

Antibacterial Activity of Some Folklore Medicinal Plants of Nepal

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ABSTRACT

Plants have been a good source of food and medicine since human civilization. The plants, which are used by human to cure various diseases and to relieve diseases, are called medicinal plants. In the present study, thirteen medicinal plants namely *Piper longum*, *Achyranthes aspera*, *Oroxylum indicum*, *Acmella clava*, *Swertia chirayita*, *Bauhinia variegata*, *Phyllanthus emblica*, *Justicia adhatoda*, *Mentha Spicata*, *Azadirachta indica*, *Curculigo orchioides*, *Withania somnifera* and *Thalictrum foliolosum* were screened for potential antibacterial activity against pathogenic bacterial strains viz *Pseudomonas aeruginosa*, *Proteus vulgaris*, *Salmonella typhi*, *Escherichia coli*, *Klebsiella pneumoniae*, *Bacillus subtilis* and *Staphylococcus aureus*. All the parts of medicinal plants used were kept in methanol solvent by soaking method. The *Azadirachta indica* gave the highest yield (23.50%) whereas *Achyranthes aspera* gave lowest yield (5.60%) of crude extract. The methanol extracts of these plants were evaluated for antibacterial activity by agar disc diffusion method

Among thirteen medicinal plants tested, all plants showed activity against at least two bacteria. *Phyllanthus emblica*, *Swertia chirayita*, *Withania somnifera* and *Thalictrum foliolosum* inhibited all the tested bacteria. Similarly three plants viz. *Acmella clava*, *Bauhinia variegata* and *Mentha spicata* inhibited 86% of tested bacteria, three plants *Achyranthes aspera*, *Oroxylum indicum* and *Azadirachta indica* were effective against 71% of screened bacteria, *Piper longum* was effective against 57% of tested bacteria, *Curculigo orchioides* was effective against only 43% of tested bacteria and *Justicia adhatoda* inhibited only 29% of tested bacteria. Among the tested bacteria, most resistant bacteria was *Escherichia coli* whose growth were inhibited by only 8 out of 13 plants extract where as *Bacillus subtilis* was most susceptible bacteria whose growth was inhibited by all plants extracts. Gram-ve bacteria were more resistant than Gram +ve bacteria. The screening of crude extracts made from tested plants used by traditional healers showed that these screened plants were potentially competent to control the bacterial growth.

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List of Abbreviations and Acronyms

alt.	Altitude
e.g.	Exempli Gratia for Example
ed., eds.	Editor, Editors
et al.	Et alii: and Others
Fig., figs.	Figure, Figures.
Gm +ve	Gram Positive
Gm -ve	Gram Negative
lb, lbs	Pound, Pounds
ml	Milliliter
NA	Nutrient Agar
NB	Nutrient Broth
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	Revolution Per Minute
MIC	Minimum Inhibitory Concentration
SD	Standard Deviation

List of Tables, Figures and Photographs

Tables.

Table 1: Percentage yield of crude methanol extract of medicinal plants.

Table 2: Antibacterial property of methanolic extracts of different medicinal plants against tested bacteria.

Tables 3: Number of microorganisms inhibited by tested medicinal plants.

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Fig 3: Zone of inhibition of bacterium *Bacillus subtilis*.

Fig 4: Zone of inhibition of bacterium *Proteus vulgaris*

Fig 5: Zone of inhibition of bacterium *Salmonella typhi*.

Fig 6: Zone of inhibition of bacterium *Escherichia coli*

Fig 7: Zone of inhibition of bacterium *Klebsiella pneumonia*.

Photographs

Photoplate 1- Medicinal Plants

Photo #: 1 *Piper longum*

Photo #: 2 *Achyranthes aspera*

Photo #: 3 *Oroxylum indicum*

Photo #: 4 *Acemella clava*

Photo #: 5 *Bauhinia variegata*

Photo #: 6 *Phyllanthus emblica*

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Photo # : 8 *Azadirachta indica*

Photo # : 9 *Curculigo orchioides*

Photo # : 10 *Justicia adhatoda*

Photo #: 11 *Withania somnifera.*

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Photoplates III

Antibacterial Test.

Photo #: 1 Methanol extracts of plants

Photo #: 2 ZOI shown by plant extract on *Bacillus subtilis*

Photo #: 3 ZOI shown by plant extract on *Salmonella typhi*

Photo #: 4 ZOI shown by plant extract on *Staphylococcus aureus.*