

## Research Article

### Anti-Microbial Evaluation of *Saraca indica* Leaves Extracts by Disk Diffusion Method

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#### ABSTRACT

*Saraca indica* (Family: Leguminosae) is an important indigenous plant of India. The plant possess several medicinal value and widely used in Ayurvedic formulation for treat number of disease like to treat painful conditions, improves complexion of the body, improves digestion and assimilation, alleviates excessive thirst, to kills all infectious agents, in blood disease, inflammation. The present study aimed to explore the antimicrobial activity of petroleum ether, ethanol extract of leaves of the plant. The antimicrobial activity of extracts was evaluated by disc diffusion method using strains of gram positive bacteria, gram negative bacteria and fungus. *Bacillus subtilis* and *Pseudomonas aeruginosa* was used to screen the *in vitro* antibacterial activity, while antifungal activity was screened against *Candida albicans* and *Aspergillus niger* at concentration 250 µg/ml and 500 µg/ml. Antibacterial drug ciprofloxacin (10 µg/disc) and antifungal drug fluconazole (25 µg/disc) used as standard. Both the extracts showed dose dependent antimicrobial activity against all gm+ve, gm-ve and fungal organism used. Comparatively ethanol extract have shown greater activity than petroleum ether extract. Therefore present study confirms the antimicrobial activity of leaf extract of *Saraca indica*.

**Key words:** Anti-microbial, Disc diffusion method, Leaf extract, Ethanol extract, Pet ether extract.

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Received: 25 January 2014

Revised and Accepted: 05 February 2014

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## INTRODUCTION

*Saraca indica* L. (Family: Leguminosae) is an important indigenous plant with a several traditional importance commonly known as asoka. *Saraca indica* commonly used in Ayurveda for treat number of disease like to treat painful conditions, improves complexion of the body, improves digestion and assimilation, alleviates excessive thirst, to kills all infectious agents, in blood disease, inflammation. Traditionally leaves of the plant are useful in stomachalgia and flowers are use in vitiated condition of pitta, syphilis, hyperdipsia, inflammation, dysentery, haemorrhoids and scabies in children [1-3], Stem bark was used as astringent, antileucorrhoeic, antibilious and uterine sedative; flowers are used as uterine tonic, antidiabetic and antisiphilitic traditionally. Aerial part of the plant important for its hypothermic, CNS depressant and diuretic activity [4,5].

Several medicinal activities including antimicrobial activity of the plant bark has been reported. The part extract of the plant was reported for antidiabetic, oxytocic, anticancer, peptic ulcer, antimicrobial, antibacterial and antioxidant activities, analgesic and CNS depressant activity [6-14]. Flower was found to contain  $\beta$ -sitosterol, flavonoids, flavone, glycosides, anthocyanins, fixed oil; bark contain different catechols, sterols, tannins, flavonoids, glycosides, leucopelargonidin and leucocyanidin. Seed and pod was found to contain oleic, linoleic, palmitic and leucocyanidin; leaves and stem are enriched with quercetin, quercetin-3-O- $\alpha$ -Lrhamnoside, kaempferol 3-O- $\alpha$ -Lrhamnoside, amyirin, ceryl alcohol and  $\beta$ -sitosterol [12, 15, 16].

The present study is an attempt to explore the antimicrobial activity of petroleum ether, ethanol extract of leaves of the plant. The anti

microbial activity of above extracts was evaluated by using strains of gram positive bacteria, gram negative bacteria and fungus.

## MATERIALS AND METHODS

### Plant Material

Leaves of *Saraca indica* Linn. were collected in August 2009 from Gonda region of Uttar Pradesh, India. Plant was identified and authenticated by Kamala Nehru Krishi Vigyan Kentra, Sultanpur, Uttar Pradesh. A herbarium with a voucher specimen (Sample No 01, Ref no KVK/Gen/2009-10/3012) was prepared and deposited to the Department of Pharmacognosy, AND College of Pharmacy, Gonda, Uttar Pradesh, India.

### Preparation of extract

The powdered leaves were passed through a sieve (No.40) and extracted using ethanol and petroleum ether separately. Both the extracts were dried by distilling the solvents in a rotary vacuum evaporator. The yield of ethanol and petroleum ether extract was found 10.3 and 7.9% w/w.

