

Biological control of *Erwinia mallotivora*, the causal agent of papaya dieback disease by indigenous seed-borne endophytic lactic acid bacteria consortium

ABSTRACT

Dieback disease caused by *Erwinia mallotivora* is a major threat to papaya plantation in Malaysia. The current study was conducted to evaluate the potential of endophytic lactic acid bacteria (LAB) isolated from papaya seeds for disease suppression of papaya dieback. Two hundred and thirty isolates were screened against *E. mallotivora* BT-MARDI, and the inhibitory activity of the isolates against the pathogen was ranging from 11.7–23.7 mm inhibition zones. The synergistic experiments revealed that combination of *W. cibaria* PPKSD19 and *Lactococcus lactis* subsp. *lactis* PPSSD39 increased antibacterial activity against the pathogen. The antibacterial activity was partially due to the production of bacteriocin-like inhibitory substances (BLIS). The nursery experiment confirmed that the application of bacterial consortium *W. cibaria* PPKSD19 and *L. lactis* subsp. *lactis* PPSSD39 significantly reduced disease severity to 19% and increased biocontrol efficacy to 69% of infected papaya plants after 18 days of treatment. This study showed that *W. cibaria* PPKSD19 and *L. lactis* subsp. *lactis* PPSSD39 are potential candidate as biocontrol agents against papaya dieback disease.

Keyword: *Erwinia mallotivora*; Biocontrol agent; Plant disease