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## RESEARCH ARTICLE

# STORAGE INSECT PESTS OF GUAVA PSIDIUM GUAJAVA LINN

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**ABSTRACT**

Guava Psidium guajava Linn. is native of tropical America and introduced in India in early 17th century and at present it has occupied an area of more than 60,000 acres in India. It has great nutritional value as fruits contain a very rich vitamin-C and - A and contain good amount of calcium. However, the crop is attacked by more than 80 species of insects. Therefore, fruit production sale and its proper utilization play an important role for earning good dividend. At ripening and storage stage the fruits were damaged by fruit flies Dacus spp., White flies, Aleurocanthus and Dialeurodicus, Thrips Selenothrips, Aphid, Coccids and mealy bugs, Drosophilla spp., etc. The protection of fruits from insects is essential part of guava economics. Pest occurrence and damage to crop and pest control strategies are given in the paper.



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## INTRODUCTION

Guava *Psidium guajava* Linnaeus is native of tropical America but is now pantropical in distribution (Butani, 1979). Although it has accupied an area of 60,000 hectares, in India it was introduced in early 17th century. Uttar Pradesh is leading states in India for Guava cultivation. The guava fruits contain a very rich vitamin-C and A and calcium relatively with fair amount. Jam, jelly and fruit butter are prepared with the guava fruits. The drought resistant crop can be grown in varying soil conditions. The area of cultivation of guava is fairly increasing in Maharashtra in recent years. However, the crop is attacked by about 80 species of insect pests. Out of which 20 insects are quick troublesome to the crop. The production of fruits during harvesting and after harvesting (storage stage) is essential part of guava economics. The insect pests associated with fruit harvesting or storage stage are discussed with respect to their diversity, feature, cycle, damage and control. Review of literature indicates that insect pests associated with ripening stage have been studied by several workers. Note worthy amongst them refer to Atwal (1976), Butani (1979), Talgeri (1967, Mehta and Verma (1968), Ayyar (1963), Hill (1975), Sathe (1999, 2003, 2012, 2014, 2015), Sathe and Gangate (2015), etc.

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## MATERIALS AND METHODS

Kolhapur is situated between $15^0$ to $17^0$ north latitude and $73^0$-$74^0$ east longitude with an average rain fall 1200mm, temperature $9^0$ to $40^0$C and 55% to 85% R. H. Based on climatic variation, 3 spots namely, Hatkanangale, Kolhapur and Radhanagari were selected for the present study. The survey of insect pests found on ripening fruits on crop and storage fruits have been carried by one week interval by spot observations/collection of insect pests. For scale insects, mealy bugs, white flies and fruit flies 1 ft long twig of crop with all possible fruits have been selected for noting the density of pests. The best time for survey was 7.00 to 8.00 am. The fruits dropped under the crop tree have also been examined for the pest occurrence and damage caused to fruits. Three stored receptacles have been also observed for noting infestation of insect pests to fruits at morning hours for 3 to 4 days. For control measures of pests on ripening fruits 0.03% Azadirachtin and some others pesticides have been used. Similarly, preventive control measures like scraping with wooden knife and clearing fruits with clean muslin cloth have also been practiced on stored fruits at morning hour. Nature of damage to fruits with respect to its shape, size, sooty mould, wounds, cavities, bores, etc have also been noted.

## RESULTS

Results recorded in Table 1 to 3 and Figs 1 to 4 indicated that fruit fly *D. dorsalis* was found on the crop throughout the year.

