



Extraction, isolation and *in vitro* antimicrobial activity of *Cassia fistula* flower

M. O. Malpani* and P. R. Rajput

Department of Chemistry, Vidya Bharati Mahavidyalaya, Amravati

ABSTRACT

Melghat region is a rich source of various important medicinal plant species. More than 700 naturalized plant species have been enlisted in the Flora of Melghat. Skin disease, an important health problem found worldwide, especially in developing countries. In recent years there has been a great interest in herbal remedies for the treatment of a number of skin ailments. Medicinal plants are promising source for preparing drugs to cure skin diseases. Fresh flowers of *Cassia fistula* plant were isolated for various ingredients i.e. terpenoids and phenolics, fats and waxes, alkaloids, quaternary alkaloids and N-oxides. These ingredients were characterized and screened for their antimicrobial activity against certain pathogens by cup plate agar well diffusion method. The pathogenic microbes selected are generally the causative agents for skin diseases. All the ingredients showed moderate to good antipathogenic activity. The result shows that the test plant might be useful in curing the skin ailments.

Key words: *Cassia fistula*, pathogens, Skin diseases.

INTRODUCTION

Cassia fistula is a deciduous, medium-sized tree up to 24 m in height and 1.8 m in girth. The tree is one of the most widespread species in the forests in India, usually occurring in deciduous forests. The tree is rarely ever wholly leafless, but in some localities it is almost bare between March and May, and new leaves appear during April-July. The flowers appear along with the leaves. In dry areas, the flowers, however, appear till October. The pods develop very rapidly by October, when they are soft and green. They commence ripening in December and continue till April, when they begin to drop.

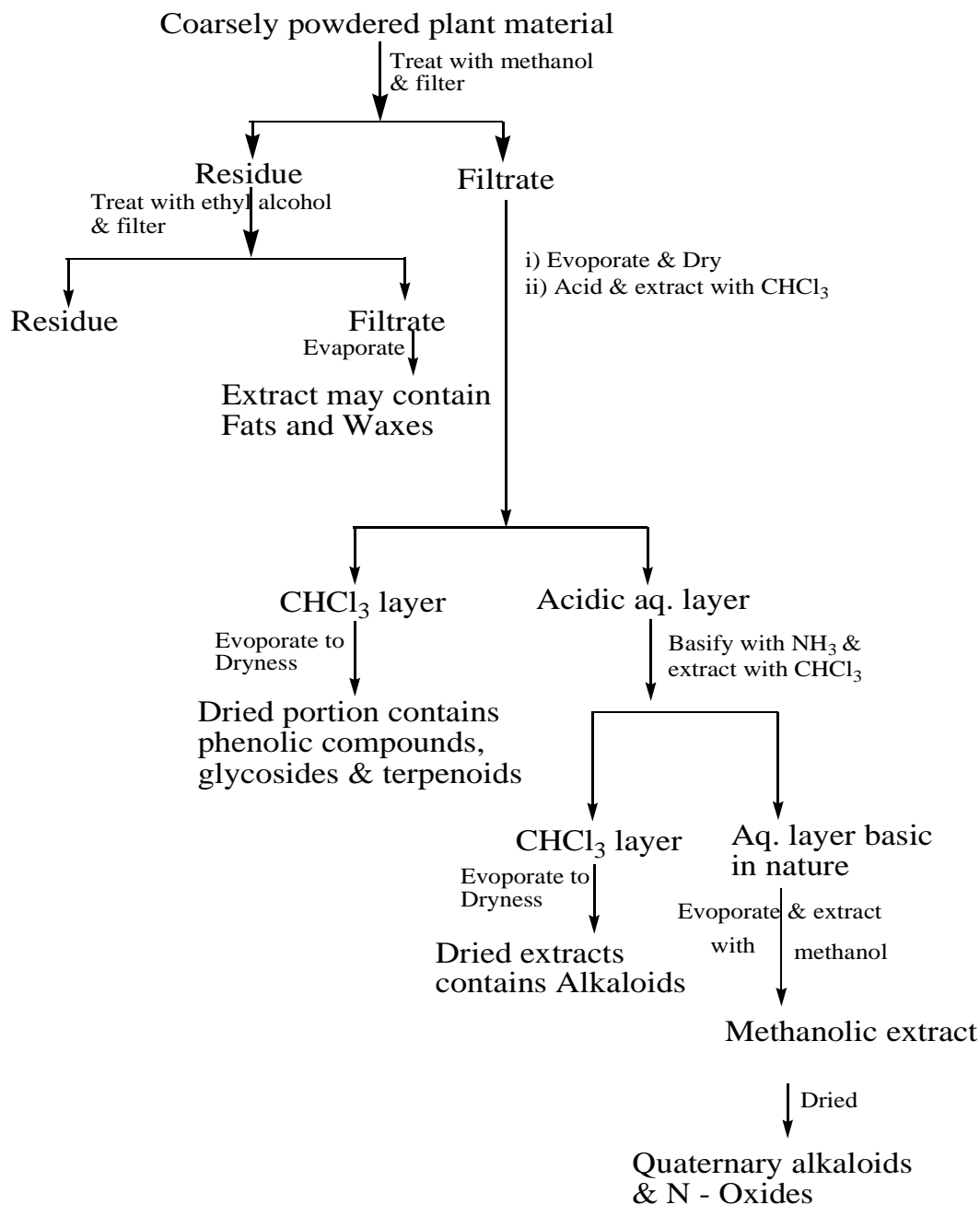
The tree has a great medicinal potential. The bark possesses tonic and anti-dysenteric properties. It is also used for skin complaints. The powder or decoction of the bark is administered in leprosy, jaundice, Syphilis and in some heart diseases. The stem bark is reported to be eaten raw for stomach-ache. The pods are official for their laxative properties. The decoction of the pods is given in pneumonia and common fever. The seeds are slightly sweet and possess laxative, carminative, cooling and anti-pyretic properties; they are given in constipation. They are useful in jaundice, biliousness, skin diseases and in swollen throat. The whole seed powder cures intestinal amoebiasis. The leaves are used in jaundice, piles, rheumatism, ulcers and also externally, in skin eruptions, ringworm, eczema, prurigo, pruritis, etc. The flowers are eaten as they possess astringent, purgative, febrifugal and anti-bilious properties. A decoction of the flowers is given in stomach troubles [1].

