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- Short communication

ASSOCIATION OF FUNGI WITH BREADFRUIT (*ARTOCARPUS ALTILIS* FOSB.)

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ABSTRACT

Nine species of fungi belonging to eight genera of Deuteromycetes were found associated with leaves and fruits of breadfruit, *Artocarpus altilis*. The fungi were *Alternaria alternata* (Fries) Keissler, *Aspergillus niger* Van Tiegh, *Aspergillus flavus* Link, *Colletotrichum gloeosporioides* (Penz.) Sacc, *Curvularia lunata* (Wakker) Boedijn., *Penicillium* sp. *Pteroconium* state of *Apiospora camptospora* Penz. & Sacc. and Spicaria sp., and *Zygosporium oscheoides* Mont.. This is the first report of association of A. *alternata, C. gloeosporioides., Curvularia lunata, Penicillium* sp. *Pteroconium* state of *A. camptospora, Spicaria* sp. and *Z. oscheoides*, with breadfruit. *Colletotrichum gloeosporioides* was the predominating fungus recorded on all infected matured leaves showing brown lesion and anthracnose symptom, and also pathogenic to breadfruit plant.

Key words: Association, Fungi, Breadfruit, *Artocarpus altilis*

Breadfruit (*Artocarpus altilis* Fosb.) is a species of angiosperm in the mulberry, family Moraceae. The plant is rich in carbohydrate so used as food. Its light weight wood is used as timber and paper pulp. So far, *Colletotrichum* sp., *Dothiorella* sp., *Fusarium* sp., *Phomopsis* sp., *Phytophthora s*p. and *Rhizopus* sp. have been reported on breadfruit (Balick and Cox 1996). A breadfruit sapling was planted in the Botanic Garden of Curzon Hall Campus in 1998 it was and started producing flowers and fruits from 2006. The plant was severely attacked by fungal disease in 2007. The present work was undertaken to isolate and identify fungi associated with leaves and fruits of the plant.

In the present study 30 samples were examined from healthy and infected leaves and fruits of the plant from 15th March, 2007 to 13th October, 2010. Freshly collected samples were examined directly under microscope and the associated fungi were isolated following 'Tissue planting' and 'Blotter' methods on PDA medium between 25 and 28^{o}C at pH 6. The experiment was carried out in the Laboratory of Mycology and Plant Pathology, Department of Botany, University of Dhaka. Identification of the isolates was determined following standard literature (Benoit and Mathur 1970, Ellis 1971, 1976, Sutton 1980).

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The pathogenicity of all the isolated fungi were tested following modified detached leaf assay (Azad and Shamsi 2011). Moist chamber was prepared by placing small cotton bar at the corner of Petri plate and autoclaved. Leaves were cut into (25^2 mm) and washed with sterilized water. Inocula were sterilized with 10% Chlorox for 10 minutes and placed on Petri plates. Six treatments with three replications for each fungus was used as follows: T_1 - control (unpricked dorsally placed leaf pieces), T_2 - control (unpricked ventrally placed leaf pieces), T_3 - dorsally inoculated unpricked leaf pieces, T_4 - dorsally inoculated pricked leaf pieces, T_5 - ventrally inoculated unpricked leaf pieces and, T_6 - ventrally inoculated pricked leaf pieces.

Anthracnose and brown lesion were recorded on leaves and fruits of breadfruit plant. Severe infection was recoded specially in the rainy season, June and July. In case of matured fruits infection was noted both externally and internally. Due to infection fruits detached from the plant (Figs. 1 - 7). In total nine species of fungi belonging to eight genera of Deuteromycetes were found to be associated with infected leaves, young and matured fruits. The isolated fungi were *Alternaria alternata, Aspergillus niger*, *A. flavus*, *Colletotrichum gloeosporioides*., *Curvularia lunata*, *Penicillium* sp., *Pteroconium* state of *A. camptospora*, *Spicaria* sp. and *Zygosporium oscheoides*, *C. gloeosporioides* were to be found as the predominating fungi associated with breadfruits (Figs. 8 - 16). Hundred per cent C. *gloeosporioides* was recorded on infected matured leaves showing brown lesions and anthracnose symptoms (Table 1).

