Virulence of entomopathogenic fungus, metarhizium anisopliae to sweetpotato whitefly, bemisia tabaci (hemiptera: aleyrodidae) under osmotic stress

ABSTRACT

The aim of the present study was to investigate the virulence of the entomopathogenic fungus Metarhizium anisopliae (isolates PR1 and GT3) under osmotic stress condition. The virulence study of the fungus was conducted by three ways—growth (germination, vegetative growth and sporulation); enzymatic activities (chitinase, protease and lipase) of M. anisopliae and percentage mortality of Bemisia tabaci to M. anisopliae. Conidia of M. anisopliae were produced under different osmotic stress conditions as SDA medium as control, SDA medium with 0.5 M NaCl, SDA medium with 0.5 M KCl, SDA medium with 1 M NaCl and SDA medium with 1 M KCl. The germination percentage, vegetative growth, sporulation, chitinase and protease activities were highest for control of PR1 isolate, reaching up to 97 %, 4.1 cm and 6.6 × 106 conidia/ml, 2.6 mU/ml and 1.7 µg/ml/min, respectively. These values decreased up to 86.7 %, 3.6 cm and 4.1 × 106 conidia/ml, 1.6 mU/ml and 1.0 µg/ml/min, respectively under osmotic stress. The lipase activity was highest for 0.5 M NaCl of PR1 isolate, reaching up to 18.2 µmol/ml/min. The mortality percentage of B. tabaci was highest for control of PR1 and GT3 isolates, reaching up to 83.9 and 83.8 %, respectively. These values decreased up to 77.4 and 77.5 %, respectively under osmotic stress. This paper concludes that both the isolate PR1 and GT3 are virulent to B. tabaci under osmotic stress condition.

Keyword: Plant protection; Biocontrol; Germination; Radial growth; Conidiogenesis; Enzymatic activity; Mortality