

Preliminary Phytochemical Screening and Antimicrobial Activities of *Boswellia serrata* Roxb. Leave Extracts

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ABSTRACT: In Indian lifestyle herbal plants play an important role. Each plant has its unique importance in health care. Leave extracts of *Boswellia serrata* Roxb. in methanol, ethanol, n-Hexane, chloroform and water is used for preliminary phytochemical screening and antimicrobial activities.

Preliminary phytochemical screening showed presence of alkaloids, flavonoids, steroids, Triterpenoid etc. The extracts were found to have significant antimicrobial activities. The result showed that ethanol and methanol extracts were more active.

KEYWORDS : *Boswellia serrata*, Antimicrobial activities, leave extracts.

I. INTRODUCTION

Boswellia serrata Roxb. (Family – Burseraceae) is commonly known as Salai or Guggal. Its gum resin is used as Antiseptic¹, Antifungal and antimicrobial¹, Anti-inflammatory², Arthritis³, Anti-obesity⁴, Asthma^{5,6}, Cardiogenic⁷, and Anticonvulsant⁸. In Unani Medicines and Ayurveda this plant has a large demand. With medicinal values this plant has cosmetic values too. Its bark resin, seed extract, flower extract, oils are studied to the large extent providing existence of Boswellic acid and other metabolites. In continuation of the work of phytochemical studies and antimicrobial analysis of various plants, we are presenting this paper on *Boswellia serrata* Roxb. leaves.

II. MATERIALS AND METHODS

Plant material collection and Authentication:-

The leaves of *Boswellia serrata* Roxb. were collected from Laling forest near Dhule city (M.S.) The leaves were shed dried and grind to powder. The powder was used for the extraction of constituents of plants.

The plant specimens were authenticated by Dr.L.K.Kshirsagar, Department of Botany, S.S.V.P.S.'s L.K. Dr. P.R.Ghogrey Science College, Dhule (M.S.).

Extraction of the powdered leaves:-

The powdered leaves were successively extracted by cold maceration process using organic solvents like n-Hexane, methanol, ethanol, chloroform and water. All the extracts were evaporated to dryness and stored for future studies.

Phytochemical Studies :-

n-Hexane, methanol, ethanol, chloroform and water extracts were subjected to preliminary phytochemical analysis. The phytoconstituents were screened according to the common phytochemical methods described by Harborne (1998)⁹.

Determination of antimicrobial activity :-

Clinical isolates of Gram positive bacteria *Staphylococcus aureus* and *Bacillus subtilis*, Gram negative bacteria *Escherichia coli* and *Pseudomonas aeruginosa* for antibacterial study and *Candida albicans* and *Aspergillus niger* for

antifungal study is taken as authentic strains^{10,11}. Antibacterial and antifungal activity assays were performed by the modified disc diffusion method^{12,13,14,15}.

The bacterial and fungal strains were obtained from National Collection of Industrial Microorganisms (NCIM), Pune, India. Ciprofloxacin for bacterial and Amphotericin for fungi were used as standard. The stock solution of each compound was prepared in DMSO.

Culture of the bacterial organisms was aseptically introduced and evenly spread on the surface of sterile Mueller Hinton agar plates. Stock solution of each compound was prepared in DMSO. Ciprofloxacin and Amphotericin B moistened with water were used as standard.

III. RESULT AND DISCUSSION

Preliminary phytochemical tests for the presence of secondary phytoconstituents present in n-Hexane, chloroform, ethanol, methanol and water extracts of *Boswellia serrata* Roxb. leaves showed the results.

Table 1 : Preliminary phytochemical screening of *Boswellia serrata* Roxb. leaves extracts.

Sr. No.	Phytoconstituents	n-Hexane	Methanol	Ethanol	Chloroform	Water
1	Carbohydrates	-	+	+	-	+
2	Glycosides	-	+	+	-	+
3	Steroids	+	-	-	+	-
4	Flavonoids	+	+	+	-	-
5	Alkaloids	-	+	+	-	-
6	Tannins	-	+	+	-	+
7	Phenolic compounds	-	+	+	-	+
8	Triterpenoids	+	-	-	+	-
9	Proteins	-	+	+	-	+
10	Amino Acids	-	+	+	-	-

(+) Positives Test

(-) Negatives Test

Table 2: Cultures used for the antimicrobial screening .

