

A record of stone weevil (*Aubeus himalayanus* Voss) (Curculionidae: Coleoptera) on ber in hot arid region of Bikaner, Rajasthan

The ber (*Ziziphus mauritiana* Lam.) is an important fruit crop growing in the marginal land of western hot arid Rajasthan. The productivity is low because of various biotic and abiotic stresses. Of these, the insect pests are major constraints causing significant loss. The pests like fruit fly (*Carpomyia vesuviana* Costa), chafer beetle (*Holotrichia* sp.) and bark eating caterpillars (*Indarbela tetraonis* Moore) (*Indarbela quadrinotata* Walker) are considered as major pests of this region (Singh, 2008). In addition, recently the severe incidence of fruit weevil, *Aubeus himalayanus* Voss (Curculionidae: Coleoptera) has been recorded in the Experimental Farm of Central Institute for Arid Horticulture, Bikaner during 2008-2009. The adult female weevil lays the eggs on the stylar end of fruits and newly hatched grubs enter into seed by making puncture in endocarp at immature stage and starts feeding on soft seed coat and later it enters into endosperm moving downward. After entering the seed, it starts feeding on inner content of the seed, and pupates within the seed by making hallow galleries. The weevil completes its life within a single fruit. The stone weevil has been reported as a new pest of ber in Karnataka (Balikai *et al.*, 1998), Rahuri and Jobner (Pareek and Nath, 1996). However, information available about this pest and its cause is very meager. This weevil is thought to be an emerging pest of ber in arid and semi arid region of India. Hence, the periodical observation has been made to study the status of this pest in this region.

The fortnight observation of stone weevil incidence on Gola and Seb varieties has been carried out through periodical

Table 1. Seasonal incidence of ber stone weevil, *Aubeus himalayanus* during 2008-09

| Month | Fortnight | Fruit weevil incidence (%) (Three sample / tree) | | | |
|---------------|-----------|------------------------------------------------------|--------|--------|--------|
| | | Cultivar | | | |
| | | Gola | | Seb | |
| | | Sample | Fallen | Sample | Fallen |
| October 2008 | I | 0.50 | 0.50 | 23.50 | 37.90 |
| | II | 21.90 | 57.90 | 35.90 | 85.20 |
| November 2008 | I | 26.70 | 41.00 | 47.90 | 66.80 |
| | II | 13.40 | 24.10 | 26.70 | 71.10 |
| December 2008 | I | 28.80 | 74.10 | 51.80 | 86.90 |
| | II | 23.80 | 69.90 | 51.10 | 89.80 |
| January 2009 | I | 12.20 | 25.10 | 33.00 | 40.10 |
| | II | 8.95 | 13.15 | 25.80 | 31.40 |
| February 2009 | I | 13.80 | 8.80 | 18.20 | 18.10 |
| | II | 6.10 | 2.00 | 10.40 | 14.00 |
| Overall mean | | 15.62 | 32.43 | 31.66 | 54.13 |
| SEm± | | 1.61 | 2.09 | 1.84 | 2.56 |

sampling from 10 unsprayed randomly selected ber trees of uniform vigour and size. The sample from selected branch of each tree was drawn from upper, middle and lower strata of the canopy. The total number of fruits and infested fruits from each branch were recorded and per cent infestation was calculated. Subsequently, the fruits of equal size with five sample consisting of 20 fruits were also drawn from the fallen fruits and per cent infestation was computed. To study the spatial variation within the tree, in relation to stone weevil damage, the data was recorded in cv. Seb from the branches selected in four directions of the tree (east, west, north, south) as well as at different heights of plant (0-1m, 1-2 m and >2 m). The weevil damage was examined by cuttings opening the fruit. Naked oviposition punctures are also counted as infested one. To assess the severity and intensity of weevil infestation on immature fruit dropping in each cultivar, throughout the season, the dropped fruits were collected and examined from surrounding the canopy of selected trees. The total number of dropped and infested fruits was recorded and percentage was worked out from three trees of each cultivars and the statistical mean comparison was worked out.

