

EFFECTS OF LEAF EXTRACTS OF SOME MEDICINAL PLANT AGAINST *ASPERGILLUS NIGER* A CAUSAL ORGANISM OF STORAGE DISEASE OF AMLA

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ABSTRACT

Amla (*Embilica officinallis*) is one of the most important fruit plant grown in India. It is good source of vitamin- C. Black mold caused by *Aspergillus niger* is a major storage problem of amla. Hence amla are significantly damaged and destroyed by *A. niger* during storage. To evaluate efficacy of different plant extracts in inhibiting colony growth of *A. niger* more or less in varying degrees. Among the 10th plant extracts tested against *A. niger*, *Tinospora cordifolia* (78.10%) were significantly superior over all other plant extracts. Next best was *Boerhavia diffusa* (72.45%), *Ocimum santum* (71.00%), *Tribulus terrestris* (62.18%), *Adathoda vasica* showed less inhibitory effect (6.60%).

KEY WORDS: *Aspergillus niger*, Amla, *Embilica officinallis*, Vitamin C.

INTRODUCTION

Embilica officinallis occurs at tropical South-Eastern Asia particularly in the central and South India. In India amla is found in U.P., Maharashtra, Gujarat, Rajstan, A.P., Karnataka, Tamilnadu, Hariyana, Punjab, H.P., Uttranchal. Among fruits Amla plant of India with a constant demand. An Amla fruit is the richest sources of vitamin C and they have tremendous medicinal value in dysentery, jaundice, dyspepsia, scurvy, anemia etc. Amla is the king of arid fruits due to its inbuilt resistance to the most adverse soil and climatic condition (Singh *et al.*, 1993). In order to regulate the supply and to enable the farmer to get a remunerative price for the produce, long term storage of amla is a pre requisite. Losses of amla during storage are considerable mainly due to sprouting and contamination by microorganisms. Nearly 40 % of the production is loosed during post-harvest handling and sprouting, out of which microbial spoilage alone contributes approximately 15-20% of the total loss (Pantastico and Bantista, 1976; Bhagchandani *et al.*, 1980; Lokesha *et al.*, 1986; Nene, 2000). In India Rajam (1993), Dama *et al.* (1999) and Poul (1999) reported new protectant against fungal disease. Black mould rot caused by *Aspergillus niger* was the predominant one. The spoilage caused by *A. niger* was as high as 80 % stated earlier by Quadri *et al.* (1982). *A. niger*, a soil saprophyte being ubiquitous in occurrence attacks amla by producing various enzymes and toxins and establishes itself in fruit, tissues. Chemically it controlled, but Chemical control may cause the poisoning to the amla fruits hence present study, an attempt has been made to find out suitable plant extracts which were used to control *A. niger* and which will be free from hazardous chemical residues.

MATERIALS AND METHODS

Aspergillus niger was isolated from contaminated amla fruit. It was purified by single spore isolation technique (Riker and Riker, 1936) and maintained on PDA slants. Antifungal activities of different medicinal plant extracts were studied in vitro by poison food technique (*Azadiracta indica*, *Adathoda vasica*, *Acharanthus aspera*, *Amaranthus veridae*, *Boravia diffusa*, *Agalecus mamrus*, *Ocimum santum*, *Tinospora cordifolia* and *Tribulus terrestris*). 20 gm fresh leaves and 20 ml of distilled water (w/v) was taken while extraction. The extracted material was then filtered through muslin cloth. The volume of extracted sap was made up to 50 ml by distilled water. The medium was then sterilized 15 lbs. 20 minutes. The sterilized medium 20 ml was poured in three plates equally. The petri plates containing leaf extracts were inoculated with loop holder of 10 days old fungal culture and incubated for ten days. Petri plates with PDA medium acted as control. The petri plates were observed on third day for inhibition of growth of *A. niger*.

Table 1. Effect of plant extracts on radial mycelia growth of *Aspergillus niger*

Sr. No	Treatment	family	Average colony dia. (mm)	Inhibition %
1	<i>Ocimum santum</i>	Labiatae	24.00	71.00
2	<i>Boerhavia diffusa</i>	Nyctaginaceae	25.66	72.45
3	<i>Tinospora cordifolia</i>	Meniseermaceae	19.96	78.10
4	<i>Tribulus terrestris</i>	Zygophyllaceae	33.02	62.18
5	<i>Amaranthus viride</i>	Amaranthaceae	44.01	50.21
6	<i>Acharanthus aspera</i>	Amaranthaceae	56.46	38.91
7	<i>Withania somanifera L.</i>	Solanaceae	58.22	38.34
8	<i>Agalecus mamrus</i>	Rutaceae	79.51	11.64
9	<i>Adathoda vasica</i>	Acanthaceae	83.12	06.60
10	<i>Azadiracta indica L.</i>	Meliaceae	45.30	46.43

Table 2. Efficacy of leaf extract of medicinal plants against the *Aspergillus niger*

1	Plant extract	Radial growth (mm) after days					Average
		2	3	4	5	6	
	<i>Ocimum santum</i>	10	17	26	26.6	27	21.32
	<i>Boerhavia diffusa</i>	8	10.3	13	21	23	15.6
	<i>Tinospora cordifolia</i>	4	8.3	12.6	19	20	12.78
	<i>Tribulus teristries</i>	7	15	19.6	26.6	36	20.84
	<i>Amaranthus viride</i>	6.3	12.6	38	40	46	28.58
	<i>Acharanthus aspera</i>	12	21.6	41	50	58	36.52
	<i>Withania somanifera L.</i>	15	24.6	41.6	48.6	56	37.36
	<i>Agalecus mamrus</i>	22	40	50	65.3	80	51.46
	<i>Adathoda vasica</i>	27	55.6	66.3	72.6	85	61.3
	<i>Azadiracta indica L.</i>	16	21.6	40.6	45.6	50	34.76

RESULT AND DISCUSSION

In present investigation plant extracts were evaluate under in vitro condition against *A. niger* to know the fungi toxic nature of their plant extracts. Though complete inhibition of the pathogen was not observed in any of plant extracts tested, but considerable amount of inhibition was noticed in some of them. Among the 10th plant extracts tested against *A. niger*, *Tinospora cordifolia* (78.10%) were significantly superior over all other plant extracts. Next best was *Boerhavia diffusa* (72.45 %), *Ocimum santum* (71.00%),s *Tribulus teristrie* (62.18%), *Adathoda vasica* showed less inhibitory effect (6.60%).

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