New records of micromycetes from Czechoslovakia. II. Filobasidiella depauperata (Petch) Samson, Stalpers et Weijman

Nové nálezy mikromycetů v Československu. II. Filobasidiella depauperata (Petch) Samson, Stalpers et Weijman

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The microscopic fungus *Filobasidiella depauperata* is recorded from Czechoslovakia for the first time. It was isolated from the surface of a *Verticillium lecanii* colony obtained from mycelial overgrowth on a caterpillar of tortricid (*Carpocapsa pomonella*, Lepidoptera). The strain is maintained in the Culture Collection of Fungi, Department of Botany, Charles University, Prague, as CCF 2746. Description and illustration are given.

Z povrchu kolonie houby *Verticillium lecanii* izolované z housenek obaleče jablečného byla vyizolována houba *Filobasidiella depauperata*. Tento druh nebyl dosud v Československu zaznamenán. Kultura houby je uložena ve Sbírce kultur hub katedry botaniky Př. f. UK v Praze pod č. CCF 2746. Je uveden její popis a vyobrazení.

In 1991 the following entomopatogenous fungi were isolated from dead caterpillars of a tortricid: *Verticillium lecanii* (Zimm.) Viégas, *Beauveria bassiana* (Bals.) Vuill. and *Paecilomyces farinosus* (Holm) Brown et Smith. After some weeks small whitish sporodochia-like formations of a very slowly growing fungus were recorded on one of a *Verticillium* colony. The fungus was isolated and determined as *Filobasidiella depauperata* (after Malloch et al. 1978; Samson et al. 1983). Description of this strain is recorded below.

Filobasidiella depauperata (Petch) Samson, Stalpers et Weijman 1983

Syn.: *Aspergillus depauperatus* Petch 1931
Filobasidiella arachnophila Maloch, Kane et Lahaie 1978

Studied material:

The fungus was isolated from a surface of *Verticillium lecanii* colony obtained from a dead caterpillar of tortricid *Carpocapsa pomonella* (Lepidoptera) in XII. 1991 by A. Kubátová as No. 174/91. The caterpillars were collected on apple-trees in Holovousy, Eastern Bohemia, Czechoslovakia by P. Syrovátko in V. 1991. The strain was deposited in the Culture Collection of Fungi (CCF), Department of Botany, Charles University, Prague, as CCF 2746.

Description:

The fungus was cultivated on the following media:

- Czapek yeast extract agar (CYA),

- CYA with cca 2 % of dried and powdered *Carpocapsa caterpillars* (CYA2C),
- water agar with cca 2 % of dried and powdered *Carpocapsa caterpillars* (WA2C),
- water agar with dead mashed *Verticillium* (WAV),
- WAV with 2 % yeast extract (WAV2YE),
- wort-beer agar (WBA).

Colonies on all of the media were whitish to white, plane, velutinous, very slowly growing, with uncoloured reverse. On CYA, CYA2C and WA2C at 25°C the colonies attained about 25 µm in diam. after 30 days. On WAV and WAV2YE at 25°C the colonies attained cca 10-20 µm in diam. after 30 days. On WBA at 25°C the growth was very poor, with colonies attaining 4 µm after 30 days. At 37°C after 30 days the growth was nil.

Hyphae hyaline, septate, without clamps, sometimes swollen at the base of the sporophores, cca 1.6-2.5 µm wide, at about 5 µm in diam. at the swellings. Sporophores of clavate form with long cylindrical stipe, cca 30-80 x 4.7-5.4 µm, often growing in verticils of 2 to 4, with 4 apical sporogenous loci on the head, without sterigmata. Spores produced in chains, hyaline, oblong to pentagonal, truncate at the base, cca 3-3.9 x 2.3-2.9 µm (see figure). Budding cells known in a pathogen *F. neoformans* as *Cryptococcus* anamorpha were not observed. Chlamydospores noted by Malloch, Kane and Lahaie (1978) in *F. arachnophila* were not observed either.

Permanent mounts of *F. depauperata* in a polyvinylalcohol are preserved in the CCF.

Notes on ecology:

F. depauperata was originally described as an entomopatogenous fungus on a *Aspidiotus* sp. (Homoptera) in Sri Lanka by Petch (1931). He reported this fungus as rather abundant on *Lepidosaphes ulmi* (Homoptera) in Norfolk, England also.

Rockwood (1951) found "a pretty little *Aspergillus*, which answers to the description of *A. depauperatus* Petch (1931)" on aphids in the Pacific Northwest of USA.

Malloch et al. (1978) isolated *F. depauperata* from a dead spider in Ontario, Canada, together with *Verticillium lecanii*. Noteworthy is another strain isolated from aphids in Wageningen, The Netherlands, together with *V. lecanii* (Samson et al. 1983). Malloch et al. (1978) noted better sporulation of *F. depauperata*, when *V. lecanii* was inoculated near a colony of *F. depauperata*.

According to the above cited data and to own observations, *F. depauperata* is considered as an entomopatogenous fungus with affinity to *Verticillium lecanii*. In contrast to the dangerous pathogen *Filobasidiella neoformans*, *F. depauperata* grows very poorly or not at all at 37°C and is nonpathogenic for homoiothermic animals (Malloch et al. 1978).

Kovaľ (1974) reported *A. depauperatus* on Homoptera in Crimea, but her description of this fungus (viz. dark green colonies, ellipsoidal conidia) is not in accordance with the description presented here.

