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# Introduction to major post-harvest diseases of *guava*

**Sumia Fatima**

Pesticides and Plant Protection Research Laboratory, Dr. Rafiq Zakaria College for Women, Aurangabad-431001, (M.S.) India.

## ABSTRACT

Guava fruits are attacked by several fungi, bacteria and other agents causing different types of disease symptoms. The injured guavas get infected by fungal forms during transportation and storage periods. Over 25 to 30 per cent loss of fruits are caused by fungal diseases in transit and storage. The common fungal forms easily penetrate into injured fruits in godown during storage period. The mycoflora isolated from infected fruits of guava collected from fruit store houses was *Alternaria, Aspergillus, Colletotrichum, and Curvularia. Fusarium, Monilia, Penicillium, Pestalotia, Phytopthora and Rhizopus* as noted in table. Each post harvest fungus causes a particular type of symptoms. Different types of symptoms caused by post harvest fungi observed and noted in table.

**Keywords:** Guava, post-harvest mycoflora, rot symptoms,

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***Address for Correspondence:**

Sumia Fatima, Pesticides and Plant Protection Research Laboratory, Dr. Rafiq Zakaria College for Women, Aurangabad-431001, (M.S.) India.

## INTRODUCTION

Guava is the richest source of phosphorous and is a very important fruit of India. It is native of Tropical America. There are reports of its cultivation in India since 17thcentury. Guava grows as a wide range of environment. It is cultivated for its fruits in all states of India. It is fruit tree which can grow in poorly drained soils, it do not require more fertilizers. There are some wild species of guava occur at various places in India, its fruits are edible but those are not cultivated at commercial state. There are different colours of fruit occur in cultivated guava, that depends on its variety. The important commercial verities of guava are strawberry guava, yellow fruited which is common in southern parts of India, Guinea guava has small sized fruits with whitish pulp. In the hills of South India a pineapple guava is extensively cultivated for its elongated fruits. Safeda is a famous name of a variety of guava which is extensively cultivated at Allahabad. It is smooth walled spherical shaped guava, Buxton and Mellanby, (1934). The Hafsi is a variety which consists of red pulp. Other important varieties which are cultivated in India are Dharwar which is commonly grown at Karnataka state. Nasik variety is famous in Maharashtra and Dholka is also cultivated in large scale at commercial basis. The fruit is susceptible for most of the mycoflora. The pathogenic organisms cause a variety of symptoms in the infected fruit. The injured guava gets infected by fungal forms during transit am storage. The common fungal farms grow on injured fruits in go down during storage are *Alternaria, Aspergillus, Colletotrichum, Curvularia. Fusarium, Monilia, Penicillium, Pestalotia, Phytopthora* and *Rhizopus* etc. Soft or pulpy fruits undergo a soft or wet rot because of the abundance of water in their tissue (Defosent 1933).

## MATERIALS AND METHODS

The infected fruits of each type rot disease of guava collected from godowns of fruit market. From the same lot 10 immature healthy fruits were collected in a sterile polyethylene bag and brought to the laboratory. A separate polyethylene bag was used for each fruit and each type of fruits. One infected fruit in one bag (Linskens and Jackson, 1995). A separate bag was used even for healthy immature fruits (Bagwan, 2010). The fungus responsible for post-harvest rot of guava fruit was isolated on PDA (Potato Dextrose Agar) medium. Before inoculation the infected fruit was surface sterilized with the help of 0.1% HgCl2 solution and then rinsed with the solution of sterile distilled water for 4-5 times. Then a small piece of infected region of fruit was removed with the help of sterile knife or needle and the piece was kept on PDA (Potato Dextrose Agar) medium amended plates in sterile condition. The inoculated petiriplates were incubated at room temperature 25+-$^{0}$ C. The fungus growing from the inoculated infected piece was inoculated on PDA medium. To get pure culture of the fungus a single hypha was removed from the inoculated petriplate and inoculated on freshly prepared PDA medium amended petriplate. To find out the pathogenecity of the

isolated fungus, a 4mm disc of growing colony was removed by sterile borer in sterile condition and inoculated on respective fruit. A set of 5 fruits was used to confirm pathogenecity. The pathogenecity was confirmed by following Koch's postulates. The mycoflora from different types of rot disease of guava fruits were isolated and confirmed the pathogenecity by the method mentioned above (Oyeleke and Manga, 2008).

The fungi were identified on the basis of morphological features, type of colony growth, colour of colony, size and shape of spores and pigmentation. The same procedure was repeated for each type of guava rot disease.

The post harvest fungi causing post harvest disease of guava noted and the symptoms caused by respective pathogen presented in table.

