



ANTIMICROBIAL ACTIVITY OF *TRIGONELLA FOENUM GRAECUM* EXTRACTS

Nupur Bhatnagar

Department of the Biotechnology, Mahatma Jyoti Rao Phoole University, Jaipur

ABSTRACT

The antimicrobial activity of methanol extracts of various plant parts of *Trigonella foenum graecum* was tested against bacterial (*E. coli* and *P. aeruginosa*) and fungal (*A. niger* and *R. stonifer*) pathogens. The methanol extract of leaf and fruit had effective inhibitory activity to all the test pathogens, while that of stem showed no antimicrobial activity against all tested pathogens.

Key Words: *Trigonella*, Antimicrobial activity, *Escherichia*, *Pseudomonas*, *Aspergillus*, *Rhizopus*

INTRODUCTION

Plants are sources of drugs, which have made important contribution to the welfare and quality of life of urban as well as rural communities especially in tropics and sub-tropics (Sofowora 1993). *Trigonella foenum graecum* commonly known as methi/fenugreek has been used for a variety of health conditions such as menopausal symptoms, digestive problems, inducing childbirth and to rebuild and strengthen the hair shaft. It reduces hair fall and promotes hair growth. Antimicrobial activities of methanolic extracts of plant parts were screened on 2 species each of bacteria (*Escherichia coli*, *Pseudomonas aeruginosa*) and fungi (*Aspergillus niger* and *Rhizopus stonifer*) and important findings are reported in this communication.

MATERIALS AND METHODS

Methanolic extracts (3%) of dried and powdered plant materials of stem, leaf and fruit of *Trigonella foenum graecum* were prepared. Pure cultures of *Escherichia coli*, *Pseudomonas aeruginosa*, *Aspergillus niger* and *Rhizopus stonifer* were used for screening antimicrobial activities.

Bacteria were grown on sterilized nutrient agar medium while fungal species on Sabouraud's dextrose agar. These were incubated at 37°C for 48h. Each bacterial culture was maintained on the same medium after every 48 h of transferring. A fresh suspension of test organism was prepared in 1% saline solution from a freshly grown culture for antimicrobial assay. *In vitro* antibacterial activity of the methanol extract was studied by the agar well diffusion method (Perez et al. 1990). The extract (100 μ L) was introduced in the well (6 mm). The plates were incubated overnight at 37°C. The antimicrobial spectrum of the extract was determined for the bacterial species in terms of zone sizes around each well. The diameters of zone of inhibition produced by the extract were compared with those produced by the commercial control antibiotic, streptomycin. For each bacterial strain controls were maintained where pure solvent was used instead of the extract. The control zones were subtracted from the test zones and the resulting zone diameter

was measured with antibiotic zone reader to nearest mm. The experiment was performed three times to minimize the error and the mean values were presented.

Anti fungal activity of the methanolic extracts was investigated by agar well diffusion method. Fungus colonies were sub-cultured onto Sabouraud's dextrose agar, SDA,) and respectively incubated at 37°C for 24 h and 25°C for 2 - 5 days. Suspensions of fungal spores were prepared in sterile PBS and adjusted to a concentration of 10⁶ cells/mL. Dipping a sterile swab into the fungal suspension and rolled on the surface of the agar medium. The plates were dried at room temperature for 15 min. Wells of 10 mm in diameter and about 7 mm apart were punctured in the culture media using sterile glass tube. 0.1 mL of fresh extracts were administered to fullness for each well. Plates were incubated at 37°C. After incubation of 24 h bioactivities were determined by measuring the diameter of inhibition zone in mm. All experiments were made in triplicate and means were calculated.

RESULTS AND DISCUSSION

In the case of *E. coli* maximum IZ was observed in leaf extract (20.00mm) and minimum in fruit extract (17.00mm). Extracts of all plant part and minimum in leaf extract (15.20mm). In the case of *R. stonifer* maximum IZ was observed only in the fruit extract (19.11 mm) and minimum in leaf extract (09.20mm). *Aspergillus niger* also had maximum IZ in the fruit extract (11.11mm) and minimum in leaf extract (09.20mm). The leaves of *Trigonella foenum-graecum* are rich in a wide variety of secondary metabolites such as glycosides, alkaloids, phytosterols, proteins, saponins and phytosterols which have been found *in vitro* to have antimicrobial properties.

REFERENCES

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