### Preliminary phytochemical investigation

Both the leaf extracts i.e. petroleum ether (PSI) and ethanol (ESI) was tested for phyto-constituents like sterols, glycosides, saponins, carbohydrates, alkaloids, flavonoids, tannins, proteins, triterpenoids. Standard procedures were followed to screen phytochemicals [17, 18].

### Antimicrobial activity

#### Disc diffusion method

The antimicrobial activity of the extracts was evaluated by using different microbial stain using

standard procedur [19, 20]. All the extracts were screened *in vitro* antibacterial activity using *Bacillus subtilis* NCIM 2063, and *Pseudomonas aeruginosa* NCIM 2036 at concentration 250 µg/ml and 500 µg/ml and antifungal activity against *Candida albicans* NCIM 3102 and *Aspergillus niger* NCIM 596 at concentration 250 µg/ml and 500 µg/ml. Antibacterial drug ciprofloxacin (10 µg/disc) and antifungal drug fluconazole (25 µg/disc) were used as standard. *In vitro* antibacterial and antifungal study was carried using Mueller- Hinton agar and Sabouraud dextrose agar media respectively. Observations were made for the zone of inhibition around the discs containing the drug and compared with standard drug.

## RESULTS

Preliminary phytochemical screening of ethanol and petroleum ether was investigated. Primarily ethanol extract showed the presence of tannins, triterpenoids, flavonoids and glycosides; and petroleum ether contain glycosides, steroids and triterpenoids. The antimicrobial activity was determined using disc diffusion method by measuring the inhibition zone in mm. Extracts showed antifungal and anti-bacterial activity. Results are given in Table 1. Antimicrobial investigation showed moderate activity for both extract against all organism use. Comparatively ethanol extract have shown greater activity than pet ether extract. Both the extracts have shown the activity in dose dependent manner.

**Table 1: Antimicrobial activity of *Saraca indica* leaf extract**

Extracts	Zone of inhibition in mm (diameter)							
	<i>B. subtilis</i>		<i>P. aeruginosa</i>		<i>C. albicans</i>		<i>A. niger</i>	
	500 µg/disc	250 µg/disc	500 µg/disc	250 µg/disc	500 µg/disc	250 µg/disc	500 µg/disc	250 µg/disc
<b>Ethanol extract</b>	<b>21.1</b>	<b>17.5</b>	<b>20.3</b>	<b>15.3</b>	<b>23.5</b>	<b>19.8</b>	<b>22.5</b>	<b>17.5</b>
<b>Pet. ether extract</b>	<b>19.2</b>	<b>14.7</b>	<b>19.6</b>	<b>14.4</b>	<b>21.7</b>	<b>18.0</b>	<b>21.1</b>	<b>17.2</b>
<b>Blank</b>	-	-	-	-	-	-	-	-
<b>DMSO (Dimethyl sulphoxide)</b>	-	-	-	-	-	-	-	-
<b>Ciprofloxacin (10 µg /kg)</b>	<b>25</b>		<b>25</b>					
<b>Fluconazole 25 µg/disc</b>					<b>30</b>		<b>30</b>	

## DISCUSSION

Presence of phytoconstituent like alkaloids, flavonoids, glycosides, tannins, steroids are responsible for antibacterial activity [21]. Previous investigations have reported the antibacterial and antifungal activity of stem bark of *Saraca indica* against different stains like strains of *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Bacillus cereus*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Salmonella typhimurium*, *Streptococcus pneumonia*, *Candida albicans* and *Cryptococcus albidus* [8]. Few studies have investigated the antimicrobial effect of the methanol, ethanol and acetone extracts of leaves of the plant against

*Staphylococcus aureus*, *E. coli*, *B. subtilis*, *Aspegillus niger* and *Aspergillus fumigates*. This study was carried out using different extract and some different organisms [21, 22]. Both ethanol extract and pet ether extract observed to possess potent antimicrobial activity. The activity may be due to the presence of glycoside, flavonoid, and tannins.

## CONCLUSION

Present study confirms the antimicrobial activity of leaf extract of *Saraca indica*. The extracts found effective against bacterial and fungal strain. Further work on extracts of the same plant is necessary to establish its exact antimicrobial activity.

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