

SYLVATIC FOCUS OF TRICHINIASIS IN NORTH EASTERN IRAN*

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ABSTRACT

In 1969 and 1976, 830 rodents and carnivores collected from North East Iran were examined for *trichinella spiralis*.

Fifty per cent of golden jackals and 30 per cent of red foxes were found infected.

The possibility of infection among the rodent was discussed.

INTRODUCTION

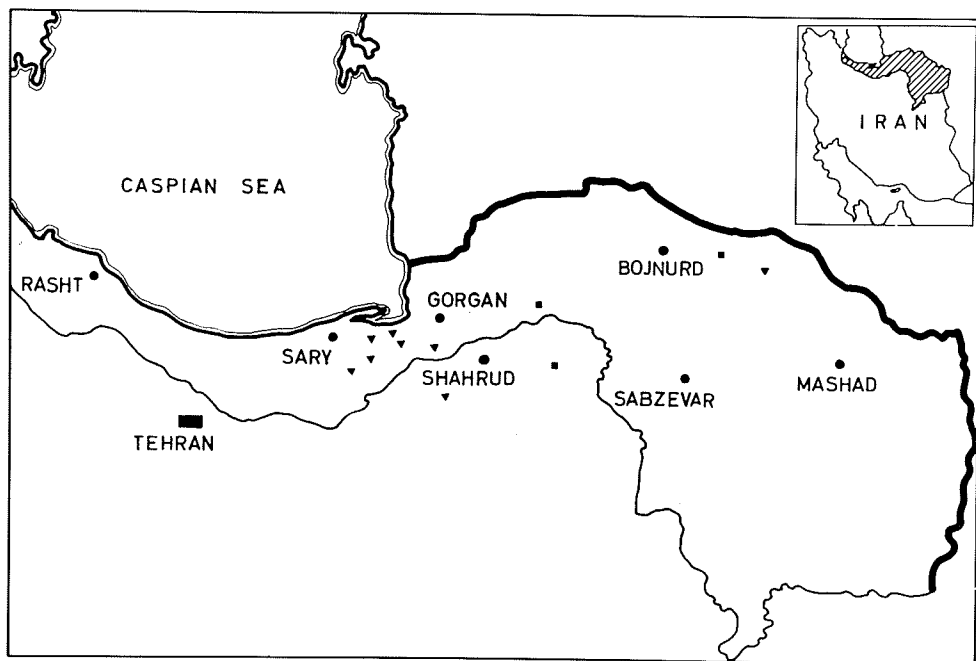
Trichiniasis among the animals in Iran was first reported by Afshar and Jahfarzadeh in two out of 4950 wild boars examined in the Teheran abattoir⁽¹⁾. In 1973 Mobedi *et al* studied the distribution and epidemiology of sylvatic Trichiniasis in the North of Iran (Caspian area)⁽²⁾. Studies by Sadighian *et al* in Isfahan⁽³⁾ and Massoud in South West areas of Iran⁽⁴⁾ have also shown the presence of sylvatic infection in these areas. The result of two studies on the sylvatic focus of infection in the Caspian area towards the East of Iran are shown in the present paper.

MATERIAL AND METHOD

The rodents and insectivores were captured by hand or snap traps

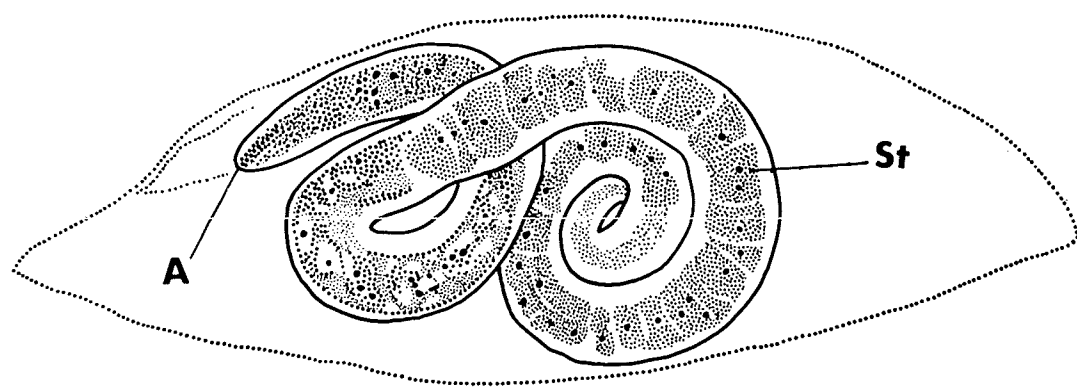
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- TOWNS
- ▼ JACKALS
- FOXES

1) *Distribution of infected animals in North Eastern part of Iran.*



2,10 mm

2) *Encysted larvae in the muscle drawn by Camera lucida.*

found 35 per cent of jackals in this area infected with *Dioctophyma renale* and *Trichinella spiralis*(2). At the present study no single infection with *Dioctophyma renale* was observed. The reason for this is probably due to last year's extensive use of insecticide in the Caspian area which had a suppressive effect on the aquatic life which plays an important part in the transmission of *D. renale*.

