RESEARCH ARTICLE

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Organoleptic Index of Guava and Current Status of Insect Pest Problems

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ABSTRACT

Guava is an important fruit in India. It is majorly growned in Utar Pradesh specially Allahabad region is very famous for this. Guava (*Psidium guajava* L.) is rich in nutrients for general health and daily intake of essential nutrients. Now a days, health professional listed this fruit in medicinal value properties material. It is very helpful in diabetes, constipation and other illness. Many insects are infesting Guava (*Psidium guajava* L.) causing damage to fruits because it is very soft and prone to pests attack. In the present study, an effort was made to document the beneficial organoleptic properties of guava and sampling strategies for pest infestation and diseases.

Key words: Organoleptic Index, Guava, Pest Problems

INTRODUCTION:

About 80 species of insect pests have been recorded on guava, but only few of them had been identified as pest of regular occurrence and causing serious damage. These are bark eating-caterpillar (*Indarbela* spp.), fruit fly (*Bactrocera* spp.) and scale insect (*Chloropulvinaria psidii*). The bark eating-caterpillar and fruit flies have wide distribution, while scale insects and mealy bugs are more common in south India and tea mosquito bug, *Helopeltis antonii* (Signoret) in central India. However, studies conducted in the recent past has revealed some of the important facts throwing further light on the occurrence and status of insect pests on this crop. Intensive surveys of guava growing regions of Uttar Pradesh revealed of fruit borer, *Deudorix isocrates* (Fab) the increase in incidence (2.5-22.5%) with crop loss range of 5.00 to 35.00 per cent. Common occurrence of another fruit borer, *Dichocrocis punctiferalis* (Guenee) in rainy season guava was also noticed. Fruit flies have been a major limiting factor in production of rainy season guava. Infestation of fruit fly ranged from 20.00 to 46.00 per cent with crop loss of 16.00 to 40.00 per cent, which is a matter of serious concern. Infestation of scale insects, aphids and mealy bugs, on leaves, shoots and fruit was also common in most of the orchards surveyed but these insects were in check by the presence of their natural enemies. Mite and shoot borer were recorded for the first time from the region. The infestation of these pests because drying and dying of affected leaves and twigs which adversely affect growth of plants, flowering and fruiting. These insects have to be identified and studied in detail. The two insect pests introduced recently in India need special attention, i.e., spiralling white fly, *Aleurodicus dispersus* (Russel) in South India and stem borer, *Aristobia testudo* (Voet) in North-East region. Efforts are needed to keep a watch on development of these insect pests and to follow strict quarantine regulation to check the further spread of introduced pests. The present paper deals with the insect pests recorded on guava along with detailed discussion on important ones.

Guava (*Psidium guajava* L. Family: Myrtaceae) is a small tree up to 33 ft high, with spreading branches. The guava plant is easy to recognize because of its smooth, thin, copper-colored bark that flakes off, showing the greenish layer beneath; and also because of the attractive, "bony" aspect of its trunk which may in time attain a diameter of 10 inch. Young twigs are quadrangular and downy. The leaves are aromatic when crushed,

evergreen, opposite, shortpetioled, oval or oblong-elliptic, somewhat irregular in outline; upto 6 inch, up 2 inch wide, leathery, with conspicuous parallel veins, and more or less downy on the underside. Faintly fragrant, the white flowers, borne singly or in small clusters in the leaf axils, are 1 inch wide, with 4 or 5 white petals which are quickly shed, and a prominent tuft of perhaps 250 white stamens tipped with pale-yellow anthers. The fruit, exuding a strong, sweet, musky odor when ripe, may be round, ovoid, or pear-shaped, 2 to 4 inch long, with 4 or 5 protruding floral remnants (sepals) at the apex; and thin, light-yellow skin, frequently blushed with pink. Next to the skin is a layer of somewhat granular flesh, 1/8 to 1/2 inch thick, white, yellowish, light- or dark-pink, or near-red, juicy, acid, subacid, or sweet and flavorful. The central pulp, concolorous or slightly darker in tone, is juicy and normally filled with very hard, yellowish seeds, 1/8 inch long, though some rare types have soft, chewable seeds. Actual seed counts have ranged from 112 to 535 but some guavas are seedless or nearly so. When immature and until a very short time before ripening, the fruit is green, hard, gummy within and very astringent.

Guava is another tropical fruit rich in high-profile nutrients. With its unique flavor, taste, and health-promoting qualities, the fruit easily fits into the category of new functional foods, often labeled as "super-fruits."It is an evergreen, tropical shrub or small low-growing tree probably originated in the central Americas. Guavas actually thrive well under both humid and dry climates and can tolerate brief periods of cold spells, but can only withstand a few degrees of frost. Its adaptability to ranging environments makes it a favorite commercial crop in some tropical areas. Botanically, this wonderful fruit belongs to the family of Myrtaceae, of the genus: Psidium. Scientific name: *Psidium guajava*. During each season, a guava tree bears many, round to ovoid or pear-shaped fruits, each about 5-10 cm long and weigh around 50–200 g. Different cultivar types of guava grown all over the world which may vary widely in flavor, pulp color, and seed composition.

The fruit is soft when ripe with sweet musky aroma and creamy texture. Internally, its flesh varies in color depending up on the cultivar and may be white, pink, yellow, or red. Ripe fruits have a rich flavor with a sweet-tart taste. Each fruit contains numerous tiny, semi-hard edible seeds, concentrated especially at its center.

