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Research Article

PHYTOCHEMICAL INVESTIGATION AND ANTIBACTERIAL ACTIVITY OF VARIOUS EXTRACT OF *CASSIA FISTULA* PLANT

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ABSTRACT

This paper deals with a Phytochemical investigation and antibacterial study of the Water , methanol ,petroleum ether extract and their acid and non acid content from the leaves and pods of cassia fistula an ethno medicinal plant against the bacteria , all the extract and acid ,non acid content exhibit good to moderate anti bacterial activity against bacteria .these bacteria are pathogenic and create various skin diseases and inflammation hence from this study we try to investigate medicinal value of plant.

Keywords: Cassia fistula

INTRODUCTION

Various medicinal plants have been used for years in daily life to treat diseases all over the world. Interest in medicinal plants reflects the recognition of the validity of many traditional claims regarding the value of natural products in healthcare[1]. *Cassia fistula* L., (Leguminosae), a semi-wild Indian Labernum (also known as the Golden Shower), is distributed in various countries including Asia, South Africa, Mexico, China, West Indies, East Africa and Brazil. It is an ornamental tree with beautiful bunches of yellow flowers. This plant is widely used by tribal people to treat various ailments including ringworm and other fungal skin infections. It is used by Malaialis tribe in India to treat nasal infection[2] . The pulp of the ripe fruits has a mild, pleasant purgative action and is also used as an anti-fungal drug[3]. Indian people are using the leaves to treat inflammation, the flowers as a purgative, the fruit as anti-inflammatory, antipyretic, abortifacient, demulcent, purgative, refrigerant, the plant is good forchest complaints, eye ailments, flu, heart and liver ailments and rheumatism[4,5,6] . It is useful in treating haematemesis, pruritus, eucoderma and diabetes[7,8]. Besides its pharmacological uses, its extract is also recommended for pest and disease control[9] . *Cassia fistula* exhibited significant antimicrobial activity and showed properties that support folkloric use in the treatment of some diseases as broad-spectrum antimicrobial agents[10] .The whole plant is used to treat diarrhea; seeds are used to treat skin diseases, flowers and fruits are used to treat skin diseases, fever, abdominal pain, leprosy by traditional people[10].*Cassia fistula* plant parts are known to be an important source of secondary metabolites, notably phenolic compounds. Fistucacidin(3,4,7,8,4_-pentahydroxyflavan) was first extracted from the heartwood[11] .Kaempferol and a proanthocyanidin have been isolated from the acetone extract of the flower[12] .A bianthraquinone glycoside, fistulin together with kaempferol and rhein have been isolated from ethanol extracts of *Cassiafistula* flowers[13]. Besides phenolics and their derivatives, a certain amount of alkaloids have also been reported in the flowers[14]. Traces of triterpenes have been observed in both flowers and fruits[15]. A compound, 3B-hydroxy-17-norpimar-8(9)-en-15-one was isolated from the pods of *Cassia fistula*[16] .In the present study we screened the antibacterial and antifungal activity ,the results of the antibacterial and antifungal activity of different solvent extract of *Cassia fistula* pod ,leaves, and an isolated compound.

MATERIAL AND METHODS

Plant material

The leaves, pod, bark of plant are collected from the "Melghat" forest region which is in Amravati district of Maharashtra state in the different different month the plant was authenticated by the taxonomists from the department of botany Shri Shivaji college Akola voucher specimen(ML102) is deposited in the herbarium of botany department of Shri Shivaji college Akola.

Extraction and isolation

The leaves, pod, bark were collelected from Melghat forest region they are get separated as leaves, flowers, bark, pod and all of them shade dried at room temperature and ground in a manual mill the powder was kept in a air tight polythene bags and extracted with water, methanol, petroleum ether, and separated the acid and non acid contain of the every extract.

Microorganism

The microorganisms which are used for the antibacterial activity were brought from National Chemical Laboratory Pune these are as follows.

