

Senna occidentalis (L.) Link.: a medicinal local weed of India

Asim Panda¹ and Sweta Mishra^{2*}

¹Department of Botany, Raidighi College. (Affiliated under University of Calcutta), Raidighi, South 24 Parganas, India;²Ambika Prasad Research Foundation, Odisha, India; *Email-Id: swetamishra.rdwu@gmail.com

ABSTRACT

Senna occidentalis has been used worldwide in the traditional treatment of many diseases. The plant is used for haematuria, rheumatism, typhoid, asthma, and disorders of hemoglobin. It also contains diverse bioactive compounds responsible for anti-inflammatory, anti-parasitic, anti-viral, and antioxidant activities. Keeping this in view, an attempt has been made to document the ethnomedicinal and pharmacological values of *S. occidentalis*. Photographs are provided for easy identification in the field.

Keywords: *Senna*, bioactive compounds, traditional therapeutics, pharmacology

INTRODUCTION

Senna occidentalis is an annual or perennial plant, native to South India that is used in several traditional medicines to cure various diseases and disorders. It is an herb that grows all over India in roadsides, waste places, and under open conditions (Yadav et al. 2010). This plant is called in different regional/vernacular languages like Hindi (Badi kasondi, Chakunda), Odia (Chakunda), English (Coffee senna), Sanskrit (Kasamarda), Urdu (Kasonji), Tamil (Nattamtakarari), Bengali (Kalkashunda), Gujarati (Kasodari), Kanada (Doddtagase), Malayalam (Natramtakara), and Telugu (Kasinda) (Manikandaselvi et al. 2016). *S. occidentalis* has been mentioned in various ayurvedic formulations. This plant is also widely consumed by tribal people as a leafy vegetable. This weed has been known to possess antibacterial, antifungal, antidiabetic, anti-inflammatory, anti-cancer, antimutagenic, and hepatoprotective

activity (Manikandaselvi et al. 2016). Medicinally, their roots, leaves, and seeds are used for fever, menstrual problems, tuberculosis, diuretics, anemia, liver complaints, and as a tonic for general weakness, illness, sore eyes, rheumatism, typhoid, asthma, disorders of hemoglobin, and leprosy. The seeds are brewed into a coffee-like beverage for asthma, malaria, fevers, and stomach complaints (Ujah et al., 2022).

DESCRIPTION

It is an erect, somewhat branched, smooth, semi-woody, herb or shrub, with a few lateral roots on midsection. This plant species varies from a semi-woody annual herb in warm temperate areas to a woody annual shrub or sometimes a short-lived perennial shrub in frost free areas. The stem of the plant is reddish purple. The young ones are 4-sided, becoming rounded with age. Leaves are alternate, even pinnately compound, each one with 4-6 pairs of nearly sessile, opposite leaflets, with a fetid smell when crushed, each leaflet ovate or oblong, lanceolate with a pointed tip and fine white hairs on the margin. The rachis has a large, ovoid, shining, dark purple gland at the base. Stipules often leaving an oblique scar. Inflorescence is a compound of axillary and terminal racemes. The flower is perfect with 5 yellowish green sepals with distinct red veins and 5 yellow petals. The fruit is a dry, dehiscent, transversely partitioned, faintly recurved, laterally compressed, sickle shaped legume(pod), with rounded tip and containing 25-50 seeds. Seeds are oval shaped, flattened, pale to dark brown,

