BIOLOGICAL CONTROL OF UZI-FLY

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CONTROL of Uzi fly is a major problem for the sericulture industry. Attempts to check the Uzi fly population by physical, chemical and biological methods are in progress. In the vicinity of the cocoon market in Ramanagaram, a suburb of Bangalore, a phorid fly was seen. The phorid fly and the Uzi fly maggots collected were kept in the same container. After two days the eggs were observed on the Uzi fly maggot and a few days later the larvae were feeding on it. Studies were made to see whether the attraction of the phorid fly was due to its parasitic nature or due to the foetid odour on the maggot. The phorid fly was identified as a species of Magaselia[1].

The phorid flies were maintained in the laboratory on crushed pupae and live maggots of the Uzi fly and the pupae of the Megaselia harvested for obtaining adults. The adults were kept in battery jars covered with a muslin cloth with cotton dipped in sugar solution serving as food.

Freshly emerged maggots of the Uzi fly was introduced into fabricated "Y" tubes with the arms of 'Y' measuring 15.2 cm in length and 2.5 cms in diameter and plugged with cotton leaving the other arm empty. The mature phorid flies were introduced at intervals of 1 hr into the third arm and plugged with cotton and observations made. The flies move towards the maggots. This was repeated 25 times and the results were the same. After 24-48-hr oviposition occured on or near the stationary maggots and pupae of Uzi fly.

The specificity of attraction towards the Uzi fly pupae was tested by using other insects, Larvae, cocoon of the silk worm Bombyx mori, Holotrica serrata fabrious and larvae of the beetle Haltica caerulea separately in one arm, Uzi fly maggot on the second and Megaselia in the third. The Magaselia fly in all cases moved towards the Uzi fly maggots the laid eggs.

Using single male and female flies separately with only one Uzi fly maggot in a 'Y' maze, observations were made. This experiment was conducted to ascertain whether the magaselia fly was attracted to the foetied odour which is similar to its natural food or due to the urge for oviposition. The male fly moved about in a random fashion while the female fly moved towards the Uzi fly maggot and laid eggs within 2 to 14 hr. This experiment was repeated ten times and every time oviposition observed on or near the maggot.

