

A CONTRIBUTION TO THE STUDY OF HELMINTH FINDINGS IN ARCHAEOLOGICAL MATERIAL IN BRAZIL¹

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(With 8 text-figures)

The study of ancient faeces or coprolites is particularly interesting as it is performed presently aiming the knowledge of ancient people habits and their parasitic diseases.

The coprolite analysis is not so recent and in the past century, Harshberger (1896) pointed that seeds that were found in human coprolites could give some informations about food habits of prehistoric populations.

We must distinguish two kinds of coprolites: the mineralized, of long geological age and those preserved in organic state (Heizer & Napton, 1969).

Since the development of Callen & Cameron's (1960) rehydration technique, the microscopic analysis of coprolites has allowed the finding, in increased numbers, of parasitic forms.

Thus, paleoparasitology emerged as a branch of paleopathology in the moment that parasitic forms were sought in archaeological material.

We can refer some reviews and annotated bibliographies about the subject. Hantzschel *et al.* (1968) reviewed a long list of papers, mainly mineralized coprolites of animal origin; Pike (1967), Gooch (1972), Wilke & Hall (1975), Fry (1977) and Araújo (1980) made also reviews about the study of parasites in archaeological

remains, but the list of publications are only about coprolites preserved in organic state and the basic subject are the human coprolites.

The presence of parasitic diseases among ancient populations was also inferred by examining mummified tissues (eg. ex Ruffer, 1910 and Cockburn *et al.*, 1977) or the intestinal contents of mummies of the old and New World (Szidat, 1944; Pizzi & Schenone, 1954; Helbaek, 1968; Ou Wei, 1973 and Allison *et al.*, 1974).

This line of research is only in its first steps in our country (Ferreira *et al.*, 1979; Araújo, 1980) and in this paper we report the opportunity we had to examine coprolites collected in caves of the State of Minas Gerais. The samples are of human and animal origin and the parasitic eggs found stimulated some considerations about their introduction as well as of their hosts, in South America, before the coming of Europeans and Africans.

MATERIAL AND METHODS

The coprolites analysed were collected in caves of Minas Gerais by archaeologists and sent to us with the identification, strata and datation already done.

The description of the archaeological sites and samples are as follows:

Gruta do Gentio II (site MG RP6) – At Unai, on the northwest of the State of Minas Gerais, Central Brazil. The climate of the region

¹ Received August 26, 1980.

is dry, with the rainy season from October to April. The vegetation is predominantly that of a savannah type.

The cave is located in a calcareous bank 2.5 km long; the entrance is about 6 m above the soil level and its main chamber measures 10 m x 14 m and about 3 m high, close to the entrance. On the roof and walls paintings of animals, anthropomorphic figures and symbols in red, black and yellow can be observed.

The archaeological studies performed up to the present time detected two moments of the cave occupation: the oldest one is represented by hunter-gatherers that left stone, bone and wooden artifacts. That layer is dated by the ^{14}C method of $8,125 \pm 120$ BP (Smithsonian Radiation Laboratory-SI-2373).

The findings of the more recent horizons suggests an occupation by ceramists-agriculturists that left artifacts such as wooden art objects, feathers, snail shells and food remains (peanuts and maize). The site was used also as a burial place and thus the datations obtained for this period were disturbed by the soil remanagement. The radiocarbon analysed from this strata revealed an occupation period ranging from $3,490 \pm 120$ BP to 430 ± 70 BP (SI - 3521).

The coprolites were collected from this last period and sent to us by the professors Ondemar Dias and Eliana Carvalho from the Instituto de Arqueologia Brasileira, Rio de Janeiro.

We received 38 samples with 50 units that, during excavations, were identified as coprolites. Of these 50 units, 36 proved to be coprolites. The others had only mineral contents, although their shape and size were similar to the coprolites.

The coprolites had not odour and some of them were cylindrical (Fig. 1) and others, with variable sizes (3 to 10 cm) were amorphous, mixed with earth.

Grande abrigo de Santana do Riacho - At Santana do Riacho, Central region of the State of Minas Gerais. It is located in a calcareous bank and was used by indian groups as a site for habitation and burial place. There have been identified two levels of occupation where several bonfires and painted stones were distributed.

The layer I is dated from $3,990 \pm 70$ BP to $4,340 \pm 70$ BP by the radiocarbon. The layer III is composed by 3 levels of burials and one of them is dated of $9,640 \pm 110$ BP. The

occupation of the site can be divided in 3 periods: a) Recent period: from the present to 5,000 BP; b) Ancient period: composed by 3 levels of burial and lithical industry, dated from 5,000 to 10,000 BP; c) A more ancient period where only fir remains were found (Junqueira *et al.*, 1979).

The coprolites of Santana do Riacho were collected from the ancient period level in close association with the burials. The coprolites were well preserved and is noticeable the remanagement of the earth in little tunnels (galleries) that lead to "nests" where the coprolites were grouped in great numbers.

We received 10 samples from Dr. André Prous, from the Museu de História Natural da Universidade Federal de Minas Gerais, 4 of which were not coprolites; the other 6 were composed of 50 to 200 units of cylindrical form, dark with brilliant spots on a smooth surface, 1 to 3 cm long and with thin extremities (Fig. 2). We received also from Dr. Prous suspected material from Lapa Vermelha IV, Lagoa Santa and Lapa Pequena, Montes Claros, both in the State of Minas Gerais, but the material after analysis proved not to be coprolites or, if so, could not be identified.

In the laboratory each sample received a number and if composed by more than one unit, the letters A, B, etc were added to the number. After that, from each coprolite was separated one fragment of about 3 cm and, in the case of little coprolites, the whole sample was used. The remaining was replaced in the original jar. Each fragment was placed in a transparent glass jar with a lid to close it hermetically and, following Callen & Cameron's (1960) technique, poured the 0.5% aqueous solution of trisodium phosphate ($\text{Na}_3\text{PO}_4 \cdot 12 \text{H}_2\text{O}$), sufficiently to cover the material. The minimum time for rehydration is 72 hours but if longer, it is possible to grow fungal and bacterial contaminants. To prevent this it is advisable to add formol-acetic solution. After 72 hours part of the material was separated and the remaining preserved.

The bigger fragments were then separated under an entomological microscope and the parasitological examination was performed by the spontaneous sedimentation method developed by Lutz (1919). Slides were made at regular intervals and the last one 24 hours after the beginning of sedimentation. The remaining sediment was

