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# *Saraca indica* (Roxb.): Monograph

**Halima Nazar, Khan Usmanghani, *Sabira Sultana**

Departments of Surgery and Allied Sciences, Faculty of Eastern Medicine, Hamdard University, Karachi-74600, Pakistan.

**Abstract**
Herbal medicines are the oldest remedies used by the human beings from the dawn of human civilization. According to WHO, majority of public approximately eighty percent countries rely on herbal medicines for the cure of disease? Medicinal plant known to exhibits a variety of therapeutic properties. *Saraca indica* is the traditional medicinal plant, commonly known as a "ashok briksh", botanist identified as a *Saraca asoca* (Roxb.), De.wild or *Saraca indica* from Caesalpinaceae family. *Saraca indica* is a remedial plant extensively used for therapeutic purpose. It is used as analgesic, improves complexion of the body, digestive problems, used in excessive thirst, bacteriostatic, anti-inflammatory and also as anti-depressant. This review contains the phytochemical constituent, different reported pharmacological activity and ethanobotanical uses. In view of its effects cited in literature there is a need of extensive research to explore its potential use and to prove its medicinal claims of this plant.

**Keywords:** *Saraca indica*, Medicinal plant, Pharmacological activity, phytoconstituents

## Introduction
Plant based medicines are the oldest remedies used by the human being. The demand for herbal products increases all over the world and major pharmaceutical companies are currently conducting research on medicinal plants on large scale for their potential medicinal value. Plant medicine has been used for the treatment of various ailments throughout the world before the advent of modern synthetic drugs [1] *Saraca indica* (Fabaceae) is indigenous plant with a number of traditional importance [2] In Ayurveda, the bark is used in indigestion, pyrexia, burning sensation, colic, ulcers, menorrhagia, vaginal discharge and acnes. Several Pharmacological activities of *Saraca indica* have been reported such as larvicidal activity, antimicrobial activity, CNS depressant activity, analgesic, antipyretic, antiulcer activity, anti-inflammatory activity etc. This review contains phytochemistry and pharmacological activities of various parts of plant and the ethanobotanical uses [2].

## Vernacular name
Ashoka (Urdu), Shabuqa(Arabic) Kankeli (Sanskrit), Ashokadamara (Kannada), Ashok (Kashmiri), Asokam (Malayalam), Ashoka (Gujrati), Ashoka (Hindi), Ashok (Marathi), Ashoka (Bengali), Ashoka (Oriya), Ashok (Punjabi), Asogam (Tamil), Ashoka (Assamese).

## Classification
**Kingdom**: Plantae
**Division:** Magnoliophyta
**Class:** Mgnoliopsida
**Order:** Fabales
**Family:** Caesalpinaceae
**Genus:** Saraca
**Species:** indica

## Adulterant
The *Saraca indica* is usually adulterated with the bark of *Polyalthia longifolia*. It is known as devdaru in Hindi and Bengali. Sometime bark of *Saraca indica* adulterated with Afanamexis polystakis bark and Sicalpinea pulchirena [3].

## Botanical description
*Saraca indica* is an evergreen herb of 7-10 cm high. It occurs up to the altitude 750 meters. Leaves are parpinnate 15-20 cm long, oblong, narrowly lanceolate, intra-petiolar and completely united. The bark is dark brown or almost black with warty surface and uneven due to the presence of rounded or projecting lenticles. Fracture splinting exposing a thin whitish and continuous layer. Flowers are apetalous, yellowish orange, corymbose, deciduous, calyx petaloid. Seeds are ellipsoid-oblong and compressed [4].

**Fig 1:** Flowers and leaves of *S.* indica

**Fig 2:** Bark of S. indica

**Fig 3:** Seeds of *S.* indica

**Phytochemistry**
Catechin, leucopelargonidin, epicatechin and 11'-deoxyprocyanidin, stearic acids- sitosterol, quercetin, kaempferol, apigenin- 7-0-p-D-glucoside, Oleic, linoleic and palmitic acid. Pelargonidin- 3, 5- diglucoside, cyanidin-3, 5-diglucoside, palmitic, stearic, linolenic, leucocyanidin, gallic acid, catechol, (-) epicatechol and leucocyanidin, lignan glycosides, lyoniside, nudiposide, 5-methoxy- 9-β-xylopyranosyl, isolariciresinol, schizandriside, epicatechin, epiafzelechin-(4β→8)-epicatechin and procyanidin B2 and β-sitosterol glucoside [5].

