

Studies on *Ornithobilharzia turkestanicum* (Skrjabin, 1913), Price, 1929 in Iran ⁽¹⁾

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INTRODUCTION.

Ornithobilharzia turkestanicum, first described by Skrjabin in 1913, was reported in Turkestan, Mongolia, France, Iraq and Pakistan prior to this study (1, 2, 3, 4, 5).

Mac Hattie (1963) studied the life history of these species and observed its presence in cattle, sheep, goats, horses, mules and camels in Iraq (4).

This infection was discovered in Iran in 1962 during investigations on the snail-born diseases of animals, carried out by the Bilharziasis Research Station in the Bilharziasis Pilot Project Area in Dezful, northern Khuzistan.

STUDIES UNDERTAKEN.

1. — **Field studies** : The guts and mesenteries of ruminants slaughtered in villages situated in the selected area for bilharziasis surveys in the vicinity of Dezful were randomly selected and brought to the Dezful Station Laboratory to be examined.

Flukes collected from the viscera were identified as *O. turkestanicum* and their identification confirmed by Dr. J. A. Dinnik, East African Veterinary Research Organization, Kenya. Examination of the viscera of cattle, goats, sheep, camels and wild boar of this area revealed the presence of *O. turkestanicum* in these animals.

Table 1 shows the number of animals examined and the rate of infection among them.

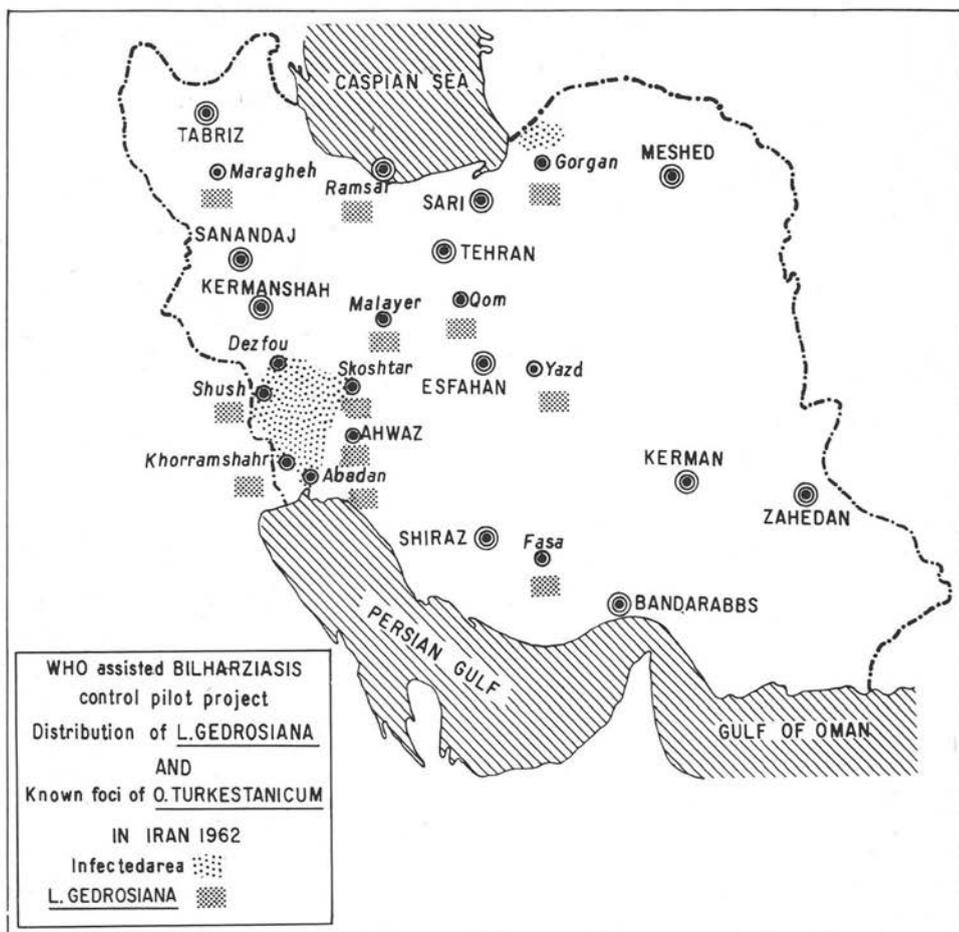
Because of the presence of the intermediate host of this trematode in other parts of Iran (Map 1) a limited investigation was carried out in the Teheran slaughter house where *O. turkestanicum* flukes were found in the mesenteric veins of one cow and one sheep, which were apparently from the northern part of Iran.