Bacteria :- Escherichia coli NCIM No. 2931, ATCC No. 25922, Staphylococcus aureus NCIM No. 5021, ATCC No. 25923, Bacillus subtilis NCIM No. 2063, ATCC No. 6633, Pseudomonas aeruginosa NCIM No.2036, ATCC No.19429,

Antimicrobial assay

The methanol, water, petroleum ether extracts (semisolid masses and dry powder) were examined for their antibacterial potency[17] by Cup plate agar method against four bacterial species. The bacterial specimens were collected from National Chemical Laboratory, Pune. The extracts were dissolved in methanol, water, and petroleum ether to obtain a concentration of 200 mg/ml. The boars (6 mm in diameter) were prepared by sterile borer[18]. Petri plate were prepared with 25ml sterile Mueller Hinton Agar. The test culture were swabbed on the top of the solidified media and allowed to dry for 10 minutes. The tests were conducted at 200 mg/ml concentration of the extract. The negative control was prepared using respective solvent. Ampicilin disc (10 mcg/disc) and Vancomycin disc (30 mcg/disc) were used as positive control. The petridishes were then incubated at 37°C for 24 hrs. The zone of inhibition was recorded in millimetres by using Himedia Zone Reader Scale.

RESULT AND DISCUSSION

Crude Petroleum ether, methanol and water extracts of *Cassia fistula* leaves and pod were tested against bacteria *Staphylococcus aureus*, *Escherichia coli*, *Bacillus subtilis*, *Pseudomonas aeruginosa*. The results indicated that the tested crude extracts showed antibacterial activity towards the bacteria. From above result it is found that the water extract of leaves and petroleum ether extract are give good result against staphylococcus aureus only but no activity against other bacterial species. Water extract of pod show good to moderate antibacterial activity against *bacillus subtilis* and *Pseudomonas aeruginosa,* like that acid content of leaves show good activity against *Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa* and non active against *bacillus subtilis,* but in the contrary the acid content of pod show good to moderate activity against all bacterial species.

Table 1: Antibacterial activity of different extract of the plant cassia fistula

Extracts	concentration	Inhibitory zones in mm			
		Escherichia coli	*staphylococcus aureus*	*bacillus subtilis*	*Pseudomonas aeruginosa*
Water extract (leaves)	200mg/ml	AB	10	AB	AB
Petroleum. ether extract (leaves)	200mg/ml	AB	12	AB	AB
Water extract (pod)	200mg/ml	AB	AB	25	12
Acid contain of (leaves)	200mg/ml	16	12	AB	18
Acid contain of (pod)	200mg/ml	20	20	25	19
Non acid contain of (leaves)	200mg/ml	AB	AB	18	20
Methanol extract of leaves	200mg/ml	19	17	16	AB
Methanol extract of pod	200mg/ml	16	40	19	18
Control(Methanol)		---	---	18	14
Control Ampicilin		30	19	35	29
Control Vancomycine		20	13	20	19

Fig. 1: Zone of inhibition shown By control Ampicilin andVancomycin against E.coli

Fig. 2: Zone of inhibition shownby control Ampicilin andVancomycin against S.a.

