

**Title** Cross-infection potential of crown rot pathogen (*Lasiodiplodia theobromae*) isolates and their management using potential native bioagents in banana

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#### **Abstract**

Crown rot infected banana samples collected from different regions of India revealed that the fungus *Lasiodiplodia theobromae* was the major pathogen responsible for crown rot and *Colletotrichum musae* and *Fusarium* spp. were the minor pathogens. The cross-inoculation experiment, conducted using five different virulent isolates of *L. theobromae* on five different commercial cultivars of banana, demonstrated that generally the isolates were more pathogenic on the original variety from which they were isolated than on the other varieties. Among the varieties, cultivar Robusta (Cavendish-AAA) was highly susceptible to all the isolates tested and cv. Karpuravalli (Pisang Awak-ABB) was less susceptible. This was supported by *in vitro* testing of the fruit leachates of different varieties on the spore germination of the most virulent isolate of *L. theobromae*. To develop biological control management strategies for crown rot disease caused by *L. theobromae*, native bioagents as well as some of the bioagents available at our laboratory were screened *in vitro* by dual culture plate and spore germination assays. Based on these tests, four *Trichoderma* sp. isolates, *T. pseudokoningii*, *T. viride* S7, *T. viride* RT1, *T. viride* S17, and two bacterial isolates, *Pseudomonas aeruginosa* and *P. viridiflava*, were found effective as they significantly ( $P \leq 0.05$ ) inhibited mycelial growth and also conidial germination of the pathogen when compared with other antagonists. Further, the *in vivo* evaluation conducted at two different storage temperature conditions, cold temperature (14.5°C) and room temperature (30°C), indicated that the native bacterial isolate *P. viridiflava* registered 100% reduction in crown rot severity (score 0) and increased the shelf life period of banana up to 94 days. This effect was on par with the chemical benomyl (0.1%) at both storage temperatures studied. The bioagents identified for the effective management of crown rot disease as well as for the increased shelf life of banana fruit would be beneficial for the chemical free banana trade of local and distant markets.

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