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SHORT COMMUNICATION

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A new species of *Dinemasporium* from sugar cane on Irabujima island, Japan

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Abstract *Dinemasporium longicapillatum* sp. nov., isolated from a decaying leaf of sugar cane collected in Irabujima island, Japan, is described and illustrated. It is similar to *D. strigosum* and *D. strigosulum* in conidial length/width ratio, but differs mainly in its smaller conidia and longer conidial appendages.

Key words Appendage length · Conidial lengh/width ratio · *Dinemasporium longicapillatum*

Dinemasporium spp. have been isolated from various plant species belonging to the Saxifragaceae, Fagaceae, Aceraceae, Simaroubaceae, and Gramineae (Matsushima 1995; Nag Raj 1993). In the course of studies on biologically active substances of fungi, fungal strain FKA-1 was isolated from a decaying leaf of sugar cane (*Saccharum officinarum* L.). Taxonomic investigation revealed that the isolate belonged to the genus *Dinemasporium*. In this study, the conidial characteristics of strain FKA-1 are compared to those of two closely related congeneric species, *Dinemasporium strigosum* (Pers.: Fr.) Saccardo and *D. strigosulum* (P. Karst.) Matsush. It is proposed that the strain is a new species designated *D. longicapillatum*.

Fungal strain FKA-1 was isolated from a decaying leaf of sugar cane collected on Irabujima island, Japan. The leaf was washed with Aerozol OT solution (Harley and Waid 1955) with some modifications (Tokumasu 1978, 1980). The strain (MAFF239569) is deposited and preserved with liquid nitrogen in National Institute of Agrobiological Sciences in Tsukuba, Ibaraki, Japan. The dried specimen as holotype is deposited in National Science Museum, Tsukuba, Japan. The authentic strains for *D. strigosum* ATCC 200690, *D. strigosum* MAFF237988, and *D. strigosulum* MFC-3J601 were obtained from the American Type Culture Collection (ATCC) (Rockville, VA, USA), MAFF (Ibaraki, Japan), and Shionogi Microbiology & Culture Collection (Osaka, Japan), respectively. These strains were cultured on rice straws (*Oryza sativa* L.) according to the agar-leaf disk method (Kishi 1995) under near-ultraviolet radiation (Yamaguchi et al. 2002). The pycnidia produced on the rice straw were sectioned using a Cryostat (Leica, Nussloch, Germany) according to the method described by Yamaguchi et al. (2002). Morphological observations were carried out under a light microscope (Vanox-S AH-2; Olympus, Tokyo, Japan) from specimens mounted in a drop of Shear's mounting medium, and a scanning electron microscope (SEM; JSM 5600, JEOL, Tokyo, Japan) from specimens fixed with the vapor from crystalline OsO_4 and coated with gold using a JFC-1200 Fine Coater (JEOL).

Taxonomic descriptions

Dinemasporium longicapillatum Y. Yamaguchi & Masuma, sp. nov.

Figs. 1–5

Sporodochia, dispersa, interdum gregaria, superficialia, cupulata, setifera, 150–450 μm in diametro. Setae simplices, subulatae, apice acutae, 5–7-septatae, atro-fuscae, usque ad 600 μm longae. Conidiophora arcte fasciculata, ramosa, laevia, hyalina, usque ad 50 μm longa. Cellulae conidiogenae phialidicae, cylindricae, 12–15 × 2.0–2.5 μm. Conidia fusiformia, allantoidea, recta vel leviter curva, obtusa, laevia, hyalina, in massa lactea vel pallide rosea, mucosa, 8–11 × 2.0–2.7 μm, apice utrinque capillolongosimplici 11–20 μm longo praedita.

Holotypus: Japan :TNS-F 11621 (dried specimen), Sarahama area, Irabujima island, Okinawa Prefecture

