

**Effect of Essential Oils from Two Aromatic Plants on *Fusarium moniliforme* shed. Isolated from *Oryza sativa* Linn.**

A Dissertation submitted for the partial fulfillment of Masters Degree in Botany, Institute of Science and Technology, Tribhuwan University, Kathmandu, Nepal

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**RECOMMENDATION**

This is to certify that Mrs. Chetana Khanal has carried out the dissertation work entitled “**Effect of Essential oils from Two Aromatic Plants on *Fusarium moniliforme* shield. Isolated from *Oryza sativa* Linn.**” under my supervision. The work is primarily based on the data collected by the student herself, and results have not been submitted for any other academic degrees. I, therefore, recommend this dissertation to be accepted for the partial fulfillment of Masters Degrees in Botany from Tribhuvan University, Nepal.

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Date of Submission: 24<sup>th</sup>. Feb. 2008 (2064 /11/ 12)

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**LETTER OF APPROVAL**

The dissertation paper submitted by **Mrs. Chetana Khanal** entitled “**Effect of Essential oils from Two Aromatic Plants on *Fusarium moniliforme* sheld. Isolated from *Oryza sativa* Linn.**” has been accepted for the partial fulfillment of the requirements for Masters of Science in Botany.

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.....

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## ABSTRACT

Antifungal activity of essential oils of *Eucalyptus citriodora* Hook. and *Cymbopogon citratus* (DC) Stapf. against *Fusarium moniliforme* Sheld. was studied in two ways; one by analyzing the mycelial growth of test fungus in different concentrations of essential oils in 10, 15 and 20 days and second by analyzing the direct infection of the fungus on oil treated rice seeds.

The infected sample of rice plant was collected from NARC and *Fusarium moniliforme* was isolated through blotter test method. The essential oils were extracted through hydro distillation process using Clevenger oil extracting apparatus and were diluted with 95% ethanol and distilled water giving concentration of 1.2, 2.5, 3.7, 4.9, 6.2, and 12.4  $\mu\text{l ml}^{-1}$  for *in vitro* treatment where as 0.04, 0.08, 0.12, 0.16, 0.2, 0.4, 0.8, 1, 1.2 and 1.4  $\text{mlg}^{-1}$  for seed treatment.

The Minimum Inhibitory Concentration (MIC) value of both the oils for *in vitro* treatment was 6.2  $\mu\text{l ml}^{-1}$  for *Eucalyptus citriodora* and 4.9  $\mu\text{l ml}^{-1}$  for *Cymbopogon citratus*. Both the oil were therefore significantly ( $p < 0.05$ ,  $\text{LSD} = 5.41$ ) effective to arrest the mycelial growth of the test fungus. Furthermore the negative correlations between the colony size of the test fungus and oil concentrations clearly supports the antifungal activity of these oils.

The maximum inhibition i.e. 90 % at 1.4  $\text{ml g}^{-1}$  for *Cymbopogon* oil and 75 % at 1.4  $\text{ml g}^{-1}$  for *Eucalyptus* oil were observed during direct rice seed treatment. Thus from comparative analysis of both the oils it was concluded that the oil of *Cymbopogon citratus* is more effective than the oil of *Eucalyptus citriodora*.

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## ACRONYMS

$\mu\text{m}$	= micro meter
ml	= milliliter
g.	= gram
$\mu\text{l ml}^{-1}$	= micron liter per milliliter
mm	= millimeter
MIC	= Minimum inhibitory concentration
TLC	= Thin layer chromatography
GC	= Gas Chromatography
$\text{ml g}^{-1}$	= milliliter per gram
PDA	= Potato Dextrose Media
$^{\circ}\text{C}$	= Degree Celsius
NARC	= National Agriculture Research Council
LSD	= Least Significant Difference
T.U.	= Tribhuwan University
Eu	= Eucalyptus
Lg	= Lemon grass