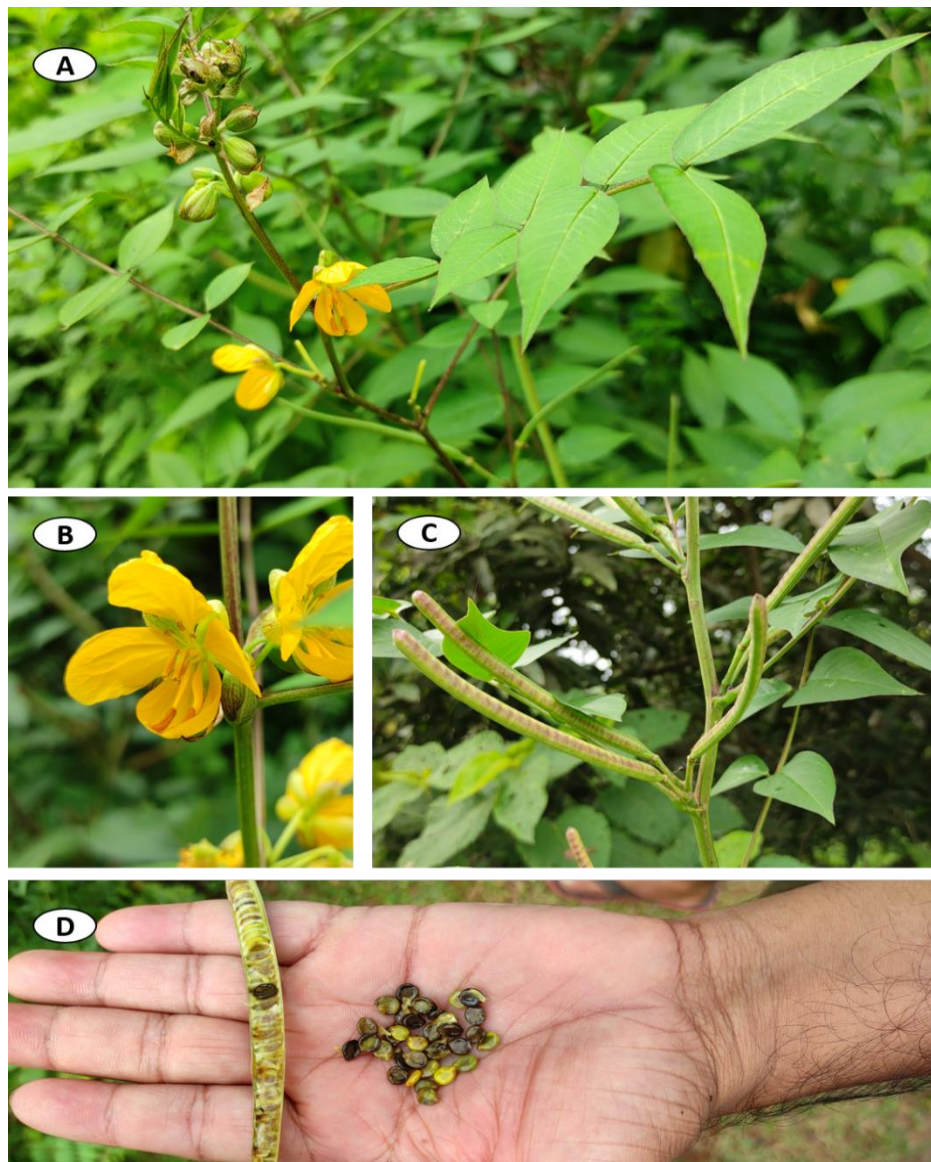


Plate 1: Vegetative parts of *S. occidentalis*: A) Leaves, B) Flower, C) Fruits, D) Seeds



Figure 1: Habit of *S. occidentalis*

slightly shiny, smoot hand with a round pointed tip (Saxena and Brahman 1994; Yadav et al. 2010) (Plate 1; Figure 1).

ETHNOMEDICINAL USES

Whole plant, roots, leaves, and seeds are the parts of the plant used in various ayurvedic formulations. A new indigenous metabolic corrective is made up of *S. occidentalis* for newborns and infants, called “Bonnisan,” which helps bring immediate relief from the discomfort caused by gastric wind. In India it was used for haematuria, rheumatism, typhoid, asthma, and disorders of haemoglobin (Yadav et al. 2010; Vijayalakshmi et al. 2013; Manikandaselvi et al. 2016; Issa et al. 2020) (Figure 2).

Whole plant: *S. occidentalis* plant extract (4-5 drops) is used in curing eye inflammations in Ayurveda. It is also used in Jamaican folk medicines for curing diarrhoea, dysentery, constipation, fever, cancer, eczema, and venereal diseases.

Root: The roots are considered as tonic, febrifuge, and diuretic; they are also used for menstrual problems, tuberculosis, anaemia, and liver complaints, and as a tonic for general weakness and illness. Roots are also used as veterinary medicines for animal diseases, and as antidote in case of poison. It is also used against gastric complaints, to increase lactation, in whooping cough etc. In Nigeria, boiled root is taken as tea for constipation and against white discharge in ladies.

Leaves: The leaves are used in gonorrhoea, fevers, urinary tract disorders, and edema. Leaf paste is externally applied on

healing wounds, sores, itch, and cutaneous diseases, bone fracture, fever, ringworm, skin diseases, throat infection and wounds. Twigs are used as tooth brushes. Burnt Leaves are mixed with coconut oil and applied on eye-lids for cooling sleep. Paste of leaves and calcium hydroxide applied to abscesses for quick opening and clearing of pus.

