



A Review on Sita Ashoka

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ABSTRACT

Saracaasoca, family: *Caesalpiniaceae* distributed throughout India. Himalaya, Kerala, Bengal and whole south region. In ancient times medicinal plants have been used in various culture of the world which has been blessed by Nature to our country. Traditionally *Saracaasoca*(*Sita Ashoka*) used as mental disorder and gynaecological disorders. Different parts of plant like leaves, bark, flowers and seeds are used in different type of activity. Proven pharmacological activities are anti-menorrhagic, oxytocic, uterine tonic, antibacterial, antifungal, anticancer, anti-inflammatory, antiarthritic, antiulcer, antioxidant, antidiabetic, hypolipidemic, analgesic, anti-nephrolithiatic, dermatoprotective, larvicidal and anti-helminthic. It also revealed various types of phytoconstituents such as flavonoids, tannins, steroids, volatile oil, glycosides, alkaloids, saponins, proteins and fatty acids.

Keywords: *Saracaasoca*, *Sita Ashoka*, *Caesalpiniaceae*, Mental disorders, Gynaecological disorders.

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INTRODUCTION

Our regular lifestyle is very fast-paced and people become sick more often, according to a survey done by NSSO (National sample survey office) in 2014, 90% of Indians prefer allopathy over AYUSH (Ayurveda, Yoga or Naturopathy, Unani, Siddha and Homeopathy).we prefer to take these drugs for quick relief. In this situation allopathy drugs also provide severe health hazards which are alarming. We need to find better alternatives and move to herbal world. Nature has blessed India with a tremendous wealth of medicinal plants therefore our country considered herbal medicinal hub of the world.¹ Nowadays herbal medicines widely accepted and trusted. Herbal medicines have similar benefit and lesser side effects or health hazards. *Saracaasocais* one of the trees having lots of health benefits. In the Ramayana (Holy Hindu book), this tree mentioned in the Asoka Vatika where Ravana kept mother Sita in exile. Sita Ashok is considered a holistic tree and worshipped in *Chaitra*, month of Hindu calendar. ^{2,3,4}

Cultivation:

Seeds are the foremost suitable propagation material. Suitable collection time for the mature seeds is from over five- to six-year-old plants in December–January.

Soil and Climate: Suitable soil environment require for the plant is slightly acidic to neutral soils. It grows better and gives maximum result in tropical region under proper irrigation.

Plantation: The crops are often grown through stem grafting technique and seeds. The saplings are grown within the well manure field.

Thinning and Weeding: After 15 -30 days weeding and thinning of the plants is usually done for the better growth of plants.

Fertilisers and Pesticides: Chemical fertilizers and pesticides are not used for the better growth of medicinal plants Although organic manures (Farm Yard Manure (FYM), Vermi – compost, manure) are suggested to use according to the requirements . For the protection of diseases, bio- pesticides are used which will be prepared from *Nem*, *Chitrakmool*, *Dhatura*, Cow's urine etc. ^{5,6}

Vernacular names⁷

Sanskrit: Apashoka

Hindi: Ashok

English: Ashoka

Bengal: Asok
Gujarat: Ashopalava
Malayalam: Asoka
Marathi: Ashoka
Punjab: Asok
Tamil: Asogam

BOTANICAL DESCRIPTION

Saracaasoca tree is perennial plant having 6-9 meters height and glabrous branches colour of the plant is dark green to greyish green . The lenticels are circular in shape and ridged are opposing to each other. Descriptions of various parts of the plant are followings:

Leaves:

Length of leave are 15-25 cm, rachis are glabrous, corky at the base; sub sessile petioles, stipulated and interpetiolar, complete united 10-13 by 6mm.

Flowers:

Flowers are having numerous fragrant, in dense auxiliary corymbs, length is 7.5-10cm across; peduncles stout; pedicels are 8-13mm long. Androecium consist; 7 or 8 stamens, much exerted; filaments fusiform; anthers are purple in colour. Gynaecium consist; pubescent ovary, especially on the sutures; style curved in a ring.

Fruits: A black colour pod which is 10-15 x 4.5-5cm.

