INTEGRATED APPROACH TO PARASITOLOGICAL SURVEILLANCE: THE USE OF eDNA IN HELMINT MONITORING IN ENDEMIC AREAS

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The One Health approach, which promotes the integration of multiple sectors, is essential in addressing Neglected Tropical Diseases (NTDs). The NTDs are endemic diseases caused by various infectious or parasitic agents that affect vulnerable populations living in poverty and with limited access to basic health services. Helminth parasites are especially relevant in this context, as they are directly related to poor sanitation infrastructure, which favors their spread through contact with contaminated soil, water and food. Although traditional microscopy is the standard method for identifying these parasites, molecular methods can offer greater sensitivity and specificity. The use of environmental DNA (eDNA) in parasitology is relatively recent but promising for understanding the dynamics of transmission and identifying sources of infection, which can contribute to early diagnosis and control, especially in endemic areas. The present study proposes the development of an auxiliary method to the traditional one based on eDNA extraction to evaluate environmental contamination by parasites and its impact on the health of residents of Brejo do Amparo, Januária - MG. To investigate the association between soil contamination and human infection, biological samples (faeces) were collected from 265 residents and 10 soil samples for standardization of the eDNA technique by Multiparallel qPCR. Of the biological samples, 81 (30.5%) were positive for helminths, in which the majority were positive for *Schistosoma mansoni* (26%), followed by *Strongyloides stercoralis* (3%), hookworms (0.75%), *Enterobius vermicularis* (0.38%), and *Hymenolepis* spp. (0.38%). In the soil, *Ascaris lumbricoides* (20%), *Toxocara cati* (30%), and *Taenia solium* (30%) were the most commonly detected species. These findings reinforce the potential of eDNA in analyzing environmental parasite burden, helping to assess risk of infection and targeting strategies for the control and prevention of NTDs.

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