J. Mycopathol. Res. 30(2) : 167-171 (1992) *Printed in India*

Foliar fungi of mangrove ecosystem of Sundarbans, Eastern India

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A survey was conducted for the first time on leaf inhabiting fungi of mangrove plants of Sundarbans, West Bengal, India. A number of fungi were isolated from excised infected leaves and identified. In this communication an illustrated account of seven fungi growing on new hosts has been presented. Among them *Khuskia oryzae* H. J. Hudson has been reported for the first time from India.

Key words : Mangrove, foliar fungi, *Khuskia oryzae*, *Bipolaris colocasiae*.

The mangrove vegetation of Sundarbans is the largest in the world. Almost all the plants reported so far from that region are economically important. Some of them have either tremendous industrial or medicinal values. Despite extensive survey on Indian fungi, no work on foliar fungi of mangrove ecosystem of Sundarbans has been carried out so far. This survey is intended to identify the parasites of mangrove plants and also to explore other potentialities of isolated fungi. The descriptions of symptoms and causal organisms are given below :

DESCRIPTION

Alternaria alternata (Fr.) Keissler. agg. (Plate I, Fig. 6)

Leaf spots distinct, irregular, discrete, few, brown with a dark brown border, surrounded by yellowish halo, margin regular ; spots present on both surfaces

of younger and older leaves ; sometimes with shot holes, 2-12 mm length and 1.5-8 mm breadth (size of spots).

Hyphae branched, septate, thick walled, coloured ; conidiophores arising singly or in small groups, simple or branched, septate, straight or flexuous, pale to mid olivaceous, smooth, 19.5-58.5 mm long and 3.9 μm wide with conidial scars. Conidia formed in long or in branched chains, obclavate, obpyriform, ovoid or ellipsoidal, with a short beak, pale to mid-golden brown, smooth, with transverse and several longitudinal or oblique septa, 23.5-31 μm, long, 8-10 μm broad, beak pale, 2-5 μm thick.

On living leaves of *Avicennia alba* Bl. (Aviceniaceae) collected from Bak-khali, 24-Parganas, West Bengal, India on 14.5.91, IMI number 348457 and on living leaves of *Sonneratia apetala* Ham. (Sonneratiaceae) collected from the same place on 14.5.91, IMI number 348458.

Bipolaris colocasiae (M. P. Tandon & Bharg.) Alcorn. (Plate I, Fig 2).

Leaf spots few to several, on the dorsal surface, more on the older leaves, spots regular to irregular, sometimes coalescing forming large patches, frequently with a yellowish halo around it, grey to brown with a dark brown margin, often spots are replaced by shot holes, 0.5-10 mm length and 3-7 mm breadth.