Fruits: Decoction of fruits and flowers are used in the treatment of mental disorders.

Seeds: Seeds are roasted brown, pulverized, using a small amount to make tea with brown sugar, used in Fujian as a tea substitute for the people with high blood pressure. Mature seeds are used on ring worms and as febrifuge. Roasted pods of this plant are eaten for cough problems in India.

BIOACTIVE COMPOUNDS

Phytochemical screening of *S. occidentalis* showed the presence of carbohydrates, saponins, sterols, flavonoids, resins, alkaloids, terpenes, anthraquinones, glycoside and balsam. Other compounds reported from *S. occidentalis* include achrosin, aloe-emodin, emodin, anthrones, apigenin, aurantiobtusin, campesterol, cassiollin, chryso-obtusin, chrysophanic acid, chrysarobin, chrysophanol, chrysoeriol, rhein, aloe-amine, Kaempferin, isorhein, 1,8-dihydroxyl-2-methyl anthraquinone, 1,4,5-trihydroxy-3-methyl-7-methoxy anthraquinone, cassiaoccidentalin A, B and C, achrosine, xanthorin, aurantiobtusin, campesterol, cassiollin, chrysoobtusin, chrysophanic acid, chrysarobin, chrysoeriol, funiculosin, galactopyranosyl, helminthosporin, islandicin,

kaempferol, lignoceric acid, linoleic acid, linolenic acid, sitosterols, mannitol, mannopyranosyl, matteucinol, obtusifolin, obtusin, oleic acid, physcion, apigenin, quercetin, rhamnosides, rhein and rubrofusarin. A large amount of alkaloids are present in the stem, leaves and fruits. seeds and roots are rich in free and bounded anthraquinones, but the quantities differ markedly, in general, the anthraquinone content is more in seeds and less in leaves (Vijayalakshmi et al. 2013; Al-Snafi 2015).

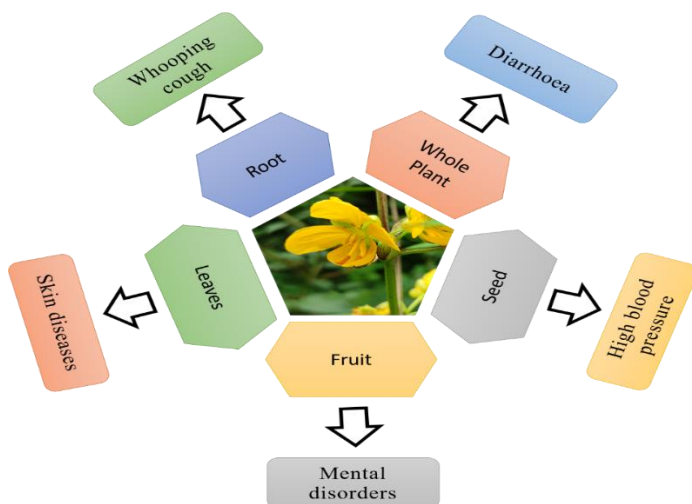


Figure 2: Medicinal uses of *S. occidentalis*

PHARMACOLOGICAL VALUES

S. occidentalis has been found to possess significant anti-bacterial, antifungal, anti-inflammatory, laxative, analgesic, chloretic and diuretic properties. The presence of flavonoids and resins are responsible for its anti-inflammatory properties.

Presence of Alkaloids are known for decreasing blood pressure, balancing the nervous system in case of mental illness and antimalarial properties. Tannins helps in wound healing and anti-parasitic. Presence of terpenes suggests possessing anti-tumour and anti-viral properties. Eudesmane sesquiterpenes have been also reported to contain antibacterial properties. Saponins are believed to have antioxidant, anti-cancer, anti-inflammatory, and anti-viral properties (Figure 3).

