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Short Communication

INCIDENCE AND PATHOGENICITY OF FUNGI ASSOCIATED WITH JUTE (*Corchorus olitorius* L.) IN LAPAI LOCAL GOVERNMENT AREA, NIGER STATE NIGERIA.

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SUMMARY

Jute (*Corchorus olitorius* L.), a widely consumed vegetable in most parts of Africa readily deteriorates in storage. This study isolated and established the pathogenicity of fungi associated with diseased and healthy *C. olitorius* leaves in Lapai Local Government Area of Niger State, Nigeria. *Aspergillus niger*, *A. flavus*, *Mucor pusillus* and *A. fumigatus* were associated with diseased leaves and all four fungi species induced characteristic disease symptoms during pathogenicity test.

Keywords: *Corchorus olitorius*, Fungi, Pathogenicity

Corchorus olitorius (L) is a long, soft, shiny vegetable crop which is grown for its food value in most subsistence farming systems in Africa (4,11). It is consumed as a health vegetable because it contains β-carotene, Cartotenoids, Vitamins B_1, B_2, C and E, high levels of iron and felate which are useful for the prevention of anemia (6). The vegetable also has varying proportion of dietary fibre and protein required for health. *Corchorus olitorius* leaf is rich in potassium, manganese and other essential energy values important in human and animal nutrition (4). The crop is also grown in rural subsistence farming system as a fibre crop (5). When fresh *C. olitorius* is harvested from its water source, it deteriorates fast and it is usually stored in air tight containers to prevent deterioration. However, this procedure enhances spoilage as moisture accumulation in the air tight containers increase relative humidity and deterioration (10). According to FAO (1), activity of fungi and bacteria are major causes of deterioration of leafy vegetables in storage, leading to altered taste, smell and appearance (7). The occurrence of fungal proliferation on fruits and vegetables is also a potential health risk to man and animals (3). This study therefore investigated the fungi associated with the deterioration of jute (*C. olitorius*) obtained from markets in Lapai Local Government Area of Niger State, Nigeria.

Fresh leaves of healthy and diseased *C. olitorius* obtained from three (3) different markets in Lapai town (9°03' 00"N; 6°34' 00"E) were surfaced sterilized (10% NaOH for 1 min and rinsed in four changes of

sterile distilled water) and 1mm^2 each of nectrotic and healthy leaf portions were plated on potato Dextrose Agar (PDA) (amended with 1ml streptomycin) and incubated at 28±2°C under alternating daily conditions of 12h light and 12hr darkness. There were three replicates of each petri-dish and resultant fungi species were isolated, identified and maintained in pure cultures.

Pathogenicity test was conducted with mycelial suspension of fungal species generated on V8 broth medium in 250ml Erlenyemer flasks for 6 days. Mycelium was blended, filtered through layers of cheesecloth and used to spray foliage of 3-week old *C. olitorius* seedlings raised in oven-sterilised soils contained in 15cm-diameter plastic pots. Inoculated seedlings were covered with transparent polythene for 12hrs. Resultant symptoms on foliage were observed and associated fungi were re-isolated.

Four fungal species; *Aspergillus niger*, *A. flavus*, *A. fumigatus* and *Mucour pusillus* were isolated from diseased leaves of *C. olitorius*. Each fungi produced deterioration of inoculated foliage during pathogenicity test. Disease was characterized by darkening of infected leaves with dark brown patches on brownish yellow leaves and attendant colour change to black at 7 days after inoculation. The ability of *Aspergillus* species to induce infection of young foliage of *C. olitorius* may be due to the fragile nature of the leaves. Pitt and Hocking (9) associated *Aspergillus* species with deterioration of vegetable crops. Eboh and Okoh (2) also identified *Aspergillus* species, *Fusarium oxysporum* and *Mucor* sp. as fungi associated with decay of leafy vegetables in Nigeria. The fact that *Aspergillus* spp. and *Mucor pusillus* are saprophytic organisms makes their proliferation on dead organic materials possible thereby providing easy access to vegetable crops in the course of the growing season. Therefore, appropriate crop sanitation that can reduce the inoculum level of these fungal species from transferring from one cropping season to the next, may reduce the rate of infection of *C. olitorius* by the fungal species.

LITERATURE CITED

1. **FAO 2005.** Food and Agriculture Organisation of the United Nations. Fruit and Vegetable Processing. FAO, Rome **22**:13-15
2. **Eboh, D. O. and Okoh, C. I. 2000.** A preliminary taxonomic study of fungi associated with some leafy vegetables in Nigeria. *Nigeria Journal of Agricultural Sciences* **2**:10-12
3. **Effiuvwevwere, B. J. O. 2000.** Microbial spoilage agents of tropical and assorted fruits and vegetables. Paragraphics Publishing Company, PortHarcourt, Nigeria. PP 1-39.
4. **Idris, S., Yisa, J. and Ndamitso, M. M. 2009.** Nutritional Composition of *Corchorus olitorius* leaves Animal Production Research Advances 5(2).
5. **Modi, M., Modi, A. T. and Hendriks S. 2006.** Potential role for wild vegetables in household food security: A preliminary case study of Kwazulu-Natal, South Africa. *African Journal Food Agriculture Nutrition Development* **6**:2-13
6. **Oyedele, D. J., Asonugho, C. and Awotoye, O. O. 2006.** Heavy metals in Soil and Accumulated by edible vegetables after Phosphate Fertilizer application. *Electrical*

Journal of Agriculture Food Chemistry **5**:1446-1453

7. **Paul, S. and Sainsbury, D. 1981**. Dictionary of Microbiology. John Wiley and Sons Publication. New York pp101
8. **Peraica, M. Radic, B., Lucic, A. and Pavloric, M. 1999.** Toxic Effects of Mycotoxins in Humans. Bulletin World Health Organisation 77:754 –766
9. **Pitt, J. I. Hocking, D. D. 1997.** Fungi and food spoilage. Blackie Academic and Professional London Press.
10. **Sullivan, G. H., Davenport, L. R. and Julian, J. W. 1996.** Precoding: key factor for assuring quality in new fresh market vegetable crops. Progress in new crops. A.S.H.S. Press, Virginia pp. 521 – 524.
11. **Velempini, P., Riddoch, I. and Batisani, N. 2003.** Seed treatments for enhancing germination in wild okra (*Corchorus olitorius*). *Experimental Agriculture* **39**:441-449