

PREVALENCE OF GOAT WARBLE FLY, *PRZHEVALSKIANA* SPP.
IN SARAB DISTRICT, IRAN

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ABSTRACT: Myiasis due to *Przhevalskiana silenus* (Goat Warble Fly Infestation, GWFI) is an economic and health problem in most goat breeding countries. Due to geographical and meteorological variations and grazing pattern, the prevalence of the infestation differs considerably throughout the world. Between September 2011 and June 2012, Goat warble infestation was investigated in the Sarab abattoir. The number of infested animals, their sex and age, the number of maggots present on each animal, location and larval stage of warble flies were recorded. Warbles were counted, measured and isolated by squeezing the subcutaneous nodules. 466 native goats (84 males and 382 females) were examined. 54 (11.5%) goats were parasitized, in which 43(79.6%) were females and 11(20.3%) were males. According to the results, out of 212 and 254, ≤ 2 and > 2 years old animals, 14 (26%) and 40 (74%) were infested to *Przhevalskiana* spp respectively. There was no significant difference between infestation of males and females and among two different age groups ($p < 0.05$). During the study 423 warbles flies larvae found in the subcutaneous tissue of slaughtered animals. The minimum, maximum, and mean number larvae per animal were 1, 12 and 6.13, respectively. The counted larvae were 138 (32.6%) first instars larvae, 173 (40.8%) second instars larvae, and 112 (26.4%) third instars larvae. Three species of *Przhevalskiana* including *P. crossii* (46.9%), *P. aegagri* (37.2%) and *P. silenus* (15.9%) were recognized. High degree of infestation highlights the potential risk of economic burden caused by goat warble fly in East Azarbaijan and needs further research in order to decrease the rate of infestation in goats.

KEYWORDS: *Przhevalskiana* spp, myiasis, goat, Sarab, Iran.

INTRODUCTION

Myiasis due to *Przhevalskiana silenus* (Goat Warble Fly Infestation, GWFI) is an economic and health problem in most goat breeding countries. Due to geographical and meteorological variations and grazing pattern, the prevalence of the infestation differs considerably throughout the world ([Giangaspero and Lia, 1997](#); [Faliero et al., 2001](#)). The causative insect belongs to the Order Diptera, the Family Oestridae and Subfamily Hypoderminae ([Zumpt, 1965](#)). The economic impacts are the loss of hides for the leather industry, loss in weight gain, milk production, and also decreasing carcass value due to inflammatory reactions and meat trimming at the slaughterhouse. In addition, *P. silenus* larvae rarely infest human beings, resulting in irritation and hypersensitivity responses ([Abul-Hab and Al-S'adi, 1974](#)).

Despite the high infestation rate in some parts of the world, little information is reported about morphopathological changes associated with this myiasis. Therefore, the present study was

undertaken to investigate prevalence and gross lesions of GWFI in naturally infested goats.

MATERIALS AND METHODS

2.1. Study area and animals

Between September 2011 and June 2012, several visits were done to the Sarab abattoir to determine the origins, sex, and age of animals, the number of maggots present on each animal, location and larval stage. The goats were from traditionally managed farms. The animals had grazed in pasture throughout the year during the daytime and had been kept in sheds at nights.

The goats were divided into two groups according to their sex and age group, namely ≤ 2 and > 2 years old. A minimum of 35 animals per month were examined throughout the study period. Inspections of slaughtered and skinned animals were carried out by examination of the inner skin surface and subcutaneous tissue. Warbles were counted, measured and isolated by squeezing the subcutaneous nodules and preserved in 70% alcohol for later identification.

2.2. Experimental laboratory design

Larvae were measured, identified and classified according to the larval stage and species. Presence or absence and denticles density above the mouth-dots were the diagnostic characters for identification of different species. In *P. aegagri*, area above the mouth-dots is without teeth. In *P. crossii* teeth are small, but still quite distinct, and arranged in a single, medially interrupted row although in *P. silenus* third larval teeth are few and extremely small, quite irregularly and highly reduced ([Zumpt, 1963](#)).

2.3. Statistical analysis

The data were analyzed by Chi square test. Significant differences were taken at $P \leq 0.05$ (SPSS version 16; [Remingtone, 1970](#)).

RESULTS

Out of 466 examined animals, 54 (11.5%) were parasitized, in which 43 (79.6%) were females and 11 (20.3%) were males. Among examined animals, 212 were ≤ 2 years old and 254 were > 2 years old animals in which 14 (26%) and 40

(74%) were infested to *Przhevalskiana* spp., respectively (Table 1).

