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Sesbania *sesban* Linn. : An overview

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Abstract

Herbal remedies have been used since the dawn of human civilization. The plains of India are home to a species of *Sesbania* (Fabaceae) known as Jayanti. *Sesbania Sesban* Linn. is in high demand since it is a nutritious herb that also has medicinal benefits. The herb is useful as a medicine. Cyanidin glucosides and delphinidin glucosides are found in flowers. Alpha-ketoglutaric acid, oxaloacetic acid, and pyruvic acid are all found in pollen and pollen tubes. Evaluation of the topical anti-inflammatory, antidiabetic, and central nervous system stimulating effects of *Sesbania Sesban* leaves in the treatment of thyroid diseases and dysuria. In traditional medicine, the *Sesbania Sesban* leaf is used as an anti-inflammatory, analgesic, demulcent, and purgative. Streptozotocin-induced diabetic rats were used to examine the renal protective effect of an aqueous extract of *Sesbania Sesban* leaves (250 and 500 mg/kg/day). Proteinuria and albuminuria both increased dramatically in diabetic rats, indicating significant hyperglycemia. Crude drug active components and their therapeutic or pharmaceutical applications are fundamental to a pharmacognostic framework. Kaempferol trisaccharide, chikusetsusaponin-iv, makes up the bulk of its composition. Tree seedlings of the nitrogen-fixing species *Sesbania Sesban* can tolerate quite high levels of nitrogen. This review compiles the research done on *Sesbania Sesban* Linn and its many facets. Plant has several medicinal uses in traditional medicine.

Key-Words: *Sesbania Sesban* Linn. Medicinal Significant, anti-inflammatory activity, CNS Stimulant

Introduction

India may be thought of as a global herbarium. Because of our abundance of plants and herbs, they are the primary source of medicine in India. *Sesbania Sesban* Linn. is in high demand since it is a herb that may be used to supplement one's diet and give medicinal benefits.

Sesbania Sesban Linn. is a well-known medicinal plant that may be found all throughout the plains of India and other tropical nations. One of the six species of the genus *Sesbania* that are extensively cultivated in the tropical area of India is *Sesbania*

Sesban Linn., sometimes known as "Egyptian *Sesban*." Widespread use as a windbreak and nitrogen fixation capacity make this a popular plant. The herb is useful as a medicine. The *Sesban* Linn. leaf poultice has been used for centuries in folk medicine. Facilitates the draining of infected material from boils and abscesses and the reduction of inflammatory rheumatic lumps and bumps. The anti-worm effects of fresh leaf juice have been well documented.²

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The active ingredient in *Sesbania sesban* Linn. is the dried bark of the *Sesbania sesban* Linn. plant. (Fabaceae) may be found all across the Indian subcontinent, especially in the plains, where it goes by the names Jayanti (SANS) and Shevri (MAR)³. *Sesbania Sesban* bark has been linked to relieving diarrhea, swelling of the spleen, and inflammation, according to many sources. Seeds for enhancing spleen size. Antifertility action is seen in flowers^{4, 5}. Arabic cognomens often used: Sesaban "Jainti, Jayant" in Bengali Yathakye, Yethugyi is the Burmese word for "thank you" Frother, Iver bean, Sesban, Sesbania, Sesban, and Common Sesban are all names for the same plant, *Sesbania*.

Jainti, Jait, and Rawasan are all possible translations in Hindi for the word "jainti Jayanti, Rajashinganee (in Guj) Appropriate Japanese Name: Arinintajinamgi Semp, Atti Mal: Jainta (Punj) Tel : Somita, Jalugu Indonesian : Janti, Jayanti, Puri Javanese : Janti Luganda : Mubimba, Muzimbandeya Sanskrit : Jayanti, Jayantika Spanish: Anil francés, Tamarindillo Tamil : Champai, Chithagathi, Karunchembai Thai : Sami, Saphaolom Vietnamese : Dien-dien¹.

