

STUDIES ON THE LIFE HISTORY OF *MEGASELIA SCALARIS* (LOEW) IN THAILAND

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INTRODUCTION

Two species of *Megaselia* cause myiasis in man and animals, *M. scalaris* and *M. rufipes*, but there are only a few cases and reports of human myiasis caused by this fly in the world. Patton (1921, 1922) recorded some cases of intestinal, ophthalmic, and wound myiasis in man and animals in which this fly was involved, either alone or in association with *M. rufipes* and *Chrysomyia bezziana*. In Thailand, Priyanond *et al.*, (1973) reported the first case of acute urethral obstruction in a female patient caused by the larvae of this species. The purpose of this study is to describe the life history and to discuss the possible importance of this fly to public health.

MATERIALS AND METHODS

The work was divided into morphological, life-cycle, and experimental studies. The species were identified and reared in the laboratory. Recognition characters at each morphological stage were studied. For studying the life cycle, the adults were reared in vials. Blood agar, made from deer blood and used as a rearing medium, was cut into small pieces and placed at the bottom of the vials. Nine pairs of male and female flies were transferred from a big jar, used for rearing colonies, to the vials, one pair to a vial, and the vials were then corked tightly. Each vial was checked daily until the flies completed their life cycle.

Experimental studies : Three infection experiments were done. In the first, white

rats were orally exposed to the larvae. In the second, the female genital organs of the animals were exposed to larvae, and in the third, white rats were injected intraperitoneally. Three white rats and newly hatched larvae were used for each test. The infected animal faeces were collected and checked every day for 7 days in the first test. In the second and third tests, infected white rats were sacrificed 7 days after infection and checked for types of myiasis.

RESULTS

Morphological study : In general appearance, the adult was a small, hump-backed fly, about 2-3 mm in length. The male was usually a little smaller than the female and the body of both sexes was yellowish-brown. The head was of the phorid type with a short proboscis. The thorax was humped and the wings were well-developed, with a forked vein R_5 on each wing. The legs were yellowish-brown with hairy tibia. The abdomen was banded with brown colour. The egg was small, canoe shaped, creamy white in colour. The mature larva was creamy white, about 4-5 mm in length. The head had one pair of toothed mandibles in place of the usual hooks. Each body segment was provided with short fleshy processes, not hairy, on the dorsal and lateral surfaces. The pupa was more robust than the larva. The anterior spiracles were extended into rodlike processes. The general appearance of the adults, larvae, and pupae are shown in Figs. 1, 2 and 3 respectively.

LIFE HISTORY OF *Megaselia scalaris* IN THAILAND

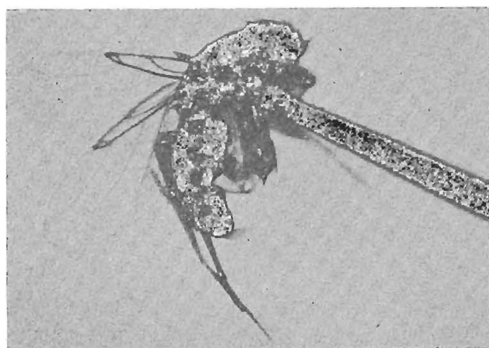


Fig. 1—Adult of *Megaselia scalaris* x 25.

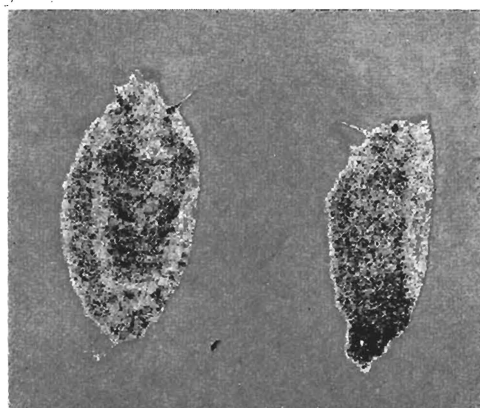


Fig. 3—Pupa of *Megaselia scalaris* x 25.



Fig. 2—Larvae of *Megaselia scalaris* x 25.

Life cycle : The following life cycle was based on room temperature set at $27 \pm 1^\circ\text{C}$ and $81 \pm 3\%$ relative humidity. Mating occurred within one day after the adults had emerged. Two days later each female deposited the eggs singly on the media, usually in the afternoon. Two to three days after the first oviposition, each female deposited eggs once more before she died. The number of eggs laid each time varied from 9 to 26. The life span of male and female flies was 2 and 7 days respectively. The eggs hatched within

Table 1

The life cycle of *M. scalaris*.

No. each pair of adults	No. eggs deposited		% hatch	Larvae (day)	Pupae (day)	Adults (day)		Life history (day)	
	1st time	2nd time				Male	Female	Male	Female
1	13	13	85.7	5-6	6-7	3	6	15-17	18-20
2	26	14	95.0	5-7	6-7	2	4	14-17	16-19
3	15	17	85.0	5-6	6-8	3	5	15-18	17-20
4	25	13	85.0	5-1	6-8	3	5	15-18	17-20
5	9	12	90.1	5-6	6-7	3	5	15-17	18-19
6	22	18	80.0	5-9	6-7	3	7	15-20	19-24
7	19	14	93.9	5-7	6-7	2	5	14-17	17-20
8	11	16	81.7	5-6	6-9	3	6	15-19	18-22
9	23	10	77.8	5-6	6-7	3	4	15-17	16-18

one day. The larvae passed 3 instars in 5 to 9 days and then pupated. The pupal stage required 7 to 9 days (see Table 1).

In experimental studies no artificial myiasis occurred in the infected white rats at all. This might be because the experimental animals were very small or unsuitable conditions were involved.

DISCUSSION

A total of 58 countries in every region of the world have been cited in the geographical distribution of this species (James, 1947). In Thailand, the flies are commonly found everywhere, usually on human and animal excrement, decaying and stale meat, milk, etc. (Sucharit *et al.*, 1976). This species can cause many types of myiasis, especially urinary myiasis. It is believed that in the majority of cases, infestation is probably a result of natural exposure, such as might come from the use of unsanitary outdoor toilets or from sleeping during the daytime with the body exposed. Or the female fly may be attracted by discharges, especially those of an albuminous nature. The ultimate stopping place of the larvae is the site that attracted the parent flies, namely the urethra or bladder (Chevrel, 1909). This species can complete its life cycle in a short time, therefore the population can increase rapidly at times. Parasitization of man by this species is accidental but it is nevertheless one of the medically important species to man since infestation may result in severe injury to the patient.

SUMMARY

The morphological, life-cycle, and experimental studies of *Megaselia scalaris* were reported. This fly is commonly found both in urban and rural areas in Thailand. It is easily identified and the humped thorax was

the most distinct characteristic of the adult. The egg to the adult stage and the life span required 15 to 20 days for the male and 16 to 22 days for the female. Experimental attempts to induce myiasis infection in laboratory animals were unsuccessful.

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