Title Biological control of crown rot of bananas with *Pichia anomala* strain K and *Candida oleophila* strain O

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Abstract

The antagonistic activity of two yeast strains (*Pichia anomala* (E.C. Hansen) Kurtzman, strain K and *Candida oleophila* Montrocher, strain O) against the parasitic complex responsible for banana crown rot was evaluated. The strains were applied at three different concentrations (10^6, 10^7, 10^8 cfu/ml) and their efficacy tested *in vivo* on three separate fungi (*Colletotrichum musae* (Berk. & Curt.)Arx, *Fusarium moniliforme* Sheldon, and *Cephalosporium* sp.)and on a parasitic complex formed by association of these three fungi. At the concentrations used *C. musae* appeared to be the most pathogenic. The complex showed intermediate aggressiveness between *C. musae* and both other fungi.

Statistically significant antagonistic effects were observed on *C. musae*, *F. moniliforme*, and the fungal complex. The highest protection level (54.4%) was observed with strain O added at 10^8 cfu/ml on crowns previously inoculated with the fungal complex. The level was lower when the fungi were inoculated separately.

Furthermore, the antagonistic effect was strongly reinforced when strain O at 10^8 cfu/ml was applied 24 h before fungal complex inoculation (59.9%), as compared to its application 15 min (24.3%) or 3 h (27.3%) after fungal complex inoculation. Bananas showed increased susceptibility to the fungal complex from March to June, and this influenced the level of protection by yeast, which decreased over the same period. A strict negative correlation ($R^2 = 0.83$) was highlighted between susceptibility of banana to crown rot and protection provided by yeast.