Occurrence of phthirapteran ectoparasite parasitizing on domestic dogs, Canis familiaris (Linne) in Jaunpur district (U.P.)

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INTRODUCTION

Phthiraptera is a group of economically important insects infesting birds and mammals. They spent their entire life span on the body of their host. They do not only affect the vitality and productivity of their hosts but are also responsible for reservoir and transmitting infectious agents among them. Askew (1971) and Marshall (1981) have excellently reviewed the work done on Phthiraptera while discussing about ecology of ectoparasitic insects.

The phthirapterans occurring on dogs have not been studied intensely in different areas of world. Some workers casually mentioned the prevalence of dog lice. Bedford (1932) and Ewing (1936) did some taxonomical contribution on trichodectidae family. Crystal (1949) made a futile attempt to provide description relating to life history stages of Trichodectes canis, a dog louse. Amin and Madbouley (1973), while reporting the distribution and seasonal dynamics of a dog tick and a dog fly, made certain observations related to H. spiniger. He has simply recorded the incidence of infestation by H. spiniger on dogs on Nile Valley and Delta of Egypt. Bouvier (1945) and Agarwal et al. (1982) have studied the feeding habits of T. canis and H. spiniger, respectively. Goel et al. (1990) have noted the incidence rate of H. spiniger and T. canis in Dehradun. A number of workers have studied the prevalence rate of ectoparasites infesting dogs but generally on fleas, ticks and mites. They casually reported the incidence rate, seasonal and distribution of dog lice along with other ectoparasites (Hewitt et al., 1971; Iwuala and Okpala, 1978; Gonzalez et al., 2004, 2007; Badr et al., 2005; Durden et al., 2005; Nithikathkul et al., 2005; Beck et al., 2006; Aldemir, 2007; Nuchjangreed and Somprasong, 2007; Agbolado et al., 2008; Chee et al., 2008; Gracia et al., 2008; Changbunjong et al., 2009; Xhaxhiu et al., 2009; Bahrami and Delpisheh, 2010; Beaucour, 2001; Bermudez and Miranda, 2011; Kumsa and Mekonnen, 2011 and Jamshidi et al., 2012). Except these, the literature relating to phthirapteran ectoparasites of dog is entirely lacking particularly in this area. Keeping in view, the veterinary importance of these creatures and also the lacunae in the field an attempt was being made to study on the prevalence of phthirapteran ectoparasites occurring on dogs of some selected areas of district Jaunpur. This is the first hand report on the prevalence of dog lice in this area.

MATERIALS AND METHODS

All the results obtained during the survey of dogs are based on field observations. The live dogs (whether infested with lice or not) were subjected to critical examination by naked eye as well as with the help of hand lens which often proved fruitful in the presence of sufficient light. In order to record the phthirapteran species, the entire body of dogs was arbitrarily divided into 10 regions (i.e. head, neck, shoulders, back, belly, fore-arm, vulva, back-arm, tail and anus). The number of
lice in every region was recorded by five-point system used by Crauford-Benson (1941) for cattle lice. This system provides an idea about the regional presence of lice. A wad of cotton soaked chloroform was used to rub in the body parts of the host so that the lice can narcotize and fall in the white plastic sheet already underneath the animal. Then a fine comb was used to collect the entire lice from the body parts of the host. Chloroform evaporated very soon from the body of host and the lice were collected causing without harm to dogs. The collected lice were preserved in 90% alcohol and classified them into species-wise, sex-wise and stage-wise in the laboratory.

**RESULTS**

Two hundred and forty five (245) dogs from street as well as homes were examined in twelve different localities of Jaunpur district during January 2009 to December 2010, to record the incidence of different phthirapteran infestation. Only two dog lice species viz. Heterodoxus spiniger Enderlein and Trichodectes canis De Geer, could be noted along with some other ectoparasites (ticks, mites, fleas). Out of the 245 dogs examined in twelve different localities of Jaunpur district, 106 have been found infested with H. spiniger (43.27% incidence of infestation). This species has been recorded from all the localities of Jaunpur district (Table 1). On the other hand, T. canis could be recorded from only 33 (13.47%) of the examined dogs. This species were not recorded in three (Jalalpur, Line Bazaar Jaunpur and Mariahu) localities during the survey. However, few samples of ticks, mites and fleas were found present upon 13 (5.31%) dogs. The collected species of ticks, mites and fleas could not be identified and so discarded from the prevalence. Although, their occurrence were indicated in table along with the phthirapteran species of dogs (Table 1).

