Vectorial potential of *Mansonella* species in the transmission of *Wuchereria bancrofti* and evaluation of mosquito collection methods in Tana-Delta, Coastal Kenya

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ABSTRACT

Different mosquito species have been incriminated as vectors of lymphatic filariasis (LF). On the Kenyan coast, Anopheles, Culex and Aedes species have been identified as vectors of LF. This study aimed at determining whether Mansonia species are also vectors of LF in Tana-Delta district of Kenya. Secondarily, the study also evaluated mosquito sampling methods. A cross-sectional study was carried out in six villages in the district, where mosquitoes were collected by three methods: Pyrethroid sprays, CDC light Traps and CDC Gravid Traps. Mosquitoes from each collection method were counted to determine the method with the highest catch. A total of 1632 mosquitoes were collected, with 1265 being collected by light traps (77.55%), 311 (19.1%) by pyrethrum sprays, and 56 (3.4%) by gravid traps. The collected mosquitoes were identified to the level of genera. Five mosquito genera were collected: Culex species, 1048 (64.2%), Aedes species, 188 (11.5%), Mansonia species, 236 (14.5%), Anopheles species 148 (9.1%), and Ficalbia species 12 (0.7%). The prevalence of Wuchereria bancrofti in Mansonia species was also determined. Fifty Mansonia mosquito species were dissected to determine presence of W. bancrofti stage III larvae (L₃). To identify filarial worms in mosquito specimen, Deoxyribonucleic acid (DNA) was extracted from filarial larvae, amplified by the PCR assays using W. bancrofti species-specific primers. Only two out of 50 Mansonia species dissected had stage II filarial larvae. Deoxyribonucleic acid (DNA) was also extracted from individual Mansonia species, and analyzed by PCR to determine W. bancrofti infectivity rates. The PCR analysis was negative for W. bancrofti. Light traps were found to be the most efficient method for mosquito sampling. There was no evidence that
Mansonia species have significant medical importance in the transmission of W. bancrofti since both dissection and PCR assays did not indicate any transmission potential in the mosquitoes. It is therefore recommended that light traps should be used in collecting large numbers of mosquitoes for parasite screening purpose.