EFFECT OF LEVAMISOLE ON THE DEVELOPMENT OF *BREINLIA SERGENTI* IN MOSQUITOES

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INTRODUCTION

Levamisole is a wide spectrum anthelmintic which is active against a large number of gastrointestinal and pulmonary nematodes (Nascimento-Filha *et al.*, 1966). Zaman and Natarajan (1973) have shown that it is active against *Breinlia sergenti* a filarial worm of slow loris. Subsequent studies by Zaman and Moti Lal (1973) and O'Holohan and Zaman (1974) have shown that it is active against human filaria as well.

In this study we are reporting on the effect of levamisole on the development of filarial larvae in the mosquito *Armigeres subalbatus*.

MATERIALS AND METHODS

Breinlia sergenti and *Armigeres subalbatus* were maintained in the laboratory according to the technique described previously (Zaman and Natarajan, 1973).

The drug was presented to the newly emerged mosquitoes for 4 days prior to giving them a blood meal. Each batch of mosquitoes (approximately 100 per cage) was given 10 mg, 20 mg and 40 mg of levamisole in 100 ml distilled water. The drug was presented to mosquitoes in cotton swabs soaked with the solution. The mosquitoes were allowed to feed on the solution *ad lib* and the controls consisted of mosquitoes fed only with distilled water without the drug. The temperature in the insectory ranged from 20°-30°C and the relative humidity was in the region of 85%. After 4 days of feeding on the drug the mosquitoes were given the blood meal on a slow loris showing microfilaraemia of 250/20 c.mm. The fully engorged mosquitoes were in separate cages. After obtaining the blood meal the mosquitoes were not given any more drug. Dissections were done on the 14th day post infection and the larvae were counted separately in the proboscis, head, thorax and abdomen.

RESULTS

In the concentrations used the drug did not effect the life span of the mosquitoes and there was no indication of increased mortality in the test cages as compared to the controls.

Table 1 shows the results of the mosquitoes given 10 mg, 20 mg and 40 mg/100 ml of levamisole respectively. The total number of mosquitoes dissected for each experiment was 20 for the test and 20 for the controls.

DISCUSSION

The study shows that levamisole has a definite effect on the development of the filarial larvae in mosquitoes and this effect is dose related. In a concentration of 40 mg/100 ml the drug completely inhibited the development of the filarial larvae in the mosquitoes. However, with the technique used it was not possible to assess the actual amount of drug ingested by each mosquito as no data are available in literature on the amount of fluid normally taken in by *A. subalbatus*. Consideration was given to injecting the drug directly into the mosquitoes but due to high mortality involved in such a procedure this technique was not used.

Table 1

Dose of Levamisole	No. of Mosquitoes with Larvae/20			
	Proboscis	Head	Thorax	Abdomen
(1) 10 mg/100 ml	13/20	10/20	9/20	11/20
Control	18/20	15/20	18/20	18/20
(2) 20 mg/100 ml	5/20	1/20	2/20	6/20
Control	18/20	11/20	12/20	19/20
(3) 40 mg/100 ml	0/20	0/20	0/20	0/20
Control	19/20	12/20	15/20	15/20

Natarajan *et al.*, (1973) have recently shown that levamisole immobilizes L_3 larvae *in vitro*. Therefore, it seems very likely that the drug had immobilized all the ingested parasites when given in concentration of 40 mg/ml with the result that larvae were unable to penetrate and develop in the mosquito tissues.

SUMMARY

Levamisole prevents the development of *Breinlia sergenti* in the insect vector *Armigeres subalbatus*. This effect is dose related and at 40 mg/100 ml there was total inhibition of larval development.

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