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Research Article

Evaluation of Antimicrobial Activity of Cedrela toona Roxb. Fruit Extracts

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Abstract

Evaluation of antimicrobial activity was performed by cup-plate method. The test microorganisms used for the antimicrobial activity were four bacterial species (two Gram positive and two Gram negative) – *Bacillus subtilis, Staphylococcus aureus*, *Pseudomonas aeuroginosa,Escherichia coli*. The test microorganisms used for the antimicrobial activity were four bacterial species (two Gram +ve and two Gram -ve) *Bacillus subtilis, Staphylococcus aureus*, *Pseudomonas aeuroginosa,Escherichia coli*.

Keywords: Cedrela toona

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INTRODUCTION

Literature survey reveals that *Cedrela toona* Roxb. is medium sized to large deciduous tree with brown to grey scaly bark. Leaves 15 – 45 cm long usually paripinnate but sometimes with a terminal leaflet in juvenile growth, leaflets mostly 8-20, ± ovate, often falcate, 4-15 cm long, 15-50 mm wide, apex acuminate, base strongly asymmetric, margins entire, mostly glabrous, domatia present as small hair – tuffs; petiole 4-11 cm long, petiolules 5-12 mm long. Penicles 20-40 cm long. Petals 5-6 mm long, white. Capsule ellipsoid, 10-20 mm long, 6-8 mm diameter; seeds winged at both ends.[1,2,3,4] Traditionally the bark is astringent, antidysentric, antiperiodic.[5] Flowers are emmenagogue, leaf is spasmolytic, hypoglycaemic and antiprotozoal.[6] Bark and heartwood yielded tetraterpenoids, including toonacillin. Heartwood also gave a coumarin gerarnyl gernalol as its fatty esters. Toonacillin and its 6 – hydroxyl derivatives are antifeedent.[5] Literature review suggests that the antimicrobial activity of the fruit of ***Cedrela toona* Roxb.** has not been studied and hence in the present study the same was investigated for methanolic extracts of fruits of ***Cedrela toona* Roxb.**

MATERIALS AND METHOD:[7,8,9,10]

Preparation of extract:

Methanolic extracts of fruits prepared by successive solvent extraction method in a Soxhlet extractor were used for the screening of antimicrobial activity.

Microorganisms used:

The test microorganisms used for the antimicrobial activity were four bacterial species (two Gram positive and two Gram negative) – *Bacillus subtilis, Staphylococcus aureus, Pseudomonas aeuroginosa, Escherichia coli*. The stock cultures were maintained on nutrient agar medium at 4ºC. The microorganisms were activated by inoculating a loopful of the strain in the nutrient broth (25ml).

Antimicrobial activity:

Evaluation of antimicrobial activity was performed by cup-plate method. Sterile Muller Hinton agar media was poured in sterile Petri plates under aseptic conditions. The test organisms 0.1 ml was spread on agar plates. Cups were made at the size of 6 mm diameter, in the agar plates using the sterile borer. Streptomycin (10 µg/disc) was served as reference standard. The disc (6 mm in diameter) was impregnated with 10 µl of each of 125 mg/ml (1.25 mg/disc), 250 mg/ml (2.5 mg/disc) and 500 mg/ml (5 mg/disc) methanol extracts of fruits of the *Cedrela toona* Roxb.. The plates containing bacterial strains and standard were maintained at 37±0.5ºCfor 1 h to allow the diffusion of solution into the medium. All the plates containing bacterial strains were incubated at 37°C±0.5ºCfor 48 h. The zone of inhibition (mm) was calculated by measuring the diameter of zone of bacterial growth around the cup. The average of three independent determinations was recorded.

Statistical analysis:

The values are represented as Mean ± S.E.M. for triplicate sets of experiments and the statistical significance was evaluated by One-way analysis of variance (ANOVA) followed by Dunnett's t-test.

