RESEARCH ARTICLE

EFFECT OF *LANTANA CAMERA* AND *OCIMUM SANCTUM* EXTRACTS ON THE FECUNDITY OF MUSTARD APHID, *LIPAPHIS ERYSIMI* (KALT.)

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Abstract: Naturally occurring compounds extracted from the plants have been identified to possess strong feeding deterrence to a number of insects. *Lantana Camera* and *Ocimum sanctum* extracts were also found priming against several pests. The present investigation has been done on the effect of *Lantana* and *Ocimum* extracts against the fecundity of mustard aphid, *Lipaphis erysimi* (Kalt.). The results revealed that both the plant extracts gave better results in comparison of control treatment. Therefore, use of both plant extracts can be incorporated in integrated pest management (IPM) in reducing the reproduction rate of aphids in mustard ecosystem.

Keywords: *Lantana, Ocimum,* Mustard aphid, Fecundity, Plant extract

INTRODUCTION

Rapeseed –mustard is one of the important oleiferous crops and constitute major source of edible oil for the human consumption and cake for animals. The use of synthetic chemical pesticides has accounted for astonishing gains in production, as the pesticides have reduced the hidden toll exacted by the aggregated attack of insect-pests. The mustard aphid, *Lipaphis erysimi* (Kalt.) is a major pest of Brassica crops (Bakhetia & Ghorbandi, 1987; Bakhetia & Sekhon, 1989). Good control of mustard aphid can be obtained by spraying traditional organic insecticides (Bakhetia, 1984 and Khurana *et al.*, 1989). Moreover, the realization of toxic hazards of pesticides and their side ill effects on man and biosphere has diverted the attention to find out some alternative and feasible control of pests by utilizing some plant products which are non hazardous to man. Thus, newer approaches for pest control are continuously being sought. The naturally occurring, biologically active plants appear to have a prominent role for the development of future commercial pesticides not only for increased productivity but for the safety of the environment and public health. Naturally occurring compounds extracted from plants have been identified to possess strong feeding deterrency to a number of insects. Earlier, *Ocimum basiliances* (L.) and *Lantana Camera* (L.) were found to be effective against *Heliothis armigera* (Hub.). It has been observed that *Lantana Camera* has an insecticide, synergist, antifeedal and repellant action against *H. armigera* (Pandey *et al.,* 1983). *Lantana* was also found effective against mustard aphid, *L. erysimi*. It was reported that the ether extract of lantana affects the fecundity of females and gave highest present mortality of aphids (Pandey *et al.,* 1987). *Ocimum sanctum* (L.) a strongly scented herbaceous plant is commonly known as basil or tulsi. It has been tested for its antifeedant, repellent and insecticidal effects. Reddy and urs (1988) reported that *Ociumum gratisimum* significantly reduced brown plant hopper *Nilaparvata lugens* (stal.) oviposition. Mallick and Banerji (1989) reported the antifeeding effect of the extract of *Ociumm sanctum* against jute semilooper, *Anomis sabulifera* (Guen.) prominent up to 24 hrs in the leaves treated with 1 percent concentration.

In view of these considerations, the present investigation was conducted to find out the effect of plant extracts of *Lantana camera* and *Ocimum sanctum* on the fecundity of mustard aphid, *Lipaphis erysimi* under laboratory conditions.

MATERIAL AND METHOD

The extracts of *Lantana camera* and *Ocimum sanctum* were tested against *Lipaphis erysimi* K. (Mustard aphid) under laboratory condition at room temperature. The plant parts, leaves of *Lantana* and inflorescence of *Ocimum* were shade dried and ground to from powder. The powder was then mixed with petroleum ether and ground properly with the help of pestle & mortar. The extract was filtered through filter paper and was allowed to dry under sunlight for the evaporation of petroleum ether. For the preparation of 0.1 and 0.01 % concentrations, 0.01 gm and 0.001 gm of extracts were weighed and taken in 10 ml flask to make the volume of 10 ml by adding petroleum ether. The treatments were replicated thrice with control.

The mustard leaves were taken and washed them properly with water. After drying, one leaf was kept in each Petri plate. The leaf was smeared with the plant extract of desired dose and allowed to dry for few minutes in Petri plate. Five gravid females were released in each Petri plate on the treated leaf and Petri plates were covered with lids. In the control, leaves were soaked in water. The observations on the fecundity were taken at 24, 48, 72, 96, 120, 144 and

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168 hrs after exposure. The average fecundity (rate of reproduction) was compared on the basis of emergence of nymphs in both the concentrations of both plant extracts.

RESULT AND DISCUSSION

Average fecundity or rate of reproduction of mustard aphid was taken for 24 hr, 48 hr and 72hr so on up to 7 days for both concentrations of plant extracts. It is clearly given in the Table 1 that 0.1 % concentration of *Lantana* showed lowest fecundity (6.66) after 24 hrs While, it was found maximum (9.0) after 168 hrs. In case of 0.01 % concentration of *Lantana*, the average fecundity after 24hr was 8.3 and after 6 days it became 11.3. In other words we can say that the average fecundity was less in 0.1% concentration than in 0.01% concentration of *Lantana*. In 0.1 % concentration of *Ocimum* the minimum fecundity i.e. 11 was recorded after 24 hr While, maximum (14.7) after 186 hrs. Likewise in 0.01%, the minimum fecundity (15.3) was recorded after 24 hrs while, maximum (19.7) after 168 hrs. In control, average fecundity was found higher than the both treatments.
A comparison between concentrations showed that 0.1 % concentration of *Lantana* found more effective than 0.1 % concentration of *Ocimum*. A similar trend was found in case of 0.01 % concentrations of *Lantana* and *Ocimum* i.e. 0.01 % concentration of *Lantana* found more effective than 0.01 % concentration of *Ocimum*.

