Antibodies to *Toxoplasma* in Panamanian Mammals

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A rare opportunity to study the prevalence of *Toxoplasma* antibody in certain free-ranging sylvatic mammals and in the absence of domestic cats, arose when the Bayano River in Darién Province on the Isthmus of Panama was dammed at Majé. When the lake filled behind the dam, mammals trapped on small islands were rescued, bled and released on the lake shore by Mr. John C. Walsh of the International Society for the Protection of Animals (ISPA) and members of the Gorgas Memorial Laboratory (GML). Animals were collected between June 1976 and May 1977, and 180 sera were available for testing of antibody against *Toxoplasma* using the dye test (Frenkel and Jacobs, 1958, AMA Arch. Ophth. 59: 260–279), at 1:2 as lowest dilution.

Antibody was found in two of seven opossums (*Didelphis marsupialis*) [reciprocal titer 128, 512]; four of seven four-toed, nine-banded armadillos (*Dasypus novemcinctus*) [128, 512, 512, 2,000]; one five-toed, eleven-banded armadillo (*Cabassous centralis*) [256]; one of 21 marmosets (*Saguinus geoffroyi*) [256]; two of 13 lesser, three-toed ant eaters (*Tamandua mexicana*) [512,
2,000); three of three spotted pacas (*Agouti paca*) [4, 256, 512]; two of four agoutis (*Dasyprocta punctata*) [512, 512]; two of four coatimundis (*Nasua nasua*) [2,000, 32,000]; two of two tayras (*Eira barbara*) [512, 2,000]; one of two collared peccaries (*Tayassu tajacu*) [256]; and one of two brocket deer (*Mazama americana*) [2].

No antibody was found in one naked-tail opossum (*Metachirus nudicaudatus*), one unspecified marmoset, 23 owl monkeys (*Aotus trivirgatus*), eight black howlers (*Alouatta villosa*), 21 two-toed sloths (*Choloepus hoffmanni*), 26 three-toed sloths (*Bradypus infuscatus*), 17 forest rabbits (*Sylvilagus brasiliensis*), six red squirrels (*Sciurus granatensis*), one spiny rat (*Proechimys semispinosus*), nine kinkajous (*Potos flavus*), and one crab-eating raccoon (*Procyon cancrivorus*).

Antibody was found in 21 (11%) of a total of 180 mammals from 22 species. Antibody was present in 11 species, 66 members of which were sampled and of which 31.8% were positive. Species with antibody were either carnivorous (tayras), omnivorous (coatimundis, opossum, armadillos, pacas, agoutis, and peccaries), or a ground feeder (ant eater). Antibody was absent in predominant tree dwellers (sloths, night mon- keys, howler monkeys, 95% of marmosets, squirrels, and kinkajous), and in a herbivore (rabbits). It is uncertain whether the 1:2 titer in a brocket deer and the 1:4 in a paca indicate toxoplasma infection.

Although ocelots and jaguarundis were observed in the area, no Felidae were captured, probably because they can swim. Such wild Felidae were shown capable of shedding *Toxoplasma* oocysts after being fed tissue cysts from chronically infected intermediate hosts (Jewell et al., 1972, *Am. J. Trop. Med. Hyg.* 21: 512-517). It is reasonable therefore to ascribe the infection of these sylvatic mammals to oocysts shed by such wild cats. No domestic cats were observed or reported by the staffs of ISPA or GML working in the area. Previously, *Toxoplasma* had been isolated from one ant eater also from Darién Province, and an antibody titer of 512 had been found in another ant eater from the canal zone in Panama, whereas five were seronegative (Walton and Arjona, 1968, *J. Parasitol.* 54: 1243-1244).

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