

## Original Article

# **Toxocara Spp. Eggs in Public Parks of Urmia City, West Azerbaijan Province Iran**

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(Received 19 Jun 2008; Accepted 4 Sep 2008)

## **Abstracts**

**Background:** The visceral larva migrans (VLM) is a syndrome observed in human infection with helminth larval eggs such as the *Toxocara* spp. that usually infects dogs and cats. Among the risk factors involved in the occurrence of VLM, particularly importance of these animal populations, an investigation was carried out for the presence of *Toxocara* spp. eggs in public parks in the city of Urmia, West Azerbaijan Province, Iran.

**Methods:** Samples were collected from total 26 existing public parks in Urmia from December 2003 to March 2004. Soil samples were collected from 3-4 distinct sites in the same area. The floating material was analyzed under the light microscope.

**Results:** *Toxocara* spp. eggs were found in 8 samples of total 102 taken samples from 26 public parks showed a contamination rate of 7.8%. The number of observed *Toxocara* eggs in each microscopic field was varied from 1-8.

**Conclusion:** Low rate of contamination with *Toxocara* spp. eggs in Urmia parks might be due to lower dog population and cultural differences of present study in this city in comparison of other cities of the world.

**Keywords:** *Toxocara*, *Visceral larva migrans*, *Dog*, *Cat*, *Iran*

## **Introduction**

In 1952, visceral larva migrans syndrome (VLM) was described (1) as the result of prolonged helminths larva migration in unusual organisms, mainly human. Human beings are infected with VLM by ingesting the helminths larval eggs mainly *Toxocara canis*. The larva hatches in the intestines and migrates through lymphatic ducts or the portal circulation into several organs, mainly the liver and the lungs and, occasionally, into the heart and the central nervous system, giving origin to the VLM syndrome, or into the ocular globe causing the ocular larva migrans syndrome (OLM) (2-4).

In spite of the differences among the studies on the frequency of anti-*Toxocara* antibodies in different age groups, there is general agreement about a higher prevalence of infection in children (5, 6). Although the usual *Toxocara* hosts are cats and dogs, direct contact with these animals is not considered as a potential risk by some researchers because the helminth eggs eliminated with the host's feces require a minimum period of two weeks to become infective (7,8). Nevertheless, it is accepted that dogs kept at home are a risk factor for the occurrence of the VLM syndrome in human beings (7). The epidemiological studies on *Toxocara* spp. infection in dogs in Iran has shown the preva-

lence rate of 10-46 % (9). To date, the importance of presence of *Toxocara* spp. eggs in public parks in Urmia city has not been investigated. Reports about contamination of soil samples from public areas have frequently shown the presence of *Toxocara* eggs, which ranged from 1.2% in the city of Murcia (Spain) to 100% in Londrina, State of Parana (Brazil) (10, 11). It has been established that among patients with toxocariasis, only about half have owned a dog or cat or had one in their home or had otherwise close contact with one (12). On the other hand, preventive effect of egg contamination by fence construction in parks has been verified (13). These facts, added to the relatively large stray dogs population in Urmia city determined the need to evaluate the contamination of public areas in Urmia with *Toxocara* spp. eggs, which was the objective of the present study.

## **Materials and Methods**

Urmia is a city located in the West Azerbaijan Province, Iran, with about 700000 inhabitants and a dog population of around 50000 dogs (unpublished data, Urmia municipality). This area is semi-humid, with mean rainfall of about 350 mm. The maximum mean monthly temperature of 28.3° C in August and the minimum mean monthly temperature-5° C in January.

Samples were collected from total 26 existing public parks with whole 609855.5 m<sup>2</sup> in Urmia from December 2003 to March 2004. The samples were collected randomly from 3-4 different

parts of each park including park pathways, children playgrounds and rubbish dumps for better evaluation of the study place.

Soil samples were collected and examined with following methods. The 50 cm<sup>2</sup> top layer of the soil samples was washed with syringe contain 50 ml saline, and poured on glass jar separately and refrigerated for a period of up to 72 hours. Samples from the same area were homogenized and drained. Fifteen ml of these samples was submitted to a fluctuation process in a saturated solution (14). They were examined under the light microscope at 100x and 400x magnification.

