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ON THE OCCURRENCE OF *SPINOSTRONGYLUS INDICUS* LOVEKAR, 1970 (NEMATODA: TRICHOSTRONGYLIDAE) IN TWO MICRO-BATS (NEW HOSTS) FROM NAGPUR AND A NOTE ON COPULATION

THIRTEEN male and fifteen female worms were recovered from the intestine of two micro-bats, *viz.*, *Taphozous melanopogon* and *Rhinolophous luctus* at Nagpur. One specimen was obtained in the act of copulation.

Measurements

Male ($n = 5$) : Length 5·5–7·0 mm and breadth 0·22–0·24 mm ; head diameter 0·10–0·12 mm; oesophagus 0·42–0·48 mm long ; nerve ring and excretory pore 0·22–0·24 mm and 0·22–0·27 mm from head end, respectively. Spicules equal, 0·37–0·39 mm long ; gubernaculum pyriform, 0·10–0·13 mm in length. Bursa 0·15–0·18 mm long and 0·24–0·37 mm broad.

Female ($n = 7$) : Length 7–13 mm and breadth 0·24–0·27 mm ; head diameter 0·12 0·15 mm ; oesophagus 0·34–0·48 mm long; nerve ring and excretory pore 0·24–0·25 mm and 0·24–0·28 mm from head end, respectively. Vulvea 2·02 4·00 mm from posterior end. Eggs 0·06–0·10 × 0·05–0·06 mm in size. Tail 0·12–0·15 mA long.

Copulation

In copulation the male is oriented at an angle to the body of female in the region where the vulva is located. The lateral lobes of the bursa fold over the body of female. The lateral bursal rays hold the female worm laterally while the dorsal and ventral rays rest ventrally. The forked tip of the dorsal ray assists in holding the female body. The spicules and genital cone are inserted in the vulva to widen its opening. The gubernaculum directs the spicules towards the anus and prevents their piercing the cloacal wall.

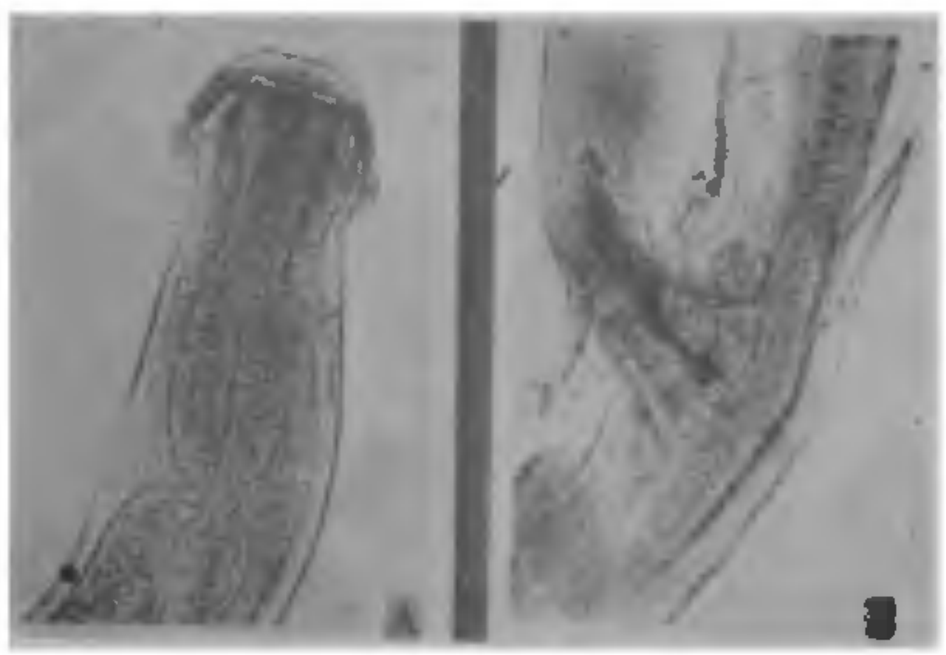

FIG. 1. *Spinostrongylus indicus* Lovekar 1970. A. Male: Microphotograph of anterior end of *Spinostrongylus indicus* Lovekar, 1970: Dorsal view × 100. B. Micro photograph of *Spinostrongylus indicus* Lovekar, 1970, in the act of copulation, × 100. C. Trifurcated tip of spicule. D. Eggs with larvae.