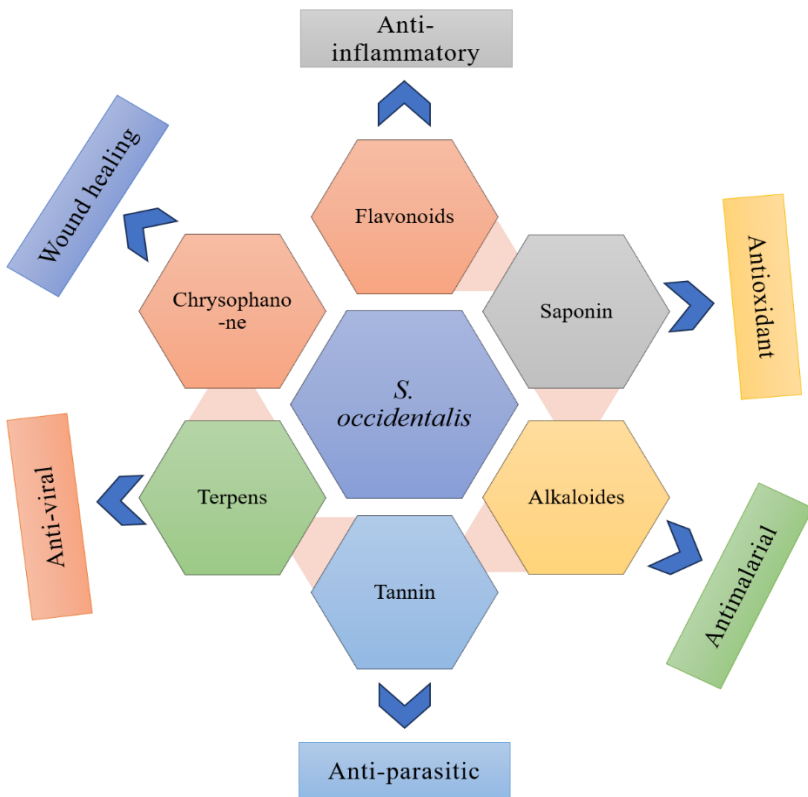


Figure 3: Pharmacological activities of *S. occidentalis*

The anthraquinones, emodin and chrysophanone have been reported to possess wound healing properties (Vijayalakshmi et al. 2013; Manikandaselvi et al. 2016; Issa et al. 2020) (Figure 2).

CONCLUSION

There are many reports supported the potential use of *S. occidentalis* as medicinal ingredient because of its wide pharmacological effects. It is also reported that raw seeds might have some toxicological side effects. The scientific research on *S. occidentalis* suggests a huge nutraceutical potential of this plant. This review is on the medicinal, pharmacological, and various biological properties of this plant. After proper processing, identification, and removal of the harmful properties of seeds, they may be utilized to prepare a good, nourishing and Ayurvedic coffee. *S. occidentalis* could be further exploited in the future as a source of useful phytochemicals and nutritional compounds for the nutraceutical and pharmaceutical industries.

REFERENCES

- Al-Snafi A.E. (2015). The therapeutic importance of *Cassia occidentalis*- an overview. Indian Journal of Pharmaceutical Science & Research. 5(3):158–171.
- Issa T.O., Mohamed Ahmed A.I., Mohamed Y.S., Yagi S., Makhawi A.M. and Khider T.O. (2020). Physiochemical, Insecticidal, and Antidiabetic Activities of *Senna occidentalis* Linn Root. Biochemistry Research International. 15; 2020: 8810744. doi: 10.1155/2020/8810744.
- Manikandaselvi S., Vadivel V. and Brindha P. (2016). Review on nutraceutical potential of *Cassia occidentalis* L. – an Indian

- traditional medicinal and food plant. International Journal of Pharmaceutical Sciences Review and Research. 37(2):141-146.
- Saxena H.O. and Bramham M. (1994). The Flora of Orissa, Orissa Forest Development Corporation Ltd & Regional Research laboratory, Bhubaneswar, Odisha.
- Ujah I.I., Onyishi C.K. and Onovo O.E. (2022). Phytochemical and vitamin constituents of *Senna occidentalis* Linn (Uzaki Mma). GSC Advanced Research and Reviews. 11(1): 11–20.
- Vijayalakshmi S., Ranjitha J., Rajeswari V.D. and Bhagiyalakshmi M. (2013). “Pharmacological profile of *Cassia occidentalis* L–A review,” International Journal of Pharmacy and Pharmaceutical Sciences. 5(3): 29-33.
- Yadav J.P., Arya V., Yadav S., Panghal M., Kumar S. and Dhankhar S. (2010). *Cassia occidentalis* L.: a review on its ethnobotany, phytochemical and pharmacological profile. Fitoterapia. 81(4):223-230.