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Laboratory and field evaluation of Polydimethylsiloxane (Aquatain) mosquito formulation against immature stages of the dengue vectors in Sri Lanka

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Laboratory, semi-field and field studies were carried out to evaluate the efficacy and effectiveness of 2 dosages of Aquatain (AMF) against *Ae. aegypti* and *Ae. albopictus* immatures (larvae and pupae) in the Kandy district. In the 1st laboratory study, two sets of 25 *Ae. aegypti* larvae were exposed to 1 ml/m^2 and 2 ml/m^2 dosages of AMF and daily larval mortality was observed for 5 - 7 days. This study was carried out with 6 replicates with an equal number of controls. The 2nd laboratory study followed the same methodology, except that this study had 4 replicates with an extended observation period of 18 days. In both studies, percent daily larval mortalities for different treatments were determined. In the 3rd laboratory study, 60 *Ae. aegypti* pupae were exposed to 1 ml/m^2 and 2 ml/m^2 dosages of AMF and the daily pupal mortality was determined. This study was carried out with 6 replicates for treatments and control. In the semi-field study, 6 water storage tanks, each with 40 *Ae. aegypti* larvae, were treated with 1 ml/m^2 dosage of AMF and in the field study, 21 tanks with a known number of *Ae. aegypti*/ *Ae. albopictus* immatures were treated with 2 ml/m^2 dosage of AMF. In both field studies, daily larval counts were taken until all larvae died / pupated. In the laboratory study 1, day 1 larval mortalities were 50% and 60.7% in 1 ml/m^2 and 2 ml/m^2 AMF dosages respectively. The day 5 larval mortalities were 60.7 % and 72.0% in 1 ml/m^2 and 2 ml/m^2 dosages respectively. In the 2nd laboratory study, larval mortalities were over 50% on day 4 and over 88% on day 11, at both dosages of AMF. A 100% larval mortality was observed on day 14 at 2 ml/m^2 and on day 15 in 1 ml/m^2 dosages. In the controls, 0.6% larval mortality was observed on day 5. In the field studies, over 50% larval mortality was observed in 1 ml/m^2 and 2 ml/m^2 dosages on day 3 and day 5 respectively. Over 90% larval mortality was observed in 1 ml/m^2 and 2 ml/m^2 dosages on day 12 and day 11 respectively. 100% larval mortality was observed in the 1 ml/m^2 dosage on day 15 while in 2 ml/m^2 dosage 99.8% mortality was observed on day 18. 100% pupal mortality was observed within 24 hours of exposure to the AMF. In conclusion, AMF is efficacious and effective against *Ae. aegypti / Ae. albopictus* larvae and pupae in water storage tanks, although it takes 2-3 weeks for complete clearance of larvae in the field. AMF showed no negative impact on the non target organism, *Poecilia reticulata*, a fresh water fish species. Thus, AMF has a place in an integrated vector management programme for dengue vector control in Sri Lanka.

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