



## The Prevalence of Commonly Encountered Parasites in Sheep in Iğdır Province, Turkey

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### ABSTRACT

Sheep farming is an important segment of the livestock sector in Turkey. However, low meat, milk, leather and wool production due to various parasitic diseases has adversely affected this sector. This study was carried out by using stool and tissue samples collected from 300 sheep registered with the Provincial Directorate of Agriculture and Forestry in Iğdır, Turkey. Stool samples were collected using native, flotation and sedimentation methods to diagnose common parasites. In addition, parasitic diagnoses were strengthened with the migration paths of parasites and the presence of cysts as a result of macroscopic examination of the liver and lungs of sheep slaughtered in the slaughterhouse. From the data obtained, the prevalence and material damage and loss of workforce of parasites were determined using appropriate statistical programs. Fascioliasis 16.7%, Nematodirosis 20% Echinococcosis 29% Dicrocoeliasis 32% varied. It was concluded that the parasite population is high in sheep in Iğdır province, Turkey. Accordingly, attention was drawn to the issue of necessary protection and controls.

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### Introduction

The sheep are preferred animals by the farmers as they are small, easy to control, could be reared in mountainous areas by using low grade pastures with low cost. The sheep are commonly raised in various centuries for meat, milk, leather and wool production, which further used and processed for making other miscellaneous local products for the domestic market (Gül and Örnek, 2018). Sheep farming is an important segment of the livestock sector (Bhowmik et al., 2020) and is quite common in the Eastern Anatolia region of Turkey. However, parasitic diseases, which are an important factor in the production and yield losses obtained from this sector, cause great losses in meat, milk, leather and wool production (Der, et al., 1994; Değer and Biçek, 2005; Acıöz, 2019). Turkey is a geographical area suitable for parasitic life as it is a country where different climate types are seen regionally (Taş, 1997; Değer and Biçek, 2005). Parasitic outbreaks due to endoparasites in domestic animals are very common in Turkey, which cause serious damage regional animal husbandry industry and ultimately to the country's economy (Deger and Biçek, 2005). Protozoan, trematode

and cestode infections that develop in the liver have a remarkable place in liver pathology (Metin, 2011; Kırçalı Sevimli, 2013). Fascioliasis disease caused by chronic trematode invasion including *Fasciola hepatica* and *Fasciola gigantica* of Fasciolidae family in the liver and bile ducts of sheep is a common worldwide (Scott, 2009; Metin, 2011; Kırçalı Sevimli, 2013). It causes hepatitis and peritonitis especially on the visceral surface of the liver (Stalker and Hayes, 2007; Scott, 2009). The trematodes penetrating the liver capsule create necrotic bleeding tunnels and coagulation necrosis in the parenchyma (Toparlak and Tüzer, 1999; Metin, 2011). The pulpy content formed in the bile ducts contains bile, pus, exfoliated cells, tissue debris, trematode clumps and egg masses and causes bile retention (Stalker and Hayes, 2007; Metin, 2011).

The dicrocoeliosis is a helminthosis disease caused by parasitism in the bile ducts and gallbladder of ruminants and many other animal species, including humans (Gürelli, 2017; Erdoğan et al., 2019). In the biological life cycle of *Dicrocoelium*, land snails serve as the first intermediate

host and ants as the second intermediate host. Sporocyst and larval stages of cercaria live in the hepatopancreatic abdomen of land snails, and metacercariae larval stages in the abdomen and brains of ants. This parasitic disease, which is especially common in ruminant animals, can cause weight loss and decreased milk production in animals by affecting the liver (Gürelli, 2017). Sheep are not immune to this parasite, and as a result of continuous metacercariae ingestion, parasites can increase in number up to 50,000 (Toparlak and Tüzer, 1999). Dicrocoeliosis records are increasing due to the expansion of arid habitats and the resistance of the parasite to anthelmintic drugs (Gürelli, 2017).

The hydatidosis caused by *Echinococcus* spp. is a common zoonotic disease in the world. The mature parasite lives in dogs, however, the hydatid cysts, which are its larvae, can be found in the organs especially liver and lung of many intermediate hosts, including humans, (Metin, 2011; Kırçalı Sevimli, 2013). Hydatid cyst disease (HSC) is a parasitic disease frequently observed in countries where agriculture and animal husbandry are common, and its incidence varies between 1 and 150 per 100,000. It was determined that 171 (0.88%) of a total of 14789 HCl cases detected between 2001 and 2005 were died in Turkey. It has been reported that lung cysts can be single in 72% and multiple in 28% cases (Korcan Tilkan et al., 2018).

The gastrointestinal nematode infestations are one of the most important reasons closely related to intensive sheep breeding. Nematodiosis, which affects young lambs, causes great losses in the late spring/early summer period (Yeşildere and Deprem, 2007). Infestations range from acute illnesses to chronic patients with sudden death. The nematodirus diarrhea in young lambs, can lead to low productivity and weight loss.

In the light of this information, it is aimed to determine the prevalence of parasites that are frequently encountered in Iğdır Province, to determine the economic losses that occur in this context, to lose work force and to raise awareness about it.

In addition, it is thought that it will contribute to further studies in the prevention of parasitic diseases with the data we can present as a result of the study.

### Statistical Analysis

Student's t-test was used for statistical analysis. Data were given as arithmetic mean±standard deviation (X±SX). Statistical significance level was accepted as P<0.05 in calculations and SPSS 20.0 statistical package program was used for calculations (SPSS 10.0 for Windows).

