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TITLE

SCHISTOSOMA MANSONI POPULATION GENETICS IN BRAZIL REVEALED SHARING OF WILD-HOST AND HUMAN STRAINS AND GEOGRAPHICAL STRUCTURE

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ABSTRACT

In Brazil, the parasite associated with human intestinal schistosomiasis is *Schistosoma mansoni*, which has also been found infecting wild rodent species. The municipality of Sumidouro is a low endemic area for *S. mansoni*, and populations of the water-rat *Nectomys squamipes* act as reservoirs of the parasite. *Schistosoma mansoni* populations infecting humans and water-rats in Sumidouro present chronobiological variation in cercariae emergence (chronotype) and phenotypic characteristics between host species. Some studies have postulated that chronotype adjustment of *S. mansoni* populations to human (diurnal chronotype) and water-rat (nocturnal chronotype) hosts could result in prezygotic isolation. To test this hypothesis, we used the mitochondrial cytochrome c oxidase subunit 1 (MT-CO1) and microsatellite loci as genetic markers. We analysed the population structure of *S. mansoni* from the definitive host species and the spatial distance of the isolates between two endemic localities (PAM and ENC-SOL) in the municipality of Sumidouro, Brazil. We obtained 555 bp MT-CO1 sequences from 243 *S. mansoni* specimens, and seven microsatellite loci were genotyped for 158 *S. mansoni* specimens, including eggs and adult helminths from water-rat and eggs from human feces. Four haplotypes of the MT-CO1 gene were found, with haplotypes 1 and 2 shared by two studied localities and haplotypes 3 and 4 exclusive to the ENC-SOL locality. Haplotypes 1, 2 and 3 were shared between human and *N. squamipes* hosts. The population structure analysis revealed geographical structure and no structure associated with definitive host species, indicating that the populations of *S. mansoni* of different chronotypes are not isolated, with significant gene flow between them. In conclusion, our results confirm that wild rodents can contribute to the maintenance of the *S. mansoni* life cycle in Sumidouro and can be used as indicators of local transmission areas.

KEYWORDS

Mansonic Schistosomiasis; *Nectomys Squamipes*; Wild Reservoir; Genetic Structure; Sumidouro

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