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OVIPOSITION-INDUCING AND MATING-INHIBITING FACTOR IN THE MALE ACCESSORY GLANDS OF *OPISINA ARENOSELLA* WALKER (LEPIDOPTERA: CRYPTOPHASIDAE)

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DURING our study involving courtship and mating in *Opisina arenosella*[1], the larva of which is a pest of coconut palm, it was noted that usually the females are monogamous (Chandran, unpublished observations). It was therefore thought that some principle in the male accessory gland might be involved in inhibition of mating in this insect, especially in the light of recent work on male accessory glands[2,3]. The present report shows that the male accessory gland of this animal does indeed contain a factor which not only inhibits mating when transferred to the female during copulation, but stimulates oviposition as well.

O. arenosella was maintained in the laboratory as already described[4]. Fifty accessory glands of 0-day-old adult males (day of emergence) already containing plenty of secretory material (unpublished observations) were dissected out. Their extract in ice-cold insect Ringer[5] made up to 1 ml was injected into the abdomen of a 0-day virgin females at the rate of 2 μl, 5 μl and 20 μl per individual, after ether anaesthesia, using a microcapillary attached to a polythene canula. Ringer-injected animals served as controls. The injected females were kept either along with males of the same age or without males. Normal uninjected females were also used for comparison. The animals were kept either individually or in pairs (of one male and female each) in bell jars; cotton swabs soaked in 10% sucrose solution kept hanging from the top of the bell jars served as the food source. The animals were kept under constant watch under a 15 W red incandescent lamp at night enabling observation of their mating and ovipositing without disturbance. After continuing the experiment for requisite number of nights the females were dissected out to locate spermatophore if any, to confirm mating. The eggs laid, if any, were counted.

Figure 1 shows the male reproductive tract and the terminal portion beyond the arrows was used for preparing the homogenate, though we do not

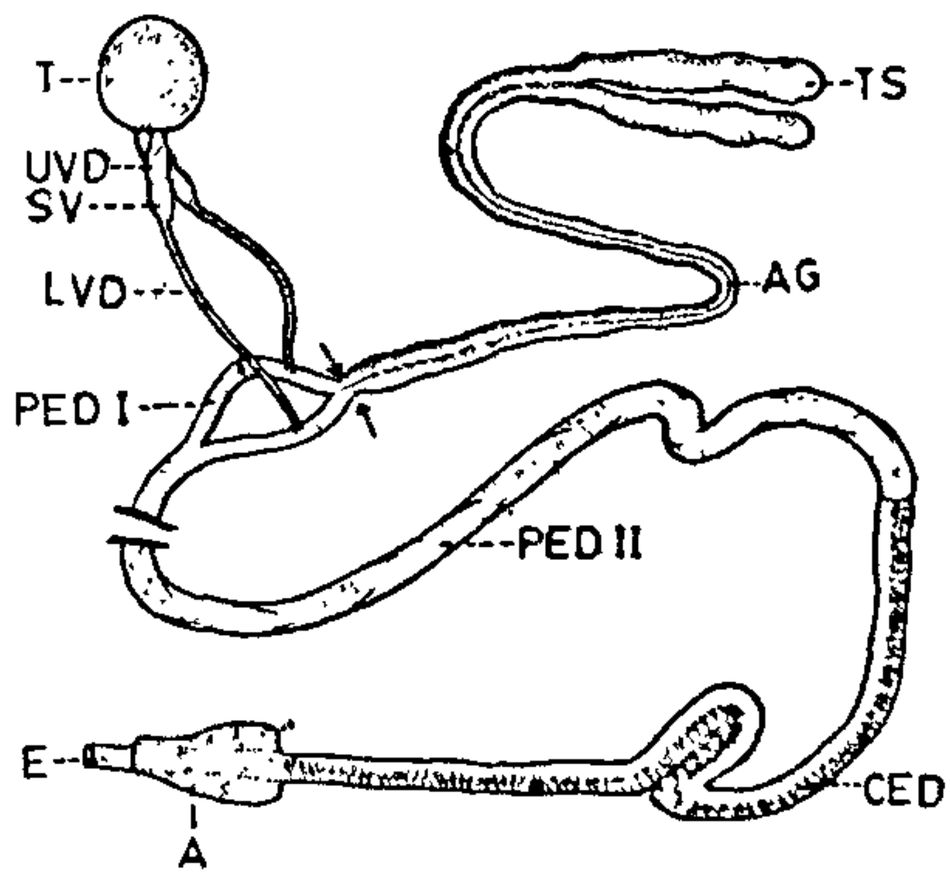

Figure 1. Adult male reproductive system of *Opisina arenosella*. The accessory gland was separated at the arrow for preparation of extract. A–Aedeagus, AG–Accessory gland, CED–Cuticular ejaculatory duct, E–Endophallus, LVD–Lower vas deferens, PED I–Primary ejaculatory duct (paired); PED II–Primary ejaculatory duct (unpaired); SV–Seminal vesicle; T–Testes; TS–Terminal sac; UVD–Upper vas deferens.