Female dogs were found higher infested in comparison to male one as out of 159 female 45.28% were infested with H. spiniger while out of 86 male 39.53% have lice infestation (Fig. 1). Similarly 15.09% female and 10.47% male dogs carried another phthirapteran species T. canis (Fig. 2). The dogs especially of poor hygienic condition were found more prevalent than normal and good one (Figs. 1, 2). Similar results were obtained in health related parameters. Poorly maintained dogs and the street dogs have been found to be more susceptible to phthirapteran infestation in both the cases. T. canis occurs upon the street dogs having very poor skin condition. Hair colour of host was found insignificant as more or less similar prevalence rate of lice has been noted in black, white, brownish red, black & white and spotted dogs (Figs. 1, 2). Dogs above 19 months years old were found infested with 45.28% H. spiniger followed by younger ones (44.34%). More than 57% younger dogs were infested with T. canis followed by older (22.03%) (Figs. 1, 2). Intensity of infestation of lice was recorded by the distribution of lice on the body of host. The entire host body was arbitrarily divided into 10 regions (i.e. head, neck, shoulders, back, belly, fore-arm, vulva, back-arm, tail and anus) and lice species were counted region wise. The dogs especially of poor hygienic condition were found more prevalent than normal and good one (Figs. 1, 2). Similar results were obtained in health related parameters. Poorly maintained dogs and the street dogs have been found to be more susceptible to phthirapteran infestation in both the cases. T. canis occurs upon the street dogs having very poor skin condition. Hair colour of host was found insignificant as more or less similar prevalence rate of lice has been noted in black, white, brownish red, black & white and spotted dogs (Figs. 1, 2). Dogs above 19 months years old were found infested with 45.28% H. spiniger followed by younger ones (44.34%). More than 57% younger dogs were infested with T. canis followed by older (22.03%) (Figs. 1, 2). Intensity of infestation of lice was recorded by the distribution of lice on the body of host. The entire host body was arbitrarily divided into 10 regions (i.e. head, neck, shoulders, back, belly, fore-arm, vulva, back-arm, tail and anus) and lice species were counted region wise. The population of lice collected from each area was assessed by naked eye with the help of a hand lens and a sufficient light source. By experience, it became possible to assess the density of any population in one of five categories (1) very light infestation (VL) – one point; (2) light infestation (L) – two points; (3) moderate infestation (M) – three points; (4) heavy infestation (H) – four points; (5) very heavy infestation (VH) – five points.

Table 1. Locality-wise prevalence rate of dog lice (H. spiniger and T. canis) with some other ectoparasites (ticks, mites etc) from different localities of Jaunpur district.