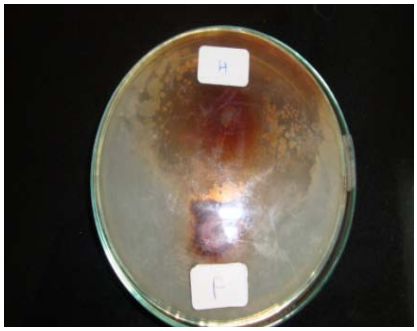

Fig. 3: Zone of inhibition shown by H & F against E.coli

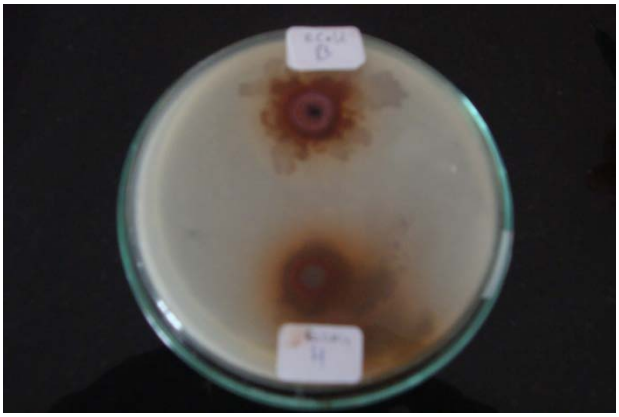

Fig. 4: Zone of inhibition shown by B & H against E.coli

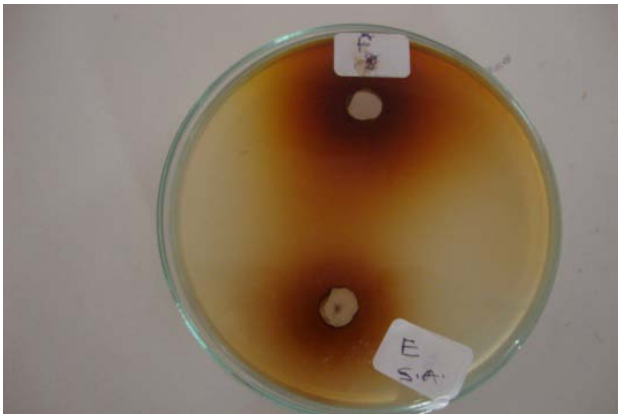

Fig. 5: Zone of inhibition shown by E & F against S.a.

Zone of inhibition shown by bacteria *bacillus subtilis*

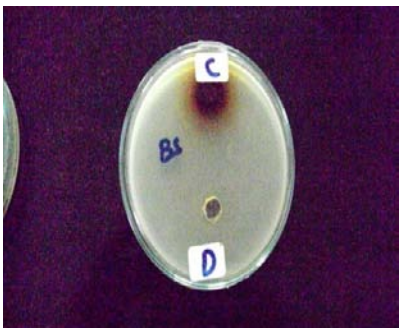

Fig. 6: Zone of inhibition shownBy C &D against Bacillus s.

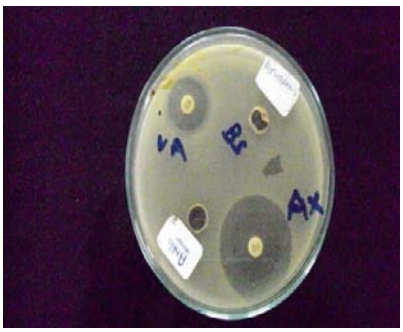

Fig. 7: Zone of inhibition shownBy control Vancomycin and Ampicilin against Bacillus s.

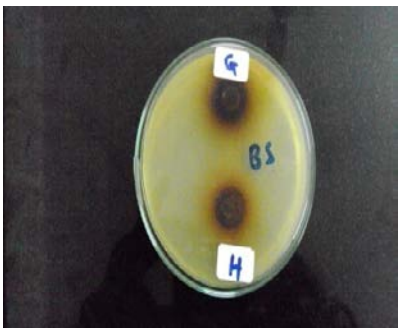

Fig. 8: Zone of inhibition shown by G & H against B. s.

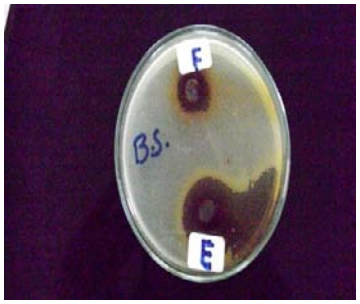

Fig. 9: Zone of inhibition shown By E & F against B.s.

