

## Preliminary Phytochemical Screening and Antimicrobial Activity Studies on *Mollugo cerviana*

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### ABSTRACT

Antimicrobial activities of the crude methanol extract as well as the ethylacetate and n-butanol fractions from the whole plant of *Mollugo cerviana* Ser. were investigated by disc diffusion method. The extract and the fractions were tested against gram positive and gram negative bacteria strains. Anti fungal activity against fungi strains like *Aspergillus niger*, *mucor*, *Aspergillus fumigates* and *Candida albicans*. DMSO as solvent. The values of zone of inhibitions were found out at 37° c for a period of 24 hrs. The plant extract had shown the ability to inhibit the growth of both gram positive and gram negative bacteria strains. Phytochemical screening revealed that the crude extract and n-butanol fraction contains alkaloids, flavonoids, saponins, triterpenoids, tannins, glycosides and phenolic groups while the ethylacetate fraction contains active constituents like saponins, glycoside, triterpenoids and steroids and its antimicrobial justifies its use in traditional medicines.

### INTRODUCTION

Plants contain chemical compounds that may be in one way or another responsible for their healing properties and other functions. The chemical compounds are secondary metabolites of which at least twelve thousand have isolated (Hasan et al., 1988).

Medicinal plants, which form the backbone of traditional medicine, have in the last few decades been the subjects for very intense pharmacological studies; this has been brought about by the acknowledgement of the value of medicinal plants as potential sources of new compounds of therapeutic value and as sources of lead compounds in the drug development (Shailendra Gurav et al., 2007). Various medicinal properties have been attributed to natural herbs. Medicinal plants constitute the main source of new pharmaceuticals and healthcare products (Ivanova et al., 2005).

*Mollugo cerviana* Ser family: Aizoaceae, is distributed in South and South East Asia. An erect slender annual herb. The herb is considered stomachic, aperients and antiseptic. An infusion of the plant is given to promote lochia discharge (George et

al., 1947). The main aim of this study was to assess the organic solvent extracts of *Mollugo cerviana* Ser. For antibacterial and preliminary phytochemical properties.

### Materials and Methods

#### Plant material and Extraction

*Mollugo cerviana* was collected from Tirunelveli District and authenticated by Dr.V.Chelladurai, Department of Botany, Central Siddha Research Unit, Tirunelveli. The shade dried powdered plant material was extracted with methanol using Soxhlet apparatus, the solvent was removed *in-vacuo* to yield a residue (15 gm) referred to as (CME). 10g of the methanol extract was suspended in water and filtered, the water soluble part was extracted with ethylacetate (500ml) followed by n-butanol (500ml) to give 0.8g and 1.2g of ethylacetate (EAF) and n-butanol (NBF) fractions respectively.

#### Phytochemical Screening

The methanol extract, ethylacetate and n-butanol fractions were subjected to phytochemical screening using standard

procedures (Trease and Evans,1996).

### Screening of Antimicrobial Activity Bacteria tested

Totally six bacterial strains were used throughout the investigation namely *Staphylococcus aureus*, *Bacillus subtilis*, *Streptococcus faecalis* (gram positive), *Esterichia coli*, *Pseudomonas aeruginosa* and *Klebsiella pneumonia* (gram negative). The fungal strains used in the study viz., *Aspergillus niger*, *Aspergillus fumigatus*, *Mucor*, *candida albicans*.

### Antimicrobial Activity

Antimicrobial activity was screened by disc diffusion method (Maruzella and Percival). The inocula were prepared by inoculating the test organisms in culture media and incubating them for 24 hrs at 37°C for the bacteria, while for fungi Saboraud's dextrose broth was used and was incubated for 48 hrs. The respective standard drugs (Table - 2) were tested for positive control, the plates were incubated at 37°C for 24hrs. The diameter of the inhibition zones observed and its value noted (in mm).

### Results

The results of the phytochemical screening revealed the presence of flavonoids, tannins, saponins, triterpenoids, phenolic groups and glycosides in methanol extract, ethylacetate and n-butanol fractions (Table -1).

The antimicrobial activities of the methanol extract, ethylacetate and n-

butanol fractions are summarized in table 2. The methanol extract showed zones of inhibition ranging from 22-32 mm against all the test organisms. The zones of inhibition produced by n-butanol fraction ranged from 18-24 mm against all the test organisms and ethylacetate fraction which was ranged from 12- 20 mm in diameter.

### Discussion

The results of phytochemical screening of the extract, ethylacetate and n- butanol fractions revealed the presence of flavonoids, tannins, saponins, triterpenoids. These metabolites have been reported to possess antimicrobial activity (Cowan, 1999). The crude methanol extract and n-butanol fraction showed strong antimicrobial activity against all the organisms tested. Therefore it should be understood that the presence of bioactive compounds which can serve as antimicrobial agent or lead compound for the synthesis of an effective and less toxic antimicrobial agent.

### Conclusion

The present study showed that the methanol extract and n-butanol fraction from the plant of *Mollugo cerviana* have antimicrobial properties which explain the basis for its use in traditional medicine to treat infected wounds. Further integrated investigation using HPTLC and GC-MS will lead to purification and structural elucidation of active principles against microorganisms.

**Table I: Phytochemical analysis of *Mollugo cerviana***

Constituents	Extract / Fractions		
	CME	EAF	NBF
Alkaloids	+	-	-
Flavonoids	+	-	+
Saponins	+	+	+
Tannins	+	-	+
Steroids	-	+	-
Carbohydrates	+	-	-
Glycosides	-	+	+
Proteins	+	-	-
Terpenoids	+	+	+
Phenolic groups	-	-	+

CME- Crude methanol extract, EAF-Ethylacetate fraction, NBF- n-butanol fraction. + = Positive, - = Negative

**Table II: Results of sensitivity test of methanol extract and fractions against various organisms**

Test organisms	zone of growth inhibition (mm)		
	CME	EAF	NBF
<i>Staphylococcus aureus</i>	24	18	20
<i>Bacillus subtilis</i>	22	14	18
<i>Streptococcus faecalis</i>	30	18	24
<i>Esterichia coli</i>	24	14	22
<i>Pseudomonas aeruginosa</i>	32	18	24
<i>Klebsiella pneumoniae</i>	30	20	22
<i>Aspergillus niger</i>	24	18	20
<i>Aspergillus fumigates</i>	22	14	24
<i>Mucor</i>	24	12	22
<i>Candida albicans</i>	24	18	22

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