

**PRELIMINARY PHYTOCHEMICAL STUDIES AND ANTIMICROBIAL
ACTIVITY OF STEM BARK OF *THESPESIA POPULNEA***

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Summary

The objective of the study is to investigate the phytochemical constituents and antimicrobial activity of alcoholic (ALTP) and aqueous (AQTP) extracts of stem barks of *Thespesia populnea* (Malvaceae) by Cup plate technique. Preliminary phytochemical investigation was carried out to identify various phytochemical constituents present in these extracts. It was found that the ALTP contained alkaloids, carbohydrates, glycosides, saponins, proteins, steroids, flavonoids, tannins and phenolic compounds; AQTP contains alkaloids, carbohydrates, glycosides, saponins, proteins, flavonoids, tannins and phenolic compounds. The aqueous extract of *Thespesia populnea* (Linn) bark showed significant anti-microbial activity against the tested bacterial organisms compare to ethanolic extract. However the zone of inhibition exhibited by the test extracts was found to be less than that of the reference standard drug (Ciprofloxacin).

Introduction

Thespesia populnea Soland ex Correa, family Malvaceae is a large avenue tree found in the tropical regions and coastal forests in India. A decoction of the bark is commonly used for the treatment of skin and liver diseases ^[1, 2]. Oil of the bark mixed with vegetable oil is useful in urethritis and gonorrhoea. The astringent bark, roots and fruits were used in dysentery, cholera and haemorrhoids ^[1, 2]. The leaves were reported to be employed locally as anti-inflammatory in swollen joints. The infusion of the bark powder is traditionally used in the treatment of diarrhoea and dysentery ^[1, 2].

The bark, leaves, flowers and fruits are useful in cutaneous infections, such as scabies, psoriasis, eczema, ringworm and guinea worm [3]. However; the bark of the plant has not been experimentally tested for its antimicrobial activity.

Hence the present study has been undertaken to investigate the antimicrobial activity of bark extracts of *T. populnea* using various bacteria.

Materials and Methods

Preparation of Extracts

The bark of the plant was collected in the month of May – June 2007 and authenticated by Dr.K.P.Sreenath, Reader and Taxonomist, Botany Department from Bangalore University. The shade dried plant material was powdered. The coarse powder was subjected to successive extraction with petroleum ether, alcohol (70%) in soxhlet apparatus and the marc obtained after alcoholic extraction was macerated with distilled water to obtain an aqueous extract. The % yield of petroleum ether, alcoholic and aqueous extracts was found to be 2.3%, 5.33% and 2.5% respectively.

The ALTP and AQTP extracts of *T.populnea* were subjected to preliminary qualitative investigations [4].

Evaluation of Antimicrobial activity:

The Cup plate technique described by Hugo and Russel (1984) was adopted for anti-bacterial activity [5].

a) Preparation of test solution:

Test solutions of petroleum ether, ethanolic and aqueous extracts were prepared by using dimethyl sulfoxide (DMSO) at concentrations 25 mg/ml and 50 mg/ml and were used for anti-microbial activity.

b) Preparation of standard solutions:

Standard drug solutions were prepared in sterile water for injection.

Ciprofloxacin - 25 µg/ml and 50 µg/ml

Results and Discussion

Phytochemical Investigation

It was found that the AQTP contains alkaloids, carbohydrates, glycosides, saponins, proteins, flavonoids, tannins and phenolic compounds; ALTP contained alkaloids, carbohydrates, glycosides, saponins, proteins, steroids, flavonoids, tannins and phenolic compounds.

Antimicrobial activity:

The aqueous extract of *Thespesia populnea* (Linn) bark showed significant anti-microbial activity against the tested bacterial organisms compare to ethanolic extract as shown in the Table .1. However the zone of inhibition exhibited by the test extracts was found to be less than that of their respective reference standard drug.

Table.1. Antimicrobial activity of stem bark of *Thespesia populnea*

Type	Test organisms (strain)	Mean zone of inhibition (mm)*					
		Ethanolic extract		Aqueous extract		Standard (Ciprofloxacin)	
		25 mg/ml	50 mg/ml	25 mg/ml	50 mg/ml	25 µg/ml	50 µg/ml
Gram Positive Bacteria	<i>Staphylococcus aureus</i> (MTCC 87)	10± 0.066	13± 0.11	14± 0.23	17± 0.17	28± 0.11	34± 0.28
	<i>Streptococcus pyogenes</i>	9± 0.11	12± 0.06	12± 0.06	16± 0.34	25± 0.05	30± 0.95
Gram Negative Bacteria	<i>Escherichia coli</i> (MTCC 46)	10± 0.11	11± 0.288	12± 0.066	15± 0.057	23± 0.338	28± 0.11
	<i>Pseudomonas aeruginosa</i> (MTCC 442)	8± 0.057	12± 0.066	13± 0.173	16± 0.346	24± 0.173	31± 0.11

- Values are mean ± SEM of triplicates

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