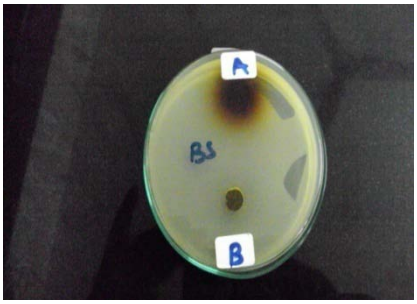

Fig. 10: A moderate .Zone of inhibition shownBy A & B against B.s.

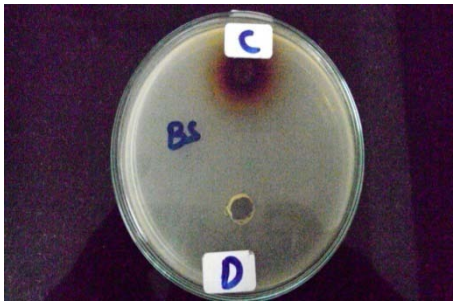

Fig. 11: A moderate Zone of inhibition Shown by C & D against B. S.

Zone of inhibition of *Pseudomonas aeruginosa*,

Fig. 12: Zone of inhibition shownBy G & H against P.a.

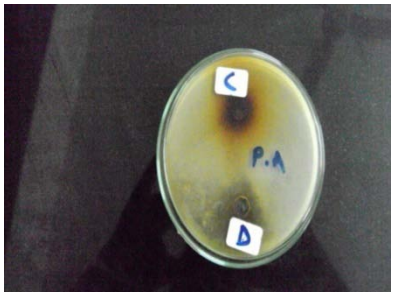

Fig. 13: Zone of inhibition shownBy C & D against P. a.

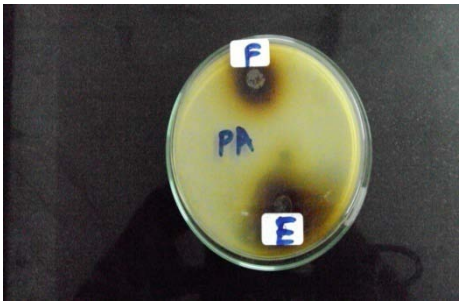

Fig. 14: Zone of inhibition shown By E & F against P.a.

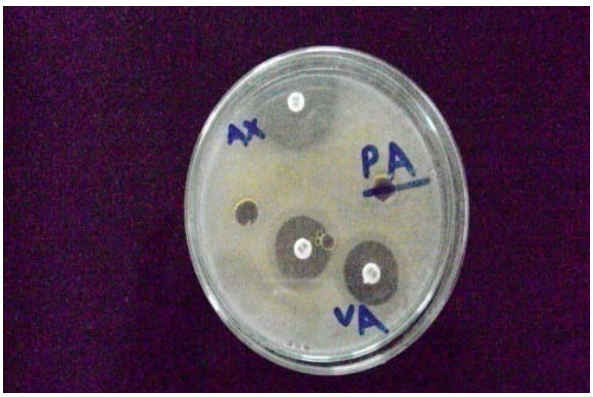

Fig. 15: Zone of inhibition shown By control vancomycine Ampiciline Against P.a.

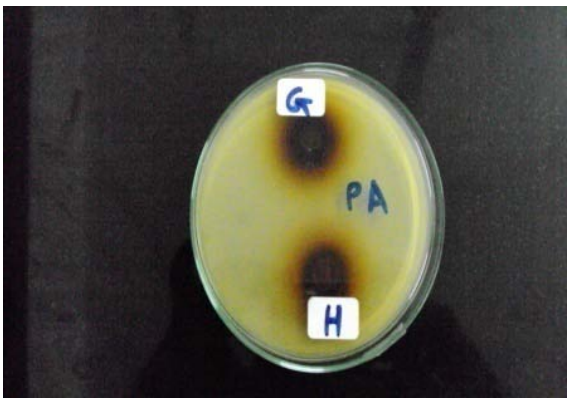

Fig.16.Zone of inhibition shown by G & H against P.a.

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