International Journal of Academic Research and Development
ISSN: 2455-4197
Impact Factor: RJIF 5.22
www.academicsjournal.com
Volume 3; Issue 1; January 2018; Page No. 1387-1388

Antibacterial and antihelminthic activity of methanolic extract of *Cassia senna* root bark

Sanjeevkumar Giri
Department of Pharmaceutical Chemistry, Karnataka State Women's University, Bijapur, Karnataka, India

Abstract
The present study was carried out to evaluate the antibacterial and antihelminthic property of *Cassia senna* root bark. Root bark extract was prepared by using Soxhlet apparatus and ethanol was used as solvent. The phytochemical screening of the extract was performed which revealed the presence of Phenols, Flavanoids, Steroids, Glycoside, Saponins and Alkaloids. The extract was subjected for antibacterial screening against a gram negative (Escherichia coli) and a gram positive (Staphylococcus aureus) bacterial strains using cup plate method. The results obtained were compared with Streptomycin which was used as reference drug. The extract was also screened for antihelminthic activity by using earthworms.

Keywords: *Cassia senna*, phytochemical, antibacterial, antihelminthic

Introduction

Throughout the ages human have relied on Nature to cater for such basic needs as the production of foodstuffs, shelters, clothing, means of transportation, fertilizers, flavors and fragrances, and not least, medicines. Plants have formed the basis of sophisticated traditional medicine systems that have been in existence for thousands of years, and their uses by many cultures have been extensively documented[1]. These plant-based systems continue to play an essential role in healthcare, and it has been estimated by the World Health Organization that approximately 80% of the world's inhabitants relay mainly on traditional medicines for their primary health care[2]. Chemical agents produced by living organisms (particularly the secondary metabolites) have evolved throughout millenniums under the evolutionary pressure, and are therefore more likely to have a specific biological activity. Despite the enormous potential, only a minor part of globe's living species has ever been tested for any bioactivity. For instance, approximately only 10% of all existing plant species has been assayed, and in the case of microbes the value is even lower. The process of drug discovery is so long involves the identification of candidates, synthesis, characterization, screening, and assays for therapeutic efficacy. Once a compound has shown its value in these tests, it will begin the process of drug development prior to clinical trials [3]. Clinical, pharmacological, and chemical studies of these traditional medicines, which were derived predominantly from plants, were the basis of most early medicines such as aspirin, digitoxin, morphine, taxol, vincristine, quinine and pilocarpine. These compounds were still a significant source of new drugs, especially in the anticancer, antihypertensive, anti-infective, immunosuppressant, and neurological disease therapeutic areas, and some of them have since progressed further into trials or onto the market [4-5].

Experimental Work

Collection of plant material: The root bark of *Cassia senna* was collected from Bijapur in the month of March 2014. Plants selected were healthy and free from Disease. Fresh root barks were immediately sprayed with alcohol to cease the enzymatic degradation of secondary metabolites. Root bark of *Cassia senna* were chopped into small fragments and split longitudinally into several sections to enable early drying under shade after shade drying pulverized into rough powder and it is used for the preparation of crude extract.

Extraction: Crude plant extract was prepared by continuous hot extraction method using Soxhlet extraction apparatus. About 20gm of powdered plant material was uniformly packed into thimble and extracted with 250ml of Methanol. The process of extraction continued till the solvent in siphon tube of extractor become colorless. Excess solvent is removed by distillation under reduced pressure; further the thick extract was taken in Petri-plate and kept for drying till all the solvent get's evaporated. Dried extract is subjected to photochemical screening.

Phytochemical Screening: Crude extract was tested for the presence of bioactive compounds by using standard chemical methods. Photochemical constituents present in *Cassia senna* root bark extract is summarized in table No-1.

Table 1: Results of Phytochemical test

Phytochemical Test	Inference
Phenols	+
Flavanoids	+
Steroids	-
Glycosides	+
Lignins	-
Saponins	-
Alkaloids	+

Biological Activity

Antibacterial Screening: The extract was subjected for

comparative antibacterial screening against a standard drug using gram negative (Escherichia coli) and a gram positive (Staphylococcus aureus) bacterial strains by cup plate method[6]. Test samples were prepared in distilled water in different concentrations viz. 500, 1000, 1500 and 2000 μg/ml and the standard drug was used at a concentration of 100 μg/ml. The results obtained are summarized in the table No-2

Table 2: Results of antibacterial activity.

Test Sample	Concentration (μg/ml)	Zone of inhibition (in mm)	
		E. coli	*S. aureus*
Sample-1	500	08	09
Sample-2	1000	11	10
Sample-3	1500	15	13
Sample-4	2000	15	14
Streptomycin	100	18	15
D. Water	--	06	06

Cup diameter= 6 mm Quantity of drug solution and control fed into each cup = 5μl

Antihelminthic Activity

Indian adult earthworms (*Pheretima posthuma*) collected from moist soil and washed with normal saline to remove all fecal matter; were used for the antihelminthic study. The earthworms of 3-5 cm in length and 0.1-0.2 cm in width were used for all the experimental protocol due to their anatomical and physiological resemblance with the intestinal roundworm parasites of human beings. Different concentrations of *Cassia senna* root bark are prepared. The earthworms are dipped and immediately taken off and kept under observation. The earthworms are checked for paralysis at various time intervals. Results obtained are summarized in table No-3.

Table 3: Results of antihelmithic activity

Test Sample	Concentration (□g/ml)	Observation time in Minutes				
		0 minutes	15 minutes	30 minutes	45 minutes	60 minutes
Sample-1	500	A	A	A	A	A
Sample-2	1000	A	A	A	A	P
Sample-3	1500	A	A	A	A	P
Sample-4	2000	A	A	P	P	P
Standard	100	A	P	P	P	P
D.Water	--	A	A	A	A	A

A= Active, P=Paralysed

Results and Discussion

The Comparative antibacterial screening of crude extract of Casia senna root bark has shown antibacterial potency at higher dose concentrations. Results summarized in the table No-2 reveal that the crude extract at dose concentration of 2000 μg/ml has shown good activity in comparison with standard drug streptomycin. The activity decreases with decrease in the dose concentration.

The antihelminthic activity results summarized in the table No-3 reveal that the scrude methanolic extract of *Casia senna* root bark is poorly active in paralyzing the worm.

References

1. Ncube NS, Afolayan AJ, Okoh AI. African Journal of Biotechnology. 2008b; 7(12):1797-1806.
2. Remington JP. Remington, The science and practice of pharmacy, 21st edition, Lippincott Williams & Wilkins. 773-774.
3. Handa SS, Khanuja SPS, Longo G, Rakesh DD. International centre for science and high technology. 2008; 21-25.
4. Das K, Tiwari RKS, Shrivastava DK. Journal of Medicinal Plants Research. 2010; 4(2):104-111.
5. Eloff JN. Journal of Ethnopharmacology. 1998; 60:1-8.
6. Sanjeevkumar Giri, Hanumanagouda H, Ramesh Londonkar, Basavaraja KM. Indian J. Heterocyclic Chem. 2009; 19(2):167