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CHORIOPTES TEXANUS (HIRST, 1924),
PSOROPTIDAE ON CATTLE IN ISRAEL

by Shoshana ROSEN *, I. YERUHAM ** and A. HADANI **

ABSTRACT: Bovine chorioptic mange, caused by Chorioptes texanus (Hirst, 1924) is reported. Eighty three (80.5%) out of 103 Israeli Friesian herds, surveyed in the years 1983-1987, were found infested. Most of the animals infested were cows while prevalence in female calves and heifers was much lower (81.9%, 12% and 6% of the infested herds respectively). In most cases the lesions were limited to the root of the tail and the escutcheon. Three cases of generalized chorioptic mange were registered in the infested herds. The clinical manifestations are described. The taxonomic characters of C. texanus are described and compared to those of C. bovis found in Israel in sheep and goats.

RÉSUMÉ: La manifestation de la gale chorioptique des bovins, causée par Chorioptes texanus (Hirst, 1924), est rapportée. Sur cent trois établissements laitiers, de la race bovine Israeli-Friensian, examinés dans les années 1983-1987, quatre-vingt trois établissements (80.5%) étaient infestés par la gale chorioptique. La grande majorité des animaux infestés étaient des vaches tandis que la prévalence de cette gale chez les veaux femelles et chez les génisses a été beaucoup plus basse (81.9%, 12% et 6% des établissements infestés respectivement). Dans la plupart des cas les lésions parasitaires ont été limitées à la racine de la queue et dans la région périnéale. Trois cas de gale généralisée on été détectés. Les établissements infestés n'ont pas enregistré de dégâts économiques. Les manifestations cliniques sont décrites ainsi que les caractères taxonomiques de C. texanus, comparés à ceux de C. bovis, isolé souvent des ovins et des caprins en Israël.

INTRODUCTION

Chorioptic mange in domestic and wild ruminants is caused by Chorioptes bovis (Hering, 1845) and Chorioptes texanus (Hirst, 1924). C. bovis (C.b) has a worldwide distribution, infesting cattle, sheep and horses (SWEATMAN, 1957). C. texanus (C.t.) has been described only twice, i.e. in goats in Texas (HIRST, 1924) and in reindeer in Canada (SWEAT­MAN, 1958). In Israel, chorioptic mange has been studied in cattle (YERUHAM, 1981) and the causal agent identified as C.b. Since then numerous field cases were diagnosed in cattle, mites collected and classified. Furthermore, of most the preserved, previously collected mite specimens have been revised and compared to the chorioptic mites.

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collected from sheep and goats. The results are described in the present communication.

**Material and Methods**

Skin scrapings were taken from mange-like lesions in animals in 103 Israeli-Friesian dairy cattle herds in the years 1983-1987 and were examined for the presence of sarcoptiform mites. The samples were examined under a Wild dissecting microscope (× 50). The mites were deposited in lactic acid on a heated plate (35°C) for clarification and then into Berlese for final identification using a phase contrast Wild microscope (× 40). Samples that were found negative for mites in the direct examination were digested (Pritchard, 1982) and re-examined. Measurements were carried out with a micrometric ocular. Specimens collected previously were also revised. The mites were classified and compared to samples of *C. b.* collected from sheep and goats, using the keys of Sweatman (1958) and Fain (1975).

**Results**

Skin scrapings from animals in 83 (80.5 %) herds were found positive for chorioptic mites. In 68 herds (81.9 %) only cows were found infested while in 10 (12 %) and 5 herds (6 %), 10-22 month old female calves and heifers respectively proved positive. In most cases the chorioptic infestation was limited to either side of the root of the tail and to the escutcheon. The lesions were small, well circumscribed, characterized by a squamous-crustous evolution and with dried serous exudate. More extensive chorioptic mange was observed in 2 cows in 2 different poorly managed herds.

In these cases the lesions extended to the perineum and the udder. Generalized chorioptic mange was observed in 2 Israeli-Friesian heifers and a Charollais bull, characterized by a thickened and wrinkled skin devoid of hair.

In general itching and scratching were not as intensive as in cases of bovine psoroptic mange. All the mites isolated in this survey were classified as *Chorioptes texanus* (Hirst, 1924). The differential diagnosis between *C. b.* and *C. t.* is based mainly on the length and form of the setae on the opisthosoma and opisthosomal lobes of the male. Measurements carried out on *C. t.* mites collected in the present survey and compared to those of *C. b.* isolated locally from sheep and goats are summarized in table 1.