### Materials and Methods

The study was carried out by using stool and tissue samples collected from 300 female sheep registered with the Provincial Directorate of Agriculture and Forestry in Iğdır Province and its districts.

#### Examination of Animals

General examination was done before slaughter. Lymph nodes and eye mucosa were checked. Respiration was examined with a heart stethoscope. Body temperature was measured with a digital thermometer. The results have been recorded.

Common parasites were diagnosed by using native, flotation and sedimentation methods of stool samples. In addition, parasitic diagnoses were strengthened by the presence of cysts and migration routes of parasites, which were seen as a result of macroscopic examinations of the liver and lungs of the sheep slaughtered in the slaughterhouse. In native, flotation and sedimentation methods, samples of eggs or cysts or cysts of parasites under the microscope in stool samples were considered positive. In addition, liver and bile were examined in the slaughterhouse. As a result, adult parasites, if any, were detected. For the echinococcosis diagnosis the fluid was drawn from the cysts detected macroscopically in the livers of sheep with an injector. The fluid was then examined under the microscope, and samples with protoscolex were considered positive.

### Results and Discussion

#### Clinical Results

Anorexia, weakness and anemia were determined in all sheep included in the study and positive for parasites, while edema under the chin was observed especially in sheep with fasciolosis. Internal parasite eggs were detected in the stool examination. Parasitic agents were observed in the internal organs of the sheep slaughtered in the slaughterhouse and included in the study.

The results are presented in Table 1 shows that 50 (16.7%) sheep were positive for *Fasciola* species, 87 (29%) positive for *Echinococcus* species, 96 (32%) positive for *Dicrocoelium dendriticum* and 60 (20%) positive for *Nematodirus* spp.

Endoparasites cause important disorders in host animals by causing malnutrition and the organ destruction. Endoparasitic diseases cause poor reproductive performance, growth retardation, and loss of quality and quantity in animal products such as meat, milk and fleece (High et al. 2007). In our study, anamnesis information was obtained by Yüksek, et al. (2007) was similar to that stated. There was also anemia as a clinical sign.

Liver fluke, *Fasciola hepatica*, is a common zoonotic parasite (Mokhtarian, et al. 2018; Shi, et al. 2020). This parasite causes diseases in animals such as sheep, goats, cattle and buffalo (Shi, et al. 2020). The prevalence of *Fasciola* spp. varies between 0.8% and 72% in sheep in Turkey (Çaya, 2012; Sevimli, 2013; Kaplan et al, 2014, Fırat and Alpak, 2019). In addition, in the study conducted by Gül (2007) in the Iğdır region, reported 17.22% *Fasciola* spp. In our study, *Fasciola* spp. the incidence rate is 16.7%. According to these values, it was concluded that there was no significant difference proportionally.

Parasitic diseases caused by liver trematodes have an important place among many parasitic infections that cause decreased productivity in animals. Among the liver trematodes, *D. dendriticum* settles in the liver of ruminants and causes weight loss and decreased milk yield. (Çınar, et al. 2018).

*Dicrocoelium* spp. It has been reported between 1.1% and 58.9% in different studies conducted in Turkey (Çaya, 2012; Cute, 2013; Kaplan et al, 2014, Fırat and Alpak, 2019). Our study parallels this, *Dicrocoelium* spp. (32%) was found. It was found to be similar according to the study of Gül (2007). *Echinococcus* spp. Hydatid Cyst is a common zoonotic disease in the world (Metin, 2011; Kırçalı Kelebek, 2013, Irak, et al. 2018). This disease,

which is also common in Turkey, poses a health and economic problem (Barış, et al. 1989).

Umur and Aslantaş (1993) found the spread of hydatid cyst in sheep slaughtered in Kars Municipality slaughterhouse to be 48.35%. Toparlak and Gül (1999) reported the spread of hydatidosis as 32.9% in sheep in the Van old Municipality Slaughterhouse, and Zeybek and Tokay (1990) as 22% in ruminants slaughtered in Ankara and its districts without any animal discrimination. According to the literature, hydatid cysts were found in

0.6-58.6% of sheep in Turkey (Cantoray, et al. 1992; Toparlak and Gül, 1999; Dik, et al.1992; Oğuz and Değer, 2013).

In our study, the rate of *Echinococcus* was found to be 29%. The results were found to be in parallel with these studies. Rates between 0.3% and 44.9% were found in Turkey for different species of *Nematodirus* spp. (Sevimli, 2013; Fırat and Aypak, 2019). This study is similar to the stated data, and *Nematodirus* spp. percentage of incidence; It was determined as 20%.

Table 1. Detected parasite species and infection rates

Types of parasites	Positive n (%)	Negative n (%)	Total n (%)
Fasciola spp.	50 (%16.7)	250 (%83.3)	300 (%100)
Dicrocoelium dendriticum	96 (%32)	204 (%68)	300 (%100)
Echinococcus	87 (%29)	213 (%71)	300 (%100)
Nematodirus spp.	60 (%20)	240 (%80)	300 (%100)

### Conclusion

As a conclusion, this research Fascioliosis 16.7%, Nematodiriasis 20% Echinococcosis 29% Dicrocoeliasis 32% were determined statistically. It was concluded that the parasite population is high in sheep in Iğdır province. It was concluded that the parasite population is high in sheep in Iğdır province. Accordingly, attention was drawn to the issue of necessary protection and controls.

It has been clearly demonstrated that helminth infections are particularly common in sheep, one of the animal groups in which we can best observe herd life among farm animals.

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