Table 1. Fecundity of adult apterous mustard aphid treated with *Lantana* and *Ocimum* extract

Treatment	24hr	48hr	72hr	96hr	120hr	144hr	168hr
T_1, *Lantana*, 0.1 %	6.66	7.33	7.33	8.0	8.3	8.7	9.0
T_2, *Lantana*, 0.01 %	8.3	9.7	9.7	9.7	10.3	10.7	11.3
T_3, *Ocimum*, 0.1 %	11	11.7	12.3	12.3	12.7	13	14.7
T_4, *Ocimum*, 0.01 %	15.3	15.7	15.7	15.7	16.7	18.3	19.7
Control	19	20	20.7	21	21.3	24.7	25.0
SEM	2.27	2.24	2.34	2.31	1.32	2.89	2.89
Cd at 5%	7.40	7.40	7.64	7.54	7.59	9.42	9.43

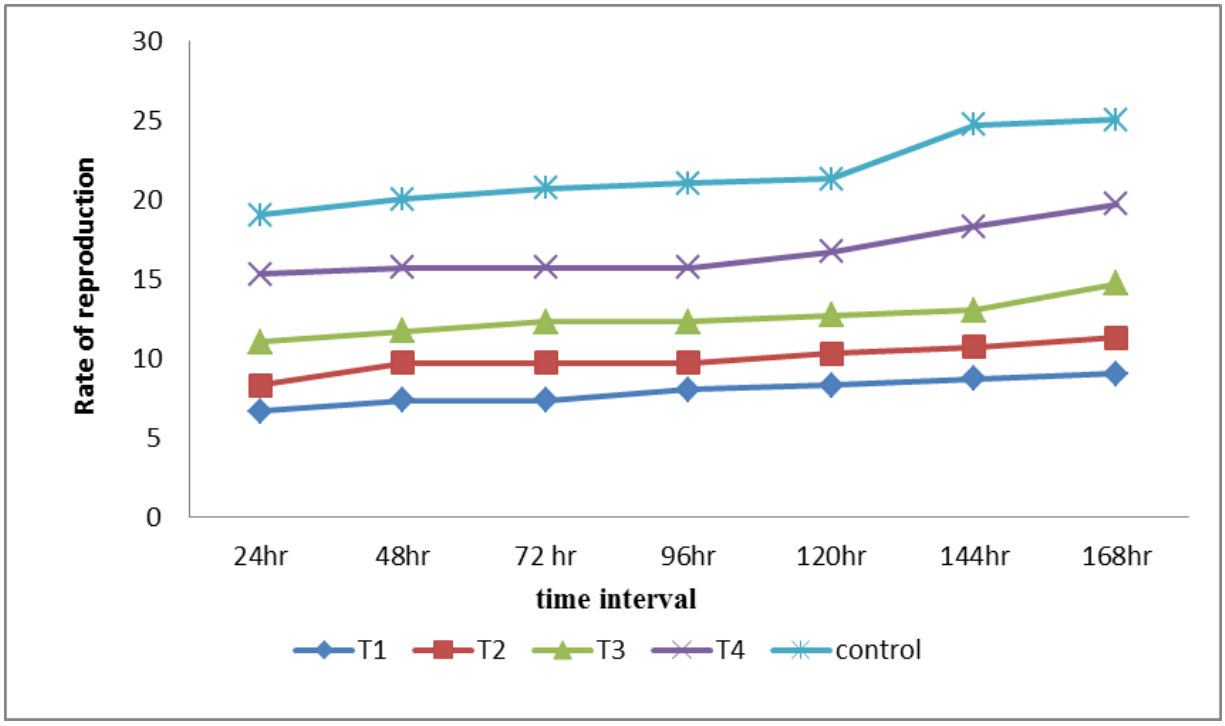

Fig. 1: Rate of reproduction of female mustard aphid, *Lipaphis eryisimi* treated with *Lantana* and *Ocimum* extracts

DISCUSSION

Above results clearly indicated the effectiveness of plant extracts of *Lantana camera* and *Ocimum sanctum* on fecundity of mustard aphid *Lipaphis erysimi.*

Plant extract of *Lantana* was found to be the best in comparison to *Ocimum* extract. The higher concentration of *lantana* extract causes more reduction in fecundity of the insect. Similarly, higher concentration of *ocimum* extract causes more reduction in fecundity in comparison to the lower concentration of plant extract used. In comparison to control both the treatments of plant extracts are superior in reducing the rate of reproduction of aphids.

This shows that *Lantana camera* and *Ocimum sanctum* after 24, 48, 72 hrs of treatment inhibited the aphid fecundity when applied at conc. of 0.1% in comparison to control. This indicates that the extracts of *Lantana* & *Ocimum* are better than the untreated check. Both the concentrations which were taken for both the plant extracts are proved better over control treatment, similar observation were also repeated by Pandey *et al.*, (1987).

They reported the effect of *Lantana camera, Azadiracta indica, Ipomea cornea etc.* against mustard aphid, *Lipaphis erysimi* and found that fecundity of aphids was found minimum at 1.0 and 1.5 percent concentration of *A. indica* and *L. camera.* The effective of plant extracts against insects may be due to their insecticidal, antifeedal, repellent or deterrent (ovipositional deterrent) nature.

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