



Research Article

STUDY OF LIPID CONTENT IN MALE AND FEMALE OF THE RED PUMPKIN BEETLE, *AULACOPHORA FOVEICOLLIS* (CHRYSMELIDAE, COLEOPTERA)

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ABSTRACT

Aulacophora foveicollis, commonly called “red pumpkin beetle” is a pest of vegetables of cucurbitaceae family e.g. pumpkin or kaddu, ghia torai, tinda, cucumber, etc. The lipid content of male and female individuals of *A. foveicollis* was extracted and the average weight of lipids in the insect body and their percentages was calculated. It was found that the weight of lipid content and its percentage in the body of a male was 1.81 mg (approx.) and 6.87% respectively and in female it was 1.65 mg (approx.) and 6.45% respectively. Thus the percentage of lipid content in male was slightly higher than in the female.

Keywords: Lipid content, *Aulacophora foveicollis*, Pest, Vegetables, Cucurbitaceae family.

INTRODUCTION

Aulacophora foveicollis Lucas, commonly called “red pumpkin beetle” belongs to the family chrysomelidae of the insect order Coleoptera. It is a pest of vegetables of Cucurbitaceae family e.g. pumpkin or kaddu (*Cucurbita pepo* L., *Cucurbita maxima*), ghia tori (*Luffa cylindrica*, *Luffa aegyptica*), cucumber (*Cucumis sativus*), etc. The adults of red pumpkin beetle are 5-8 mm long and 3.4 to 3.75 mm broad. The body is brilliantly coloured red dorsally and black ventrally. The adults feed on the leaves, flowers and buds of younger plants and damage them. In the present work, the lipid content of male and female insects of *A. foveicollis* have been investigated and it has been found that there was the difference in the lipid content in males and females (Bahan, 2010).

MATERIALS AND METHODS

For the present work, the insects were collected from pumpkin or kaddu (*Cucurbita pepo* L., *Cucurbita maxima*) plants grown in Nandal Chhapra Village, a suburb of Patna, situated South of New Bypass Road, Patna. The

collected insects were kept in breeding chambers of plastic jars. Their tops were closed by a fine mosquito net to prevent the escape of insects, without obstructing ventilation and observation from the outside. The food and water were also placed in the breeding chambers. In order to prevent the entry of ants breeding chambers were kept in water. Every morning the insects were provided with fresh leaves and tender shoots of the host plants for feeding. The male and female insects were weighed separately and dried in vacuum desiccators at 65°C till the constant weight was obtained. The difference between weight and dry weight of insects was considered to represent the amount of water in the body. The difference was converted in terms of percentage. The dried insects were weighed and placed in a saxhlet with a heating mantle (250 ml capacity) for lipid extraction. Petroleum ether was used as a solvent. The extraction period ranged from 24 to 30 hours. The insoluble residues were dried in an oven (regulated at 75°C) for 2 to 3 days and constant weights were recorded. The difference in weights of insects before and after lipid extraction provided the amount of lipid in the body. The data collected were recorded and analyzed.

RESULTS AND DISCUSSION

For detecting the lipid contents in the body of insects, the initial weight of insects, their constant weight after keeping in a desiccator at 65°C for 72 hours or more and weight of insect's dry residue after removing lipids from their body by dissolving them in petroleum ether were taken so that the amount and percentage of lipids were known as shown in Table 1 and Table 2. The average percentage of lipids or fats in male *A. foveicollis* is 6.87 mg and in female, it is 6.45 mg.

There is great variation in the lipid content in insects of different orders or in insects of same order or even in individuals of the same species as observed by many workers. In most insects, the females contain a greater

percentage of lipids than male to utilize them to form yolk in the development of eggs. Pandey and Sharma (1993) working on *Chrysocoris stollia* found that the lipid content is greater in females than in males. (Wang *et al.*, 2005; Wang *et al.*, 2005a) studied lipid content of *Drosophila melanogaster* and found that the lipid content was significantly higher in females than in males. Bahan (2010) studied lipid content in *Coccinella septempunctata* and *Epilachna dodecastigma* and found that percentage of the lipid content was also higher in females than in males, but in *A. foveicollis* it was found that the lipid content in males was slightly greater than in females. It is contrary to the findings of Pandey and Sharma (1993) in *Chrysocoris stollia*, and Wang *et al.* (2005) in *Drosophila melanogaster*.

Table 1. Lipid content of male *Aulacophora foveicollis*.

S. No	No. of insects	Wt. of insects in mg	Constant wt. (in mg) of insects after 72 hours or more in Desiccator at 65°C	Wt. (in mg) of insects dry residue after removing lipids by Petroleum ether	Wt. (in mg) of lipids in insects' body	% of lipids (fat) in insects' body
1	20	530	120	85	35	6.60
2	24	620	160	115	45	7.25
3	22	590	150	110	40	6.77
Mean	22	580	143.33	103.33	40	6.87

Table 2. Lipid content of female *Aulacophora foveicollis*.

S.No	No. of insects	Wt. of insects in mg	Constant wt. (in mg) of insects after 72 hours or more in Desiccator at 65°C	Wt. (in mg) of insects dry residue after removing lipids by Petroleum ether	Wt. (in mg) of lipids in insects' body	% of lipids (fat) in insects' body
1	30	780	210	150	60	7.69
2	32	750	210	160	50	6.66
3	17	400	100	80	20	5.00
Mean	26.33	643.33	173.33	130	43.33	6.45

CONCLUSION

It is just possible that in *A. foveicollis* the experiments were carried out on females after they laid their eggs and their lipid contents were utilized to a great extent in the formations of yolk of their eggs. As such the lipid content in females was reduced. Hence, it is concluded that the lipid content in male red pumpkin beetles was higher than in female beetles.

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