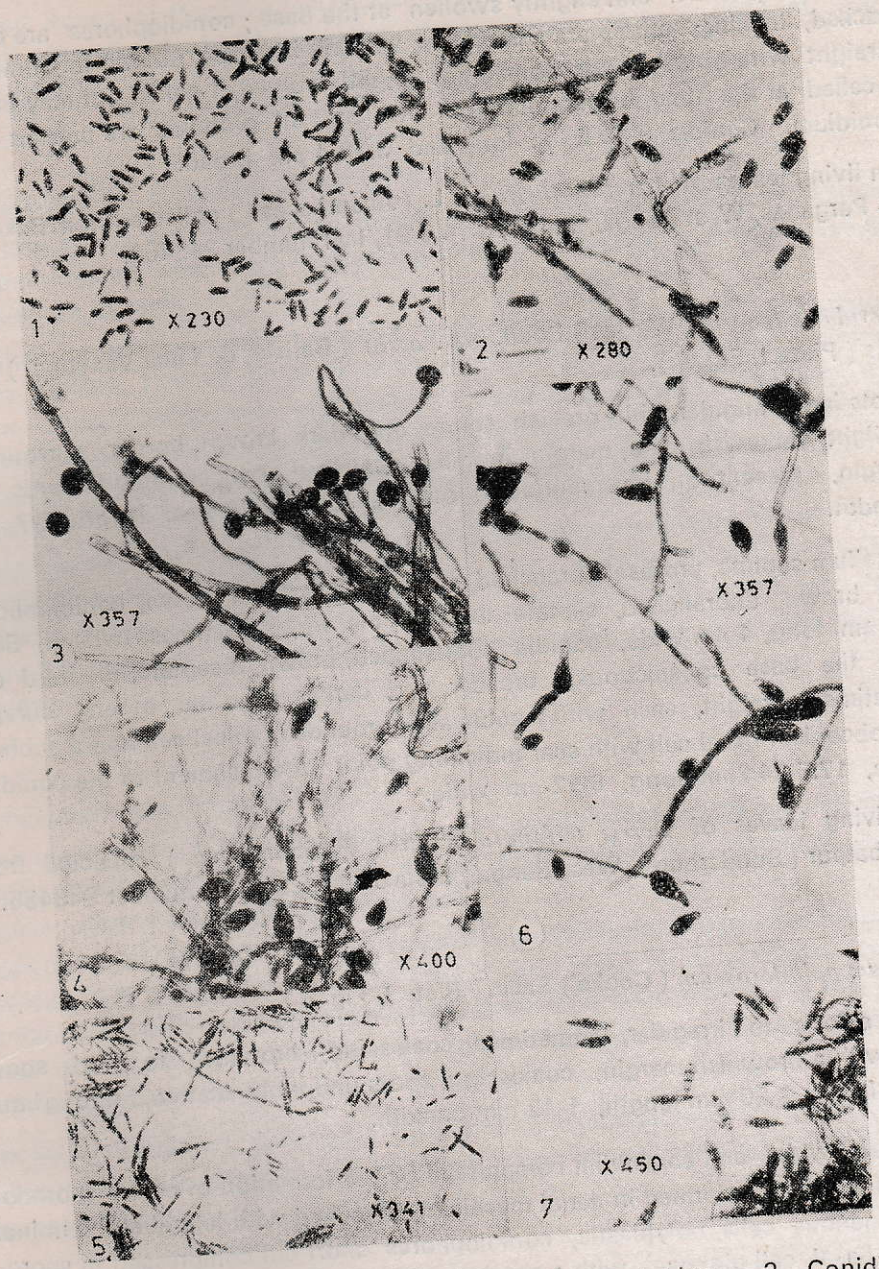
Hyphae branched, septate, brownish, conidiophores terminal on hyphae, or arising laterally from and perpendicular to hyphal cells, septate, erect, up to 39-136.5 μm long and 3.9-6 μm broad, fertile towards the apex ; apical part of conidiophore geniculate or knotted, with scars of fallen conidia, conidia short, ovoid, rounded at both ends, conidia 3-5 septate, 21.5-27.3 μm long and 3.9-6 μm broad.

On living leaves of *Avicennia officinalis* (Aviceniaceae) collected from Bak-khali, 24 Parganas, West Bengal, India on 14.5.91, IMI number 348452.

Colletotrichum glocosporioides (Penzig) Penzig & Sacc. (Plate I, Fig. 1)

Spots developed on the dorsal surface of leaf, irregular, frequently at the margins, coalescing and form large patches, 3-15 mm length and 2-8 mm breadth, small, discrete spots also appear on the lamina, usually central region is brown with a dark brown border, leaf margins also show necrotic symptoms.

Mycelium consists of rather narrow, sparsely septate, hyaline hyphae; acervuli are formed on dark stroma, rounded, or elongated or irregular in shape and up to 500 μm in diameter. Setae are rarely more than 200 μm long, 4 8 μm thick and



Figs. 1 - 7. 1. Conidia of *Colletotrichum gloeosporioides*; 2. Conidia and conidiophores of *Bipolaris colocasiae*; 3. *Khuskia oryzae*; 4. *Curvularia lunata* conidia and conidiophores; 5. *Fusarium pallidoroseum* macro- and microconidia; 6. *Alternaria alternata* conidia with conidiophores; 7. *Pestalotiopsis* sp. conidia.

1-4 septate, brown and slightly swollen at the base ; conidiophores are closely packed, hyaline; conidia are subhyaline, variable in shape, oblong to cylindrical ; straight with obtuse ends, sometimes slightly curved, 1-celled but may become 2-celled at the time of germination. One or 2 oil globules are present in the conidium. Conidia 8-19.5 μm long and 3.12-4 μm broad.

