ISSN 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

Available online at: http://www.iajps.com *Research Article*

ANTIBACTERIAL ACTIVITY OF LEAF AND FLOWER EXTRACTS OF *BUTEA MONOSPERMA(LAM.)*

Poornachandar.G[1]*, Sree vennela.P[2], Venkata ramana devi[2], B.Chandrasekhar Rao[3].

1. Srinivasa Pharmaceutical Institute and Centre for Research, Burugupally(v), Vikarabad(m), Rangareddy, Telangana, India.

2. Department of Biochemistry, Osmania University, Tarnaka, Hyderaba, Telangana, India.

3.SSJ College of Pharmacy, V N Pally, Hyderabad, Telangana, India.

Corresponding author:
Poornachandar.G
Assistant professor (Biotechnology)
SPICR,Vikarabad,R.R dist,A.P
Mail id: bio.poorna@gmail.com

Mobile number:9966943450

ABSTRACT

The present paper deals with antibacterial activity of Butea monosperma (Lam.), an important medicinal tree in India. The in-vitro antibacterial activity of methanol, chloroform, ethyl acetate and aqueous extracts were studied by cup plate method against gram positive bacterial species (cocci and bacilli). Among these, chloroform and aqueous extracts were possessing potent inhibitory effect. Tetracycline and streptomycin are used as standard antibacterial agents.

Key words: *Butea monosperma(lam), antibacterial activity, chloroform and aqueous extracts, tetracycline, streptomycin.*

INTRODUCTION:

Medicinal plants represent a rich source of antimicrobial agents. The development and spread of resistance to the existing antibiotics by microorganisms are due to indiscriminate use of commercial antimicrobial drugs commonly used in the treatment of various diseases. Although number of plants with antimicrobial activities has been identified, great number still remains unidentified [1].

Butea monosperma is a medium-sized deciduous tree belongs to family Leguminosae-Papilioneae. This tree is also called 'Flame of the Forest' and Bastard Teak. It grows throughout the Indian subcontinent, especially in Indo-Gangetic plains. It is said that the tree is a form of Agnidev, God of Fire. It was a punishment given to Him by Goddess Parvati for disturbing her and Lord Shiva's privacy. This tree gets up to 50 ft high, with stunning flower clusters. It loses its leaves as the flowers develop, January - March. The trunk becomes twisted and gnarled by the wind, making it a conversation piece. Use it as a specimen, or as a background component of the canopy. These are also used as cheap leaf plates and cups for rural feasts. In some parts of the country these are used for wrapping tobacco to make biddies. These are further used as packing material for parcels. The cattle also eat the palas foliage quite eagerly. The bark yields a kind of coarse and brown colored fiber, which is used for rough cordage. Butea gum is a dried astringent juice obtained from incisions in the stem of the tree. The juice exuded by the bark hardens in to brittle ruby colored gum beads. This gum is sanctioned to be used as a substitute for the kino gum. It finds use for caulking boats as well. The flowers yield an orange dye. A preparation of the same is used as an insecticide. The tree acts as a host for lac insect and is, therefore, useful in producing natural lac [2,3] . It is a sacred tree, referred to as a treasurer of the gods, and used in sacrifice related rituals. From its wood, sacred utensils are made. The flowers are offered as in place of blood in sacrifice rituals to goddess Kali. The dry stem pieces are used to make sacred fire. It is an anthropogenic tree of several castes. 'Chakradatta' mentions the use of its gum in external astringent application. The leaves are believed to have astringent, depurate, diuretic and aphrodisiac properties. It promotes diuresis and menstrual flow. The seed is anthelmintic. When seeds are pounded with lemon juice and applied to the skin the act as a

rubefacient [4]. It is traditionally used in the treatment of diabetes, leprosy, gout, skin diseases[5]. It has antistress, antioxidant, anti-inflammatory activity and antibacterial activity[6].

Butea monosperma flowering plant

Flower

Leafs

MATERIALS AND METHODS:

Collection of Plant materials

The flowers and leaves of Butea monosperma(lam) were collected in the month of February-march, 2013 from local area which near to vikarabad, rangareddy,Andhra pradesh, India. The plant specimen were identified and authentificated from SAP college,vikarabad.

