

## Prevalence of *Toxocara vitulorum* in Calves in Erzurum, Turkey

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### Summary

This study was performed between February and May 2010 to determine the distribution of *Toxocara vitulorum* in calves in Erzurum, Turkey. For this purpose fecal samples of 508 calves at different age, gender and breed, from 15 different villages of Erzurum were examined by using the Fülleborn saturated salt solution method. *Toxocara vitulorum* eggs were found in 113/508 (22.2%) of the calves feces. The prevalence in calves smaller than 6 months of age was 24% and 10.6% in 6-12 months old. There was a significant difference in the overall prevalence of *T. vitulorum* between age groups ( $P<0.05$ ), whereas was not among gender and breed groups ( $P>0.05$ ).

**Keywords:** Calf, Erzurum, *Toxocara vitulorum*

## Erzurum da Buzağılarda *Toxocara vitulorum*'un Yaygınlığı

### Özet

Bu çalışma Şubat 2010-Mayıs 2010 tarihleri arasında Erzurum ilindeki buzağılarda *Toxocara vitulorum*'un yaygınlığını belirlemek amacıyla yapılmıştır. Bu amaçla, Erzurum'a bağlı 15 farklı köyde, farklı yaş, ırk ve cinsiyetteki buzağılardan elde edilen dışkı örnekleri Fülleborn'un tuzlu su flotasyon tekniğiyle incelenmiştir. Dışkı örnekleri alınan 508 buzağının 113'ünde (%22.2) *T. vitulorum* yumurtası bulunmuştur. *Toxocara vitulorum* altı aylıktan küçük buzağılarda %24, 6-12 ay arası buzağılarda %10,6 oranında tespit edilmiş ve yaş grupları arasındaki fark istatistiksel olarak önemli bulunmuştur ( $P<0.05$ ). Cinsiyet ve ırklara göre ise *T. vitulorum*'un yaygınlığının istatistiksel olarak önemsiz olduğu tespit edilmiştir ( $P>0.05$ ).

**Anahtar sözcükler:** Buzağı, Erzurum, *Toxocara vitulorum*

### INTRODUCTION

*Toxocara vitulorum* (syn. *Neoascaris vitulorum*, Goeze, 1782) is a parasitic ascarid of *Bubalus* and *Bos spp.*<sup>1</sup> found generally in tropical and subtropical climates worldwide<sup>2</sup>. Calves become infected by ingesting third stage larvae from an infected dam's milk<sup>3,4</sup>, but not from ingesting eggs in the environment<sup>3,5</sup>. Larvae ingested by calves develop into adults in 3-4 weeks, and then begin shedding eggs in the feces. An adult female *T. vitulorum* produces thousands of eggs daily<sup>6</sup>. Egg production ranges from 8000 to as high as 100.000 eggs per gram faeces per day<sup>1</sup>. *Toxocara vitulorum* eggs do not hatch in the environment, but larvae in the egg develop to the infective third stage larvae. The infective eggs hatch in the host and the larvae penetrate the intestinal wall, and become hypobiotic in muscles<sup>4</sup>. Patent toxocariasis is seen in young calves up to 6 months of age when adult worms are

spontaneously eliminated<sup>4,6</sup>. Intestinal toxocariasis is associated with diarrhea, poor performance, intestinal and biliary obstruction, and death<sup>5,7</sup>. Visceral larva migrans caused by *T. vitulorum* in mature cattle is usually asymptomatic<sup>6</sup>.

Studies done to determine distribution of *T. vitulorum* in Turkey and other countries showed that infection rate varies between 0.3 and 29%<sup>8-19</sup>, 0.9 and 54%<sup>20-24</sup> respectively.

This study was performed to investigate the prevalence of *T. vitulorum* in calves in Erzurum, Turkey.

### MATERIAL and METHODS

Sample collection was performed at village cattle



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enterprises from 15 different villages of Erzurum (39°52' N, 41° 17' E), Turkey from February to May, 2010. Fecal samples were collected from recti of 508 calves (The average number of animals on farms is 5-30. These farms are not used antiparasitic drugs regularly, there is the use of common pasture) at different age, gender and breed. The samples were put in labeled plastic bags and age (less than 6 months old, 6-12 months old), sex, and breed (Brown Swiss, East Anatolian Red, Holstein, Simmental) properties were written on bags and delivered to our laboratory. Evaluation of samples was performed by using the Fulleborn saturated salt solution method<sup>6</sup>. Number of eggs per gram (EPG) of feces was counted by Mc Master egg counting method<sup>25</sup>.

Statistically, Chi-square test was used and infection status was evaluated in terms of age, gender and breed (SPSS Version 10.0.1, 1999, Chicago, IL).

## RESULTS

From the 508 calves sampled, 113 (22.2%) were determined to be shedding *T. vitulorum* eggs in their feces. The prevalence of infection in calves smaller than 6 months of age was 24% and 10.6% in 6-12 months of age. There was a significant difference in the overall prevalence of *T. vitulorum* between age groups ( $P<0.05$ ) (Table 1). The mean EPG of feces of the age groups is presented in Table 1.

