

THE MONGOLIAN GERBIL, *MERIONES UNGUICULATUS* (RODENTIA: CRICETIDAE): A SUITABLE HOST FOR SPECIES OF NEW WORLD LEISHMANIAE

ANTONIA M. R. FRANCO; SAULO C. BOURGUIGNON; ELIZABETE F. RANGEL* & MARIA P. DEANE

Instituto Oswaldo Cruz, Departamento de Protozoologia, *Departamento de Entomologia, Caixa Postal 926, 20001 Rio de Janeiro, RJ, Brasil

The gerbil *Meriones unguiculatus* is a small rodent indigenous to the desert regions of northeastern China and Mongolia (Canadian Council on Animal Care. *Guide to the Care and Use of Experimental Animals*, v. 2, 1984, Ottawa). Other species of the genus, chiefly *M. libicus*, are known as reservoirs of Old World leishmaniasis due to *Leishmania major* (*Las leishmaniasis*, OMS, série Informes Técnicos, no. 701, 1984, Geneva). However we have found but one reference to the inoculation of a New World parasite, *L. mexicana* in "a gerbil", without mention of genus or species: one of six inoculated specimens developed lesions "with very many L. D. bodies" (R. Lainson & J. Strangways-Dixon, 1964, *Trans. R. Soc. Trop. Med. Hyg.*, 58: 136-153). We here report a study on the susceptibility of *M. unguiculatus* to three New World *Leishmania* species.

The parasites were: *Leishmania (Leishmania) amazonensis* (MHOM/BR/77/LTB0016) isolated from a human case in Três-Braços, Bahia; *L. (Viannia) guyanensis* (MDID/BR/79/IM77) isolated from the viscera of an opossum *Didelphis marsupialis*, in Manaus, Amazonas (J. Arias et al., 1981, *Trans. R. Soc. Trop. Med. Hyg.*, 75: 537-541); *L. (L.) chagasi* (MCAN/BR/82/Tigre) isolated from a dog in Campo Grande, Rio de Janeiro. The parasites had been characterized by specific monoclonal antibodies (G. Grimaldi Jr, et al., 1987, *Am. J. Trop. Med. Hyg.*, 36: 270-287) or by isoenzyme electrophoresis and maintained by subcutaneous passages in hamsters and in NNN culture medium.

In all cases the inocula were of amastigotes from lesions produced in hamsters by *L. ama-*

zonensis or *L. guyanensis*, or from spleen of hamsters infected with *L. chagasi*. The technique for preparing the inocula was as described by P. L. Moriearty & G. Grimaldi Jr (1983, *Mem. Inst. Oswaldo Cruz*, 78: 49-59).

Results with *L. amazonensis*: 14 gerbils received two intradermal inoculations of 5×10^6 amastigotes each, in the back of the right hind paw and in the rump; all developed lesions at the sites of inoculation, represented by small ulcers (Fig. 1) or significant enlargement and patchy loss of hairs in the inoculated as well as in the non-inoculated opposite foot.

During a follow-up of more than 18 months for some of the animals, complete healing of the ulcerated lesions occurred; however, abundant parasitism persisted and the parasite was reisolated at necropsy, from the blood and from various samples of the skin in inoculated and non-inoculated sites.

Laboratory reared *Lutzomyia longipalpis* were infected on two gerbils inoculated 11 and 13 months before with *L. amazonensis*; the infections were detected in one out of seven (14%) and 15 out of 22 flies (68%), respectively, dissected on the 6th day after feeding.

Results with *L. guyanensis*: in all five gerbils inoculated with 10^6 amastigotes of *L. guyanensis*, intradermally in the back of the right hind foot, a small nodule was detected within a month at the site of inoculation (Fig. 2); scanty parasites were present in imprints of biopsied skin samples from those areas and reisolation was possible through hemoculture from three gerbils killed two and half months after inoculation.

Results with *L. chagasi*: two of four animals that received intracardiac inocula of 10^7



Fig. 1: experimental infection with *Leishmania amazonensis* in gerbil *Meriones unguiculatus*. Ulcerated lesion at base of tail.



Fig. 2: right hind foot with a small nodule in gerbil inoculated with *Leishmania guyanensis*.

hamster spleen amastigotes, were infected with *L. chagasi*. The parasites were scarce in spleen imprints in one animal necropsied two and half months after inoculation, but an extremely heavy infection was produced in a hamster killed five months after being inoculated with a liver and spleen triturate from the other gerbil, necropsied five months post-inoculation.

The results reported in this brief note indicate that the gerbil *Meriones unguiculatus* is a good experimental host for studies on neotropical leishmaniae: it is susceptible to the agents of both cutaneous and visceral diseases but it is able to control the infection while maintaining the parasites for long periods.

The gerbil certainly does not suffer the same dramatic and traumatic consequences of leishmanial infections as the hamster and certain mouse strains.

Meriones unguiculatus is easy to handle and to breed, nearly odourless and is quite

resistant to most of the infections common among laboratory rodents.

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