

A PROJECT REPORT
ON
MEDICINAL PLANT LAWSONIA INERMIS AND
ITS USES IN EVERYDAY LIFE
FOR THE SESSION
2020-21

SUBMITTED BY:
DEPARTMENT OF BOTANY



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Report

Project on 'Medicinal Plant *Lawsonia inermis* and its uses in everyday life' was prepared by students of department of botany during the month of July 2020. Nine number of students were participated in this project work. They collected data from local people of Pattamundai and different sources about the uses of *Lawsonia inermis*. The departmental faculties co-operated them in all these works and this project is original. The project was guided by Dr. Anjali Kumari Dash, H.O.D, Dept. of Botany.

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SARACA ASOCA- A SACRED TREE OF INDIAN SUBCONTINENT

Saraca asoca (the ashoka tree "sorrow-less") is a plant belonging to the Detarioideae subfamily of the legume family. It is an important tree in the cultural traditions of the Indian subcontinent and adjacent areas. It is sometimes incorrectly known as *Saraca indica*. The flower of Ashoka tree is the state flower of Indian state of Odisha. The Ashoka is a rain-forest tree. Its original distribution was in the central areas of the Deccan plateau, as well as the middle section of the Western Ghats in the western coastal zone of the Indian subcontinent. It is becoming rarer in its natural habitat but isolated wild Ashoka trees are still to be found in the foothills of the central and eastern Himalayas.

The Ashoka tree is considered sacred throughout the Indian subcontinent, especially in India, Nepal and Sri Lanka. This tree has many folklorical, religious and literary associations in the region. It is believed Shakyamuni Buddha was born under an ashoka tree in Lumbini Garden. In *Mahākāvya*, or Indian epic poetry, the ashoka tree is mentioned in the *Ramayana* in reference to the *Ashoka Vatika* (garden of Ashoka trees) where Hanuman first meets Sita. Some authors hold that the young girl at the foot of this tree is based on an ancient tree deity related to fertility. As a wild tree, the Ashoka is a vulnerable species. It is becoming rarer in its natural habitat, but isolated wild Ashoka trees are still to be found in the foothills of the central and eastern Himalayas in scattered locations of the northern plains of India as well as on the west coast of the subcontinent near Mumbai.

Taxonomy of the plant

The taxonomy of the plant *Saraca asoca* is as follows:

Kingdom : Plantae
Division : Magnoliophyta
Class : Magnoliopsida
Order : Fabales
Family : Leguminosae
Sub family : Caesalpinaceae
Genus : Saraca
Species : asoca.
Botanical name : Saraca asoca
Synonym : Saraca indica

(Pradhan et al., 2009; Preeti et al., 2012; Iyenger, 2009;
Rangari, 2012; Purohit & Vyas, 2004)



Habitat

Habit and

Saraca asoca is extensively found in Malayan Peninsula, Myanmar, Srilanka and Bangladesh. It is grown in Indonesia (Kokate et al., 2003). In India it is commonly found in Khasi hills of Assam, hilly areas of West Bengal, Western Ghats of Maharashtra and Northern areas (Purohit & Vyas, 2004; Sivarajan & Balachandran, 1994). Its original distribution was in central areas of Deccan Plateau as well as the central parts of Western Ghats in the Western coastal region of the Indian Subcontinent (Preeti et al., 2012) also found in Andaman Islands (Kokate et al., 2003). The tree is found in Central and Eastern Himalaya, Eastern Bengal, Western Peninsula, Burma and Malaysia (Ali, 2006). It is widely distributed throughout Indian Subcontinent in evergreen forests up to an elevation of about 750 meters. Its propagation is done by the seeds (Prajapati et al., 2003). It grows well in tropical and subtropical climate (Kokate et al., 2003). There are a few varieties of the Ashoka tree. One variety is larger and highly spreading. The columnar varieties are common in cultivation. Ashoka is a medium sized evergreen tree with oblong leaflets and vibrant flower clusters. It grows to a height of 6 to 9 meters. The leaves are alternate, paripinnate, stipules caduceous, rachis pulvinate, 7-30 cm long, petiolule 0.1-0.6 cm long elliptic to oblong or lanceolate, apex acute or acuminate, base acute or rounded or subcordate, subcoriaceous, glabrous, midrib raised above, secondary nerves 11 pairs, looped, tertiary nerves reticulate copper red when young and green when mature and are almost 30 cm long with 4 to 6 pairs of leaflets. The leaflet is 12 cm long and 5 cm wide on average. The trunk of Ashoka tree is often tubercled, bark lanceolate, dark, shallowly fissured and on old stems is dark green in colour, often marked by bluish and ash white patches of lichen.



