Population Density,Trematodal Infection and Ecology of *Lymnaea* Snails in Shadegan, Iran

Short Communication

Karimi*,G.R., Derakhshanfar, M. and Paykari, H.

Parasitology Dept., Razi Vaccine & Serum Research Institute,

P.O.Box 11365-1558, Tehran, Iran

Received 5 Apr 2004 ; accepted 10 Nov 2004

Summary

Two snail species belonging to genus *Lymnaea*, *L.auricularia* and *L.gedrosiana*, were collected from 6 different districts of Shadegan area of Khoozestan. Eight percent of the total collections of the snails revealed the occurrence of larva in them. The prevalence of larva within the snails varied in different districts may be due to different geoclimatic conditions and availability of fresh water. Seasonal prevalence of snails and factors affecting snail populations including water temperature, light, water depth and pH under field conditions were also studied.

***Keywords*:** prevalence, trematod, ecology, *Lymnaea*, Iran

Introduction

Snails have been known to play an important role as intermediate hosts for helminth parasites of men and animals. Among these helminth parasites of livestock schistosomiosis and fasciolosis have been described as a serious problem in Iran (Karimi 2003, Mansourian 1992). The habitate requirements of the intermediate hosts of the two most important flukes differs slightly. The intermediate hosts for *Fasciola hepatica* are emphibious snails that live close to the edge of slow moving or stagnant water whereas those transmitting *Ornithobilharzia turkestanicum* live in deeper water and are close to being true aquatic snails in their behavior. They can

*Author for correspondence. E-mail:Karimighr2003@yahoo.com

adapt to an amphibious existence in adverse conditions. The important *Lymnaea* species of snails involved in the transmission of ornithobilharziosis vary in their geographical distribution in the world. *L.auricularia* and *L.gedrosiana* have been found similar species in Iran and Iraq (Arfaa *et al* 1980, Karimi 2003, Monsourian 1992). Studies on different fresh water snails have been carried out in various provinces of Iran including Fars, Khoozestan and Mazandaran (Farahnak *et al* 2003, Mansourian 1992, Massoud 1974, Shahlapour 1996). Although some districts of Shadegan area have wide water resources of large irrigation system adjacent to river Jarrahi and Karoon, study on fresh water snails was still obscured. Thus it was found essential to enquire on some properties of the distribution and seasonal incidence as well as factors affecting the snail population of fresh water snails represented by those inhabiting different districts of Shadegan area and its different localities. In the present study the animal trematod intermediate hosts in Shadegan was determined.

Materials and Methods

Collection of snails. During a period extending from Aprill 2002 to March 2003 snails were randomly collected from water bodies of six districts of Shadegan area including Abshar, Bozi, Jafal, Hosseini, Khanafereh and Darkhovein by using sieve. Each area was divided into north, south, west and east parts that subjected to study once per month. The snails were gathered from 0.5-0.75 meters of river sides and kept in a plastic flask with fresh water. Temperature, depth and pH of water bodies were estimated under field conditions during the study. The individual snail collections were brought to the laboratory in separated glass jars. The jars were covered with muslin cloth to allow aeration. During transit, natural habitant vegetation found in the water of collection was used as food while leaves of lettuce were provided as food in the laboratory.

Identification of snails. The collected snails were washed thoroughly and cleaned from mud, debris and cittiates. The snails could not shed larvaed under the

prevailing room conditions, hence they were crushed with a view to examine their internal contents for the presence of trematod larvae. The experiments were performed at room temperature. Snails were classified according to the shell morphology described by Mansourian (1992) and Malek (1980).

Results and Discussion

A total of 1321 conoid snails were collected from six districts of Shadegan area. All the snails were crushed and examined for the presence of trematod larvae (Table 1). *Lymnaea auricularia*, *L.gedrosiana*, *Physa* sp. and *Melanoides* sp. were identified. All the snails carring infection were found to occur in common ecological behavior like aquatic inhabitant with permanent water bodies containing clear fresh still water and abundant vegetation of Nymphaea (Lilly), Typla (kocndar) and Nelumbia (lotus) besides pady. Generally, the peak incidence was recorded in summer followed by autumn and winter and lowest during spring. These incidences coincided with Karimi (2003), Mansourian (1992) and Massoud (1974).