It seems that in autumn the transmission of infection with *T. spiralis* from golden jackals by hunting hundreds of wild boar and exposing their viscera to the jackals in the hungle.

Infection in golden jackals was reported from Isfahan (3), South of Iran(4), also from Bulgaria(6), USSR(7) and Afghanistan(8).

Red foxes have a quite different distribution. They are predators and need a large open steppe and mountainous areas which provide ample different species of small mammals.

It seems that in some seasons prey like small mammals constitutes a major food for red foxes. Study of the stomach contents of 31 red foxes captured from north eastern areas of Iran showed 58 per cent insects, 33 per cent fowl, 30 per cent rodents, 16 per cent rabbits, occasionally turtle, snail shells and lizard remains.

Red foxes bear a disastrously long winter when the earth is covered with snow and they have difficulty in finding food. In this harsh situation, in order to survive, they easily become a carrion eater and may even prey on each other. During the hunting, we observed that the infected foxes were not able to run fast and they tried to hide themselves from view. This disability exposes them to stronger animals of their own kind. When food is scarce and they become carrion eaters, this habit leads to more infection among them. Thus the food scarcity facilitates the transmission of *Trichinella* infection among red foxes in winter. Infection in red foxes has also been reported from Isfahan(3), USSR(9), and USA(10) and Europe(11). In the present study 796 rodents, insectivores and Lagomorpha were examined in 1969 and 1976 and no infection was detected. This confirms the results of Nelson's studies in Kenya among 2711 rodents examined(12). It seems that the rodents do not play a significant role in maintenance of the syvatic cycle. Rodents such as voles have a tendency to enormously increase in number and as a result, there is the probability that infection may occur among them on the downward curve of the cycle when the plant source of the food vanishes and the carrion eating and cannibalism begins.

Another important group is the Muridae family as Kozar has stated(13). They are exposed to the infection, feeding from animal carcasses around human dwellings and abattoirs. During the present study attention was given to the Muridae family (wood mouse, house mouse, scaly tailed murine rat and rat).

Rausch believes that some reported *Trichinella* in shrews and odents is incorrect identification(14).

The most common larvae found in encapsul form among rodents is *Ascaris columnaris*. In direct examination of the muscle the observation of stichocyte and terminal anus are important in identification. To observe this structure a thin section and a good clearance of the larva is important.

Although the only four wild boars examined during the present study were negative, reported infection among them in north⁽¹⁾ (2) and south west⁽⁴⁾ Iran indicates that this animal consists of the main source of *Trichinella* infection in this country. Approval to this is the present study when the infection was not found in carnivores living out of the wild boar habitat.

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and ca. nivores by hunting. A total of 732 small mammals from these areas were examined in 1969 and 98 large and small mammals in 1976.

The muscle tissue of the animals cut in very thin layers compressed between microscope slides cleared with glacial acetic acid 10 per cent and searched under the low power of a microscope, or the larvae were liberated from the capsule by digesting them in one per cent chloric acid and pepsine. Larvae were also used to infect laboratory white mice and rats, by feeding them with infected muscles.

RESULTS

Eight out of 16 golden jackals (50 per cent) and three out of 10 red foxes (30 per cent) were found infected with *Trichinella larvae*. Most of the golden jackals were collected from the eastern edge of the Caspian area which is covered with forest, while foxes were hunted from the north eastern area where the forest vanishes and steppe and sparsely vegetated area appears.

The infection was absent from the areas where, according to the existing report, the wild boar does not exist. For example, not a single infected carnivore was found in Mashad and Sabzevar areas where no wild boar lives.