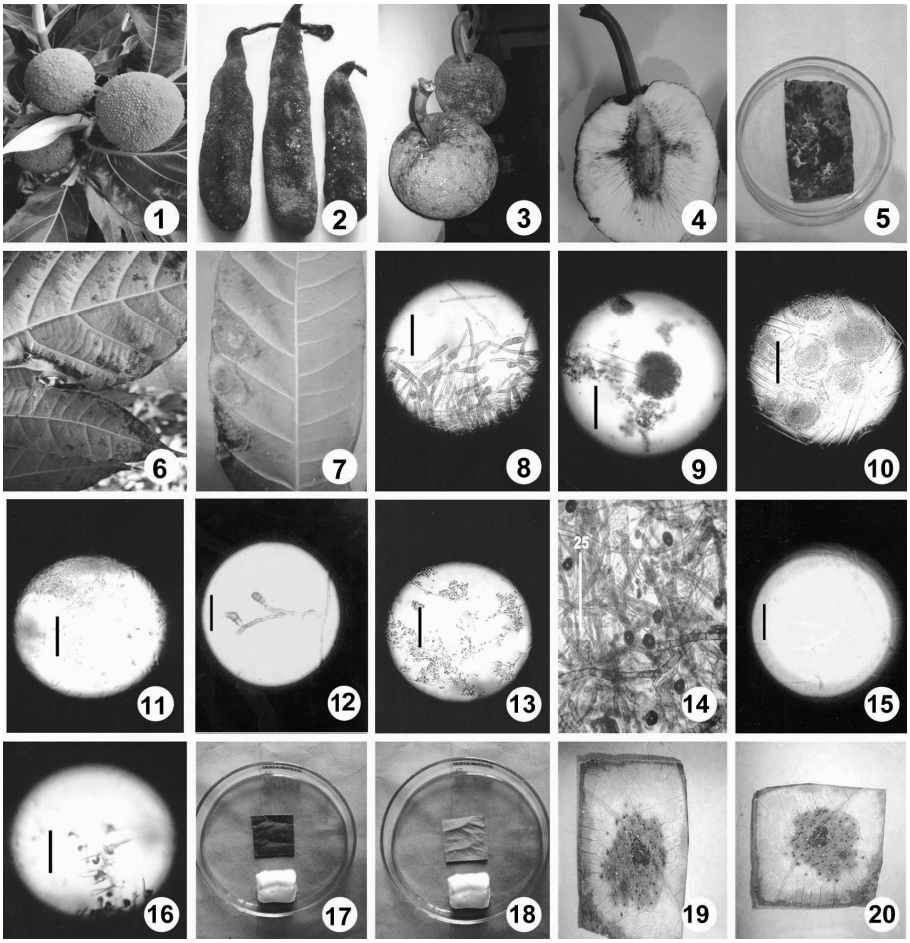
Table 1. Frequency (%) of association of fungi with infected fruits of breadfruit (*Artocarpus altilis*).

Name of isolate	Percentage of particular fungus				Total	Mean
	Expt. 1	Expt. 2	Expt 3	Expt 4		
Alternaria alternata	13.3	4.0	-	-	17.4	4.4
Aspergillus flavus	4.0	19.3	13.2	12.2	48.7	12.2
Aspergillus niger	6.0	5.3	4.0	3.3	18.6	4.65
C. gloeosporioides	48.8	50.4	43.1	39.6	181.9	45.5
Curvularia lunata	24.0	23.1	28.3	26.4	101.8	25.5
Penicillium sp.	-	13.3	4.0	12.2	29.5	7.3
Pteroconium	13.3	-	-	-	13.3	3.4
Spicaria sp.	13.2	3.3	-	-	16.5	4.3

- = Not isolated.

Six fungal species were isolated from fruits of the plant, of which the percentage association of *C. gloeosporioides* was highest (45.5) and *Pteroconoum* state of *A. camptospora*. was lowest (3.4), (Table. 1). Healthy leaves were completely free from fungal associates. *C. gloeosporioides* was the only fungus that was isolated from the leaves showing brown lesion and anthracnose symptom. Frequency association of *C.*

gloeosporioides was 100%. Leaves showing brown lesion with black colony only *Z. oscheoides* was found. Frequency association of the fungus was 100%.



Figs 1 - 20. *Artocarpus altalis*: 1. healthy fruits, 2 - 3. Infected young and matured fruit, 4. L. S. of infected fruits, 5. fungal colony on infected fruit skin, 6. leaf with anthracnose symptom, 7. leaf with brown lesion with *Z. oscheoides* colonies, 8. *A. alternata*, 9. *A. niger*, 10. *A. flavus*, 11. *C. gloeosporioides*, 12. *Curvularia lunata*, 13. *Penicillium* sp., 14. *Pteroconium* 15. *Spicaria* sp., and 16. *Z. Oscheoides* (Bar = 50 µm), 17. Control (uninoculated dorsally placed leaf pieces), 18. Control (uninoculated ventrally placed leaf pieces), 19. Dorsally inoculated pricked leaf pieces and 20. Ventrally inoculated pricked leaf pieces.

The present report is the first record of association of fungi with breadfruit from Bangladesh. At the same time this is the first record of association of *A. alternata, Aspergillus niger*, *A. flavus*, *C. gloeosporioides*, *Curvularia lunata.*, *Penicillium* sp., *Pteroconium*, *Spicaria* sp. and *Z. oscheoides* with breadfruit plant.

Pathogenicity test following detached leaf inoculation assay revealed that *C. gloeosporioides* produced symptoms on both dorsally and ventrally pricked inoculated leaf pieces of breadfruit. Uninoculated and inoculated unpricked control leaf pieces did not produce any symptom. Present result also established that *C. gloeosporioides* was capable of causing infection on pricked leaves. (Figs. 17 - 20).

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