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INSECTICIDAL ACTIVITIES OF NEWLY ISOLATED ACTINOMYCETES AGAINST THE RIFT VALLEY FEVER MOSQUITO *Aedes aegyptii*

Abstract:

Insect vectors of diseases were and still one of the most pressing problems which affect human health and the environment. Therefore, it is still a big demand to try to find new environmentally safe biocontrol agents to manage insect vectors. The present study was carried out to evaluate the insecticidal activities of some new actinomycete strains isolated from different habitats in Riyadh; and Dammam and Jobail of the eastern region of Saudi Arabia. The selective isolation of actinomycetes led to the selection of 165 actinomycete strains from the isolation plates and 45 different strains were chosen after de-replication of them. Larvae of the mosquito vector, *Aedes aegyptii*, were reared in the laboratory and a preliminary screening study was performed by application of the liquid cultures of the 45 selected actinomycete strains to detect the most active strains for further work. Four strains, GB24, GO59, GO64 and GO510 were found to have good promising activities against larva of *A. aegyptii*. Larvicidal activities were evaluated after 24 hr exposure of groups of 2nd instar larvae to different concentrations of the four active crude extracts. At 200 ppm, 100% mortality in larvae was recorded with the four extracts and the highest larval mortality was found with the extract of strain GB24. Also, the actinomycete extract GB24 caused severe effects on the development of the mosquito larvae. The four most active actinomycete strains were characterized by studying their cultural and morphological characteristics and the results revealed that strains GB24 and GO510 belong to genus *Streptomyces*, while strain GO64 belong to genus *Micromonospora* and strain GO59 is a member of genus *Amycolatopsis*. Assignment of the most potent strain GB24 to genus *Streptomyces* was supported by the chemotaxonomical characteristics and confirmed by the phylogenetic analysis which revealed that it is mostly a subspecies or strain of the species *Streptomyces viridochromogenes* with high similarity percent of 99.3%. The present investigation clearly showed the insecticidal potentials of the selected actinomycete strains and that strain *Streptomyces* GB24 can be identified as a potential biocide producer but further studies should be done to confirm.

Keywords:

Insecticidal, Actinomycetes, Characterization, *Aedes aegyptii*.