In October 2011, larvae were found under the subcutaneous tissue of slaughtered animals at the first stage of development. During the study 423 larvae were found in the subcutaneous tissue of slaughtered animals. The minimum, maximum and mean values for the number of larvae per animal were 1, 12 and 6.13, respectively. There were 138 first instars larvae (32.6%), 173 second instars larvae (40.8%), and 112 third instars larvae (26.4%) recovered according to the developmental stages. No larvae were found between May and June 2012. The larvae only presented in subcutaneous tissue and there was no significant difference between the infestation of males and females and among two age groups ($p < 0.05$). According to the number of mouth hooks of pseudocephalon on third stage larvae, Three species of *Przhevaeskiana* including *P. crossii* (46.9%), *P. aegagri* (37.2%) and *P. silenus* (15.9%) were identified (Figures 1 and 2).

Table 1: Number and percentage of infested animals, divided according to the time of sampling, sex and age groups

Month	Examined animals	Infested animals					
		Females	Males	Age group 1	Age group 2	Overall	Number %
September	40	-	-	-	-	-	-
October	32	1	-	-	1	1	4.2%
November	51	4	1	2	3	3	6.7%
December	62	17	4	4	12	17	5.2%
January	29	24	6	2	14	21	13.8%
February	97	18	3	5	7	8	9.5%
March	83	14	2	1	3	2	11.9%
April	41	8	-	-	1	2	8/9%
May	12	-	-	-	-	-	-
June	19	-	-	-	-	-	-
Total	466	382	84	212	254	54	11.5%

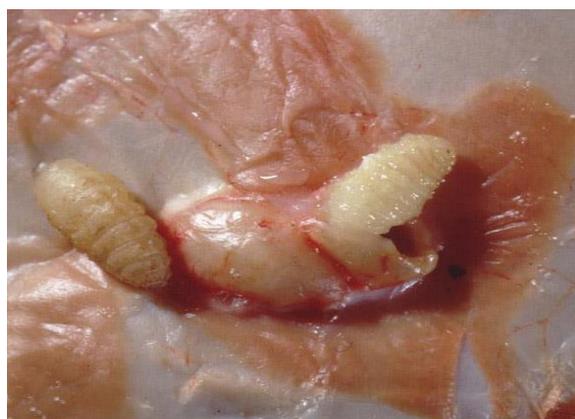


Figure 1: Subcutaneous tissue. Second larval stages of *P. silenus* sized about 8-12 mm in length.



Figure 2: Subcutaneous tissue. Third larval stages of *P. silenus* sized about 13-19 mm in length.

DISCUSSION

Several surveys have been carried out to determine the prevalence of *Przhevaeskiana* spp.

around the world. In Anatolia (Turkey), the infestation rate ranges from 53 to 94% of flocks ([Sayin et al., 1973a](#); [Sayin et al., 1973b](#)). The infestation rate was 24% in Albania ([Tagari and Manehasa, 1973](#)) and 22 to 25% in Iraq ([Abul-Hab and Al-S'adi, 1974](#)). In Italy and Greece, the infestation rate exceeds to 70% ([Himonas, 1982](#); [Puccini and Giangaspero, 1985](#)). In Iran, the infestation rate varies from 4.2 to 93%, depending on the area. The prevalence of *Przhevalskiana spp.* in goat in this study (13%) is lower than the aforementioned reports and southern part of Iran as well (Fars and Khouzestan provinces), ([Bagi Bageban, 1992](#); [Rahbari et al., 1992](#); [Navidpoor and Golamian, 2005](#)). However, it is similar to other studies reporting the infestation rate in Yasooj (15.2%), ([Bagi Bageban, 1994](#)) and Egypt ([Morsy et al., 1998](#)) where a 11.68% infestation has been reported among slaughtered goats. The maximum and minimum numbers of parasite (1-18 larvae) for each infested animal was lower than similar reports in southern part of Iran (2-200 parasites per infected animals) and in agreement with reports from Italy ([Wall and Shearer, 2001](#)) and Saudi Arabia ([El-Azazy, 1996](#)). The low prevalence and intensity of parasite in this area in comparison with results from southern part of Iran could be attributed to the climate conditions in East Azerbaijan. The climate of this region is cold and semiarid, with mean annual rainfall of 289.4 mm. The maximum monthly mean temperature of 29.8° C in August and the minimum monthly mean temperature of -8 ° C in January have been recorded. Thus, it seems that adult flies are more active during summer and spring time in this region.

It has been shown that, younger animals appear to be more prone to infestation than older animals ([Wall and Shearer, 2001](#)) although, in the present study there was no difference in prevalence of myiasis between two age groups. In the present study, there was not any significant difference between infestations in male and female confirming the result by [Jafari-Shorigeh and Rezazadeh \(1997\)](#). Since the larvae were found from October to April, we concluded that an effective drug against *Przhevalskiana spp.* at least 1-2 times at the season of adult flies activity (spring and summer) could decrease the incidence of the infestation in this area. However, with regard to the economic and health importance of the disease, as an important veterinary problem in goat rearing areas, it is necessary to investigate in more detail the pathogenesis and immunopathology of the infestation, particularly after repeated

exposure in order to design proper control programs.

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