

Fungi of Delhi. XXXIV

Zygorhynchus japonicus, a new record from India and its hyperparasite

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Zygorhynchus japonicus was isolated from decaying leaves of *Corchorus olitorius*. This is a new record from India and a second report after its isolation. *Aspergillus flavus* was observed to parasitize it quite frequently and distinctly.

INTRODUCTION

Numerous fungi were isolated from the decaying leaves of *Corchorus olitorius* including a number of *Mucorales*. Among them *Zygorhynchus japonicus* Kominami was also isolated. This forms a new record from India and is a second report of its isolation. In isolation plates *Aspergillus flavus* was frequently observed to overgrow and parasitize the colonies of *Z. japonicus*. When the sporangiophores were mounted and observed the hyphae of *A. flavus* were found often growing inside the sporangiophores of *Zygorhynchus*. There are several reports of *Mucorales* being parasitized by fungi other than *Aspergillus* sp.

MATERIALS AND METHODS

Pure cultures of *Zygorhynchus japonicus* and *Aspergillus flavus* isolated from decaying leaves were maintained on Czapek's-Dox agar. The mycoparasitism in Petri dishes was studied by inoculating them at a distance as is done for studying antagonism (Heuvel 1970). The plates were incubated for four days at $23 \pm 1^\circ\text{C}$. The sporangiophores, where *A. flavus* overgrew them were mounted and observed under the microscope.

RESULTS AND DISCUSSION

Fast growing colonies *Zygorhynchus japonicus* Kominami (Mycol. Centralbl. 5: 3, 1914) filling the plates in three days on Czapek's-Dox agar. Sporangiophores

colourless to white in mass, smooth, septate 6-1.5mm in diameter, variable in length up to 1 cm. Sporangia spherical, yellowish brown, dehiscing at maturity, 45-55 μm in diameter. Columella 25-35 20-30 μm . Sporangiospores elliptical to oval, smooth, colourless, variable in size, 5-11 x 4-6.5 μm . Chlamydospores absent. Zygospores heterogametic, brown to black, rough, 65-85 μm , projections 2.5-3.5 μm in length; smaller suspensor straight and short up to 15 μm long; larger suspensor curved to straight sometimes ending in pyriform swelling, 25-30 μm long, with varies. Homothallic. (Fig. 1 a,b).

This fungus was first described from soil from Kamakoura, Japan. According to Hesseltine et al.(1969) type is unknown. Our isolate closely resembles the description given by K o m i n a m i (1914).

The hyphae of *Zygorhynchus japonicus* and that of its hyperparasite, *Aspergillus flavus*, are quite distinct from each other. The sporangiophores of *Z. japonicus* are much than the hyphae and conidiophores of *A. flavus*. Hyphae of *A. flavus* were observed to overgrow the sporangiophores of *Z. japonicus*. At places the hyphae were found to grow parallel to the sporangiophores (Fig.1c). Later it penetrated through lysed walls and proliferated inside (Fig.1d,e). Eventually the protoplast of sporangiophores shrank and the cells finally collapsed.

Although the mechanism of parasitism was not determined in this experiment, investigations by other workers (Dennis, Webster 1971; Jones et al. 1974) show that penetration is possible only through disintegration of host wall by the action of enzyme or antibiotics. In the present case the lysed walls of sporangiophores indicate the dissolution of host cell wall by the parasite, which is likely as *A. flavus* is well known to produce a complex of cellulases (Ojutiola 1976). Moreover, the broader sporangiophores are easily penetrated the thin hyphae parasite. Physical factors and the size of the host hyphae has been suggested to be involved in penetration (Bharat Rai 1980; Dwivedi, Arora 1978).

Thus it is likely that *A. flavus* grows over *Zygorhynchus japonicus* and penetrates it by dissolving its cell walls, resulting in the death of *Zygorhynchus*.

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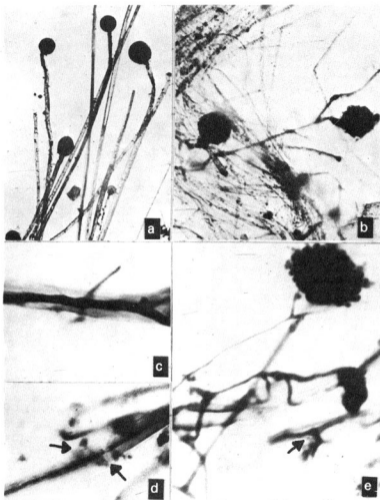


Fig. 1. *a* - sporangiophores and sporangia of *Zygorhynchus japonicus* (x 200); *b* - zygospores of *Z. japonicus* (x 125); *c* - hyphae of *Aspergillus flavus* hyperparasitizing *Z. japonicus*; *d* - lysed wall of sporangiophore (arrow); *e* - *A. flavus* penetrating sporangiophore of *Z. japonicus* (arrow)