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SHORT COMMUNICATION

THE CROPTEETH AND SPINES OF THE CROP OF *LIPEURUS LAWRENSIS TROPICALIS* PETERS (PHTHIRAPTERA : ISCHNOCERA)

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In the crop of bird lice, both Ischnoceran and Amblyceran, sclerotised structures known as cropteeth are present of which the shape, size and arrangement vary considerably. Consequently, the cropteeth have been suggested to have some taxonomic value. In the present paper the cropteeth of the Ischnoceran *Lipeurus lawrensis tropicalis* have been described.

The lice were obtained directly from the poultry birds and also from a culture maintained in the laboratory according to Arora and Chopra (1957). For studying the cropteeth, the crop was removed, stained in acid fuchsin, teased on the slide at the clove oil stage and mounted in canada balsam.

The crop of *L. l. tropicalis* is pear-shaped, being broadest anteriorly, at the oesophageal end. It is transparent when empty and opaque when it contains pieces of barbs and barbules. An antero-dorsal area, 200—275 m μ long and 20-70 m μ wide, bears 15-17 rows of internal cropteeth (Figs. 1 and 2), the individual rows being slightly curved. The teeth in each row either form a continuous row or are interrupted by gaps into 2-3 groups. Those in the more anterior rows are greater in number and tend to be smaller in size in comparison to the more posterior rows (Table 1). Even in the same row there is variation in their size from 4-10 m μ in length and 1.5—3.5 m μ in basal width. Each tooth is conical, attached by its broad base to the wall of the crop, with its apex pointing posteriorly. They are longer than the cropteeth of *L. caponis* which too is ectoparasitic on the chicken. In the latter, Waterhouse (1953) found their, maximum length to be 7 m μ.

Table I. *Showing the number of cropteeth in each row*

Number of rows	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
Number of crop teeth	8—14	7—13	8—17	8—17	8—14	8—14	8—17	8—14	8—13
Number of rows	10th	11th	12th	13th	14th	15th	16th	17th	..
Number of crop teeth	7—12	6—11	6—11	6—11	6—9	4—8	3—8	2—7	..

Scattered around the cropteeth are numerous minute teeth, 1.5—4.0 m μ long and 1—2.5 m μ wide at the base. In addition to these, the entire inner wall bears fine spines, 3.5—5 m μ long and 0.35—0.7 m μ wide, arranged lengthwise,

The cropteeth of *L. l. tropicalis* are better organised than those of *Goniodes bicuspidatus* described by Waterston (1926), *Philopterus ocellatus*, *Ornithobius* sp. described by Blagoveshchenskii (1949) and of *L. caponis* and *Columbicola columbae* studied by Waterhouse (1953).

The manner in which the cropteeth operate was studied in fully hardened as well as teneral specimens, in the former after removing the tergites under Stereozoom binocular and in the latter directly with strong incident illumination.

The barbs and barbules are cut by the mandibles into pieces of uniform size and the latter stored length-wise in the crop. Waves of anti-peristalsis starting at the posterior end of the crop, followed by peristalsis in the opposite direction, cause these pieces to strike against the rows of cropteeth so that their mechanical trituration occurs. The smaller teeth and the spines probably give purchase to the crop contents.

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REFERENCES

ARORA, G. L. AND CHOPRA, N. P. 1957. Some observations on the biology of *Lipeurus tropicalis* Peters. *Res. Bull. Punjab Univ.* **130,** 485-491.

BLAGOVESHCHENSKII, D. I. 1949. Structure of digestive system of Mallophaga in connection with their nutrition. *Parasitol. Sborn. Zool. Inst. Acad. U.S.S.R.* Leningrad. **11,** 229-252.

WATERHOUSE, D. F. 1953. Studies on the digestion of wool by insects IX. Some features of digestion in chewing lice (Mallophaga). *Aust. J. Biol. Sci.* **6,** 257-275.

WATERSTON, J. 1926. On the crop content of certain Maliophaga. *Proc. Zool. Soc. Lond.* **96,** 1017-1020.