It can be seen from table 1 and fig. 1-2 that the lengths of setae 1, 3 and 4 and the spatular seta 2 are typical to each one of these closely related species, permitting differential identification. Setae 1 and 3 are finer and significantly shorter in *C. t.* than in *C. b.* (62.7 μ and 119 μ as compared to 119 μ and 86 μ respectively). Seta 4, located posterolaterally on the opisthosoma, is significantly shorter in *C. t.* than in *C. b.* (17.2 μ and 59.1 μ respectively).

**Table 1**

<table>
<thead>
<tr>
<th>Host</th>
<th>Parasite</th>
<th>No. of setae Length (μm)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cattle</td>
<td><em>Chorioptes texanus</em></td>
<td>Range</td>
<td>Mean (±) **</td>
</tr>
<tr>
<td></td>
<td></td>
<td>42-70</td>
<td>62.7 (± 8)</td>
</tr>
<tr>
<td>Sheep and goats</td>
<td><em>Chorioptes texanus</em></td>
<td>Range</td>
<td>Mean (±) **</td>
</tr>
<tr>
<td></td>
<td></td>
<td>105-210</td>
<td>119 (± 32.6)</td>
</tr>
</tbody>
</table>

* The results refer to 20 males of each species.
** Mean ± standard deviation.
Spatular seta 2 located postero-medially on the opisthosomal lobes were also typical for each species (SWEATMAN, 1958).

Larvae, proto- and deutonymphs and adults of C.t and C.b. didn’t show morphological differences. Similarly no differences could be observed in body length and width as shown in table 2.

**DISCUSSION**

In the present survey 83 (80.5%) out of 103 dairy herds were found infested with chorioptic mange. In most of the cases (81.9%) cows were involved. 10-22 month old female calves were parasitized in 12% of the herds. In a previous survey (YERUHAM, 1981) the parasite was not found in female calves aged less than 18 months. In few

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**TABLE 2**

Measurements of length including opisthosoma and width of males and females of C. texanus and C. bovis * (in μm)

<table>
<thead>
<tr>
<th>Species of mite</th>
<th>Sex of mite</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Length</td>
</tr>
<tr>
<td>Chorioptes texanus</td>
<td>Male</td>
<td>R ** M *** (±)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>R M (±)</td>
</tr>
<tr>
<td>Chorioptes bovis</td>
<td>Male</td>
<td>R M (±)</td>
</tr>
<tr>
<td>(sheep)</td>
<td>Female</td>
<td>R M (±)</td>
</tr>
</tbody>
</table>

* The results refer to 15 specimens of each species.
** Range.
*** Mean ± standard deviation.
cases (6%) heifers were found infested. The extreme rarity of chorioptic mange in male calves might be due to their being removed from the farm at a relatively young age (12-14 months). Chorioptic mange was also diagnosed in a 2 year old Charolais bull, bred on a dairy farm. Chorioptic mange was reported to cause loss in milk production (SCHWARDT, 1949). In both studies carried out in Israel the chorioptic lesions were circumscribed and no economic losses were reported. In general the lesions were limited to the root of the tail and to the escutcheon. In no case were mites found in the area of the fetlock as reported for bovine chorioptic mange elsewhere (SWEATMAN, 1957; GRÜNDER, 1983; LANCASTER and MEISCH, 1986). Only 3 cases of generalized chorioptic mange were diagnosed involving 2 heifers and a Charollais bull.

All the mites collected from the infested animals were identified as *C. texanus*, described previously only twice i.e. from goats in U.S.A. (HIRST, 1924) and from reindeer in Canada (SWEATMAN, 1958).

To the best of our knowledge *C. texanus* has not been reported from cattle nor has it been detected in other parts of the world. It is not known when and how *C. texanus* invaded the country. Sarcoptiform mites collected from bovines in Israel in 1960 and identified as *C. bovis* have been recently re-examined and classified as *C. texanus*. In Israel chorioptic mange occurs in cattle throughout the year and its dissemination is probably enhanced by local herd management and intensive cattle movement.

*C. bovis* has been described in many countries infesting both bovines and ovines (SWEATMAN, 1957; FAIN, 1975; LANCASTER, 1986). This species has been often isolated from sheep and goats in Israel.

As mentioned above, length and form of certain male opisthosomal setae confirm with those described elsewhere (SWEATMAN, 1958), though in our case these setae were shorter both in *C. texanus* and *C. bovis*. Chorioptic mange in dairy cattle is easily controlled by pyrethroids (CAMPBELL and REW, 1986) and amitraz (CURTIS, 1985).

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