Microorganism	Strain Name	Strain reference
Gram positive bacteria	Staphylococcus aureus	NCIM 2079
	Bacillus subtilis	NCIM 2250
Gram negative bacteria	Escherichia coli	NCIM 2109
	Pseudomonas aeruginosa	NCIM 2036
Fungi (Yeast)	Candida albicans	NCIM 3471
	Aspergillus niger	NCIM 545

Table 3: Antimicrobial activities of n-Hexane, Chloroform, Ethanol and Methanol extracts.

Sr. No.	Sample code	B.Subtilis	S.aureus	P.aeruginosa	E.coli	C.albicans	A.niger
1	EC	7.52	10.62	-	-	-	-
2	EE	13.32	14.34	13.45	-	-	-
3	HE	7.15	12.14	-	-	-	-
4	ME	13.20	11.75	14.28	-	-	-
5	Ciprofloxacin	30.40	23.41	3.32	25.29	NA	NA
6	Amphotericin B	NA	NA	NA	NA	10.12	10.94

[EC:- Chloroform extract ,EE: Ethanol extract, HE : n-Hexane extract, ME: Methanol extract.]

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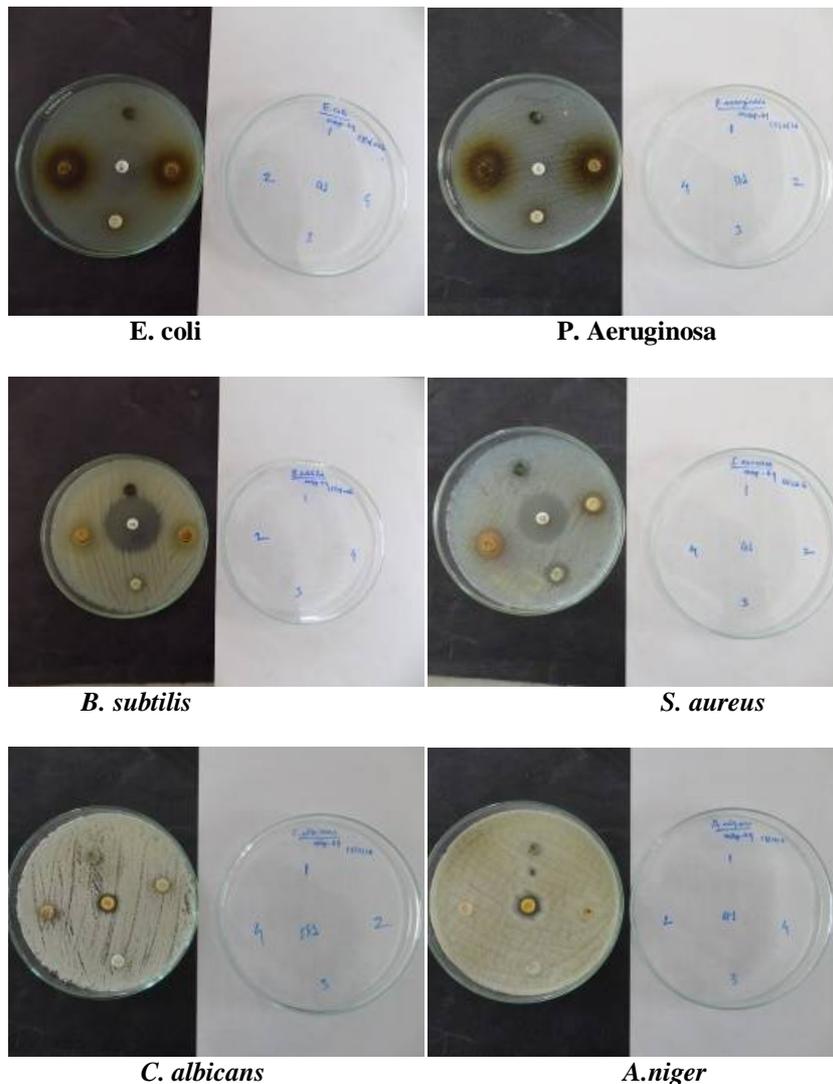
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IV. CONCLUSION

Leave extracts of *Boswellia serrata* Roxb. in different organic solvents were evaluated for preliminary phytochemical screening give presence of flavonoids, Triterpenoids, alkaloids etc. screening of antimicrobial activity showed that highest antimicrobial activity is shown by ethanol extract and methanol extract, Hexane extract showed moderate activity while chloroform extract showed lowest antimicrobial activity. Antifungal activity is not shown by any leave extracts of *Boswellia serrata* Roxb.

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