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2. — **Laboratory studies:** Studies were undertaken to determine the molluscan intermediate host and to trace the life cycle of this trematode in Iran.

Because of the high density of *Lymnaea gedrosiana* and a large number of *O. turkestanicum* in the project area, a relationship between these two was suspected. Therefore, a large number of *L. gedrosiana* collected from bodies of water near villages with infected animals was brought to the laboratory and examined either by the crushing method or by placing them under the light so they would shed cercariae.

Among 2 880 *Lymnaea* examined, 7 were found infected with furcocercous cercariae. These cercariae were used to infect five *Tatera indica*. 80-82 days after exposure mature *O. turkestanicum* were found in the liver and mesenteric veins of 2 of these rodents.

Table I

ANIMALS INFECTED WITH *O. turkestanicum* IN VILLAGES NEAR DEZFUL IN 1962

Animal Examined	No. Examined	No. Infected	% Positive
Cow	185	128	69
Sheep	53	15	28.3
Buffalo	31	11	35.4
Goat	4	4	100
Camel	9	4	44.4
Wild boar (+) ...	1	1	(+ 1) 1
Total	283	163	57.5

+ Accidentally killed

(*) Accidentally killed.

Again 90 laboratory-bred *L. gedrosiana* were experimentally infected with miracidia hatched from eggs of *O. turkestanicum*, collected by scraping the intestinal mucosa of one infected cow and buffalo (both infected only with *O. turkestanicum*). These *Lymnaea* started shedding cercariae 21 days after exposure to infection; 52 of them were infected. One group of 10 *Tatera indica* was experimentally infected with a known number of cercariae; mature flukes were recovered from all of them. The result of this experiment is summarized in Table 2.

In order to find other susceptible animals, 10 albino rats, 2 rabbits and 4 guinea pigs were also experimentally infected with 40-50 cercariae from experimentally infected *Lymnaea*. Eight albino rats were autopsied 2-3 months after exposure and only 2 male *Ornithobilharzia* flukes were found in the liver of one rat.

In one rabbit infected with 900 cercariae, autopsied 102 days after exposure, 376 flukes (299 males and 77 females) were found in the liver and mesenteric veins. The other rabbit and one of the guinea pigs were autopsied before the prepatent period and found negative. Another guinea pig infected with 1 000 cercariae revealed only 9 flukes 39 days after exposure. The last 2 guinea pigs are still under observation.

DISCUSSION AND CONCLUSION :

O. turkestanicum is prevalent among the ruminants of the villages of northern Khuzistan. It is, however difficult to restrict the infection to separate villages since ruminants of several villages use water from snail breeding places situated in different areas; thus the distribution of infection as shown in map 1 is based on the villages where host animals are kept.

Table II

THE RESULT OF STUDY ON SUSCEPTIBILITY OF *Tatara indica* TO *O. turkestanicum*
DEZFUL - 1962

Serial No. of Animal	Days Elapsed Between Exposure & Autopsy	No. of Cercariae	No. of flukes Recovered		
			male	female	total
1	53	1.000	147	193	340
2	115	1.000	84	121	205
3	64	300	31	7	38
4	65	300	42	24	66
5	123	500	10	10	20
6	187	300	38	40	78
7	196	500	17	31	48
8	178	1.000	106	101	207
9	176	500	29	12	41
10	173	500	46	28	74

Since *L. gedrosiana*, presently known intermediate host of the parasite, has been found in other parts of Iran, the infection probably occurs in other parts of this country. The low infection rate of snails studied during winter time is probably the effect of the unfavourable season. The biology of this trematode as well as the overall distribution of the disease and other possible intermediate hosts should be determined by further investigations.

