STUDIES ON SOME PLANT DISEASES CAUSED BY MUSHROOMS IN EGYPT

BY

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B.Sc. Agric. Sc. (Plant pathology), Ain Shams University, 2001

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ABSTRACT

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Fourteen phytopathogenic mushrooms were isolated from different naturally diseased host plants i.e. sugarcane, casuarina, morus and eucalyptus from some governorates in Egypt, i.e. Assiut, Kalubia and El-Sharkia. The isolated fungi were purified and identified up to genera as *Agrocybe* sp. (2 isolates), *Schizopora* sp. (4 isolates), *Omphalotus* sp. (5 isolates), *Gloeophyllum* sp. (one isolate), *Bjerkandera* sp. (one isolate) and *Ganoderma* sp. (one isolate).

Seven isolates of these fungi were proved for their pathogenicity on plant hosts grown under greenhouse conditions. Pathogenicity test revealed that all fungal isolates were pathogenic to their host plants.

Schizopora sp. (isolate 13) caused pre and post-emergence damping-off as well as root-rot, *Schizopora* sp. (isolate 2,3),and *Ompholotus* sp. (isolate7) caused root-rot and plant death, meanwhile slightly yellowing were showed on casuarina leaves artificially infected with *Ganoderma* sp. (isolate 10).

Schizopora sp. (isolate 4), and *Bjerkandera* sp. (isolate12), caused yellowing, dead leaves, and root-rot of morus and eucalyptus young trees respectively. Resultus of host range test of one fungal isolate, *Schizopora* sp. (isolate 13) on sugarcane casuarina, morus and eucalyptus plants showed that, this isolate was highly pathogenic to sugarcane plants. No clear symptoms were showed in casuarina, morus and eucalyptus young trees.

Scanning electron microscopic observations indicated that, hyphae of *Schizopora* sp. (isolate13) penetrated the epidermal cells, cortex and filed metaxylem and pith of sugarcane roots. The basidiocarps were formed and filled completely surrounded the plant roots in the late stage of infection.*Schizopora* sp. (isolate 2), caused complete decay on infected casuarina roots. Fungal hyphae have filled metaxylem vessels, meanwhile *Omphalotus* sp. (isolate 7) caused slight decay and the fungal hyphae were filled parenchymal cells of infected casuarina roots. Gelatinous materials were observed in metaxylem vessels without any decay in casuarina roots infected with *Ganoderma* sp. (isolate 10).

Physiological studies revealed that the tested fungal isolates produced cellulose and pectin degrading enzymes either in cultural filtrates or in plant tissues. The most active fungal isolates in reducing carboxymethylcellulose viscosity in medium were *Schizopora* sp. (isolate 2), followed in descending order by *Omphalotus* sp. (isolate 7), *Schizopora* sp. (isolate 3), *Schizopora* sp. (isolate 4) and *Bjerkandera* sp. (isolate 12). The lowest isolate was *Schizopora* sp. (isolate 13). The carboxymethlylcellulose activity extracted from sugarcane, morus and eucalyptus plants artificially infected with *Schizopora* sp. (isolate 13), *Schizopora* sp. (isolate 4), and *Bjerkandera* sp. (isolate 12), respectively was greater than that extracted from healthy ones.

Activity of cellulase enzyme extracted from casuarin young trees was very high in plants artificially infected with *Omphalotus* sp. (isolate 7) followed in descending order by *Schizopora* sp. (isolate 2), *Schizopora* sp. (isolate 3) and lowest ones *Ganoderma* sp. (isolate 10). Meanwhile *Schizopora* sp. (isolate 13) showed the highest activity in reducing pectin viscosity followed in descending order by *Ganoderma* sp. (isolate 10), *Schizopora* sp. (isolate 3), *Omphalotus* sp. (isolate 7), *Schizopora* sp. (isolate 4) and *Schizopora* sp. (isolate 2). The lowest fungus was *Bjerkandera* sp. (isolate 12) in the medium. However, the activity of such

enzyme extracted from sugarcane, morus and eucalyptus young trees artificially infected with *Schizopora* sp. (isolate 13), *Schizopora* sp. (isolate 4) and *Bjerkandera* sp. (isolate 12) was greater than that extracted from healthy ones. The casuarina young trees infected with Omphalotus sp. (isolate 7) showed high enzyme activity followed in descending order by *Ganoderma* sp. (isolate 10), *Schizopora* sp. (isolate 3) and *Schizopora* sp. (isolate 2).

The ability of fungal isolates for degrading lignin was studied. The obtained results indicated that the tested fungal isolates showed high ability to degrade lignin. *Omphalotus* sp. (isolate 7) was the highest effective fugus followed in descending order by *Bjerkandera* sp. (isolate 12), *Schizopora* sp. (isolate 3), *Schizopora* sp. (isolate 2), *Schizopora* sp. (isolate 4), and *Ganoderma* sp. (isolate 10). The lowest one was *Schizopora* sp. (isolate 13).

Peroxidase activity was also studied in healthy sugarcane seedling and casuarina young trees as well as in seedling and young trees artificially infected with *Schizopora* sp. (isolate 2, 3, 13) and with *Omphalotus* sp. (isolate 7), and *Ganoderma* sp. (isolate 10) respectively. Activity such enzyme was also detected in morus and eucalyptus young trees artificially infected with *Schizopora* sp. (isolate 4) and *Bjerkandera* sp. (isolate 12), respectively.

Electrophoretic separation of peroxidase isozyme showed that, the infected sugarcane plants with *Schizopora* sp. (isolates 13) contained enzyme pattern likely that found in mycelial mats of the phytopathogenic fungus.

Key words : Schizopora, Omphalotus**,** Agrocybe**,** Ganoderma**,** Gloeophyllum**,** Bjerkandera**,** sugarcane**,** morus, eucalyptus, root- rot, phytopathogenic mushrooms**.**

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