

## Toxoplasmosis of the Two-toed Sloth, *Choloepus didactylus*, in Brazil

Natural infections of *Toxoplasma* have been recorded from two edentates, the nine-banded armadillo, *Dasypus novemcinctus* (Lainson, 1964, Tr. Roy. Soc. Trop. Med. Hyg. **58**: 287) and from the lesser anteater, *Tamandua tetradactyla* (Walton and Arjona, 1968, J. Parasit. **54**: 1243-1244). In the case of the armadillos cysts were seen in the brains of two apparently healthy animals and the parasites were isolated in laboratory mice. The infection in the lesser anteater was also proven parasitologically by the isolation of the parasite from homogenized brain which had been inoculated into white mice. Serum from the same anteater gave a positive titer of 1:64 in the fluorescence inhibition test and 1:128 in the methylene blue dye test. One out of six other anteaters gave a positive dye test titer of 1:512.

In May 1970 a two-toed sloth, *Choloepus didactylus*, was found moribund in its cage and was killed. This animal had been in our laboratory for 66 days and had been captured in the Barcarena district of Pará. Smears from the internal organs were fixed in methanol and stained by Giemsa's method. Small pieces of liver and spleen were ground up in physiological saline with a pestle and mortar. Quantities of 0.1 ml of the homogenate were inoculated intradermally and 0.5 ml intraperitoneally into each of two hamsters (*Mesocricetus auratus*). Both hamsters were found dead 7 days later. Numerous endozoites (as defined in Hoare, 1972, J. Trop. Med. Hyg. **75**: 56-58) were seen in the peritoneal exudate of both animals. The strain was highly virulent in white mice, killing them in 4 to 7 days. Endozoites were seen in the stained smears of peritoneal exu-

date, peripheral blood, heart, lung, liver, spleen, and kidney of the sloth. The greatest numbers of parasites were seen in the lungs, liver, and spleen. Small developing tissue cysts containing up to 20 cystozoites (as defined by Hoare, loc. cit.) were seen in the smears from the heart and lungs.

We are unable to say with any certainty where the sloth became infected with *Toxoplasma*. It is possible that we were dealing with a chronic infection acquired in the wild that was exacerbated by the stress of captivity (Beverley, 1969, Symp. Brit. Soc. Parasit. **7**: 43-49). We cannot, however, exclude the possibility that infection took place in our laboratory, especially as the sloth was kept in an open cage outside our screened animal house. Toxoplasmosis is quite common in the city of Belém and a number of strains have been isolated from febrile patients (Noura, Lainson, and Shaw, 1968, Rev. Serv. Esp. Saude Publ. **14**: 39-45 and unpublished observations). *Toxoplasma* has also been isolated from domestic pigeons in Belém.

The nature of the infections in the armadillos and anteaters indicates that they acquired their infections in the wild, where domestic cats are absent. This suggests that under sylvatic conditions animals other than domestic cats might play the role of the primary host (Frenkel, 1971, Revta Lat-Am. Anat. Patol. **10**: 5-12; Lainson and Shaw, 1971, J. Prot. **18**: 365-372) and points to the importance of transmission by the ingestion of tissue cysts in addition to oocysts (Landau et al., 1972, Ztschr. Parasitenk. **38**: 250-270). In this respect it is interesting to note the antibody levels

for toxoplasmosis in Brazilian Amerindian populations, living in areas where there are no domestic cats, do not appear to differ greatly from Brazilians living in urban or rural areas (Baruzzi, 1970, Rev. Inst. Med. Trop. São Paulo **22**: 93-104) where cats are common.

The present record of a natural infection of

*Toxoplasma gondii* in the two-toed sloth, *Choloepus didactylus*, would appear to be the third record of this parasite from an edentate, and the first from sloths.

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