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SOME STUDIES ON LICE INFESTING GOATS IN BENI-SUEF, MIDDLE EGYPT

(With 3 Tables & 2 Figs.)

By

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بعض الدراسات عن قمل الماعز في بنى سويف ـ مصر الوسطى

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أجريت هذه الدراسة فى بنى سويف فى الفترة من مايو عام ١٩٨٦م حتى أبريل عام ١٩٨٧م وتم فحص عدد ٨٨٣ حيوان من الماعز وقد بلغت نسبة الإصابة تبلغ ١٢٫٣٪ ، وأن درجة الإصابة تختلف من درجة بسيطة ، ومتوسطة وعالية وكانت النسب تبلغ ٣٨٫٧٪ و٤١٫٨٪ و١٩٫٥٪ على التوالى من أعداد الحيوانات المصابة · وكانت نسبة الإصابة أعلاها خلال فصل الخريف · كما تبين من تشخيص العينات التى تم جمعها وجد أن كلها تتبع نوعين أحدهما من النوع الماص (لينوجنس أفريكانس) والآخر نوع قارض (بيفركولا كابرى) · تم دراسة مقاسات الجسم المختلفة ورسم العينات بالإضافة إلى تصويرها فوتوجرافياً · وبدراسة تأثير عقار الأيفوماك على أطوار هذه الأنواع من القمل وجد أن له تأثير مجدى عليها وخصوصاً أنه يستمر وجوده داخل الدم حتى فقس البويضات ليقتل اليرقات التى تنتج منها ·

SUMMARY

The results of the present study revealed that 12.3% of the examined goats in Beni-Suef region harboured lice. Among the infested animals, it was reported that, 41.8%, 38.7% & 19.5% were considered as moderate, light and heavy degrees of infestation respectively. According to the keys supplied it was found that the sucking lice (Linoganthus africanus) was more predominating than the biting one (Bovicola caprae) which was detected. It was observed also that the hieghest degree of infestation was in Autumn. The morphological characters of the present species were reported, as well as control of these species by ivomec injection was tried.

INTRODUCTION

Lice have been known to be injurious insects to man, animals and birds on account of the direct irritation they cause to their host, feeding its blood, epidermal

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scales, scabs, wool-wax feather-fibers beside being vector transmittors of some diseases. KELLOGG and PAINE (1911) were the first to describe Trichodectes climax from goats in South Nigeria, also FERRIS (1916) and UNDERHILL (1924) mentioned that goats harboured one suctorial species, Linoganthus stenopsis and a biting louse Trichodectes climax. PARISH and RUDE (1945) stated that goats in U.S.A. were commonly infested with Trichodectes hermsi; T.caprae and Linoganthus stenopsis. In India, CAMERON (1951) and MEHROTRA and SINGH (1978) reported that goats were infested by Linoganthus stenopsis L.africanus, Haematopinus spp., Bovicola Climax and Trichodectes limbatus and they stated that the maximum rate of infestation with the different species during Winter and followed by that in Spring. While in Philippine, TONGSON, et al. (1981) mentioned that goats were infested with Bovicola limbata and Linoganthus africanus.

In Egypt several authors who recorded that goats were infested by both sucking & biting lice among them, SAID (1957) observed Linoganthus stenopsis and Bovicola caprae infest goats at Wadi El-Natroun, while SAID and ATIF (1961) in their work did not find any louse on the examined goats at Shebin El-Kanatir District. Also, SALIT (1977) mentioned that goats were infested with L.stenopsis as well as MUNIBARI (1984) and ABDEL-GAWAD, et al. (1989) recorded that goats were infested with Linoganthus africans; L.stenopsis and Bovicola caprae. They reported that Winter was the most suitable season for propagation.

Concerning the morphology of the lice infesting goats, KELLOGG and PAINE (1911) were the first to describe Linoganthus africanus and it was followed by several authors as WERNECK (1936), FERRIS (1951), Derhalli (1977), TUFF (1977), MUNIBARI (1984) and BENITEZ-RODRIGUEZ, et al. (1985) who gave some descriptions for some sucking and biting species infesting goats.

Concerning the control of goat lice, there were several authors who tried to use some insecticides as BABCOCK (1944) used 0.2% D D T and BAKER (1969) who used chlorinated hydrocarbon & organic phosphorus insecticides as well as CHAMBERLAIN and HOPKINS (1971) who used 3 spray applications of 0.1% of synthetic juvenile hormones of insects at 2 weeks intervals. Moreover, BENZ (1985) stated that Ivermectin at a dose of 1 ml/50 Kg./B.W. was completely effective against cattle lice.