Table 1. *Prevalence of various species of conoid snail in Shadegan*

	District						**Total**
	Abshar	Bozi	Jafal	Hosseini	Khanafereh	Darkhovein	
No. of snail	100	180	362	0	337	342	1321
Positive	0%	0%	10%	0%	10%	10%	8%

Regarding the effect of water temperature on snails population it was found that late summer and autumn was included in the optimum temperature required for breeding and reproduction of snails. It was clear that the temperature had a great effect on snail population. These results were in line with those of Mansourian (1992), Massoud (1974) and Shahlapour (1996). They reported that the temperature of 20ºC being the optimum constant for snail growth and this temperature was recorded in autumn and spring. Studing the effect of day light on snail population

revealed that egg production was not affected by decreased day light period. It was observed that in autumn season young snails began to appear. This also occurred in early winter where the young snails predominated. In summer season the collected old snails were many, while young were very few. These results coincided with Malek (1980) and Massoud (1974). They reported that ova production of snails is not affected by increasing the period of day light and darkness has not harmful effect on it. *Lymnaea* snails were collected from the main and small canals as well as narrow ditches where pH ranged from 7.2-7.6, which maximum during early winter closure. The mean pH value during the study was 7.4. *Lymnaea* species were seen floating in the surface because they needed a high rate of oxygen consumption (Maqbool *et al* 2003, Karimi 2003).

In conclusion, this is the first time that Shadegan is reported as one of the foci of *Lymnaea* in Iran because of the satisfactory climate (humidity and fresh water) in marsh and rivers beside them. The incidence of infected snails in the present study was 8%. Also *L.auricularia* and *L.gedrosiana* act as suitable intermediate hosts in this area.

References

Arfaa, F., Movafagh, K. and Mahdavi, M. (1980). *Lymnaea gedrosiana* an intermediate host of *Fasciola hepatica* in Iran. *Journal of Parasitology* 55:134-135.

Farahnak, A., Essalat, M. (2003). A study on cercarial dermatitis in Khuzestan province, South western Iran. *BMC Public Health* 3:35.

Karimi, G.R. (2003). Epidemiological studies on *Ornithobilharzia turkestanicum* in sheep and its snail in Shadegan area and evaluation of serological tests for diagnosis of infection. Ph.D. Thesis, Ahwaz University, Iran (in Persian).

Karimi, G.R., Hoghooghi Rad, N., Paykari, H., Abshar, N. and Sayfiabad Shapouri, M.R. (2003). An investigation on sensitivity of fresh water snails to infection by

Ornithobilharzia turkestanicum under laboratory condition. *Iranian Journal of Veterinary Research* 8:149-154 (in Persian).

Malek, E.A. (1980). *Snail transmitted parasitic diseases*. Vol I & II. CRC Press.

Mansourian, A. (1992). Fresh water snail fauna of Iran. Ph.D. Thesis, Tehran Medical Sciences University, Iran (in Persian).

Maqbool, A., Hayat, C.S., Tanveer, A., Salahuddin, M. and Arfan, A. (2003). Prevalance and ecology of *Lymnaea* snails in Punjub. *Iranian Journal of Veterinary Research* 8:192-195.

Massoud, J. (1974). Observation on *Lymnaea gedrosiana*, the intermediate host of *Ornithobilharzia turkestanicum* in Khuzestan, Iran. *Journal of Helminthology* 48:133-138.

Massoud, J. (1974). The effect of variation in miracidial dose on laboratory infections of *Ornithobilharzia turkestanicum* in *Lymnaea gedrosiana*. *Journal of Helminthology* 48:139-144.

Shahlapour, A.A. (1996). A survey on the role of fascioliasis intermediate host in disease. *Scientific and Educational Quartery of Jahad-e-Sazandegi* 30:121-124 (in Persian).