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#### TITLE

**FUNCTIONAL EVALUATION OF MIRNAS IN SCHISTOSOMIASIS TRANSMITTING SNAILS AND THEIR ROLE IN RESISTANCE/SUSCEPTIBILITY TO SCHISTOSOMA SPP. (TREMATODA: DIGENEA)**

#### AUTHORS

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#### ABSTRACT

Schistosomiasis is a parasitic disease caused by parasites of the genus *Schistosoma* spp., which have different snails as intermediate hosts, such as those of the genus *Biomphalaria* and *Bulinus*. Small RNA sequencing on *Biomphalaria glabrata*, revealed for the first time, 89 mature microRNAs (miRNAs) predicted as important in regulating the expression of genes involved in immunological, epigenetic, and metabolic processes. Therefore, the present objective of this study was to evaluate the influence of miRNAs in the snail response towards parasite. Snails of different species or lineages with variable susceptibilities to infection were used for this approach. Thus, six miRNAs, identified in *Biomphalaria* spp. were selected based on their potential role in the regulation of innate immune genes in other organisms. The expression levels of those miRNAs are being evaluated by qPCR in hemolymph and head/foot of *Biomphalaria* spp. and *Bulinus* spp., selected for their susceptibility and resistance to parasite. These snails were exposed or not to miracidia of the parasite *Schistosoma* spp.. Also, the expression of these miRNAs was evaluated in nine different tissues (hemolymph, plasma, head/foot, hepatopancreas, stomach/intestine, ovotestis, albumen gland, kidney, and mantle) of *B. glabrata* snails with different compatibilities selected from one original population. Subsequently, *Biomphalaria* spp. snails will be injected with selected and non-specific miRNA inhibitors designed as anti-miR. After confirming the inhibition of miRNAs, the snails have been exposed to *S. mansoni* miracidia. After four weeks, shell sizes, morphological changes, infection rate, and cercariae release have been evaluated. To date, an increase of miR-8, miR-124, miR-184, and miR-1985 expression was observed in resistant *Biomphalaria* spp. snails after exposure to *S. mansoni* miracidia when compared to susceptible snails. Also, an increase in miR-184 expression was observed in *Bulinus wrighti* after exposure to *Schistosoma haematobium* miracidia. We had no evidence of miR-124 expression in *Bulinus* spp. and it appeared as only expressed in the head/foot of *Biomphalaria* sp.. This study aims to characterize miRNAs and genes potentially involved in mechanisms of resistance to infection by *Schistosoma* spp..

#### KEYWORDS

microRNA; *Biomphalaria* spp.; *Bulinus* spp.; Resistance/Susceptibility; *Schistosoma* spp

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