

Summary

A cross sectional survey was carried out to assess the prevalence of microfilaraemia and chronic disease, and to examine the frequency distribution of diurnally subperiodic *W. bancrofti* mf in Teressa Island, remotely located in the Nicobar district of Andaman and Nicobar Islands, with a population of 1935. The overall endemicity rate observed was 17.1%. Mf carriers were found in all the 11 villages in this island with mf rates ranging from 5.11% to 25%. Mf rate increased gradually with age, reaching a peak in the age class 31-40 years and thereafter showed a decreasing trend. Mf rate and disease rates were significantly higher ($P < 0.001$) in males (14.7% and 5.2% respectively) than females (8.6% and 1.5% respectively). Acute disease occurs only in the age group of 40 years and above, with a prevalence of 1.2%. Chronic disease prevalence shows a gradual increase with age. Hydrocele (84.6%) was the commonest disease manifestation among males whereas lymphoedema was the only manifestation encountered among females. The negative binomial distribution fitted to the data on distribution of microfilarial counts gave a perfect fit. The data having been fitted to the negative binomial, the expected mf prevalence could be determined as 16.82% as against an observed prevalence of 11.83%.

In all mosquitoes belonging to 12 species were found biting the native aborigine tribe. *Oc. niveus* predominated among the mosquitoes from man landing collections. The percentage of *Oc. niveus* in the total biting mosquito population was 89.7% followed by *Ae. malayensis* (3.4%). The values of finite rate λ of increase observed in *Oc. niveus* fluctuating on or around at 1, indicates that the *Oc. niveus* population is stable. These fluctuations could be attributed to the seasons of the year. Abundance of adult population of *Oc. niveus* ascended sharply in the early summer month of February and thereafter fluctuated through the other summer months (March-April) and monsoon (May-October) of the year showing the seasonal variations in population fluctuation.

Among the 12 species of mosquitoes dissected, only *Oc. niveus* was found to be naturally infected with *W. bancrofti* in Teressa Island. Infection was observed to be perennial whereas the infectivity was seen during most part of the year, barring February, July and August. The results confirm active transmis-

sion by *Oc. niveus* in the Teresa island. The overall host efficiency index of *Oc. niveus* was 0.43, suggesting that over 40% of the mf ingested were able to complete their development into infective stage.

The annual biting and infective biting rates were estimated to be 21591 and 107 respectively. The Annual Transmission Potential was 163. It was estimated that 3.71 infective stage larvae were available in the vector population during the study period per person at risk. The pattern of MTP suggests that the intensity of transmission was high during summer months than the winter and monsoon months. Active and perennial transmission is evident.

Biting activity of *Oc. niveus* was seen throughout the day, exhibiting a bimodal peak, with the first one at dawn (0400-0600 h) and the other towards the dusk hours (1600-1800 h). The proportion of mosquitoes biting in the forenoon was 40.4% whereas in the afternoon it was 59.6% respectively. This was true for both parous (42.0% vs. 58.0%) and nulliparous mosquitoes (39.9% vs 60.1%). However, the risk of transmission of filariasis due to *Oc. niveus*, based on parity status was found to be during the dawn (0400h) and dusk (1600-1800) hours.

Overall parous rate observed during the study period was 23.67. The proportion of mosquitoes belonging to nulliparous, 1-D, 2-D and 3-D was 76.33%, 18.17%, 5% and 1% respectively. The parous rate starts to decline from January until July and thereafter begin to raise from August and attains a peak during the month of September and thereafter shows a steady decline. A higher survival is noticed during the late monsoon months (August to October) Probability of survival through different gonotrophic cycles was almost similar. A similar pattern in probability of survival was observed between seasons. The survivorship curve drawn suggests that mortality increases with age of the mosquitoes. Abundance of parous females was lowest in December – January then rose sharply in February and thereafter showed small fluctuations towards a declining trend until March-July and thereafter gradually increases from August until November and then dips down in December. The survival of the vectors as in-

licated by the proportion of parous mosquitoes was found to be less in the summer season. Maximum transmission was found to take place between May and October.

The microfilariae were found to be over dispersed in *Oc. niveus*. The later stages of the parasites were observed to be randomly distributed. However, the distribution pattern was considerably narrowed down in the case of infective stage larvae. The probability of survival of the parasite was less in the latter stages of the larval parasite. Prevalence of infection and the degree of parasite aggregation in the vector population falls with parasite stage, implying the operation of density dependent mechanism on the survival of the vector mosquito.