Antibacterial and Antifungal Potential of *Clerodendrum inerme* Crude Extracts against Some Human Pathogenic Microorganism

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Summary

Present study is focused to evaluate the anti-microbial and antifungal potential of plant *Clerodendrum inerme*. The plant also called as *Dedonia* is actual a decorative, but traditionally being utilized to treat the infections like skin rashes, eye infection, umbilical cord infection by local peoples. This work is first step to explore the potential of this plant as antibacterial and antifungal.

The shade dried leaves of the plant was extracted with water, ethanol and chloroform using maceration technique. The resultant extract was evaluated against bacteria E.coli (gram negative), Staphylococcus (gram positive) and fungi aspargillus. All the extract has shown the inhibitory activity against all exposed Microorganisms. The ethanolic extract is having highest activity among all extract and chloroform extract with lowest activity.

Key words: *Clerodendrum inerme*, Dedonia, skin rashes, antifungal, antibacterial.

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Introduction

Plants have been an integral part of human society since the start of civilization. India is rich in its plants diversity, a number of plants have been documented for their medicinal potential which are in use by the traditional healers, herbals folklorists and in Indian systems of medicine namely, Ayurveda, Unani, Siddha apart from a Homeopathy and Electropathy[1]. These plant species play major role in the health care of the nation's population.[2]

Different national and international pharmaceutical companies are utilizing such plant based formulations in treatment of various diseases and disorders world around.[3-5]. Many of the plant species have been documented pharmacologically and clinically which are endowed in phytochemicals with marked activity on human pathogenic bacteria. [6, 7].

An attempt was made to study the possible anti bacterial potential of the plant *Clerodendrum inerme* (L.) Gaertn. [Verbenaceae]. It is a straggling shrub, leaves obovate to elliptical oblong, and glabrous. Plant is commonly grown as hedged. Locally the plant is known as *Dedonia* its leaves are used in chronic pyrexia[4].

The plant is reported to contain chemicals 3- epicaryoptin, neolignan and pharmacologically reported as hypertensive[8], anti-Lipidemic[9], antimaleria[10].Traditionally utilized to treat the infections like skin rashes, eye infection, and umbilical cord infection[11].

Materials and methods

Plant material

Clerodendrum inerme (L.) Gaertn. [Verbenaceae], leaves of the plant were collected from the college campus, shahada , dist Nandurbar, Maharashtra, India.

Preparation of extracts

Crude plant extracts; were prepared by maceration technique. The protocol is described below:

1. ***Preparation of alcoholic extract-***

Freshly dried and healthy plant leaves were ground into fine powder in an electric grinder. Powder so obtained was stored in dessicator. Two hundred gram of the plant leaf powder was allowed to macerate with 95% ethyl alcohol (EtOH) for 24hours. Mother liquor (Crude MeOH extract) was filtered out and residual plant material was again macerated with

95% Ethyl alcohol (EtOH) for 24 hours. The process is repeated four times to obtain maximum yield of EtOH extract, Obtained Extract was evaporated to dryness at 50°C under reduced pressure.

2. ***Preparation of chloroform extract-***

Freshly dried and healthy plant material was ground into fine powder in an electric grinder. Powder so obtained is stored in dessicator. Two hundred gram of plant leaf powder was allowed to macerate with chloroform for 24hours. Mother liquor (Crude MeOH extract) was filtered out and residual plant material is again macerated with chloroform for 24 hours obtained extract was evaporated to dryness at 50°C under reduced pressure.

3. ***Preparation of aqueous extract-***

Shade dried plant material (200 g) is ground to a fine powder, It is poured with chloroform water I.P., and left for 72 hours at room temperature. The filtrate, thus obtained, was evaporated to complete dryness on a water bath. The residue thus obtained is aqueous plant extract.

Microorganisms

The leaf extracts were tested for possible antibacterial activity in the cup method assay[12] using three human pathogenic bacteria listed in table no. 1. The bacteria were obtained from the bacterial stock, Department of Microbiology, P.S.G.V.P mandal's College of pharmacy, Shahada, Dist. Nandurbar, Maharashtra, India. The bacterial cultures were maintained at 4^0C on selective Medias.

Anti microbial assay

The selective media plates were inoculated with inoculums of 10^6 sizes, a sterile swab is dipped into diluted culture inoculums, the agar surface of the plates is spread using spreader. Cups are developed by using borer. The cups were filled with 500µg/ml, plant extracts, which were placed in cups with the help of a sterile pipette. The plates were allowed to stand at room temperature for 30 minutes. (Pre diffusion time) and then incubated at 37^0C for 24 hrs in case of bacteria and 48 hrs for fungi. The zones of inhibition were recorded after specified time. The experiments were repeated thrice and the mean of the triplicate of the results is summarized in table 1.

Results and Conclusions

Table – 1

Antibacterial and Antifungal activity of *Clerodendrum inerme (leaves)* [a] crude extracts
Inhibition zone (mm)

Plant Extracts (500 µg / ml)	Zone of Inhibition in MM		
	Gram Negative	Gram positive	fungi
Alcohol	0.3	0.1	0.2
Aqueous	0.22	-	0.1
chloroform	0.2	0.1	-

Gram Positive Bacteria - Staphylococcus aureus **2**
Gram Negative Bacteria - Escherichia coli
Fungi – A.niger
[a]Values are the mean of replication of three; -, no inhibition.

The present study is focused to evaluate the anti microbial and antifungal potential of plant *Clerodendrum inerme*.and result is found satisfactory. Water, ethanol and chloroform extract produced by maceration technique had demonstrated the inhibitory activity against almost all species. Among all extract highest activity is associate with ethanol extract followed by water and then chloroform. Further systematic work on the similar line may result in discovery new moiety or a lead molecule.

Acknowledgement

Thanks Are Due To Department Of Microbiology And Pharmcognosy For Technical Support To The Authors. Authors Are Also Grateful to the President, *Chairman, And Principal Of College Of Pharmacy Shahada* For there Cooperation And Providing Space And Other Facilities.

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