

بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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لم ترد بالأصل



PATHOLOGICAL STUDIES ON WHEAT POWDERY MILDEW DISEASE IN EGYPT

By

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B. Sc. Agric. Sci. (Plant Pathology), Alex. Univ., 1971
M. Sc. Agric. Sci. (Plant Pathology), Cairo Univ., 1980

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Faculty of Agriculture
Zagazig University

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1. J. A. E. K.

2. J. A. E. K.

Abstract

The obtained results from this investigation can be summarized as follows:

(1) Thirty five isolates of *Erysiphe graminis* f. sp. *tritici* were obtained from 16 different wheat varieties which showed powdery mildew symptoms during disease survey. These isolates were identified into five physiological races, i.e. 1431, 1631, 3435, 3631 and 3635. (2) The race 3635 was the most frequently isolated and virulent as compared with the other races. (3) Also the race 3635 exhibited higher reaction on the tested commercial wheat varieties, while the race 1431 gave the lowest reaction. (4) Isozymes analysis of two enzymes (Esterase and Peroxidase), revealed that, a complete phylogentic relationship was detected among the five tested races. (5) RAPD-PCR based assay showed also obvious variations between these races. (6) *Erysiphe graminis* f. sp. *tritici* was detected to be has a narrow host range since infection was limited to wheat. (7) Varietal reaction to powdery mildew disease indicated that, four introduced wheat vars. showed seedling and adult plant resistance. While, 15 introduced vars. and 12 commercial vars. showed susceptibility at both stages. Moreover, 9 introduced vars. and 30 commercial vars. showed susceptible reaction at seedling stage, but were resistant at adult plant stage. (8) Late sowing dates resulted in higher disease severity as compared with early sowing ones. Similarly, high seed rate with wide row spacing was the most favourable to increase disease severity on the growing plants. (9) Sowing vareitl mixtures led to reduce disease severity under field conditions. (10) Wheat plants showed higher disease severity

when were infected at seedling stage, but exhibited lower severity with plant age development. (11) Disease incidence was obviously observed during the growing season with lower temperature (14.7°C), higher relative humidity (67.4%) and lower rainfall (5.4 cc). (12) Induced resistance to wheat powdery mildew disease can be effectively obtained on wheat seedlings using a novel inducer named "Bion", when applied as foliar application or seed soaking treatment especially after 24 hrs., as time soaking. (13) Wheat plants showed striking increase of peroxidase activity after inoculation with the pathogen, as compared with uninoculated plants. At the same time, the susceptible infected var. exhibited higher activity of this enzyme as compared with resistant one. (14) Infection with wheat powdery mildew led to decrease in both chlorophyll-a and chlorophyll-b on susceptible var. While, both forms of chlorophyll of the resistant variety were not affected. (15) The fungicide Sumi-8 (5 EC) showed the best seed dressing treatment and also the best foliar application to control disease under greenhouse conditions. (16) Race 3635 of *Erysiphe graminis* f. sp. *tritici* exhibited resistance to some fungicides, i.e. Afugan and Impact, but remained relatively sensitive to Sumi-8 (5 EC). (17) Biocontrol studies showed that, *Trichoderma harzianum* was more effective to reduce disease severity as compared with the other microorganisms tested. In addition, neem leaf extract was the most effective to reduce disease severity as compared with the other tested plant extracts.

PRESENTATION

* *To the eternal memory of my father.*

* *I am surely indebted to my wife ' Sanaa ' my sons ' Ahmed ' and ' Bassam ' and my daughter ' Mona ' for their cooperation, assistance, encouragement and patience, without them the good life and this work not be completed .*

