



## PLANT EXTRACT USING FOR MANAGEMENT OF STORAGE ROT OF GINGER IN SATARA TAHSIL (M.S.)

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### ABSTRACT

Ginger rhizome stored for seed and commercial purpose in different types of storage structure fungal rot causes considerable damage in different areas of Satara Tahasil. Mostly this method used in villages like Nagthane, Borgaon, Bharatgaon, Valase, Shendre from Satara Tahasil. The efficacy of 11 plant extract was evaluated against storage rot *Fusarium solani* and *Pythium aphanidermatum*. Extract of *Lawsonia inermis*, *Allium sativum*, *Lantana camera*, *Datura stramonium*, *Azadirachta indica*, either alone or in combination when applied on ginger rhizome reduced the growth of rot fungus. They effectively inhibit the growth of pathogen and considerable loss is reduced. The result of present investigation suggested. That storage rot can be effectively minimized by dipping rhizome of ginger in extract of *Allium sativum* @ (20 % w/v) for 30 min before storage.

**Keywords:** Storage rot, Ginger, Plant extract.

### INTRODUCTION

Ginger (*Zingiber officinale* Rosc.) is an important spice crop which is known for its medicinal properties. In Maharashtra Satara Tahasil occupies as major areas for ginger cultivation. Satara ginger (Ale) is popular in Maharashtra as well as in thought country also. Ginger rhizomes are stored for seed and commercial purpose in different types of storage structure. In general two pathogen viz, *Pythium aphanidermatum* and *Fusarium solani* causes serve rot do rhizomes during storage. The spoilage of rhizome due to rot reduced its germination capacity to prevent such damage some widely used plant extract as a biological agent are used to control storage rot of ginger [1,2]. At attempt was made to test plant extract as bio-control agent on the fungal rot during storage of ginger rhizome.

### MATERIALS AND METHODS

#### In vitro evaluation of plant extract

Different plant parts i.e. leaves of *Datura stramonium*, *Argemone mexicana*, *Lantana camara*, *Azadirachta indica*, *Aloe barbanidensis*, *Tamarindus indica*, *Ocimum sanctum*, *Cassia fistula*, rhizome of *Curcuma longa*. Clove of *Allium sativum*, bulb of *Allium sepa*, they were initially washed, air dried and individually crushed in warring blinder using sterile water (1:1 w/s). The extract was filtered through muslin cloth and centrifuged at 3000 rpm for 30 min. the clear supernatant

was collected, which considered as 100% stock. These extracts evaluated at 5,10,15 & 20% dilutions against the pathogens in petriplates [3] pathogenic fungi (*P.aphanidermatom*, *F. solani*) were locally isolated from rotted rhizomes of ginger. Three petriplates were used for each treatment and a separate control was also maintained in which medium was without any plant extract and my silica agar disc (2 mm diam) taken from a 7 day old culture of *P.aphanidermatum* or *F.solani*, was kept on the surface of the medium containing plant extracts and incubated 28+/- till the plates were completely covered with mycelial growth of pathogen. The mycelial growth was measured and percent growth inhibition was calculated.

### RESULT AND DISCUSSION

The results (Table1) revealed that all the plant extracts inhibit mycelia growth of *F.solani* and *P. aphanidermatum*. Singh *et al.*[4] report that leaves extract of *L.camara*, *A. Indica* and *O. sanctum* gave good control of *Fusarium* rot of banana storage. In present experiment *Allium sativum*, *Azadirachta indica*, *Edura siratnonium*, *Ocimum sanctum* report that leaves extract of above plant gave good control to *Fusarium* rot to ginger and leaves extract of *Allium sativam* *Aladiracte indica*, *Ertara strationium*, *Lantana camara* gave control of *P. aphanidermtum* of ginger.

The result (Table2) revealed that plant extracts of singly or combine used slows more effect on loss of weight, disease incidence and Rhizome recovery. The *Allium sativum* and *A. indica* when combine used shows more effect also *Latena camara*, *D. Stramonium*, and *O.santum* stows good effect only *Allium sativum* when singly used shows more effective.

All the plant extract reduced the rhizomes loss in weight as well as infection of rhizomes rot under storage

conditions. The maximum effect was noticed when rhizomes were treated with *P. aphanidermatum*, *Allium sativum* and *A. indica* increasing the maximum of the rhizome recovery. The storage loss of ginger incited by *F.solani* and *P.aphandermaum* may be minimized by dipping the rhizome of ginger in extract of *A.sativum* (a) (10% w/v) or in combine suspension of *A.indica* (a) 0.5% for 30 min before storage.

**Table 1. Effect of plant extract on mycelial inhibition (%) of *fusarium solans* and *pythium apanidermatum***

Plant Extract	<i>F.solani</i>				<i>P. aphanidermatum</i>			
	5%	10%	15%	20%	5%	10%	15%	20%
<i>Allum sativa</i>	40.10	75.14	83.21	92.48	45.2	76.39	89.07	97.04
<i>Aloe farbandensis</i>	32.02	40.2	51.05	59.22	34.4	39.06	47.61	58.20
<i>Argemone mexicana</i>	34.28	42.89	48.00	58.38	32.2	44.40	48.30	55.15
<i>Azadirachta indica</i>	42.30	69.18	77.20	86.82	34.10	64.62	73.55	80.72
<i>Cassia fistula</i>	31.44	41.15	46.28	50.33	26.77	30.91	43.73	46.49
<i>Curcuma longa</i>	30.18	42.58	41.32	51.27	25.23	32.64	43.58	46.38
<i>Detura stramorium</i>	41.79	74.21	81.18	88.45	42.62	66.92	74.48	81.90
<i>Lantana camara</i>	40.12	66.07	73.34	79.78	39.71	64.02	79.08	82.02
<i>Lawsrnia inermis</i>	41.52	63.08	68.54	75.20	35.81	54.89	65.72	77.08
<i>Ocimum sanctum</i>	39.02	65.80	75.32	73.31	35.92	61.24	69.32	77.79
<i>Tamrindus indica</i>	35.61	49.22	58.31	64.51	32.71	49.10	59.34	69.04
Control CD (P=0.05)	0	0	0	0	0	0	0	0
plant extract				0.87				0.85
conc				0.41				0.37
Interaction				1.72				1.22
CV(%)				2.47				2.41

**Table 2. Effect of plant extract and their combinations on incidence, loss in weight and rhizome recovery of ginger**

Treatment	Loss in weight (%)		Disease in incidence (%)		Rhizome recovery (%)	
	2006	2007	2006	2007	2006	2007
Plant extract	13.46	12.28	5.78	3.42	85.38	86.58
<i>Allium sativum</i>	16.62	14.88	6.72	4.92	83.02	85.22
<i>A.sativum</i> & <i>A.indica</i>	21.78	19.51	7.68	6.39	78.29	81.12
<i>Datura stramonium</i>	20.41	18.32	6.78	5.58	78.42	82.42
<i>Lantena camers</i> <i>D.stramonium</i> and <i>O.santum</i>	21.22	18.20	8.94	6.72	77.18	80.42
<i>Lantena camara</i>	21.72	19.81	9.00	7.92	78.02	79.78
<i>Lawsonia inermis</i>	23.01	21.60	9.76	8.09	77.08	79.32
<i>Ocimum sanctum</i>	22.81	20.01	9.18	8.00	78.01	80.12
Control	32.79	30.16	21.94	21.12	65.94	67.92
CD (P=0.05)	1.21	1.20	1.42	1.48	1.29	1.89
CV(%)	3.02	3.08	5.00	5.31	1.23	1.73

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