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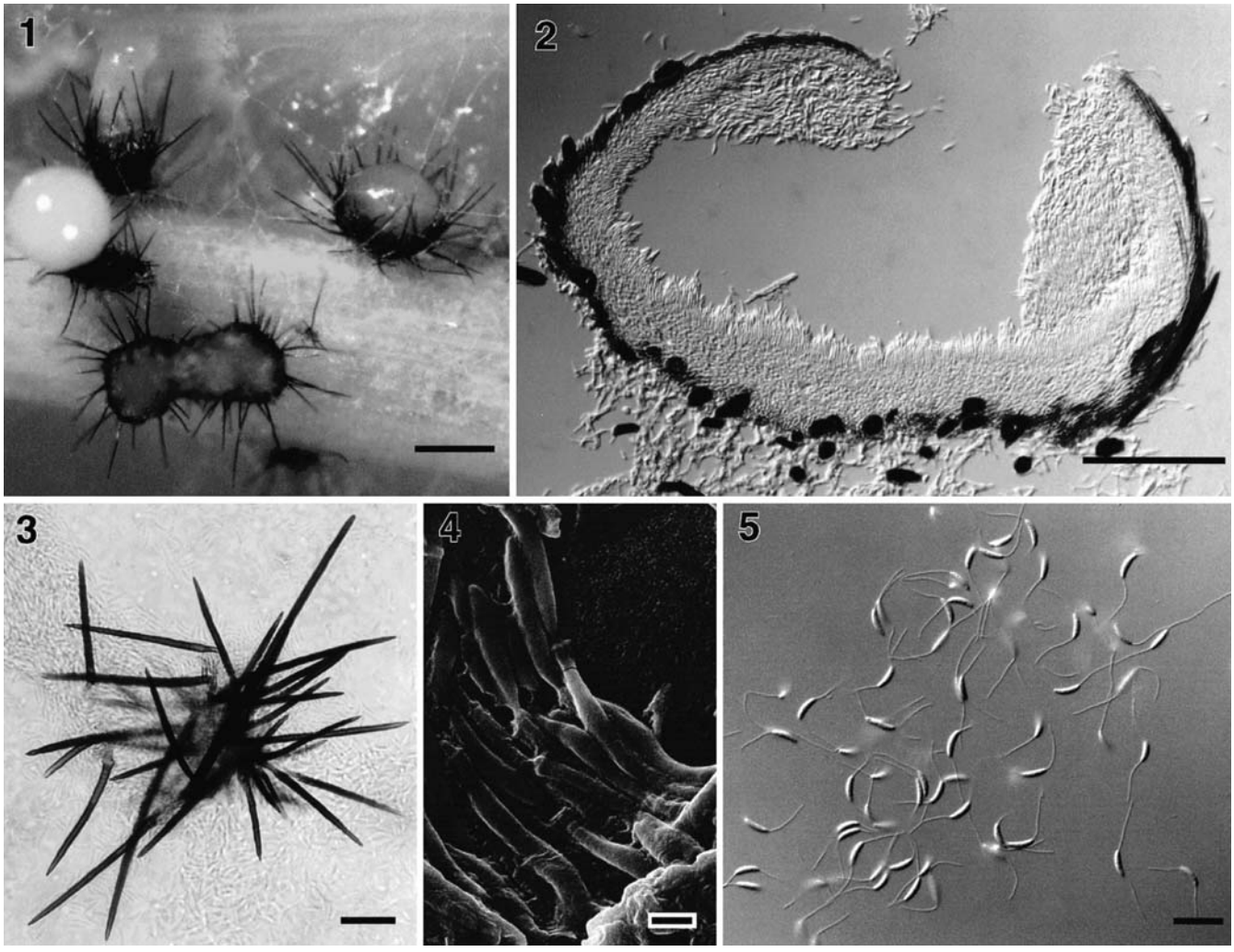

Figs. 1–5. Mycological characteristics of strain FKA-1. **1** Conidiomata on a turf (agar-leaf disk method). **2** Cross section of conidioma. **3** Conidiomatal setae. **4** Conidiogenous cells and developing conidia. **5** Conidia with long appendages. *Bars* **1** 300 μm; **2** 100 μm; **3** 30 μm; **4** 2 μm; **5** 20 μm

on *Saccharum officinarum* (sugar cane), Aug. 1999, col. Y. Yamaguchi.

Conidiomata were stromatic, scattered or occasionally gregarious, beaklike in form to cupulate, superficial or basally immersed, unilocular, 150–450 μm in diameter, dark brown to black, and setose (Fig. 1). The basal stroma of the conidioma consisted of a pale brown "textura angularis," extending at the sides and upwards as a colorless tissue to form an excipulum. Conidiomatal setae arising from the excipula (Figs. 1, 2) or the basal stroma (Figs. 2, 3), subulate to subcylindrical, unbranched, with 5 to 7 septa, brown to dark brown in color, up to 600 μm long. Conidiophores lining the inner concavity of the conidioma, with a few septa and slightly branched on the central elements of basal stroma, and extensively branched and septate on the side of excipulum, up to 50 μm long (Fig. 3). Conidiogenous cells were subcylindrical to cylindrical enteroblastic, with a cup-shaped collarette at the apex, and 12–15 × 2.0–2.5 μm in size (Fig. 4). Conidia (Fig. 5) were fusiform to allantoid or ellipsoidal, apex obtuse, unclearly truncate, unicellular, hyaline, milkwhite to pale rose colored in a slimy mass, smooth, guttulate, and 8–11 × 2.0–2.7 μm (mean conidial length/width ratio = 4.1:1) with a single, unbranched, tubular appendage at each end. Appendages (Fig. 5) were 11–20 μm long and almost centric. These characteristics suggest the fungus on this strain belongs to the genus *Dinemasporium*. Furthermore, conidial size, conidial length/width ratio, and appendage length of strain FKA-1 were compared with those published previously for *Dinemasporium* spp. (Matsushima 1995; Nag Raj 1993). From their data it was apparent that strain FKA-1 was related to both *D. strigosum* (conidial size, 8–10 × 1.5–2 μm; appendage length, 8–13 μm; conidial length/width ratio, 5:1) and *D. strigosulum* (conidial size, 9–11 × 2–2.5 μm; appendage length, 7–10 μm; conidial length/width ratio, 4:1). Conversely, practical examination of conidial size (Fig. 6) and appendage length (n = 50) (Fig. 7) revealed that strain FKA-1 could be distinguished from *D. strigosum* and

