NOTE ON PARASITE EGGS IN MINERALIZED CARNIVORA COPROLITES FROM THE UPPER PLEISTOCENE SOPAS FORMATION, URUGUAY

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Desiccated coprolites are the most common source for the study of parasites in ancient remains. Mineralized coprolites, however, have rarely been studied in the search for parasites anywhere in the world. As far as we are aware, there are few papers on paleoparasitology that deal with mineralized coprolites; Jones (1983) found *Trichuris trichiura* eggs in human coprolites from England, and Ferreira et al. (1993) found nematode larvae in 1.5 million year old hyena coprolites. There is also a single reference in Häntzschel et al. (1968), which mentions intestinal worms in mineralized coprolites (Lichtwitz 1929).

We have recently had the opportunity of examining two mineralized coprolites collected from the Piedra Pintada outcrop of the Sopas Formation at the Cuareim River, in Artigas County of northern Uruguay. This formation extends in northern Uruguay mainly through Artigas, Salto and Tacuarembó counties and has a maximum thickness of 8 to 10 meters, with the textural pattern commonly narrowing towards the surface. Its lithology is characterised by brownish conglomerates, conglomerate sandstones, siltstones, and sandy siltstones; calcium carbonate is found as dust in concretions or duricrusts 1.5 meters thick. It was assigned to the Lujanian Stage, Upper Pleistocene (Cione & Tonni 1995), based on the presence of several mammalian taxa that are the biostratigraphical support for these chronostratigraphic units in Buenos Aires Province, Argentina. The record of *Equus (Amerhippus) neogeus* allows us to correlate its fossil assemblage with the Upper Lujanian Substage (Ubilla 1996, Ubilla & Perea, in press). The lithofacies of the stratigraphic section of the Sopas Formation at Piedra Pintada, where the materials were collected, are mainly brown sandy silts of fluvial origin. At the top of this stratigraphic section, a planar caliche 1 meter thick was recorded, indicating pedogenesis of the underlying fluvial deposits. Radiocarbon dating suggests at least 43,000 years BP for the Piedra Pintada fossil assemblage.

The samples were found by the paleontological team of Verde and Ubilla and examined for food remains. The coprolites (Fig. 1) were diagnosed as being carnivore in origin (Verde et al. 1998). Food remains include incisors, molars and postcranial bones of micromammals, especially Caviinae rodents, possibly *Microcavia* or a related genus (Ubilla et al., in press). The known fossil mammals of the Order Carnivora in the Sopas Formation are *Lycalopex gymnocercus* (Canidae), *Felis concolor*, *Panthera* cf. *P. onca*, *Smilodon populator* (Felidae) and *Lontra longicaudis* (Mustelidae).

Two grams of pulverized material from each sample were sent to our Laboratory of Paleoparasitology (ENSP/FIOCRUZ) for parasite research. Our first successful

Fig. 1. Mammal coprolite radiocarbon dated from 43,000 years BP, Uruguay

experience with fossilized material was with a hyena coprolite from Italy (Ferreira et al. 1993). The same technique using 10% hydrochloric acid solution (Reinhard et al. 1988) revealed helminth eggs in one of the samples (MHD-P-404, MHD-P, Museo Histórico Departamental de Artigas, Artigas, Uruguay). Unfortunately, in this case the eggs were all destroyed after some hours, probably the effect of hydrochloric acid. We then tried the following procedure: small portions of the powder of each sample were put in contact with drops of a 10% hydrochloric acid solution, crushed, and soon after repeatedly washed with distilled water. Glass slides with a well were used for this step. The mixture was put in a conical glass jar for spontaneous sedimentation, and the sediment was examined microscopically after appropriate slide preparation (Reinhard et al. 1988). Although poorly preserved, the eggs remained in the slides (Fig. 2). The operculated eggs measured 46.62 - 56.61 x 33.3 μm, suggesting a trematode or a Pseudophyllidea cestode, but they have not yet been specifically identified.

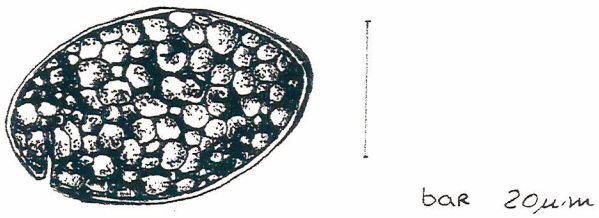

Fig. 2. Operculated egg in mammal coprolite, Uruguay. 46.62-56.61 x 33 μm

With this note, we would like to call the attention of paleoparasitologists to the immense value of paleontological feces, and the necessity of improving techniques for examining mineralized coprolites in the search for parasites.

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