Infection was not found among 26 insectivores including 13 hedgehogs (*Erinaceus europaeus*), 13 shrews (*Crocidura lucodon*), 28 lagomorpha including seven hares (*Lepus capensis*) and 21 pika (*Ochotona rufescens*), 746 rodents including 56 asiatic jerboas (*Allactaga elater*), four dormice (*Gils glis*), 160 house mice (*Mus musculus*), 206 wood mice (*Apodemus sylvaticus*), 10 Indian scaly tailed murine rats (*Nesokia indica*), seven rats (*Rattus ratoides*), 108 hamsters (*Cricetulus migratorius* and *Calomyscus bailwerdi*), 69 voles (*Microtus transcasicus* and *M. socialis*, *M. arvalis* and *M. nivalis*), 126 gerbils (*Meriones persicus*, *M. crassus*, *Rhombomys-opimus*), and four wild boars (*Sus-scrofa*).

DISCUSSION

Golden jackal inhabit covered areas of Caspian forest. At the present study the samples were collected only from the eastern edge of the forest and infection was as high as 50 per cent among them. These scavenger animals are widely distributed in the whole Caspian forest. Beyond their natural food they feed on the flesh of all kinds of carcasses even their own species. At night they scavenge on garbage discarded around the houses. The natural food for the animals, in undisturbed conditions, is carrions of animals lifted in the jungle, fish, frogs, worms, insects, snails, lizards, birds and fruit. In 1967 Sadighian

ISOLATION OF VIBRIO PARAHAEMOLYTICUS FROM FISH AT THE CASPIAN SEA

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Vibrio parahaemolyticus belongs to the family of sea loving halophilic vibrio species present in most areas of the world. This bacteria has been isolated from sea water, sea food, vomitus and stool of patients suffering with food poisoning of gastroenteritis.⁽¹⁾

Reports from different parts of the world especially U.S.A. and Japan have indicated that these organisms were the causative agents for epidemics of gastroenteritis.^(2,3)

Vibrio parahaemolyticus has also been isolated from infected open wounds and also ear infections of people who have been in contact with sea water.

Sea foods in Iran are supplied from two main sources, the Caspian Sea in north and the Persian Gulf in south. The present investigation concerns the presence of *Vibrio parahaemolyticus* from sea foods 'mainly fish' in the Caspian Sea.

MATERIALS AND METHODS

Three samples were obtained by swab from intestinal tract, nostrils and gills of 33 freshly caught fish. The samples were immediately inoculated into two kinds of preservative media⁽⁴⁾ and forwarded to the laboratory for investigation within 24 to 48 hours. Subculture were made from transport media into enrichment media and special media simultaneously⁽⁵⁾ and incubated for 24 hours, if suspected colonies of *Vibrio parahaemolyticus* were not noted on the special media. Further subcultures were made from enrichment media into special media, suspected colonies of *Vibrio parahaemolyticus* were subcultured for final identification by biochemical tests, and sero agglutination tests, with type specific antisera. Isolated strains were then sent to Dr. Oscar Felsenfelds (Tulane University

Research Center, Cavington) for final confirmation of the three isolated strains.

RESULTS

Three cultures from three fish out of 33 were positive for *Vibrio parahaemolyticus*.

The organisms were isolated from all three sources as noted in Table 1.

The final identification of *Vibrio parahaemolyticus* were made according to biochemical reactions shown in Table 2, and they were also confirmed serologically which showed k vi type K46.

Table 1
Number of fish positive for *Vibrio parahaemolyticus*
in relation to site of culture

Site Cultured				
Result	No. of fish	Intestinal	Gills	Nostrils
Positive	3	3	3	3
Negative	30	30	30	30

DISCUSSION

Isolation of *Vibrio parahaemolyticus* from fish confirms the presence of this organism in the Caspian Sea. At present, studies are being carried out to investigate the pathogenicity of *Vibrio parahaemolyticus* in diarrheas and food poisoning among the inhabitants of the Caspian Sea areas. Studies similar to the present will also be conducted at the Persian Gulf to rule out or in the presence of *Vibrio parahaemolyticus* in marine life in the Persian Gulf.

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Table 2
Biochemical reactions of isolated and confirmed
Vibrio parahaemolyticus

Biochemical Tests	Reaction	Biochemical Tests	Reaction
Oxidase	+	Lysine decarboxylase	+
Indol	+	Phenyl alanine	-
Simmons citrate	+	Hemolysed on rabbit blood	+
H ₂ S (TSI)	-	Caseine hydrolyzed	+
V.P.	-	Arabinose	+
M.R.	+	Mannose	+
Urea	-	Sucrose	-
Growth in broth (3%, 7%) NaCl (10%)	-	Lactose, salicine	-

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