

## Abstract

### **Molecular malacology and xenomonitoring schistosomiasis: Implication of *Bulinus africanus* as an intermediate host of *Schistosoma haematobium* in Lake Malawi.**

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The life-cycle of *Schistosoma haematobium*, a trematode parasite, involves both humans and *Bulinus* freshwater snail species. Recent reports have identified *Bulinus* spp. novel to Lake Malawi, but their role in *Schistosoma* epidemiology is unknown. Due to the emergence of hybrids of *S. haematobium* and *Schistosoma bovis* south of Lake Malawi, this study sought to investigate the intermediate hosts of these *Schistosoma* spp., to identify parasite transmission foci, and determine potential areas for their hybridization. Infection screening was conducted on 106 snails collected in 2017 from the shoreline of Lake Malawi, Magochi District, using both conventional and quantitative PCR xenomonitoring methods. Snails were selected for species identification (n=10) by inspecting a 644bp fragment of the *cox1*, which was later aligned to entries on GenBank. The distribution of *Bulinus* spp. and *Schistosoma* spp. was then mapped onto Magochi district. Four snails were matched to sequences of *Bulinus africanus* and another identified as a *Bulinus angolensis*-like specimen. Although no snails were infected with *S. bovis*, the qPCR cycle threshold values indicated that individuals from both snail species were developing pre-patent infections with *S. haematobium* across the shoreline, including some Magochi tourist beaches. This study builds on recent surveys implicating the newly reported *B. africanus* and *B. angolensis*-like snails in the transmission of *S. haematobium* in Lake Malawi for the first time. There is a risk for introduction of *S. bovis* and subsequent hybridisation with the endemic *S. haematobium*, as *B. africanus* is a competent host of both parasites. The finding of snails infected with *S. haematobium* on tourist beaches poses a risk for its translocation to non-endemic areas. Xenomonitoring will continue in Malawi, utilising novel *Schistosoma* species-specific TaqMan probes to ascertain the species identities of pre-patent infections in snails.