

## Intestinal Parasites in Pet Animals in Some Pet Shops of Afyonkarahisar and Kütahya Province

Kağan TURAN<sup>1</sup>, Mahmut Sinan EREZ<sup>2</sup>, Esmâ KOZAN<sup>2\*</sup>

<sup>1</sup>*Faculty of Veterinary Medicine, University of Afyon Kocatepe*

<sup>2</sup>*Department of Parasitology, Faculty of Veterinary Medicine, University of Afyon Kocatepe*

\*Corresponding author e-mail: esmakozan@aku.edu.tr

### ABSTRACT

This study was carried out in a total of 8 pet shops between March and August 2016 in order to determine intestinal parasites in various animals which are offered for sale in Afyonkarahisar and Kütahya Province. In this study, fecal samples of 7 dogs, 2 cats, 14 rabbits, 22 hamsters and 102 bird cages which are sheltered budgerigars, canaries, pigeons, partridges, quails were collected from 8 pet shops in Afyonkarahisar and Kütahya provinces. Samples were processed with Fulleborn saturated salt flotation method than examined parasitologically. Parasitic infection rates were 42.86% (3/7) in dogs and 71.43% (10/14) in rabbits. *Isospora* spp. oocysts were detected in one of three infective dog (%33) and *Toxocara canis* eggs were seen in fecal samples of all three infective dogs (%100). *Eimeria* spp. was identified in stool samples of two quail cages, *Eimeria* spp. and *Capillaria* spp were detected in fecal samples of two pigeon cages. In addition to that eggs of *Ascaridia columbae* were detected in one pigeon cage. No parasitic infection was found in other birds, hamsters and cats except pigeons and quails. It has been thought that pet animals which are offered for sale should be controlled regularly in terms of parasitic infections and eliminated of parasites with proper treatment when required.

**Keywords:** Helminth, Petshop, Pet Animal

### Afyonkarahisar ve Kütahya'daki Ev ve Süs Hayvanı Satış Yerlerinde Bulunan Çeşitli Hayvanlarda Bağırsak Parazitlerinin Tesbiti

#### ÖZET

Bu çalışma Afyonkarahisar ve Kütahya'daki ev ve süs hayvanı satış yerlerinde bulunan çeşitli hayvanlardaki bağırsak parazitlerinin yaygınlığının belirlenmesi amacıyla Mart-Ağustos 2016 tarihleri arasında Afyonkarahisar'da 4, Kütahya'da 4 olmak üzere toplam 8 merkezde yapılmıştır. Bu amaçla ev ve süs hayvanı satış yerlerinde satışı sunulan 7 köpek, 2 kedi, 14 tavşan, 22 hamster ile muhabbet kuşu, kanarya, papağan, güvercin, keklik ve bildircin gibi kanatlıların barındırıldığı 102 kanatlı kafesinden dışkı örnekleri Fulleborn doymuş tuzlu flotasyon yöntemi ile parazitolojik açıdan incelenmiştir. Paraziter enfeksiyon oranı köpeklerde %42,86 (3/7), tavşanlarda %71,43 (10/14) olarak tespit edilmiştir. Enfeksiyon tespit edilen köpeklerden 1'inin (% 33.33) dışkısında *Isospora* spp. oocysti tespit edilirken 3'ünde (% 100) *Toxocara canis* yumurtası görülmüştür. Değerlendirmeye alınan kanatlı kafeslerinden 2 bildircin kafesinde *Eimeria* spp., 2 güvercin kafesinde *Eimeria* spp. ve *Capillaria* spp.'ye rastlanırken 1 güvercin kafesinde de bunlara ilaveten *Ascaridia columbae* yumurtası görülmüştür. Güvercin ve bildircinlerin dışında incelenen diğer kanatlılar ile hamster ve kedilerde herhangi bir paraziter enfeksiyona rastlanılmamıştır. Bu sonuçlar ev ve süs hayvanı satış yerlerinde bulunan hayvanların da düzenli parazit kontrollerinin yapılması gerektiğini ve gerekli hallerde uygun antiparaziter tedavi seçeneklerinin uygulanması gerektiğini düşündürmüştür.