**Pharmalogical activities**
**Antimicrobial activity**
Different extracts (chloroform, methanol, aqueous and ethanolic) of *Saraca indica* stem bark were evaluated for antibacterial and antifungal activity against different strains such as Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa, Bacillus cereus, Klebsiella pneumoniae, Proteus mirabilis, Salmonella typhimurium and Streptococcus pneumoniae and the fungi: Candida albicans and Cryptococcus albidus. Among all the extract Methanolic extract found to possess strongest antibacterial and antifungal activity [7].

**Anticancer activity**
*Saraca indica* flowers were investigated for anticancer activity. Results indicated 50 percent cytotoxicity against (in vitro) in Dalton's lymphoma ascites and Sarcoma-180 tumour cells at a concentration of 38 mug and 54 mug respectively [8].

**Antioxytocic activity**
Oxytocic activity of *Saraca indica* was seen in rat and human isolated uterine preparations. Estrogen primed or gravid uterus was more sensitive to the alcoholic extract [9].

**Antidiabetic activity**
Hypoglycemic effect of the methanolic bark extracts of *Saraca indica* Linn in normal and streptozotocin induced diabetic rats was evaluated. At dose of 400mg/kg through oral route the extract has shown a significant hypoglycemic activity [10].

**CNS depressant activity**
*Saraca indica* leaves extract in various solvent such as petroleum ether, chloroform, methanol and water shows CNS depressant activity depending upon their polarity. Phenobarbitone induced sleeping time by using actophotometer method was used to determined this activity. *Saraca indica* leaves extract significantly decreased (67.33%) the locomoter activity in mice [11].

**Antiulcer activity**
The aqueous suspension of *Saraca indica* flowers are used to determined the antiulcer activity in albino rats. The result of the study showed that the flowers of *Saraca indica* suspension exhibit an antiulcer potential. Antiulcer potential might be due to inhibition of gastric secretion, stimulation of mucus secretion and endogenous gastric mucosal prostaglandin synthesis [12]

**Anti-inflammatory activity**
*Saraca indica* ethanolic extract of leaves was evaluated for anti-inflammatory activity in animal model. Carrageenan induces paw edema method was used. The ethanolic extract at a dose of 200mg/kg of *Saraca indica* significantly ($P$<0.01) reduce the paw edema. *Saraca indica* ethanolic extract caused inhibition, in a short duration, as compare to that of 10 mg / kg diclofenec [13].

**Uterine tonic activity**
*Saraca indica* estrogenic effect of U-3107 (1mg/kg p.o) was evaluated in normal and overiectomised rats. An aqueous suspension was administered for a period of 21 days. U-3107 holds estrogenic activity only in the presence of functional ovary and is devoid of any progestational activity [14].

**Analgesic activity**
*Saraca indica* (Ashoka) and *Shorea robusta* (Shal) aqueous and alcoholic extracts of bark skin were evaluated for their analgesic activity in Swiss albino rats. Both the extracts of *Saraca indica* and *Shorea robusta* showed significant analgesic activity at 300 mg/ Kg body weight as compared with control from. The analgesic activity might be due to the presence of phytoconstituents such as alkaloids and steroids in these plants. The result of the study concluded that Ashoka and Shal exhibited analgesic property, however further experimental as well as clinical evaluations are necessary [15].

**Larvicidal activity**
Ether extract of the *Saraca indica* leaf and the chloroform extracts of the bark were evaluated for larvicidal activity. The pet ether extracts of leaves and chloroform extract of the bark of *Saraca indica* showed significant Larvicidal activity [16].