Preparation of Extracts

Apparatus used: soxhlet apparatus, macerator, beakers, mantle, round bottom flask, separating funnel etc.

Chemicals used: methanol, chloroform, ethylacetate, water etc.

Method of extraction from Butea monosperma flowers:

Soxhlet extraction method

Flowers of *Butea monospherma (Lam.)* were collected, shade dried at room temperature and ground in a manual mill and sieved with 2mm copper sieve to form uniform powder . 50 g of dried powdered drug was weighed and filled in the thimble of Soxhlet apparatus. After that the thimble was foxed with the round bottom flask, and the assembly was attached to the condenser. And the paraffin wax was put at the joints of the assembly for the easy removal of the assembly at the completion of the extraction procedure. Then the solvent for extraction (methanol) was filled. After completion of the extraction procedure the extract was filtered using Whattman filter paper and then concentrated at 45°C. Dried extracts were kept at 20°C until further test were carried out.

Solvent system – methanol

Drug solvent ratio-1:5

Time of extraction- 16 hours

Temperature for extraction- 60-70 ^{O}C

Maceration method

The flowers were shade dried at room temperature and ground in a manual mill and sieved with 2mm copper sieve to form uniform powder. The sieved powder was used for evaluation and extraction

purpose. The powder of Butea monosperma flowers was extracted by maceration method using different solvents (methanol,chloroform,ethyl acetate,water). Dried extracts were kept at 20°C until further test were carried out.

Method of extraction from Butea monosperma leafs:

Maceration method

The leaves were shade dried at room temperature and ground in a manual mill and sieved with 2mm copper sieve to form uniform powder. The sieved powder was used for evaluation and extraction purpose. The powder of Butea monosperma leaves was extracted by maceration method using different solvents (methanol,chloroform,ethyl acetate,water). Dried extracts were kept at 20°C until further tests were carried out.

Determination of Antibacterial Activity

Microorganisms used: gram positive bacterias (cocci and bacilli species).The methanol, chloroform, ethyl acetate and aqueous extracts were examined for their antibacterial potency by Cup plate method against gram positive bacterial species (cocci and bacilli). Petri plates were prepared with nutrient agar media.1ml inoculums suspension was swabbed uniformly over the agar medium to get uniform distribution of bacteria. These plates were labelled and 50mg of each plant extracts was added aseptically into the agar plate. Tetracycline and streptomycin were used as positive control. The Petri plates were then incubated at 37°C for 24 hrs during which the activity was evidenced by the presence of zone of inhibition surrounding the plant extract. The negative control was prepared using respective solvent. The zone of inhibition was measured and expressed in millimeters.

RESULTS AND DISCUSSION:

The results obtained for the antibacterial tests performed on different solvent extracts of *B. monosperma* are presented in Table 1. Plant based antimicrobial compounds have enormous therapeutic potential as they can serve the purpose without any side effects that are often associated with synthetic antimicrobials. In the present study, four solvents namely methanol, chloroform, ethyl acetate and water were selected for the plant extraction. According to table 1 the chloroform extract of *Butea monosperma*

recorded inhibition zone of 17 mm against cocci and 18 mm against bacilli, the aqueous extract of *Butea monosperma* offered inhibition zone of 20 mm against cocci and 22 mm against bacilli and the methanol extract recorded inhibition zone of 6 mm against bacilli and no activity against cocci species. The activity can be due to the presence of some of the phytochemical components like saponins, tannins and phenolic compounds7. Among these the aqueous extract shown better antibacterial activity. The ethyl acetate extract did not show any inhibitory activity against any of the test bacterial strains.It is evident that chloroform and aqueous extracts of butea monosperma showed significant activity against Gram positive bacterias (cocci and bacilli species) which was comparable to the inhibition zone observed for control tetracycline and streptomycin.*B. monosperma* has been reported for the treatment of many diseases like, the leaves are used to cure boils, the roots are useful in elephantiasis and in curing night blindness, and flowers are reported to possess astringent, depurative, aphrodisiac and tonic properties. All the solvent extracts obtained from *B. monosperma* flower possess antibacterial activity except ethyl acetate.

