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Scientific Note

Additions of three hyphomycetous fungi to the hyphomycetes of Pakistan

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Abstract

Hyphomycetous fungi *Asteromyces cruciatus,* a laboratory contaminant, *Gyrothrix dichotoma* from the fallen bottle brush branch and *Wiesneriomyces javanicus* from the deteriorating and decaying leaf of *Holstonia scholaris* a new host, were identified/ recorded for the first time from Rawalpindi, Pakistan.

Key words: Hyphomycetes, Taxonomy, *Asteromyces cruciatus, Gyrothrix dichotoma, Wiesneriomyces javanicus*

Adição de três fungos hyphomycetous aos hyphomycetes do Paquistão

Resumo

Os fungos Hyphomycetous *Asteromyces cruciatus*, um contaminante laboratório, *Gyrothrix dichotoma* que acomete ramos em solo e *Wiesneriomyces Javanicus* fungo de deterioração e incidente em folhas caídas de *Holstonia scholaris* um novo hospedeiro, foram identificados/ registrados pela primeira vez em Rawalpindi, Paquistão.

Palavras-chave: Hyphomycetes, Taxonomia, *Asteromyces Cruciatus*, *Gyrothrix dichotoma, Wiesneriomyces Javanicus*

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In Asia, Pakistan high mycological biodiversity is saved but relatively few studies were undertaken. In Pakistan, saprophytic mycoflora consist of large number of fungi. However, information about their distribution in Pakistan areas is still lacking. Hyphomycetes are saprophytic mycoflora having asexual reproductive structures mode, producing on substrate without enclosing tissues (lack closed fruiting bodies) and referred as an imperfecti fungi, called Deuteromycota (anamorphic fungi). Under humid weather conditions, these fungi grow and developed their fruiting structures. Dedicated efforts of Ahmad (1956), Ahmad (1969) and Ahmad et al. (1997) broadly covered the whole areas of Pakistan for saprophytic fungi but the detailed indigenous mycoflora of different parts of the country have not yet be explored. The objective of the study is to explore the mycoflora of Pakistan.

Sampling sites: The plant litter was collected from main campus, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi (PMAS-AAUR), Pakistan and examined for the presence of various saprophytic fungi.

Collection of samples: The considered samples were bottled brush branch and deteriorating leaf of *H. scholaris.* The collected samples were brought to Plant Pathology Lab in paper bags.

Morphological and taxonomic studies: After washing with sterilized water, these samples were incubated in moist chamber on blotter paper in Petri dish plates at room temperature during summer season of 2010. These were studied in water and then in lacto-phenol mount under the Nikon microscope (X400), and identified by following and comparing these with the available existing literature. Other literature (Sultana, 1986 & 1987; Ellis, 1971; Mirza & Quereshi, 1978; Ahmad et al., 1997) was also consulted during this study. Hyphomycetes are difficult to indentify which requires knowledge of developmental features and skill with microscope. Seifert & Kendrick (2011) explained that hyphomycetes identified on microscopic morphology including condial, septation, shape, size, colour, arrangement of condia, conidiogenous cells and presence of sporodochia.

Asteromyces cruciatus

Colonies effuse, Light brown to darker shade and then black. Mycelium immersed and superficial, colony on potato dextrose agar (PDA) consists of thick and comparatively thin radiating, grayish patches, turns black with the production of conidia. Stroma none, Setae and hyphopodia absent. Conidiophores micronematous, mononematous, branched, or unbranched, straight or slightly flexuous, hyaline to olivaceous brown, smooth, narrow 2-3 µm thick, Conidiogenous cells clavate or broader 4-6 µm giving rise denticles 3 to many, cylindrical long, narrow toward tips 3-6 x 0.6-1 µm. Conidia long, ovoid to obpyriform or obclavate, pale to olivaceous brown, thick walled, smooth, without a germ slit, aseptate, 10-17.5 µm long and 4-6 µm thick at the broadest part (Figure1).

Material examined

It was an uninvited guest in the petri plate, isolated as laboratory contaminant (Table 1).

Date and collection number: 05-05-2010; ARID PP No. 07.

Table 1. Hyphomycetous fungi isolated from various samples collected from different locations.

