Prevalence of goat warble fly, *Przhevalskiana silenus* in southeastern of Iran

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**Abstract.** During the period May 2007 to April 2008, 1964 goats slaughtered at the Kerman Abattoir (southeastern of Iran) were examined for the *Przhevalskiana silenus* larvae. Of the 1964 goats, 289 (14.71%) were infected with *P. silenus* larvae. The infection observed from July 2007 to February 2008, and the prevalence rate varied from 6.8% in August to 41.8% in February. From infected goats, 151 and 138 were female and male respectively. The difference in the prevalence of the infection between males and females was not significant (*P* > 0.05). The three larval stages (first instar larvae, second instar larvae and third instar larvae) were observed in infected goats and the mean number of larvae in infected goats was 11.12. The percentage of larvae in subcutaneous tissue of back and flanks was (71.25%) and (28.75%) respectively, and this difference was significant (*P* < 0.05). These findings provide a basis for further studies to determine methods for the control of goats hypodermosis in southeastern of Iran.

**Keywords:** Goat; *Przhevalskiana silenus*; Iran.

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**Introduction**

Goat warble fly infestation is a myiasis caused by larvae of *Przhevalskiana silenus* (Diptera: Oestridae) that migrate subcutaneously and it is characterized by the presence of warbles under the skin of infested animals, especially back and flanks. The warble fly is of economic importance since it reduce the quality of animal hides, the quality of wool dippings and overall reduce the body weight in infested animals (Liakos, 1986). For many years the exact taxonomy of the goat warble fly was uncertain and on the basis of the morphological differences the existence of three different species was suggested – namely *P. silenus*, *P. crossii* and *P. aegagri*. More recently, careful morphological analyses, gene-enzyme and molecular analyses studies indicated that these three species belong to the same species, *P. silenus* that parasitizes goats (Tassi et al., 1986; Tassi et al., 1989; Otranto et al., 2004).
Goat warble fly infestation have been studied by some researchers in European, Asian and African countries (Tassi et al., 1989; Giangaspero and Lia, 1997; Otranto et al., 1999; Papadopoulos et al., 1997; El-Azazy, 1996; Morsy et al., 1998; Faliero et al., 2001). Kerman province is a area at southeastern of Iran. Small ruminants are the major food animals in Iran agriculture. Since there was no published report on the prevalence of goat warble fly at Kerman province and after observing several cases of goat warble fly, Przhevalskiana silenus, in the Kerman abattoir, this work investigates the monthly prevalence and the number of P. silenus larvae among slaughtered native goat.

Materials and methods

Study area and animals

This study was conducted on goats in Kerman province, located in the southeastern of Iran. The city of Kerman and the surrounding regions have a semi-moderate and dry climate, with a maximum and minimum temperature of 39.6°C, and -7°C respectively.

From May 2007 to April 2008, monthly visits were made to the Kerman abattoir, a total of 1964 goats investigate for the occurrence of Przhevalskiana silenus larvae and information was collected on: number and sex of animals, the region of larvae on subcutaneous tissue and the number of larvae on the infested animals.

Laboratory examination

The gathered larvae were counted, washed in physiological saline solution (NaCl 0.9%) and stored in a separate special container for each carcass with 70% alcohol and 1-2 drop glycerine. Then, larval stages were measured, identified and classified in different larval stage under a stereomicroscope according to the keys by Zumpt (1965), first instar larvae = 2-7mm; second instar larvae = 8-10mm; third instar larvae = 10-18mm.

Statistical methods

The results were analysed by Mann-Whitney and $X^2$ tests with values of $P<0.05$.

Results

The details of infestation of P. silenus larvae in goats slaughtered in Kerman abattoir is shown in table 1. From a total of 1964 goat examined, 289 (14.71%) were infected, 151 were females and 138 were males. There was no significant difference between the prevalence of infestation in female and male animals ($P>0.05$). The month of August 2007 had the lowest rate of infestation (6.8%), while February 2008 had the highest rate of infestation (41.8%). Three larval instars observed in infected goats.

