

## The finding of helminth eggs in a Brazilian mummy

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### Summary

Coprolites were collected with the aid of a rectosigmoidoscope from a naturally mummified body of a child. The body dates from  $3.490 \pm 120$  to  $430 \pm 70$  BP and was found in the State of Minas Gerais, Brazil. The coprolites were rehydrated with a trisodium phosphate solution and concentrated by the spontaneous sedimentation method.

Microscopical examination showed eggs the same shape and size as those of *Trichuris trichiura* and of an ancyllostomid.

### Introduction

In a previous paper (FERREIRA *et al.*, 1980) the finding of helminth eggs in pre-colonial coprolites collected from a cave was discussed. This report relates to the finding of eggs of the same parasites in coprolites extracted from the abdominal cavity of a mummy from the same cave.

### Materials and Methods

The mummy was collected by the staff of the Instituto de Arqueologia Brasileira, Rio de Janeiro, from the Gentio II

Cave (site MG RP 6) at Unai, situated in the north-west of the State of Minas Gerais, Brazil. The cave and the region of the archaeological site were described in a previous paper (FERREIRA *et al.*, 1980).

The naturally mummified body of a child about eight to nine years old (Fig. 1), completely wrapped in a net of fragile plant material was found in the layer dated by the <sup>14</sup>C method (Smithsonian Radiation Laboratory) from  $3490 \pm 120$  to  $430 \pm 70$  BP. Ornaments were also found at the burial place. The head was separated from the body and had only small fragments of soft tissues on the occipital region. As shown by X-ray, the legs are tightly flexed with the knees drawn up to the chest.



Fig. 1.



Fig. 2.

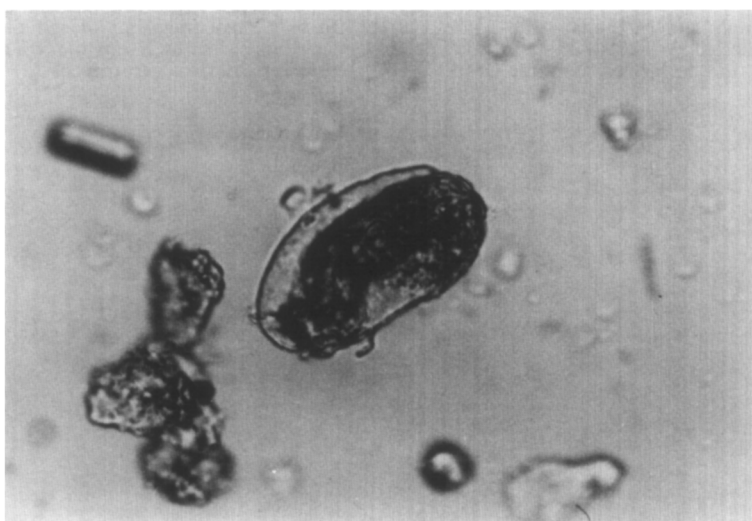


Fig. 3.

Since a complete autopsy would certainly destroy the wrapping, a rectosigmoidoscope was introduced through a hole into the abdominal cavity and with the aid of a forceps, fragments of visceral tissue and coprolites were collected.

The coprolites were processed as recommended by CALLEN & CAMERON (1960) and microscopic analysis was performed after spontaneous sedimentation (LUTZ, 1919).

### Results

The microscopic analysis of the coprolites showed two types of eggs, one type the same shape and size as those of *Trichuris trichiura* (Fig. 2), measuring  $54.21 \mu\text{m} \times 25.02 \mu\text{m}$ , and the other ancylostomid (Fig. 3), measuring  $66.75 \mu\text{m} \times 34.36 \mu\text{m}$ . The eggs were not so well preserved as those formerly found in the coprolites from the strata of the cave and no larval forms or protozoan cysts were detected.

### Discussion

Mummies in South America have been found mainly in Chile and Peru and studied by palaeopathologists. VREELAND & COCKBURN (in COCKBURN & COCKBURN, 1980) identified three main types of mummification in pre-Columbian America: "(1) *Natural mummification*, caused by such factors as dryness, heat, cold or absence of air in the burial unit or cave. (2) *Intentional natural mummification*, brought about through the intentional exploitation or deliberate enhancement of natural processes. (3) *Artificial mummification*, produced by a variety of techniques including evisceration, fire-and-smoke curing and the application of such embalming substances as resins, oils, herbs and other organic materials."

In Brazil, the finding of mummies is unexpected since humidity in most parts of the country is not

ideal for preservation. However, the mummy studied was found in a cave in a semi-arid region of savannah-like vegetation. In the same cave a partially mummified human chest and bones with fragments of mummified skin and muscles were also found.

MANIALAWI *et al.* (1978) used an endoscope to examine Egyptian mummies and recommended their method as a safe technique. Our experience would agree with this, as the material was collected with minimum damage to the mummy.

This is the first Brazilian mummy studied for parasites. So far the only observations of this kind in South America, have come from Chile and Peru (PIZZI & SCHENONE, 1954; ALLISON *et al.*, 1974; ALLISON & GERSZTEN, 1977; FOUANT, 1981).

Microscopical examination of the coprolites suggests that hookworm infection was present among the Indians before European colonization since there are no historical records of whites and negroes in that region of the country at that time.

The origin of hookworm infection in South America was discussed by SOPER (1927) and FONSECA (1970) based on recent faecal examination of Indians, and by ARAÚJO (1980), VREELAND & COCKBURN (in COCKBURN & COCKBURN, 1980) and FERREIRA *et al.* (1980) based on archaeological findings. As pointed out by FONSECA (1970), if the human hookworm was already present in South America in pre-colonial times, it certainly could not have originated from human migrations across the Bering Strait as the larval forms could not have resisted the low temperatures of the soil. One acceptable explanation for such findings is the transpacific migration of Asiatic populations (MEGGERS & EVANS, 1966).

#### Acknowledgements

The authors wish to express their gratitude to Profs. Ondemar Dias, Eliana Carvalho and Lilia Cheuiche Machado, from the Instituto de Arqueologia Brasileira, for the opportunity of examining the archaeological material. We also wish to thank Dr. Raul Reis Gonçalves for the use of the rectosigmoidoscope.

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*Accepted for publication 2nd June, 1982.*