**Table 1. Insect pest diversity, life cycle, damage and control on guava**

| Sr. no. | Species | Life cycle | Damage | Hosts | Control |
|---|---|---|---|---|---|
| 1. | *D. dorsalis* | Life cycle form egg to adult completed in 2 to 4 days | Infested fruits showed depressions, dark greenish punctures and small exits; larva feed on pulpy content of fruits. | banana, citrus, mango, papaya, melons, brinjal. | Spray 0.03% Rogor or Phosphamidon (or) Azadirachtin. |
| 2. | *C. pisidii* | Life cycle completed within 2.5 to 3 months | Scales remained stick to the fruiting bodies, fruits, showed sooty moulds and disfiguring. Fruits start rotting from infested area. | citrus, mango, jamun, jackfruit, sapota, litchi, etc. | Spray 0.1% dichlorovos (or) 0.3% Azadirachtin |
| 3. | *A. dispersus* | Life cycle completed within 20- 40 days | Infected fruits disfigured, noted depressions, sooty moulds and dark spots. White powdery material found on fruits. | mango, fig, citrus, jamun, jackfruit; all kinds of fruits, ornamental plants and vegetables. | Spray 0.3% Azadirachtin (or) malathion (or) 0.02% phosphamidon |
| 4. | *D. mangiferae* | Life cycle completed within 30 days | Malformation and depression to fruits. | mango, citrus, grapevine, fig, papaya, mulberry, etc. | Spray 0.3% Azadirachtin (or) malathion (or) 0.02% phosphamidon |
| 5. | Aphid and Thrips | Many generations completed | Malformation and depression to fruits. | mango, citrus, grapevine, fig, papaya, mulberry, etc. | Spray 0.3% Azadirachtin (or) malathion (or) 0.02% phosphamidon |

**Table 2. Pest biocontrol agents on guava**

| | | |
|---|---|---|
| 1. | *D. dorsalis* | *Ophius* spp. – *Dirhinus* sp. |
| 2. | *D. mangiferae* | *Chrysopa* sp. (predator) *Rodalia* sp. (predator) |
| 3. | *C. pisidii* | Lace wings (predator) |
| 4. | Aphids | Lady bird Beetle (predator) |

**Table 3. Occurrence of insect pests on ripening fruits of guava in Kolhapur**

| Sr. no. | Insect name and place | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | March | April | May | June |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | *D. dorsalis* | 2 | 2 | 3 | 4 | 5 | 5 | 8 | 8 | 8 | 9 | 8 | 7 |
| 2. | *C. pisidii* | 2 | - | - | - | - | - | - | - | 3 | 5 | 5 | 4 |
| 3. | *A. dispersus* | 5 | 8 | 6 | 6 | 2 | - | 2 | 6 | 8 | 8 | 8 | 6 |

**Fig. 1. *D. dorsalis* damaged fruit (Early stage)**

**Fig. 2. *D. dorsalis* damaged fruit (Later stage)**

Its intensity was high from January to June; scale insect *C. psidii* occurred during the summer months while, white fly was very dominant and found throughout the year. Its population was declined during the month November to January and steadily increased during the summer and monsoon months. *Selenothrips* sp. was also found on the crop with less intensity. Similarly, mealy bug *Drosicha mangiferae* (Green) (Hemiptera: Coccidae) and Aphid *Aphis gosypii* Glover (Hemiptera: Aphidae) were also associated with the ripening fruits occasionally and found sucking the cell sap of fruits.

Drosophila spp. was found affecting storage crop. Therefore, the fruits be stored in cool place, go down having temperature range 8-10$^0$C. Life cycle, nature of damage, host plant parts and chemical and biological control measures are suggested in Table 1 and 2.

Preventive control measures for above pests refer to,

1. Collection and destruction of crop plant parts infected by pests.

**Fig. 3. *A. dispersus* damaged fruits**

**Fig. 4. Guava fruits damaged by *Drosophila* spp**

2. Clearing fruits with muslin cloth.
3. Scrapping fruits with wooden knife for removing scale on the fruits and sooty moulds.

