

Host choice and multiple blood feeding behaviour of malaria vectors and other anophelines in Mwea rice scheme, Kenya

Abstract:

Abstract Background Studies were conducted between April 2004 and February 2006 to determine the blood-feeding pattern of Anopheles mosquitoes in Mwea Kenya. Methods Samples were collected indoors by pyrethrum spay catch and outdoors by Centers for Disease Control light traps and processed for blood meal analysis by an Enzyme-linked Immunosorbent Assay. Results A total of 3,333 blood-fed Anopheles mosquitoes representing four Anopheles species were collected and 2,796 of the samples were assayed, with Anopheles arabiensis comprising 76.2% (n = 2,542) followed in decreasing order by Anopheles coustani 8.9% (n = 297), Anopheles pharoensis 8.2% (n = 272) and Anopheles funestus 6.7% (n = 222). All mosquito species had a high preference for bovine (range 56.3–71.4%) over human (range 1.1–23.9%) or goat (0.1–2.2%) blood meals. Some individuals from all the four species were found to contain mixed blood meals. The bovine blood index (BBI) for An. arabiensis was significantly higher for populations collected indoors (71.8%), than populations collected outdoors (41.3%), but the human blood index (HBI) did not differ significantly between the two populations. In contrast, BBI for indoor collected An. funestus (51.4%) was significantly lower than for outdoor collected populations (78.0%) and the HBI was significantly higher indoors (28.7%) than outdoors (2.4%). Anthropophily of An. funestus was lowest within the rice scheme, moderate in unplanned rice agro-ecosystem, and highest within the non-irrigated agro-ecosystem. Anthropophily of An. arabiensis was significantly higher in the non-irrigated agro-ecosystem than in the other agro-ecosystems. Conclusion These findings suggest that rice cultivation has an effect on host choice by Anopheles mosquitoes. The study further indicate that zooprophyllaxis may be a potential strategy for malaria control, but there is need to assess how domestic animals may influence arboviruses epidemiology before adapting the strategy.