

Antifungal activity of pyocyanin produced by *Pseudomonas aeruginosa* against *Fusarium oxysporum* Schlech a root-rot phytopathogenic fungi

Sabry Y. Mahmoud^{*1}, El-Sayed H. Ziedan², Eman S. Farrag^{3, 4},
Raffat S. Kalafalla³ and A. Mohamed Ali³

¹Agricultural Microbiology Department, Faculty of Agriculture, Sohag University, Egypt.

² Plant Pathology Department, National Research Centre, Dokki, Cairo, Egypt.

³University of Hafr Al Batin, College of Applied Medical Science, Department of Medical Laboratory Technology, 1704, Hafr Al Batin-319 91, Saudi Arabia.

⁴Agricultural Botany Department (Microbiology), Faculty of Agriculture, South Valley University, Qena, Egypt.

Abstract : The *Pseudomonas aeruginosa* produces secondary metabolites such as pyocyanin. The study aimed to production and characterization of pigment pyocyanin and to evaluate its antifungal potential against *Fusarium oxysporum* Schlech. causing root-rot diseases of agronomic crops. Fifteen bacterial strains were isolated from wild rhizosphere plants then identified based on biochemical and physiologic tests and MicroScan. Antifungal activity of *P. aeruginosa* isolates was screened using dual culture assay. The antifungal compound were extracted by chloroform extraction method then partially purified. Fourier Transform Infrared (FT-IR) was used to characterize the compound, then its structural was done using FTIR library. Pyocyanin antimicrobial activity was evaluated using light microscopy. On the basis of biochemical and physiologic tests and MicroScan, three isolates were identified as *P. aeruginosa*. Among these isolates, isolate HB9 exhibited the highest activity against *F. oxysporum*. Pigment production was achieved after 24 hrs of incubation with a color change to bluish green. UV-visible spectra and FT-IR study revealed characteristic of pyocyanin. It showed to inhibit the growth of *F. oxysporum* with the clear inhibition zone. Spores formation was inhibited and immature, also swelling hyphae were observed in pyocyanin-treated *F. oxysporum*. The properties of the pyocyanin indicated an important bioactive compound which has the ability to cease the reproduction of *F. oxysporum*.

Keywords: Pyocyanin, *Pseudomonas aeruginosa*, FT-IR, Antifungal activity, *F. oxysporum*.

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