

Identification and application of fungal biocontrol agent *Cladosporium cladosporioides* against *Bemisia tabaci*

ABSTRACT

The entomopathogenic fungus *Cladosporium cladosporioides* is a potential candidate for biocontrol of insect pests. We isolated a strain of *C. cladosporioides* BOU1 from an infected brown plant hopper (BPH) of rice and characterized it using morpho-physiological and molecular analyses. Internal transcribed spacer regions and intervening 5.8S rRNA gene (ITS) sequencing and morphopathogenic analyses confirmed that BOU1 is a strain of *C. cladosporioides*. To select the suitable medium for this fungus, a single conidium of BOU1 was grown in potato dextrose agar (PDA), potato dextrose agar with yeast (PDAY), Sabouraud dextrose agar (SDA) and synthetic nutrient-poor agar (SNA) media. The suitable medium for this fungal isolate was determined by fungal growth (colony area and conidiogenesis), and enzymatic activities (protease and lipase). The fungal growth parameters including enzymatic activities showed that the PDA medium is most suitable culture medium for *C. cladosporioides*. Finally, the pathogenicity of this fungal isolate was evaluated against whitefly, *Bemisia tabaci* through direct contact toxicity assay on eggplant leaves by dipping under laboratory conditions. The BOU1 strain caused mortality in *B. tabaci* in a dose-dependent manner, the highest mortality being 71% at 1×10^8 conidia/mL. To the best of our knowledge, this is the first report of isolation and molecular characterization of an entomopathogenic fungus *C. cladosporioides* from a BPH of rice. This study suggests that BOU1 is a potential candidate for biological control of whitefly for the promotion of sustainable agriculture.

Keyword: Biological control; Fungal growth; Whitefly; Virulence; Enzymatic activity