ANTIBACTERIAL ACTIVITY OF LEAF EXTRACT
OF Abutilon indicum

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ABSTRACT:

Chloroform, ethanol and aqueous extracts of the leaves of Abutilon indicum were investigated for antibacterial activity against Bacillus subtilis, Staphylococcus aureus, Klebsiella pneumoniae, Pseudomonas aeruginosa, Escherichia coli and Salmonella typhi. Among the various extracts, maximum antibacterial activity was exhibited by ethanol extract (14, 25, 14, 25, 17, 18 mm) followed by chloroform extract (13, 17, 8, 15, 15, 20 mm) while aqueous extract, showed no activity.

Key words: Abutilon indicum, antibacterial activity.

INTRODUCTION

As we move into the 21st century, we observe a big change in the attitude of physicians, researchers and the general public towards prophylaxis and therapeutics originating from plant drugs. Nearly all-major pharmaceutical houses are back into research on plant products (Shah and Gopal, 1986). Medicinal and aromatic plants constitute a major source of natural compounds, which are widely used in medicinal products, cosmetics and paints that are of paramount importance in everyday life. Hence the ethnobotanical approach is currently being applied to the search for new drugs using plants, which are being used by traditional societies.

Abutilon indicum belongs to the family Malvaceae, locally known as thutti. The herb is a febrifuge, anthelmintic, anti-inflammatory and is useful in urinary and uterine discharges, piles and lumbago (Porchezhian and Ansari, 2000). The reports are available for the use of leaves in treating bleeding piles, toothache and tender gums, in bronchitis, in catarrhal bilious diarrhoea, in gonorrhoea and inflammation of the bladder and in fevers. (Kirtikar and Basu, 1999).

Earlier studies revealed that the leaves contain steroids, sapogenins, carbohydrates and flavonoids. Petroleum ether extract and benzene
extract were found to possess very good analgesic property. Also it is has been proved to have CNS depressant and antidiabetic activity (Lakshmayya et al., 2003).

The present study is aimed to analyze the antibacterial activity of the leaves of Abutilon indicum.

MATERIALS AND METHOD

Collection and preparation of plant material:

The leaves of Abutilon indicum collected from local areas of Coimbatore were air dried and broken into coarse material. The powder was subjected to extraction using Soxhlet apparatus with chloroform, ethanol and water. The three extracts were concentrated into paste consistency. From each extract 300 mg was dissolved in 10 ml of Dimethyl Sulphoxide (DMSO) and stored in airtight containers.

Antibacterial activity:

The antibacterial activities of these extracts were tested against Bacillus subtilis, Staphylococcus aureus, Klebsiella pneumoniae, Pseudomonas aeruginosa, Escherichia coli and Salmonella typhi. The antibacterial sensitivity pattern for the isolates was studied by the disc diffusion method (Kirby et al., 1996).

Methodology:

Muller Hinton agar media was prepared and the plates were swabbed with 24 hrs cultures of respective bacteria grown in nutrient broth overnight. Sterile discs of 6mm diameter were impregnated with 25µl of each extract separately. Blank disc impregnated with DMSO was used as negative control and discs of chloramphenicol (30 µg) as positive control. The plates were then incubated at 37ºC for 24 hrs. Inhibition was recorded by measuring the diameter of inhibition zone at the end of 24h. Each experiment was repeated in triplicates.

RESULTS AND DISCUSSION

The results obtained in the study are depicted in Table 1 which shows the growth inhibition produced by the leaf extracts of Abutilon indicum on 6 species of bacteria. The activities can be referred as either less, moderate or highly active based on the zone of inhibition that ranges from 9-12mm, 12 – 16mm or >16mm respectively (Hiremath et al., 1993).

The leaf extract of Abutilon indicum was found to be highly active against Staphylococcus aureus, Pseudomonas aeruginosa, Escherichia coli and Salmonella typhi (25, 25, 17,18mm). The chloroform extract was found to be moderately active against all organisms tested except for Klebsiella pneumoniae (8mm). Aqueous extract was found to
possess no activity against any of the bacteria tested. The results of the plant extract tested against various bacteria were in concordant with the positive control (chloramphenicol). The comparative study of the antibacterial activity of the different extracts of *Abutilon indicum* along with negative and positive control revealed that it possesses good antibacterial potential.

Table 1. Antibacterial activity of the leaves of *Abutilon indicum* against bacterial pathogens by disc diffusion method.

| Name of the bacterial pathogens | Inhibition zone (mm) |
|--------------------------------|----------------------|
|                                | DMSO* (Control) | Chloroform extract | Ethanol extract | Aqueous extract | Chloramphenicol (Control) |
| *Bacillus subtilis*            | -                | 13                | 14              | -              | 27                        |
| *Staphylococcus aureus*        | -                | 17                | 25              | -              | 25                        |
| *Klebsiella pneumoniae*        | -                | 8                 | 14              | -              | 30                        |
| *Pseudomonas aeruginosa*       | -                | 15                | 25              | -              | 23                        |
| *Escherichia coli*             | -                | 15                | 17              | -              | 22                        |
| *Salmonella typhi*             | -                | 20                | 18              | -              | 22                        |

* D-Methyl Sulfoxide

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