Distribution

Chad, Egypt, Kenya, Uganda, Angola, Australia, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, China, Congo, Cook Islands, Cote d'Ivoire, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Fiji, French Polynesia, Gbon, Gambia, Ghana, Tonga, United States of America, Vanuatu, Vietnam, Zambia, Zimbabwe. The origin of *S. Sesban* is unclear, but it is widely distributed and cultivated throughout tropical Africa and Asia. Leaves Leaves paripinnate, compound 12-18cm long made up of 6-27 pairs of leaflets. long, narrow; leaflets in many pairs, rounded or oblong, usually asymmetric at the base, often glaucous; stipules minute or absent⁶. Flowers The raceme has 2-20 flowers which are yellow with purple or brown streaks on the corolla Flowers attractive, yellow, red, purplish, variegated or streaked, seldom white, large or small on slender

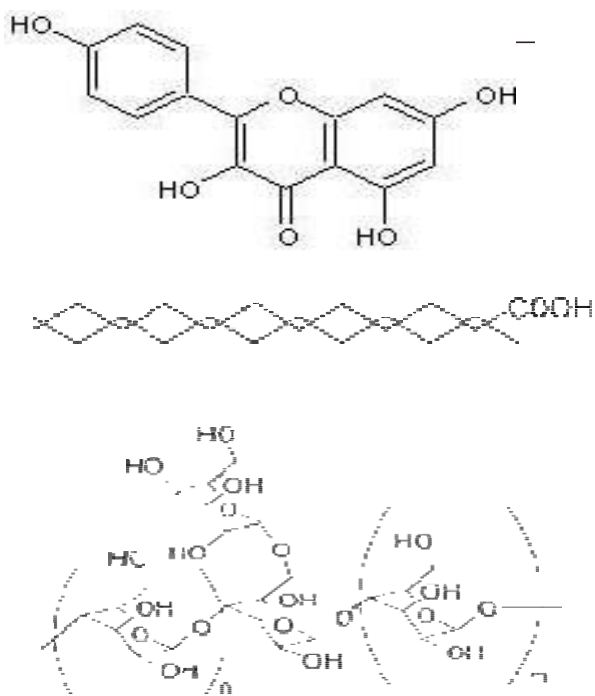
pedicels, solitary or paired in short axillary racemes, usually unpleasantly scented; all petals long clawed, standard orbicular or obovate. Pods pale yellow, linear, usually 10-20 cm long, cylindrical or compressed, rarely oblong; up to 40 seeds are found in a pod; seeds oblong or sub quadrate, brown or dark green mottled with black. Two subspecies are recognized within *Sesbania Sesban*, namely ssp. *Punctata* (restricted to northern portions of sub-Saharan Africa) and ssp^{6, 7}. Young shoots Straight, green and canescent Wood *Sesban's* wood is light in weight compared to the woods of *Calliandra* and *Leucaena*¹. Ecology⁸ Soil requirements Grows in a wide range of soils from loose sands to heavy clays. Tolerates saline soils (1.0% salt concentration in the seedling stage to 1.4% at maturity); alkaline soils (pH <10); and acidic soils, as well as water-logging and flooding. Tolerant of low P, but P application has a positive effect on growth and nodulation. Tolerant of metalliferous mine tailings high in Cu, Zn and Pb. Moisture *Sesbania Sesban* is native to monsoonal, semi-arid to sub-humid regions with 500-2,000 mm annual rainfall. Grows best where periodic water logging or flooding is followed by a progressively drier season. Temperature *Sesbania Sesban* is tolerant of cool highland-tropical or sub-tropical conditions, growing at up to 2,300 m altitude in Kenya and as far south as 27° latitude in Australia. These environments experience cool winter temperatures, with mean monthly minimum temperatures for the coldest month of 7-10°C and average annual temperatures ranging from 17-20°C. Tolerates light frosts, but will be killed by heavy frost. Light Has moderate shade tolerance Cultivation and propagation^{9, 10} *Sesbania Sesban* grows well in the subtropics and is significant in extending the nitrogen-fixing forage trees into cooler, higher elevation regions of the tropics. It has outstanding ability to withstand water logging and is ideally suited to seasonally flooded environments. When flooded, it initiates floating, adventitious roots and protects its stems, roots and nodules with spongy, aerenchyma tissue. It is common along streams, swamp banks and moist and inundated

