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Antibacterial Activity of Acacia Catechu Seed Against Urinary Tract Pathogens

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ABSTRACT

The study aims to investigate the antibacterial efficacy of the Acacia catechu seed extract against selected Urinary tract pathogens Acacia catechu is known as the Cutch tree. This plant has the following medicinal properties: Astringent, Bactericidal, Refrigerant, Stimulant, Masticator, Expectorant. Acacia catechu seeds are flat, dark brown, and measure 5-8 mm in diameter. The seeds are edible, and the extract is useful in the treatment of many medical conditions in the Ayurveda. Urinary tract infections are the most common infection caused in women; hence this study can determine the antibacterial effectiveness among the pathogens causing urinary tract infections.

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INTRODUCTION

Acacia catechu is a moderate size deciduous, prickly tree typical to Southern Asia and generally dispersed in India. It is regularly known as "khair," and its different parts are utilized since old occasions in Ayurvedic medication. Several studies have reported that the *Acacia catechu* induces apoptosis in human oral squamous carcinoma cells and other SCC-25 cells

In Ayurveda, it is being used in the treatment of hack, loose bowels, throat contaminations, ceaseless ulcers, and wounds. Catechu is also used for its mitigating,anti-diabetic, Chemopreventive antimicrobial, immunomodulatory, antipyretic, antidiarrhoeal, hypoglycemic and hepatoprotective properties. Urinary tract contaminations happen when microorganisms enter the urinary tract through the urethra and start to duplicate in the bladder. Urinary tract diseases (UTIs) are the most well-known conditions requiring clinical treatment, with 6-10% of every single youthful female showing bacteriuria. The incidence of UTIs increases with age and 25-half of females matured at least 80 have bacteriuria.

A large portion of the urinary tract contaminations is brought about by gram-negative microscopic organisms like Escherichia coli, Klebsiella sp., Pseudomonas aeruginosa. The treatment primarily includes the utilization of anti-infection agents, yet the pathogenic microorganisms are getting progressively impervious to antibiotics. Instable movement of the bowel is a condition that can be brought about by various bacterial, viral, and parasitic pathogens. Certain studies have proven that the silver nanoparticles synthesised from cumin extract posses antioxidant and anti inflammatory properties. Similarly the silver nanoparticles were synthesised from ginger oil [19].The characterisation of these particles is done using visible spectrophotometer. The comprehension of the reason for looseness of the intestines in a given setting is a troublesome errand that requires efficient observation of the different pathogens. The accessibility of a well prepared clinical microbiology research center is essential to embrace such investigations.Clinical investigations led at the National Institute of Cholera, and Enteric Diseases (NICED), which incorporates emergency clinic and network, based reconnaissance for loose bowels was centered around common enteric pathogens utilizing traditional assay [23,24]. The present study is focused on the antibacterial capability of *Acacia catechu* seeds against commonly known Urinary tract Pathogens.

MATERIALS AND METHOD

Plant Material

Acacia seeds were collected during the month of December 2015 from Hosur, Tamil Nadu, India, confirmed by Green Chem Herbal extracts & Formulations, Bengaluru, Karnataka, India. Seeds were washed and conceal dried for a week and were processed to fine powder. This seed powder was gone through 100 passed through 100 mesh sieves and stored in a sealed polyethylene bag for one hr, in a 20 L round base jar with Graham condenser. The condenser was cooled, spinning with chilled water. After 1 h of extraction, round bottle flask was cooled to room temp, and the concentrate was filtered and collected. The marc, an insoluble build-up, was separated over and again with 10 L of ethanol, twice. The concentrates were separated and gathered. The consolidated foci were dissipated to dryness under diminished tension in a Buchi rotational evaporator (Switzerland) at 65°C, to get 150 g of seed powder separate. The w/w yield of the prepared extract was 6%.

Antibacterial activity

Microorganisms Tested

Staphylococcus aureus MTCC3381
Escherichia coli MTCC739
Klebsiella pneumonia MTCC432
Pseudomonas aeruginosa MTCC424
Minimum Inhibitory Concentration (MIC)
Minimum inhibitory concentration (MIC), which is considered as the least
Convergence of the example that inhibits the noticeable Growth of an organism was investigated by the Broth dilution method.

Preparation of inoculum

Organisms were sub-cultured on nutrient agar, followed by incubation for 24h at 37°C. Inoculum were set up by transferring various colonies of microorganisms to sterile nutrient broth. The suspensions were blended for 15sec and incubated for 24h at 37 °C. Required volume of suspension culture was diluted to match the turbidity of 0.5 McFarland standard (1.5x108 CFU/mL).

Preparation of Sample

Tests were set up in dimethyl sulphoxide (DMSO) at the centralization of 2 mg/ml.

Micro Broth Dilution

A series of 15 tubes were filled with 0.5 ml sterilized nutrient broth Consecutively, test tubes 2–14 got an extra 0.5 ml of the Sample sequentially diluted to make concentrate sequence from 5000 – 1.2.µg. The first tube served as the control. All the other tubes got 0.5ml of inoculum. The tubes were vortexed well and incubated for 24h at 37°C. The

subsequent turbidity was observed, and after 24 h , MIC was determined to indicate Growth or No Growth by evaluation of turbidity using optical thickness readings at 600nm.

RESULT AND DISCUSSION

Phytomedicines are used in the traditional system for management of Urinary tract infections .primarily, it is used for painful urination. Several studies were conducted in a wide variety of herbal extracts against commonly known Urinary tract pathogens like E.coli, Pseudomonas, Klebsiella,Pseudomonas aeruginosa ,staphylococcus aureus . Forskalin commonly claimed to be as weight loss medicine also proved by researchers as effective in treating UTI when injected in to the bladder [25,23]

Acacia catechu seed was investigated against Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa, Klebsiella pneumoniae. The significant pathogen that usually causes urinary tract infection.Microbroth dilution was performed which revealed No Growth from the concentration at 2500mg/ml.

The values recorded are methods for three free examination ± Standard Deviation (n=3)

CONCLUSION

The study reveals that *Acacia catechu* seeds could be useful in the management of Urinary tract infection. Rotavirus and cholera vaccines are now available as a prescription product in India for the first time after a hiatus of 30 years. Not much progress has, however, been made with a Shigella vaccine. It would be interesting to see how these vaccines would ameliorate the burden of enteric infections in settings of diarrhea in endemic areas all over India.

CONFLICT OF INTEREST

NIL

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NIL

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