**Table:** Post harvest mycoflora associated with fruit rot of *guava* and their symptoms

| S. N. | Disease and pathogen | Symptoms |
|---|---|---|
| 1. | **Fruit rot of guava** *Guignardia psidii* | Dark brown water soaked spots appear on fruits at ripening stage. Only mature fruits are susceptible for infection, Lal, et.al, (1980). |
| 2. | **Fruit rot of guava** *Drechslera halodes f. sp. destrcutum* | Small, rounded, dark brown spots with light yellow margin occur on fruit .In advances stages, spots increase in size and cause soft rot of fruit. Affected fruits emit dirty odour, Lal, et.al, (1980). |
| 3. | **Fruit spots of guava** *Phomopsis sp.* | Numerous dark brown spots appear on affected fruit. In severe cases, fruit pulp becomes brown and soft. Dark black coloured necrotic spots appear on the fruits. Mc Rae,(1934); Singh and Thakur,(2005) |
| 4. | **Dry rot or Charcoal rot of guava** *Macrophomina sp.* | Dark Black coloured necrotic spots appear on the fruits. Spot is roughly circular. Infection reaches to the pulp. Pulp turns black in colour, Singh and Thakur,(2005). |
| 5. | **Fruit rot of guava** *Fusarium solani* | Disease starts as water soaked lesion on fruit surface. Gradually the spots increase in size. The center of spot is slightly depressed. Lesions increase rapidly. Skin and pulp of fruit becomes soft,Ranjana&Mehrotra (1980). |
| 6. | **Fruit rot of guava-** *Beltraniarh-ombica* | Water soaked spots develop on ripe fruit .Fruits become black within 6-7 days due to production of conidial mass of fungus.Meena, et. al, (2009). |
| 7. | **Soft rot of guava-** *Myrothecium roridum* | Small, circular slightly sunken olive grey spots appear on the fruit which later increase in size. Affected fruit get covered with white woolly mycelium with dark green viscid spore mass, Rai, et.al.,(1982a); Singh and Thakur,(2005) |
| 8. | **Fruit rot of guava-** *Physalospora psidii* | Diseases initiate from stylar end of the fruit and gradually the infection increases towards stem end region. The circular brown water soaked lesions occur first , later changes to dark brown, Stevens & Pierce,(1933); Rai, et.al, (1982 b) |
| 9. | **Fruit rot of guava-** *Botryodiplodia Sp.* | Brownish discolored areas occur mostly at the stem end region of the fruit. The infections extend or proceed down ward in an irregular manner. Rot is soft and watery, Patel & Patel, (1989). |
| 10. | **Fruit rot of guava-** *Pestalotia olivacea* | Brown water soaked lesions appear fist, which later turns russet coloured. In severe cases affected areas get covered with white puffy fungal growth with black pinhead like acervuli, Singh and Thakur,(2005). |
| 11. | **Fruit rot of guava-** *Alternaria charatrum* | Water soaked brown depressed lesions develop on injured areas of the fruit. Water soaked lesions ultimately cover the whole fruit, Sonkar, et. al,(2009). |
| 12. | **Fruit rot of guava-** *Phytopthora parasitica* | The infection starts at the stem region of the fruit. The infection spread slowly and cover up the entire fruit .Fruits get shrivel up and turn dark brown .The fruits become mummified and silky in texture. |
| 13. | **Fruit rot of guava** *Aspergillus niger* | The infected fruit show water soaked spots which later turns brown. The center of spot gets depressed. The affected areas get covered with black spores of the fungus, Sonkar, et. al,(2009). |
| 14. | **Black tip of fruit of guava-** *Helminthosporium atro- olivaceum* | Elongated spots with grey centers are formed on fruit which later change into large patches. The pulp of fruit turns black. Infection induces fast ripening of fruits, Singh and Thakur, (2005). |
| 15. | **Fruit rot of guava** *Phyllosticta psidii* | The infected fruit show dark brown spots. The spots affect the pulp of the fruit. In severe cases entire fruit get deteriorated, Srivastava, et.,al, (1964). |
| 16. | **Fruit rot of guava** *Phoma psidii* | Initially minute spots are developed on the fruit surface; The mature fruits are highly susceptible. Spots are slightly depressed. Later the spots become brownish and water soaked, Sudirchandra & Khanna, (1966); Meena, et. al, (2009). |
| 17. | **Black rot of guava** *Meliola psidii* | The disease is characterized by presence of velvety covering on the recently harvested fruits. In severe cases, whole fruit turn black due to occurrence of moldy growth of the fungus. Sonkar, et. al, (2009). |
| 18. | **Fruit rot of guava** *Penicillium decumbens* | The affected area of fruit becomes brown and watery which may break easily with little pressure. In heavy infections, fruits get covered with moldy growth of the fungus. Saha, (1945). |
| 19. | **Fruit rot of guava** *Aspergillus avamori* | Water soaked areas develop on the fruit t6hat enlarge with maturity of fruit and turn brown. The center of the spot get depressed,Sonkar, et. al, (2009). |

## RESULT:

The post harvest rot causing fungi isolated from infected guava fruits were *Guignardia psidii, Drechslera halodes f. sp. destructum, Phomopsis, Macrophomina sp., Fusarium solani, Beltraniarh-ombica, Myrothecium roridum, Physalospora psidii*, *Botryodiploidia sp., Pestalotia olivacea, Alternaria charatrum, Phytopthora parasitica, Helminthosporium atro-olivaceum*, *Phyllosticta-psidii, Phoma psidii, Meliola psidii, Penicillium decumbens* and *Aspergillus avamori.* After the confirmation of pathogenecity test by Koch postulates the symptoms of each type of diseases causing fungus presented in table.

GUAVA ROT
(*Phytopthora nicotianae var. parasitica*)

FRUIT ROT
*Gloeosporium psidii*

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