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Resistance of Culex quinquefasciatus (Diptera: Culicidae) to widely using insecticide groups of Sri Lanka

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Culex quinquefasciatus Say 1823, the major vector of lymphatic filariasis, is one of the most abundant and major urban nuisance mosquito species in Sri Lanka. Synthetic insecticides that are applied by way of space spraying and larvicides are mainly used in vector control programmes. Development of resistance to Organophosphate (OP) and Pyrethroid (PY) insecticides is a major threat to control mosquito vectors. To determine the effectiveness of insecticides application in Sri Lanka for Culex spp. vector mosquitoes, susceptibility tests were performed on *Cx. quinquefasciatus* on larvicides belong to OP group and adult insecticides belong to PY and OP groups. Wild *Cx. quinquefasciatus* were collected from selected localities in the filarial belt Sri Lanka: Chilaw, Negombo, Kirulapana, Maharagama, Homagama, Wadduwa, and Galle. World Health Organization (WHO) recommended larval and adult bioassays were performed for mosquitoes collected from each location using deltamethrin (0.05%) and permethrin (0.75%) of pyrethroid group, malathion (5%) of organophosphate group (n = 2625) as adulticides and temephos (n = 875) of organophosphate group as a larvicide. Larval mortality rates varied between 16% and 76% for temephos (OP). Adult mortality rates obtained for 0.75% Permethrin, 0.05% Deltamethrin (PY) and 5% Malathion (OP) varied from 16% to 87%, from 8% to 79% and from 89% to 100% respectively. Samples obtained from all localities showed high degrees of resistance (<80% mortality according to WHO guidelines) for PY adulticides and OP larvicide. However, *Cx. quinquefasciatus* from all localities were susceptible to OP adulticide. The high levels of PY resistance found in the principle lymphatic filariasis vector in Sri Lanka needs to be considered in future chemical vector management programmes.

Keywords: *Culex quinquefasciatus*, Organophosphate, Pyrethroid, resistance, insecticides, Sri Lanka.

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