Throughout the season from October 2008 to February 2009 the incidence of fruit weevil was high in Seb variety compared with Gola. Initially it was recorded during Ist fortnight of October on Seb (23.50 %) and IInd fortnight of October on Gola (21.90 %). The maximum infestation (28.8 %) on Gola and Seb (51.8 %) was recorded during Ist fortnight of December from tree sample and Ist fortnight of December on Gola (74.10) and IInd fortnight of December on Seb (89.80) in fallen fruits (Table 1). The immature fruit dropping was maximum (48.52 %) in IInd fortnight of November in Gola and IInd fortnight of October (73.48 %) in Seb (Fig. 1&2) and it was always high in Seb than Gola. At Udaipur, the maximum infestation of stone weevil was in the cultivar Seb followed by Mundia and Umran and it destroyed 10 per cent of fruits (Srivastava and Nanda, 1983). The stone bulb ratio and fruit shape might be the reason for higher damage. The overall pooled mean damage was 23.63 and 43.28 per cent in Gola and Seb, respectively and the significant variation was observed among the two cultivars with respect to mean per cent incidence of stone weevil (Table 2). The data on intra tree distribution (east, west, north and south) of stone weevil

Table 2. Mean comparison of stone weevil incidence on different varieties of ber

| Variety | Mean damage (%) | | Pooled mean |
|---------------|-----------------|---------------|-------------|
| | Tree sampled | Ground fallen | |
| Gola | 15.62 | 32.43 | 23.63 |
| Seb | 31.66 | 54.13 | 43.28 |
| Over all mean | 23.64 | 43.28 | 33.45 |
| T-Valu | 8.31 | 14.81 | 7.88 |

Significant at 0.05 probability level

Table 3. Intra -tree distribution of stone weevil incidence in ber cv. Seb

| Direction of quadrate | Mean damage (%) | Stratum of branches (height m) | Mean damage (%) |
|-----------------------|-----------------|--------------------------------|-----------------|
| East | 32 (5.50) | 0-1 m | 33 (5.61) |
| West | 21.3 (4.45) | 1-2 m | 22.05 (4.43) |
| North | 38.66 (6.07) | >2 m | 16.65 (3.88) |
| South | 17.33 (3.94) | | |
| Row mean | 27.33 | | 23.96 |
| CD (0.05) | NS | | NS |

* Figures in parentheses are square root transformed values

incidence showed non significant differences. However, the maximum infestation was observed in the northern (38.66 %) and eastern (32 %) side of the tree. The mean per cent damage from different stratum of branches shows non significant differences. However, the branches which are selected just above the ground (0-1 m), showed maximum (33 %) infestation compared to the braches at 1-2 m and above 2 m height from the ground (Table 3). The branches near the ground might be suitable for adults, emerging from residues or surviving population in the tree. Generally the infestation decreased from lower branches to the top branches. In both cultivars, the seed infestation was higher in the fruits collected from the ground compared to those collected from plants. It was very severe during early stage of development (Qumruzzaman *et al.*, 2009). The data revealed that the weevil infestation was found throughout the season with two peaks at mid-November and December in Gola and Seb and intensity of damage and fruit drop was more during early stage of fruit development. The fruits infested after 75 per cent of

maturity showed only the egg laying punctures and it did not favour the larval development. However, detailed studies are needed as it is an emerging pest of ber to arid and semi-arid region of India.

Fig.1. Fruits drop Vs Stone weevil incidence on ber (Gola)

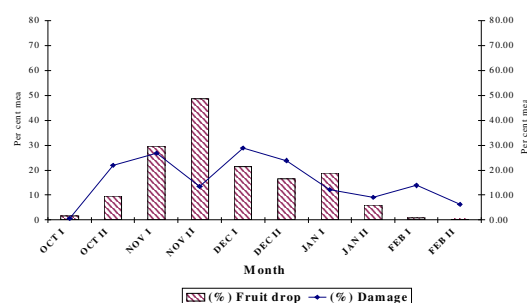
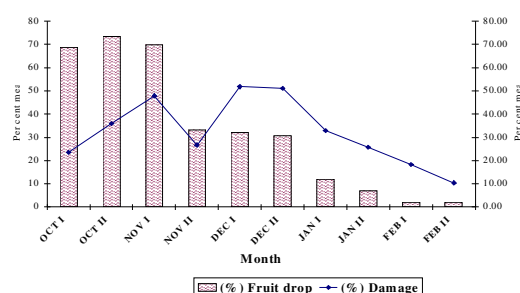


Fig. 2. Fruits drop Vs Stone weevil incidence on ber (Seb)



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