

Isolation and characterization of *Streptomyces* species with antifungal activity from selected national parks in Kenya

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Accepted 15 April, 2010

Abstract

Microorganisms and their natural products are potentially important for the biological control of crop diseases without detrimental effects to the environment. In this study, acetonitrile-methanol extracts of 361 actinobacterial isolates obtained from Aberdares, Arabuko Sokoke, Lake Bogoria, Mt Kenya, Kakamega, Ruma, Shimba Hills and Imenti forest national parks in Kenya were screened for antagonism against *Fusarium oxysporum*, *Fusarium spp* and *Colletotrichum kahawae*, which are important crop pathogens. Twenty-three isolates showed antagonistic activity to one or all of the test fungi. Five isolates that were antagonistic against all test fungi were investigated further and were also found to have antibacterial activity against *Staphylococcus aureus* and *Escherichia coli*. Morphological and physiological studies show that the isolates belong to streptomycetes. Phylogenetic analysis of amplified actinobacterial 16S rRNA gene confirmed that all the five antagonistic isolates formed close phylogenetic clusters with known members of *Streptomyces* species with a (97 - 100%) sequence identity. The results suggest that protected areas may be ideal habitats for isolation of antagonistic actinobacterial species which may have the potential for beneficial application in biological control of fungal pathogens. However, further investigation by characterization of the antifungal and antibacterial compounds produced will be necessary.

Key words: Protected areas, soil *streptomyces*, bio-prospecting, antimicrobial, phytopathogens.