Remarks

Lovekar[1] described *Spinostrongylus indicus* from a micro-bat *Taphozous kacchensis* at Aurangabad, M.S.,

India. The authors collected the same worm from the intestine of two micro-bats, *viz.*, *T. melanopogon* and *Rhinolophus luctus* at Nagpur. The present worms differ from the type species in the head bearing two projecting teeth, six head papillae, a crown of sixteen backwardly directed spines of which four are simple and twelve forked and a long dorsal ray. All these are considered by the authors as variable characters.

Naidu[2] described copulation in *Bunostomum trigocephalum* (Rud. 1808) Railliet, 1902; a bursate nematode without gubernaculum and genital cone. In the present form copulation is studied for the first time and the function of genital cone and gubernaculum is ascertained.

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QUANTITATIVE EFFECTS OF HMAC ; 1, 6-HEXAMETHYLENE BIS = (1-AZIRIDINE CARBOXAMIDE) ON STERILITY OF *DYSDERCUS CINGULATUS* FABR.

CHEMOSTERILIZATION is an extension and amplification of the sterile male technique, the principle of which was proven in screw-worm fly, *Cochliomyia hominivorax* (Baumhover *et al.*[1]). This fascinating concept is still in its infancy but if directed in a proper way it has great potential in the control and eradication of some more ecologically and geographically delineated insect populations. A number of chemicals inducing sexual sterility have been applied in the laboratory against several pest species of public health importance and also pests affecting our valuable crops. However, a few alkylating and nonalkylating agents like apholate, tepa, metepa, hempa, etc., have also been successfully used to control the red cotton bug, *D. cingulatus* in the laboratory (Mustafa and Naidu[2]; Ahmad[3,4]) but practically no effort has been made to evaluate the efficiency of HMAC; 1, 6-hexamethylene bis = (1-aziridine carboxamide) against this pest species. During the present studies an attempt is, therefore, made to evaluate the efficiency of HMAC on the fecundity and fertility of *D. cingulatus*

The bugs were obtained from the normal strain of *D cingulatus* and is maintained in laboratory since 1974. They were kept at 27 ± 1° C and reared on water soaked cotton seeds. HMAC, was procured through Dr. A. B. Borkovec, in charge, chemosterilant investigations, USDA, Maryland. 4·0%, 2·0%, 1·0%, 0·5% and 0·25% solutions of HMAC were prepared in distilled water and the desired concentration of the chemical was applied topically on the abdominal sternum of the freshly emerged bugs in the manner described by Abedi[5].

TABLE I

Quantitative effects of HMAC on sterility of D. cingulatus

Sex treated	Conc. %	No. of eggs laid			% net sterility
		Average	Extremes		
Male	0·25	127·2	68	231	47·6
Female	0·25	129·6	92	185	31·7
Both	0·25	209·6	138	313	68·6
Male	0·5	77·6	42	112	53·1
Female	0·5	103·7	92	182	37·4
Both	0·5	197·3	84	308	85·0
Male	1·0	149·7	58	222	62·4
Female	1·0	138·0	66	252	51·9
Both	1·0	370·5	234	507	91·2
Male	2·0	144·2	90	244	100·0
Female	2·0	86·7	70	185	100·0
Both	2·0	82	68	96	100·00
Male	4·0	..	..	..	Adults died within 24 hrs of treatment
Female	4·0	..	..	..	,,
Both	4·0	..	..	..	,,

The results obtained (Table I) show that HMAC could produce sterility in *D. cingulatus* and the compound like some other chemosterilants may be referred as radiomimetic, possessing an ability to replace the hydrogen in the fundamental genetic material with an alkyl group that results in an effect similar to irradiation. Such compounds are effective in producing mitotic disturbances or nucleotoxic conditions particularly in tissues where cell multiplication takes place at a high rate. During the present studies the rate of sterility increased with an increase