Dactylella shizishanna sp. nov., from Shizi Mountain, China

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A new species, Dactylella shizishanna, is described from Hubei province, China and compared with the similar species of Dactylella crassa. A key to the species of Dactylella producing adhesive nets is given.

Keywords: Dactylella, new species, predacious fungi

Introduction

Following phylogenetic analysis of the 18S rDNA, 5.8S rDNA, ITS1 and ITS2 sequences, Scholler et al. (1999) proposed a new generic concept for predatory anamorphic Orbiliaceae (Ascomycota) in which the trapping device is the main morphological criterion for delimitation of the genera. Four genera were defined: Dactylellina, forming stalked adhesive knobs or non-constricting rings and adhesive knobs; Gamsylella, producing adhesive columns and unstalked knobs; Arthrobotrys, forming an adhesive network; and Drechslerella forming constricting rings. Non-predatory species were classified among Dactylella and Gamsylella and 51 new combinations were proposed. Trapping devices also provide the main morphological basis for delimiting species. The classification outlined by Scholler et al. (1999) has yet to be stabilized, and is not commonly accepted. For example, Dactylella arcuata Scheuer & J. Webster, which has adhesive networks and adhesive knobs on the conidia, was combined in Gamsylella where species form stalked adhesive knobs (Scholler, 1999).

During a survey of nematophagous fungi in China, soil samples from Shizi Mountain, Hubei Province were sprinkled on to corn meal agar (CMA) inoculated with the free-living nematode, Paragrellus redivius. After about one month, a fungus with multisepate, clavate conidia and net trapping devices

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was discovered. It resembled *Dactylella crassa* Miao, Lei & Liu (Miao et al., 1999). However, a detailed study of our isolate and comparison with *D. crassa* clearly indicate that the fungi differ in conidial type, size and number of septa. Consequently, a new taxon is introduced to accommodate this new taxon. We follow the traditional view for the genera of *Arthrobotrys*, *Dactylella* and *Monacrosporium* which has been widely accepted and used (Cooke and Dickinson, 1965; Castener, 1968a,b; McCulloch, 1977; Schenek et al., 1977; Van Oorschot, 1985; Rubner, 1996; Liu and Zhang, 1994; Zhang et al., 1994). We therefore introduce the new fungus in *Dactylella* rather than in *Arthrobotrys*.

**Dactylella shizishanna** X.F. Liu & K.Q. Zhang, *sp. nov.* *(Figs 1-13)*

**Etymology:** in reference to Shizishan, the place where the soil samples were collected.

*Coloniae* in extracto granorum zaeae maiides cum agar albidis. *Mycelium* sparsum, *Hyphae* hyalinae, septatae, ramosae, *Conidiophora* erecta, septata, hyalina, simplicia vel ramosa, 35-200 µm altae, basi 1.5-2.5 µm crassae, sursum leniter attenuatae, apice 0.5-1 µm crassae, ibi unum conidium ferentes. *Conidiis* hyalinis, clavatis, rectis vel leniter curvatis, alquod constricta in septum 22.5-74 × 5-10 µm, 2-9-septatis, praecipue 3-7-septatis. *Reticula* tenacia quae vermiculos nematodeos capiunt evolventibus. *Chlamydosporis* in culturis vetustioribus.

*Colonies* on CMA whitish, slow growing, extending 3.5 cm in diam. in 15 days at 25ºC, aerial hyphae scant, hyaline, septate, branching, commonly 2.5-3.7 µm wide. *Conidiophores* growing from mycelium on the substratum, single, erect, rarely branched, 35-200 µm high, 1.5-2.5 µm wide at the base, tapering upward gradually to a distal width of 0.5-1 µm, and bearing a single conidium. *Conidia* colourless, clavate, gradually narrowing at the basal end, obtuse at the distal end, straight or sometimes slightly curved, sometimes constricted at septa, (2-)3-7(-9)-septate, 22.5-74 × 5-10 µm (mean 50.6 × 6.6 µm). The proportion of conidia with 3, 4, 5, 6 and 7 septa is 10%, 30%, 33%, 18% and 6%, respectively. The predacious organ exhibits a three-dimensional adhesive network. *Chlamydospores* formed in older cultures.

*Holotype:* CHINA, Hubei Province, Wuhan, Shizi mountain, 8 November 2001, Herbarium of Laboratory for Conservation and Utilization of Bio-resource, Yunnan University [YMF W7244021].

The morphology and trapping devices of *D. shizishanna* resemble those of *Dactylella crassa* (Miao et al., 1999). However, *D. crassa* forms both macrocondia and microcondia, and single spore isolation from either kind will give cultures that produce both spore types. In contrast, *D. shizishanna* forms only one type of conidium. The conidial width in the two species also differs greatly (*D. shizishanna* 5-10 µm wide, *D. crassa* 10-13 µm). The conidia of *D. shizishanna* are 2-9-septate (mainly 3-7-septate), whereas those of *D. crassa* are 1-5-septate (mainly 3-4-septate).
Figs 1-13. *Dactyllela shizishanna* X.F. Liu & K.Q. Zhang sp. nov. 1-2. Conidiophores. 3. Chlamydospore. 4-11. Conidia. 12. Germinating conidium. 13. Adhesive network. Bars. 1, 2 = \( \mu m \), 3 = \( \mu m \), 4-12 = \( \mu m \), 13 = \( \mu m \).
Key to *Dactylella* species producing adhesive networks

1. Producing two types of trapping devices: three-dimensional adhesive network and a sticky knob at the tip of mature conidia. Conidia fusiform, commonly 3-septate, (30-)35-54 µm × 4-6 µm.......................................................... *D. arcuata*
   1. Producing only three-dimensional adhesive network.............................................. 2

2. Only one type of conidium. Conidia clavate, 2-9-septate, mainly 3-7, 22.5-73.8 × 5-10 µm .......................................................................................................................... *D. shizishanna*
   2. Two types of conidia (macroconidia and microconidia) produced............................. 3

3. Macroconidia 1-5-septate, mainly 3-4-septate, clavate, 44.5-60 × 10-13 µm; microconidia clavate, occasionally 1-septate, 22-30 × 4-5 µm....................................................... *D. crassa*
   3. Macroconidia 4-12-septate, secondary conidia commonly formed......................... 4

4. Macroconidia clavate to cylindric-clavate, non-branched, 35-90 × 4-7.5 µm; microconidia clavate, non-septate, 15-17 × 5 µm......................................................... *D. multiformis*
   4. Macroconidia fusiform, commonly 1-2 branches, 47.5-155 × 7.5-16.5 µm; microconidia 0-1-septate, cylindric, fusiform, 24-47.5 × 3-5.3 µm....................................................... *D. iridi*

Acknowledgements

The project was supported by the National Natural Science Foundation of China, 30230020, 30070006. E.H.C. McKenzie is thanked for critically commenting on the manuscript. L. Cai is thanked for helpful suggestions on the manuscript.

References


Fungal Diversity


(Received 9 January 2003; accepted 10 June 2003)