## **Results**

*Toxocara* spp. eggs (Fig. 1) were found in 4 public parks from 26 public parks showed a contamination rate of 3.9% (Fig. 2). The eggs were found in 8 samples of total 102 taken samples showing a contamination rate of 7.8%. The number of observed *Toxocara* egg in each microscopic field was varied from 1-8. The highest number of eggs in each microscopic field was found in Mellat Park, this number for Golestan was 2 samples in each microscopic field. In Saheli Mafi and Hesar parks, one egg was observed in each microscopic field. The positive samples were found from 3 locations (park pathway, playground and rubbish dumps) of Mellat and Golestan parks and one site (rubbish dump) on Saheli Mafi and Saheli Hesar parks.



Fig. 1: *Toxocara* spp eggs from soil sample (400X).

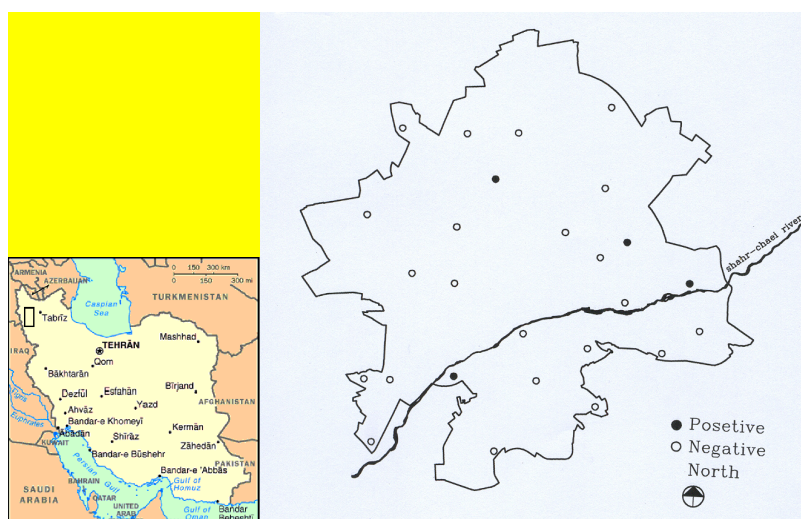


Fig. 2: Geographical location of 26 parks in Urmia, North West of Iran. Filled circles indicate *Toxocara* positive parks.

## Discussion

It is common to see cats and dogs in public parks in many city centers in Iran. Additionally, there is an increase in the number of cats and dogs in recent years. This increase possibly depends on increasing number of pet owners and the number of animals. All these animals defecate in public parks as well as the other places.

Many studies show that egg prevalence of helminthes, which can cause disease in human significantly, increases in soil samples (4). The risk of contamination from soil is more than being in direct contact with cats or dogs. This is because eggs need a period to be incubated in soil to be infective (15).

We found 8 out of 102 soil samples taken from the parks in Urmia as contaminated. The pre-

valence of *Toxocara* egg was 7.8%. The contamination of public parks recorded in Urmia was important, being lower than the contamination found in Aydin (18.91%), Marche (34%), Havana (42.2%), Basrah (12.2%), Hannover (30.8%), Jerash, Zarga (15.5%), Michigan (19%), Illinois (16.3%), Frankfurt (87.1%), and Kansas (20.6%) (16-25). This fact might be the consequence of a relatively lower dog population in this region. On the other hand owner and dog walking in public parks are very uncommon due to some cultural reasons may count as one of the reasons for lower contamination of the parks in Urmia. In fact, in a study in Shiraz almost the similar result has been obtained (6.3%) (26). However, public parks included in our study were not surrounded by fence. These parks are more prone to contamination because cats and dogs can freely live in them. Toxocariasis were reported from dogs and cats in Iran and revealed prevalence of 19.2–46 and 1.9–31.43% in dogs and cats, respectively (9, 27-29). There are a few reports on VLM prevalence in human in Iran. Rokni *et al.* reported 10 VLM cases (30). In two separate studies, seropositive rates of toxocariasis in children have been reported as 25.6% and 5.3% from Shiraz and Western part of Iran, respectively (31, 32).

Although the results of the present study represent relatively low contamination with eggs of *Toxocara* spp. in parks of Urmia, however, its potential risk for human infection underlines the need for preventive programs and further studies. Meanwhile, the authorities and the population should be alerted to the necessity of controlling the dog population associated with the treatment animals against worms, and about the potential for zoonotic infection in Urmia, Iran.

### Acknowledgements

This work was supported by the Research Council of Faculty of Veterinary Medicine, Urmia

University, Iran. Authors would like to thank Dr. J Samadi and Dr P Mohamadi for their technical assistance. The authors declare that they have no Conflict of Interests.

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