Distribution of Malaria Vectors Along Altitudinal Gradient in Western Kenya.

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Background: Malaria is a challenge in sub-Saharan Africa where over 80% of estimated 2 million deaths occur annually. Partly, malaria control relies on measures targeting the vector. To correctly implement evidence based vector control measures understanding vector composition is paramount. This study determined composition and abundance of malaria vectors along altitudinal gradient (1000m-1600m) in western Kenya.Larval and indoor resting anophelines were sampled in Kisian (1000-1200m), Emutete (1453-1632m) and Iguhu (1450-1580m) using standard sampling procedures. ANOVA was used for data analysis.

Results: Five anopheline species were identified from larval habitats, four species showed no variation (Person $\chi 2 = 13.6$; $P = 0.09$) in abundance while one species was found only in one highland site. Only two species of four were found resting indoor and there was no variation in indoor resting density of An. gambiae s.l. ($F= 2.46$; $df = 2, 297$; $P = 0.08$) and An. funestus ($F = 0.94$; $df =2, 297$; $P = 0.38$) along the gradient. PCR analysis of An. gmabiae s.l. showed significant variation in abundance of An. gambiae s.s and An. arabiensis along the altitudinal gradient in both larval (Pearson $\chi 2 = 133.4$; $df = 2$; $P < 0.001$) and adult (Pearson $\chi 2 = 8.6$; $df = 2$; $P = 0.013$) samples. An. gambiae s.s was abundant in higland but An. arabiensis was also observed at altitude > 1300m. Diversity in distribution of anopheline larvae correlated with the diversity in larval habitat in study areas. An. arabiensis was observed above 1300 m phenomenon not reported before in same sites, suggesting an ecological expansion by this important vector. There is need for constant monitoring of vector populations is necessary to understand changes in malaria transmission dynamics as vector species expand ecological zones.

Key words: *Anopheles, Diversity, Altitude, Ecological Expansion*