Common internal parasites encountered in donkeys in Kiambu District, Kenya

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SUMMARY

In six donkeys examined at postmortem, several species of internal parasites were encountered. Dicotyelidae, Gasterophilus intestinalis, Strongylus vulgaris and S. edentatus were each isolated from 100% of the donkeys. Cysticercus rodentium and Strongylus equinus were isolated from 83% and 67% of the examined donkeys respectively, while Cyathostomum convictum and Trichostrongyloides seraphini were isolated from 50% and Panoloplocephala mammillata, Anoplocephala perfoliata and Cyathostomum convivum were each isolated from 33%. The others were: Habronema muscae, Trichostrongylus axei, Trichostrongylus tenuicolis, Parascaris equorum, Cysticocystis aculeatus, Cysticocystis ultrasectus, Trichostrongylus tenuis and Ceppiius aculeata isolated from 17% each.

INTRODUCTION

The donkey has a world wide distribution and has been regarded as the most common African equine (Epstein, 1984). In Kenya and other parts of the world, the donkey is used either for carrying loads on its back or as a draught animal (Fielding, 1987). For a long time, the health aspects of the donkey have been ignored. Consequently, the disease conditions affecting this animal are not well understood. From literature, it appears that internal parasitism is one of the most important conditions of the donkey (Ngatia and Kuresa, 1991; Kanjaria, Ngatia and Wanjura, 1994; Perara and Pakana, 1990; Eysker and Pakana, 1989).

To facilitate formulation of internal parasitism control, there is a need to identify important internal parasites that affect donkeys in various parts of the world. The purpose of this study was to identify parasites that affect donkeys in Kenya.

MATERIALS AND METHODS

Six donkeys were used in this study. They were purchased from various parts of Kiambu District (Kenya) where donkeys are commonly used. The donkeys included in this investigation had no history of anthelmintic treatment. They were transported to the Department of Veterinary Pathology and Microbiology, University of Nairobi where they were sacrificed and postmortem examinations conducted.

A thorough postmortem examination was conducted on each animal and any lesions noted. In examining the gastrointestinal tract for the presence of parasites, the methods described by Pandey (1980a, 1981); Pandey and Eysker, (1988, 1989); Eysker and Pandey (1989) were followed. Briefly, various portions of the gastrointestinal tract (stomach, duodenum, jejunum, ileum, caecum and colon) were isolated by tying double ligatures followed by sectioning.

The various sections were opened and their contents emptied into separate containers. The mucosa of each segment was carefully examined for parasites and scraped into their respective containers. One fifth of the contents of each container was preserved in 5% formalin and later examined under the microscope for parasites. The helminths were identified following the criteria described by Lichtenfels (1975).

Larvae of the Gasterophilus spp were identified according to the method described by Zumpt (1965). The meconium and faeces were examined for Strongylus vulgaris larvae according to the method of Pandey (1980a). The trachea and bronchi were opened and examined visually for the presence of eggs and larvae of the parasites. The liver was cut in numerous places to examine for parasites.

RESULTS

Table 1 gives the summary of results. For ease of description, the parasites are grouped according to the location they were found. From the stomachs of the donkeys in this study, larvae of the Gasterophilus spp were recovered from all the donkeys (100%). The larvae were identified to belongs to the species G. intestinalis. Helminths of the genera Trichostrongylus axei and Habronema muscae were recovered from the stomachs at the rate of 16.7% each.

Helminths recovered from the small intestines and their isolation rates were: Cysticocystis ultrasectus (16.7%).
Table 1. Internal parasites found in six donkeys, their location and infestation rates