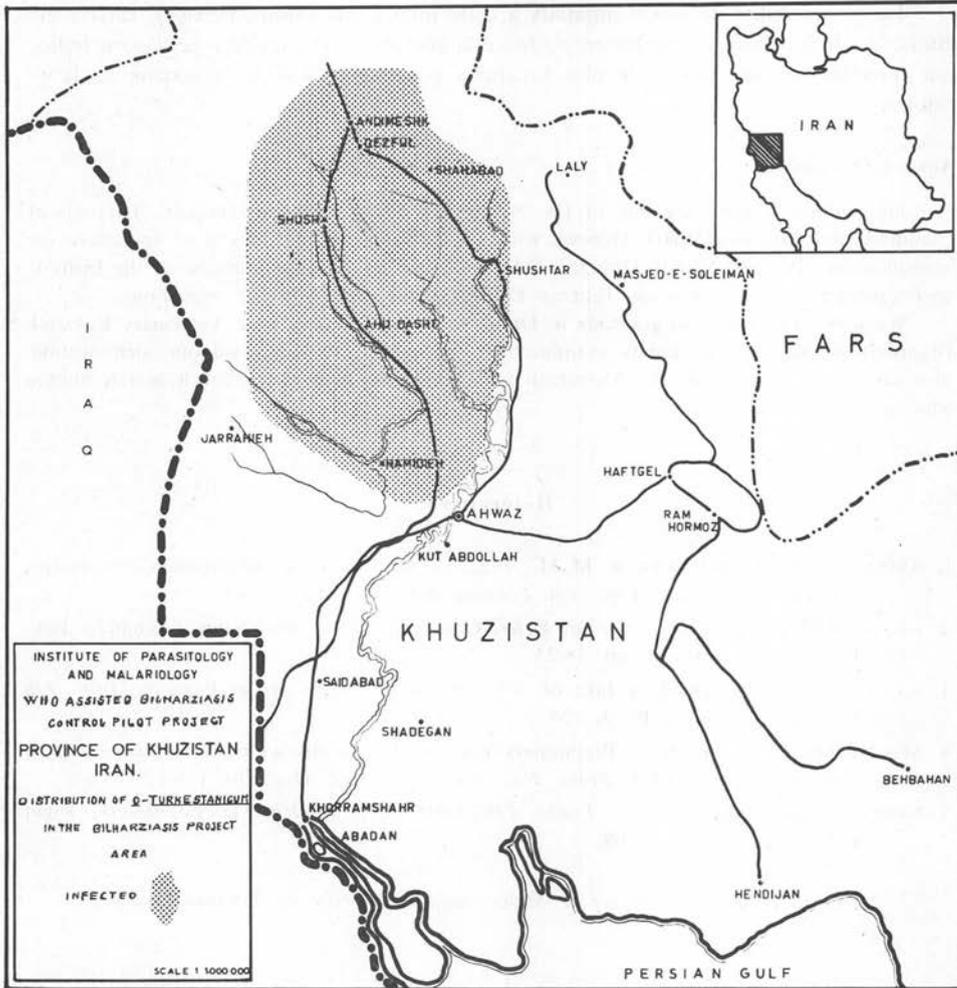
Among laboratory animals used, *Tatara indica*, which is common in this area, has proved to be most susceptible to infection.

Rabbits, although they produce a large number of adult flukes, are poor hosts since none of the eggs obtained from their viscera hatched out during this limited experiment. Similarly, guinea pigs and albino rats seem to be poor hosts. Further studies are underway which will enable us to give a clear cut view about the degree of susceptibility of common laboratory animals to this trematode.

In connection with the presence of this infection in man the examination of about 9 000 urine and 1 000 feces samples from the inhabitants of villages with breeding places highly infected with *L. gedrosiana*, has not revealed a single case of infection.

Summary

The presence of *O. turkestanicum* in Khuzistan (and from a single observation in the north part of Iran) and its prevalence among cattle, sheep, goats, camels and wild boar of the bilharziasis infected area was determined. The role played by *Lymnaea gedrosiana* as an intermediate host of infection was confirmed.



Susceptibility of different animals (rabbits, guinea pigs, rats) was studied, and *Tatera indica* was found to be the best prospect for laboratory life cycle maintenance.

Résumé

La présence d'*Ornithobilharzia turkestanicum* chez les Ruminants du Khuzistan septentrional est signalée. La fréquence dominante de ce parasite s'observe parmi les Bovins, Ovins (chèvres, moutons), chameaux et sanglier. Le rôle joué par *Limnaea gedrosiense* comme hôte intermédiaire de ce Trématode est établi.

La susceptibilité de divers animaux à cette infestation (lapins, cobayes, rats) a été étudiée ; elle a permis de mettre en évidence la réceptivité particulière de *Tatera indica* qui apparaît comme l'animal le plus favorable pour l'entretien de la souche au laboratoire.

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