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ANTIFUNGAL ACTIVITY OF THE ESSENTIAL OILS OF *EUCALYPTUS* AGAINST GROUND NUT STORAGE FUNGI.

Baig Mumtaz, Sumia Fatima and Kadam V. B.
Department of Botany, Dr. Rafiq Zakaria College for women. Aurangabad-431001, Maharshtra, India

ABSTRACT
The antifungal effect of the essential oil of *Eucalyptus* grand is on storage fungi of A rachis hypogeal. Stored for 5 months are evaluated using the disc diffusion agar method. The oil exhibited a wide spectrum of fungi toxicity. Essential oils from the leaves were extracted by hydro distillation. Thus the oil can be exploited as a fumigant against storage fungi for the preservation of stored groundnut seeds due to its wide range of activity, non-phytotoxicity.

KEY WORDS: *Eucalyptus*, essential oil, fungi toxicity, hydro distillation, phytotoxicity,

INTRODUCTION

Oil seed deterioration during storage is a major problem ton profitable grain legume crop production, it causes considerable loss. Post harvest loss due to mould attack estimated 30%- 80% in legume is alarming considering the value of grain legumes as a major source of protein. The uses of chemical synthetic fungi cides have many adverse effects Hal and Harman (1991). The alternative choice to control post harvest fungi be the use of botanical eco friendly fungicides which are safe and easily biodegradable fungicides which less impact on environmental consumers. The antifungal activity of higher plants and important factor for disease resistance and control against a wide range of fungi which infects crops. (Padmavati, 1997; Umechurapa, 2001;). Many essential oil containing plants or herbs are known as folklore as possessing curative powers.

Several studies have shown that biological activities of the essential oils from medicinal plants, particularly with respect to their antibacterial, antifungal and insecticidal properties. (Chaurasia and Kher, 1978; Dubey and Dwivedi, 1991). Extracts of plants have also exibited a marled effect on spore germination. (Singh and Dwivedi, 1990). The antifungal effect of the essential oil of *Cedrus deodara* Roxb. Against storage moulds of *Capsicum annum* L. The Eucalyptus belongs to the family Myrtaceae and is globally distributed genus. Lots of the species are mainly used for pulping and papermaking and are grown on plantation in tropical and subtropical regions. The present studies investigate the potential use and efficacy of the volatile fraction of *Eucalyptus grandis* L. leaves against storage fungi of groundnut.

MATERIALS AND METHODS

Fresh leaves of 22 year old *Eucalyptus grandis* L. were collected from the college campus. The leaves were thoroughly washed in distilled water and cut into small pieces. In the study, hydro distillation was carried out using steam. One Kg of fresh leaves was placed in a round bottom flask, and 3 lit of distilled water added. After 8hrs of steam distillation the oil layers had separated from the water layers and were collected and a hydrous sodium sulphate was added to remove the water. Yield of the essential oils were determined and the oils were stored in specimen bottles at (6^0C). Some physicochemical properties of the oil were determined by the method of Cangenau (1970). The fungi toxic spectrum and effect of some physical factors like temperature on storage The Hanging drop technique (Pereira, 1983) used to determine the viscosity of the oil. The viscosity of the oil was determined using a Hakes roto viscometer, by using the method Dixit *et al.* (1978).

Analyse the seed mycoflora of the stored seeds by standard blotter paper method and agar plate (Agarwal and Singh, 1974). Pure cultures of fungi growing on the seeds were isolated, purified and identified based on their cultural, morphological and biochemical properties given by Samson et al. (1984).The disc diffusion agar method is used to determine the fungi static and anti fungal nature of the essential oil of *Eucalyptus grandis* leaves by Kivanc and Akgul (1989). About 10ml of PDA (potato dextrose agar) was poured into Petri dishes and allowed to solidify. Spore suspension was made of 10-10 cells /ml was introducing 0.1 ml with a micropipette on to the agar plate. Sterilized Whatman paper (6 mm disc) soaked in 3 concentrations (500 ppm and 2000 pm) of the essential oil. Three of the soaked discs were placed on a fungal spore or conidia seeded plate with the help of sterile forceps. Three replicate were produced for each fungus. The plates were incubated at 25^0C for 5-7 days. The inhibition was measured after 48 hrs of incubation.

