PREVALENCE OF WARBLE FLY INFESTATION IN CATTLE IN SALT RANGE ZONE OF NWFP PAKISTAN

BY

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ABSTRACT
Prevalence of warble fly infestation in cattle in salt range areas recorded in Kohat and Karak district of NWFP was 33.41%. A total of 1200 cattle were examined in the hilly grazing area, house hold, non grazing stock and slaughter houses. Only one species of Hypoderma, i.e. Hypoderma lineatum was found from these areas recorded. The prevalence of WFI was higher in grazing field areas as compared to house hold stock, slaughter house versus grazing area, males versus females, and young versus old animals in both the districts of NWFP. The highest month-wise prevalence was recorded in December and the lowest in July and August.

KEYWORDS: Prevalence, Infestation, Warble fly, Cattle disease, Kohat, Karak, Pakistan

INTRODUCTION
The warble fly infestation (hypodermosis) is a notorious and common disease of cattle, buffaloes, sheep and goats in Pakistan (Ayaz, 1998). This disease is endemic in these animals in semi-hilly, mountainous and riverine areas of southern Punjab, Pakistan (Shah et al., 1981 and Ayaz and Khan, 1999). WFI has been considered to be responsible for substantial economic losses to the livestock industry worldwide (Tarry, 1986). Hide damage (due to formations of holes by third-instars) is often considered to be a most important consequence of WFI. An annual loss of $ 192 million in USA (Khan, 1977), 100 million shillings in Austria (Kutzer, 1984), £ 13 million in UK (Colwell, 1992), 119 million lire ($ 42 million) in Greece and $ 11.5 million in Italy (Macchioni, 1984) has been documented due to this disease. WFI not only results in loss of millions of rupees each year in Pakistan but also worsens the protein deficiency for human consumption in terms of carcass depreciation and lowered productivity of infested animals (Souls by, 1982). Pakistan produces 7.5 million hides and 36.3 million skins per annum (Anonymous, 2004) but as far as ascertained, no report is available on the economic losses to the livestock industry of Pakistan caused by WFI. The present study was therefore conducted to determine the prevalence of warble fly infestation in Kohat and Karak districts of salt range zone of NWFP Pakistan.

MATERIALS AND METHODS
The studies were conducted from July 2005 to June 2006 in Kohat and Karak districts of salt range zone of NWFP Pakistan. The topography of the land is mountainous, hilly tract and plain area (Thal). These districts are surrounded by north east huge mountain of shin ghar tract, west by north Waziristan, Bannu and south by Orakzai agency. The maximum and minimum temperature during summer and winter months are 40°C and −4 °C, respectively. The maximum average annual rainfall and the maximum average wind velocity are 11 mm and 36 km/h, respectively. The average relative humidity (minimum and maximum) are 32% and 45%, respectively.
Prevalence
A total of 1200 cattle of different sex and age were sampled based on proportional allocation (Thru field, 1995) and examined for the presence of WFI in the study area. Surveillance studies were carried out to record month-wise, sex-wise and age-wise prevalence of the disease. The larvae of warble flies were extracted from the backs of naturally infested cattle and buffaloes according to methods described by Scholl and Barrett (1986) with slight modification. Briefly, 5% solution of $H_2O_2$ was injected into the warble and the larvae were expelled out by the back pressure caused by $H_2O_2$ activity. After washing in saline solution, the larvae were preserved in glycerin alcohol (Anonymous, 1971). Larvae were boiled in 10% potassium hydroxide (KOH) for 1 h to clear the stigma plates of posterior spiracles. The samples were washed with distilled water for 15 min, rinsed in glacial acetic acid for 10 min and stained in acid fuschin. They were dehydrated in ascending grades of ethyl alcohol starting from 30% to absolute alcohol for 5–10 min in each grade, then washed in xylol and cleared in ceder wood oil. The larvae were mounted using Canada balsam and identified (Zumpt, 1965 and Barrett, 1981).