Seed: Seeds are 4-8, generally reddish brown with fibres, ellipsoidal shaped oblong, 3.8 cm. Long and slightly compressed.^{1,7-11}

Identification: Sample of crude drugs were identified by checking following parameters like: pH (1% w/v solution): 5 to 7, loss on drying: NMT 5%w/w, moisture content NMT 5% w/w, and volatile oil content are notavailable. Thin layer chromatography assay was performed tannins were NLT 30 % w/w¹¹ determined.

Chromatographic evaluation:

Preparation of test solution

Alcoholic extract of coarsely powered drug extracted with dichloromethane and concentrated. 5ml of concentrated dichloromethane solution use as test solution

Stationary phase: TLC precoated plate with Silica gel 60 F254

Solvent system: Toluene: Ethyl acetate: formic acid (5:4:1)

Test solution applied: 6µl

Distance travelled by solvent system: 8 cm

Development chamber: Twin through chamber (10×10cm) with SS lid.

Visualization: under 254 nm- major spots at Rf 0.50,0.83 and 0.93(all grey); under 366 nm- major spots at Rf 0.33 and 0.87(both greenish yellow); after derivatization with anisaldehyde-Sulphuric acid -major spots at Rf 0.33,0.50(both light violet),0.58(brown) and 0.81(blue).¹²

PHYTOCHEMISTRY

Herbal medicines having various phytoconstituents, based on different measurelike metabolic origin chemical nature, precursor molecules of primary metabolism are responsible for biological activities. Herbal formulations and plant derived drugs are scientifically evaluated for the toxicity and other effects related to their use. The most important parts of plants as bark, leaves, flower and seeds having various types of phytoconstituents and biomolecules reported from are as follows: **(Table No.1)**

Pharmacological properties:

Antimemnorhagic, oxytocic and uterine tonic:

Aqueous extract of bark has stimulating and relaxing the intestinal muscle, prolong uterine contractions and also as a uterine sedative.^{1,11} In vitro and *in vivo* animal models having oxytocic effect of Isolated phenolic glycoside and also shows *in vitro* on human myometrial tubes.^{24,25}

Antibacterial:

Acetone, methanolic, ethanolic and aqueous extracts of bark, dried flower buds and leaves shows antibacterial activity. Antibacterial activity of water solubleextract wasfind out by MIC (Minimum Inhibitory Concentration). Which have been tested against many pathogenic bacteria like *P. aeruginosa*, *B. subtilis*, *E. coli*, *S. typhosa*, *S. typhi*, *S. viballerup*, *S. enteritis*, *S. aureus*, *B. cereus*, *K.*, *S. boydis*, *S. sonnei*, *S. flexneri*, *S. dysenteriae*, *P. vulgaris*, *V. cholerae*, *P. vulgaris*.^{16, 17, 19, 20, 29-39} Phytochemicals, like tannins, flavonoids, saponins and coumarin are present in methanolic fraction of flower. That methanolic plant extract give the greatest inhibition against a few pathogenic bacteria and contagious species. So that we

can conclude the presence of phytoconstituent like alkaloids, flavonoids, glycosides, tannins, steroids in *Saracaasocaplant* are liable for antibacterial activity.^{40, 41}

Antifungal

Methanolic and aqueous extract of leaves flowers and barks having antifungal activity^{29, 30, 35} Which have been identified by disc diffusion method against pathogenic organism like, *Candida albicans*, *Candida glabrata*, *Candida tropicalis*, *Rhizomucormiehei*, *Aspergillus niger*, *Aspergillus fumigates*. Ethyl acetate fraction of leaf demonstrated most noteworthy antifungal activity against *Rhizomucor* species and zone of inhibition was found 20 mm.⁴²⁻⁴⁶

Anticancer

Different research paper mentioned that deviation in redox balance with reactive nitrogen species (RNS), reactive oxygen species (ROS), raised level of oxygen free radicals shows waS significant role in the origin and progression of human pestilence including malignant growth.⁴³⁻⁴⁶ Phenol and other bioactive compounds present in *Saraca indica* bark extract (SIE) are answerable for higher radical scavenger activity due to their antioxidant potential; and they are also involved in modulation of signalling pathways. Anti-breast malignant growth, cancer prevention agent and toxicological assessment of *Saraca indica* bark extract are shows that this herbal preparation can possibly be utilized in integral and elective in complementary and alternative medicine for breast cancer therapy.⁴⁷⁻⁵²