This tree bears fragrant flowers in paniculate corymbose inflorescence from December end to May, with peak flowering during February –March. Its flowering season is around February to April. The Ashoka flowers come in heavy, lush bunches. They are bright orange-yellow in color, turning red before wilting. The flower lacks petals and occurs as clusters. They sometimes grow directly from the main stem. Even though the flower lacks the attractive sepals look like petals. They are four in number. There are 7 stamens which appear like hairs all around the flower cluster. The fruits attain its maturity during last week of May–July. Seeds were dispersed from the pod to the tree premises upon complete maturity. The seed pod is purple black, flat, oblong, apiculate 20 cm long and contains four to eight obovate- orbiculate seeds.

METHODOLOGY

Saraca asoca plant was collected and studied in detail during 2016 to 2017 through field survey in different area Pattamundai of Kendrapara district. During the period of study, door to door visits were made to identify local people with

specialized knowledge on use of Ashoka plants. Plant parts were collected with noting its local names, parts used and ethno medicinal uses. The specimen was processed using the standard herbarium techniques and are preserved in the Botany laboratory.

Processing of plant material Preparation of crude powder:

The collected plant material was manually cleaned to remove coarse impurities and then air-dried in shade at a well-ventilated place in the laboratory. Further drying was done in the incubator to remove moisture at a temperature of 40°C. The dried bark and seeds were crushed and grounded in electric mixer-grinder to form crude powder and stored in airtight container or poly bags (Azwanida, 2015; Odey et al., 2012) .

Preparation of methanolic extracts: 50 g crude powder of each plant material was soaked in 400 ml of analytical grade methanol in a glass flask and was covered with aluminum foil followed by stirring at hourly intervals at room temperature (Sharma et al., 1971) [14]. Soaking was done for a period of 72 hours. The soaked crude powder was filtered through Whatman filter paper No.1 with separating funnels. The filtrates were concentrated by evaporation at 50-55°C in a rotator vacuum evaporator (Kanojiya et al. 2015) [15] .

Preparation of aqueous extracts:

50 g of crude powder of each plant material was soaked in 400 ml of triple glass distilled water in a glass flask and was stirred at hourly intervals initially for 2-3 times followed by 8 hours of undisturbed activity at room temperature. Soaking was done for a period of 12 hours. The soaked crude powder was filtered through Whatman filter paper No. 1 with separating funnels. The obtained filtrate was

concentrated by using rotator vacuum evaporator at 45-50°C using the procedure described by Kanojiya et al. (2015) [15] with some

Preservation of extracts:

The extracts were labeled individually and kept in airtight glass bottles in a cool and dark place at 4°C (refrigerator) for further use.

Phytochemical analysis of extracts

Extract residue obtained from each plant were tested for the presence of phytoconstituents such as alkaloids, tannins, flavonoids, saponins, glycosides, resins, triterpenes, reducing sugars and proteins by standard procedures (Das et al., 1964; Harborne, 1973) [16, 17] .

Test for alkaloids: 0.5 to 0.6 g of various extracts were mixed in 8 ml of 1% HCl, warmed and filtered. 2 ml of the filtrate were treated separately with both reagents (Wagner's and Dragendorff) a) Dragendorff reagent: The filtrate of the extract was added to the reagent and development of turbidity or precipitation was considered as the presence of alkaloid. b) Wagner's reagent: The filtrate of the extract was added to the reagent and development of brown flocculent precipitate indicated the presence of alkaloids.

Test for reducing sugars: 5 ml of extract solution was poured in a test tube and equal quantity of Benedict's reagent was added and heated. The appearance of brown red precipitate indicated the presence of reducing sugars.

Test for glycosides: The solution obtained in Benedict's test was filtered and diluted HCl was added. Equal quantity of Benedict's reagent was added and boiled. Appearance of brownish precipitate revealed the presence of glycosides.

Test for tannins: Methanol was added to the residue of the extract. The solution was heated and filtered through Whatman filter paper. Filtrate obtained was treated with different reagents.

a) Lead acetate test: 2-3 drops of lead acetate solution was added to the above mentioned extract solution. The formation of precipitate indicated the presence of tannin.

b) Ferric chloride test: Few drops of ferric chloride solution were added to the above filtrate. A green colouration in the filtrate of the methanolic extract indicated the presence of tannin.

