RESEARCH NOTE

Parasitism by *Primasubulura jacchi* (Marcel, 1857) Inglis, 1958 and *Trichospirura leptostoma* Smith and Chitwood, 1967 in *Callithrix penicillata* Marmosets, Trapped in the Wild Environment and Maintained in Captivity

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Callithrix penicillata Thomas, 1904, a Neotropical primate belonging to the family Callitrichidae, found in the Brazilian States of Bahia, São Paulo, Goiás, Minas Gerais and also in Rio de Janeiro (where it seems to have been introduced by man), presents a natural parasitism, considerably high and heterogeneous, and sometimes reported from specimens soon after their capture. In these spontaneous infections several protozoans and helminths can be found. The purpose of this paper is to study the development of the natural parasitism in the digestive system of this primate for long period in captivity, aiming to verify how long they persist in this simian, in the absence of intermediate hosts in the environment. The experiments were carried out with 21 *C. penicillata* marmosets, captured in the vicinities of Felixlândia, Minas Gerais, 170 km far from Belo Horizonte.

In captivity, they were maintained in individual wire cages measuring 70 x 40 x 40cm. A room (5 x 4 m), where the cages were kept, had its window provided with wire mesh to avoid insects. In the winter, electric heaters kept the temperature near 25°C. The primates were fed on bread soaked in milk in the morning; the standard food was offered in the afternoons (LH Pereira et al. 1986 *Lab Anim Sci 36:* 189-190) during the week. On Saturdays and Sundays they were fed on bananas.

Coproscopies – The faeces were collected in the first week following the arrival of marmosets at the animal house. Later, the procedure was performed every month until the end of the experiment (18 months). The coproscopic techniques (floating: EC Faust et al. 1939 *J Parasitol 26:* 241-246; centrifugation: LS Ritchie 1948 *Bull US Army Med Dep 8:* 326; spontaneous sedimentation: W A Hoffman et al. 1934 *Puerto Rico J Publ Health & Trop Med 26:* 283-298) are very used for laboratory diagnosis of parasites of man. Used together, the possibilities of false-negative results decrease.

Necropsies – Primates with spontaneous death were necropsied, as well as 50% of the remaining marmosets after the end of the experimental period. The procedure was performed as suggested by MM Wong (1970 *Lab Anim Care 20:* 337-341) with minor additional modifications: administration of an overdose of sodium pentobarbital (Abbott), collecting fecal samples for the three tecniques, the removal of viscerae and other organs from carcasses were distributed separately to Petri dishes with addition of saline followed by macroscopical examination. Small fragments of viscerae were removed to Bouin fixative (for histological sectioning). The small and large intestines were opened separately. Gastric contents were washed with saline plus curettage of intestinal mucosa. Each organ was dissected separately. The helminths found were later fixed in 70°C Railliet-Henry solution, and transferred to Amann lactophenol for microscopic examination.

About 90% marmosets were passing *Primasubulura jacchi* eggs in the faeces in the first month of capitivity; the respective adult worms found, with their eggs, in marmosets number 9, 11 and 14 which died spontaneously in different periods of observation. This high positivity declined progressively until the seventh month; at that period no eggs of this nematode being found. The simians necropsied later (18 months) did not show eggs or parasites.

Eight out of 21 marmosets (38%) showed spirurid worm eggs in the first set of coproscopic examinations. The positivity oscilated throughout the observation period. Some marmosets presented negative results for this parasites, showing positivity in the subsequent month, for eleven months. After twelve months they were consis-

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tently negative. The clear identification was achieved when the marmoset number 19 (died in the fifth month of observation) presented five parasites in the pancreatic ducts, later identified as *Trichospirura leptostoma.*

