September 2009 *Volume 3 Issue 2-3*

Trade Science Inc.

Research & Reviews in

BioSciences

Regular Paper

RRBS, 3(2-3), 2009 [120-122]

Comparative studies on antibacterial potency of leaf, stem bark and root bark of butea superba Roxb.,

H.A.Sayeswara[1], H.S.Ravikumar Patil*[2]

[1]Department of Zoology Sahyadri Science College(Autonomous) Kuvempu University Shimoga. , Karnataka, (INDIA)

[2]Department of Biotechnology, GM Institute of Technology, Davanagere-577006, Karnataka, (INDIA)

E-mail : patil_varuni @rediffmail.com

Received: 23rd May, 2009 ; Accepted: 3rd June, 2009

ABSTRACT

Antibacterial activity of methanolic leaf; stem bark and root bark extract of *Butea superba* Roxb., was evaluated through disc diffusion method. Prelimenery phytochemical tests revealed the presence of alkaloids, saponina, sterols and tannins at different concentrations. Antibacterial activity was tested against gram +ve and gram -ve organisms. The methanolic leaf extract exhibited maximum activity against *Staphylococcus aureus*(NCIM-2079) Stem bark methanolic extract on *Enterobacter aerogenes*(NCIM-2340) and root bark extract on *Enterobacter aerogenes* (NCIM-2340). All the extracts tested exhibited concentration dependent activity against tested organisms.

KEYWORDS

Butea superba;
Antibacterial studies;
Phytochemical evaluation.

INTRODUCTION

Butea superba Roxb., a member of Papilionaceae is a rare, endangered medicinal plant, found sparsely distributed in Western ghat region of Karnataka state. The plant is commonly known as Lathapushpa (Sanskrit) and Muttugada balli (Kannada). Leaf juice is used in treating heat eruptions in children, bark is used in the preparation of tonics, elixire and in poultice, root is known to contain two glycosides, butrin (Chopra, 1952). Toxicological studies on root extract revealed that dominant lethal doses doesn't have any toxic effect on male reproduction (Pongpanparadon A, *et al* 2002), Root extract is used against errectile dysfunction (Cherdshewasart W, Nimsakul N, 2004) root bark extract is known to inhibit acetylcholin esterase. Local tribal groups of Davanagere district, Karnataka, India, uses the aqueous extracts of leaves, stem bark and root with lime juice in healing the wounds, aqueous leaf extract is mixed with honey and cows urine (in the proportion of 2:1:1) is used in treating jaundice and the root in increasing the sexual potency in male (root were ground in to thick paste and mixed with jaggery and made in to pills, thick paste without jaggery is applied externally, and each pills a day before intercourse is suggested for male) (Manjunatha, 2004).

Critical review of the literature revealed that this plant genetic resource has not been tested for its antibacterial potency and hence an attempt has been made to analyze the antibacterial property of this species.

MATERIAL AND METHODS

Collection of plant materials

Leaves, Stem bark and root bark of Butea superba Roxb., were collected from the Joldal range of Davanagere district, Karnataka during 2003 April and

identified by the first author and taxonomic authenticity was confirmed by referring to herbarium specimens at Madras herbarium, Botanical Survey of India, Southern Circle, Coimbatore and voucher specimen were deposited in Departmental herbaria, Department of Biotechnology, Kuvempu university, Shankaraghatta as authentic specimens for future reference.

Preparation of extracts and preliminary phytochemical studies:

Leaves, Stem bark and root bark of *Butea superba* Roxb., were collected, shade dried, powdered mechanically. The powdered materials were exhaustively extracted with aqueous methanol at 40-60°C for about 48 hrs. The solvent was distilled off at low temperature under reduced pressure in rotavapor (Buchi.) and concentrated on water bath to get the crude extract. The extracted drug was subjected to various phytochemical tests to detect the active constituents in it (Sofowara 1993, Trease and Evans 1989).

Antibacterial screening

The bacterial strains obtained from National chemical laboratory, Pune (listed in TABLE 2) were employed for screening purpose by disc diffusion method. 25 mg, 50 mg and 100 mg of the extracts were dissolved in 1ml of aqueous methanol. Filter paper discs (Whatman No.1) of 5 mm-diameters were loaded with bold of crude extract and sterilized. 100µl of 24 hrs broth cultures were spread on sterilized nutrient agar media, impregnated discs were placed on it and incubated for 24 his at 37°C. Streptomycin disc (10µg/disc) was used as a standard drug. The diameters of zone of inhibition in mm were recorded. The experiment was performed in triplicates and average diameter of zone of inhibition were obtained. The average values are given in TABLE 2.