MATERIAL and METHODS

Eight hundred and eighty three goats were examined in Beni-Suef district during the period between May, 1986 and April, 1987. The lice were collected from infested animals according to BRAM (1978): 5 of one square inch areas on neck, shoulders, back and hip were examined ~~and examined~~ and estimated for the degree of infestation, where 1-5 living lice detected in the examined area were considered light; 5-20 moderate and over 20 years considered as heavily infested.

The specimens collected were prepared according to the method described by RICARDO-PALMA (1978) and identified according to the keys of KIM and LUDWING (1978) for sucking lice and SOLER - CRUZ, et al. (1987) for biting ones.

The specimens were drawn by using camera lucida; measured with micrometeric scale and microphotographed.

For control, 6 animals were chosen (3 infested by Linoganthus africanus as a 1st group and 3 with Bovicola caprae as a 2nd group). Two animals from each group were injected by Ivomec (Ivermectin/MSD) at a dose of 1 ml/50 Kg. B.W. S/C in the neck region. The 3rd animal of each group was left untreated.

RESULTS

The results of this study as shown in table (1) revealed that 109 goats out of 883 examined were found to be lice infested (12.3%). It was found that 38.7% of the infested animals harboured light degree of infestation, while there were 41.8% moderatly & 19.5% heavily infested.

Concerning the lice species, according to the keys used, the results revealed that, 86.7% of infested animals harboured sucking lice which were identified as Linogathus africanus (KELLOGG and PAINE, 1911) and 13.4% harboured biting lice which were identified as Bovicola caprae (GURLT' 1848).

Concerning the seasonal prevalence, it was observed from the same table that Autumn was more favourable where 16.7% of the examined goats were infested, among them 73.3% by L.africanus and 26.7% by B.caprae. It was followed by Summer where the infestation percentage reached 16.0% from the examined animals, of which 95% & 5% were L.africanus and B.caprae respectively. In Winter, it was observed that 11.5% of the examined goats were lice infested, of which 78.3% by L.africanus and 21.7% by B.caprae. Also the study showed that the percentage of infestation reached 6.5% and all the lice collected were identified as L.africanus during Spring.

Concerning the degree of infestation, the results showed that the heavy infestation reached its maximum (30.5%) in Winter, and it was followed by Summer, Spring & Autumn where the rates of infestation degrees reached 25%, 12.5% & 10% respectively. While the moderate degree of infestation reached its maximum during Spring (68.7%) and it was followed by that of Summer, Autumn and Winter. While the rates reached 50%; 26.7% & 21.7% from the totally infested animals respectively. The light degree of infestation reached its maximum at Autumn (63.3%) and its minimum (18.8%) at Spring season.

Concerning the morphology of the species collected it was found that the total length of Linoganthus africanus male table (2) (Fig. 1-a & 2-a) reached 1.67

mm and 0.61 mm in its body width. The head was found longer than broad where its length reached 0.36 mm and the width reached 0.22 mm. The postantennal region bulged with well chitinized margins. The antannae composed of 5 segments and reached 0.29 mm in the length. The thorax appeared more or less squarish and its measurments reached 0.24 x 0.31 mm while the respiratory spiracles reached 7 pairs; the first pair was found onthe meso-thoracic segment dorsally located and 6 pairs were found on the abdominal segments. The first pair of legs of L.africanus was the smaller and reached 0.37 mm in the length. The abdomin reached 1.05 mm in its length and 0.63 mm in its width. The length of basal apodema reached 0.30 mm and that of parameters was 0.26 mm. The Females of Linoganthus africanus as shown in Table (2) and Figs. (1-b & 2-b) were a little larger in measurments than that of males. The width of gonopods reached 0.14 mm and the width between gonopods reached 0.26 mm.

Concerning the measurements of Bovicola capare, it was found from Table (2) and Figs. (1-c & 2-c) that the body length of male reached 1.19 mm and its width 0.65 mm. The head was broader than long and its length and width reached 0.37 & 0.44 mm respectively. The antennal length reached 0.32 mm and the throax measured 0.32 mm in both its length & width. The respiratory spiracles reached 7 pairs and the first one was located on the meso-thoracic segment venterally and its diameter reached 0.01 mm. The length of legs ranged between 0.35-0.47 mm, while the abdomen reached 0.98 mm in its length and 0.65 mm in its width. The length of basal apodema reached 0.31 mm and the length of parameters reached 0.29 mm. The female of Bovicola caprae as shown in Table (1) and Figs. (1-d & 2-d) had the same measurments with some variations, and the width of gonopoda reached 0.12 mm with a distance between genopods reached 0.22 mm.