Histological remarks – Tissue sections of the spleen, liver, lungs, pancreas and linphonodes were stained and examined. The results are sumarized as follows: no abnormalities were seen in *marmosets 2* and *10.* In *marmoset 5* hyperplasy with some giant Reed-Sternberg cells was seen in the spleen. Megacariocytes were present in this organ. Slight steatosis and albuminous degeneration were also seen in the liver. The *marmoset 6* presented severe hyperplasy of lymphonodes and spleen, showing large number of Reed-Sternberg cells, sistematically distributed in all their thickness with almost loss of the follicular structure. Diffuse colagenic neoformation in the medular and in the cortical regions. In the liver, large numbers of mononuclear cells within the hepatic sinusoids with Reed-Sternberg giant cells, granular-histio-lymphocyte infiltration and albuminous degeneration and diffuse steatosis were present. Visible changes were not seen in the intestine and in the lungs. The findings in *marmoset 19* were: lymphonodes and liver with histological picture as that found in *marmoset 6.* Spleen, lungs and intestine: without abnormalities. Pancreas: a parasite was found (*T. leptostoma*), in a transversal section, in the lumen of an excretor duct. Fibrous productive chronic pancreatitis with exudate of mononuclear cells. Hypotrophy of exocrine parenchyma. In *marmoset 21,* the lymphonodes presented hyperplasic irritative state. Spleen: pronounced congestion of sinusoidal splenic vessels with the finding of numerous giant cells with 2, 4, 6 or 8 nuclei, similarly of those of human Hodgkin disease. Hipotrophy of Malpighi follicules and red polp congestion. Liver: hidropic or vacuolar degeneration and diffuse steatosis. Lungs: scarce local infiltration of mononuclear peribronchial and peribronchiolar cells. Pancreas: focuses of citosteatosis. Intestin without visible changes.

Primasubulura jacchi (Marcel, 1857) Inglis, 1958 was reported by this author as belonging to Family Subuluridae (Yorke & Maplestone 1926 Subfamily Parasubulurinae López-Neyra, 1945). ALB Barreto (1919 *Mem Inst Oswaldo Cruz 11:*10-70) mentioned this nematode (firstly described as *Subulura jacchi*) as a member of Subfamily Subulurinae Travassos, 1914.

Our data of initial 90% positivity for eggs in faeces suggest this parasite is very frequent in *C. penicillata* in the wild environment, but is lost after seven months in captivity, despite the anterior observations of AL Melo and LH Pereira (1986 *A Primatologia no Brasil 2:* 483-488) showing this parasite even after 12 months, but their marmosets were maintained in captivity in other conditions than those of the present work.

JA Porter Jr (1972 *Lab Anim Sci 22:* 503-506) reported the finding of *P. jacchi* in several species of *Saguinus* sp; with 70% positivity among individuals.

AG Chabaud and M Larivière (1955 *Compt Rend Soc Biol 149:* 1416-1419) tried to infect several insects as *Tenebrio molitor, Akis punctata, Periplaneta americana* and *Blabera fusca* with *P. jacchi* eggs. They found the 3rd stage infective larvae only in *B. fusca,* despite the *P. americana* was the only of them found in the environment where the primates were maintained.

The histological intestinal mucosa changes found in the present work could not be attributed to *P. jacchi.* Conversely, it was not possible to exclude this worm, at least in part, as playing a role in the diarreic picture, sometimes found.

Trichospirura leptostoma, a parasite of pancreas, was described by WN Smith and MB Chitwood in 1967 (*J Parasitol 53:* 1270-1272) as a nematode belonging to the Thelazioidea group. These same authors found the infection in 22 out of 42 *C. jacchus* from Brazil.

GE Cosgrove et al. (1970 *J Am Vet Med Assoc 157:* 696-698) reported this nematode in 28 out of 107 *Saguinus* sp. necropsies; these callitrichids coming from South America. They found pathological changes in four out of 30 infected tamarins.

In the present experiment, a single case of chronic fibrous pancreatitis was observed in marmoset number 19, including the finding of the worm in the pancreatic duct. Marmoset number 6 presented infiltration in that viscera, but it was not possible to attribute this parasite as responsible for any clinical abnormality presented by this marmoset.

TC Orihel (1970 *Lab Anim Care 20:* 395-401) reported *T. leptostoma* in 25 out of 63 simians imported from South America: *Saimiri sciureus, Aotus t rivirgatus, Callicebus moloch* and *Callimico goeldii.* The same authors observed the parasite in the pancreatic ducts of a captivity born *C. moloch,* but in a period of its life this specimen was maintained together with other individuals positive for *T. leptostoma,* so the possibility of mainting the parasite life cycle in the captivity can not be excluded if insects are not avoided.

In fact, B Illgen-Wilcke et al. (1992 *Parasitol Research 78:* 509-512) reported systematic observations on the experimental cycle of *T. leptostoma* from *C. jacchus* – cockroach – *C. jacchus* and the respective patencies.

Our data show that the parasitism in *C. penicillata* by *T. leptostoma,* acquired in the wild remains positive at least up to the eleventh month after its arrival at the laboratory.