoslovak Genetics School after the Second War, he focused his interest on genetic studies of the individual variability of higher Fungi (e.g. studies of variability in the spore length of *Coprinus fimetarius*). After a relatively short period of two years he changed the domain of his activity and went to the research group of Biogena, Roztoky near Prague (later the name of this institution changed to the Research Institute of Antibiotics and Biotransformations). He worked here for ten years, in the field of applied microbial genetics and mycology, as the Head of its Department of Microbiology. He focussed his interest here on genetic studies of the production of antibiotics and other microbial products by fermentation. Having reached some important successful results in this sphere he was awarded the Medal of Honour of the Czechoslovak Ministry of Health in the year 1955. Amongst important scientific publications by Jan Nečásek from that period his participation on the monograph "Antibiotika" (Herold, Vondráček, Nečásek & Doskočil, Nakl. ČSAV, Prague 1957) is worth mentioning.

In the year 1961 Jan Nečásek returned to Charles University, Department of Microbiology & Genetics. He came back as a mature and experienced scientist. He continued the same important and fruitful activity of his life as a university teacher here. After the tragical death of the Head of the Department, prof. Karel Hrubý, in 1962, Jan Nečásek became the leading geneticist not only at the Faculty of Science, but also, gradually, in the whole Czechoslovakia. In those years he focused his scientific interest mainly on the problems of experimental mutagenesis in Bacteria and Fungi. However, not only these questions stood in the centre of

his scientific interest. Besides other problems he was studied, for example, the genetic aspects of fruit-body production in *Coprinus sterquilinus*, the genetic base of the origin of mutants with reduced mycelial growth rate in *Coprinus cinereus* (his habilitation thesis), and quantitative genetic aspects of the resistance of *Schizophyllum commune* to the proteosynthetic inhibitor cycloheximide.

Czech mycologists consider Jan Nečásek a mycologist. He himself, however, consider himself first of all a geneticist, working in the genetic sphere of experimental mycology. The importance of Jan Nečásek for Czech genetics may be illustrated by another book of his, the famous university text-book "General Genetics" (Nečásek, Cetl et al., SPN, Prague 1979), which – already from the second edition – has become the main text-book for genetics teaching in Czech Republic till now.

In the year 1980 Jan Nečásek left Charles University and became the leading research worker at the South-Bohemian branch of the Institute of Experimental Botany of the Czechoslovak Academy of Science in České Budějovice (lately transformed into the independent Institute of Plant Molecular Biology of the Czechoslovak Academy of Science). He studied questions of genetic engineering of plants there. It must be said that his mycological activities were strongly reduced in that period. He has actively worked there up to the year 1995.

Not only the scientific and/or pedagogical activities of Jan Nečásek are remarkable, but also his "social" and organizational activities were extraordinarily extensive. In the years 1969–1978 he was the Head of the Department of Genetics, Microbiology & Biophysics at the Faculty of Science, Charles University (besides he also held the function of Vice-Dean of the Faculty from 1971 to 1974). He was the founder of the origin of the Section for General Genetics of the Czechoslovak Biological Society, and for a long time he was its first chairman. He also acted as the first president of the Czechoslovak Gregor Mendel Genetic Society, in which this Section was later transformed. He is the honorary president of this Society up to the present. Moreover, Jan Nečásek is a very active member of the Czechoslovak Microbiological Society. Mycologists, however, know Jan Nečásek as the extraordinarily active member of the Czech Scientific Society for Mycology – he took a part in its central committee untill 1982. In the past he also participated in the activities of the editorial boards of the journals Česká mykologie and Biologické listy. He is the holder of the Golden Medal of Johann Gregor Mendel of the Czechoslovak Academy of Science, of the Memorial Medal of Johann Gregor Mendel, which is awarded by the Moravian Museum in Brno, and of the Golden Medal of the Faculty of Science of Charles University in Prague.

Jan Nečásek is the author of more than a hundred publications, including scientific papers, books and text-books, lectures, referative papers, semi-scientific articles and others. His scientific and pedagogical activities, including his publications, are appreciated not only in the Czech Republic, but abroad as well.

It is a pleasure for me, as for the one from his past close co-workers, to have the chance to wish Jan Nečásek good physical health and mental vigour for the long time to come – on behalf of all his 3-F (fans, friends and followers).

