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Management of post-harvest diseases of mango fruit

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Abstract

Mango fruit is one of the most important cultivar in the konkan region. In post-harvest handling, mango fruit affected by number of post harvest diseases. Some of the pathogens that severely attack mango fruit are the fungal *Colletotrichum*, *Lasiodiplodia* and *Aspergillus* causing the post harvest diseases of the mango fruit. The presence of these pathogens can generate postharvest losses between 5-30% of mango production. In some places of konkan region, the fungicides such as Carbendezim has been used to control the fruit rot diseases such as Anthracnose, Stem end rot and *Aspergillus* rot. The carbendezim fungicide used in post-harvest may be dangerous to health due to its residue particles may be present in the fruit. To reduce and eradicate use of fungicides such as carbendezim in post-harvest, the chemical preservatives such as Calcium Chloride +Potassium Chloride + Sea Salt, Sodium Benzoate and Potassium Metabisulphide has been tried as post-harvest treatments. These chemical preservatives controlling post- harvest diseases as stem end rot as compared to untreated fruits. There was no scorching effect of these chemical preservatives on the harvested fruits.

Keywords: Mango fruit, fruit rot diseases, carbendezim, anthracnose, stem end rot, *Aspergillus* pottasium metabisulphide, sodium benzoate

Introduction

Mango is the most important fruit crop of konkan region. The crop, once harvested, accelerates its ripening by increasing its respiration rate and ethylene production. This causes rapid deterioration of the fruit, with the presence and incidence of phytopathogenic agents such as *Colletotrichum*, *Lasiodiplodia* *Aspergillus*, (Zakawa *et al.*, 2020) [3] causing the major fruit rot disease such as Anthracnose, Stem end rot and *Aspergillus* rot. It is very essential to protect the fruits from fruit rot disease as the post-harvest losses that causes the huge losses. During the post-harvest period of mango, different physical and chemical methods can be used to inhibit or reduce the presence of pathogens of fruit rot of mango. With this view the efforts have been made to control or restrict the growth of fungus to control the post-harvest diseases by using chemical preservatives such as Potassium Metabisulphide and Sodium Benzoate means to control the post-harvest diseases such Fruit Anthracnose, Stem End Rot and *Aspergillus* rot

Materials and Methods

The post-harvest experiment has been conducted at Regional fruit Research station, Vengurla during the 2024-25. The different types of post -harvest treatments has been given to the harvested fruits of mango are as follows.

Treatment details		:	
Tr. No.	Treatments		Dose/ Concentration (%)
T ₁	Calcium Chloride +Potassium Chloride + Sea Salt	10.0 g.+ 0.5g +5g	
T ₂	Treatment with Sodium Benzoate	1g	
T ₃	Treatment with Potassium Metabisulphite.	1 g	
T ₄	Control (Untreated fruits)		

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The observations on different post-harvest rots were recorded on 5th, 10th and 15th days after treatment. The Percent incidence (PI) and Per Cent Disease Index (PDI) was calculated by following formula.

$$\text{Percent Incidence (PI) (\%)} = \frac{\text{No. of disease plant part observed}}{\text{Total number of plant part observed}} \times 100$$

Per cent Disease Index (PDI) was calculated by using the formula.

$$\text{PDI (\%)} = \frac{\text{Sum of all disease ratings}}{\text{Total no. of ratings} \times \text{Maximum disease grade}} \times 100$$

Table 1: Effect of post - harvest treatments on fruit rot diseases of mango

Tr. No.	Per cent disease incidence (PI)								
	Anthracnose			Stem End Rot			Aspergillus rot		
	5 DAT	10DAT	15DAT	5 DAT	10DAT	15DAT	5 DAT	10DAT	15DAT
T ₁	0.00 (0.00)	8.00 (14.75)	10.00 (18.44)	0.00 (0.00)	28.00 (31.88)	46.00 (42.64)	0.00 (0.00)	0.00 (0.00)	4.00 (7.38)
T ₂	0.00 (0.00)	8.00 (14.75)	10.00 (18.44)	0.00 (0.00)	24.00 (29.22)	42.00 (40.28)	0.00 (0.00)	2.00 (3.69)	6.00 (11.06)
T ₃	0.00 (0.00)	6.00 (11.06)	8.00 (14.75)	0.00 (0.00)	16.00 (23.02)	32.00 (34.41)	0.00 (0.00)	0.00 (0.00)	4.00 (7.38)
T ₄	0.00 (0.00)	10.00 (16.38)	12.00 (20.06)	0.00 (0.00)	46.00 (42.64)	72.00 (58.72)	0.00 (0.00)	4.00 (7.38)	8.00 (13.06)
SEm±	0.00	4.20	2.24	0.00	2.32	3.23	0.00	3.10	4.03
CD at 5%	NS	NS	NS	NS	7.16	9.96	NS	NS	NS

Table 2: Effect of post - harvest treatments on fruit rot diseases of mango

Tr. No.	Per cent disease incidence (PDI)								
	Anthracnose			Stem End Rot			Aspergillus rot		
	5 DAT	10DAT	15DAT	5 DAT	10DAT	15DAT	5 DAT	10DAT	15DAT
T ₁	0.00 (0.00)	1.60 (2.05)	2.40 (2.77)	0.00 (0.00)	15.60 (23.10)	41.20 (39.84)	0.00 (0.00)	0.00 (0.00)	0.80 (1.02)
T ₂	0.00 (0.00)	1.60 (2.05)	1.60 (2.05)	0.00 (0.00)	14.80 (22.47)	36.40 (37.01)	0.00 (0.00)	0.40 (0.51)	1.20 (1.24)
T ₃	0.00 (0.00)	1.20 (1.54)	1.60 (2.05)	0.00 (0.00)	7.60 (13.82)	22.40 (28.12)	0.00 (0.00)	0.00 (0.00)	0.80 (1.02)
T ₄	0.00 (0.00)	2.0 (2.26)	2.80 (2.99)	0.00 (0.00)	25.20 (30.04)	53.60 (47.11)	0.00 (0.00)	0.80 (1.02)	3.60 (3.38)
SEm±	0.00	0.58	0.41	0.00	2.03	2.48	0.00	0.43	0.74
CD at 5%	NS	NS	NS	NS	6.27	7.64	NS	NS	NS

DAT:-Days After Treatment.

Table 3: Effect of post- harvest treatments on phytotoxic effect on fruit.

Scorching OR Phytotoxic effect on fruit	
Treatments	% Scorched Fruits
T ₁	0.0
T ₂	0.0
T ₃	0.0
T ₄	0.0

Results and Discussion

The results of this experiment indicated that treatments such combination of Calcium Chloride +Potassium Chloride + Sea Salt, Sodium benzoate and Potassium metabisulphite were found less percent incidence (PI) and percent disease index as compared to untreated fruits at 10 DAT and 15 DAT. This shows that theses chemical preservatives are to be found effective for the management of Stem end rot at 10 DAT and 15 DAT as compared to untreated fruits to some extent. However there was no significant effect of these chemical preservatives in controlling Fruit Anthracnose and *Aspergillus* rot as compared to untreated fruits at 5 DAT and 15 DAT. There was no phytotoxic or scorching effects on harvested fruits of these treatment at the given level concentration. This shows that chemical preservative such

as potassium metabisulphite, Sodium benzoate can control the stem end rot of the fruit to some extent.

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