**Anahtar Kelime:** Helminth, Petshop, Pet Hayvanı

## INTRODUCTION

Pet animals are now in many homes all over the world and one of the most important friends especially for the children's physical, social and emotional development, as well as, making a contribution to psychological and physical lives of old people (Robertson et al. 2000). For this reason, pet animals which are kept in the house should be treated against diseases and take preventive measures regularly in terms of animal welfare and human health. Pet animals, which have positive contributions to the lives of many people from different ages and sex, can seriously threaten the health of animal owners and other people with parasitic, bacterial, fungal and viral diseases. Gastrointestinal parasites have an important role in these diseases. Pet shops, where more than one animal is kept in the same cage and not having proper hygiene conditions, can spread protozoan and helminth infections to other animals which live together and people who adopt these animals.

Cats, dogs as well as rabbits, hamsters and various birds can be fed as a hobby in a home. Cats and dogs can be risky for human health in terms of intestinal parasites in many parts of the world (Schantz 1994).

There are a limited number of studies in the world to determine the parasites of pet animals that are offered for sale in pet shops (Pinto et al. 2001, Hasegawa et al. 2008, Lv et al. 2009, Damman et al. 2011, Roberto et al. 2012). Sürsal et al. (2014) investigated the prevalence of intestinal parasites from hamsters and rabbits throughout 22 pet shops in Ankara and Kirikkale province in Turkey. In this study, it was aimed to examine various pet animals which are offered for sale in pet shops from the point of intestinal parasites in Afyonkarahisar and Kütahya Province.

## MATERIALS AND METHODS

In this study, fecal samples of 7 dogs, 2 cats, 14 rabbits, 22 hamsters and 102 bird cages which are sheltered budgerigars, canaries, pigeons, partridges, quails were collected from 8 pet shops randomly selected in Afyonkarahisar and Kütahya provinces of Turkey. Stool samples were brought to Parasitology Laboratory of Faculty of Veterinary Medicine, Afyon Kocatepe University. Samples were prepared with Fulleborn saturated salt flotation method (Urquhart et al. 1996) than examined under light microscopy.

## RESULTS

Parasitic infection rates were 42.86% (3/7) in dogs and 71.43% (10/14) in rabbits. Parasitic infection

was found in 3 of 6 dogs less than one year of age and no parasitic infection was found in three dogs less than one year of age and one dog older than one year of age. *Toxocara canis* eggs were seen in fecal samples of all three infective dogs (%100) and *Isospora* spp. oocysts were detected in fecal samples of one infective dog (%33). *Eimeria* spp. was detected in fecal samples of two quail cages, *Eimeria* spp. and *Capillaria* spp. were found in stool samples of two pigeon cages. In addition to that eggs of *Ascaridia columbae* were seen in one pigeon cage. No parasitic infection was found in other birds, hamsters and cats except pigeons and quails.

## DISCUSSION AND CONCLUSIONS

In addition to feeding pet animals like dogs, cats, birds and rabbits, also feeding exotic animals like frogs, turtles, snakes are getting very common at home. Pet animals have positive contributions to people's mental and physical health but it is an indisputable fact that these animals are also a risk for zoonotic diseases (Schantz et al. 1980; Schantz 1994, Dinç et al. 2015). Especially children, pregnant women and immunodeficient people due to various serious illnesses are at greater risk for parasitic, bacterial and viral zoonoses (Geffray 1999, Hemsworth and Pizer, 2006).

*Toxocara canis* is a nematode commonly found in dogs all over the world. *Toxocara canis*, which infrequently causes infection in adult dogs, can cause severe infections in young dogs (Soulsby 1982). Also, it can cause various clinical symptoms like ocular, visceral larva migrans and allergic respiratory tract infections in humans (Pinelli et al. 2008; Pinelli and Aranzamedi 2012). Eggs of *Toxocara canis* shed by feces of infected dogs and become infective from 3-6 weeks to several months depending on environmental conditions. Humans become infected especially when they ingest infective larvae containing eggs which are stuck to the hair of puppies or fecally contaminated foods (Umur et al. 2011). Whether the feces of the infected dogs which are kept in pet shops are not cleaned regularly, it is inevitable that infective eggs of unremoved stool are stuck to hair of the dogs. It has been reported that the prevalence of *T. canis* in dogs has varied between 13.2% and 47.8% in different cities of Turkey (Çerçi 1992, Doğanay and Öge 1993, Güçlü and Aydenizöz 1995, Umur and Arslan 1998, Orhun and Ayaz 2006, Kozan et al. 2007). However, no information was found in dogs which are sheltered in pet shops. In this study, the parasitic infection rate of *T. canis* was detected %100 in 8 commercial pet shops randomly selected in Afyonkarahisar and Kütahya provinces. This situation is considered to be a serious risk for public health, especially for animal keeper and children.

