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TITLE

INTERMEDIATE AND DEFINITIVE HOSTS OF WILD SCHISTOSOMA MANSONI: ECOLOGICAL NICHE MODELING OF HOSTS IN LOW ENDEMICITY AREAS

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ABSTRACT

IntroductionThe relationship between the environment and animal life began to be seen as an important tool to help control zoonoses. Climate variations lead to changes in the environment, which can influence the spatial distribution of species and, consequently, the spread of diseases to humans. Considered the main non-human definitive host species of Schistosoma mansoni in Brazil, the wild rodent Nectomys squamipes plays an important role as a reservoir in maintaining the schistosomiasis cycle in the absence of humans. This study demonstrates the results of ecological niche modeling of intermediate and definitive wild hosts of S. mansoni in the Regional Health Superintendence of Barbacena (Minas Gerais State), which has registered 31 municipalities, 80% of which are classified as endemic for parasitosis. Methods Environmental variables associated with the distribution of each species were used based on information from the scientific collections of Global Biodiversity Information Facility (GBIF) and Species Link to project the ecological niche model in the geographic space. Abiotic variables such as the mean annual temperature, isothermality, and precipitation seasonality were obtained from World Clim.The R-Studio software (version 4.3.1, R Core Team), a script-based statistical programming environment, was used for ecological niche modeling, in which occurrence data and
abiotic variables were loaded. The modeling algorithms used were BIOCLIM and MAXENT (R-Studio packages), they project, in pixels, the area suitable for the establishment of the species, according to the selected bioclimatic variables. Results Ecological niche modeling of the wild host, N. squamipes, revealed the occurrence of the species in geographic overlap with the Biomphalaria species. Conclusions Knowing the influence of bioclimatic variables and identifying favorable conditions for the establishment, occurrence, and distribution of species are important information for developing strategic actions for the surveillance and control of this endemic species. The presence of the definitive wild host needs to be considered by control programs of schistosomiasis.

KEYWORDS

Schistosomiasis; Schistosoma mansoni; Ecological Niche Modeling; Nectomys Squamipes

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