

Estimating the Crop Losses Caused by Fusarium wilt of Chili and Its Control by Targeting Mitochondrial Respiratory System with Novel Inhibitors using Computer Aided Drug Designing

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Wilt is an economically important disease of chili crop causing considerable reduction in yield. In the present study, four areas in Punjab, Pakistan were surveyed and disease samples were collected. The incidence of disease was 25, 35, 42 and 53% in Kasur, Lahore, Sialkot, and Gujranwala. The pathogenic fungus was isolated from the infected plant parts and was identified as *Fusarium oxysporum* based on the morphological and cultural features. Many fungicides used in agriculture inhibit respiration. The mitochondrial respiratory system (complex II) is one of the most common targets for antimicrobial agents. Succinate dehydrogenase inhibitors (SDHIs) interfere with succinate dehydrogenase enzyme and disrupt the respiratory chain by binding to ubiquinone site, thus blocking the energy production as well as synthesis of the biosynthetic precursors. The present research work is focused on finding the compounds with high intrinsic activity against *F. oxysporum* causing wilt of chili. Fungicidal activity of twelve novel SDHI compounds was evaluated using mycelial growth and spore germination assay. Compounds C6 and C10 were highly active against *F. oxysporum* in mycelial growth assay with 89.5% and 88.6% inhibition while compound C11 was least potent with 64.5% inhibition. Compounds C1 and C6 were most effective in inhibiting the spore germination. The results of present study showed that compound C1, C6 and C10 were the most potent in reducing mycelial growth and spore germination of *F. oxysporum*. The shortlisted three compounds (C1, C6, and C10) have potential to control Fusarium wilt of chili.

Index Terms: Complex II, SDH, fungicide, Fusarium wilt, chili crop.

Biography:

S. Iftikhar is a doctoral student with about eight years of research experience at the university level. She did B.Sc. (Hons.), and M.Sc. (Hons.) in Agriculture, with specialization in phytopathology from Institute of Agricultural Sciences, University of the Punjab, Lahore, Pakistan. Sehrish is currently focused on designing fungicides against potato diseases. She has published several original papers in reputed international peer reviewed journals covering plant pathology, virology, plant-pathogen interactions and plant disease control."