**Immunomodulatory Activity**
Saraca indica seed integument induces apoptosis in human T-lymphocytes. Saracin is a lectin found in the seed integument of *Saraca indica*. Saracin has been found to be mitogenic for human lymphocytes. Saracin has a higher affinity for the CD8 (+) than CD4 (+) T cells as revealed by fluorescence-activated cell sorting (FACS) analysis. Saracin found to be an interesting immunomodulator for the mammalian immune system [17].

**Antioxidant activity**
Different extracts of *Saraca indica* bark such as ethanolic, hydroalcoholic and acetone of was studied for antioxidant potential by using DPPH (1, 1, diphenyl-2 picryl hydrazyl) in-vitro model. Hydroalcoholic (ethanol 60%) extract shows the highest IC50 value 193.88 µg/ml. The acetone extract prepared by ultrasonication extraction method showed the lowest IC50 value 97.82 µg/ml [18].

**Antipyretic activity**

*Saraca asoca* seed was studied for antipyretic activity using Brewer's yeast induced pyrexia in Wistar rats at oral doses of 300 mg/kg and 500 mg/kg. Both the dose levels of the research drug and standard drug aspirin (100 mg/kg) showed significant ($P$<0.01) antipyretic activity when compared to the control group. The dose 500mg/kg showed the highly significant antipyretic [19].

**Cardioprotective activity**

Cardioprotective activity of alcoholic extract of *Saraca indica* (SI) bark was investigated against cyclophosphamide induced cardiotoxicity. Treatment with *Saraca indica* significantly ($p$<0.05) reversed the status of cardiac biomarkers, ECG, oxidative enzymes and lipid profile in cyclophosphamide induced cardiotoxicity. The histopathology reports, biochemical and ECG support the cardioprotective effect of *Saraca indica* which could be attributed to antioxidant activity [20].

**Ethanobotanical uses**

Dried root of *Saraca indica* is used in paralysis and hemiplegia. It is used to treat skin trauma and broken bones. Paste of roots is useful in freckles, inflammations, ulcers and skin diseases. It acts as a blood purifier. It is used in eczema, psoriasis, dermatitis, and herpes. It helps to relieve Pruritis, scabies and Tineapedis. Bark of tree rejuvenates the skin tone. Root is used in ammenorhea. It dissolves oxalic stones present in kidney. It is useful in dysmenorrhoea and endometriosis. Its decoction is used in rickets and calcium deficiency**.** Dried flowers of *Saraca indica* are used to treat diabetes. Decoction is used for the treatment of dysentry. Fluid extract of *Saraca indica* flowers is used to treat haemorrhagic dysentery. Bark of the tree is used to treat internal piles, scorpion bite. *Saraca indica* is used to purify blood. The leaves and bark are used to get rid of worms in stomach [21].

**Conclusion**

*Saraca asoca* is one of the universal plants having number of medicinal properties. This versatile plant is the source of various types of compounds and reliable source of medicine. Ashoka possess several pharmacological activities like anti-cancer, anti menorrhagic, anti oxytoxic, antimicrobial activity. Numerous phytochemical and pharmacological studies have been conducted on different parts of *Saraca indica*. The present literature supports the potential of *Saraca indica* as a medicinal tree. In view of the nature of the plant, more research can be done to search the unexplored and unexploited potential of this plant.