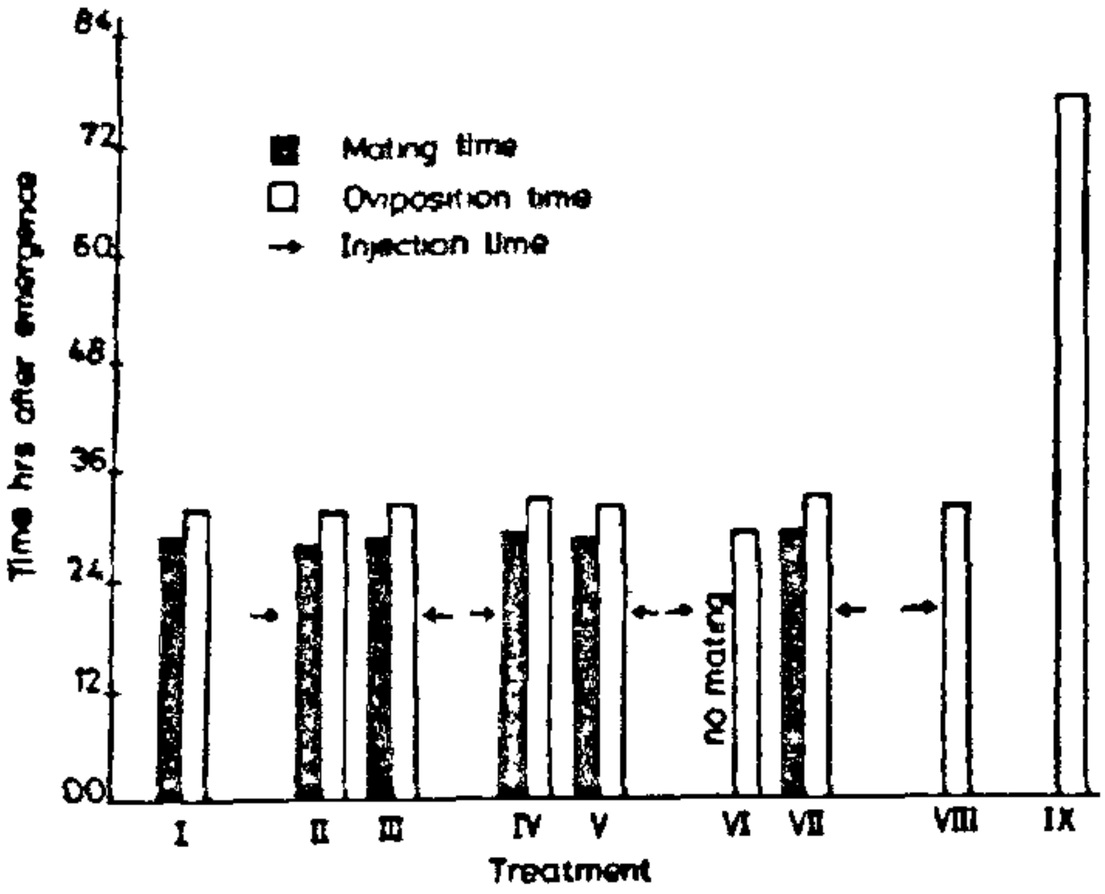

Figure 2. Effect of different doses of male accessory gland extract on mating and oviposition in female *O. arenosella*. I. Normal female mated with normal male; II. Virgin female injected with 2 μl extract and kept with male mated; III. Control female injected with 2 μl Ringer solution and kept with male mated; IV. Virgin female injected with 5 μl extract, mated when kept with male; V. Control female injected with 5 μl Ringer solution, mated when kept with male; VI. Virgin female injected with 20 μl extract, kept with male. No mating took place; VII. Control female injected with 20 μl Ringer solution and kept with male, mated; VIII. Virgin female injected with 20 μl extract. No male kept in company; IX. Virgin female not injected.

preclude secretion further down the genital tube. Data on mating are given in figure 2. It may be seen that injection of 2 μl and 5 μl extract does not have any effect on mating whereas injection of 20 μl extract completely inhibited mating. Though no mating took place, the animal laid eggs at the proper time. All animals laid a mean of about 80 eggs, there being no significant difference between the experimental and control animals. It may be seen that virgin females not injected also laid eggs but only after a delay of about 48 hr. This showed that the male accessory glands of *O. arenosella* contained a factor or factors apparently transferred to female during copulation, which prevented further mating and stimulated egg laying by the mated female. This is a mechanism employed by many insects for the purpose[2,3]. The fact that further mating is prevented in injected females with immediate effect suggests that it is most likely that the effect is directly on the central nervous system. However, its effect on the oviposition is a delayed one; also, the fact that egg-laying though delayed for a further period of 48 hr does take place in non-injected virgin females suggests that it is apparently mediated hormonally[6,7] and that stimuli other than male accessory gland material may be involved in oviposition.

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ACTIVATION OF THE ALTERNATIVE PATHWAY OF THE COMPLEMENT SYSTEM BY MYCOBACTERIA

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THE alternative pathway of the complement system (APC) is thought to be a very important line of defence in a nonimmune host[1]. Microbes which activate the APC are considered to be less pathogenic than those which do not[2–4]. For demonstration of complement activation generally serum is used as a source of complement. In the case of Streptococcus group-A, it has been reported that