

- Short communication

Consumption of hogplum (*Spondias mangifera*) leaflet by immature and adult stages of hogplum beetle (*Podontia 14-punctata* L.) under laboratory condition

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The fruit of hogplum (*Spondias mangifera* Wild.) is locally known as Amra which is very much popular fruit in Bangladesh. Its fruits are edible, delicious and sources of vitamin C and carotene (Mondal & Amin, 1990). In most cases it is consumed in green stage and is also used as prickle, chattni, murabba, etc (Ahmed, 1969). The hogplum is a deciduous perennial tree with thick succulent leaves and it grows all over the country. But the quality fruits are produced only in the southern districts of Bangladesh (Sarder & Mondal, 1983), especially in Barisal and Patuakhali districts (Uddin & Khan, 2014). Its cultivation is seriously hampered by hogplum beetle or fourteen spotted leaf beetle. The fourteen spotted leaf beetle, *Podontia quaturdecempunctata* or *Podontia 14-punctata* L. (Chrysomelidae: Coleoptera) is distributed throughout South East Asia and feeds on *S.mangifera* Wild (Anacardiaceae) in Bangladesh (Husain & Ahmed, 1977; Howlader, 1993).

In Bangladesh, the beetles appear in June, abundant during July to September and disappear in October. The peak period of defoliation is August and September (Baksha, 1997). The beetles cause serious damage from March to August with two generations in a year (Mondal, 1975). Both adults and grubs of this beetle feed on the leaves of the hogplum (Ahmed, 1969; Mondal, 1975; Sarder & Mondal, 1983) and heavy infestation often cause complete defoliation of the tree during peak period. Their attack results in stunted growth of the plant and eventually reduces the fruit size and yield (Mondal, 1975). During severe infestation the larvae devour the old leaves, tender parts of stems, and even the green barks of the plants (Howlader, 1993). The knowledge of feeding rate of any insect pest can help in determining damage potential and management strategies of insect pest. Considering the above facts, the research work was undertaken to measure leaflet consumption rate of hogplum by immature and adult stages of Hogplum beetle (*Podontia 14-punctata* L.).

Experiment was conducted in the Entomology laboratory, Department of Patuakhali Science and Technology University (PSTU), Dumki, Patuakhali Bangladesh, during April to October, 2013. The laboratory experiment was carried out under normal room temperature ($32 \pm 2^{\circ}\text{C}$) and relative humidity ($85 \pm 5\%$) with a $14 \pm 2:10 \pm 2$ light and dark cycle (L:D) following completely randomized design (CRD) with 3 replications.

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Leaflet consumption by larvae: The leaflet consumption by different instars of larvae of *P. 14-punctata* was measured in terms of leaflet weight (g) and area basis consumed. Ten plastic pots were used. Fresh hogplum leaflets with uniform age and thickness were collected. The leaflet was placed at the bottom of the plastic pot in an erect condition. To maintain uniform ages and thickness of leaflets the sixth leaflets from the tip of the twigs were selected to feed the larvae. Sands and soil mixture (1:1) was placed at the base of the pot and maintained a thickness of 3 cm for pupation.

The weight of leaflets was taken using electronic balance before placing them in the pot for feeding. Single newly hatched larva was placed in each pot and was covered with a piece of mosquito net. Larval moults and eating pattern of the larvae were recorded. Fresh leaflets were provided regularly by replacing the previous one. Daily (for 24 hours; on weight basis) leaflet consumption was determined by the differences of weight of leaflets recorded before and after feeding by each larval instar. The quantity (for 24 hours on area basis) of leaflet consumed by larvae was also determined by using asquare mm graph paper.

Leaflet consumption by adult male and female: Twenty plastic pots were prepared with fresh leaflets of hogplum and sand: soil mixture as described earlier. Ten pots were used for male and another ten for female adult beetles. One male or female adult beetle was placed in each plastic pot. The mouth of the each pot was covered with a piece of mosquito net. Feeding pattern of the male and female beetles was observed. The leaflet consumption for 24 hours on weight basis was determined by the differences of weight of leaflets recorded before and after feeding for each male and female adult beetle. The quantity (for 24 hours; on area basis) of leaflet consumed by larvae was also determined by using square mm graph paper.

Leaflet consumption by different larval instars, male and female beetles after 24 hours on weight and area basis: The leaflet consumption by different larval instars after 24 hours on weight basis ranged from 0.108 g to 0.908 g. The highest leaflet consumption (0.908 g) was recorded for 4th instar larvae and the lowest (0.108 g) was for 1st instar larvae. Similarly, leaflet consumed by different larval instars after 24 hours on area basis ranged from 29.28 mm² to 189.27 mm² while the highest leaflet consumption (189.27 mm²) by area basis was recorded for 4th instar larva and the lowest (29.28 mm²) was for 1st instar larva (Table 1) (Plate 1).

Table 1. Leaflet consumption by different larval instars, male and female beetles after 24 hours on weight and area basis under laboratory condition

Larval Instars	Leaflet consumption (g) after 24 hours (weight basis) (Mean ± SE)	Leaflet consumption (mm ²) after 24 hours (area basis) (Mean ± SE)
1 st instar	0.108 ± 0.002	29.28 ± 4.08
2 nd instar	0.203 ± 0.001	48.60 ± 4.02
3 rd instar	0.847 ± 0.002	123.50 ± 5.15
4 th instar	0.908 ± 0.003	189.27 ± 4.06
Male	0.25 ± 0.05	93.20 ± 13.27
Female	0.59 ± 0.11	308.30 ± 102.01

Values are average of 10 observations.

The leaflet consumption by adult male on weight basis ranged from 0.00g to 0.45g with an average of 0.25g. On area basis, leaflet consumption ranged from 0.00 mm² to 227.0 mm² with a mean of 93.20 mm² and standard error 13.27. In case of female, the range of leaflet consumption on weight and area basis was 0.00 - 1.41g and 0.00 - 794 mm², respectively. The average leaflet weight and area consumed by female was 0.59g and 308.30 mm², respectively with standard error 0.11 and 102.01, respectively (Table 1) (Plate 1). The findings of the present study are correlated with findings of Uddin & Khan (2014). During severe infestation the larvae devour the old leaves, tender parts of stems, and even the green barks of the plants (Howlader, 1993).



Plate 1. Consumption of hogplum leaflet by larvae (left and middle) and adult (right) of hogplum beetle

The rate of leaf consumption by the larva was increased with increasing its age. Female beetle consumed more area of leaf than male beetle.

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