2024-04

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Springer International Publishing

https://link.springer.com/article/10.1007/s10750-023-05414-0

Influence of land use on the abundance and spatial distribution of mosquito larvae of the Anopheles gambiae complex in a malaria expansion area in northern Tanzania

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Abstract

In many countries, successful control of larval mosquito populations for malaria control is still hindered by poor knowledge of preferred breeding habitats and natural factors limiting larval abundance. In Africa, preferred breeding habitats for malaria mosquitoes vary regionally and for many regions, they are still not well known. Moreover, variables that limit abundance of larvae of malaria mosquitoes are still ambiguous and impacts of surrounding land use practices are unclear. To study this, we sampled mosquito larvae from 164 small ground habitats (SGHs) in the lake Manyara basin (LMB) in northern Tanzania, a malaria expansion area with diverse land use types. We found that Anopheles gambiae s.l. was the only malaria mosquito breeding in SGHs in the region and its abundance was positively affected by turbidity and proximity to human dwellings. SGHs appear to be the major breeding sites for An. gambiae s.l. in the LMB despite the presence of larger temporary ponds which support negligible numbers of this species. In this region, we recommend that control of malaria via control of population of larval An. gambiae s.l. should prioritize SGHs to optimize use of limited resources and avoid damage to the environment by targeting unimportant habitats.