RESULT AND DISCUSSION:

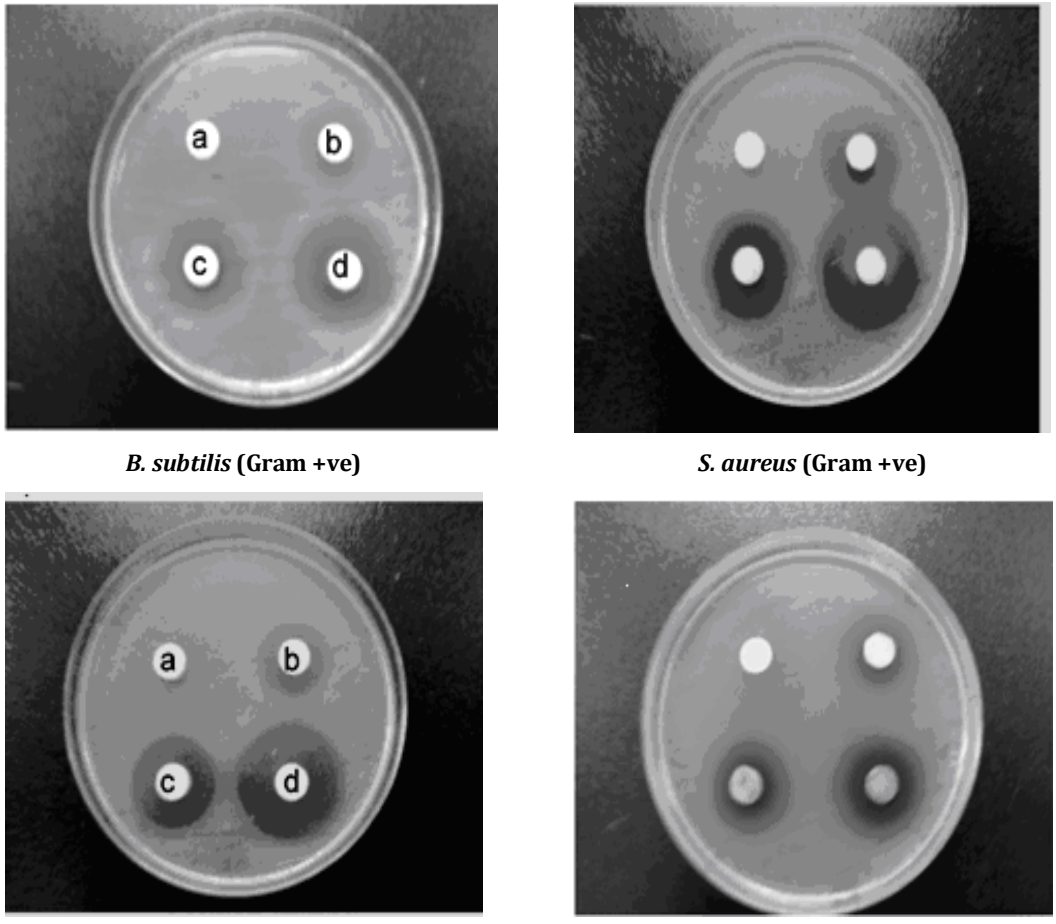
The results of antibacterial activity are shown in Table 1 and Figure 1

Table 1: Antimicrobial activity of methanol extracts of fruits of *Cedrela toona* Roxb.

Sample	*Conc.*	*Mean ± SEM of diameter of zone of inhibition(in mm)*			
		Gram positive bacteria		*Gram negative bacteria*	
		B. subtilis	*S. aureus*	*E. coli*	*P. aeuroginosa*
Methanolic extract (a)	1.25 mg/disc	6.5±0.12	7.2±0.24	6.9±0.12	7.5±0.18
Methanol extract (b)	2.5 mg/disc	16.3±0.26	17.0±0.23	16.8±0.19	17.4±0.15
Methanol extract (c)	5 mg/disc	20.0±0.38	19.3±0.33	20.6±0.17	20.8±0.14
Streptomycin (d)	10 µg/disc	24.7±0.11	23.7±0.18	25.2±0.18	25.6±0.20

Values are expressed as Mean ± S.E.M. of triplicate measurements. A value of P<0.05 was considered statistically significant (By one way ANOVA, followed by Dunnett's t-test).

Methanolic extract of plant shows antimicrobial activity against multiple gram positive and gram negative strains.



***B. subtilis* (Gram +ve)** ***S. aureus* (Gram +ve)**

***E. coli* (Gram –ve)** ***P. aeuroginosa* (Gram -ve)**

Figure 1: Antibacterial activity of methanol extracts of fruits of *Cedrela toona* Roxb. with Gram positive bacteria and Gram negative bacteria

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