Anti-inflammatory, antiarthritic

It has been reported that the leaf, bark, and root's ethanolic and methanolic extracts have anti-inflammatory effects by significantly inhibiting the binding of various transcription factors like NF-B, AP-1, and GATA-1 to their specific DNA sequences, which lowers the levels of cytokines that promote inflammation. The plant's extracts successfully lowered the levels of the pro-inflammatory cytokines TNF- and IL-1.^{17, 53-58}

Antiulcer:

In albino rats, ulcers were reported to be treated by the aqueous extract of *S. indica* flowers.^{9, 20} The presence of saponins, triterpenes, tannins, catechin, sterols, phenolic glycosides, and flavonoids led to the antiulcerogenic effect that was observed. Inhibiting basal gastric secretion, stimulating mucus secretion, increasing endogenous gastric mucosal secretions, and/or the antioxidant activity of the flavonoids present in the aqueous extract of *S. indica* all contribute to the molecules' ability to reduce ulcers. These molecules also work to combat reactive oxidants that are present in the gastrointestinal lumen.⁵⁹⁻⁶¹

Antioxidant, antidiabetic and hypolipidemic:

In methanolic and chloroform extracts of leaf, bark and flower number of antioxidant compounds (flavonoids, lignin glycosides, β -sitosterol and its glycosidic form, polyphenolics such as gallic acid were found.^{19, 41, 62} Different fraction of flavonoids obtained from flowers and leaves having properties to inhibit α -glucosidase and α -amylase enzymes. These studies have also reported *S. asoca* extracts decreases lipid and cholesterol level and also helps to reduce the elevated glucose in blood. They have also been reported to reduce the diabetes-induced renal oxidative stress. This plant extract has also been used to improve pancreatic, renal and hepatic profiles as well as the overall health in diabetic mice.^{12, 63}

Analgesic:

Aqueous extract of Acetone shows the higher analgesic activity as compare to methanol extract of *Saracaasocaseeds*. It is commonly acknowledged that all flavonoid compounds have analgesic effect because they prevent the production of prostaglandins, which reduces the stimulation of nociceptors. Flavonoids are interfering with the cyclooxygenase system, which ultimately interferes with the formation of prostaglandins by preventing the synthesis of arachidonic acid. The presence of flavonoids in the plant may be responsible for the plant's ability to reduce pain.⁶⁴⁻⁶⁸

Anti-nephrolithiatic and antiurolithic activity:

The methanolic extract of *Saraca indica* bark has antiurolithic action in a model of ethylene glycol-induced hyperoxaluria in Wistar male rats. This activity is confirmed by the significant decrease and prevention of the growth of urinary stones, as measured by the parameters such as serum markers (creatinine and uric acid), tissue homogenate markers (calcium, oxalate, and phosphate), urinary parameters (calcium, oxalate, phosphate, uric acid, and magnesium), and urinary output.

The ability of *S. asoca* root to dissolve kidney stones made of oxalic acid is well recognised. It has also been used to treat kidney stones that clog the urinary tract.^{1,69-71}

Dermatoprotective:

Skin conditions include eczema, psoriasis, acne, dermatitis, herpes-kushta/visarpa, pruritis, scabies, tinea pedis, and skin cancer have been treated with extract of *S. asoca*'s root, bark, and seed. ^{1,41} It has been demonstrated that the flavonoid-rich flower extract of *S. asoca* reduces skin tumours, skin injuries, freckles, and external skin inflammations. It has been claimed that seed extracts are useful against

dermatophytic fungus. ¹Melanin is a crucial component in the skin's defence against free radicals and various ionising radiations, such as UV radiation. Tyrosinase has emerged as a key player in the regulation of skin pigmentation in a melanogenic pathway as a result of research into the skin-lightening effects of SA. It has been found that the bark, leaf, and seed were the three sections that were analysed.⁷²⁻⁸²

Cardioprotective effect:

