

Antibacterial Activity and Phytochemical Screening of Some Medicinal Plants of Nepal

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Sc. in Botany**

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CERTIFICATE

This is to certify that **Mr. Madhaba Prasad Pandey** has carried out the dissertation work entitled “**Antibacterial Effects and Phytochemical Screening of Some Medicinal Plants of Nepal**” under my supervision. As to my knowledge, the result he acquired is not submitted or published for any other academic degree. So I recommend this dissertation to be accepted for the partial fulfillment of Master of Science in Botany.

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ABSTRACT

Eighteen different medicinal plants which were being used to treat the bacterial diseases in Nepal were selected. The medicinal plants were extracted in methanol by soaking method. The *Drymaria cordata* gave the highest yield (20%) whereas *Urtica dioica* gave lowest yield (4%). The methanol extract of these plants were evaluated for antibacterial activity against medically important bacteria viz. *Bacillus subtilis*, *Pseudomonas aeruginosa*, *Salmonella typhi*, *Proteus vulgaris*, *Escherichia coli*, and *Staphylococcus aureus*. The *in vitro* antibacterial activity was performed by agar disc diffusion method.

Among 18 medicinal plants tested, in the present study, all plants showed activity against at least two bacteria. *Phyllanthus amarus* and *Rhus javanica* inhibited all the tested bacteria. Similarly, *Drymaria cordata* was effective against 83% of tested bacteria. Nine plants (*Bauhinia purpurea*, *Ageratum conyzoides*, *Urtica dioica*, *Lantana camara*, *Cinnamomum tamala*, *Melia azedarach*, *Vitex negundo*, *Oxalis corniculata*, and *Zizyphus mauritiana*) inhibited the growth of 67% and five plants (*Euphorbia hirta*, *Taraxacum officinale*, *Achyranthes bidentata*, *Mimosa pudica*, and *Cissampelos pareira*) were effective against only 50% of screened bacteria and remaining one plant *Ficus religiosa* inhibited growth of 33% of the screened bacteria.

The most susceptible bacteria were *Staphylococcus aureus* whose growth was inhibited by 17 out of 18 plants screened whereas *Escherichia coli* were found to be the most resistant bacteria being susceptible to only five plants. The gram-positive bacteria were found to be more susceptible as compared to gram-negative bacteria.

Phytochemical screening was also performed on all these plants on aqueous and alcoholic extract by their color reaction with different reagents and chemicals to detect the presence of alkaloids, glycosides, saponins, terpenoids, and tannins. Most of the plants contain these secondary metabolites but on varying concentration. Among the screened plants, 67% of plants contain alkaloids, 78% plants found to contain glycosides, saponins and terpenoids each and 72% plants showed the presence of tannins.

The medicinal plants which were used against bacterial disease were found to have antibacterial principles and were found to be rich in different phytochemicals.

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LIST OF ABBREVIATIONS AND ACRONYMS

alt.	Altitude
e.g.	<i>Exempli gratia</i> : for example
ed., eds.	Editor, editors
<i>et al.</i>	<i>Et alii</i> : and others
fig., figs.	Figure, figures
Gm +ve	Gram positive
Gm -ve	Gram negative
lb, lbs	pound, pounds
MIC	Minimum inhibitory concentration
mL	Milliliter
NA	Nutrient agar
NB	Nutrient broth
Nep.	Nepali
p., pp.	page, pages
T. U.	Tribhuvan University
TUCH	Tribhuvan University Central Herbarium
viz.	Namely
W	West
C	Central
E	East
ZOI	Zone of inhibition
rpm	Revolutions per minute

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