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Management of *Colletotrichum gloeosporioides* causing papaya anthracnose with best resulting Plant extract and Bio-agents

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Abstract
Papaya is infected by more than 25 diseases worldwide. Among those diseases, *Colletotrichum gloeosporioides* causing the anthracnose disease is much important as considering the post harvest scenario of papaya. Various factors responsible for post harvest rot of papaya. Therefore this attempt is being taken to investigate the anthracnose disease and to control by using the fruit dip treatment of best resulting plant extracts and bio-agents. The affected part shows elongated dark brown to black lesions, ultimately rotted and eventually fell off. The comparative fungi toxic potential of best resulting three plant extracts and three bio-agents were used. This study revealed that among the bio-agents, *Trichoderma harzianum* exerts the minimum disease intensity at 10^6 cfu/ml concentration while among the plant extracts *Lantana camara* at 10% concentration shows minimum disease intensity.

Keywords: Management, Bio-agents, papaya, *Colletotrichum gloeosporioides*

Introduction
Carica papaya, the papaya plant, is generally belonging natively to the tropical climates in the Americas. This is a short- lived herbaceous plant. Papaya was nicknamed as 'tree melons' by the early European explorers because of its fleshy fruit nature, but papaya is actually considered to be a berry. Among the most traded tropical fruit, papayas are the fourth most traded following bananas, mangoes, and pineapples. Considering the world scenario, India leads the production of papaya followed by Brazil, Indonesia, Nigeria and mexico. USA gives only 0.1% of the total papay production in the world.A typical papaya fruit consists of: seed (8.5%), skin (12%) and pulp (79.5%). Despite of its susceptibility to natural enemies, it is widely accepted for its multipurpose, early bearing, space conserving and as a herbaceous crop.

There are more than 25 diseases reported till date in worldwide. Quite a few viral diseases, few bacterial diseases and several fungal diseases attack papaya plantation. Some of the common diseases are stem or collar rot, anthracnose, powdery mildew, bacterial canker, leaf spot and wilt, papaya ring spot virus etc. *Pythium aphenidermatum* causes stem or collar rot while *oidium indicum* causes powdery mildew in papaya, *Erwinia* species causing bacterial canker, *cladosporium /fusarium /penicillium* species causes internal blight of papaya. The diseases mentioned above, the fungal diseases are the most important because serious economic loss caused to growers. Apart from this, anthracnose is the most important fungal disease caused by *Colletotrichum gloeosporioides.* The fungus is more abundant in tropical and subtropical regions than in the temperate. The requirement of the environmental condition is warm and humid for the pathogen to infect different plant hosts.

India adds 42% among the whole mass production under papaya cultivationfrom 30% of the area around the globe, which makes India the dominant producer of papaya. 1.9% of the total area under fruit cultivation is unther the area of papaya cultivation and productivity is about 6.6% of India's total fruit crops. Area under papaya cultivation is approximately 138.4(000') ha with a production of 5988.8 thousand metric tons and productivity about 43.3 mt/ha. In India the main cultivating states are Tamil Nadu, Uttar Pradesh, Bihar, Assam, Karnataka, Gujarat, Maharashtra and West Bengal. Tamil Nadu has the largest productivity among all the states in India with productivity of 92.535 metric tons/hectare.

All though papaya performs best under tropical conditions where it bears fruits throughout the year, it also produces excellent crops in the milder sub tropical areas. Odisha comes among the

leading papaya producing states in India with a production of 70.29 thousand metric tons with a productivity of 23.045 mt/ha. It is estimated that approximately 3.05(000') ha is the area under papaya cultivation.

We have used many plant extracts and bio-control agents in *in-vitro* method for the management of the disease. To know more the efficacy of best resulting bio-agents and plant extracts, we have conducted fruit dip treatment of papaya in the Department of Plant Pathology, Institute of Agricultural Sciences, Siksha O Anusandhan (Deemed to be) University.

