

Evaluation of Bush Clearing as a Control Measure against Afrotropical Malaria Vectors

Nyanchongi, B O

Abstract:

An investigation of the efficacy of bush clearing as a control measure against *Anopheles gamb/ae sensu lata* was carried out on Rusinga Island in western Kenya. A knowledge, attitude and practices (KAPs) survey and empirical studies on the effects of vegetation cover on larval mosquito breeding ecology/adult resting behavior were conducted. Of the 1451 interviewees 43% and 34% knew and used bush clearing as a method of malaria control respectively. 69% learnt of this method from the formal education system. There were significantly more *An. gambiae* mosquitoes in aquatic habitats exposed to sunlight than in those under bush cover ($p < 0.001$) Conversely, more culicine mosquitoes were recovered in artificial habitats under bush cover than in those exposed to sunlight ($P < 0.001$). A 3 " 3 Latin square experiment designed to explain these results suggested the influence of shade and temperature. Significantly more *An. gambiae* larvae were sampled from sunlight-exposed habitats than from those under papyrus mats ($p < 0.001$) or potted plants ($p < 0.001$). The proportion of larvae sampled from the latter pair of habitats did not differ significantly ($p = 0.028$) Pairwise comparisons of the proportion of culicine larvae sampled from the three habitats found no significant differences between mats and potted plants ($p = 0.566$) but the two differed from the open sunlit habitats ($p < 0.001$). The proportions of *An. gambiae* and culicine larvae collected under the three habitats were highly correlated with the water temperature ($p < 0.005$), the former species preferring warm and the latter cooler water. Adult resting collections using the prototype 'Testing basket' developed captured significantly more *An. gambiae* and culicine mosquitoes indoors (in human dwellings) than outdoors (in the bushes nearby) ($p < 0.001$). Analysis of the mosquitoes' abdominal status (unfed, blood fed and gravid) found no likelihood of deliberate exophily. Polymerase Chain Reaction (PCR) analysis of the adult resting *An. gamb/ae* complex mosquitoes detected 53% *An. gambiae* and 47% *An. arabiensis* females. The significantly large proportions of *An. gambiae* found breeding in sunlight-exposed than bush covered aquatic habitats and resting indoors than outdoors implies that bush clearing may not be effective in controlling this species.