Notes on systematic position:

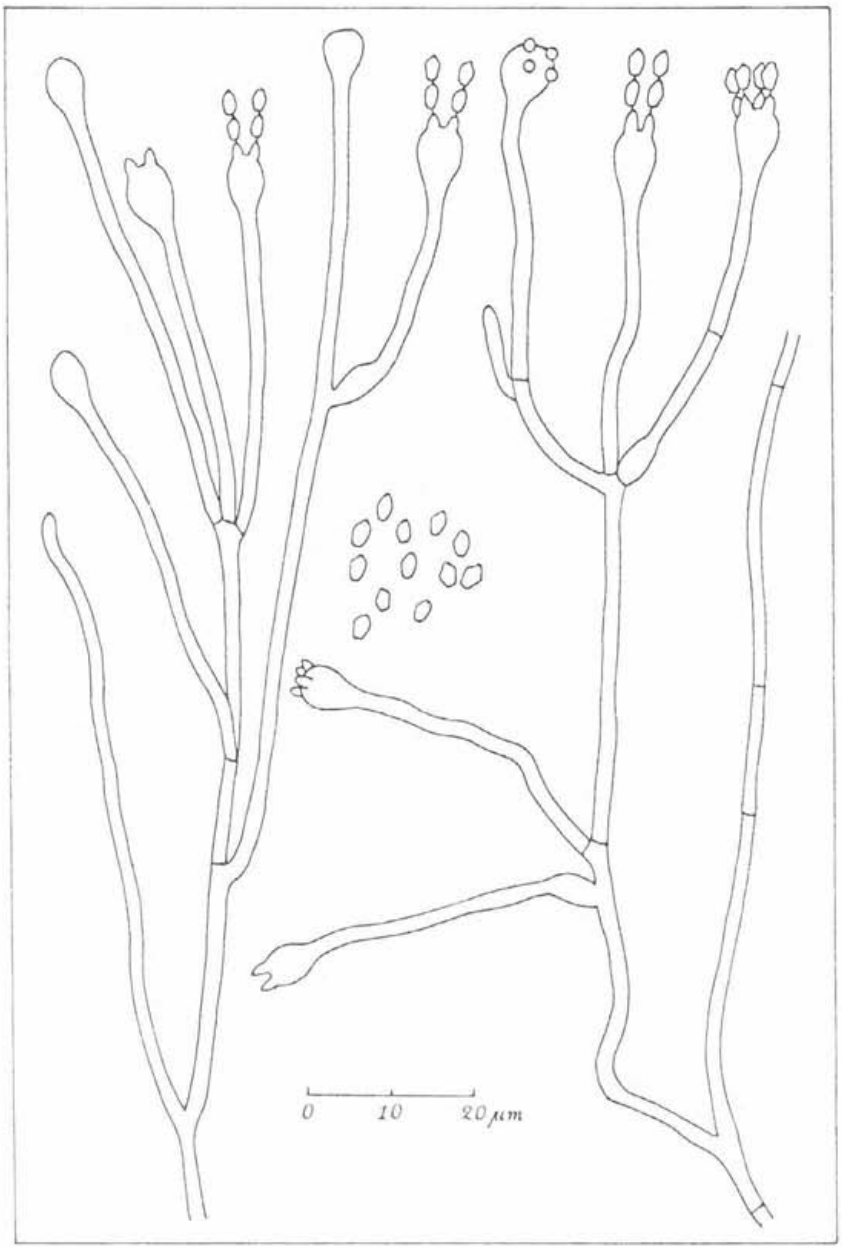
From a systematic point of view, the genus *Filobasidiella* is included in *Sporidiales, Ustilaginomycetes, Basidiomycotina* (after Hawksworth, Sutton et Ainsworth 1983). Kwon-Chung has suggested the inclusion of this genus in the *Filobasidiaceae* of the *Ustilaginales* and later a new order, *Filobasidiales* (Kwon-Chung 1975, 1987).

With regard to the morphological resemblance, Malloch et al. described *F. arachnophila* as differing from *F. neoformans* by spore shape and the absence of a yeast-like growth phase and clamp connections. Samson et al. (1983) found that *F. arachnophila* is identical with *Aspergillus depauperatus* Petch and they made, therefore, a new combination *Filobasidiella depauperata* (Petch) Samson, Stalpers et Weijman.

Khan et al. (1981), Samson et al. (1983) and Kwon-Chung (1987) have maintained the accomodation of *F. depauperata* in the genus *Filobasidiella*, but they have accepted it with some reservations:

- *F. depauperata* has sporogenous structures strongly resembling basidia of *F. neo-formans* and its spores are produced in chains as those of *F. neoformans* (they are not discharged) but *F. depauperata* lacks clamp connections and yeast like growth phase.
- After Khan et al. (1981), who investigated the ultrastructure of *F. arachnophila* by transmission and scanning electron microscopes, the septa in *F. depauperata* have dolipores with septal swellings, without the pore caps, resembling the septal pore apparatus of *F. neoformans* and some yeast-like fungi. The type of spore formation in *F. depauperata*, however, is enteroblastic; in *F. neoformans* the spore formation is holoblastic. These authors also reported the inability of *F. depauperata* to hydrolyze urea, oxidize phenolic compounds, and synthesize starch (physiological features characteristic of *F. neoformans*).
- According to Samson et al. (1983), the carbohydrate profile of two investigated strains of *F. depauperata* revealed basidiomycetous affinities. On the contrary, the vast majority of the mycelial cells are monocaryotic, demonstrating that *F. depauperata* is not a typical basidiomycete.

Regarding Samson et al. (1983), further genetic studies are required to determine whether the spores are sexual or not and thus whether the fungus is an anamorph or a teleomorph. On the basis of the above mentioned facts, the generic position of *F. depauperata* is considered to be uncertain.



Filobasidiella depauperata (Petch) Samson, Stalpers et Weijman, strain CCF 2746 grown on CYA, sporophores with spores.

A. Kubátová del.

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