Sensitivity of different larval collection methods in dengue vector surveillance in the Kandy and Nuwara Eliya districts

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A study was carried out during the period June 2005 - May 2006 in the Kandy and Nuwara Eliya districts to determine the sensitivity of 1, 5, 10 and 15 larvae collection methods in dengue vector surveillance. Aedes larval surveys were conducted at 19 sites in 17 Divisional Director of Health services areas of the two districts. In each survey, a minimum of 100 houses were visited, all possible indoor and outdoor Aedes breeding sites were examined. Twenty Aedes larvae were collected randomly in groups of 1st, 2nd-5th, 6th-10th, 11th-15th and 16th-20th larvae, in separate containers, from
each positive container (if a particular container had < 20 larvae, all larvae were collected and grouped as previously). Larvae were identified to species. Sensitivity of 1, 5, 10 and 15 larvae collection methods were determined taking the 20 larvae collection method as the gold standard. Five Aedes species, namely, Aedes aegypti, Ae. albopictus, Ae. chrysolineatus, Ae. macdougalli, and Ae. vittatus were found to be breeding in the containers in the study sites. Of the 353 positive containers, 236 (66.86%) were positive for a single Aedes species, 110 (31.16%) for two species and 7 (1.98%) for 3 species. For Ae. aegypti, the sensitivities of 1, 5 and 10 larval collection methods were 68.26 (95% CI: 59.32 – 77.21), 91.35 (95% CI: 85.94 – 96.75) and 99.03 (95% CI: 97.16 – 100.0), respectively. 100% sensitivity was observed in 15 larvae collection methods. For Ae. albopictus, the sensitivities of 1 and 5 larvae methods were 74.66 (95% CI: 68.93 – 80.39) and 95.48 (95% CI: 92.73 – 98.22), respectively. Ten and 15 larvae collection methods were 100% sensitive. It is recommended to collect a minimum of 10 Aedes larvae (or all if < 10 larvae), to achieve a > 99% sensitivity for dengue vector surveillance. Entomological teams should be well trained in differentiating Aedes larvae from non-Aedes larvae in the breeding habitat, in order to prevent collection of non-Aedes larvae that occur commonly in the breeding sites of Ae. aegypti and Ae. albopictus.

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