

REVIEW ARTICLE ON SINDURI (*BIXA ORELLANA*)

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ABSTRACT

Sinduri (Bixa orellana) one of plant mention in Bhavprakash nighantu. Sinduri belongs to family bixaceae and acharya bhavprakash included sinduri in Pushpavarga. Its flowers are very beautiful hence most commonly found in garden. It is native to the tropical America and is found in large quantities from Mexico to Ecuador, Brazil and Bolivia. In india it is cultivated in mysore. Present article deals with botanical and ayurvedic classification, various pharmacological action, cultivation and medicinal uses of sinduri according to ayurveda and modern science.

KEYWORDS- Sinduri, Bixa orellana, Pushpavarga.

INTRODUCTION

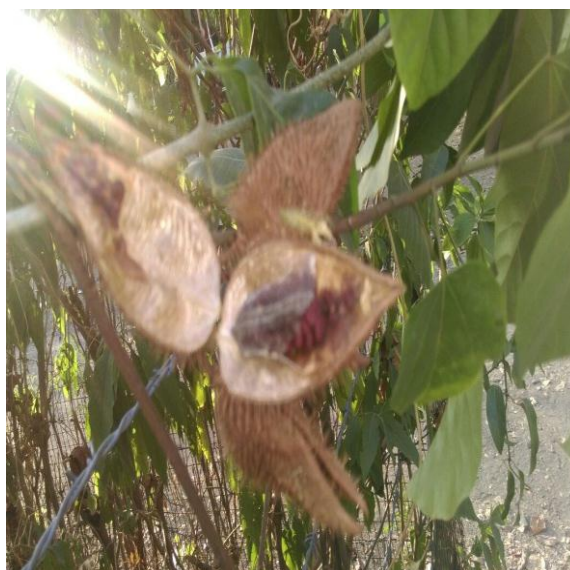
Sinduri (*Bixa orellana*) in todays era most commonly used as an coloring agent. The intense red color of the seed is due to bixin in the seed coat. Sinduri has been used for centuries to preserve and flavor food and it is considered to be mainly a culinary spice, though it does have some traditional medicinal uses that have recently been confirmed by science. Acharya bhavprakash

mention properties as it is sheeta (cold), it helps to normalise vatiated Pitta dosha and it is used in Visha dosha (toxic condition), Trushna (thust) and Chardi (Vomitting).

Recently varrious research is performed on sinduri. Their fore it is an attempt to provide collective information and repsrent it in systemic manner.

Sinduri- (*Bixa orellana*)





Fruits of Bixa orellana

Vernacular Name

Sanskrit- Sinduri
 English- Lipstick plant
 Brazil- Annato
 Hindi- latkan
 Kannada- Rangamali
 Tamil- Sappiraviraj
 Oriya- Lotkon
 Marathi- shendri
 Gujrati- sinduri

Botanical classification

Kingdom- Plantae
 Order- Malvales
 Family- Bixaceae
 Genus- Bixa
 Species- B. Orellana

Ayurvedic Classification

Cause effect relationship- Karan dravya
 Living-non living- Chetana dravya
 Constitution- Aap mahabhut pradhan

Origin- Audhbbhida

Usage- Aushadhi dravya

Morphology- Kshupa

Rasa- katu, kashaya

Virya- katu

Vipaka- sheet

Karma- Vish and Chardi dosha hara

Chemical composition

Bixin ($C_{25}H_{30}O_4$) is a major chemical constituents present in seeds, fat and starch also present in small quantity. Isobixin, beta carotene, ellagic acid, salicylic acid tomentosic acid, orellin, bixin.

Properties and action

Fruit pulp in small quantity performs Grahi karma and purgative when given in large quantity.

External Morphology

It is a fruiting shrub. Height of plant approximately upto 6-20 feet and age is approximately 60 years.

Leaves

Leaves of this plant are pointed and 5-15 cm long and 4-11 cm wide in size.

Flowers

Flowers occur in vertical upright clusters, which prominently appear above the foliage. Flowers are showy, white or pink, nearly 5 cm broad, with five petals and a dense mass of stamens in the center.

Fruits

fruit is two valved, ovoid, red in color and spiny, and approx. 2.5 – 5 cm long.

