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Effect of storage temperature and relative humidity on the decay of garlic bulb

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Abstract : After harvest in late April or by mid-May of the year, garlic is dried for a few days in the sun and stored in ordinary jute bag or netted nylon bags. No care is seriously taken to store garlic at low temperature and low relative humidity. Due to this, garlic decay during storage. To prevent decay of garlic it should be stored at low temperature and low humidity. In the present work, it was observed that 5^0C temperature completely control damage of garlic bulbs at all RH level. The rate of decay of garlic bulb following the increase of temperature at 50% relative humidity was slower than that stored at 60 and 70% relative humidity. It was maximum at 70% relative humidity level.

Keywords : Relative humidity, temperature

INTRODUCTION

Economically garlic is highly popular agricultural product in every part of the world for the preparation of various recipes such as Soup, Pasta, Meat, Fish, Seafood, Main dish, etc. Garlic is used as medicine. In Ayurveda the use of garlic has been recommended for home remedies such as cold, cough, allergies, toothache, ring worm, diabetes, viral and bacterial infections, etc. The main biochemical constituents found in the fleshy storage leaf of garlic are volatile oil which contains Allyl disulphide, Ally proylsulphide and polysulphide, Allicin and Allocetion I and II. During storage of garlic, it is damaged by the infection of some pathogenic fungi such as *Aspergillus niger, Fusarium moniliforme, Fusarium solani, Fusarium culmorum, Aspergillus sydowi, Fusarium oxysporum, Aspergillus flavus* and *Aspergillus nidulans.* To protect damage of garlic bulb from pathogenic fungi temperature and relative humidity plays an important role. Higher relative humidity and temperature favours growth of pathogenic fungi. It is necessary to store garlic bulbs at low temperature and low relative humidity.

In the present work, the role of relative humidity and temperature in the protection of garlic from damage during storage has been evaluated.

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MATERIAL & METHOD

5^0, 10^0, 15^0, 20^0, 25^0 and 30^0C temperature were maintained in the refrigerator incubator and BOD incubators. Glycerol solution to maintain 50%, 60% and 70% RH was taken in desiccators. The noted RH levels were maintained each for the noted temperature. Four uninjured bulbs of dried garlic as were noted earlier were taken in one petri dish and set in each desiccators. The lid of the desiccators was sealed with Vaseline. The experiment was set in the last week of May, 2013 and the observation for decay was made in the last week of August, 2013 i.e. the storage period was of three month duration.

RESULT

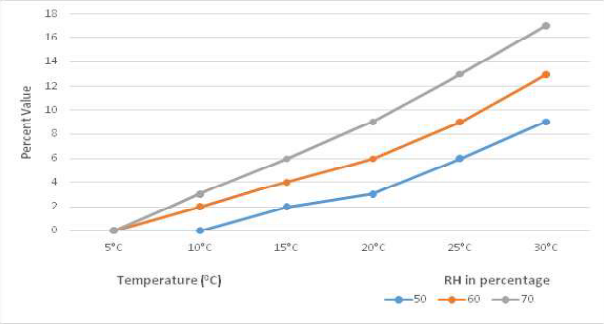
In the present study, it was observed that 5^0C temperature completely control damage of garlic bulbs at all RH level. The rate of decay of garlic bulb following the increase of temperature at 50% relative humidity was slower than that stored at 60 and 70% relative humidity. It was maximum at 70% relative humidity level. The fungi involved were *Aspergillus niger, Aspergillus flavus* and *Fusarium moniliforme.*

The temperature of storage above 10^0C seems not desirable due to considerably high percent of decay of garlic. 30^0C of temperature proved the worst for maximum percent of decay. The result is represented in table 1 and graph 1.

Table 1: Effect of Temperature and RH of storage of garlic on their % decay

Si. No.	RH(%)	Temperature(^{0}C)					
		5	10	15	20	25	30
1.	50	0	0	2	3	6	9
2.	60	0	2	4	6	9	13
3.	70	0	3	6	9	13	17

Graph 1: Effect of Temperature and RH of storage of garlic on their % decay



CONCLUSION

Decay of garlic during storage is due to infection of some pathogenic fungi. In low relative humidity and temperature the pathogenic fungi cannot grow thus, saving the garlic from damage. So, it is desirable to store garlic at low temperature and low relative humidity. During present work, it was observed that at a temperature of 5^0C no any damage occurred in garlic bulb during storage even at high relative humidity. The rate of decay of garlic bulb following the increase of temperature at 50% relative humidity was slower. Then that stored at 60 and 70% relative humidity. It was maximum at 70% relative humidity level. The fungi involved were *Aspergillus niger, Aspergillus flavus* and *Fusarium moniliforme.*

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