<table>
<thead>
<tr>
<th>Month</th>
<th>Examined Animals</th>
<th>Overall (%)</th>
<th>Female</th>
<th>Male</th>
<th>No. of larvae Range (Mean)</th>
<th>Larval instar</th>
<th>Larval regions (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Back</td>
</tr>
<tr>
<td>May 2007</td>
<td>99</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2-16(9)</td>
<td>L1</td>
<td>-</td>
</tr>
<tr>
<td>June</td>
<td>185</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3-15(11)</td>
<td>L1, L2</td>
<td>-</td>
</tr>
<tr>
<td>July</td>
<td>242</td>
<td>21(8.6)</td>
<td>10</td>
<td>11</td>
<td>L1</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>August</td>
<td>424</td>
<td>29(6.8)</td>
<td>17</td>
<td>12</td>
<td>L1</td>
<td>L3</td>
<td>-</td>
</tr>
<tr>
<td>September</td>
<td>281</td>
<td>36(12.8)</td>
<td>20</td>
<td>16</td>
<td>1-23(17)</td>
<td>L1, L2</td>
<td>-</td>
</tr>
<tr>
<td>October</td>
<td>224</td>
<td>71(31.6)</td>
<td>38</td>
<td>33</td>
<td>2-20(9)</td>
<td>L1, L2</td>
<td>-</td>
</tr>
<tr>
<td>November</td>
<td>191</td>
<td>61(31.9)</td>
<td>26</td>
<td>35</td>
<td>L1</td>
<td>L3</td>
<td>-</td>
</tr>
<tr>
<td>December</td>
<td>108</td>
<td>24(22.2)</td>
<td>12</td>
<td>12</td>
<td>1-27(14)</td>
<td>L2, L3</td>
<td>-</td>
</tr>
<tr>
<td>Jan 2008</td>
<td>66</td>
<td>24(36.3)</td>
<td>16</td>
<td>8</td>
<td>3-15(11)</td>
<td>L3</td>
<td>-</td>
</tr>
<tr>
<td>February</td>
<td>55</td>
<td>23(41.8)</td>
<td>12</td>
<td>11</td>
<td>6-10(8)</td>
<td>L3</td>
<td>-</td>
</tr>
<tr>
<td>March</td>
<td>25</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>April</td>
<td>64</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>1964</td>
<td>289(14.71)</td>
<td>151</td>
<td>138</td>
<td>1-29(11.12)</td>
<td></td>
<td>71.25</td>
</tr>
</tbody>
</table>

L1 = First instar larvae, L2 = Second instar larvae, L3 = Third instar larvae.
The first instar larvae, from July 2007 to October 2007, second instar larvae, from October 2007 to December 2007, and third instar larvae, from December 2007 to February 2008 were observed in infected goats. No larvae were found in May-June 2007 and March-April 2008.

The mean larvaes was 11.12, and larvaes were found in the subcutaneous tissue of back and flanks region. 71.25% and 28.75% of larvaes were observed in subcutaneous tissue of the back and flanks region respectively and this difference was significant (P<0.05).

Discussion

The goat warble fly, *Przhevalskiana silenus*, is common around the Mediterranean basin (Wall and Shearer, 1997). The prevalence of *P. silenus* (goats warble fly) in goats has been reported from different countries such as Iraq (Abul-Hab and Al-S'adi, 1974), Turkey (Sayin, 1977), Egypt (Morsy et al., 1985), Greece (Haralampidis, 1987; Papadopoulos et al., 1997), Saudi Arabia (El-Azazy, 1996) and Italy (Puccini et al., 1985). The prevalence of *P. silenus* in goats in our study was 14.71% and with comparison of the prevalence of *P. silenus* from other countries, our results are lower than those in Turkey (53-94%) (Sayin, 1977), Iraq (22-25%) (Abul-Hab and Al-S'adi, 1974), Greece (54.2%) (Papadopoulos et al., 1997), Italy (56.5%) (Otranto and Puccini, 2000), but higher than those from Saudi Arabia (6.8%) (El-Azazy, 1996) and Egypt (11.68%) (Morsy et al., 1998).

Sex-related effects on prevalence of infection were evaluated and was not significant difference between male and female animals.

In this study according to larvaes size that measured, first instar larvae found from July 2007 to October 2007, second instar larvae found from October 2007 to December 2007 and third instar larvae found from December 2007 to February 2008, which is in accordance with study by Otranto and Puccini (2000). In serological examination of goats in Greece, presence of *P. silenus* antibody were detected from May to November (Papadopoulos et al., 1997). In this work no larvae were found in May-June 2007 and March-April 2008. The months of May and June probably is simultaneous with early stage of L1 development and absence of these larvae in our studies may be due to the difficulties in detecting them in subcutaneous tissues. March and April is simultaneous with the pupation period and reproduction of the adult flies. The pupation period takes place from February to April, according to weather conditions (Sayin et al., 1973; Sayin, 1977; Puccini et al., 1985, 1988; Otranto and Puccini, 2000). In present study L3 found in winter season, which is similar with studies of Abul-Hab and Al-S'adi (1974) in Iraq, Puccini et al. (1985) in Italy, Zeybek (1988) in Turkey and Morsy et al. (1998) in Egypt that reported warble (third instar larvae) infestations in winter among living animals and ended by beginning of spring (March). In this study the *P. silenus* larvae at different development stages were found in back and flanks regions, but percentage of larvaes was significantly higher in back regions than flanks regions. These observation confirm the findings of Morsy et al. (1998) and Otranto and Puccini (2000). Otranto and Puccini (2000) reported that eggs are only laid on back and flanks of animals and *P. silenus* larvaes penetrate directly from the place where the eggs are laid into the subcutaneous tissue. Based on the findings, the authors recommend treatment at the beginning of L1 development (May-June) by ivermectin drug that described by Giangaspero et al. (2003).

References