EXPERIMENTAL SECTION

The flowers of *Cassia fistula* plant were collected from the Melghat forest region of Amravati, District of Maharashtra, India in the month of April – July and the plant material was authenticated by the taxonomists Dr. S. P.

Rothe from the Department of Botany, Shri Shivaji College Akola. A voucher specimen (ML - 102) was deposited in the herbarium of Department of Botany, Shri Shivaji College, Akola.

Fig. 1: Tree Diagram showing extraction and isolation method



Extraction and isolation:

The flowers of *Cassia fistula* plant were shade dried at room temperature and ground in a manual mill to get coarse powder. The powder was kept in the air tight polythene bags and stored at a dry place. The coarse powdered material of flower was treated with methanol and filtered. The residue thus left was again treated with ethyl alcohol and filtered to get fats and waxes. The filtrate was acidified, extracted with chloroform and separated by using separating funnel. The chloroform layer contains terpenoids and phenolics whereas acidic aqueous layer on basic

treatment with ammonia followed by chloroform treatment gave alkaloids, whereas methanolic treatment gave Quaternary alkaloids and N- Oxides. All the isolated constituents were analyzed phytochemically and screened for their antimicrobial activity [2].

Chemicals:

Mueller Hinton agar, SDA and Antifungal Assay Agar (Himedia Lab); Methanol, Chloroform, (Ranbaxy laboratories Ltd. S.A.S. Nagar); Standard Discs of *Nystatin*, *Clotrimazole* and *Ampicilin /Cloxacilline* (Himedia Lab); Nutrient Broth, PDA (Himedia Lab)

Microorganisms:

The microorganisms which were used procured from Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. Viz: *Rhizopus sp.*, *Curvularia eryostides*, *Drecheslera tetrameda*, *Fusarium cicerg*, *Bipolaris sorokenia*

Antifungal assay:

The Fats & Waxes, Terpenoids & Phenolics, Alkaloids, Quaternary alkaloids & N-oxides, were examined for their antifungal potency by Cup plate agar method [3, 4] against five fungal species viz., *Rhizopus sp.*, *Curvularia eryostides*, *Drecheslera tetrameda*, *Fusarium cicerg*, *Bipolaris sorokenia* which generally related to **skin diseases**. Petri plates were prepared with 25ml sterile SDA. A sterile cork borer (8 mm) was used to make wells in each plate for extracts. 1 ml inoculums suspension was swabbed uniformly over the agar medium to get uniform distribution of fungi. These plates were labelled and 100µl of each plant extract (at concentration of 200 mg/ml) was added aseptically into the well. The petri plates were then incubated at 27°C for 48 hrs during which the activity was evidenced by the presence of zone of inhibition surrounding the well. The negative control was prepared using respective solvent. Nystatin disc (100 units/disc), Clotrimazole disc (10 mcg/disc) and Ampicilin /Cloxacilline (10 mcg/disc) were used as positive control. The zones of inhibition were recorded in millimetres by using Himedia Zone Reader Scale.

Table No. 1:- Antifungal activity of different extract of the plant *Cassia fistula*

Extracts	Concentration	Inhibitory zones in mm				
		<i>Rhizopus sp</i>	<i>Curvularia eryostides</i>	<i>Drecheslera tetrameda</i>	<i>Fusarium cicerg</i>	<i>Bipolaris sorokenia</i>
1) Fats & Waxes	200 mg/ml	06 mm	04 mm	16 mm	07 mm	14 mm
2) Terpenoids & Phenolics	200 mg/ml	08 mm	--	08 mm	14 mm	20 mm
3) Alkaloids	200 mg/ml	02 mm	--	06 mm	06 mm	16 mm
4) Quaternary alkaloids & N-oxides	200 mg/ml	04 mm	06 mm	05 mm	18 mm	16 mm
5) Nystatin disc (Control)	100 mcg/disc	12	14	18	16	--
6) Clotrimazole disc (Control)	10 mcg/disc	14	12	10	--	10
7) Ampicilin /Cloxacilline (Control)	10 mcg/disc	22mm	---	---	20mm	---

RESULTS AND DISCUSSION

The results obtained for the antifungal assay performed for various isolated ingredients of *C. fistula* plants are presented (Table 1). Among the various isolated ingredients, Fats & Waxes set of extract was found to be more effective against *Drecheslera tetrameda* and *Bipolaris sorokenia*. Terpenoids & Phenolics group extract was effective against *Fusarium cicerg* and *Bipolaris sorokenia*. Alkaloids, Quaternary alkaloids & N-oxides were found to be more effective against *Bipolaris sorokenia*, Whereas Quaternary alkaloids & N-oxides set also effective against *Fusarium cicerg*. Activities of the various extracts were comparable to those of standard antifungal agent *Nystatin*, *Clotrimazole* and *Ampicilin /Cloxacilline* as control.

In the present study five different fungal strains were used to screen possible antifungal activity related to skin diseases of *C. fistula* extracts. A result clearly indicates that, extracts showed significant antifungal activity.

However, further detailed study in the light of medicinal science is advised to get correct insight of the treatment.

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