Molecular characterisation of medically important freshwater snails in Saudi Arabia

Mohammad H. Al-Harbi, Hajri Al-Shehri, E. James LaCourse, J. Russell Stothard*

Health authorities in the Kingdom of Saudi Arabia (KSA) face several national challenges to eliminate schistosomiasis transmission, particularly in the southern region where there is active transmission is known and application of molecular methods of snail identification has been limited. Better knowledge of snail-related aspects is needed, and this study sought to better characterise local populations *Biomphalaria* and *Bulinus*. Two targeted malacological surveys were conducted to collect snails from active transmission foci in Albahah and Abha. Water chemistry measurements were made with snails subjected to traditional surveillance methods e.g., cercarial shedding test and modern molecular methods of DNA sequencing, microsatellite DNA typing and qPCR analysis to detect *Schistosoma* DNA within snails. A total of 80 *Biomphalaria* specimens were examined. Size-fractionation of microsatellite alleles at six loci revealed very low intra-populational genetic diversity and only two *cox*1 haplotypes were found. Although no *Biomphalaria* were found shedding cercariae in the field, the qPCR assay screening for *S. mansoni* DNA detected ten positive samples from Albahah. In addition, molecular characterisation of snails collected from an active transmission location in Abha confirmed the presence of *Bulinus forskalii*, which has not been reported from this area before. Our results provide a novel epidemiological insight into increasing opportunities for *Schistosoma* transmission. This raises some concern that requires further holistic efforts in environmental control to stop further emergence and spread of medically important snails and parasites, particularly KSA regions close to the border with Yemen.