



## PHYTOCHEMICAL ANALYSIS OF *SARACA ASOKA* BARK EXTRACTS

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### ABSTRACT

Ashoka is the most ancient tree of India, generally known as an "ashok briksh", botanists identify it as *Saraca asoca* (Roxb.), De. wild or *Saraca indica* belonging family *Caesalpinaceae*. About 1000 gm of air dried crude powder material of bark of *Saraca asoca* were extracted with ethanolic and chloroform in a Soxhlet extractor for 36 hours respectively. It was concentrated to dryness under reduced pressure and controlled temperature (40-50°C) using rotary evaporator. A brownish mass weighing 165g of ethanolic and 150gm of chloroform extract were obtained which gave a yield of 16.5% and 15% respectively w/w with respect to dried powder. The preliminary screening of bark of *Saraca asoca* was evaluated for its phytochemical constituents by using generally accepted laboratory technique for qualitative determination which showed the presence of phytosterols, carbohydrates, Flavonoids, Phenolic compounds and Tannins.

**Keywords:** *Saraca asoca*, Phytochemicals, ashok briksh.

### INTRODUCTION

Medicinal herbs are moving from fringe to mainstream use with a great number of people seeking remedies and health approaches free from side effects caused by synthetic chemicals.<sup>1</sup> Natural sources as medicinal products contain organic substances and could be obtained in both primary and secondary metabolic process since the ancient times. Especially, plant kingdom has proved to be the most useful in the treatment of many diseases and they provide an important source of all the drugs in the world. Bioactive constituents of these plants like steroids, terpenoids, carotenoids, flavonoids, alkaloids, tannins and glycosides etc have served a valuable starting material for drug development.<sup>2</sup> Ashoka tree, universally known by its binomial Latin name *Saraca asoca* (Roxb.), De.wild or *Saraca indica* belonging family *Caesalpinaceae*. It is one of the endangered tree called in english as Asok tree. It is also known as Kankeli (Sanskrit), Ashoka (Assamese), Ashoka (Bengali), Ashoka (Gujrati), Ashoka (Hindi), Ashokadamara (Kannada), Ashok (Kashmiri), Asokam (Malayalam), Ashok (Marathi), Ashoka (Oriya), Ashok (Punjabi), Asogam (Tamil), Ashokapatta (Telugu).<sup>3-5</sup>

*Saraca asoca* is a small evergreen tree which grows to a height of 7-10 m. It occurs above the altitude of 750 m. Leaves are paripinnate 15-20 cm long and the leaflets 6-12 in number, oblong and rigidly sub-coriaceous. Leaves are narrowly lanceolate, cork like at the base and with a short pestistipules are intra-petiolar and completely united. The bark is dark brown or grey or almost black with warty surface. Stem bark are rough and uneven due to the presence of rounded or projecting lenticles. Bark channeled, smooth with circular lenticles and transversely ridged, sometimes cracked. Fracture splinting exposing striated surface, a thin whitish and continuous layer is seen beneath the cork leaver. Flowers are fragrant.

Flowers are Polygamous apetalous, yellowish orange turning to scarlet, in short laterally placed corymbose, axillary panicles, bract small, deciduous, calyx petaloid. Seeds are 4-8 in number, ellipsoid-oblong and compressed.<sup>6-10</sup> Phytochemicals are used as templates for lead optimization programs, which are intended to make safe and effective drugs.<sup>11</sup>

Hence the rationale of the present study was to carry out preliminary phytochemical screening of *Saraca asoca* extract.

### MATERIALS AND METHODS

#### Authentication

The bark of *Saraca asoca* was authenticated by Prof. (Dr) Krishna Kumar. G, Chairman, Dept of Applied Botany, Mangalore University, Mangalore.



#### Bark

The bark of *Saraca asoca* was collected from campus of Yenepoya University, Derlakatte, Mangalore.



**Extraction**

About 1000 gm of shade dried bark of *Saraca asoka* was powdered and was extracted with ethanol and chloroform in a Soxhlet extractor for 36 hours respectively. It was concentrated to dryness under reduced pressure and controlled temperature (40-50°C) using rotary evaporator. The ethanolic and chloroform extract yielded a brownish mass weighing 165g & 150gm respectively. Extracts were concentrated by vacuum distillation to dryness; the yield obtained was 16.5% & 15 % respectively w/w with respect to dried powder.

**Chemicals**

All the chemicals required for phytochemical screening was procured from Rajesh chemicals, Mumbai.

**Phytochemicals Analysis**

Phytochemical analysis of the test solution was carried out according to standard methods.<sup>12-14</sup>

**Test for phytosterols: Salkowski reaction**

To 0.5 ml chloroform extract in a test tube add 1ml of Conc. H<sub>2</sub>SO<sub>4</sub> from the sides of the test tube. Appearance of reddish brown colour in chloroform layer indicates presence of phytosterols.