<table>
<thead>
<tr>
<th>Localities of Jaunpur</th>
<th>Number of dogs examined</th>
<th>Number and percentage of dogs infested with H. spiniger</th>
<th>T. canis</th>
<th>Other ectoparasites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chakkey</td>
<td>31</td>
<td>13 (41.94%)</td>
<td>07 (22.58%)</td>
<td>03 (9.67%)</td>
</tr>
<tr>
<td>Jalalpur</td>
<td>17</td>
<td>08 (47.06%)</td>
<td>-</td>
<td>01 (5.88%)</td>
</tr>
<tr>
<td>Keraket</td>
<td>23</td>
<td>10 (43.48%)</td>
<td>05 (21.74%)</td>
<td>01 (4.35%)</td>
</tr>
<tr>
<td>Line Bazar, Jaunpur</td>
<td>12</td>
<td>05 (41.67%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Matapur</td>
<td>21</td>
<td>09 (42.86%)</td>
<td>02 (9.52%)</td>
<td>01 (4.76%)</td>
</tr>
<tr>
<td>Mariahu</td>
<td>14</td>
<td>05 (35.71%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Shakar Mandi</td>
<td>19</td>
<td>09 (47.37%)</td>
<td>03 (15.79%)</td>
<td>-</td>
</tr>
<tr>
<td>Shahagarj</td>
<td>27</td>
<td>11 (40.74%)</td>
<td>05 (18.52%)</td>
<td>02 (7.41%)</td>
</tr>
<tr>
<td>Thanaagadi</td>
<td>15</td>
<td>06 (40.0%)</td>
<td>03 (20.0%)</td>
<td>01 (6.67%)</td>
</tr>
<tr>
<td>Trilochan Mahadeo</td>
<td>19</td>
<td>10 (52.63%)</td>
<td>02 (10.53%)</td>
<td>01 (5.26%)</td>
</tr>
<tr>
<td>Vazidpur Farm</td>
<td>18</td>
<td>08 (44.44%)</td>
<td>03 (16.67%)</td>
<td>01 (5.56%)</td>
</tr>
<tr>
<td>Zafarabad</td>
<td>29</td>
<td>12 (41.38%)</td>
<td>03 (10.34%)</td>
<td>02 (6.90%)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>245</strong></td>
<td><strong>106 (43.27%)</strong></td>
<td><strong>33 (13.47%)</strong></td>
<td><strong>13 (5.31%)</strong></td>
</tr>
</tbody>
</table>
Most of the dogs carried moderate lice (38%) followed by very light (23%), light (16%), heavy (12%) and very heavy (8%) infestation concerning with *H. spiniger* (Fig. 1). Similar results have been obtained from *T. canis* infestation where moderate infestation was noted 39%, followed by very light (30%), light (18%), heavy (9%) and very heavy (3%) (Fig. 2).

Date regarding the presence and number of eggs observed were not used as these could not be detached from a live dog due to glue with hair and skin of the host. Although, few samples of the lice eggs were collected to confirmation of the collected species. Injured areas of dogs are more prone for *T. canis* as it was collected mostly from wounds. Some *T. canis* were also recorded from head and neck region of the host body.

**DISCUSSION**

Present study is the first hand report on incidence of *phthiratperan* infestation upon the dogs in Jaunpur district (U.P.). Earlier, Amin and Madbouly (1973) have made an attempt to record the incidence of infestation by *H. spiniger* in Nile Valley and Delta of Egypt. In Egypt, Amin and Madbouly (1973) has recorded only 5% infestation by *H. spiniger* whereas in Jaunpur district incidence rate of same was found significantly higher (43.27%). Moreover, Amin and Madbouly (1973) did not record *T. canis* from Egypt. In Jaunpur district *T. canis* was recorded on 13.47% dogs. Goel et al. (1990) could record 19.51% *H. spiniger* and 4.39% *T. canis* from Dehradun. Gonzalez et al. (2004) has also reported *T. canis* along with fleas, mites and ticks. Parameters like host health, hair/skin colour, hygienic condition and age were included for determination impact on prevalence of dog lice. Hair colour of host seems to be insignificant as more or less similar result for prevalence were obtained during present study. Poor health and unhygienic condition were found
most prone for *H. spiniger* and *T. canis*. Most of the workers paid their attention on prevalence of fleas, ticks and mites of dogs and cats and rarely pointed on the phthirapteran species (Hewitt et al., 1971; Iwuala and Okpala, 1978; Schwartz et al., 1983; Mech et al., 1985; Wall and Shearer, 2001; Gonzalez et al., 2004; Durden et al., 2005; Nithikathkul et al., 2005; Beck et al., 2006; Aldemir, 2007; Nuchjangreed and Somprasong, 2007; Torres and Figueredo, 2007; Agbolado et al., 2008; Chee et al., 2008; Gracia et al., 2008; Shourijeh et al., 2008; Changbunjong et al., 2009; Xhaxhiu et al., 2009; Bahrami and Delpisheh, 2010; Kumsa and Mekonnen, 2011; Norhidayu et al., 2012 and Wells et al., 2012). Recently, Jamshidi et al. (2012) noted the prevalence of *T. canis* and *Linognathus setosus* (8.4%) in Tehran. In present studies ticks, mites and fleas was also reported but not included in the prevalence.

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