RESULT AND DISCUSSION

The phytochemical screening of aqueous methanolic leaf; stem bark and root bark of *Butea superba* Roxb., reveal the presence of alkaloids, saponins, glycosides sterols and tannins and phenolic compounds (TABLE 1).

TABLE 2. Reveals the antibacterial activities of the tested drugs. All the extracts tested were found effective against gram +ve and gram -ve bacterials strains

TABLE 1: Preliminary phytochemical screening of aqueous methanolic extracts of Leaf, Stem bark and root bark of *Butea superba* Roxb.,

Chemical Groups	Tested Drugs		
	Methanolic leaf extract	Methanolic stem bark extract	Methanolic root bark extract
Alkaloids	+	+	++
Glycosides	++	+++	++
Saponin	+++	+++	+
Tannin	+	++	++
Phenolic compounds	+	+++	++
Flavonoids	++	+	+++

TABLE 2: Antibacterial activity of aqueous methanolic stem bark extracts of *Butea superba* Roxb.,

Tested Organisms	Tested Drugs								
	Methanolic leaf extract			Methanolic stem bark extract			Methanolic root bark extract		
	2.5mg	5mg	10mg	2.5mg	5mg	10mg	2.5mg	5mg	10mg
Bacillus subtilis NCIM-2063	8.5	9.2	10	5.5	6.5	7.4	6	6.5	7.8
Escherichia coli- NCIM-2065	10.2	11	11.8	8	9.2	10.5	7	7.8	8.6
Enterobacter aerogenes-NCIM-2340	9.3	10.5	11	8.5	9.8	11	8.5	12	13
Alcaligenes faecalis- NCIM-2262	9.5	12	12.5	7.5	8.7	9.5	6	7.2	8
Staphylococcus aureus NCIM-2079	12.5	13.2	14	8.5	9.4	10.2	9	10.2	11

tested. Aqueous methanolic leaf extracts exhibited maximum activity against *Staphylococcus aureus*. Methanolic stem bark extract showed maximum activity against *Enterobacter aerogenes*. Methanolic root bark extract exhibited maximum activity was against *Enterobacter aerogenes*. In the entire cases inhibition zone increased with increase in drug concentrations and thus exhibiting concentration dependent activity. These results provide a support to some of the traditional medicinal properties of the genus *Solanum.*

ACKNOWLEDGEMENT

The authors are grateful to Sri G M Lingaraju, Secretary and Dr. S G Hiremat, Principal GMIT, Davangere Karnataka, INDIA, for their financial assistance and lab facilities. The authors wish to thank all the staff members of the Dept of Biotechnology of GMIT. Davangere, KARNATAK, INDIA.

REFERENCES

[1] M.C.Castello, A.Phatak, Naresh Chandra, M.Shron; Indian Journal of Experimental Biology, **40**, 1378-1381 **(2002)**.

[2] W.Cherdshewasart, W.Cheewasopit, P.Picha; Journal of Ethnopharmacology, **93(2-3)** p.255-260 **(2004)**.

[3] R.N.Chopra, S.L.Nayar, I.C.Chopra; Glossary of Indian Medicinal Plants. CSIR, New Delhi **(1956)**.

[4] M.M.Iwu, A.R..Duncan, C.O.Okunji; New antimicrobials of plant origin.p.457-462 In: J.Janick (ed.) Prospectives on new crops and new uses. ASHS press, Alexandria, VA **(1999)**.

[5] K.R.Keshavamurthy; Medicinal plants of Karnataka, Karnataka Forest Department (ed.) Bangalore, India **(1994)**.

[6] B.K.Manjunatha; Floristic composition of Davanagere district Karnataka PhD. thesis submitted to Dept. of Biotechnology, Kuvempu University, Shankaraghatta, Karnataka. India **(2004)**.

[7] A.Pongpanparadon, S.Aritaja)t, K.Saenphet; Southeast Asian J.Trop.Med.Public Health, **33(suppl 3)**, 155-58 **(2002)**.

[8] J.Robbers, M.Speedie, V.Tylor; Pharmacognosy and Pharmacobiotechnology. P.1-14 uriliams and Baltimore (ed.) Baltimore **(1996)**.

[9] L.A.Sofowora; Medicinal plants and traditional medicine in Africa. Spectrum Books Ltd, Ibaban. Harborne. pp. 55-71 **(1993)**.

[10] G.E.Trease, W.Evans, C.Trease; Evans.Pharmacognosy: A Physicians's Guide to Herbal Medicine. 13th Edition. Bailliere, Tindall. London **(1989)**.