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Review Article

SESBANIA GRANDIFLORA (AGASTYA): A REVIEW ON ITS PHYTOCHEMICAL & PHARMACOLOGICAL PROFILE

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ABSTRACT

In indigenous system of medicine *Sesbania grandiflora* is used as medicinal plants. It has unique medicinal properties and used for its antibiotic, anthelmentic, antitumor and contraceptive properties. The whole plant of agasthya is medicinally used in Ayurvedic formulation like medicinal preparation Grahani Kapata rasa, Ratnagiri rasa, and Pittakasantaka rasa etc. The preliminary Phytochemical screening revealed the presence of polyphenols, flavonoids, amino acids, steroids, saponine, carbohydrates. In traditional Indian medicine literature a large number of plants & herbs form a part of our nutrition & provide us therapeutic effect *Sesbania grandiflora* is one of such plants. The present review summaries the Phytochemical & pharmacological effect of *Sesbania grandiflora*.

Key Words: Indigenous, *Sesbania grandiflora*, Grahani Kapata, Ratnagiri Rasa, Pittakasantaka rasa.

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INTRODUCTION

Sesbania grandiflora is commonly known as Hadaga.An indigenous medicinal plant in India, known as Sesbania and agathi in ayurvedic system of medicine which belongs to family Leguminosae. It is soft wooded tall slender tree that reaches 6.9 m in height, 20-25 cm width. Leaves 5-30 cm long; leaflets 16-30 pairs, linear-oblong. Pods 50 cm long or 15-20 pale coloured seeds. 10 cm long with showy, fleshy, white, crimson, red or pink petals. It is cultivated in India, Australia, Indonesia, Malaysia, and Myanmar, Philippine (Kirtikar KR and Basu BD, 1998). In India it is found at West Bengal, Assam, Karnataka, and North-Eastern. It is cultivated as Ornamental plant, grows wild in hedges and shady forests (Das KC and Tripathi AK, 1998; Mukul B *et al*., 2012).

Plant Description

Vernicular Name**(** Kanitta J and WanneeJ, 2015)
Marathi :Hadaga
English : Humming Bird
Hindi :Hadga ,Hathia ,Agastoya ,Basna
Sanskrit :Agastya ,Dirghashimbi
Kanada :Agase
Telgu :Agise,Bakapushpam
Tamil :Acham ,Peragatti
Bengali :Agasti
Guajarati :Agathio
Malayalam :Akatti
Nepali: Agasti

French: Fagotier
German: turibaum
Indonesian: tuwi,toroy
Italian: Sesbania
Spanish: picodeflamenco
Thai:Kae-ban
Vietnamese:sodua

BOTANICAL DESCRITION

***Flower*:** flower are fleshy with large snow white, pink creamsons petal. They are 7.5 to 10 cm long with short auxiliary reacemes.

Bark

The shape of bark is incurred exfoliating in irregular scale thick, hard externally yellowish grey in color, longitudinally fissured, internally light brown to reddish brown longitudinally fibrous & striated.

Leaflets

Leaflets of S.grandiflora are dorsiventral,upper and lower epidermis are single layered by thin cuticle.

Fruits

Looks like flat, long and thin green beans.

Pods

Pods are thin which can grow upto 45 cm long and contains about 28-30 seeds. Flowering and fruiting is almost throughout the year mostly during winter.

PHARMACOLOGICAL ACTIVITY

***Antioxidant activity*:** The acetone & ethanol extract of *Sesbania grandiflora* was evaluated for antioxidant activity by using DPPH assay, total Phenolic content, reducing power assay and inhibition of lipid oxidation in linoleic acid emulsion.

Antiulcer activity

The antiulcer activity of *Sesbania grandiflora* leaves ethanolic extract assesed by pylorus ligation, administration of aspirin, ethanol & indomethacin for induction of ulcers and histological studies. Ethanolic extract of leaves of S.G. at dose of 400 mg/kg shows significant reduction in ulcer index and reduced the basal gastric acid secretion.