Coccidiosis is an important disease, which can lead to fatal intestinal infections, that is usually caused by protozoan *Isospora* species in dogs (Corea et al. 1983, Dunbar et al. 1985). Puppies usually get infected by ingested sporulated oocysts with contaminated food and water after the birth. Although immunity is developed against disease in time, shedding a few oocysts are still a source of infection for puppies. Because oocysts can be easily sporulated under proper conditions and maintain their infectibility up to several months (Dubey 1978). It has been reported that *Isospora* spp. can rarely cause clinical infections in puppies due to exposure to stress, humid shelters or insufficient hygiene (Ütük et al. 2007). In this study, oocysts of *Isospora* spp. were detected %33 of less than 1-year-old dogs. In case of inadequate hygienic conditions and humid shelters, it is thought to continue as a source of infection for new dogs which is brought to the pet shop. Shelters or cages should be cleaned to remove oocysts in pet shops after selling of pet animals to provide hygienic conditions for new ones. Quail take place in pet shops recently cause of low breeding costs and small place necessity. Many parasitic infections can be found in quails like other avian animals. Coccidiosis is the most common parasitic infection in quails. Intestinal cells have damaged the cause of intracellular localization of *Eimeria* spp. For this reason, maldigestion, malabsorption is seen associated with intestinal inflammation. In addition to development disorder, animals are exposed to secondary infections (Gesek et al. 2014). Teixeira et al. (2004) reported that coccidiosis is a major parasitic and mostly subclinical infection which is highly adverse effects in quail breeding due to intestinal lesions, despite mild or non-specific clinical symptoms. Pigeons have been used for communication in history. Recently, they are used for diagnosis of certain diseases as a laboratory animal, source of food and breeding as a hobby (Tiğın 1973, Cooper 1984, Dranzo et al. 1999). For this reason, pigeons can be sold in pet shops like canaries, budgerigars and parrots as cage birds. However, viral, bacterial and parasitic diseases also affect the quality of life negatively in pigeons like other animals. Coccidiosis which causes infection in many mammals can also lead to serious economic losses in avian animals (Levine 1985). *Eimeria labbeana*, *E.columbarum*, *E.columbae*, *E.tropicalis*, *E.pfeifferi*, *E.janovyi*, *E.curvata*, *E.waiganiensis*, *E.gourai* and *E.duculai* species were described from pigeons as the cause of coccidiosis in different regions of the world according to literature. Also, *E.labbeana*, *E.columbarum*, *E.columbae*, *E.pfeifferi* species were identified as the cause of coccidiosis from pigeons in Turkey (Gül et al. 2009). In this study, *Eimeria* spp. was detected in fecal samples which are collected from cages of pigeons in pet shops.

*Ascaridia columbae*, especially in the small intestines of the pigeons, is the most important and pathogenic parasitic ascaridiasis that affects a wide range of avian animals (Baker 2007, Bizhga et al. 2011). According to the study on domestic and wild pigeons in Niğde region, 5.1% *Ascaridia columbae*, 19.9% *Capillaria* spp. were found in domestic pigeons and 4.3% *Capillaria* spp. were found in wild pigeons in terms of stool examination (Sarı et al. 2008). In another study which is conducted in Van region, %18.62 *Capillaria* spp. and %11.03 *A. columbae* were detected as a result of fecal examination (Gül et al. 2009). No information was found about parasitic infection status of domestic pigeons which is sold in pet shops. In this study, oocyst of *Eimeria* spp. and eggs of *Capillaria* spp. and *A. columbae* were identified from fecal samples of pigeon cages in pet shops. It has been thought that parasitic infections can be common in pigeon which is offered for sale in pet shops. Parasitic infections in avian animals can cause growth disorders, decreased egg yield and increased susceptibility to secondary infections. For this reason, avian animals should be controlled regularly in terms of parasitic infections in pet shops.