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Location</th>
<th>Infestation rate in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasterophilus intestinalis</td>
<td>Stomach</td>
<td>100%</td>
</tr>
<tr>
<td>Habronema muscae</td>
<td>Stomach</td>
<td>16.7%</td>
</tr>
<tr>
<td>Trechonostrongylus axei</td>
<td>Stomach</td>
<td>16.7%</td>
</tr>
<tr>
<td>Trichodentorhynchus tenuscolis</td>
<td>S. Intestine</td>
<td>16.7%</td>
</tr>
<tr>
<td>Cylicocyclus ultrasectum</td>
<td>S. Intestine</td>
<td>16.7%</td>
</tr>
<tr>
<td>Trichuris tetrarida</td>
<td>S. Intestine</td>
<td>16.7%</td>
</tr>
<tr>
<td>Parascaris equorum</td>
<td>S. Intestine</td>
<td>16.7%</td>
</tr>
<tr>
<td>Cylicocyclus radiatus</td>
<td>S. Intestine</td>
<td>63%</td>
</tr>
<tr>
<td>Cysticola carinatum</td>
<td>S. Intestine</td>
<td>50%</td>
</tr>
<tr>
<td>Pararhadinema maritima</td>
<td>S. Intestine</td>
<td>33%</td>
</tr>
<tr>
<td>Anoplophora perfoliata</td>
<td>S. Intestine</td>
<td>33%</td>
</tr>
<tr>
<td>Strongyulus vulgaris*</td>
<td>L. Intestine</td>
<td>100%</td>
</tr>
<tr>
<td>S. edentatus</td>
<td>L. Intestine</td>
<td>57%</td>
</tr>
<tr>
<td>S. equinus</td>
<td>L. Intestine</td>
<td>30%</td>
</tr>
<tr>
<td>Cystocerca serrata</td>
<td>L. Intestine</td>
<td>33%</td>
</tr>
<tr>
<td>Cysticola corinum</td>
<td>L. Intestine</td>
<td>16.7%</td>
</tr>
<tr>
<td>Cysticola auriculata</td>
<td>L. Intestine</td>
<td>16.7%</td>
</tr>
<tr>
<td>Cristinaconstoma acuticollis</td>
<td>L. Intestine</td>
<td>16.7%</td>
</tr>
<tr>
<td>Dictyocaulus arfieldi</td>
<td>Lungs</td>
<td>100%</td>
</tr>
</tbody>
</table>

Key: * Larvae also found in cranial mesenteric arteries
S: small L. Large; Int. Intestinal

Trichuris tetrarida (16.7%); Trichodentorhynchus tenuscolis (16.7%); and Parascaris equorum (16.7%).

Parasites recovered from both the small and large intestines (jejunum and colon) included: Cylicocyclus radiatus (63%); Cysticola carinatum (50%); Paranoplophora perfoliata (33%) and Anoplophora perfoliata (33%).

From the large intestines, helminths belonged to several genera were isolated as follows; Strongyulus vulgaris (100%); S. equinus (67%); Trechonostrongylus serratius (50%); Cysticola corinum (33%); Cysticola auriculata (16.7%), and Cryptococcus acuticollis (16.7%).

Besides the occurrence of S. vulgaris in the large intestines, their larvae were also found in the cranial mesenteric arteries. Similarly, larvae of Strongyulus spp were also found in the liver.

Long worms of the species Dictyocaulus arfieldi were recovered from the bronch and bronchiolae of all the donkeys. Their larvae were also observed in the tracheo-bronchial froth.

**DISCUSSION**

Results of this study indicate that the donkey is a host to many types of the internal parasites. Lung worm of the species Dictyocaulus arfieldi appear to be a common parasite in the lungs of donkeys. Although it is known to occur in donkeys in other parts of the world (Pasley, 1980b), its occurrence in Kenya has not been reported previously.

The majority of parasites encountered in the donkeys in this study were helminths although larvae of Gasterophilus spp were also seen. Like in horses (Niehler and Colts, 1966; Sohshy, 1982; Jubb and Kennedy, 1970; Blood Hamerson and Radostits, 1989), Gasterophilus larvae were common parasites in the stomach of these donkeys. Their occurrence in donkeys has previously been reported in Kenya (Ngati and Kuria, 1979). Whereas the latter authors found only G. nasalis in the stomachs of donkeys in their study, in the present study, only G. intestinalis was found and only in the stomachs.

The large strongyles (S. vulgaris, S. edentatus and S. equinus), were quite common. However, S. equinus was less commonly isolated than the other species. Kanja et al
(1994) also reported the occurrence of *S. vulgaris* and *S. edentatus*, but not *S. equinus*. However, the prevalence of the first two species were much lower than reported.

The small strongyles were also commonly isolated. In general, they were isolated from all the donkeys but in different combinations and prevalence rates (Table 1). These were recovered mainly from the large intestines although some of them also occurred in the small intestines of some donkeys. This observation is in agreement with those of other authors, who also found heavy infections of donkeys with small strongyles (Karanja et al., 1994; Ngatia and Karin, 1991; Pandey and Eysker, 1990; Eysker and Pandey, 1989).

Although *D. arnfieldi*, *P. axei*, *P. equorum*, *A. perfoliata*, *P. mammillata* and larvae of *G. intestinalis* are known to occur in donkeys in other parts of the world, their occurrence in donkeys in Kenya has not previously been reported in Kenya (Pandey, 1980a, 1981; Anderson and Fogh, 1981; Gothe, 1987; Foster, 1990, De Jesus, 1965; Zhdanova, 1972, Pandey and Eysker, 1981, 1990, and Soulsby, 1982).

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