bottomlands. Sesbania Sesban shows some tolerance. Propagation methods Sesbania Sesban has a hard, impermeable seed

coat, and scarification is recommended to ensure uniform germination. For research purposes, soaking in sulphuric acid followed by rinsing in water is common. Hot water treatment or soaking in cold or tepid water for 24 hours may also be effective. The seed germination rate is 65% in about 16 days. Vegetative propagation using stem cuttings is not a widespread practice; Sesbania Sesban can also be established by tissue culture. Environmental adaptation Sesbania Sesban shows some cool tolerance. It grows well in the subtropics and is significant in extending the nitrogen fixing forage trees into cooler, higher elevation regions of the tropics up to 2,000 m. (Gutteridge and Shelton 1998). It is outstanding in its ability to tolerate waterlogging and is ideally suited to seasonally waterlogged environments. When flooded, it initiates floating adventitious roots and protects its stems, roots and nodules with spongy, aerenchyma tissue. Evans and Macklin (1990) report the rainfall. Another outstanding feature is its tolerance of both saline and alkaline soil conditions (Hansen

and Munns 1985). However, its tolerance of highly acid, aluminium saturated soils is not known. Biophysical limits Altitude: 100-2300 m, Mean annual temperature: (10 min.) 18-23 (45 max.) deg. C, Mean annual rainfall: 500-2000 mm. Soil type: Tolerates seasonal or permanently waterlogged soils as well as saline, acidic and alkaline soils. Reproductive Biology Sesbania Sesban is assumed to be largely out-crossing, however interspecific hybridization is reported with *S. goetzei*; the carpenter bee is its main pollinator. Flowering starts shortly after the onset of the rains (in areas where there are 2 rainy seasons, it flowers and sets fruit twice). Pods are indehiscent and do not shed their seeds until well after pod maturity propagation and management to moisture stress and tolerates soil alkalinity and salinity. Chemical constituents Major Pod: kaempferol trisaccharide Leaf: chikusetosaponin iv Others:

lupeol, α -amyrin, galactomannan, stigmasta-5, cholesterol, campesterol, β sitosterol, linoleic acid, oleic acid, palmitic acid, stearic acid, lignoceric acid. Leaf: 3-o-[α -L-rhamnopyranosyl]-oleanolic acid, Therapeutic uses Lignoceric acid actomannanitic acid Kaempferol Ilexoside XL VIII cholesterol, campesterol, β -sitosterol



tic uses Lignoceric acid Galactomannan Palmitic acid Kaempferol Ilexoside XL VIII cholesterol, campesterol, β -sitosterol. Cholesterol Lupeol Anti inflammatory Activity The leaves of Sesbania SESBAN evaluated the topical anti-inflammatory activity of the crude saponins extract by carrageenan induced rat paw edema method by preparing the gel formulation. The activity was carried on Wistar albino rats, receiving two strengths of crude saponin gel at a concentration of 1% w/w and 2% w/w respectively and Diclofenac sodium gel (1% w/w) was used as reference drug. The crude saponins extract in 2% w/w gel formulation showed significant anti-inflammatory. The effects of exogenous administration of Petroleum ether, Chloroform and Methanol extracts of bark of Sesbania Sesban and Sesbania grandiflora in carrageenan induced inflammation model, the result of anti-inflammatory activity of extracts of above plants showed that petroleum ether extracts of bark of Sesbania Sesban and Sesbania grandiflora were