RESULTS AND DISCUSSION

The esults showed in the table 2. Spore germination of pathogens was strongly in hibiteo a significant inhibition of fungal spore germination by deferent concentrations of essential oil. At 2000 ppm showed potent and completely in libitory effect on spore germination. About 98% inhibition of fungal spore germination was observed at 1500

ppm concentration of eucalyptus grandis oil. The oil exhibited a moderate to high antifungal activity against the *Aspergillus feavus Aspergillus fumigates, Fusarium oxysporum, sclerotium rolfsii, Rhizoctonia bataticola, Rhizopus nigricans* and *curvularia lunata.* Low antifungal effects of eucalyptus oil were observed against *Aspergillus candid* us and *Alternaria alternate*. With fungal mycelia growth inhibition percentage from 70-85% respectively. The oil did not exhibit any adverse effect on seed germination or early seeding growth of groundnut. Due to non phytotoxicity and fungi toxicity the essential oil of eucalyptus can be exploited as a fungi toxicant against storage fungi for the preservation of legume seeds (Agarwal and Singh, 1974; Hal and Harman, 1991).

Table- 1. Phytochemical properties of the essential oil of *Eucalyptus grandis.*

S. No	Parameters	Values
1.	Specific gravity (Kg/m3)	0.07734
2.	Specific rotation (-rod/kg)	19.58
3.	Refractive index	1.1770
4.	Acid Value (Ph)	1.20
5.	Saponification Value (mg/g)	28.16
6.	Carbonyl percentage (%)	30.20
7.	Viscosity	0.068

Table: 2. Fungi toxic spectrum of the essential oil of eucalyptus grandis.on isolated fungi of groundnut.

S.NO	Fungi	Spore germination inhibition %		
		500ppm	1000ppm	2000ppm
1.	*Aspergillus flavus*	88	99	100
2.	*Aspergillus Niger*	83	85	100
3.	*Aspergillus candid us*	65	70	100
4.	*Aspergillus fumigates*	90%	95	100
5.	*Alternaria alternate*	75	85	100
6.	*Fusarium oxysporum*	85	95	100
7.	*Fusarium semitectun*	83	90	100
8.	*Penicillium citrinum*	65	90	100
9.	*Scleroytium rolfsii*	55	95	100
10.	*Cephalosporium SP*	92	89	100
11.	*Rhizoctonia bataticola*	66	90	100
12.	*Rhizophus nigricans*	80	95	100
13.	*Macrophoma phaseo lina*	72	97	100
14.	*Curvularia lunata*	70	99	100

REFERENCE

Agarwal V.K. and Singh O.V. (1974). Routine testing of crop seeds for fusarium moniliforme with a selective medium. *Seed Sci. Res.* **2**:19-22.

Chaurasia S.C. and Kher. (1978. Inhibitory effects of essential oils of three medicinal plants against various fungi. *Ind. Drugs pharm. Ind.* **13**:7-9.

Dixit S. N. and Tripathi S. C. (1978): fungi toxicity of some seed extract. *Nat. Acad. Sci. Lett.* **1**:287-288.

Dubey R.C. and Dluivedi R.S. (1991). Fungi toxic properties of some plant extracts against vegetative growth and sclerotia of Macrophomina phaseolina. *Ind. phytopathol.* **44**: 411-413.

Jadhav K.D. and Jadhav C.D. (1984). Use of some vegetable oil, plant extracts and synthetic products as protect ant from pulse beetle callosobruhus masculatues in stored grain *J. Food Sci. Tech.* **14**: 100- 113.

Hal and Harman G. E. (1991). Protection of stored legume seeds against attack by storage fungi mechanism of action of lipoidal 7 oil seed treatment. *Crop Protect*.**10**: 375-380.

Kurucheue V. and Padmavati R. (1997). Fungi toxicity of selected plant products against pythium aphanidermatun. *Ind. Phytopathol*. **50**: 529-535.