

Mosquito larvicidal activity of Sri Lankan isolate of *Bacillus* strain

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Over two billion people mainly in tropical countries are at a risk from mosquito-borne diseases. The current insecticides are encountered with several problems such as resistance development, high cost and environmental and health concerns. The development of alternative insecticides such as biological control agents is therefore a major priority. The objective of the present study is to identify potential biological control agents of Sri Lankan environmental isolates of *Bacillus* strains against vector mosquitoes in Sri Lanka.

Soil samples were collected from the dry zone of Sri Lanka. *B. thuringiensis* (Bt H-14) and *B. sphaericus* (Bs-2362) standard cultures were obtained from the Medical Research Institute. Soil suspension was prepared in sterile distilled water and pour plated on nutrient yeast extract agar. *Bacillus* colonies were identified by phase contrast microscope and those producing parasporal bodies were assigned to *B. thuringiensis*. Isolated *Bacillus* strain was cultured in nutrient broth and final whole culture was lyophilized. Isolated *Bacillus* strain and standards, Bt H-14 and Bs-2362 were prepared for bioassay according to the standard procedure and they were tested against larvae of *Culex quinquefasciatus*, *Aedes aegypti* and *Anopheles tessellatus* under laboratory conditions following the WHO standard protocol.

A mosquito larvicidal *Bacillus* strain was isolated from the soil samples. Identification tests showed that the isolate had similar microscopic morphologies i.e. rod shape cell body with oval shape sub terminal spore, to those of Bt H-14 and Bs-2362 and the parasporal body was observed under phase contrast microscope. *Bacillus* isolate and Bt H-14 both were positive for Voges-Proskaur and negative for indole test. Based on above isolated *Bacillus* strain was tentatively assigned to *B. thuringiensis*. Isolated *Bacillus* strain showed comparable larvicidal activity (LC_{50} 1.28 ppm) to those of Bt H-14 (LC_{50} 1.27 ppm) and Bs-2362 (LC_{50} 1.86 ppm) against *Ae. aegypti* and less activity against *Cx. quinquefasciatus* and *An. tessellatus*.

This study showed that the isolated *Bacillus* strain could be used as a potential biological control agent against mosquito larvae, especially against *Ae. aegypti*.

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