

CONFIRMATION OF *TATERA INDICA* (RODENTIA:GERBILLIDAE) AS THE MAIN RESERVOIR HOST OF ZOONOTIC CUTANEOUS LEISHMANIASIS IN THE WEST OF IRAN

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Abstract

During our study (Summer of 1994) twenty two *Tatera indica* were collected and two out of them (9.09%) were naturally infected with amastigote. Parasites were cultured in NNN+LIT medium and isolated promastigotes were sent to the Medical University of Montpellier in France for identification. The result of isoenzyme test showed, the parasite is *Leishmania major* zymodem MON 26-(=LON 1), therefore *Tatera indica* was known the main reservoir host of zoonotic cutaneous leishmaniasis in the west of Iran. This is the first report on the isolation and identification of *L.major* zymodem MON 26-(=LON 1) from this species of rodent. Mean time, *Rhombomys opimus* was absent in this areas.

Introduction

Zoonotic cutaneous leishmaniasis is an important health problem in Iran and there are several foci of the disease in the country.

In foci in the central and north eastern parts of the country the main animal reservoir is *Rhombomys opimus* (2,4,5,6,10,11) but this gerbil is absent in the plains of south-western and southern Iran where there are important foci of ZCL. In fact ZCL became number one health problem in war fronts in Haman and Khuzistan among soldiers and revolutionary guards with thousands of cases especially in the first three years of war (1981 - 1983).

In 1977 the disease was reported from southwestern Iran (7) but it was mentioned that the main animal reservoir has to be found because there is no *Rhombomys* in that area.

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Later, in 1988 the infection of *Tatera indica* was reported in Khuzistan (3) but this was only on the basis of finding amastigotes in lesions of white mice after being inoculated by scrapings from the ears of apparently healthy gerbils.

In this study, we present the report of the isolation and characterization of *Leishmania* from *Tatera indica* with some notes on geographical distribution of this gerbil in the country.

Materials and methods

Survey was carried out in the rural region of Mehran city (The villages of Firooz-Abad and Farrokh-Abad), Ilam province, west of Iran during the summer of 1994.

Mehran city is located on latitude of 33°7' 15" N and longitude of 42°9' 45" E with an altitude of 155m from sea level. The weather is very hot in the summer (above 45°C) and the total annual rainfall is 250mm. (See Fig. 1).

Rodents were captured by live traps baited with walnut, cheese, carrot, cucumber, lettuce and wheat. First the active colonies of rodents were recognized and then the live traps were put near the animal burrows, once a month.

In the laboratory, impression smears were prepared from the ears of the animals (1) and examined under the microscope. Samples from infected *Tatera indica* were injected subcutaneously at the base of the tail of laboratory mice and cultured in NNN+LIT medium, containing 200i penicilin per ml, incubated at 20-21°C and examined twice a week from day 4 for the presence of promastigote.

Positive cultures were subcultured every 15 day. Isolated promastigote were sent to the Medical University of Montpellier in France for isoenzyme characterization.

Results

Twenty two *Tatera indica* and eight *Nesokia indica* were collected and examined. The results are listed in the table 1.

According to table 2, out of 22 *Tatera indica* (9.09%) were infected. Parasites from one infected rodent were injected into 10 laboratory mice. Nodules and ulcers containing numerous amastigote appeared within 11 days in only one mouse but after six months all mice became positive. Cultured parasites were sent

to Medical University of Montpellier, France, for isoenzyme characterization. They were characterized as *L. major* zymodeme MON 26 (=LON 1). Meanwhile no parasite were found in *Nesokia indica*.

Discussion

This is the first report on the isolation and characterization of *L. major* zymodememnon 26 (=LON1) from *Tatera indica* in Iran and as far as we know, in the world. The same zymodeme have been reported from *Rhombomys opiums*, *Meriones libycus* as well as *Phlebotomus papatasi* and *Ph. caucasicus* (11) and also from several patient in endemic foci of Iran.¹

Identification of the main animal reservoirs of ZCL in southwest of Iran was a problem for us till it was found that *Tatera indica*, the commonest gerbil in the area has symptomatic infection. It was found by inoculation of the scraping from the ears of these gerbils into white mice and finding amastigotes in the lesions. The rate of infections was 12.5% of examined *Tatera*. Although *Meriones libycus*, *Nesokia indica* and some dogs were also found infected, but it seems that their infection in this area is accidental and the main animal reservoir is *Tatera indica* (3).

This gerbil is the most common wild rodent in all plain areas in the southwest and in southern Iran.

Fig 2 shows the map of geographical distribution of this gerbil in the country. Although this extends to the plains of southern Baluchistan, but in that part of the country, the commonest gerbil is *Meriones hurrianae* that seems to be the main animal reservoir of ZCL (9) although the infection of *Tatera indica* has been reported in Baluchistan of Pakistan (8).

Table 1. *Leishmania* infection in rodents trapped in rural areas of Mehran city, west of Iran, 1994.

