

VECTORS AND TRANSMISSION OF MALARIA IN CANAL-IRRIGATED AND NATURAL-STREAM-IRRIGATED SYSTEMS IN MATALE DISTRICT, SRI LANKA

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Malaria is one of the public health problems in Sri Lanka. *Anopheles culicifacies* and *An. subpictus* are considered as primary and secondary vectors, respectively, in the island. River and stream-bed pools are known breeding places of these vectors. Therefore, a study was carried out to assess the anopheline vectors and malaria transmission in a canal- and natural-stream irrigated areas in the dry zone of Central Sri Lanka. Adult and larval mosquito collections were made from January to December 1998, using four standard methods by the entomology teams attached to Anti-Malaria Campaign, Matale. Parasitological data were collected from the two government hospitals and mobile malaria clinics in each area. The data collected by the Anti Malaria Campaign, Matale were used.

A total of 3094 and 2576 anopheline mosquitoes representing 11 species were collected from canal-irrigated and traditional-stream-irrigated village areas, respectively. Numbers of *An. culicifacies* ($P < 0.001$) and *An. subpictus* ($P < 0.001$) collected using cattle-baited huts and traps from the natural-stream-irrigated area were significantly higher than the canal-irrigated area. So was true for both immature vector larvae collected. High densities of *An. culicifacies* larvae were found in the pools in stream beds during the dry season of the year. However, fewer numbers of *An. culicifacies* and *An. subpictus* were found in the water logged area due to seepage from the irrigation canal. In the twelve month period there were 605 and 1642 malaria fever episodes with either *Plasmodium vivax* or *P. falciparum* reported from the canal- and natural-stream-irrigated areas, respectively. The incidence of malaria patients in natural-stream-irrigated area was significantly higher than in the canal-irrigated area (Odds ratio = 0.31, 95% CI = 0.29-0.35, $\chi^2 = 650.26$, $P < 0.001$).

This study on population dynamics of malaria vectors and malaria transmission clearly shows that the density of *An. culicifacies* and *An. subpictus* in the natural-stream-irrigated area was higher than that in the canal-irrigated area due to the formation of pools in the stream beds during the dry season. The findings would help in organizing larval control operations in canal-irrigated and natural-stream-irrigated areas in Sri Lanka.