Materials and Methods

In the primary step healthy fruits of papaya were washed and for 2 minutes it is surface sterilized in 1% sodium hypochlorite solution. Unripe healthy papaya fruits were artificially inoculated by dipping in spore suspension of test fungus which was previously prepared in sterile distilled water with pure culture of *Colletotrichum gloeosporioides.* One hour after inoculation these papaya fruits were treated with various bio-control agents and Phytoextracts. Four papaya fruits were taken in each treatment which was repeated three times in complete randomized design. Treated fruits were air dried and kept in well aerated room at laboratory, department of plant pathology, Institute of agricultural sciences, SOA University. Observations were recorded. Estimation of anthracnose was taken by using 0-5 scale described by Jagan *et al.* (2017) and calculated the percent disease incidence in each treatment. The following best resulting Phytoextracts and bio-agents were taken for the fruit dip treatment.

Table 1: List of best resulting Plant extract and Bio agents used for Fruit dip treatment

Sl. No.	Treatments	Name of the Treatments	Concentration
1	T_1	*Lantana camara*	10%
2	T_2	*Curcuma longa*	10%
3	T_3	*Allium cepa*	10%
4	T_4	*Trichoderma harzanium*	10^6 cfu/ml
5	T_5	*Trichoderma virens*	10^6 cfu/ml
6	T_6	*Trichoderma viridae*	10^6 cfu/ml

Result

Table 2: Show the table B discloses that under bio-agents *Trichoderma*

Sl. No.	Treatments	Name of the Treatments	Concentrations	Percent Disease Intensity (%)
1	T_1	*Lantana camara*	10%	37.38
2	T_2	*Curcuma longa*	10%	44.55
3	T_3	*Allium cepa*	10%	56.44
4	T_4	*Trichoderma harzianum*	10^6 cfu/ml	46.65
5	T_5	*Trichoderma virens*	10^6 cfu/ml	57.84
6	T_6	*Trichoderma viridae*	10^6 cfu/ml	50.55
7	T_7	Control		100
			SE(m)	1.771
			C.D.	0.568

From the above table it is seen that all the treatments tested against the anthracnose disease were significantly reduced the disease as compared to the control. The lowest disease intensity was recorded on *Lantana camara* i.e., 37.38% at 10% concentration. Similarly, *Trichoderma harzianum* reflects minimum disease intensity i.e., 46.65% at 10^6 cfu/ml concentration

Discussion

Under fruit dip treatment, three bio agents such as *Trichoderma harzianum, Trichoderma virens* and *T. viridae* and three plant extracts *Lantana camara, Allium cepa* and *Curcuma longa* were studied against the anthracnose disease caused by fungus *Colletotrichum gloeosporioides*. The result on table: B discloses that under bio-agents *Trichoderma harzianum* showed the least disease intensity percent of 46.65% at 10 6 cfu/ml concentration followed by *Trichoderma viridae* 50.55%. And under plant extracts Lantana camara shows the lest disease intensity of 37.38% with 10% concentration followed by curcuma longa 44.55%.

Conclusion

The fruit dip treatment with best resulting bio-agents and plant extracts revealed that all the treatments which were treated against the anthracnose disease, reduced the disease as compared to the control is quite significant. In case of plant extracts minimum disease intensity was recorded in Lantana camara at 10% concentration (Ademe A. 2013 and Yogarajah 2014) [1, 3]. Similarly in case of bio-agents minimum disease intensity was recorded in Trichoderma harzianum (Mevada and Kapadia 2019) [2] at 10 6 cfu/ml.

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References

1. Ademe A. Evaluation of Antifungal Activity of Plant Extracts against Papaya Anthracnose (*Colletotrichum gloeosporioides*). Journal of Plant Pathology &Microbiology. 2013;04(10).
2. Mevada RR, Kapadiya HJ. Effects of various fungicides, biocontrol agents, phytoextracts and essential oils on post harvest of management of banana anthracnose (*Colletotrichum musae* Berk. & Curt.). International journal of chemical studies 2019;7(6):387-391.
3. Yogarajah K, Ranathunge NP, Weerasooriya MKB. *In vitro* evaluation of antifungal potential of some plant extracts against *Colletotrichum gloeosporioides* causing papaya anthracnose disease. Plant Science and Forestry 2014;18:517-520.