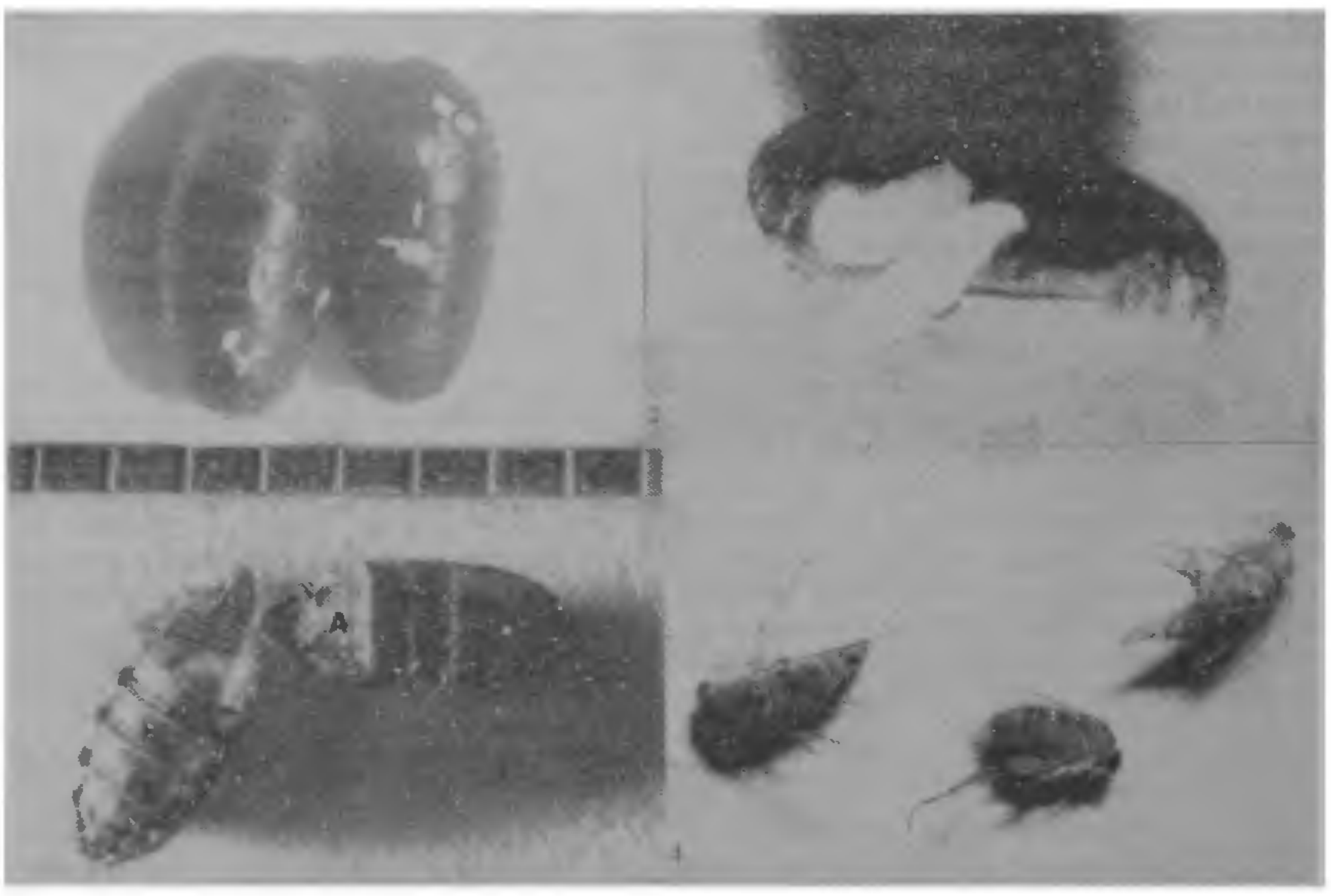

Figure 1-4. 1. The eggs of Megaselia on the pupae of the Uzi Fly Pupae. **2.** Megaselia Maggots emerging out of the Uzi Fly Pupae. **3. (A)** The Pupae of Megaselia. **(B)** Pupal case. (Each division measures 0.1 cm .) **4.** The adults of Megaselia.

Life history of Megaselia was studied. The eggs are white in colour oval in shape measuring 0.05 cm in length and 0.01 cm in width with a smooth dorsal surface and brush like ventral surface (figure 1). The eggs hatch within 22 to 36 hr after they are laid. The maggots (figure 2) measures 0.05 cm to 0.15 cm and on the first day and feed on the contents of the Uzi fly pupae moving in and out of the debris for five to six days and undergo pupation. The larvae have a pair of respiratory horns present on the centre of the 11th segment pointing backwards. The pupae are oval in shape brown in colour pointed anteriorly, rounded posteriorly and flatened ventrally, convex dorsally measuring 0.4-0.45 cm in length with eleven segments. A pair of spines are present on the 9th segment at the sides pointing upwards (figure 3). The pupal stage extends for a period of 10–12 days. The apical tip breaks open and eclosion occurs. The adults have a prominent humped thorax, long spiny legs with eight segmented abdomen (figure 4). The adults live for 10–15 days and feed on the Uzi fly debris. Further experiments are in progress to check the population of Uzi fly with Megaselia.

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1. Berg, B. G., *Flies and disease*, Princeton Univ. Press, New Jersey, Vol. 1, p. 86. 1971.

INDUCTION OF OOGONIAL/OOCYTE FUSION BY X-IRRADIATION IN THE OVARIES OF THE RED COTTON BUG, *DYSDERCUS KOENIGII* FABR. (HETEROPTERA:PYRRHOCORIDAE)

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IONIZING radiations are known to induce several abnormalities in the ovaries—one of them being fusion between the oocytes. Reports of this abnormality have come from polytrophic ovaries only[1,2]. In this note we report this phenomenon along with some variants in the telotrophic ovaries of the hemipteran, *Dysdercus koenigii* also.

When one-day old fifth (ultimate) instar larvae of this insect are exposed to soft X-radiation at a dose rate of 444.44 rad/min, the emerging adults exhibit the following types of fusion in the germ cells of their ovaries: (i) fusion between (normal) oogonia (figure 1) (ii) fusion between hypertrophied oogonia (figure 2) (iii) fusion between a hypertrophied oogonium and oocytes (figure 3) (iv) fusion between oocytes with their separate identities retained (figure 4) or completely lost (figure 5).

Fusion between the oocytes has also been reported by agents other than ionizing radiations *viz.*, by juvenile hormone[3-6] and chemosterilants[7]. However, the end product of all these cases is reported to be a structure called a compound egg chamber[1] or a compound follicle[3,5]. Various reasons have been given to explain this phenomenon. Masner[7], for instance, believes that the compound follicle may be formed by actual fusion between oocytes or by more than one oocyte entering the same egg chamber. Socha and Gelbic[4], on the other hand, believe that a pressure exerted on the follicles sets in strong cytoplasmic currents which ruptures the follicular and interfollicular tissue causing fusion. However, they do not mention the nature or source of the envisaged pressure.

In our studies, we find the fused germ cells naked (*i.e.*, devoid of any follicular epithelium, figure 2) or lacking in interfollicular tissue (figure 3). This indicates that radiation in some way impairs the mobility of the prefollicular cells in the germarium. They either fail to move resulting in the first condition or the fusion occur earlier than their movements so that they can only encircle the compound follicle but not reach their interfollicular spaces. King[1] thinks that the presence of more than one nuclei in an oocyte may not necessarily be due to oocyte fusion but could as well be due to nuclear division. Our histological pictures show both completely (figure 1, arrows) and incompletely (figure 1, broken arrows) fused condition of the germ cells. This negates King's postulate[2] as also Masner's[7] suggestion that more than one oocyte may enter the same egg chamber to form a compound follicle. So far, fusion between the oocytes alone has been reported. Here we report some variants of this phenomenon; *viz.*, fusion between normal oogonia, between hypertrophied oogonia (hypertrophy of germ cells is another effect of radiation), between a hypertrophied oogonium and an oocyte and between oocytes. However, since we only see the end product, we do not know if the differentiation of these variants follows the process of fusion or precedes it. At least in cases (types 3–5 in these studies) where the compound follicle is surrounded by a follicular epithelial sheath, differentiation should precede fusion because the follicle formation (by ensheathment of the prefollicular cells) occurs in the basal part of the germarium where the germ cells are only in the oogonial stage.

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