In conclusion, It has been determined that various animals offered for sale in pet shops may be infected with parasites which affect their quality of life or even zoonoses. People who work in pet shops should be aware of the necessity of regular parasite control and elimination of parasites with proper treatment. It has been assessed that regular cleaning of the animal shelters should consider in case of preventing the spread of parasitic infections and animal welfare.

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## REFERENCES

- Baker DG.** 2007. Flynn's parasites of laboratory animals. 2nd. ed. American Collage of Laboratory Animal Medicine, Blackwell Publishing, USA.
- Bizhga B, Sotiri E, Boçari A, Kolleshi D.** 2011. *Ascaridia columbae* in *Colubia livia domestica*. Albanian J Agric Sci. 2(10): 8-12.
- Cooper JE,** 1984. A veterinary approach to pigeons. *J Small Anim Pract*, 24: 505-516.
- Corea WM, Corea CNM, Longoni H, Volgato OA, Tsunoda K.** 1983. Canine isosporosis. *Canine Pract*. 10: 44-46.
- Çerçi H.** 1992. Ankara İli Elmadağ İlçesi kırsal yöre köpeklerinde görülen mide-bağırsak helmintlerinin yaylıışı ve insan sağlığı

- yönünden önemi. *Türkiye Parazitoloj Derg*, 16: 59-67.
- Damman P, Hilken G, Hueber B, Köhl W, Bapper MT, Mahler M.** 2011. Infectious microorganisms in mice (*Mus musculus*) purchased from commercial pet shops in Germany. *Lab. Anim.* 45: 271-275.
- Dinç G, Doğanay M, İzgür M.** 2015. Important bacterial infections transmitted to humans from pet animals. *Türk Hijyen ve Deneysel Biyoloji Dergisi*. 72(2): 163-174.
- Doğanay A, Öge H.** 1993. The prevalence of ascariasis in stray dogs in Ankara. *Ankara Üniv Vet Fak Derg*, 40: 552-562.
- Dranzoa C, Ocardo M, Katete P,** 1999. The ecto-, gastrointestinal and haemo-parasites of live pigeons (*Columba livia*) in Kampala, Uganda. *Avian Pathol*, 28, 119-124.
- Dubey JP.** Pathogenicity of *Isospora ohioensis* infection in dogs. *JAVMA* 1978; 173 (2): 192-197.
- Dunbar MR, Foreyt WJ.** 1985. Prevention of coccidiosis in domestic dogs and captive coyotes (*Canis latrans*) with sulfadimethoxine-ormetropin combination. *Am J Vet Res.* 46 (9): 1899-1902.
- Geffray L.** 1999. Infections associated with pets. *Rev Med Interne*, 20(10): 888-901
- Gesek M, Welenc J, TylickaZ, Otrocka-Domagała I, Paździor K, Rotkiewicz A.** 2014. Pathomorphological changes in the alimentary system of Japanese quails naturally infected with *Eimeria tsunodai*. *Bull Vet Inst Pulawy* 58: 41-45.
- Güçlü F, Aydenizöz M.** 1995. Konya köpeklerinde parazit enfeksiyonlarının yayılışı. *Türkiye Parazitoloj Derg*, 19: 550-556.
- Gül A, Özdal N, Değer S, Denizhan V.** 2009. Van'da Evcil Güvercinlerde (*Columba livia domestica*) Coccidia ve Helmint Türlerinin Yayılışı. *YYU Veteriner Fakültesi Dergisi*, 20 (2), 45 - 48.
- Hasegawa H, Sato H, Iwakiri E, Ikeda Y, Une Y.** 2008. Helminths collected from imported pet murids, with special reference to concomitant infection of the golden hamsters with three pinworm species of the genus *Syphacia* (Nematoda:Oxyuridae). *J Parasitol.* 94: 752-754.
- Hemsworth S, Pizer B.** 2006. Pet ownership in immunocompromised children-a review of the literature and survey of existing guidelines. *Eur J Oncol Nurs*, 10(2): 117-27.
- Kozan E, Sevimli FK, Birdane FM.** 2007. Afyonkarahisar ve Eskişehir İllerindeki sokak köpeklerinde görülen gastrointestinal cestod ve nematod enfeksiyonları. *Türkiye Parazitoloj Derg.* 31(3): 208-211.
- Levine ND.** 1985. *Veterinary Protozooloji.* Iowa State University Press, Ames.
- Lv CC, Feng C, Qi M, Yang HY, Jian FC, Ning CS, Zhang LX.** 2009. Investigation on the prevalence of gastrointestinal parasites in pet hamsters. *Zhongguo Ji Sheng Chong Xue Yu Ji Sheng Chong Bing Za Zhi.* 27: 279-280.
- Orhun R, Ayaz E.** 2006. Van Yöresi Köpeklerinde Bulunan Endoparazitler ve Halk Sağlığı Yönünden Önemi. *Türkiye Parazitoloj Derg*, 30: 103-107.
- Pinelli E, Brandes S, Dormans J, Gremmer E, vanLoveren H.** 2008. Infection with roundworm *Toxocara canis* leads to exacerbation of experimental allergic inflammation. *Clin Exp Allergy.* 38: 649-658.
- Pinelli E, Aranzamedi C.** 2012. *Toxocara* infection and its association with allergic manifestations. *Endocr Metab Immune Disord Drug Targets* 12:33-44
- Pinto RM, Gonçalves L, Gomes DC, Noronha D.** 2001. Helminth fauna of the golden hamster *Mesocricetus auratus* in Brazil. *Contemp Top Lab Anim Sci.* 40: 21-26.
- Roberto P, Girivetto M, Marangi M, Mancianti F, Giangaspero A.** 2012. Endoparasite infections in pet and zoo birds in Italy. *The Scientific World Journal* 2012: Article ID: 253127
- Robertson I.D., Irwin P.J., Lymbery A.J., Thompson R.C.A.** 2000. The role of companion animals in the emergence of parasitic zoonoses. *Int J Parasitol.* 30: 1369-1377.
- Sarı B, Karatepe B, Karatepe M, Kara M.** 2008. Parasites of domestic (*Columba livia domestica*) and wild (*Columba livia livia*) Pigeons in Niğde, Turkey. *Bull Vet Inst Pulawy*, 52, 551-554.
- Schantz PM, Weis PE, Pollard ZF, White MC.** 1980. Risk factor for toxocaral ocular larva migrans: a case-control study. *Am J Public Health.* 70: 1269-1272.

