



STUDIES ON MARKET DISEASES OF GARLIC (*ALLIUM SATIVUM L*)



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ABSTRACT

*Garlic (*Allium sativum L*) is one of the most commercially cultivating crops from Maharashtra state of the India. Post harvest loss of garlic due to fungal diseases during storage period. Total 12 mycoflora observed on garlic bulbs. Surveyed of post harvest diseases include white rot, black mold, blue mold, brown rot, soft rot etc. caused by *Aspergillus* sps, *Fusarium* sps. *Sclerotium cepivorum*, *Colletotrichum circinans*, *Botrytis cinerea*, *Rhizopus stolonifer*, *Alternaria porri*, *Macrophomina phaseolina* and *Penicillium* sps. common fungi causes black mold, Soft rot, Purple rot, Brown rot, Neck rot, Basal rot, Internal rot and blue mold respectively. In present study, the management of post-harvest diseases help, suggestion and guideline to cultivar and researches to reduce fungal diseases of garlic bulb and enhance quality and quantity of garlic production.*

KEYWORDS

Garlic bulb, black mold, blue mold, Aspergillus, Penicillium.

RESEARCH PAPER

Introduction:

Garlic (*Allium sativum* L) is important spice commercially cultivated one of the oldest crop producing in India. India is the second largest producer after China with 1.6 million MT annually, (FAO). The garlic producing states in India includes mainly Maharashtra, Karnataka, Gujarat, Bihar and Madhya Pradesh. Maharashtra produces about 16 percent of the total production of India. Garlic is important crop used daily in kitchen. The bulbs in particular are affected by association of number of fungal pathogens both in fields and storages. The bulbs due to handling, cultivation practices and ill storage are infected severely by number of fungal pathogens. Although some fungi such as *Claviceps purpurea* have been known for centuries because of their high and acute toxicity, it was only after the discovery in 1960 of the aflatoxins, carcinogenic metabolites of *Aspergillus flavus*, that a large number of species were found as mycotoxins producers (Northolt & Soentoro, 1988). Due to association of these fungi it has been also found that the bulbs are significantly damaged and destroyed resulting in bulb rot and bulb necrosis. The storage of post harvest garlic affected by different factors, when the humidity is high increases susceptibility to post harvest disease. Inadequate and improper field curing after harvest, infection by different pathogen. The losses due to reduction in weight, sprouting and rotting.

In India about 35-40 % losses estimated to be lost as post harvest losses during handling and storage. Garlic is susceptible to a number of physiological disorders during storage such as freezing injury, translucent scales and watery scales. Post harvest garlic infected by fungi during storage period. Post harvest diseases of garlic include white rot, black mold, blue mold, neck rot, brown rot, soft rot etc. *Aspergillus niger* is a saprophytic fungi causing black mold disease of garlic. While *Penicillium* sps. causes blue mold disease and *Fusarium* sps. causes white rot. The infection of fungi spoilage garlic and ultimately decreases the qualitative attributes and quantity of food.

Black mold disease cause by *Aspergillus niger* at high temperature. It invades onion and garlic bulbs through injured portions of outer scales (Rajasab and Rao 1992). In India is very common wherever onion or garlic is stored (Gupta and Shrivastava, 1992). However blue mold of garlic is caused by various sps. of fungal pathogens.

Material and Method:

Post-harvest diseases of garlic bulb collected from different district of Marathwada regions of Maharashtra such as Aurangabad, Beed, Jalana, Nanded, Osmanabad, Parbhani district. 15 to

20 bulbs were wrapped in plastic paper, placed inside wooden box and incubated at 27⁰C. The samples culture on PDA at 25 to 27 ⁰C culture on a plate. Isolation and purification of post-harvest disease pathogen. The triplicate cultures were prepared during purification of pathogen. After 7 days morphological characters observed. The fungi were identified after reference to Thom & Raper, (1945), Gilman (1957), Ellis (1971, 1976), Ellis & Pamella (1985), and Booth (1971), Domsch *et al.*, (1980). The total number of fungal species was calculated on percent basis to find out the difference in nature and number of fungi arising out between treated and non-treated fruits and the difference of two media used.

Table No.1 Market diseases of Garlic (*Allium sativum* L)

Sr. No.	Name of diseases	Pathogen
1	Black mold	<i>Aspergillus niger</i>
2	Blue mold	<i>Penicillium sps</i>
3	White rot	<i>Sclerotium cepivorum</i>
4	Smudge	<i>Colletotrichum circinans</i>
5	Basal rot	<i>Fusarium oxysporum</i>
6	Brown rot	<i>Botrytis cinerea</i>
7	Purple blotch	<i>Alternaria porri</i>
8	Internal bulb rot	<i>Macrophomina phaseolina</i>
9	Neck rot	<i>Botrytis squamosa</i>
10	Soft rot	<i>Rhizopus stolonifer</i>
11	<i>Penicillium</i> decay	<i>Penicillium corymbiferum</i>
12	<i>Aspergillus</i> rot	<i>Aspergillus flavus</i>

Result and discussion

Total 12 mycoflora observed on garlic bulbs. Out of these 12 fungi *Aspergillus*, *Penicillium* and *Fusarium* commonly occurrence on garlic bulbs. Post harvest diseases of garlic include white rot, black mold, blue mold, neck rot, brown rot, soft rot etc. *Aspergillus niger* is an saprophytic fungi causing black mold disease of garlic. While *Penicillium* sps causes blue mold disease and *Fusarium* sps causes white rot .The infection of fungi spoilage garlic and ultimately decreases the qualitative attributes and quantity of food. Fungal diseases of garlic bulb caused by *Aspergillus niger* and *Penicillium* sps. mostly occurred in all districts. Controlling of post harvest diseases, proper storage, infrastructure, and management are essential to improving storage and marketing period.

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