Onchocerca gutturosa (Neumann, 1910) in sudanese cattle

I. The microfilariæ

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RÉSUMÉ

Onchocerca gutturosa (Neumann, 1910) chez des bovins soudanais I. Les microfilaires

La répartition des microfilaires d'Onchocerca gutturosa chez des bovins soudanais est différente de celle observée chez les bovins européens.

On les trouve au milieu du dos et plus particulièrement sur la bosse. Elles sont absentes des oreilles et de la région ombilicale. Le taux d'infestation d'O. gutturosa dans un troupeau constitué d'animaux de tous âges a été determiné ante mortem comme étant de 27 p. 100. Ce taux augmente nettement avec l'âge.

INTRODUCTION

Onchocerca gutturosa is known from many parts of the world including some countries on the African continent neighbouring the Sudan (6); Ethiopia (1); Chad (7); Central african Empire (8); Uganda (2). The first published record of O. gutturosa in the Sudan was made by MOHAMED in 1931 (11). HUSSEIN et al. (9) studied the prevalence of O. gutturosa in slaughtered animals and found adult worms in 170/248 animals examined.

No precise information is as yet available regarding the skin distribution of the microfilariae in zebu cattle in Africa although HUS-SEIN et al. (9) found microfilariae in the ears and udders; however the assumption made by the latter authors that the pattern is similar to that seen in European cattle has not been supported by sampling of other areas of the body.

The purpose of this paper is to report the detailed skin distribution of the microfilariae as well as the prevalence of infection in a herd in the Khartoum area.

MATERIALS AND METHODS

Ten complete hides were obtained from the local slaughter house. It was ascertained that hides were complete including the skin of the head, ears, tail and limbs. The hides were sampled in accordance with our previous method (4, 5) and the sampling sites were shown in figure 1; in every case the samples taken are of the same surface area (approximately 50 mm²) and numbered from 100 to 200 samples.

Samples of microfilariae were fixed and stained in a solution containing 0.05 p. 100 methylene blue in 2 p. 100 formalin.

Nuchal ligaments containing worms were obtained from the slaughter house; fragments of female worms were removed to normal saline and microfilariae released by teasing the uteri of

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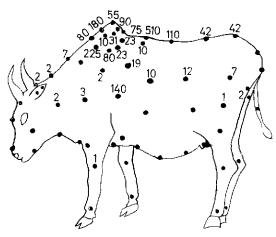


Fig. 1. — Distribution of *Onchocerca gutturosa* microfilariae in the hides of Sudanese zebu cattle. Dots represent areas sampled.

the worms. The microfilariae were processed in a manner similar to that employed for skin microfilariae.

Skin snips of variable size were taken from 60 heads of cattle from the University Farm with the aid of a sharp scalpel. The snips were taken from the apex of the hump. All the animals from which snips were taken were born in the University Farm and had never left it; all, but three, were female. These snips were shaved, cut in small pieces and allowed to stand in warm saline for 3 hours at least following which the saline was examined for the presence of microfilariae.

RESULTS

Of the 10 hides examined, 3 liberated no microfilariae. Of the remaining 7 positive hides, 1 released microfilariae of O. armillata only, 3 had both O. armillata and O. gutturosa and 3 hides had O. gutturosa microfilariae only. In all positive hides microfilariae of O. gutturosa occurred in largest densities in the midline of the hump and immediately behind it. They also occurred in moderate numbers along the midline of the back up to the cervical and down to the sacral regions as well as in the area immediately lateral to the hump. Figure 1 is representative of the picture in the positive hides.

Table I shows the length of *O. gutturosa* microfilariae from both skin and uteri. The width of the microfilaria varied between 4 and 6.5 µm.

Table 1. Length of microfilariae of O. gutturosa in µm

	Length	range	Number measured
Skin microfilariae	257	206-280	70
Uterine microfilariae	232	208-256	70

Out of the 60 animals examined at the University Farm 16 had microfilariae of O. gutturosa in the skin snips taken from the hump (table II). The positive animals were all more than 7 years of age and the prevalence seemed to increase with age: the 4 oldest cows in the sample (18, 19, 20 and 22 years of age) were all positive. The 3 youngest calves examined (less than 1 year of age) were all male and were negative.