Test for flavonoids: 1 ml of extract was dissolved in 5 ml ethanol (95%) and a few drops of diluted NaOH solution was added. Intense yellow colour appeared in the test tube. It became colourless on addition of a few drops of diluted HCl indicated the presence of flavonoids.

Test for resins:

A small amount of extract residue was dissolved in alcohol and a few drops of distilled water were added. The appearance of turbidity was considered as a positive test for resin.

Test for saponins: 1 ml of extract was taken in a test tube and small amount of sodium bicarbonate and water were added. It was shaken vigorously. Formation of froth indicated the presence of saponins.

Test for sterol

a) Salkowski reaction: 1 g residue of extract was taken in 2 ml of chloroform. Thereafter 2 ml of concentrated sulfuric acid was added by the side of the tube.

The tube was shaken for a few minutes and the development of red colour in the chloroform layer and greenish yellow fluorescence in the lower layer indicated the presence of sterol.

Test for protein

a) Biuret test: 1 g of residue of extract was taken in water and 1 ml of 4% NaOH solution was added. Appearance of violet pink colour indicated the presence of protein.

Uses

The dried bark of the tree constitutes the drug. The bark contains hematoxylin, saponins, tannins and catechol. The powder of the bark contains silica, sodium, potassium, phosphate, magnesium, iron, calcium, strontium and aluminium. A crystalline glycosidal substance has been isolated from the bark with galactose as the constituent sugar. The properties include antibacterial, anticancer, antifungal, anti-larval, anti-oxidant, anti-hemorrhagic, anti-inflammatory, antipyretic, analgesic and cooling activities.

Ashoka tree is a famous medicinal plant which cures ample number of disorders. Each part of the tree is loaded with one or the other health benefits. Listed below are few effective health benefits of Ashoka tree.

Cosmetic: The bark of the tree is used for preparing cosmetics to improve the complexion. In addition it is also beneficial for ladies who face painful or irregular menstrual cycle. It also best recommended remedy to treat vaginal discharge

Stomach Swelling: Intake of bark or leaves of Ashoka helps to get rid of worms

and removes swelling in the stomach. Furthermore the stem bark is rich in anti-fungal, pain killing and anti-bacterial properties.

Blood Purifier: Consuming tonics made of bark, flowers and leaves of Ashoka tree treats diarrhea and purifies the blood

Diabetes: Dried flowers of the tree are very helpful for the people who are suffering from diabetes. Prepare powder from dry flower of the tree and take daily to keep sugar level in control.

Piles: In addition the Ashoka herbal supplements cure the bleeding caused by piles. You can also prepare a decoction using the bark of the tree to treat internal piles.

Inflammation: Decoction of the bark relieves from burning sensation and can be used as a wash. It also soothes inflammation externally and internally.

Uterus: The bark of this herbal tree is rich in ketosterol. It treats uterine fibroids and other internal fibroids as well. Hence it is considered as one of the common household remedy for uterine disorders. The mucosa of the uterus could be toned by powdered bark. Boil 2 tsp of bark powder in 2 glass of water till it is reduced to 1/4th. Filter it and take 30ml of this decoction 2 times a day

Fungal Infection: Ashoka tree bark is loaded with chloroform, methanol and other properties that treat bacterial and fungal infections

Complexion: Capsules produced from Ashoka tree are of great benefit for skin and overall complexion. In addition these tablets are consumed as natural

supplement to treat irritations or burning sensations in the skin

Toxicity Study

Extraction of different solvents like petroleum ether, chloroform, methanol and water extract when administered up to 2000 mg/kg body weight, none of the extracts produced any toxic symptom of mortality (Verma *et al.*, 2010). Different doses of *Saraca asoca* extract were administered in randomly selected healthy rats in a dose of (500, 1000, 1500 and 2000 mg/ kg body weight) and rats were observed for toxicity then the vital organs of rats were removed and taken for macroscopic examination. Toxicological evaluation of *Saraca indica* bark extracts are promising and indicate that, this herbal preparation may have a potential to be used as a complimentary medicine (Yadav *et al.*, 2015).

CONCLUSION

Asoka tree is a sacred tree which is very beneficial in our everyday life. It is under vulnerable group and now on the way of extinction due to climate change. So we must take care of this tree for the benefit of mankind. The scientific studies have proved most of the claims of traditional medicines. However, further detailed clinical research appears worthwhile to explore the full therapeutic potential of this plant in order to establish it as a standard drug.

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PROJECT ON: 'Medicinal plant' Lawsonia inermis and its uses
in everyday life'

DEPARTMENT: Botany

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SESSION-2020-21
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