Cultivation

Soil should be prepared in the same manner as for cotton. Seeds, previously softened by soaking in water, are planted in holes or furrows 2.5-3.5 m apart in shaded nurseries. Seeds germinate in 8-10 days. As the young plants develop, they should be protected by artificial shade or intercrops, with increased light as they get older. When 15-25 inches high, they are ready for outplanting, spaced for final distribution at 4.5-6 m apart. Plantings fare well if in 60 cm cubed plots filled with well aged farm manure. Water well at planting. Can be intercropped with cassava, corn, and malanga. After 3 months, plantation should be weeded and superfluous plants removed. Except for periodical weeding, the plantation needs little attention. ANAI recommends growing medicinal or culinary herbs, like lemongrass, between the shrubs (DAD, WO2). Collection of seed may begin as early as 18 months, a full crop expected 3-4 years after sowing. Trees remain productive for 10-15 years. Capsules are gathered, usually by hand, when they are reddish and beginning to break open. It is wise to prune branches rather vigorously when harvesting the capsules; pruned plants yield better. Capsules are dried in the shade for about 10 days then exposed to the sun until all have opened. Clusters and seeds are then placed in a bag and beaten with a stick to loosen the seed. Thus, seeds are easily removed from the capsule, and little dye is lost. Seeds are then sifted to separate seed from trash. Seed is again sun-dried 4-6 hours before bagging. For home extraction of dye/spice, pouring hot water over the pulp and seeds to macerate and separate them by pounding with a wooden pestle. Remove seeds, letting the pulp settle, pouring off excess water; dry pulp gradually in the shade. In India, the plant produces throughout the year, with two main crops in March and September. In Hawaii, harvests are in May, September, and the best yields are obtained in January, with about 44 kg/ha for round pod variety and 939 kg/ha for pointed-pod variety. A tree should yield 4.5-5 kg dried seed per year. An average yield of 500-2000 kg/ha per year is satisfactory, but up to 4500 kg/ha have been reported in five-year old fields; 100 kg of seed yield about 5-6 kg of material which contains 12-30% bixin.

Pharmacological actions**ANTIBACTERIAL ACTIVITY**

P.sumathi and A. Parvathi dealt with antibacterial potential of the crude aqueous and organic extracts from leaves, seeds and empty seed capsules of Sinduri (*Bixa orellana*) against one Gram-positive and three Gram-negative bacteria by using agar diffusion method. The leaf extracts of methanol, dimethyl sulphoxide, ethanol and acetone exhibited potential and significant antibacterial activity against *Staphylococcus aureus* at 800, 1600; 1600 and 3200 µg/ml, respectively. However, none of the aqueous extracts showed antibacterial activity against the tested bacteria. The extracts of dimethyl sulphoxide and methanol from empty seed capsules also showed effective antibacterial activity against *Staphylococcus aureus* and *Salmonella typhi* at 3200 and 800 & 3200 µg/ml, respectively. Various solvents and aqueous extracts of the seeds did not show any appreciable antibacterial activity except in dimethyl sulphoxide solvent extracts. Moderate growth inhibition zone of *Salmonella typhi* and *Staphylococcus aureus* in dimethyl sulphoxide was noticed at high concentrations of 6400 µg/ml.

Hypoglycaemic activity

Animal experiment performed on streptozocin induced diabetic dogs. and it was found that decrease blood glucose levels in fasting normoglycaemic and streptozotocin-induced diabetic dogs. In addition, in normal dogs, it suppressed the postprandial rise in blood glucose after an oral glucose load. Interestingly, the extract also caused an increase in insulin-to-glucose ratio in normal dogs. Increased insulin levels were not due to increased insulin synthesis as after 1-h residence time and half-hour postprandial, decreased C-peptide levels was also observed.

Anti-hyperlipidemic Activity

Aqueous extract of outer seed coating of Sinduri (*Bixa orellana*) shows hypocholesteremic activity. In this study Male Fisher rats were divided into three groups (n=12): C group, fed standard diet and water; H group, fed high-lipid diet and water and; HU group, with high-lipid diet and aqueous annatto extract for 60 days. The treatment with annatto extract in animals fed with the high-lipid diet lowered the LDL- and total cholesterol and raised the HDL-cholesterol, suggesting a hypocholesterolemic effect. Neither high-fat diet nor aqueous annatto extract had any significant effect on serum levels of albumin or serum activities of transaminases which suggested that no liver injury was induced.

Diuretic Activity

The present investigation was aimed at investigating the diuretic activity of *Bixa orellana* Linn. leaves. The dried leaf powder was subjected to successive Soxhlet extraction with petroleum ether, chloroform, ethyl acetate, methanol and water. Among these, petroleum ether, methanolic and aqueous extracts were investigated for diuretic activity in Wistar rats using standard

methods. The diuretic activity was assessed in terms of urine output and levels of sodium, potassium and chloride in urine. The results obtained revealed that the methanolic extract showed significant diuretic activity at a dose of 500 mg/kg body weight by increasing the total volume of urine and levels of sodium, potassium and chloride in urine when compared to standard drug, Furosemide and Arachis oil as control and vehicle for the extracts.

Hepatoprotective activity

Rajib ahsam et al. conducted animal study on swiss albino rats for hepatoprotective activity of *Bixa orellana*. In their study it was found that methanolic extract of *Bixa orellana* shows highly significant result on experimental animal and assumed that the effect of *Bixa orellana* extract on liver protection is related to glutathione-mediated detoxification as well as free radical suppressing activity.

Antiparasitic activity

In vitro study was conducted on *Leishmania amazonensis* (M2269) samples and evaluated by smears analyses (counting, availability and mobility) and by Giemsa staining method (presence of cytoplasmic granules, nuclear structure and kinetoplast). In this study it is observed that Hydroethanolic extracts of *Bixa orellana* Leaves, stem and roots were shown to present antiparasitic activity.

Medicinal Uses

According to Ayurveda

Root bark is used in fever

Seeds are useful in syphilis

Decoction of leaves are useful in Kamala (Jaundice)

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