Isolation of a Potential Microbial Agent for Controlling Dengue Vector Mosquitoes in Sri Lanka

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Aedes aegypti (Linnaeus) is considered as the major vector transmitting dengue in Sri Lanka. Objective of this study was to isolate bacterium from the natural environment and identify their larvicidal activity for controlling Ae. aegypti larvae. Preliminary survey was revealed that zero dengue infection in Pudumurippu area in Sri Lanka. Therefore, a lake in Pudumurippu area was selected for the isolation of spore forming bacteria through spread plate technique. Preliminary larvicidal activity of these isolates was performed against third instar Larval (L3) stage under the laboratory and field conditions. At 48 hours, post challenge the greatest larvicidal activity was observed in LW10 isolate; the sample was subjected for 16s-rRNA sequence analysis. Larvicidal activity of this bacteria was compared with a commercial strain of Bacillus thuringiensis israelensis (Bti) which is widely used for controlling Ae. aegypti larvae. The isolated bacteria was identified as a new strain of Baccilus cereus (SL001; accession number MG827268) and showed the higher larvicidal activity with concentrations 2.8 ± 0.31X105CFUmL-1 under laboratory and field conditions (mean cumulative mortality rate was 91 ± 4.1% at 48 hours challenge experiments on L3). When comparing Bti with local strains of B. cereus showed the significantly (P ? 0.05) higher larvicidal activity. B. cereus (SL001) displayed high growth rate while tolerating wide range of salinity (0-30gL-1), pH (6-10) and could be propagated with using newly developed low cost culture media (made using local raw materials). A locally isolated bacteria strain, B. cereus showing larvivorous activity was observed first time in Sri Lanka. This bacteria species could be used to control Ae. aegypti, dengue vector mosquitoes.

Awards Won:
Third Award of $1,000