TABLE I
*Toxicity of Vacor to lesser bandicoot rats*
(means ± S.E.)

| Concentration of Vacor % | Rats M | Rats F | Weight, g (Range) | Mortality % | Food eaten g/100 g body wt. (Range) Unpoisoned | Food eaten g/100 g body wt. (Range) Poisoned | Poison eaten mg/kg body wt. (range) |
|---|---|---|---|---|---|---|---|
| 0·25 | 2 | 3 | 185 (159–215) | 100 | 6·0±0·4 (5·1–7·4) | 1·3±0·3 (0·9–2·5) | 33·3±7·2 (23·3–61·7) |
| 0·25 | 3 | 2 | 341 (213–392) | 100 | 5·3±0·3 (4·6–6·3) | 1·4±0·2 (0·7–1·8) | 34·8±5·3 (17·5–46·1) |
| 1·0 | 2 | 3 | 293 (224–396) | 100 | 6·0±0·3 (5·4–7·0) | 1·3±0·2 (0·6–2·0) | 125·8±23·0 (57·4–200·7) |

fed 2 g of the food, mixed with Vacor at a concentration of 20 mg/kg initial body weight. Thirty minutes after the poisoned food was put in the cages, all rats had eaten all of the food. All five rats died overnight; conditions of death were as noted above.

The $LD_{50}$ for Vacor is obviously less than 20 mg/kg body weight, and rats fed 1% Vacor ate, on average, more than six times that amount of poison. Vacor is also about twice as toxic as zinc phosphide; and when mixed with food at 1% concentration, it has about double the intake of zinc phosphide bait of the same concentration (unpublished work). No problems of acceptance of Vacor baits were observed during any tests, although such problems have been noted for other species[9]. The present findings suggest that 1% concentration of Vacor should be effective against lesser bandicoot rats; a recent field trial in urban Calcutta, using 2% Vacor against a mixed population of *R. rattus* and *B. bengalensis*, demonstrated as effective control as that using zinc phosphide[10]. Before a general recommendation for field use can be made, however, information is needed on the toxicity of Vacor to the other principal Indian rodent pest species[3]. This new effective acute rodenticide should also prevent the development of poison and bait-shy residual populations during control campaigns when used as an alternative in conjunction with zinc phosphide[2].

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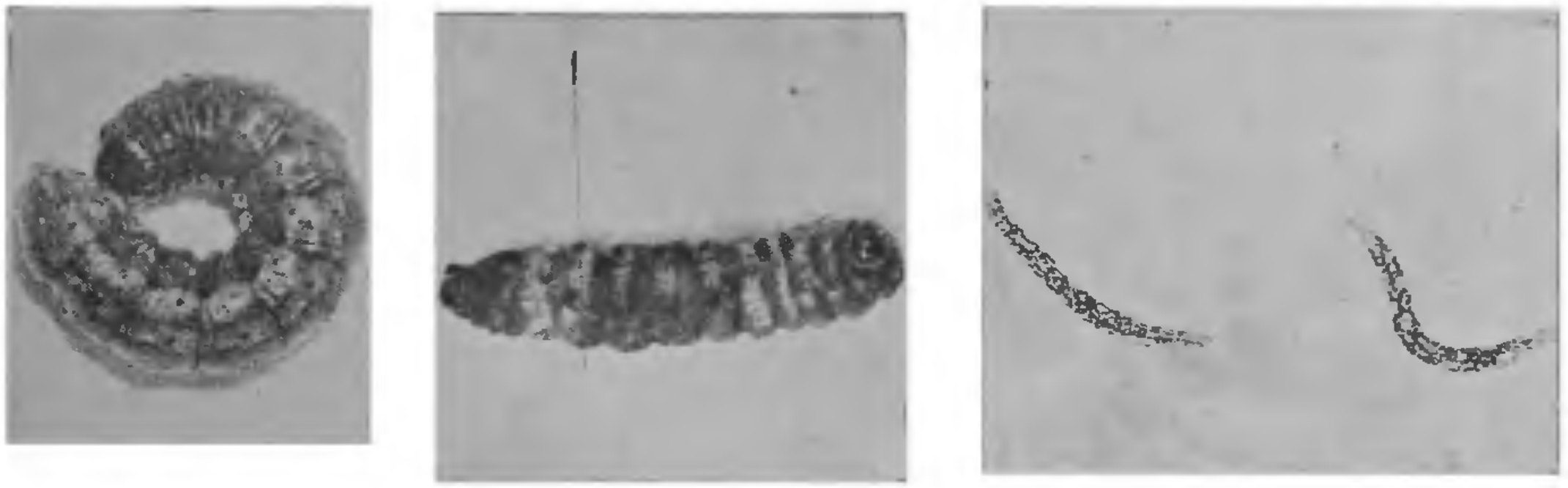
## ISOLATION OF AN ENTOMOPHILIC NEMATODE FROM POTATO CUTWORMS

DURING 1973–74 a survey for natural enemies of potato cutworms was conducted in Simla (H.P.) and Jullundur (Punjab). In April 1974, a total of 4,160 caterpillars of *Agrotis ipsilon* Hufn. was collected from Jullundur, of which 320 were infected with an entomophilic nematode (*Neoaplec-*

*tana* sp.). Some of the *A. segetum* caterpillars were also found infected with this nematode. Cutworms dying of nematode infection exhibited similar symptoms as caused by bacterial septicemia. As most of the caterpillars were in their final instars, mortality (due to this nematode) in their earlier instars could not be determined.



FIGS. 1–3. Fig. 1. Healthy caterpillar of *Agrotis segetum*. Fig. 2. Caterpillar of *A. segetum* infected with lower concentration of *Neoaplectana* sp. Fig. 3. *Neoaplectana* larvae.

For obtaining nematode culture, infected cutworms were washed with sterilized water and kept in a water trap. The nematode larvae inside the host migrated through water to the bottom of the basal dish of the trap. These larvae were collected daily.

For pathogenicity test, eight earthen pots were taken, of which four pots were filled with sterilized sand and four with garden soil. Twenty larvae of *A. segetum* in their third instar were released in each pot. The cutworms were fed on potato leaves. Four pots (2 with sand and 2 with garden soil) containing potato leaves and cutworms were sprayed with nematode suspension and the remaining set was sprayed with water to serve as control. The pots were covered with perforated polyethylene sheets. Food was changed daily. Cutworms in the pots were not disturbed and at the end of the experiment total number of moths emerged in each pot was noted. From the treated pots no moths emerged, but from control all the caterpillars gave rise to moths.

Some of the cutworms infected with this nematode were kept individually in petri dishes for further observations. From the heavily infected cutworms, the larvae (Fig. 3) after eating away the internal contents of the host started emerging and spreading all around the body of the host. Within a period of about 10 days these nematodes consumed all the body contents of the host leaving behind the chitinous head capsule and cuticle. The cutworms which ingested less number of nematodes showed visible symptoms of infection, *viz.*, white colonies of nematode on the underside of the abdominal segments (Fig. 2), and such caterpillars took unusually longer time to die.

The pathogenicity of this nematode was also tested on the field collected caterpillars of *A. ipsilon* Hufn., *Amathes c-nigrum* L. and white grubs. All the caterpillars died, but in case of white grubs only 75% mortality was caused by this nematode.

Isolation of this entomophilic nematode (*Neoaplectana* sp.) from potato cutworms (*A. ipsilon* and *A. segetum*) is a new record from India. However, success has earlier been reported for the control of various pests of other crops by means of Neoaplectanid nematodes[1-6].

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