

**PREVALENCE AND INTENSITY OF *Toxocara canis* EGGS IN THE HAIR AND  
FAECAL SAMPLES OF DOGS IN ILESÀ AND IBADAN, SOUTHWESTERN NIGERIA**

**BY**

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## ABSTRACT

The study investigated the presence of *Toxocara canis* eggs in the faeces and hair of dogs from Ilesha and Ibadan, Southwestern Nigeria. It also compared the prevalence and intensity of *Toxocara canis* eggs in the hair and faecal samples of dogs from the two study areas, identified the possible risk factors for *Toxocara* infection in dogs and determined the knowledge of dog owners about toxocariasis. This was with a view to preventing zoonotic parasitic infection caused by the parasite.

Samples of fresh dog faeces were collected into a pre-labelled, clean, sterile universal plastic bottle containing 10% formaldehyde solution. With permission of dog owners, hair samples were taken with the aid of small scissors from three different locations on the dog's body; the neck, back and the peri-anal regions. The samples taken were labelled with sex and age of dogs was grouped into puppies, young dogs and adults. The faecal and hair samples were processed for helminth eggs concentration using the modified Kato-Katz technique for the recovery of helminth eggs. Processed faecal and hair samples were examined under light microscope at a magnification of X100 for *T. canis* eggs, and other helminth eggs were identified based on standard identification keys. Questionnaires were administered to dog owners to collect information on the knowledge on toxocariasis and risk factors for *Toxocara* infection in dogs. Data collected were analyzed using SPSS 17.0 and statistical significance was assigned at  $P \leq 0.05$ .

Out of a total of 477 faecal samples examined, 144 (30.2%) dogs were positive for intestinal helminth eggs. Three gastrointestinal helminths were identified with a prevalence of

20.8% for *T. canis*, 17.6% for *Ancylostoma caninum* and 6.3% for *Dipylidium caninum*. The prevalence of *T. canis* among dogs at Ilesha (30.5%) was significantly higher ( $p < 0.05$ ) than the prevalence of the parasite obtained at Ibadan (14.9%). There was no significant difference ( $p > 0.05$ ) in the prevalence of *T. canis* between male and female in Ibadan and Ilesha. Among the age groups, the highest prevalence of *T. canis* was recorded in dogs aged less than six months old. Analysis of risk factors showed that mode of life of dogs played a significant role in the prevalence of *T. canis* infection ( $P < 0.05$ ). A total of 801 hair samples were collected from 267 dogs comprising 150 dogs from Ibadan and 117 dogs from Ilesha. 450 hair samples were collected from dogs at Ibadan and 351 hair samples from Ilesha. Out of 450 hair samples examined from Ibadan, 12 (8.0%) was contaminated with *Toxocara* ova from the neck, 11 (7.3%) from back, and 9 (6.0%) from the anal regions and a total of 72 eggs was recovered from the hair samples. In Ilesha, out of 351 hair samples examined, *Toxocara* ova was recovered from 10 (8.5%) hair samples collected from the neck region, 12 (10.3%) from the back region and 8 (6.8%) from anal region. A total of 116 eggs were recovered from the hair samples from the three regions. The total number of eggs recovered in both locations was higher in the male dogs than in the female dogs. All the eggs recovered were unembryonated.

The study concluded that presence of *T. canis* eggs in the hair of dogs examined from both locations could serve as another route of transmission of these nematode eggs to humans.

**Key words:** Faecal samples / *Toxocara canis* / Dogs / Hair / Nematodes eggs

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Importance of Dogs to Man

The domestic dog (*Canis familiaris*) is generally considered as the first domesticated mammal and has co-existed with a man as a working partner and house pet in all areas and culture since the days of the cave dwellers and are the most successful canids adapted to human habitation worldwide (Birchard and Sherding 2006).

In human society, dogs play many roles such as pets, guards, hunting and farming companions and they are also used in therapeutic programmes such as life-saving actions, transport, and, last but not least, for fun and research (Szabova *et al.*, 2007). There is evidence of the role of dogs in physical and psychological human well-being (Beck and Meyer., 1996). As communities become urban, the presence of pets within houses has increased in popularity (Overgaauw *et al.*, 2009). Nonetheless, dogs may represent a potential risk for human health due to the possibility of the transmission of zoonotic diseases (Chonel and Ben, 2011). Dogs are kept as pets and are increasingly considered a member of the family. Dogs play an important role in the treatment of behavioural problems of children, the well-being of the elderly and decrease work leave through illness and visits to the doctors (Beck and Meyers, 1996).

#### 1.2 Parasitic infections in Dogs

Apart from the benefits of dogs to the human population, there are potential health hazards associated with the ownership of the dogs, besides the risk of bites, scratches, and allergies, several infections can be transmitted to humans as zoonosis. Significant agents of

parasitic zoonoses of dogs are *Toxocara*, *Gardia*, *Cryptosporidium* and *Toxoplasma* (Buijs, 1993; Overgaauw 1997; Valkenburgh *et al.*, 2007). These parasites have oral faecal transmission cycle and human can be infected either by faecal contamination of food, water or the environment (garden, sandpits, and playgrounds) or by direct contact (Hill *et al.*, 2000; Good *et al.*, 2004).

### 1.2.1 *Toxocara canis*

*Toxocara canis* is the most common intestinal parasite of dogs and is cosmopolitan in distribution and causes the disease known as toxocariasis (Overgaauw 1997). *T. canis* is a parasitic ascarid nematode considered to be one of the most common gastrointestinal helminths of dogs and other canids. They have worldwide distribution (Parsons 1987; Overgaauw 1997) and are prevalent in all locations that have domestic dogs, puppies, and other canids. *T. canis* can also be found in paratenic hosts such as humans, pigs, birds, rodents, goats, monkeys and rabbits which can accidentally ingest embryonated *T. canis* eggs from the contaminated environment and in which the second stage larva of the parasite cannot undergo further development (Marty, 2000). Hosts of *T. canis* are purely terrestrial hence toxocariasis is limited to terrestrial terrain (X and Jin, 1998). The parasite is host specific and adult lives in the intestine of dog where it causes toxocariasis. In the intestine, the parasite absorbs nutrients from the animal, interfere with normal digestive processes and can damage the lining of the intestine.

Dogs infected with adult *T. canis* release a large number of infective eggs in their faeces into the environment. Environmental contamination is due to the presence of many dogs and thus, infection of the inhabitants especially children whose play habits and attractions to these animals combine to facilitate infection (Sowemim, 2007). Human toxocariasis can be primarily

contracted through accidental ingestion of embryonated *T. canis* eggs from contaminated soil and dog furs ( Wolfe and Wright, 2008), fresh unwashed vegetables, or

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