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**MALARIA VECTORS AND TRANSMISSION DYNAMICS
IN A "PURANA" VILLAGE ECOSYSTEM**

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Malaria transmission was studied in a traditional tank-irrigation based rice-producing village (Mahameegaswewa) within the Huruluwewa watershed in the malaria-endemic low country dry zone of Northcentral Sri Lanka during August 1994 - February 1997. Adult anopheline mosquitoes were collected from human and bovid bait, bovid-baited trap huts, and indoor catches. Larval collections were done from surface water habitats by a standard dipping technique. Head-thoraces of adult female anophelines were tested for the presence of the malaria parasites *Plasmodium falciparum* and *P. vivax*, and blood engorged abdomens for the presence of human blood, by enzyme-linked immunosorbent assays (ELISA). House surveys were done at 2-day intervals to record cases of blood-film confirmed malaria amongst the villagers. Malaria data also were obtained from a clinic located within the watershed.

More than 7800 female anophelines in 14 species were collected. Malaria parasite infections were seen in 7 species. High rates of sporozoite infection and human blood feeding were seen in *Anopheles culicifacies*. A malaria outbreak occurred during October 1994 - January 1995 when 45% of village residents experienced at least a single disease episode. Only *An. culicifacies* abundance lagged by 1 month correlated positively with monthly malaria incidence during the outbreak period. Microepidemiological analysis showed that the distance of houses from the nearby Yan-Oya stream was a risk factor for malaria. This was related to the breeding pattern of *An. culicifacies* in the pooled Yan-Oya stream, which is the only permanent source of flowing water in the watershed and functions as the natural feeder canal to the Huruluwewa tank. A classical pattern of successive waves of *An. culicifacies* larval abundance, adult abundance and human malaria was seen during the outbreak. A wider study of 7 watershed villages (including Mahameegaswewa) showed that indoor resting *An. culicifacies* abundance decreased with increasing distance from the Yan-Oya stream. Human malaria too, was substantially lower in villages situated beyond 1 km distance from the stream.

It was concluded that *An. culicifacies* was epidemiologically the most important vector in the study area, and that the stream was the key breeding habitat for this species. The option of using irrigation water management to contain malaria in the Huruluwewa watershed is presently under investigation. This work was supported by the DANIDA, NORAD and the Government of Japan, by way of grants to the International Water Management Institute (IWMI).