CONCLUSION:

Plant extracts have greater potential against microorganisms as they contain antimicrobial compounds and that can be used in the treatment of various infectious diseases. The flower extracts of *B. monosperma* in different solvents such chloroform and aqueous extracts showed activity against bacterial species (cocci and bacilli) which may cause different diseases such as skin infection, gastroenteritis, urinary tract infections, neonatal meningitis, immunosuppresant diseases, blood infections etc.Chloroform and aqueous extracts showed potential activity against all the test pathogens. Further studies need to be done on preparation of drugs using the active extracts such chloroform and aqueous extracts of the flowers of *B.monosperma* which can be used for curing several pathogenic diseases.

REFERENCES:

1. Yadav S, Kumar S, Jain P, Pundir RK, Jadon S, Sharma A, Khetwal KS and Gupta KC., Antimicrobial activity of different extracts of roots of Rumex nepalensis spreng. Indian Journal of Natural Products and Resources., l2 (1);2011: 65-69.
2. Murti., Proc Indian Acad Sci., 1940, 12A, 477; Rao, Ibid, 1941, 14A, 29.

3. Puri., J Sci Indust Res., 1953, 12B, 462.

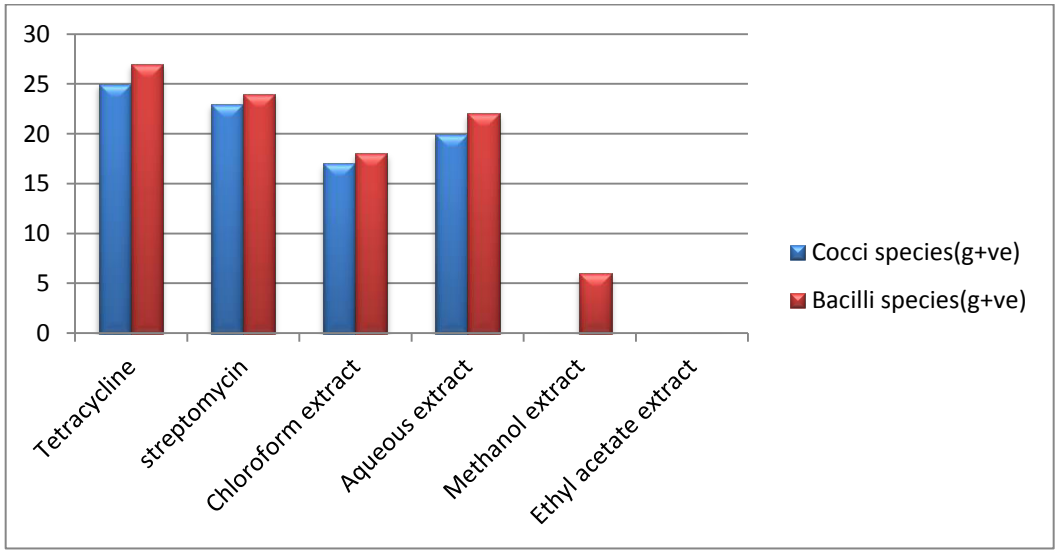
4. Gupta., Phytochemistry., 1970, 9, 2231.