**Test for triterpenoids: Brieskorn and Binar test**

To chloroform extract, add few drops of chlorosulphonic acid in glacial acetic acid. Appearance of red colour within five minutes indicates presence of triterpenoids.

**Test for saponins: Foam test**

A small amount of extract taken in a test tube with little quantity of water. Shake vigorously. Appearance of foam persisting for 10 minutes indicates presence of saponins.

**Test for alkaloids: Dragendroff's test**

Dissolve various extract of the herbal drug in chloroform. Evaporate chloroform and acidify the residue by adding few drops of Dragendroff's reagent (Potassium Bismuth Iodide). Appearance of orange red precipitate indicates presence of alkaloids.

**Test for carbohydrates: Molisch's test**

Mix the extract with Molisch reagent and add Conc. H<sub>2</sub>SO<sub>4</sub> along the sides of the test tube to form layers. Appearance of reddish violet ring the interference indicates the presence of carbohydrates.

**Test for flavonoids: Lead Acetate test**

To the alcoholic solution of the extract add few drops of 10% Lead acetate solution. Appearance of yellow precipitate indicates presence of flavonoids.

**Test for lactones: Legal's test**

To the extract mixtures add sodium nitroprusside and pyridine. Then the mixture is treated with NaOH. Appearance of deep red colour indicates the presence of lactones.

**Test for phenolic compounds and tannins: Ferric chloride test**

Take 2 ml of extract in a test tube and add ferric chloride solution drop by drop. Appearance of bluish black precipitate indicates presence of phenolic compounds and tannins.

**Test for proteins: Ninhydrin test**

Few drops of Ninhydrin added to the extract. Appearance of blue colour indicates presence of amino acid where as proteins may rarely give positive result.

**Test for glycosides: Keller-Killiani test**

Extract+ 1ml of glacial acetic acid + few drops of ferric chloride solution + Conc. H<sub>2</sub>SO<sub>4</sub> (Slowly through the sides of the test tube). Appearance of reddish brown ring at the junction of the liquids indicates the presence of deoxysugars

**RESULTS**

In this study, we found that *Saraca asoka* bark extract possess Phytosterols, Carbohydrates, Glycosides, Phenolic Compounds & Tannins (table 1).

**Table 1:** Phytochemical analysis of *saraca asoka* bark extracts

Phytochemicals	Tests	Results (+ / -)
Phytosterols	Salkowski reaction	+
Triterpenoids	Brieskorn and Binar test	-
Saponins	Foam test	-
Alkaloids	Dragendroff's test	-
Carbohydrates	Molisch's test	+
Flavanoids	Lead Acetate test	+
Lactones	Legal's test	-
Phenolic Compounds & Tannins	Ferric chloride test	+
Proteins	Ninhydrin test	-
Glycosides	Keller-Killiani test	+

(+) Presence, (-) Absence.



## DISCUSSION

Many Studies on cell culture and animals have suggested that phytosterols containing plants attenuate the inflammatory activity of immune cells, including macrophages and neutrophils.<sup>15,16</sup> Flavonoids, having antimicrobial activity either inhibit or kill many bacterial strains, inhibit important viral enzymes, such as reverse transcriptase, protease and also destroy some pathogenic protozoans.<sup>17</sup> Plant Sitosterol (chemical structures similar to that of cholesterol) induces apoptosis when added to cultured human prostate, breast and colon cancer cells.<sup>18-20</sup> Phenolic compounds possess biological properties like antiapoptosis, antiaging, anticancer, anti-inflammatory, anti-atherosclerosis, cardiovascular protection, improves endothelial function and inhibit angiogenesis and cell proliferation activities. Studies on different medicinal plants have also shown the antioxidant properties which are rich in phenolic compounds.<sup>21</sup> Tannins are known to possess anthelmintic activity, neuroprotective functions capable of reversing 6-hydroxydopamine-induced toxicity.<sup>22</sup> Glycosides (Phenylethanoid) are known to possess wide array of pharmacological activities including antibacterial, anti-tumor, antiviral, anti-inflammatory, neuro-protective, antioxidant, hepatoprotective, immunomodulatory and tyrosinase inhibitory actions.<sup>23</sup>

## CONCLUSION

In our preliminary phytochemical screening, we found that the *Saraca asoca* bark extract posses Phytosterols, Triterpenoids, Carbohydrate, Glycosides, Flavonoids, Phenolic compound and Tannins. This suggests that, the *Saraca asoca* bark extract may possess Anti-inflammatory, analgesic, anti-diarrhoeal, anti-microbial, antioxidant, immunomodulatory, anthelmintic, anti-tumour, hepatoprotective and immunomodulatory activities.

However further research is required to study its comprehensive analysis including quantitative / semi quantitative test, characterize its chemical structure and to assess its biological activities.

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