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In vitro Studies on Oviposional Preference of Pomegrante Fruit Borer (*Deudorix epijarbas*)

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A B S T R A C T

An experiment was performed on ovipositonal preference of females of Anar butterflies (*Deudorix epijarbas*) under laboratory condition in the Division of Entomology, SKUAST-K, Shalimar during 2012. Studies revealed that adult female laid eggs on flowers, fruits and also on stalk and leaves within the vicinity of fruiting parts. More number of eggs (63.75) were laid on 30-40 days old fruits with a percentage (52.46%) mainly on calyx cup followed by 19.00 laid on matured fruits, which accounts for 5.63 per cent. Other plant parts viz., flower buds, fully opened flowers, leaves, stalk and fruit let stage were least preferred by *D. epijarbas* adults for ovipositiion.

Introduction

Pomegranate (*Punica granatum* L.) is a non-climacteric table fruit relished for its delicacy and nutritive value. It belongs to genus *Punica* and family Punicaceae. Pomegranate contains 1.6 per cent proteins, 0.1 per cent fats, 0.7 per cent minerals, 14.6 per cent carbohydrates, 0.3 per cent iron and 16 mg of vitamin C per 100 gm of fruit (Banker, 1988; Bose). In addition to 78 per cent moisture, the fruit is reported to contain 5.1 per cent fiber, 10 mg of calcium, 5 mg of phosphorus and 0.3 mg of nicotinic acid. Dietary supplementation with pomegranate is believed to prevent cancer (Afaq *et al.*, 2003). Many pests including 91 insects, 6 mites and 1 snail have been reported on pomegranate. The most obnoxious pest is pomegranate butterfly, *Deudorix* (=*Virachola*) *isocrates* Fab., also called as anar butterfly or pomegranate fruit borer which may destroy more than 50 per cent of fruits (Balikai *et al.*, 2011). Severe infestation of fruit borer has resulted in the reduction of pomegranate yield as well as cultivation of the fruit in the country.

In Kashmir, an allied sps. of this insect, *Deudorix epijarbas* (Moore) has been recorded as a serious and predominant pest of

pomegranate fruits (Zak-ur-Rab, 1980). The pest is a worst enemy of pomegranate fruits cultivation in Himachal Pradesh and Jammu and Kashmir. The pest attacks fruit from early stages till maturity of the fruit. The caterpillar bore into developing fruits and feed upon the pulp and seeds causing fruit drop, resulting into rotting of fruits due to secondary attack of fungi and bacteria and making the fruit unfit for human consumption. The damage caused by infestation affects the quality of fruits which renders them unfavorable for market.

The status of this pest and its extent of damage to the crop in Kashmir valley have not been fully studied so far. Therefore, for developing a sound pest management system, a basic knowledge on biology of the pest is essential. The fruit is popular as a kitchen garden fruit; therefore, use of insecticides is not feasible, causing toxic and environmental hazards. Eco-friendly and sustainable methods of pest control is the need of the present times.

Only chemical management of this pest has been tried in Kashmir and no IPM strategies have been developed so far. There is an urgent need to develop management strategies of pomegranate fruit borer which are more in harmony with environment. The increasing importance of pomegranate and pervasive nature of *D. epijarbas* and change in philosophy from chemical control to integrated pest management, have necessitated to undertake studies on the pest with the following objectives:

Materials and Methods

An experiment was performed on ovipositional preference of females of Anar butterflies in cages (18´´x18´´x18´´) under laboratory condition (at ambient room temperature and relative humidity) the Division of Entomology, SKUAST-K, Shalimar during 2012. Care was taken to tag the young flower buds with the date of emergence. Accordingly, the age of the fruit was calculated from the date of bud emergence. Five numbers of each of the below mentioned plant parts were kept randomly in each cage. Five pairs (laboratory reared population) of adults were released in each cage for free choice oviposition. Adult butterflies were fed with 50% honey solution for maintenance.

Different parts of plant material

Flower bud
Flower
Fruit let stage (10-20 days)
Young fruit (30-40 days)
Stalk
Leaves
Mature fruits

No. of adult pairs/replication: 05
No. of Replications: 04
Design of Experiment: CRD

Results and Discussion

The present investigations on the ovipositional behaviour of fruit borer (*Deudorix epijarbas*) revealed that adult female laid eggs on flowers and fruits and also on stalk and leaves within the vicinity of fruiting parts. The egg distribution pattern studies (Table 1) revealed that more number of eggs (63.75) was laid on 30-40 days old fruits with a percentage (52.46) mainly on calyx cup followed by 19.00 laid on matured fruits, which accounts for 5.63 per cent. Other plant parts viz., flower buds, fully opened flowers, leaves, stalk and fruit let stage were least preferred by *D. epijarbas* adults for oviposition and received 6.25 (5.14%), 5.00 (4.11%), 6.00 (4.93%), 9.50 (7.81%) and 12.00 (9.87%) eggs, respectively. Eggs laid on flower bud, fully opened flower and leaves were at par. However, eggs received on stalk, fruit let stage, young fruit and mature fruit differed significantly.

Table.1 Preference by *D. epijarbas* adults for oviposition in different plant parts

Fruiting parts of pomegranate	No. of eggs laid	% egg laying
Flower bud	6.25[a]	5.14
Fully opened flower	5.00 [a]	4.11
Leaves	6.00 [a]	4.93
Stalk	9.50[b]	7.81
Fruit let stage	12.00[c]	9.87
Young fruit	63.75[e]	52.46
Mature fruit	19.00[d]	15.63
C.D(p≤0.05)	**2.367**	-

These findings are in consonance with similar report of Murugan and Thirumurugan (2001) and Karuppuchamy *et al.,* (1998) who revealed that some of chemical cues present in young fruits might have attracted the lepidopterans pests to lay more eggs on them. According to Thirumurugan (1992), 30 days old fruits recorded the highest amount of amino acids and sugars. Further, *D. isocrates* adults preferred the calyx cup region for egg laying may be ascribed to the constant stimulants and volatiles present in that region (Thompson and Pellmyr, 1991) and lower amount of tannin and total phenolics when compared to fruits (Karuppuchamy *et al.*, 1998).

Means followed by a common letter in a column are not significantly different at 5% level of by DMRT

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