



**ANTIFUNGAL ACTIVITIES OF ESSENTIAL OILS AND CRUDE
EXTRACTS OF SOME AROMATIC PLANTS AGAINST *FUSARIUM*
ROT OF *TRICHOSANTHES DIOICA* ROXB**



**A Dissertation
Submitted for the Partial Fulfillment of the
Requirements for the Degree of M.Sc. in Botany**

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KIRTIPUR, KATHMANDU,
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LETTER OF RECOMMENDATION

This is to certify that Mrs. Bina Wagle has carried out the dissertation work entitled “**ANTIFUNGAL ACTIVITY OF ESSENTIAL OILS AND CRUDE EXTRACTS OF SOME AROMATIC PLANTS AGAINST *FUSARIUM* ROT OF *TRICHOSANTHES DIOICA* ROXB**” under my supervision. The entire work is based on the collection of primary data by the student. This result of the present work has not been submitted for any other degree with the best of my knowledge.

I am satisfied from her job. I recommend this dissertation for the partial fulfillment of Master's Degree in Botany from Tribhuvan University, Kirtipur, Kathmandu, Nepal.

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LETTER OF APPROVAL

This dissertation entitled “**ANTIFUNGAL ACTIVITY OF ESSENTIAL OILS AND CRUDE EXTRACTS OF SOME AROMATIC PLANTS AGAINST *FUSARIUM* ROT OF *TRICHOSANTHES DIOICA* ROXB**” submitted by **Bina Wagle** has been accepted for partial fulfillment of the requirement for Master's Degree of Science in Botany.

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ABSTRACT

The infected Pointed gourds samples were collected from the local market of Kathmandu Valley. The fungus isolated from the infected Pointed gourds was identified as *Fusarium solani*, which was responsible for the storage fruit rot disease. Pathogenicity test was carried out for the confirmation of disease by transferring the inoculum from the pure culture of *Fusarium solani* to healthy Pointed gourds. For the control, the essential oils and extracts from five aromatic plants viz. *Zanthoxylum armatum*, *Mentha arvensis*, *Amomum subulatum*, *Valeriana jatamansi* and *Cymbopogon flexuosus* were used to assess their fungitoxic activities against the test fungus. Each essential oils was diluted to different concentrations of 0.625, 1.25, 2.5, 5.0 and 10.0 μlml^{-1} (in 80% Acetone) and the extracts were diluted in to 0.625, 1.25, 2.5, 5.0, 10, 20, 30, 40, 50 & 100 μlml^{-1} (in distilled water). The value of minimum inhibitory concentration (MIC) and percentage of mycelial growth inhibition of the essential oils and extracts were obtained as, the oil and extract of *Cymbopogon flexuosus* showed the highest fungitoxicity (100%) at the concentration of 5.0 and 50 μlml^{-1} , similarly the oils and extracts of *Zanthoxylum armatum*, *Mentha arvensis*, *Amomum subulatum* and *Valeriana jatamansi* were found to be 10 and 100 μlml^{-1} respectively. The percentages of mycelial growth inhibition were found to be different, according to their different concentration of each essential oils and extracts. The highest percentage of mycelial growth inhibition were found to be oils of *Cymbopogon flexuosus* followed by *Amomum subulatum*, *Zanthoxylum armatum*, *Mentha arvensis* and *Valeriana jatamansi* respectively and similarly extracts of *Cymbopogon flexuosus* followed by *Zanthoxylum armatum*, *Amomum subulatum*, *Valeriana jatamansi* and *Mentha arvensis* respectively. Thus comparative fungitoxicities of five different essential oils and extracts were observed against *Fusarium solani*.

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ABBREVIATIONS

Alt	Altitude
T.U	Tribhuvan University
CDB	Central Department of Botany
S.N	Serial Number
Sq.	Square
DFRS	Department of Forest Research Survey
Viz.	Visually
cm	Centimeter
m	Meter
gm	Gram
ml	Milliliter
GC	Gas chromatography
HPPCL	Herb Production and processing Co. Ltd
MAPS	Medicinal and aromatic plants
MIC	Minimum inhibitory concentration
mm	Millimeter
km	Kilometer
NARC	National Agricultural Research Council
NTFPs	Non-timber forest products
PDA	Potato Dextrose Agar
ppm	Parts per million
TLC	Thin Layer Chromatography
WEC	Western, eastern and central