Diuretic activity

Diuretic Activity of *Sesbania grandiflora* flowers had been evaluated by measuring urine volume sodium and potassium content and ph. Methanolic and aqueous extracts shows significantly increase in sodium volume and sodium content, potassium excretion was increased by aqueous extract.

Anti diabeticactivity

Antidiabetic activity was investigated by using methanolic extract of *Sesbania grandiflora* rat model T2DM. the fasting glucose level lipid peraoxidase (MDA)Superoxide dismutase(SOD). Estimation Of Catalyst (CADA),.glut four where evaluated and all were compare to that of known antidiabetic drug metformin(100mg /kg P.O.) methanolic extract reduced T2DM induced decrease in the level glut four in the liver.

Cytotoxic activity

Sesbania grandiflora bark was evaluated for cytotoxic potential using petroleum ether, chloroform, methanol & aqueous extract against brine shrimp lethality bioassay, allium cepa root model and MTT assay. In brime shrimp lethality bioassay methanolic bark extract was found most potent with LC_{50} values of 924.34.Methanolic bark extract of *Sesbania grandiflora* showed potent cytotoxic activity against human overy epithelial terato carcinoma cells.

Wound healing activity

Ethanol extract of flowers of *Sesbania grandiflora* was evaluated by using exicision and incision wound model in wistar rats. Ethanolic extract showed significant wound healing activity at (4%w/w) dose as compared to standard nitrofuraze (0.2% w/w).

Sesbania grandiflora in pharmaceutical

***Tablet binder* (**Shaikh M *et al.,* 2014) - Seeds of *Sesbania grandiflora* studied as mucilage in tablet formulation as binder.The granules were prepared by using 2,4,6,8,and 10% of mucilage using lactose as diluents,2% talc and magnesium stearate as glidant and lubricant respectively.The granules show excellent flow property.

Reducing agent

Sesbania grandiflora leaf extract were used to synthesise iron oxide and zinc oxide nanoparticles using zinc nitrate and ferrous chloride. FTIR was used to analyze the various functional groups present synthesized nanoparticles.

Table 1. Plant Description

Kingdom	Plantae
Subkingdom	Tracheobionta
Superdivision	Spermatophyta

Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Rosidae
Order	Fabales
Family	Leguminosae
Genus	Sesbania
Species	*Sesbania grandiflora*

Table 2. Phytochemical constituent

Leaves	Alkaloid, flavanoids, glycosides, tannins, steroids, proteins, carbohydrates Saponins, amino glycoside, vit. A,C &B complex, Glycoside, coumarines,
Flowers	Carbogydrate, proteins,& amino acid, glycosides, flavonoids, alkaloids, tannins &polyphenolc, saponins. Oleanolic acids, kamferol-3-rutinoside
Fruits & pods	Alkaloids, glycosides, saponins, tannis, flavonoides, carbohydrates, protein & sterols, saponins, sesbanimide.
Bark	Alkaloids, glycosides, saponins, tannis, flavonoides, phenols, gums.
seed	Leucocyanidin& cyaniding ((Lakshmi T 2011, Avalaskar AN *et al.*, 2011, Arun A *et al.*, 2014)**:**