RESULTS
Only one species of *Hypo derma*, i.e. *Hypo derma lineatum* was identified. The average prevalence of warble infestation in cattle was 33.41% in salt range zone of NWFP. The prevalence of WFI in slaughter house was higher versus grazing field areas, males versus females in both the districts. The highest month-wise prevalence was recorded in December and the lowest in July in both the species of animal and districts. No cattle were found infested from March to June in slaughter houses and from February to August in hilly areas. The younger animals were found to have higher WFI compared with older ones $\chi^2$-analysis of the data revealed highly significant association in the month-wise ($P < 0.01$), sex-wise and age-wise ($P < 0.05$) prevalence of WFI in cattle in both the districts. The average number of holes was found to be 13 o 4n the cattle.

Discussion
The results of the present studies, therefore, provide baseline data on epidemiological assessment of the disease in hilly tract zone of NWFP Pakistan. There is a wide variation in the prevalence of WFI among different parts of the world (O’Brien, 1995, Martinez-Moreno et al., 1996, Benakhla and Lonneux, 1999, Frangipane di Regalbono et al., 2003 and Haines et al., 2004) and even within Pakistan (Shah et al., 1981 Ayaz et al. 2007. This variation in the rate of prevalence of WFI in different areas might be due to the differences in the environmental conditions affecting the development of the warble flies (Tarry, 1980). Other determinants affecting the prevalence might include host specificity, breeds, husbandry and the use of insecticides.

The month-wise prevalence is the pattern of the life cycle of warble fly. No prevalence of WFI was recorded from March to June, during which it lays eggs. The lowest prevalence in July/August is due to the fact that first stage larvae may be present in different organs during this period (Benakhla et al., 1999). The highest prevalence in December is because of the appearance of third stage larvae (L3) on the back of the animals during this month that can be easily palpated and the number of detectable infested animals is increased (Abdul-Hak, 1973, Reina et al., 1996 and Rasulov et al., 2004). The higher prevalence of WFI in males than females could be attributed to: (i) the physiological differences between the two genders or (ii) the management practices in the area. The females are grazed in the study area and the males are kept tied. Hence, males are more prone to infestation than females which can run away from the attacking flies (Scholl and Weintraub, 1988 and Khan et al., 1997). The higher prevalence of WFI in young animals could be due to their softer skin, which facilitates the penetration of first instars of *Hypo derma* as reported earlier (Minar and Brevev, 1983, Scholl et al., 1989 and Minar, 1995).
Table-1: Warble Fly Infestation in cattle in salt range zone of NWFP

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of district</th>
<th>No. of villages</th>
<th>No. of Animals</th>
<th>Infested Animals</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Kohat</td>
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<td>600</td>
<td>198</td>
<td>33</td>
</tr>
<tr>
<td>2.</td>
<td>Karak</td>
<td>6</td>
<td>600</td>
<td>203</td>
<td>33.34</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>12</td>
<td>1200</td>
<td>401</td>
<td>33.41</td>
</tr>
</tbody>
</table>

Table-2a: Warble fly maggots in cattle in Karak district.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Village</th>
<th>No of Animals</th>
<th>Infested Animals</th>
<th>No of Larvae</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sabir abad</td>
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<td>18</td>
<td>8</td>
<td>36</td>
</tr>
<tr>
<td>2</td>
<td>Ghar kala</td>
<td>125</td>
<td>41</td>
<td>11</td>
<td>33</td>
</tr>
<tr>
<td>3</td>
<td>Jatta Ismail khel</td>
<td>150</td>
<td>44</td>
<td>4</td>
<td>29</td>
</tr>
<tr>
<td>4</td>
<td>Faqir abad</td>
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<td>23</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>Rehmat abad</td>
<td>150</td>
<td>51</td>
<td>9</td>
<td>34</td>
</tr>
<tr>
<td>6</td>
<td>Andi Karak</td>
<td>50</td>
<td>21</td>
<td>13</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>600</td>
<td>198</td>
<td>-</td>
<td>33</td>
</tr>
</tbody>
</table>

Table-2b: Warble fly infestation in cattle in Kohat district.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Village</th>
<th>No of Animals</th>
<th>Infested Animals</th>
<th>No of Larvae</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>12</td>
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<td>8</td>
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<tr>
<td></td>
<td>Total</td>
<td>600</td>
<td>203</td>
<td>-</td>
<td>33.34</td>
</tr>
</tbody>
</table>

REFERENCES


Zumpt, P., 1965. Myiasis