The results of control by Ivomec as shown in Table (3) revealed that the number of different stages on the animals injected by the drug decreased and some of the insects were found dried and attached to the skin of the treated animals. It was conculuded that the sucking lice (L.africanus) completely disappeared 4 weeks post-treatment and the biting ones (B.caprae) 3 weeks post treatment.

DISCUSSION

The results of this study revealed that 12.3% of the examined goats were infested by light, moderate and heavy degrees. Identification of the collected specimens, showed that the sucking type belong Linoganthus africanus (KELLOGY and PAINE, 1911) and the biting type diagnosed as Bovicola caprae (GURLT, 1848). The obtained results agreed with those observed by UNDERHILL (1924), SAID (1957), ANDREWS (1973), MEHROTRA and SINGH (1978), TONGSON, et al. (1981), MUNIBARI (1984) and ABDEL-GAWAD, et al. (1989) who recorded that goats in Egypt infested by the above mentioned two species and very rarely they found Linoganthus stenopsis.

Concerning the seasonal prevalence, it was observed that Autumn was the most suitable time, where 16.7% of the examined goats were infested, and it was followed by that examined during Summer, Winter and Spring where the percentages of infestation reached 16%, 11.5% & 6.5% respectively. Also this study showed that the sucking lice, Linoganthus africanus, was the most predominant. The obtained results are in agreement with those obtained by MUNIBARI (1984) and ABDEL-GAWAD, et al. (1989) who reported that the sucking lice Linoganthus africanus predominated the other species. Also they observed that Winter was the most suitable for lice infestation. This difference in seasonal time may be due to that these authors worked in Delta, Cairo and Giza areas where the climatic conditions during Winter equal that of middle Egypt (Beni-Suef) during Autumn season.

Morphologically, the obtained measurements and descriptions are in agreement with those of DERHALLI (1977), TONGSON, et al. (1981) and MUNIBARI (1984) for Linoganthus africanus, and with those of MUNIBARI (1984) and BENITEZ RODRIGUEZ, et al. (1985) for Bovicola caprae.

The results of control by Ivomec revealed that the sucking and biting lice were killed within 4 & 3 weeks respectively. Therefore the Ivomec is suitable also for lice control, while it was observed that it had no effect on the eggs, while the larva dies after hatching and when sucked blood because of the long acting effect of the drug. The obtained results are in agreement with those obtained by BABCOCK (1944), BAKER (1969) and CHAMBERLAIN and HOPKINS (1971) who used different insecticides, and with BENZ (1985) who used Ivomec for control of cattle lice.

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Table (1)
Seasonal incidence of Sucking lice (Linoganthus africanus) and biting lice (Bovicola caprae) with the degrees of infestation in Beni-Suef area

Seasons (no.of examined)	% of infestation	% of degrees of infestation			Species observed	
		Light *	Moderate **	Heavy ***	L. africanus	B. caprae
Summer (250)	40 (16%)	25	50	25	38 (95 %)	2 (5%)
Autumn (180)	30(16.7%)	63.3	26.7	10	22(73.3%)	8(26.7%)
Winter (205)	23(11.5%)	47.8	21.7	30.5	18(78.3%)	5 (21.7%)
Spring (248)	16(6.5%)	18.8	68.7	12.5	16(100%)	-
Total (883)	109(12.3%)	38.7	41.8	19.5	94(86.7%)	15(13.4%)

* The number of lice in an area of one square inch was 1-5
** The number of lice in an area of one square inch was 5-20
*** The number of lice in an area of one square inch was over 20

Table (2)