Table 3. Pharmacological Activity

Sr.No.	Part Used	Extract	Activity
1.	Leaves	50% Ethanol, 70% Acetone	Free Radical Scavenging & Antioxidant. (Shyamala S and Vasantha K, 2010)
2.	Leaves	Ethanol, Acetone, Water	Anticancer. (Ponnanikajamideen M *et al.*, 2015)
3.	Leaves	Aqueous, Ethanol,Acetone	Antimicrobial. (Padmalochana K and Dhana R, 2014)
4.	Leaves	Ethanolic Extract	Anthelminitic (Sable *et al.*, 2013)
5.	Leaves	Ethanolic Extract	Antiulcer. (Bhalke*et al.*, 2010)
6.	Leaves	Aqueous Extract	Hypolipidemic Activity. (SaravanakumarA *et al.*, 2010)
7.	Leaves	Aqueous Extract	Anthelminitic. (Karumari *et al.*, 2014)
8.	Leaves, Stem	Ethanolic Extract,Aqueous Extract	Antibacterial. (Abubakar *et al.*, 2015)
9.	Leaves, Stem, Granular Pods, Roots	Methanolic Extract, Aqueous Extract	Antibacterial,Potential And Antioxidant. (Ouattara MB *et al.*, 2011)
10.	Leaves	Methanolic Extract,	Free Radical Scavenging Activity. (Singh *et al.*, 2012)
11.	Leaf protien	Precipitated with 65% ammonium sulphate	Antioxidant, antibacterial, cytoprotective. (Zarena *et al.*, 2014)
12.	Leaf	Ethanolic Extract	Antihypertensive activity.(Natrajan AC *et al.*, 2017)
13.	Leaves	Aqueous Extract	Antiurotithiatic,Antioxidant Activity. (Doddola *et al.*, 2008)
14.	Leaf	MethanolicExtract	Analgesic And CNS Depressant. (Kumar BS and Naheed F, 2012)
15.	Leaves,White Flowers	Aqueous Acetone Ethanol	Antioxidant Activity. (Perumal S *et al.*, 2014)
16.	Flowers	Ethanolic Extract	Wound Healing Activity. (Sheikh M *et al.*, 2011)
17.	Flowers	Ethanolic Extract Aqueous Extract	Hepatoprotective. (Kale *et al.*, 2012)
18.	Flowers	Methanolic Extract	Natural Indicator(Mahadik*et al.*, 2016)
19.	Flowers	Methanolic Extract	Antioxidant Activity (kumar*et al.*, 2012)
20.	Flowers	70% Alcoholic	Antidiabetic (Kumar *et al.*, 2015)
21.	Flowers	Methanolic Extract Aqueous Extract	Diuretic(Eswaraiah *et al.*, 2012)

22.	Flowers	Petroleum Ether Chloroform,Methanol, Aqueous Extract	Immune-Modulatory (Mallik and Nayak, 2014)
23.	Flower	Methanolic extract aqueous extract	Antisolar (Elumalai*et al.,* 2012)
24.	Fruit	Petroleum Ether Extract	Hepatoprotective (Ramakrishn S *et al.,* 2012)
25.	Fruit	Methanolic Extract	Anti Hyperglycemic(Mantha K *et al.,* 2014)
26.	Fruit	Petroleum Ether Extract	Hepatoprotective (Tathe*et al.,* 2010)
27.	Bark	Methanolic Extract, Aqueous Extract	Cytotoxic (Gupta B *et al.,* 2013)

Fig 1. Agathi Flowers

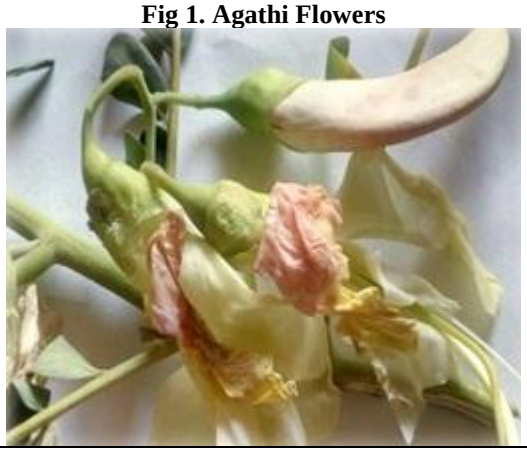

Fig 2. Agathi Leaves

Fig 3. Agathi Pods

Fig 4. Agathi Seeds

CONCLUSION

Form ancient time medicinal plants have been used in treatment of diseases. *Sesbania grandiflora* is one of the medicinal plants. The detail information as presented in this review on the phytochemical & pharmacological action & pharmaceutical aspect of different extracts might be helpful toprovide details evidence for use of this plant in different medicine.

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CONFLICT OF INTEREST

No interest

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