RESEARCH NOTE

Paleoparasitology of Schistosomiasis

Adauto Araújo+, Luiz Fernando Ferreira

Escola Nacional de Saúde Pública, Fundação Oswaldo Cruz, Rua Leopoldo Bulhões 1480, 21041-210 Rio de Janeiro, RJ, Brasil

Key words: coprolites - mummies - paleopathology

Eighteen years ago, when we began our studies in paleoparasitology, the main question proposed was whether *Schistosoma mansoni* infection has been really introduced by African slave trade in South America or has it been present among indians before Columbus. Up to now the question remains without answer, but it is interesting to point to some old and recent arguments regarding schistosome infection in ancient times.

In 1944, BF Magalhães and CB Dias (1944 *Mem Inst Oswaldo Cruz 41*: 363-367) discussed the origin of *S. mansoni* infection, reviewing the beginning of African slave trade in Brazil, and suggesting that the African origin was not so well demonstrated as written in some textbooks of parasitology.

A clear and definitive answer could be achieved by the find of schistosome eggs in pre-columbian coprolites - preserved feces in archaeological sites. Starting from that point, and to answer the question above, we began our studies in paleoparasitology, and we have examined up to now 1,100 coprolites dated from 30,000 years ago to colonial times, collected in South American archaeological sites. Ancylostomiasis, trichuriasis, and oxyuriasis have been found as intestinal infection among prehistoric indian population, but no *S. mansoni* eggs were found in human coprolites (LF Ferreira et al. 1988 *Paleoparasitologia no Brasil*, PEC/ENSP/FIOCRUZ, Rio de Janeiro, 158 pp).

However, negative data in paleoparasitology must be viewed cautiously, and some findings of *S. haematobium* and *S. japonicum* in human archaeological material are important for this discussion.

MA Ruffer (1910 *Br Med J I:* 16) found *S. haematobium* eggs in an Egyptian mummy of the Twentieth Dinasty, dated of 3,200 years before Christ (BC). A Cockburn et al. (1977 *J Ass Med Can 117*: 415-418) and P Lewin (1977 *Am J Dis Ch 131*: 349-350) also recorded *S. haematobiun* eggs in tissues of Egyptian mummies.

Recently, AM Deelder et al. (1990 *Lancet 24*: 724) developed a technique to detect schistosome antigen in mummified tissues, and RL Miller et al. (1992 *BMJ 304*: 555-556) discussed the paleoepidemiology of schistosomiasis, only regarding *S. haematobium* in ancient Egypt.

S. japonicum eggs were found in China, in a 2,100 old male corpse (S Lingbiao & O Hung 1981 *Acta Acad Sin 3*: 1), and schistosome infection was recorded also by O Wei (1973 *Lancet 2*: 1198) in a lady of the Han Dinasty (206 BC-220 AD).

Before all these records, WL Paraense (1959 *Rev Bras Mal D Trop 2-3*:105-117) pointed that the distribution of the three parasite species of man must be viewed through the principles of geographical speciation, not allowing the exclusion of a separate center of speciation for each species: *S. japonicum* in the East, *S. haematobium* in the Ethiopic region, and *S. mansoni* in the Neotropical region.

In Europe, Africa, and the Americas there is no record of *S. mansoni* infection and the question presented remains to be answered. Coprolite examination, and molecular biology techniques applied to paleoparasitology (molecular paleobiology) are the possible means to get a comprehensible understanding of the origin and ancient distribution of these three species of *Schistosoma* that infect man.

Suported by PAPES/FIOCRUZ-CNPq.
+Corresponding author. Fax: +55-21-290.0484
Received 16 April 1997
Accepted 30 June 1997