5. Tandon., Proc Nat Acad Sci India sect., 1969, A32, 237.

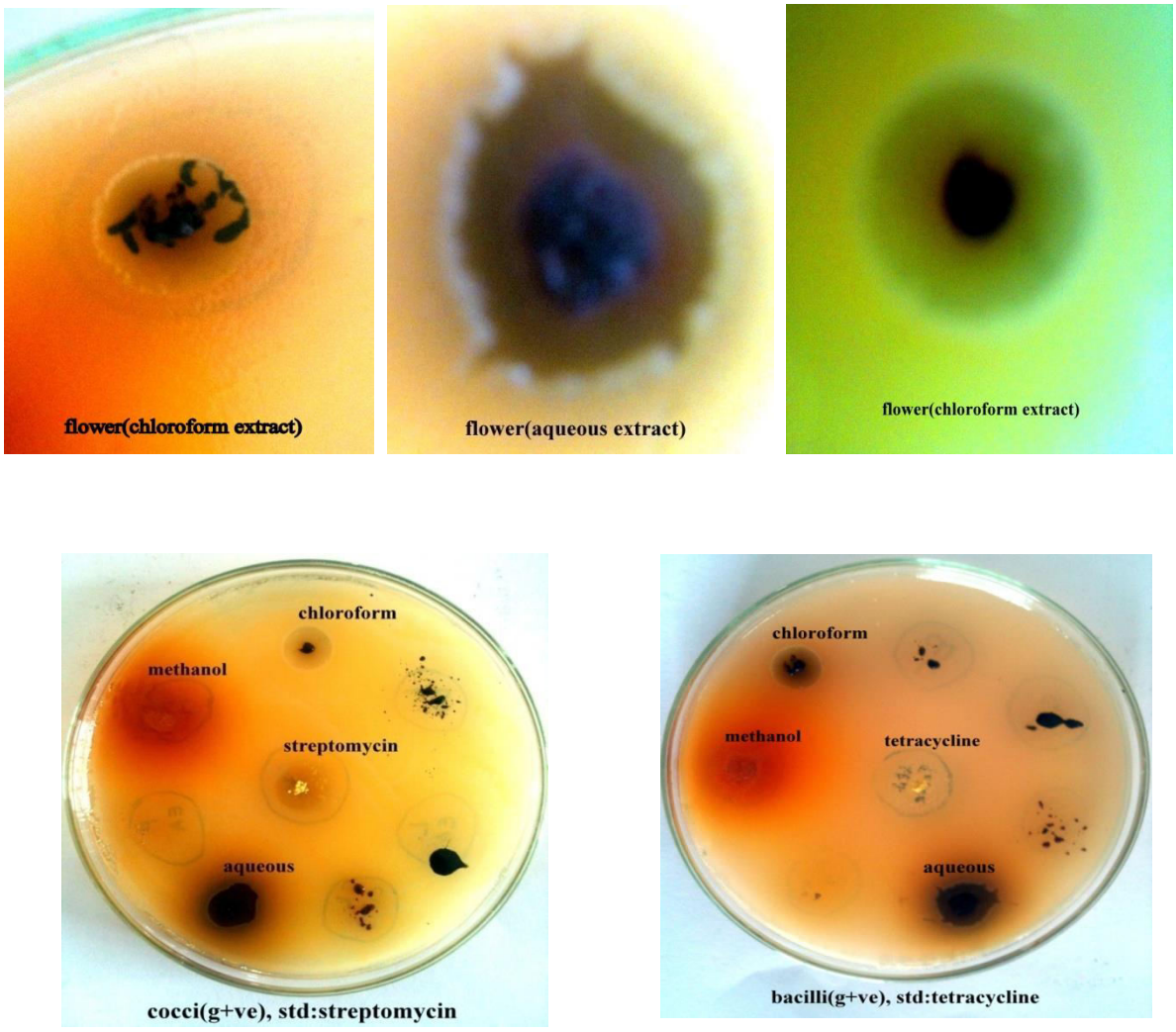
6. Jamkhande PG, Patil PH, Surana SJ. Evaluation of n-butanolic fractions of Butea monosperma flowers on dexamethasone induced hyperglycemia and hyperlipidemia in mice. International Journal of Phytopharmacy Research., 1 ;2010:5-10.

Table 1. Antibacterial activity of flower extracts of *Butea monosperma* against bacterial strains

Bacterias (g+ve)	Diameter of zone of inhibition in mm					
	Plant extracts				Standards	
	Chloroform	Aqueous	Methanol	Ethyl acetate	Tetracycline	Streptomycin
Cocci	17	20	-	-	25	23
Bacilli	18	22	06	-	27	24



Antibacterial activity of flower extracts of *Butea monosperma* against bacterial strains



Antibacterial activity of flower extracts of *Butea monosperma* of vareas strains of bacteria