Table 2. The prevalence of O. gutturosa in University Farm dairy cattle.

Age-group	N° of positive animals		
in years	total N° examined		
< 1	0/3		
1 - 2	0/8		
3 - 6	0/17		
7 -10	4/10		
10	12/19		
	1		

1re colonne, dernière ligne, lire : > 10.

DISCUSSION

The data reported in this paper confirms the occurrence of *O. gutturosa* in indigenous zebu in the Sudan. 16 of the 60 University Farm animals examined alive had patent infections (26.6 p. 100); all these animals were born and reared in the Farm with no history of ever leaving Khartoum. The prevalence rate obtained is probably less than the actual rate since it is possible that some negative animals may have had prepatent or postpatent infections.

None of the animals less than 7 years old yielded any microfilariae while prevalence in animals over 7 years of age was 50 p. 100; this higher rate in old animals is probably a result of the longer exposure to the bites of infective intermediate hosts.

HUSSEIN et al. (9) reported a prevalence rate of 68.5 p. 100, a figure based on finding of adult

worms in slaughtered animals. The discrepancy between the prevalence rate reported here and that of the latter authors may be because they were detecting at least some of the prepatent and postpatent infections as well as patent ones. HUSSEIN et al. stated neither the age of the slaughtered animals nor the locality in which they originated and, since there is no published information concerning prevalence rates in different parts of the country, it would not be possible to rule out rates of occurrence in other parts of the country being higher than in the Khartoum area.

Microfilariae of O. gutturosa recovered from both skin and uteri of worms in this study were slightly longer than previously reported. The figures obtained here are 206-280 µm and 208-256 um for skin and uterine microfilariae respectively. EICHLER (1) found that microfilariae of O. gutturosa of English cattle measured 175 to 240 µm long for umbilical skin forms and 180 to 275 µm for uterine forms. MELLOR (10) working in England reported that the length of skin microfilariae of O. gutturosa ranged from 182 to 218 µm. The uterine microfilariae in this study had the same length as those reported by EICHLER (3) but the skin forms are somewhat longer although the lower limit of the range well fits into that reported by EICHLER (3).

The most interesting finding in this study is the pattern of skin-distribution of the microfilariae

which contrasts sharply with the distribution reported for English and European cattle (3). The microfilariae were found in the upper part of the body and the hump (fig. 1). None were found in the umbilical region and only an occasional microfilaria in the ears. This is in disagreement with the work of HUSSEIN et al. (9) who reported a pattern in sudanese cattle similar to that in european animals. However, these latter authors did not sample entire hides and examined only ears, scrotums and udders. This difference in the spatial distribution of microfilariae between temperate European and tropical zebu cattle is difficult to explain at the present time. It probably reflects differences in the feeding behaviour and may be even the identity of the vectors in the two regions. The vector of O. gutturosa in England and Europe is Simulium ornatum but no information is as yet available about the vector in the Sudan or in neighbouring African countries. Until more information about the vector(s) and their biting behaviour is available speculation would not be justified.

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SUMMARY

Onchocerca gutturosa (Neumann, 1910) in Sudanese cattle I. The Microfilariae

The skin distribution of microfilariae of *Onchocerca gutturosa* in Sudanese cattle is different from that reported from European cattle. Microfilariae are found in the midline of the back, the highest densities being in the region of the hump. Microfilariae did not occur in the ears or umbilical region.

The prevalence rate of O. gutturosa in a Khartoum herd containing all agegroups was determined antemortem and found to be 27 p. 100; prevalence distinctly increased with age.

RESUMEN

Onchocerca gutturosa (Neumann, 1910) en los bovinos sudaneses

La repartición de las microfilarias de *Onchocerca gutturosa* en bovinos sudaneses es diferente de la observada en los bovinos európeos. Se encuentran en medio de la espalda y más particularmente en la giba. No ocurren en las orejas y en la region umbilical.

Se determinó ante mortem la tasa de infestación de *O. gutturosa* en un rebaño constituido por animales de todas edades ; fué de 27 p. 100. Dicha tasa aumenta mucho con la edad.

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