Measurments of males & females of Linoganthus africanus and Bovicola caprae

Item \ Species	Linoganthus africanus		Bovicola caprae	
	Male	Female	Male	Female
Total body length	1.63 - 1.82 (1.67)	1.82-2.20 (1.99)	1.66-2.50 (1.91)	1.68-1.76 (1.72)
,, ,, width	0.52 - 0.70 (0.61)	0.52-0.91 (0.65)	0.60-0.71 (0.65)	0.68-0.72 (1.72)
Head length	0.31 - 0.39 (0.36)	0.38-0.42 (0.40)	0.31-0.42 (0.37)	0.33-0.39 (0.36)
,, width	0.12 - 0.26 (0.22)	0.18-0.22 (0.20)	0.40-0.49 (0.44)	0.41-0.44 (0.43)
Antennal length	0.26 - 0.33 (0.29)	0.25-0.26 (0.25)	0.29-0.35 (0.32)	0.25-0.29 (0.27)
Thorax length	0.20 - 0.26 (0.24)	0.26-0.33 (0.30)	0.26-0.36 (0.32)	0.18-0.29 (0.24)
,, width	0.26 - 0.33 (0.31)	0.25-0.33 (0.30)	0.30-0.33 (0.32)	0.17-0.21 (0.19)
Diameter of spirade	0.02 - 0.04 (0.03)	0.02-0.03 (0.02)	0.01-0 02 (0.01)	0.01-0.02 (0.02)
Length of fore leg.	0.23 - 0.52 (0.37)	0.39-0.52 (0.44)	0.33-0.38 (0.35)	0.33-0.39 (0.37)
,, ,, mid leg	0.39 - 0.66 (0.50)	0.44-0.60 (0.52)	0.37-0.52 (0.44)	0.40-0.52 (0.46)
,, ,, hind leg	0.23 - 0.66 (0.43)	0.50-0.65 (0.60)	0.43-0.49 (0.47)	0.41-0.51 (0.46)
Abdomenal length	0.91 - 1.30 (1.05)	1.32-1.51 (1.40)	0.92-1.04 (0.98)	1.18-1.29 (1.21)
,, width	0.55 - 0.70 (0.63)	0.80-0.95 (0.86)	0.60-0.71 (0.65)	0.68-0.72 (0.69)
Length of basal apodema.	0.26 - 0.33 (0.30)	—	0.26-0.39 (0.31)	—
Length of parameters.	0.22 - 0.30 (0.26)	—	0.52-0.30 (0.29)	—
Width of gonopeda	—	0.12-0.15 (0.14)	—	0.12-0.13 (0.12)
,, between gonopods.	—	0.12-0.30 (0.26)	—	0.20-0.25 (0.22)

These measurments are the range and the mean of 5 individuals of each species & sex.

Table (3)
The effect of Ivomec (Ivermectin / MSD)
on lice infesting goats in Beni-Suef area

animals \ Periods (weeks)		The number of lice/ 1^2inch before treatment	The number of lice / 1 square inch after treatment (weeks)				
			1 st	2nd	3 rd	4 th	5 th
Infestation by sucking (Linognathus africanus)	Treated (2)	15 - 20	6 - 8	5 - 9	4 - 5	2	—
	non-treated (1)	15 - 18	16-20	14-19	11-16	16-17	18-20
Infestation by biting (Bovicola caprae)	Treated (2)	8 - 11	3 - 6	2 - 3	1	—	—
	non-treated (1)	10 - 13	12-16	12-15	16-20	18-19	17-20

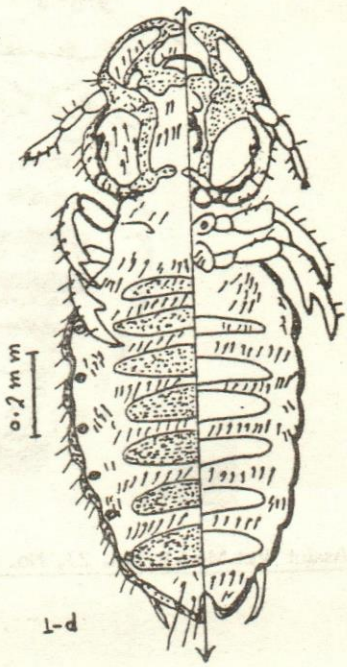

Fig. (1-a): B.africanus male
Fig. (1-b): L.africanus female
Fig. (1-c): B.caprae male
Fig. (1-d): B.caprae female

Fig. (2-a): L.africanus male
Fig. (2-b): L.africanus female

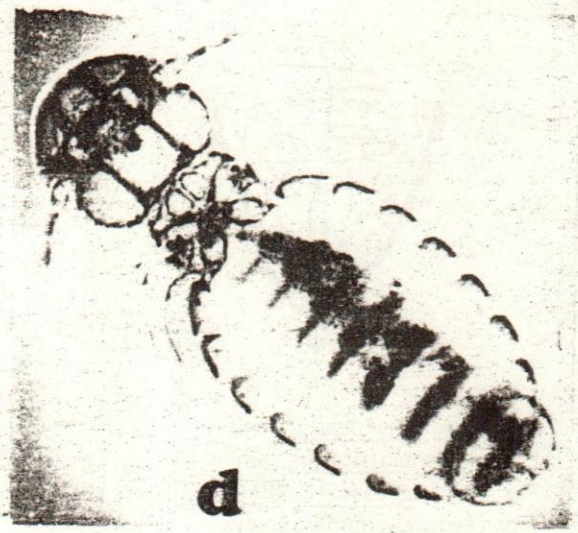

Fig. (2-c): B.caprae male
Fig. (2-d): B.caprae female