Sr. No.	Fungal species	Substrate	Location	Date of collection	Collection number
1	*Asteromyces cruciatus*	Laboratory contaminant on PDA plate	PMAS-AAUR, Laboratory	05/05/2010	ARID PP No. 7
2	*Gyrothrix dichotoma*	Fallen twig of bottle brush	PMAS-AAUR, campus	05/06/2010	ARID PP No. 8
3	*Wiesneriomyces javanicus*	Deteriorating leaves of *Holstonia scholaris*	PMAS- AAUR, campus	25/06/2010	ARID PP No. 9

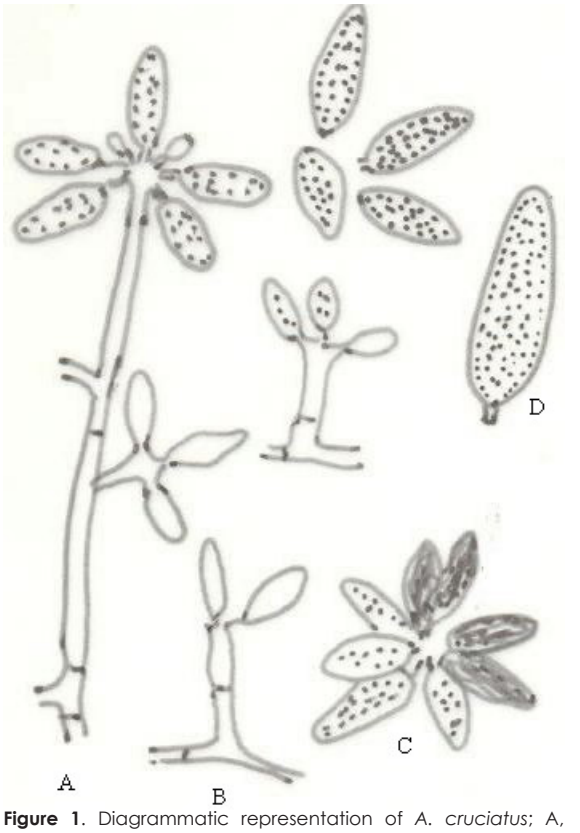

Figure 1. Diagrammatic representation of *A. cruciatus*; A, conidiophore (branched); *B, conidiophores* (unbranched); C, star shaped conidia arrangement; D, conidia (X400).

Habit and habitat:

It mostly present on dead leaves, grass stems and decomposing seaweeds in temperate climates of the world like Pakistan. On substrates it exposed to environment and conidia carried away by air (Shanthi & Vittal, 2010). *Asteromyces cruciatus* produced pentapeptide lajollamide A, and compounds regiolone, hyalodendrin, gliovictin, N-norgliovicitin and bis-N-norgliovictin which have many biological activities and antimicrobial properties (Gulder et al., 2012).

Gyrothrix dichotoma

Colonies effuse gray to dark brown or black, velvety. Mycelium superficial, partly immersed, smooth, septate, hyaline, olivaceous and growing on pseudostroma. Hyphopodia absent and conidiophores micronematous. Setae straight below, septate, slightly bulbous at the base, 1.5 µm dia and gradually tapers above to 1µm, smooth, branching, short, dichotomous and tips of branches twisted or bending, olive brown, 0.5 µm dia. Conidiogenous cells arising at the bases of setae, obclavate and polyblastic, cylindrical to truncate at their tips. Conidia straight or slightly curved at ends, hyaline or subhyaline, smooth, 6 x 2.5 µm. Conidia solitary, dry, straight, some time remain in bundles at the base, slightly curve at the tips, cylindrical in the middle, aseptate, colorless, smooth, 12-15 x 1.5-2µm (Figures 2; A and B).