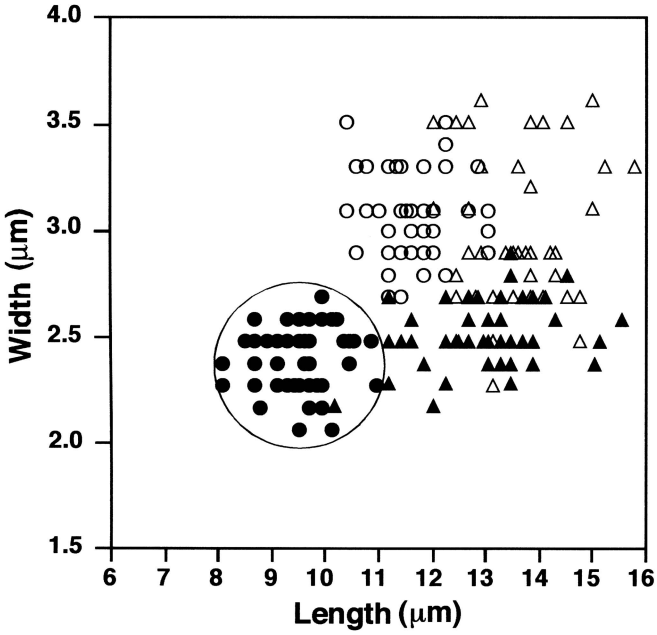

Fig. 6. Comparison of conidial size of *Dinemasporium* spp. *D. longicapillatum* FKA-1 (●), *D. strigosum* ATCC 200690 (△), *D. strigosum* MAFF 237988 (○), and *D. strigosulum* MFC-3J601 (▲)

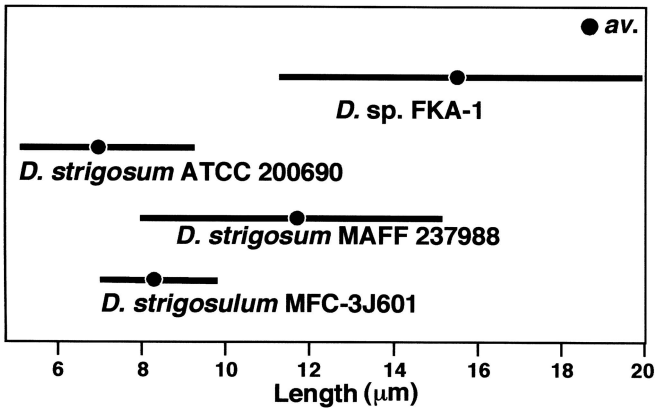

Fig. 7. Comparison of conidial appendage among *Dinemasporium* spp.

D. strigosulum. It is proposed that strain FKA-1 accomodates a new species designated *D. longicapillatum*.

As for other characteristics, conidia of *D. strigosum* are apparently truncate whereas those of *D. longicapillatum* are less truncate. Although the extent to which conidia are truncate is not a definitive characteristic involved in the classification of *Dinemasporium* spp. (Nag Raj 1993), it might be a character that can be used to distinguish between *D. longicapillatum* and *D. strigosum*.

The genus *Dinemasporium* has been isolated from many plant genera (Nag Raj 1993; Sutton 1980): *D. cytosporoides* (Sacc.) B. Sutton from *Deutzia*, *Fagus*, and *Ulmus*; *D. desipiens* (De Not.) Sacc. from *Acer*, *Ailanthus*, *Amorpha, Caragana*, *Celtis, Ulmus*, *Fraxinus*, *Morus*, *Populus*, and *Salix*; *D. rhodophaeum* Speg. from *Phragmites*; *D. strigosum* from *Agrostis*, *Cynodon*, *Dactylis*, and *Stipa*; and *D. strigosulum* from *Oryza* straw (Matsushima 1995). Similar to *D. strigosum* and *D. strigosulum*, *D. longicapillatum* was isolated from the family Gramineae.

When cultured using the agar-leaf disk method (Kishi 1995), *D. strigosum* and *D. strigosulum* only developed conidiomata on the leaves of members of the family Gramineae, rice straw, and sugar cane. However, in addition to these, *D. longicapillatum* also grew on poplar twigs and rose and gardenia leaves. *Dinemasporium longicapillatum* has different substrate requirements for morphogenesis when compared to *D. strigosum* and *D. strigosulum*.

No secondary metabolites have been reported from *Dinemasporium*. Diketopiperazine macrophominol, originally reported as being a phytotoxic compound responsible for causing black bean plant root rot, produced by *Macrophomina phaseolina* (Tassi) Goid. (Trigos et al. 1995), was isolated from the culture broth of strain FKA-1 (data not shown). Although the effect of *D. longicapillatum* on the host plants has not been studied, the production of macrophominol by *D. longicapillatum* might be involved in pathogenicity to plants.

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