

## CRICETULUS MIGRATORIUS (GRAY HAMSTER) , ANOTHER POSSIBLE ANIMAL RESERVOIR OF KALA-AZAR IN MESHKIN-SHAHR , IRAN

M. Mohebbali <sup>1</sup> , DVM , MPH , PhD ; M. Nasiri Kanari <sup>2</sup> , DVM ; A. Kanani <sup>1</sup> , MS ; Gh.H. Edrissian <sup>1</sup> , Pharm D, MS ; S. Anvari <sup>3</sup> ; A. Nadim <sup>4</sup> , MD , PhD

**Key words:** *Visceral leishmaniasis* , *Rodents* , *Irai*.

### Abstract

Altogether , 120 Rodents of 4 species were trapped alive in various parts of Meshkin-Shahr district where visceral leishmaniasis is endemic. 13 of them were *Cricetulus migratorius* (gray hamste) that all were caught inside the living rooms. Nine of them showed *Leishmania* antibody in titers of  $\geq 1:100$  in direct agglutination test (DAT) and amastigotes were found in the spleen smears of 2 *Cricetulus migratorius* One of them showed *Leishmania* antibody in titer of 1:400 and another one in titer 1:800 in DA test. This is the first report on the natural infection of a rodent with *Leishmania* in its internal organs in the endemic foci of visceral leishmaniasis in Iran.

### Introduction

Visceral leishmaniasis (VL) or kala-azar is an endemic disease in some areas of Ardabil province in north west and Fars province in south of Iran. In other provinces of the country , the disease has been reported in sporadic form (2,3,4,9). In addition to dogs , wild carnivores such as jackals and foxes that have been found infected with *leishmania* are also considered as the animal reservoirs of Kala-azar in Iran , Particularly in the areas where

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1-Dept. of Medical Parasitology , School of Public Health and Institute of Public Health Research , Tehran University of Medical Sciences and Health Services, P.O.Box 14155-6446 , Tehran Iran.

2-School of Vetenary Medicine , Islamic Free Univesity of Karaj.

3-Kala-azar Laboratory , Imam Khomeini Hospital , Meshkin-Shahr , Iran.

4-Dept. of Epidemiology and Biostatitics , School of Public Health and Public Health Research , Tehran University of Medical Sciences and Health Services , P.O.Box 14155-6446 , Tehran , Iran.

sporadic cases of disease have been found (8,9). But at least in the endemic foci of visceral leishmaniasis , dogs are the main source of infection for human visceral leishmaniasis (2).

### Materials and methods

Rodents were trapped alive in various parts of Meshkin-shahr area. Killing the caught rodents , their blood samples were collected in two heparinized capillary tubes. These samples were tested in the Kala-azar laboratory of Imam Khomeini Hospital in Meshkin-Shahr district , by direct agglutination test , DAT , (6,7).

*Leishmania donovani* antigen for DAT was received from Dr.A.El Harith, the Royal Tropical Institute in Amsterdam , Netherlands ; through the World Health Organization.

The spleen and liver samples of sero-positive rodents (>1:100 in DAT) were cultured in NNN+LIT medium and checked twice a week up to sixth week.

A total number of 720 smears were prepared from the blood (Thick and Thin) and internal organs including spleen and liver (Impression smears). The smears were stained with standard Giemsa and examined microscopically for amastigote form of the *Leishmania*.

### Results

Altogether , 120 rodents of 4 species were trapped alive in various parts of Meshkin-Shahr area. 13 of them were *Cricetulus migratorius* (gray hamster) and one of them was *Musmus culus* that all were caught indise houses. 105 *Meriones persicus* and one *Alactaga* sp. were trapped outside the villages. The result of serological tests is shown in table 1.

From 13 *Cricetulus migratorius* , 9 were Sero-Positive in DA test with *Leishmania* antigen in titers of >1:100. However from 105 *M.persicus* only 7(%6.6) had *Leishmania* antibody titers of 1:100. Amastigotes were found in 2 smears prepared from spleens of 2 *Cricetulus migratorius*.

The two parasitologically infected *Cricetulus migratorius* were also serologically positive , in titers 1:800 (one case) and 1:400 (another case) with *Leishmania* antigen in DA test.

## Discussions

In a previous study (5) , *Meriones persicus* had been reported to be naturally infected with *Leishmania* in East Azerbaijan , north of Iran. In the smears prepared from the cutaneous lesion of *M.persicus* , considerable numbers of amastigotes were seen. Microscopical examination of the smears prepared from the internal organs and blood of this rodent did not show any amastigotes.

Therefore , this case may had been due to zoonotic cutaneous leishmaniasis. So far , *Leishmania* has not been isolated from internal organs of naturally infected rodents in Iran , except in some rare cases from *Rhombomys opimus* , the reservoir of zoonotic cutaneous leishmaniasis in Iran (Dr. A. Nadim , personnal communication).

Therefore , this is the first report on the infection of a rodent with *Leishmania* in internal organs (spleens) in an endemic focus of Kala-azar in Iran where the indigenous ZCL has not been found. Of course , in some other parts of the world (eg. Italy and Iraq) *L.infantum* s.s. has been isolated from *Rattus rattus* in previousiy (1).

Although , this study shows natural *Leishmania* infection of gray hamster , as the ZVL , is highly endemic in studied area , it seems that *Cricetulus migratorius* is an accidental host. But the rodent may have a role in transmission of the disease to children inside the living rooms.

## Acknowlegments

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Table 1- Result of serological tests from Meshin-Shahr district.

Species	No. Tested	Leishmania Antibody Titers					
		Neg.	1:10	1:100	1:200	1:400	1:800
1.Cricetulus migratorius	13	1	3	3	1	4	1
2.Meriones persicus	105	44	54	7	-	-	-
3.Alactaga	1	1	-	-	-	-	-
4.Mus musculus	1	-	1	-	-	-	-
Total	120	46	58	10	1	4	1

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