Species of rodents	No. of examined	No. of positive	% infected rodents
<i>Tatera indica</i>	22	2	9.09%
<i>Nesokia indica</i>	8	0	0%

1. Personal communication with Nadin and Edrissian.

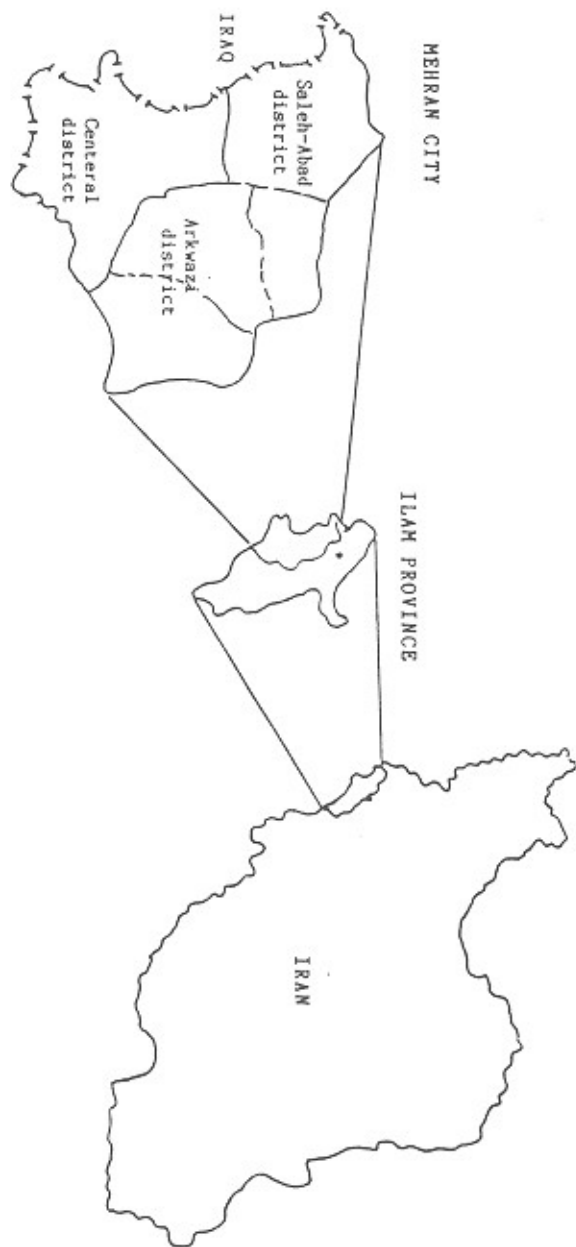


Fig. 1- Situation of Mehran city in Iran.

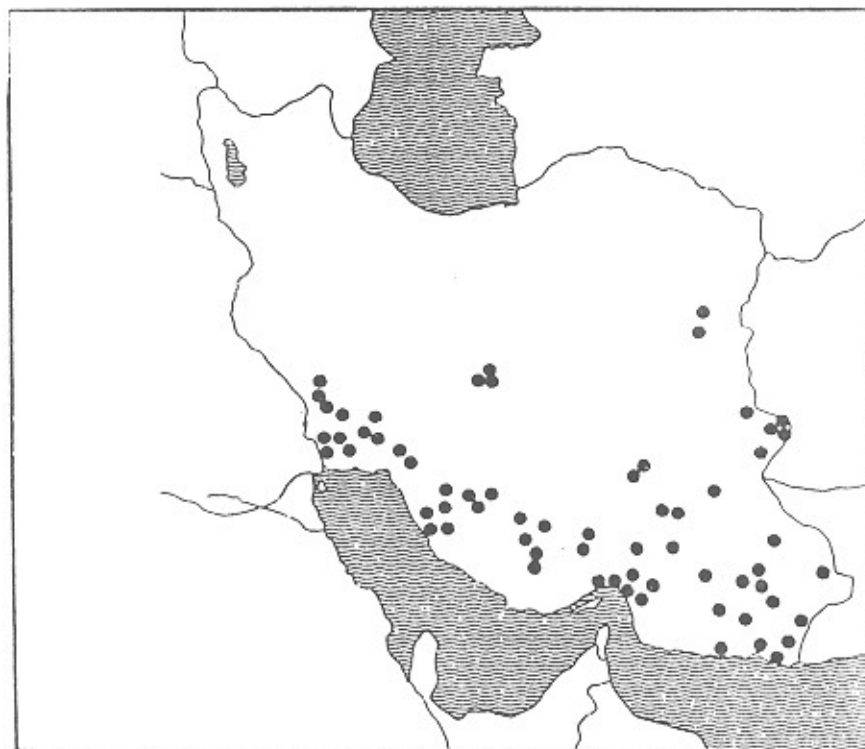


Fig. 2- Geographical distribution of *Tatera indica* In Iran.

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