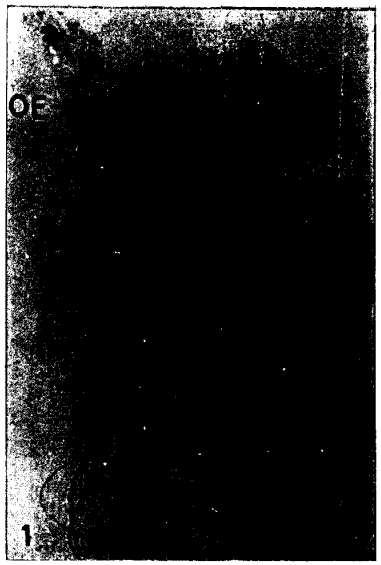

Fig. 1. Crop showing the arrangement and distribution of cropteeth. ×63.
CR=Crop, CT=Cropteeth, OE=Oesophagus.

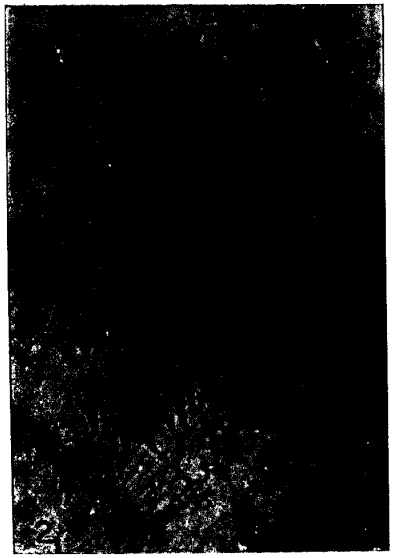

Fig. 2. Crop showing the structural details of cropteeth. ×630.
CT=cropteeth

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DRUG METABOLIZING ENZYMES IN MOUSE LIVER INFECTED WITH *PLASMODIUM BERGHEI**

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Liver metabolism is adversely affected during infection with malarial parasite (von Brand, 1973). Drug demethylation and hydroxylation are the two important processes which constitute the phase one of drug metabolism in liver (Sherlock, 1975). The pattern of drug metabolism is well known to be conditioned by several factors like liver disease and physiological stresses (Wilkinson and Schenker, 1976 ; Kato, 1977). Such an information is not available with regard to the host in malarial infection. The present communication deals with drug metabolizing enzymes in mouse liver infected with *Plasmodium berghei*.

Male mice (Swiss strain, 20-30 g body weight) drawn from the C.D.R.I. stock colony were used. *P. berghei* was received from the National Institute of Communicable Diseases, New Delhi. The inoculum of infected blood was prepared in 3.8% sodium citrate and one million parasitized R.B.C. were injected intraperitoneally in each mouse. The animals were sacrificed when the parasitaemia had established at 10-15%. Liver was washed with 150 mM KCl and homogenates (10% w/v) prepared in the same solution. The post-mitochondrial fraction was prepared as described by Schneider and Hogeboom (1950). Aminopyrine demethylase and aniline hydroxylase activities were assayed in post-mitochondrial fraction according to the methods of Bend, Hook, Elasterling, Gram and Fouts (1972) and Imai and Sato (1966) respectively. Protein estimation was done according to Lowry, Rosebrough, Farr and Randall (1951).

Table 1. *Aminopyrine demethylase and aniline hydroxylase activities in mouse liver infected with* P. berghei

Group	Aminopyrine demethylase (n mole formaldehyde formed/mg protein/hr.)	Aniline hydroxylase (n mole p-aminophenol formed/mg protein/30 min.)
Control	38.56±7.36 (6)	1.71±0.19 (6)
Infected	21.22±3.09 (6)*	0.52±0.16 (6)*

*$P < 0.01$; Number of animals used in each experiment is given in parentheses.

The results of the behaviour of two microsomal drug metabolizing enzymes, aminopyrine demethylase and aniline hydroxylase, are shown in Table 1. It is clear from the data that the activities of both the enzymes in the liver of infected animals got markedly decreased as compared with the control animals. It would clearly suggest that malarial

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