**Efficacy of berberine in controlling foliar rice diseases**

ABSTRACT

Berberine showed in vitro remarkable antifungal activity against rice pathogens including Bipolaris oryzae, Curvularia lunata, Pyricularia oryzae and Rhizoctonia solani with MIC values of 125 µg/mL. It showed potent preventative and curative activities in suppression of brown leaf spot disease of a susceptible Oryza sativa var. KDML 105 under greenhouse conditions. Berberine at 5 mg/mL showed effective brown leaf spot disease suppression in rice when applied before pathogen inoculation. It also showed higher fungicidal activity in suppression of brown leaf spot disease in plants aged 30 and 60 days than did difenoconazole and mancozeb when applied after pathogen inoculation. Moreover, berberine at 10 mg/mL significantly ($P < 0.05$) reduced the percentage of rice blast disease severity by 49.81%, which was similar to the action of difenoconazole and mancozeb when applied twice under field conditions. However, it showed low fungicidal activity against dirty particle disease, a complex disease of rice, under field conditions when compared with synthetic fungicides. These results indicated that berberine is a promising bioactive compound which may be developed as a lead compound in a new fungicide to control brown leaf spot and blast diseases of rice.

**Keyword:** Blast disease; Brown leaf spot disease; Chemical control; Botanical fungicide; Fungicides