- Schantz P.M.** 1994. Of worms , dogs and human hosts: continuing challenges for veterinarians in prevention of human disease. *J Am Vet Med Assoc.* 204: 1023-1028.
- Soulsby E.J.L.** 1986. Helminths, Arthropods and Protozoa of Domesticated Animals. 7th. Edition. Baillere Tindal, London.
- Sürsal N, Gökpinar S, Yıldız K.** 2014. Prevalence of İntestinal Parasites in Hamster and Rabbits in Some Pet Shops of Turkey. *Türkiye Parasitol Derg.* 38: 102-105.
- Teixeira M, Teixeira Filho WL, Lopes CWG.** 2004. Coccidiosis in japanese quails (*Coturnix japonica*): characterization of a naturally occurring infection in a commercial rearing farm. *Brazilian Journal of Poultry Science.* 6(2):129-134.
- Tiğın Y,** 1973. Ehli güvercinlerde (*Columba livia*) bulunan ektoparazitler. *Ankara Üniv Vet Fak Derg,* 20 (2-3): 372-390.
- Umur Ş, Arslan M.** 1998. Kars yöresi sokak köpeklerinde görülen helmint türlerinin yayılışı. *Türkiye Parazitol Derg,* 22: 188-193.
- Umur Ş, Köroğlu E, Güçlü F, Tınar R.** 2011. Nematoda. In: Veteriner Helminтологи. Ed. Tınar R. Dora Basım Yayın Ltd. Şti. Bursa.
- Urquhart GM, Armour J, Duncan JL, Jennings FW, Dunn AM,** *Veterinary Parasitology,* 2nd Ed., Oxford: Blackwell: 307 pp.
- Ütük AE, Şimşek S, Özdemir H, Kızıl Ö.** 2007. Doğal Enfekte Köpeklerde Klinik Isospora spp. Enfeksiyonu. *F.Ü. Sağ. Bil. Derg.* 21 (1): 1-3.