Guava is low in calories and fats but carry several vital vitamins, minerals, and antioxidant polyphenolic and flavonoid compounds that play a pivotal role in the prevention of cancers, aging, infections, etc. The fruit is a very rich source of soluble dietary fiber (5.4 g per 100 g of fruit, about 14% of DRA), which makes it a good bulk laxative. The fiber content helps protect the colon mucosa by decreasing exposure time to toxins as well as binding to cancer-causing chemicals in the colon. Guava-fruit is an excellent source of antioxidant vitamin-C. 100 g fresh fruit provides 228 mg of this vitamin, more than three times the required DRI (daily-recommended intake). Flesh just underneath its thick outer rind composes exceptionally higher levels of vitamin-C than its inner creamy pulp.

Scientific studies suggest that regular consumption of fruits rich in vitamin-C helps the human body develop resistance against infectious agents and scavenge cancer causing harmful free radicals from the body. Further, it is essential for collagen synthesis within the body. Collagen is one of the chief structural proteins in the human body necessary for maintaining the integrity of blood vessels, skin, organs, and bones. The fruit is a very good source of Vitamin-A, and flavonoids like beta-carotene, lycopene, lutein and cryptoxanthin. The compounds are known to have antioxidant properties and therefore essential for optimum health. Further, is also critical to maintaining healthy mucosa and skin. Consumption of natural fruits rich in carotene is known to protect from lung and oral cavity cancers.100 g of pink guava fruit provides 5204 µg of lycopene, nearly twice the amount than in tomatoes. (100 g tomato contains 2573 µg of lycopene). Studies suggest that lycopene in pink guavas prevents skin damage from UV rays and offer protection from prostate cancer. Fresh fruit is a very rich source of potassium. It contains more potassium than other fruits like banana weight per weight. Potassium is an

important component of cell and body fluids that helps controlling heart rate and blood pressure.

Further, the fruit is also a moderate source of B-complex vitamins such as pantothenic acid, niacin, vitamin-B6 (pyridoxine), vitamin E and K, as well as minerals like magnesium, copper, and manganese. The human body uses manganese as a co-factor for the antioxidant enzyme, superoxide dismutase. Copper required for the production of red blood cells.

FRUIT FLY BIOLOGY:

Egg:

Under optimum conditions, a female can lay more than 3,000 eggs during her lifetime, but under field conditions from 1,200 to 1,500 eggs per female is considered to be the usual production. Development from egg to adult under summer conditions requires about 16 days.

Larva:

The mature larva emerges from the fruit, drops to the ground, and forms a tan to dark brown puparium.

Pupa:

Pupation occurs in the soil. About nine days are required for attainment of sexual maturity after the adult fly emerges.

Adult:

Brown or dark brown with hyaline wings and yellow legs.

DAMAGE SYMPTOMS:

- Adults and maggots attack semi-ripe fruits
- Oviposition punctures on fruits
- Maggots destroy and convert pulp into a bad smelling
- Discoloured semi liquid mass

SAMPLING FOR INSECT PESTS:

Aphids, whitefly: Count and record the number of both nymphs and adults on five randomly selected leaves per plant. Thrips: Count and record the number of nymphs and adults of thrips present on five terminal leaves per plant (tapping method also can be used to count thrips). Fruit fly: Hanging of bottle traps containing 100 ml water emulsion of methyl euginol (0.1%) + malathion (0.1%) during fruiting season (April - July) is very effective for control of fruitfly. Ten traps per hectare of orchards gives satisfactory control. For diseases: Whenever scouting, be aware that symptoms of plant disease problems may be caused by any biotic factors such as fungal, bacterial, viral pathogens or abiotic factors such as weather, fertilizers, nutrient deficiencies, pesticides and abiotic soil problems. In many cases, the cause of the symptom is not obvious. Close examination, and laboratory culture and analysis are required for proper diagnosis of the causal agent of disease. Generally fungal diseases cause the obvious symptoms with irregular growth, pattern & colour (except viruses), however abiotic problems cause regular, uniform symptoms. Pathogen presence (signs) on the symptoms can also be observed like fungal growth, bacterial ooze etc. Specific and characteristic symptoms of the important plant diseases are given in description of diseases section.

Root Sampling:

Always check plants that appear unhealthy. If there are no obvious symptoms on plants, examine plants randomly and look for lesions or rots on roots and stems. Observe the signs of the causal organism (fungal growth or ooze). It is often necessary to wash the roots with water to examine them properly. If the roots are well developed, cut them to examine the roots for internal infections (discolouration& signs). Count the total number of roots damaged/infested/infected due to rot should be counted and incidence should be

recorded. Leaf sampling: Examine all leaves and/or sheaths of each plant for lesions. Leaf diseases cause most damage during the seedling and flowering stages of plant growth. Observe for the symptoms and signs on the infected plant parts. Determine the percent area of leaf infection by counting the number of leaves (leaf area diameter)/plant infected due to disease and incidence should be recorded.

Fig. 1: Infected Guava

Stem, Flower And Fruit Sampling:
Carefully examine the stem, flower, and fruit of plants for symptoms and signs of fungal or bacterial diseases. The stem, flower, and fruit should be split or taken apart and examined for discoloration caused by fungi and bacteria. Count the number of stems, flowers and fruits infected due to disease and percent disease incidence should be recorded. C. Yellow/blue pan water/sticky traps set up yellow pan water/sticky traps 15 cm above the canopy for monitoring whitefly and blue sticky traps for thrips @ 4-5 traps/acre. Locally available empty tins can be painted yellow/blue and coated with grease/Vaseline/castor oil on outer surface may also be used. D. Light traps set up light trap @ 1 trap/acre 15 cm above the crop canopy for monitoring and mass trapping insects. Light traps with exit option for natural enemies of smaller size should be installed and operate around the dusk time (6 pm to 10 pm).

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