Contamination of Community Soil with Ova of *Toxocara* species in Mumbai City

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ABSTRACT

Of the 48 soil samples from public places viz., playground, foot path, public parks and veterinary clinics premises examined, 4 samples (8.33%) were found to be contaminated with ova of helminthic parasite of the genus *Toxocara* collected from children play ground (n=3) and veterinary hospital (n=1).

Keywords: Ova, public health, soil, *Toxocara*

There has been a co-evolution of human and animals since the earliest domestication, and there has been an intricate relationship between human with other species. However, modernization resulted into urban and rural counterparts, yet animals, particularly dogs and cats continued to be a part of urban environment at home as pet, community as stray and even synanthropic dwelling. Of the several helminthic affections, toxocariasis (mostly *Toxocara canis* in dog and *Toxocara cati* in cat) has been established as saprozoosis and their larvae have the capability of tissue migration leading to a clinical syndrome known as visceral larva migrans i.e. (VLM) (Overgaauw and van Knapen, 2008). Human infection occurs due to accidental ingestion of embryonated eggs along with contaminated soil, vegetables or tissues of paratenic hosts (Magnaval et al., 2001). The VLM has been a worldwide public health problem including India (Hegde et al., 1995; Fomda et al., 2007; Moiyadi et al., 2007). The present study was undertaken owing to lack of data on prevalence of soil-borne helminthosis in general and toxocariasis in particular in Mumbai city.

A total of 48 soil samples were collected from children play ground (n=37), foot path (n=4), public park (n=4) and premises of veterinary clinics (n=3) from various places of Mumbai city for parasitological examination. Approximately 100 g soil was sampled from 25 cm² ground up to 3-5 cm deep into a sterile polythene bag and analysed using zinc sulphate floatation technique. Briefly, 50 g of representative soil sample was filtered through a sieve in order to remove course particles and debris followed by washing with water and 100 ml of 0.005% tween-80 solution. The mixture was homogenised and centrifuged at 2500 rpm for 10 minutes, the supernatant was discarded and sediment was mixed with 33% zinc sulphate floatation solution and re-centrifuged for 10 minutes at 2500 rpm and filled the tubes with flotation fluid up to the brim so as to create a convex meniscus. A cover slip was placed on the top and allowed to stand undisturbed for 30 min. Finally, cover slips were carefully removed from tubes and placed over a clean slide and observed under microscope. Based on the morphology and morphometry the helminth ova were identified (Soulsby, 2005).

Of the 48 samples examined, 4 (8.33%) samples were found to be contaminated with helminth ova identified as *Toxocara* spp based on the typical
morbidity and morphometry (Fig. 1). Three samples collected from children playground and one sample from veterinary clinics were found to be positive for the *Toxocara* ova, while all other samples were found to be negative (Table 1).

Present study revealed 8.33% prevalence of *Toxocara* ova in soil samples collected from different locations of Mumbai city. Similar surveys revealed prevalence ranging from 2.21% to 40.4% (Harbinder et al., 1997; D’Souza et al., 2002; Das et al., 2009). Since playground and public parks have free access to pet and stray animals, they potentially act as source of contamination. Further, street food vendors discard left out food that attracts these stray and scavenging animals. Surprisingly, pets are brought to such public places for defecation thereby contaminating the soil. When children play over such contaminated soil, the ova could lead to larva migrans in such individuals.

Pet owners and the visitors should be made aware of such soil borne helminthic zoonosis and guidelines must be followed regarding hygiene and environmental sanitation at community places.

**References**


**Table 1. Occurrence of *Toxocara* spp. ova in soil samples collected from Mumbai city**

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Place</th>
<th>Samples analysed</th>
<th>Positive Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Children playground</td>
<td>37</td>
<td>3 (8.1%)</td>
</tr>
<tr>
<td>2</td>
<td>Foot path</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Public park/Garden</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Veterinary clinics</td>
<td>3</td>
<td>1 (33.33%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>48</td>
<td>4 (8.33%)</td>
</tr>
</tbody>
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**Fig. 1. Helminth ova identified as *Toxocara* species in soil sample**