Cyclophosphamide induced cardiotoxicity shown the effect to expand the age of hydrogen peroxide and superoxide radicals. These reactive oxygen species (ROS) damage the heart by going above the mitochondrial capacity of the heart's cells to detoxify oxygen radicals. Therefore, the therapy of CP-induced cardiotoxicity may benefit from the cell antioxidant activity. ⁸³⁻⁸⁷Saraca indica (SI), which includes flavonoids, epiafzelechin-(4@8)-epicatechin, and procyanidin 2, as well as n-octacosenol, -sitosterol, glycoside, tannins, and saponins, is useful as a heart tonic. Epicatechin's protective effects against myocardial ischemia-reperfusion injury. Treatment with SI effectively prevents cardiac damage brought on by CP by reversing the influx of inflammatory cells and myofibril fragments. The epicatechin in SI can restore the antioxidant status of cells and increase the dependability of cardiovascular muscle by vasodilatation. In addition, flavonoids, triterpenoids, and tannins are touted as effective antioxidants or potentially cardioprotective compounds. These phytoconstituents alongside others in SI might be giving the defensive impact against CP incited cardiotoxicity.⁸⁸⁻⁹²

Antipyretic effect

Fever brought on by a disturbance or one of the side effects of tissue injury, inflammation, graft rejection, or other illnesses. The production of prostaglandins, which raises the thermoregulatory center's temperature, is a component of its aetiology. Most antipyretic drugs, including NSAIDS, block COX-2 articulation to reduce elevated body heat by blocking PgE2 production. ⁹³⁻⁹⁵

One of the phytochemicals found in the Saraca asoca plant is flavonoids, which often have antipyretic, analgesic, and anti-inflammatory activities in other plant species. High concentrations of flavonoids and tannins are among the notable phyto-constituents found in the acetone extract of S. asoca seeds. These biologically active components may therefore be to blame for the antipyretic effects of the seed extract. This study has allowed us to conclude that this medication may be used as a reliable, affordable, non-toxic, and effective herbal antipyretic medication.⁹⁶⁻⁹⁸

RESULT

According to reports, the dried root of S. asoca is effective in treating paralysis, hemiplegia, and visceral numbness by acting on the parasympathetic and autonomous nerve systems. ¹ The treatment of rickets, delayed bone consolidation, and calcium insufficiency also make use of the tissue-promoter capabilities of the extracts of seeds and flowers. Similar to this, numerous other biological/pharmacological effects of the various plant extracts have been noted, including as a contraceptive, an anti-leucorrhoea agent, a cure for dysentery, worm infestations, and stomach pain. ^{1, 3, 53}

Table 1. Showing Parts of plant with their respective Phytoconstituents with references

Part of plant	Phytoconstituents	References
Bark	Flavonoids (catechin, epicatechin, epiafzelechin, procyanidin B2, deoxyprocyanidin B, leucocyanidins and leucopelargonidin), tannins, steroids, volatile oil, glycosides, steroidal glycosides (β -sitosterol glucoside), Lignin glycosides (lyoniside, nudiposide, 5-methoxy-9- β -xylopyranosyl, isolariciresinol and schizandriside) Antioxidants (polyphenolics, gallic acid and ellagic acid)	1,3,11,12,15-18
Leaves	alkaloids, steroids, flavonoids (quercetin, - β -sitosterol, ceryl alcohol), tannins, saponins, terpenoids, polyphenolics, glycosides (quercetin-3-O- α -rhamnoside and kaemferol-3-O- α -L rhamnoside) and carbohydrates polyphenolics (gallic acid and ellagic acid)	1,3,11,15,16,21-23
Flower	tannins, flavonoids (quercetin, leucocyanidin, and polyphenolics), saracasin, saracadin, waxy substances, carbohydrates, proteins and steroids, fatty acids (oleic, palmitic, stearic, linolenic and linoleic acids), glucosides (quercetin-3-O-P-D-glucoside, apigenin-7-O-p-Dglucoside, pelargonidin-3,5-diglucoside and cyanidine- 3,5-diglucoside)	1,3,11,17,22
Seeds	fatty acids (oleic, linoleic, palmitic and stearic)	1,3

CONCLUSION

Sita Ashoka is most ancient plant found in India. Every part of plant is useful. It has so many pharmacological benefits . It has been used in several Ayurvedic preparations due to presence of number of phytoconstituent.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest. The research received no specific grant from any funding agency in the public, community, or non-for profit sectors.

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