On living leaves of *Acanthus ilicifolius* L. (Acanthaceae) collected from Bak-khali, 24 Parganas, West Bengal, India on 14.5.91, IMI number 348460.

Curvularia lunata (Wakker) Boed. var. *aeria* (Batists, de Lima Vasconc.) M.B. Ellis (Plate I, Fig. 4).

Spots large, angular with greyish centre and dark brown border, surrounded by light yellowish halo, margin irregular, scattered, concentrated towards leaf margin, present on both surfaces of the leaf, 3-10 mm length, 2-7 mm breadth.

Mycelium septate, profusely branched, subhyaline to light brown, conidiophores dark brown, unbranched, septate towards the tip, sometimes twisted, 58.5-136 μm long, 4 μm wide, conidia boat-shaped, brown, 3-septate, the third cell from the base conspicuously broader and darker than the others, curved, sometimes straight, each with a subhyaline, rounded, apical cell and a subhyaline obconical basal cell with scar indicating point of attachment to the conidiophore, 17.5-24.2μm long, 8-12 μm wide.

On living leaves of *Derris trifoliata* Lour (Papilionaceae) collected from Bhagbatpur (Sundarban), West Bengal, India on 14.5.91, IMI number 348455.

Fusarium pallidoroseum (Cooke) Sacc. (Plate I, Fig 5)

Spots elliptic to irregular, sometimes coalescing, brownish to red, some times with a brownish margin, coalescing, spots uniformly scattered throughout the surfaces, 2-20 mm length, 1-12 mm breadth.

Mycelium white and somewhat compressed by the formation of effuse sporodochia, conidiophores formed in aerial mycelium, branched with lateral and terminal conidiogenous cells, polyblastic, conidiophores short but compressed in sporodochia, basal cell globose, with a number of short, one-celled branches. Each branch bears two to four short cylindrical to pyriform phialides at its apex, conidia hyaline, fusiform, basal cell wedge-shaped, 2-5 septate, 6-23.4 μm long and (2-4 μm) broad.

On living leaves of *Heritiera fomes* Buch. Ham. (Sterculiaceae) collected from Bak-khali (Sundarbans), 24 Parganas, West Bengal, India on 14.5.91, IMI number 348453.

Khuskia oryzae H. J. Hudson (Plate I, Fig. 3)

Spots grey colour with dark brown margin, vary in size and shape from minute dots to elongated, sometimes coalescing forming large patches, 5-10 mm length and 3-6 mm breadth.

Mycelium septate, profusely branched, subhyaline to light brown. Ascospores hyaline, curved, 1-celled but later unequally 2-celled, 15.6-23.4 μm long and 4-7 μm broad, ascospores germinating producing conidia, conidiophores brownish, short, micronematous or semimacronematous, branched, hyaline to coloured, smooth, conidiogenous cells monoblastic, discrete, solitary, ampulliform or subspherical, colourless, conidia solitary, acrogenous, simple, spherical or broadly ellipsoidal, compressed dorsiventrally, black, shining smooth, O-septate, conidiophores 4-6 μm thick, conidia 12-15.6 μm diam. On living leaves of *Nipa fruticans* Wumm (Arecaceae) collected from Bak-khali (Sundarbans), 24 Parganas, west Bengal, India on 14. 5. 91, IMI number 348451.

Pestalotiopsis sp. (Plate 1, Fig. 7)

Leaf spots distinct, circular, discrete with greyish white centre and dark brown border, surrounded by a reddish yellow halo, 2-5 mm in diameter, margin regular, observed on both surfaces of leaf.

Acervuli black, granular, initially covered and later expose black spore masses, conidia 21.5-27.3 μm long and 3.9-4.7 μm broad at the widest part, 4 septate, end cells hyaline, intermediate three cells pale brown, the two upper ones dark, 2-3 apical setulae up to 19.5-20 μm long, basal appendage 7-8 μm long.

On living leaves of *Excoecaria agallocha* L. (Euphorbiaceae) collected from Bhagbatpur (Sundarbans), 24 Parganas, West Bengal, India on 14. 5. 91, IMI number 348454.

ACKNOWLEDGEMENTS

The authors are grateful to Dr. B. C. Sutton, International Mycological Institute, Kew, Surrey, England for identifying the fungi.

(Accepted for publication 15 June 1992)