*Toxocara vitulorum* eggs were observed in 60 (22.2%) male and 53 (22.3%) female calves. Prevalence of *T. vitulorum* did not differ significantly between the males and females, ( $P>0.05$ ) (Table 1). Distribution of *T. vitulorum* in animal breeds is given in Table 1. Prevalence of *T. vitulorum* did not differ significantly between animal breeds ( $P>0.05$ ).

## DISCUSSION

*Toxocara vitulorum* is the most important parasite that is responsible for calf mortality and morbidity under three months of age in tropical countries. Heavy burden of adult *T. vitulorum* in young calves could result in high mortality rate and economic losses<sup>26</sup>.

The prevalence of *T. vitulorum* in cattle is 15.2% in India<sup>28</sup>, 40% in China<sup>22</sup>, 54.4% in Nigeria<sup>21</sup>, 2.9% in Syria<sup>29</sup>, 36% in Vietnam<sup>27</sup>, 7.6% in Mali<sup>23</sup> and 17.6% in United States of America<sup>24</sup>. In Turkey the infection rate is 0.3-6.2% in Konya<sup>9,12</sup>, 1.1% in Erzurum<sup>19</sup>, 4.3% in Thracia<sup>17</sup>, 4.6% in Ankara<sup>15</sup>, 5.1% in Bursa<sup>11</sup>, 13% in Kars<sup>18</sup>, 16% in Van<sup>16</sup> and 29% in Hakkari<sup>13</sup>. In this study, prevalence of *T. vitulorum* in Erzurum was found as 22.2% and it is higher than the rate stated in the previous study conducted in Erzurum<sup>19</sup>.

Differences in the prevalence of the infection can be attributed to several factors like cattle enterprise types, barn types, climatic diversities of the regions, application of hygiene measures and usage of antiparasitic drugs.

We think that the prevalence rate differences of *T. vitulorum* between the two studies performed in Erzurum is related with the diversities at the animal numbers, cattle enterprise types and the barn types that the studies performed. In the previous study, Arslan et al.<sup>19</sup> used 189 animals whereas we used 508 and it is certain that this difference would affect the prevalence rates. On the other hand, cattle enterprise types, barn types and their conditions could lead to prevalence variation. In the other study it was reported that modern barns were used. In modern operations application of hygiene and antiparasitic drugs are orderly. But the animals of this study raised in village type barns in which hygiene and antiparasitic drug applications are irregular and also live-stock movement is uncontrolled. When these conditions

**Table 1.** Distribution of *Toxocara vitulorum* for age, gender, breed and EPG counts

**Tablo 1.** *Toxocara vitulorum*'ün yaş, cinsiyet, ırk ve EPG sayılarına göre dağılımı

Categories	n	np	p (%)	Mean EPG
<b>Age (Month)</b>				
0-6	442	106	24	7154 (50-66700)
6-12	66	7	10.6	656 (50-2100)
<b>Gender</b>				
Female	238	53	22.3	
Male	270	60	22.2	
<b>Breed</b>				
Brown Swiss	326	74	22.7	
East Anatolian Red	132	31	23.5	
Holstein	31	4	12.9	
Simmental	18	4	22.2	

n; examined calves, np; infected calves, p; infection rate

of cattle enterprise types taken into consideration, obviously it is more common to come across with parasitic and microbial infections in village type barns. All these factors explain the high prevalence rate (22.2%) of our study compared to the other (1.1%). Also, in the cities of the same region (Kars, Van and Hakkari) which have similar climatic conditions and breeding methods with Erzurum, the results of the studies about the prevalence of *T. vitulorum* (13%, 16% and 29% respectively) are similar to our data (22.2%).

*Toxocara vitulorum* infections were more common in 1-3 months of age calves and infection rates were decreased up to 1 year and rare after 1 year old<sup>8,10,30</sup>. In this study; infection rate was 24% in less than 6 months of age calves, 10.6% in 6-12 months of age calves.

In various studies<sup>8,16,25</sup>, relations between infection rate and gender was investigated and males were found to be the predominant. Infection rates of two genders were found to be quite different; but this difference was not regarded as statistically significant. In this study; infection rate was 22.2% in males, 22.3% in females and these results were not found to be statistically significant ( $P>0.05$ ).

It is known that the EPG counts of *T. vitulorum* infected animals are not determining the severity of the infections. It is completely related with the ability of the females' egg production<sup>25</sup>. In the previous studies it was shown that the number of EPG of feces ranged between 25 and 95.200 and it was inversely related with the age of the animal<sup>11,15,16</sup>. In this study, the EPG counts were detected between 50 and 67700 and our results consistent with the consequences of the other studies. The number of eggs per gram of feces was found to be higher at less than 6 month old calves than 6-12 month old calves.

As a result, *T. vitulorum* has been shown to be highly prevalent in Erzurum region and it is concluded that fight against this parasite is beneficial to cattle health. Also, we would like to make stockbreeders and veterinarians in the area aware that the prevalence of this parasite is high.

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