

RESEARCH NOTE

Re-evaluation of Schistosomiasis Mansoni in Minas Gerais, Brazil - II. Alto Paranaíba Mesoregion

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Schistosomiasis has, since its arrival in Brazil, been spreading continuously, due to migration trends. Initially, the migrants left their homes for colonization purposes. Nowadays, they constitute the unskilled labor force at the cities. They usually work in civil construction, industry or in agriculture, and live on city's periphery which lacks good sanitary conditions. Thus, the presence of individuals with schistosomiasis, together with the susceptible intermediate host links the chain, causing the appearance of new foci.

The endemic areas of schistosomiasis in the State of Minas Gerais are located in the eastern areas of the São Francisco river in the mesoregions of the north of Minas, Jequitinhonha, Mucuri Valley, Rio Doce Valley, Metropolitan Belo Horizonte, Zona da Mata, west of Minas, Campo das Vertentes, and Central Mineira. Information about schistosomiasis is quite rare in the western regions of this river in the mesoregion of

the northwest of Minas, south/southwest, Mineiro Triangle and Alto Paranaíba.

The prevalence of schistosomiasis in the Alto Paranaíba mesoregion was re-evaluated for the purpose of verifying the possibility of the spread of the disease. A malacological survey was also made in order to amplify the planorbic chart of the state. Malacological surveys were undertaken in 31 municipalities of the region. Water sources were examined in the neighborhood of the schools investigated, and in areas most frequented by the students. The molluscs captured were packed and sent to the laboratory where they were measured and examined by exposure to artificial light for *Schistosoma mansoni*. About five snails, per water source were fixed just after their capture, for later morphologic identification (WL Paraense 1975 *Arq Mus Nac* 55: 105-128).

The Kato-Katz quantitative stool method (N Katz et al. 1972 *Rev Inst Med Trop São Paulo* 14: 397-400) was used for parasitological diagnosis (two slides per fecal sample). The target population was made up of primary school students aged 7 to 14 years old from the state educational system of the urban areas of the 31 municipalities of the region. Epidemiologic investigations were undertaken in positive cases.

The sample size required to evaluate the disease's prevalence in the area was based on estimated parameters of 2% prevalence, a precision of 0.5 and a confidence limit of 95%.

A total of 1,892 planorbids were collected in 14 municipalities (Fig.) and identified as *Biomphalaria glabrata*, *B. tenagophila*, *B. straminea*, *B. intermedia*, *B. peregrina* and *B. schrammi*. Intermediate hosts of *S. mansoni* were observed in five municipalities: *B. glabrata* (Araxá and Sacramento), *B. straminea* (Douradoquara, Grupiara and Sacramento) and *B. tenagophila* (Patos de Minas). All the planorbids were negative for *S. mansoni* cercariae.

Among the 3,486 students examined, six (0.2%) were positive for *S. mansoni*, one from each of the following municipalities: Cruzeiro da Fortaleza, São Gotardo, Coromandel, Perdizes and two from Araxá (Fig.). Only in Araxá the cases were considered autochthonous. All the students positive for *S. mansoni* were treated.

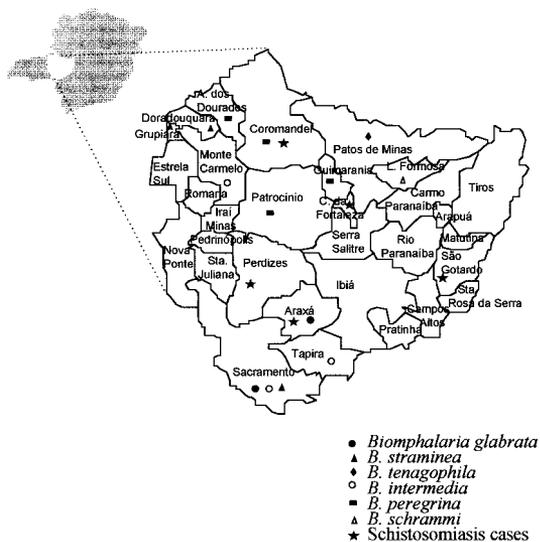
Nowadays, one observes a seemingly paradoxical situation in Brazil. Although large scale chemotherapy has reduced the prevalence of schistosomiasis, the disease is expanding in some regions. According to MP Barreto (1967 *Rev Soc Bras Med Trop* 3: 91-102), migratory movements have considerable influence on the dissemination of these endemic diseases. In fact, schistosomia-