having better anti-inflammatory activity as compare to other extracts in carrageenan induced paw oedema in rats¹¹. Adjuvant-induced arthritis in the rat Oral administration of petroleum ether extracts of bark of Sesbania Sesban (300mg/kg p.o. b.w.) twice each day during the 21 days of adjuvant induced arthritis showed a significant decrease in injected paw oedema from 12th day till 21st day in petroleum ether extracts of bark of Sesbania Sesban and arthritis paw oedema maximum reduction was from 14th day till 21st day in all above plants extracts. In Non- injected paw all above plants extracts showed paw edema was observed in arthritis and maximum decrease was on 12th day till 21st day. Body weight, spleen and thymus weight were observed¹². attenuating Effect The attenuating effects of Sesbania Sesban leaves aqueous extract in streptozotocin (STZ)-induced diabetic rats at dose of 250 and 500 mg/kg per day was given to diabetic rats for 12 weeks. Cold and hot water tail immersion tests, photoactometer and Rota-rod tests were performed to assess degree of colder, thermal spontaneous motor activity and motor co-ordination changes respectively at different time intervals i.e., week 0, 4, 8 and 12. Tissue superoxide anion and total calcium levels were determined after 12 weeks to assess biochemical alterations. Histopathological evaluations of sciatic nerve were also performed. Sesbania Sesban was increased tail flick latency significantly in diabetic rats also reduced superoxide anion and total calcium levels¹³.

Antidiabetic Activity The aqueous leaves extract of Sesbania Sesban was evaluated for its antidiabetic potential on normal and streptozotocin (STZ)-induced diabetic rats at the doses of 250 and 500 mg/kg body weight per day for 30 days. The fasting Blood Glucose Levels (BGL), serum insulin level and biochemical data such as glycosylated hemoglobin, Total Cholesterol (TC), Triglycerides (TG), High Density Lipoproteins (HDL) and Low Density Lipoproteins (LDL) were evaluated and all were compared to that of the known anti-diabetic drug glibenclamide (0.25 mg/kg b.w.). The statistical data indicated significant increase in the body weight, liver glycogen, serum insulin and HDL levels and decrease in blood glucose, glycosylated hemoglobin, total cholesterol and serum triglycerides when compared with

glibenclamide¹⁴. Potential Antifertility Activity The different doses of Sesbania Sesban seed powder inhibit the ovarian function, change the uterine structure and prevent the implantation, thus, control the fertility of female albino rats. The root extracts of Sesbania Sesban showed oleanolic acid 3- β - Dglucuronide spermicidal activity^{15,16}. CNS Stimulant Effect In his study Sesbania Sesban was intended to evaluate the CNS stimulant activity of crude drug extract. The activity was carried out on albino mice. Caffeine was used as a reference drug. The crude extract showed significant CNS¹⁷. Other uses Various medicinal uses for

Sesbania Sesban have been recorded in Africa and Asia^{9,10}. The leaves and flowers are used in medicinal poultices and teas, which are said to have the effect of astringency, or contraction of body tissues. Bark exudates from Sesban produce a gum of medium commercial quality. The leaf of Sesbania Sesban has traditionally been used as purgative, demulcent, maturant, anthelmintic and for all pains and inflammation. Fodder The leaves and tender branches of Sesbania Sesban are high in protein (20-25% crude protein) and have high digestibility when consumed by ruminants, such as cattle and goats. Anti-nutritional factors are suspected to be present in Sesban fodder. Feeding Sesban fodders to monogastric animals (such as chickens, rabbits, and pigs) is not recommended

Conclusion

According to this review, Sesbania Sesban has considerable biological potential. The assessment of physical constants is a key metric for identifying pharmacological adulteration or mishandling. The presence or absence of inorganic contaminants may be inferred from the drug's ash content, which might vary widely depending on the drug's intended use. The extensive information on the therapeutic activities of the ingredients included in this review is thought to offer detailed evidence for the use of this plant in diverse medications. This research demonstrates that Sesbania Sesban's leaves and pods have a high concentration of chemical compounds that have anti-inflammatory, anti-diabetic, and central nervous system (CNS) stimulating effects.

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