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Book review

S. S. TZEAN, S. C. CHIU, J. L. CHEN, S. H. HSEU, G. H. LIN, G. Y. LIOU, C. C. CHEN et W. H. HSU:

Penicillium and related teleomorphs from Taiwan.

– 159 p., Food Industry Research and Development Institute, P. O. Box 246, Hsinchu 30099, Taiwan, R.O.C., 1994. ISBN 957-9055-17-3. 68 USD (paperback).

Penicillia, widely distributed and known fungi, are all the time drawing the attention of investigators. This pictorial atlas is 9th book in the series of Mycological Monographs prepared by workers of the Food Industry Research and Development Institute at Hsinchu, Taiwan. Some previous monographs dealed, for example, with the genera *Rhizopus* and *Aspergillus*. This book is a result of four-year research on penicillia and related teleomorphs in Taiwan. As the authors state, 4047 isolates were obtained for this study from miscellaneous substrates (soil, litter, seeds, dung, dried fruits etc.).

The book has five chapters. In the "Introduction" significance, morphology and history of the study of penicillia are shortly presented. In the following chapter material and methods are described. The chapter is completed with colour photographs of colony textures, line drawings of conidiophore types and conidia. Interesting information is included in the chapter dealing with "Occurrence and habitats" of the penicillia studied. On the basis of this study *Penicillium citrinum*, *P. oxalicum*, *P. simplicissimum* and *P. janthinellum* are considered to be the most frequent *Penicillium* species in Taiwan. A very important part are the dichotomous keys to subgenera and species based on micromorphological and macromorphological features. From the taxonomic point of view Pitt's system of the four Penicillium subgenera was followed.

The basic part of the book consist of plates and descriptions of 57 species of fungi (47 species of the genus *Penicillium*, 7 of *Talaromyces*, two of *Eupenicillium* and the in our country unknown species *Sarophorum palmicola*). Species descriptions are based on colony characters on Czapek yeast extract agar (CYA), malt extract agar (MEA), growth ability on glycerol nitrate agar (G25N) and on CYA at 5 C and 37 C. For colour nomenclature the manual by Kornerup and Wanscher was used. Microscopic features are given on MEA.Each species description is completed with excellent line drawings, colour photos of colonies, microphotographs and scanning electron microphotographs. In general, the emphasis is placed on the pictorial part of book. Unfortunately, some of the colonies have an unusual appearance (e. g. *Penicillium glabrum*) or unusual colours (e. g. blue agar on many photos). It would have been nice to have had a discussion on species, synonyms, taxonomic problems and references to related species.

The book is completed by a species index, an appendix with data sheets for the recording of important characters and a bibliography of 86 references.

The atlas has a conspicuous light pink-violet cover (20 × 28 cm) and is printed on high quality paper. Although this monograph deals primarily with penicillia in Taiwan, it is a valuable contribution to the world *Penicillium* literature. It can be recommended to all mycologists investigating soils, food and feed and many other substrates.

A. Kubátová

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Preparation of manuscripts. Manuscripts are to be submitted in English, German or French. The text of the manuscript should be written on one side of white paper (A4, 210 × 297 mm) with broad margins (maximum 30 lines per page). Each manuscript must include *an abstract* (in English) not exceeding 300 words and a maximum of five key words. The paper will be followed by an abstract in Czech (or Slovak). The journal is responsible, however, for the translation of abstracts into Czech for foreign authors. Please send *two copies* of the typescript. The authors are asked to submit diskettes with *the accepted manuscripts* prepared on IBM-compatible personal computers. The files should be in ASCII under DOS. Both HD and DD/3.5″ and 5.25″ diskettes are acceptable.

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Ryvarden L. (1978): The Polyporaceae of North Europe, Vol. 2. Inonotus-Tyromyces. – Oslo, 507 pp. (book)

Tommerup I. C., Kuek C., and Malajczuk N. (1987): Ectomycorrhizal inoculum production and utilization in Australia. – In: Sylvia D. M., Hung L. L., and Graham J. H. (eds.) Proceedings of the 7th North American Conference on Mycorrhizae, pp. 93–295, Gainesville.

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