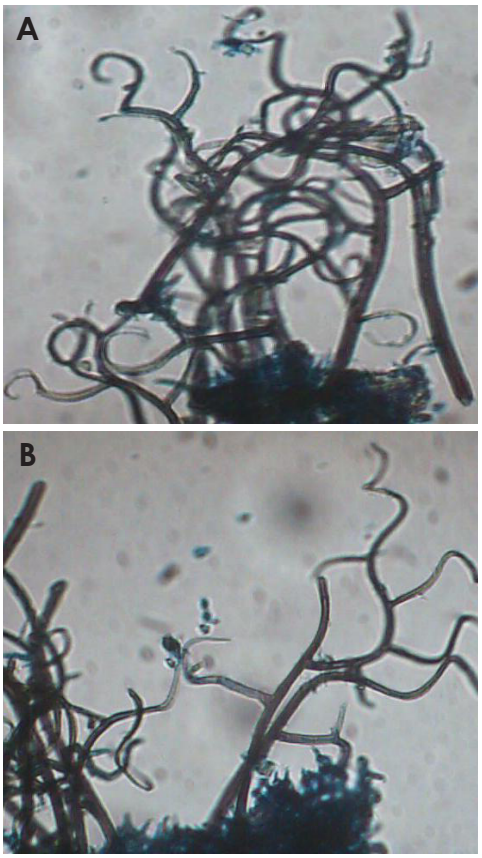

Figure 2. (A and B) G. dichotoma (X400)

Material examined:

It was studied on fallen twig of bottle brush from PMAS-Arid Agriculture University, Rawalpindi Campus (Table 1).

Date and collection number: 05.06.10; ARID PP No. 8.

Habit and habitat:

It is mostly saprobic on all types of plant debris (decaying leaves and branches).

Wiesneriomyces javanicus

Colonies effuse, sporodochia pulvinate with brown stromatic base, bearing hyaline conidiophores and golden yellow slimy conidial mass, encircled by curved dark brown setae. Setae simple, long, incurved, septate, brown, swollen at the bases 7 µm, tapering towards the

apex to 2 µm. Conidiophores macronematous, arising close to one another forming sporodochium and branched at the apex, branches straight or flexuous, hyaline, smooth. Conidiogenous cell clavate, polyblastic, discrete, three in number and each cell with two or three denticles at the apex which bear the conidial in chains with isthimi. The conidial chain with isthimi consists of seven conidia and aggregates in slimy masses, single conidium smooth, gutullate, aseptate, and the conidia remain attached to one another by narrow isthimi (Figures 3 and 4).

Material examined:

It was studied and confirmed on deteriorating leaves of *H. scholaris* a new host, PMAS-Arid Agriculture University, Rawalpindi Campus (Table 1).

Date and collection number: 25.6.2010; ARID PP No. 9.

Habit and habitat:

It is present on all type of litter, rotten leaves and twigs (Shanthi & Vittal, 2010; Ellis, 1971). This specie is widely distributed in tropics (Manoch et al., 2008).

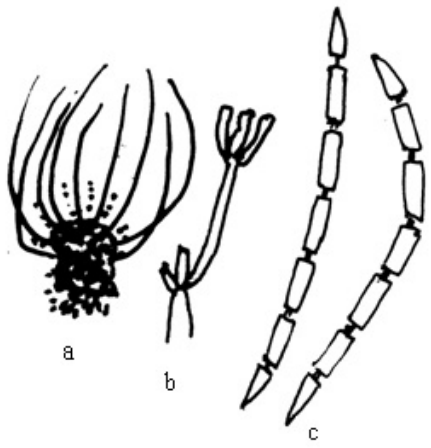

Figure 3. *W. javanicus*; a, Sporodocium; b, conidiophore and c, conidia (X400)

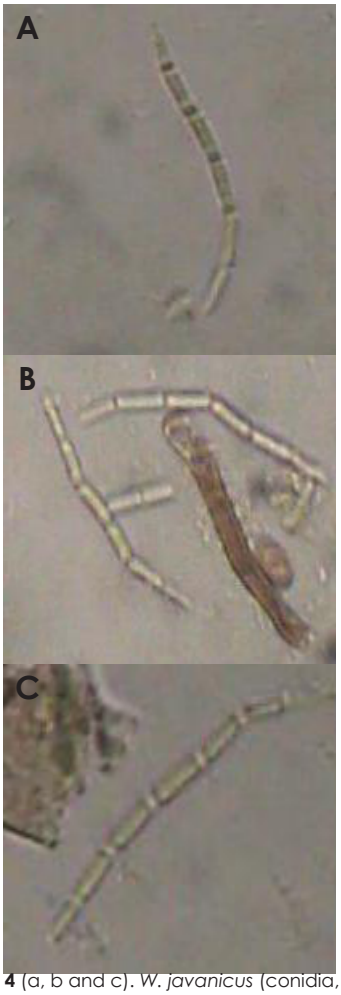

Figure 4 (a, b and c). *W. javanicus* (conidia, X400)

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