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Antibacterial activity of *Anona squamosa and Tribulus terrestris* leaf extracts

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ABSTRACT

The effect of ethanol and aqueous leaf extracts of *Anona squamosa* and *Tribulus terrestris* on the growth of Gram negative Pseudomonas aeruginosa , *Escherichia coli* and Gram positive Staphyloccous epidermidis, Streptococcus agalactiae bacterial strains was evaluated *in vitro* by agar well diffusion assay method. The extracts inhibited the growth of all test organisms. Extract of *A. squamosa* exhibited greater antibacterial activity than T.terrestris. Gram positive strains were found more sensitive than Gram negative strains. Ethanol extract showed comparatively more inhibitory effect than aqueous extract. Staphyloccous epidermidis was found more sensitive to the leaf extracts of *A.squamosa* while Streptococcus agalactiae to that of *T. terrestris*. Zone of inhibition increased with increase in concentration of the extract. The significance of these results is discussed. The results may be of importance in identification of new potential antibacterial compounds in plants.

Key words : *Anona squamosa*, *Tribulus terrestris*, Leaf extracts, Bacterial strains, Inhibition zone.

INTRODUCTION

Plants are rich in wide variety of secondary metabolites such as tannins, terpenoides, alkaloids, flavonides, phenols, essential oils which have antibacterial properties (Trease and Evans, 1972; Cowan, 1999). Many natural antimicrobial compounds can be derived from plants (Gordon and David, 2001). Plants based antimicrobials have enormous therapeutic potential and may become the base for the development of new medicines (Trease and Evans, 1972).

In recent years several workers (Ikram and Inamul, 1984; Naqvi *et al.*,1991; Samy *et al.*, 1998; Dorman and Deans, 2000; Samy and Ignacimuthu, 2000; Srinivasan *et al*., 2001; Kapoor *et al.*, 2007; Nair and Chanda, 2007a and 2007b; Seema *et al.*, 2007 and Sengottuvel *et al*., 2007) screened many plants for antibacterial properties.

In this study, leaf extract of two plants *A. squamosa* and *T. terrestris* were evaluated for potential antibacterial activity against the clinically significant two Gram negative bacterial strains, *Pseudomonas aeruginosa* ATCC27853, *Escherichia coli* ATCC25922, and two Gram positive bacterial strains *Staphylococcus epidermidis* ATCC12228, and *Streptococcus agalactiae* NCIM2401.

Anona squamosa belongs to Anonaceae family. It is cultivated mainly for the edible fruits. All parts of plant are used in natural medicine in the tropics. It is considered to be good source of natural antibacterial compounds (Oliver-Brever, 1986). *Tribulus terrestris* classified under the family Zygophyllaceae is a naturally grown wild plant native to tropical and sub tropical regions of the world. Different parts of *T. terrestris* are reported to posses antibacterial properties (Firas *et al.*, 2008).

MATERIALS AND METHODS

Fresh mature leaves of *Anona squamosa* and *Tribulus terrestris* were collected and washed in tap water. These leaves were then surface sterilised with 0.1% $HgCl_2$ for 1-2 minutes and again washed twice in sterile distilled water to ensure that the traces of $HgCl_2$ are removed and kept for drying in shade. The dried leaves were then ground into fine powder. 10 g of the powder was extracted in 100 ml ethanol and distilled water using soxhlet apparatus. Then the extracts were kept at room temperature for complete evaporation of solvent and water. The residue was mixed in appropriate amount of DMSO (Dimethyl Sulphoxide) to get the stock solutions of different concentrations *viz.*,100, 200, 300, 400, 500 µg / µl and used for determining the effect on the growth of Gram negative *Pseudomonas aeruginosa* and *Escherichia coli* and Gram positive *Staphyloccous epidermidis, Streptococcus agalactiae* bacterial strains.

The required bacterial strains procured from National Chemical Laboratory (NCL), Pune were maintained on nutrient agar slants for use as test organisms. A loopful of 24 hrs old test organisms was added in 30 ml sterile nutrient broth for activation and shaken thoroughly to obtain uniform suspension.

The antibacterial activity of the plant extract was determined following the agar well diffusion method

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