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sis was introduced in the municipality of Araxá as early as the 40's, as a result of the construction of the Grande Hotel Barreiro, a project which attracted migrants from endemic areas probably infected with *S. mansoni* (HV Silveira Neto et al. 1971 *Rev Soc Bras Med Trop* 24: 74). Also, N Katz and OS Carvalho (1983 *Mem Inst Oswaldo Cruz* 78: 281-284) and OS Carvalho et al. (1985 *Rev Saúde públ S Paulo* 19: 88-91) reported a focus in the municipality of Itajubá which was introduced as a result of the implantation and expansion of the industrial district. Afterwards, Carvalho et al. (1988 *loc. cit.* 22: 237-239), Carvalho et al. (1989 *loc. cit.* 23: 341-344) respectively, described the focus of Paracatu, which attracted migrants because of the region's intense gold mining activities, and the focus of Passos, because of agricultural activities in the region.

Among the six species of *Biomphalaria* found in the regions (*B. glabrata*, *B. tenagophila*, *B. straminea*, *B. intermedia*, *B. peregrina* and *B. schrammi*), only the first three have an epidemiologic importance in the transmission of the schistosomiasis. *B. glabrata* is the most important planorbid of these three due to its wide distribu-

tion and high susceptibility to infection by *S. mansoni* (WL Paraense & LR Correa 1963 *Ciênc e Cult* 15: 245-246); *B. straminea* is the most well adapted to all climatic variations and ecologic conditions of the Brazilian hydrographic basins (WL Paraense 1986 *Distribuição dos Caramujos no Brasil*, p. 117-128. In FA Reis et al. *Modernos Conhecimentos sobre Esquistossomose Mansônica*, Biblioteca da Academia Mineira de Medicina, Belo Horizonte) and *B. tenagophila* is distributed along a large coastal area, from the south of the State of Bahia to the Chuí in the State of Rio Grande do Sul. WL Paraense and LR Correa (1987 *Mem Inst Oswaldo Cruz* 82: 577) emphasize the slow but constant expansion of schistosomiasis in Brazil, mainly in the southeastern and southern regions and the important role of *B. tenagophila* as a vector in those regions.

AB Pellon and I Teixeira (1950 *Distribuição Geográfica da Esquistossomose Mansônica no Brasil*, Divisão de Organização Sanitária, Rio de Janeiro, 108 pp.) reported a prevalence of schistosomiasis of 0.3% for the Alto Paranaíba mesoregion. Later N Katz et al. (1978 Summary of the XIV Congr Soc Bras Med Trop, João Pessoa, PB, p. 102) verified a prevalence of 0% and the present survey 0.2%. Pellon and Teixeira (*loc. cit.*) used the qualitative stool method of spontaneous sedimentation (A Lutz 1919 *Mem Inst Oswaldo Cruz* 11: 121-125) while the Kato-Katz quantitative method was used in the present work and as well as by Katz et al. (1978 *loc. cit.*). The size of the sample varied in the three surveys: in the first, 6,718 students were examined in 12 municipalities; in the second, 2,488 students were examined in 3 municipalities and in the third, 3,486 students were examined in 31 municipalities. In the three surveys, students were aged 7 to 14 years old.

The data obtained allows us to assert that the Alto Paranaíba mesoregion, excepting Araxá, remains free of schistosomiasis mansoni. However, the presence of intermediate hosts of *S. mansoni* together with migrants with schistosomiasis indicate the potentiality of this region as focus of schistosomiasis.

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