**References**


1. Anitha B, Mohan VR, Athiperumalsami T, Suthaa S. Ethnomedicinal plants used by the Kanikkars of Tirunelveli District, Tamil Nadu, India to treat skin diseases. Ethnobotanical leaflets, 2008; 12:171-180.
2. Sharma PC, Yelne MB, Dennis TJ, Joshi A, Billore KV. Database on medicinal plants used in Ayurveda. Department of ISM&H, Ministry of Health and Family Welfare (Govt. of India) 2005; 3:76-87.
3. BL Sharma. Dravyaguna Hasthamalaka, 1 st edition, Publication scheme, Jaipur, 1957, 420.
4. Pradhan P, Joseph L, Gupta VR, Chulet, Arya H, Verma R, Bajpai A. Saraca asoca (Ashoka): A Review Journal of Chemical and Pharmaceutical Research. 2009; 1(1):62-71.
5. Aditya M, Anil K, Neelam R, Ashok K. Phytochemical and Pharmacological Importance of *Saraca indica* International Journal Of Pharmaceutical And Chemical Sciences. 2013; 2(2):1009-1013.
6. Singh A, Singh S, Sarma BK, Singh UP, Srivastava R, Singh KP. Internet J Alternative Med. 2009; 6(2):1-20.
7. Prathiba J, Malathi R. Antimicrobial properties of the stem bark of *Saraca indica* (Caesalpiniaceae) European Review for Medical and Pharmacological Sciences, 2009; 13:371-374.
8. Kaur JD, K Misra K. J Indian Chem Soc. 1980; 57(12): 1243.
9. Bhandary MJ, Chandrasekhar MJKR, Averiappa KMK. J Ethnopharmacol, 1995; 47(3):149-158.
10. Preethi F, Fernandes, Jennifer, Pricilla K. Hypoglycemic activity of *saraca indica* Linn barks Journal of Pharmacy Research. 2010; 3(3):491.
11. Angad V, Houtem KR, Jana Raja, Saiket S, Sandeep S, Ashutosh M. Pharmacological evaluation of *Saraca indica* leaves for CNS depressant activity in mice J Pharm sci. 2010; 2(6):338-343.
12. Maruthappan V, Sakthi Shree K. Antiulcer activity of aqueous suspension of *Saraca indica* flower against gastric ulcers in albino rats Njar VCO, Adesanwo J.K, Raji Y. Methyl angolensate: The antiulcer agent of the stem back of Entandrophrarma angolense. Planta Med. 1995; 61:91-92.
13. Mujumdar AM, Naik DG, Dandge CN, Puntambekar HM. Anti- inflammatory activity of curcuma amada roxb. In albino rats. Indian Journal of Pharmacology. 2000; 32:375-377.
14. Mitra SK, Gopumadhavan S, Venkatarangana MV, Sharma DNK and Anturlikar SD. uterine tonic activity of U-3107 (even care), a herbal preparation in rats, Indian journal of pharmacology. 1999; 31:200-203.
15. Poonam SM, Jangde CR, Narnaware SD, Subhash R. Experimental evaluation of analgesic property of bark skin of *Saraca indica* (Ashoka) and Shorea robusta (Shal) Journal of Applied Pharmaceutical Science. 2014; 4(03):062-065.
16. Nisha M, Anitha MG, Bala TSL, Sivakumar SM, Narmadha R, Kalyanasundaram M. larvicidal activity of *saraca indica* extracts against three mosquito vector species springer- verlay. 2009; 104:1017-1025.
17. Ghosh S, Majumder M, Majumder S, Ganguly NK, Chatterjee BP. Saracin: A lectin from *Saraca indica* seed integument induces apoptosis in human T-lymphocytes, PMID: 10545202, Arch Biochem Biophys 1999; 371(2):163-8.
18. Panchawat S, Sisodia SS. In vitro antioxidant activity of Saraca asoca roxb. De wilde stem bark extracts from various extraction processes. Asian Journal of Pharmaceutical and Clinical Research. 2010; 3(3):231-233.
19. Sasmal S, Majumdar S, Gupta M, Mukherjee A, Mukherjee PK. Pharmacognostical, phytochemical and pharmacological evaluation for the antipyretic effect of the seeds of Saraca asoca Roxb. Asian Pacific Journal of Tropical Biomedicine. 2012; 2(10):782-786.

20. Viswanatha Swamy AHM, Patel UM, Koti BC, Gadad PC, Patel NL, Thippeswamy A AHM. Cardioprotective effect of *Saraca indica* against cyclophosphamide induced cardiotoxicity in rats: A biochemical, electrocardiographic and histopathological study Indian J Pharmacol. 2013; 45(1):44-48.
21. Verma AB, Saroj A, Gautam B, Dubey C, Tripathi S. Review on Ethnobotanical Importance of *Saraca indica* International Journal for Pharmaceutical Research Scholars. 2014; 3:1-1.