## DISCUSSION

Since *P. ghajava* fruit have great nutritive and medicine value, they should be protected from insect pests. According to Butani (1979) about 80 species of insects are associated with *P. ghajana*. Out of which 20 species were more dangerous to the crop. The major pests he reported on guava refer to fruit flies, bark eating caterpillar, castor capsule borer and many cell sap suckers such as white flies, scales, mealy bugs, Aphids, thrips, tea mosquito bug, etc. The weevils are also very serious pest of mango both at fruting bodies and leaves. All above pests affected the yield of crop adversely. At rippening stage of fruits, fruitflies were major pests in India (Butani, 1979). The fruit fly diversity reported on this crop refer to *Dacus dorsalis* (Hendel), *Dacus cucurbitae* (Coquillett), *Dacus zonatus* (Saunders) and *Dacus diversus* (Coquillett). The maggots of above species were found feeding on pulpy content of the fruits and contaminated the fruits by secondary infection, causing necrosis.

A good number of scales insects and mealy bugs have been reported on the guava (Butani, 979). Those were mostly polyphagous which suck the cell sap from tender parts of the crop such as leaves and twigs including fruits. Mealy bugs exuded sweet sticky substance, honey dew on which sooty mould developed due to saprophytic fungus, which affected photo synthesis and growth of the crop and finally affected the quality and quantity of fruits. The present results are in agreement with the previous finding. *Chloropulvinaria psidii* was reported from South India, Pujab, Uttar Pradesh and Maharashtra as a potential pest of guava and several other horticulturel crops (Butani, 1979).

It has also been reported from Bangladesh and Shri-Lanka on guava. In Maharashtra it was responsible for damaging, storage, rippening and developing fruits. White flies such as *Aleurocanthus rugosa* Singh, *A. woglumi* Ashhy, *Alerotuberculatus psidii* (Singh) and *Pealius misrae* Singh have been recorded on guava on as cell sap suckers on tender leaves as a miner pests. However, *A .dispersus* was found to be the dominant on guava in Maharashtra. Recently, Sathe and Gangate (2015) studied the host plants of *A. dispersus* from Kolhapur region of India. They reported 8 host species from this region. The important hoste were Guava, Brinjal, China raised, Custard apple, Rose, Mango, Citrus and Terminalia. They also studied the seasonal abundance and migratory behavior of *A. dispersus*. Pest control with insecticides on horticulture and edible crops is not without danger therefore, ecofriendly control measures are to be designed for the safty of humans, other organisms and the environment (Sathe, 2014, 2015). However, the control measures suggested in the text for insect pests will add great relevance in crop protection.

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## REFERENCES

Atwal. A.S. 1976. Agricultural pests of India and South east Asia. Kalyani public. New Delhi. pp 199 – 247.

Ayyar. R.T.V. 1963. Hand book of economic entomology for south India.516 pp. Government of Madras, Madras (21, 60, 108, 256). Butani P.K.1979.Insects and Fruits, Khosale and Pragati Printers Dehli-pp 55-60.

Hill, D.S. 1975. Agricultural Insect pests of the tropics and their control. 516 pp. Cambridge Uni. Press, Cambridge.

Mehta, P.R. and Verma, B.K. 1968. Plant protection. 587 pp. Directorate of extension, ministry of food, agriculture, community development and cooperative, New Delhi (57,108)

Sathe, T. V. and Gangate, U. 2015. Hosts plants for White fly *Aleurodicus dispersus* (Russel) from Kolhapur region, India. *Int.J.Rec.Sci.Res*,6 (2), 2817-2820.

Sathe, T.V. 1999. White fly *Aleurodicus dispersus* a new pest of guava. *Psidium gnajava* in Kolhapur. *Indian J. Ent*, 61,195-196.

Sathe, T.V. 2003.Agrochemicals and Pest Management, Daya Publishing House, pp 1-217.

Sathe, T.V. 2012. Pests of Ornamental plants, Daya Publishing House, New Dehli pp.1-99.

Sathe, T.V. 2014. Recent trends in biological pest control. Astral Int. pvt. Ltd. New Delhi. Daya publishing House. pp 1-204.

Sathe, T.V. 2015. Biological pest control through Ichnenmonids. Astral Int. pvt. Ltd. New Delhi. Daya publishing House. pp 1-117.

Talgeri, G.M. 1967. Entomology section in retrospect. *Poona Agri. Coll. Mag.,* 57 (4), 84 – 100.

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