ANTIMICROBIAL ACTIVITY OF ABUTILON INDICUM

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ABSTRACT

During past several years, there has been growing interest among the usage of various medicinal plants from traditional system of medicine for the treatment of different ailments. A number of herbs belonging to the specie Abutilon are noted for their medicinal benefits in traditional system of medicine. It is used in ayurveda, folk medicines, siddha unani and tibetian medicine system. Abutilon indicum family Malvaceae, commonly called as Atibala is an important medicinal plant. The whole plant as well as specific part such as flower, leaves and fruit is used to treat various health ailments. The plant is found to possess anticonvulsant, larvicidal, immunodulatory, Lipid lowering, diuretic. The present study was conducted to determine the antimicrobial activity of different plant leaf extracts with different solvent viz; ethanol against Gram positive bacteria (Staphylococcus aureus), Gram negative bacteria (E. coli) and Fungal (Aspergillus niger & Candida parapsilosis). The disc diffusion method was used to test the antimicrobial activity. The result shows that more antimicrobial activity shown for E. coli Staphylococcus aureus by Abutilon indicum at low concentration of 5µg/ml. The result shows that more antimicrobial activity shown for Abutilon indicum at low concentration of 5µg/ml. The result shows that more antimicrobial activity shown for Candida parapsilosis by Abutilon indicum at low concentration of 5µg/ml.

KEYWORDS: ayurveda, folk medicines, siddha unani and tibetian medicine, Aspergillus niger & Candida parapsilosis.
INTRODUCTION

Abutilon indicum (Family: Malvaceae) is extensively grown in Bangladesh, India, Pakistan, Srilanka (Kirtikar KR et al.). The plant is considered as antibacterial, astringent, anthelmintic, carminative and diuretic. It is used locally for high fever, colds, tuberculosis, bronchitis, mumps, diabetes, hernia, hemorrhoids, diarrhea and various types of worm infections. Many chemical constituents have been isolated from Cuscuta reflexa such as Cuscutin, quercitin, coumarin, amarbelin, myricetin and oleanolic acid. A. indicum leaves are used in the treatment of toothache, lumbago, antifertility and liver disorders (Anyensu et al., 1978). Bark and root are used as antidiabetic, aphrodisiac (Lakshmayya et al., 2003) nerve tonic and diuretic. The plant extracts and their products for antimicrobial activity have shown that a potential source of novel antibiotic prototypes of higher plants (Afolayan et al., 2003). Antimicrobial activity in seeds has been reported by Srinivasan et al. The methanolic extract of A. indicum exhibited some estrogenic potential of antifertility substances (RK JohriPahwa et al.). Gossypetin – 8 & 7- glycosides and cyanidin 3- rutinoside are also isolated by Sebastian (SS Subramaniam et al). The seeds are reported as laxative (MK Sebastian et al). Pushpagadan has described the ethnomedicobotanical investigations in Kerala for use of leaves of A. indicum in malarial fever, cold, cough, chest pain. Gallic acid shows analgesic activity in animal models (Harborne et al.).

MATERIALS AND METHODS

Leaves Collection: The leaves for the present study from the respective plants was collected from different regions of Telangana i.e, Abutilon indicum and was allowed to dry under shade and made into a fine powder. The powder (100 grams) was Soxhlet extracted with methanol and dried under rotavapor at 40-50°C for 3 hours. This measure was taken in order to evaluate the antimicrobial activity.

OBTAINING THE MICROORGANISMS

Bacterial Culture: The bacterial cultures for the present investigation were obtained from Primer Biotech Research Center, Hyderabad. They were inoculated into the Luria broth and stored.

Luria broth composition (g/lit)
1. Casein enzyme-10
2. Hydrolysate -5
3. Yeast extract -5
4. Sodium chloride-5

Two bacteria used for the present study were; E. coli and Staphylococcus aureus.

**Fungal Cultures:** Two fungi used for the present study, Candida parapsilosis and Aspergillus niger were also obtained from Primer Biotech Research Center.

**Equipment preparation:** To conduct the experiment, the nutrient agar media was prepared by dissolving 28g of nutrient agar in 1000ml distilled water. It was then sterilized in autoclave along with the petri dishes, spreader, 4-25ml conical flasks, forceps and cotton balls. The agar was then transferred into the petri dishes and was allowed to solidify. Thereafter the procedure was executed in laminar air flow to ensure proper aseptic conditions.

**Preparation of Paper Discs:** The mode of antimicrobial activity of the above medicinal plant leaves were performed using the Chromatographic paper. Fine round paper discs were obtained and were sterilized.

**RESULTS AND DISCUSSION**

**Antimicrobial activity:** The antimicrobial activity of all the Leaf extracts was examined against Gram positive and Gram-negative bacteria and fungal strains by measuring zone of inhibition.

The antimicrobial activity was performed by Agar disc diffusion method at concentration level of 2.5, 5.0, 7.0, 10µg/ml respectively.

Ampicillin (antibacterial), Itraconazole (antifungal) as standard drug at a concentration of 200µg/ml.LB Agar was used as culture media for antibacterial and potassium dextrose agar was used as culture media for antifungal activity. The results of the antimicrobial activity are shown in figures and tables.

**Abutilon indicum**

<table>
<thead>
<tr>
<th></th>
<th>2.5µg/ml</th>
<th>5µg/ml</th>
<th>7.5µg/ml</th>
<th>10µg/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E.coli</em></td>
<td>1 cm</td>
<td>2.5 cm</td>
<td>2.5 cm</td>
<td>3 cm</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>2 cm</td>
<td>4 cm</td>
<td>3 cm</td>
<td>3.4 cm</td>
</tr>
<tr>
<td><em>Aspergillus niger</em></td>
<td>0.9 cm</td>
<td>1 cm</td>
<td>1 cm</td>
<td>1 cm</td>
</tr>
<tr>
<td><em>Candida parapsilosis</em></td>
<td>1.2 cm</td>
<td>1.7 cm</td>
<td>2.3 cm</td>
<td>2.5 cm</td>
</tr>
</tbody>
</table>
The Abutilon indicum leaf extract showed high activity against *Staphylococcus aureus* at very low concentration (2.5µg/ml) compared to *E.coli*, leaf extract showed high activity against *Candida parapsilosis* at a very low concentration (2.5µg/ml) compared to *Aspergillus niger*. The zone of inhibition had calculated in cm.

**CONCLUSION**

The present article successfully evaluated the role of Abutilon indicum for its antimicrobial activity. It was already reported that the phytochemicals have an excellent ability to act against microorganisms (Murali Krishna.T, et al.). This could be due to the active chemicals which are present in the Abutilon indicum making it a potential antimicrobial activity. We could also accomplish the role of Abutilon indicum as an antifungal agent. Further, upon proper clinical and pharmacological studies, Abutilon indicum could be one the suitable drugs for many diseases.

**REFERENCES**