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Senna – A Medical Miracle Plant

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Senna is a small, perennial, branched under-shrub. It is cultivated traditionally over 10,000ha in semi-arid lands. Since its leaves and pods are common laxatives, they are widely used in medicine and as a household remedy for constipation all over the world. India is the main producer and exporter of senna leaves, pods and sennosides concentrate to world market. Basically, the senna leaves that are used for medication are dried leaflets belonging to species of Cassia. For ages, senna has been used as a potent cathartic or purgative. Several scientists and researchers are of the view that the senna possesses this property owing to the apparent presence of elements and compounds such as dianthrone glycosides (1.5 to 2 per cent), main sennosides A and B along with minor quantities of sennosides C and D and other intimately associated amalgams. Besides being a laxative, senna is used as a febrifuge, in splenic enlargements, anaemia, typhoid, cholera, biliousness, jaundice, gout, rheumatism, tumours, foul breath and bronchitis, and probably in leprosy. It is employed in the treatment of amoebic dysentery as an anthelmintic and as a mild liver stimulant. Leaves are astringent, bitter, sweet, acrid, thermogenic, cathartic, depurative, liver tonic, anthelmintic, cholagogue, expectorant, ferbifuge. Usefull in constipation, abdominal disorders, leprosy, skin disorders, leucoderma, splenomegaly, hepatomegaly, dyspepsia, cough, and bronchitis.

Keyword: Senna, Laxative, Sennosides, Thyphoid, Constipation, glycosides.

1. Introduction

The senna plant is a small shrub belonging to the Caesalpiniaceae family. Incidentally, the senna belongs to two genus of Cassia- *C. senna* also known as Alexandrina senna, and *C. angustifolia* that is also called the Tinnevely senna. While the first variety of senna is found along the Nile River in Egypt and Sudan, the second type is widely cultivated in southern and eastern parts of India. It is cultivated traditionally over 10,000 ha in semi-arid lands in coastal districts of Tirunelveli, Ramnathapuram and Madurai in Tamil Nadu. Although, successful cultivation has been demonstrated in many parts in western

India, its commercial cultivation has recently come up in Kutch (Gujarat) and Jodhpur division of Rajasthan. It can grow over sand-dunes after rainy season and can be maintained as a perennial crop for 2–3 years. *C. senna* is imported from Egypt and sold in the market as Alexandrian senna. Basically, the senna is a small shrub that is native to North Africa and grows in abundance all over the region. The shrub normally grows up to a height of three feet and has light green stalks. The plant bears grayish-green colored leaves that are very delicate. In addition, the herb bears oblong shaped pods or fruit cases. The leaves as

well as the pods of the plant have therapeutic use.

1.1 Botany

As an annual crop, it remains in field for 110–130 days. The plant bears compound leaves, made up of 5–8 pairs of shortly stalked oval-lanceolate leaflets (2.5cm × 1.5cm) and produce successive flush of flowering shoots both in axillary and sub-terminal position 60–70 days after sowing. The flowers are large and brilliant yellow in colour, producing medium-sized pods (3.5cm–6.5cm × 1.5cm) after 90 days. They contain 5–8 yellowish, flat seeds. It is predominantly self-pollinated crop but outcrossing could be high (20%) through beetles.

1.2 Climate and Soil

Its plants grow up to 1m tall over marginal lands in subtropical climate in peninsula India. It sheds leaves with the onset of cold weather in north-western India. The crop thrives over well-drained, sandy loam lateritic soils of 7–8.5 pH, though fertile fields and irrigated crop support better growth and produce higher yields. It needs an around warm and dry weather. Even temporary stagnation of water in fields can cause loss to the crop.

1.3 Land Preparation and Sowing

The land is ploughed, harrowed and exposed to hot sun for 10–15 days, before dividing into small fields for maintaining drainage. It is given 20:40:20kg/ha of N, P and K basally, mixed with 25 kg of Aldrin (5%) or BHC (5%) to ward off cut-worms and termites. If soil is rich in K, then K₂O is skipped out. Seed rate is 6 kg/ha for line-sown crop, placed 1cm deep at 30cm × 30cm or 45cm × 30cm spacing in rain-soaked fields. The seeds are collected at dough mature stage, soaked in water for 12hr, treated with 2.5 g/kg Captan or Thiram

before sowing either wet or air-dried for 2–3hr to ensure high germination (90%). The sown crop is given light irrigation if it does not rain for next 7 days. The crop is weeded, hoed and thinned 30 days after sowing to maintain 70,000–75,000 plants/ha.

1.4 Season

A composite culture called, Trinnevelly Senna, is grown all over south India. The main crop is largely rainfed, sown with monsoon rains (July in north-western India and September–October in south India), whereas February sown senna is restricted to Tamil Nadu where it is sown with spring rains as an irrigated crop.

1.5 Manures and Fertilizers

Trials on use of inorganic fertilizers at several locations in India revealed that the crop takes away, 40kg N and 25-50kg P₂O₅/ha applied as basal dressing and 40kg N/ha applied in 2 split doses. Application of 5-10t of FYM/ha as top dressing gave better yield.

1.6 Irrigation and Interculture

The crop is given one weeding-cum-hoeing after 50 and 70 days respectively and garden soils are given 5 light irrigations during dry weather. In Tamil Nadu, senna is grown after harvesting paddy and intercropping companion sesamum, cotton and vegetables. In north-western India, senna–mustard and senna–coriander rotation gives higher returns.

1.7 Harvest and yield

Three pickings of leaves and pods are usually taken 50, 90 and 130 days after sowing. Usually, flowering shoots are chopped off initially to increase branching and to allow its plants to put up more vegetative growth. Mature leaves and 15–25 days old pods are harvested. On an average,

1.2–1.5 tonnes/ha of dry leaves and 3.5–4q pods/ha are obtained.

1.8 Post Harvest Technology

The dry foliage and pods should possess a minimum of 2.5 and 3.0% total sennosides respectively. The harvested produce should be spread in thin layer in open sun for 6–10hr. It is further dried in well-ventilated drying sheds for 3–5 days. It should have not more than 8.0% moisture at storage. The colour of dry leaves and pods should be ensured to remain light green to yellow. The sennosides are soluble in water and exposure of the produce to rain water during drying can reduce these contents. The produce is liable to storage loss up to 30% in content. Therefore, it is recommended to store in cool, dry place after reducing the bulk under hydraulic press and wrapped in gunny bags lined with polythene, particularly for distant transportation. Grading of the produce is common for marketing. The extra large, bold, yellowing-green leaves and pods are placed in first grade and sell at a premium.

1.9 Medicinal and Health Benefits

- ✓ Purgative, anthelmintic, antipyretic, cathartic, laxative, vermifuge, diuretic, Detoxifying, Colon Cleansing, Body Detoxing.
- ✓ Senna is a powerful cathartic used in the treatment of constipation, working through a stimulation of intestinal peristalsis.
- ✓ Aid the body in cleaning waste.
- ✓ Promote the excretions of toxins which are thought to contribute to fatigue and general ill-health.
- ✓ The anthraquinones of this herb can inhibit a variety of bacteria (staphylococci and Bacillus Coli) and dermatomyces (Microsporum audouini, etc.).

- ✓ Alleviate constipation by increasing the amount of water and electrolytes (substances in the blood such as sodium and potassium that help to regulate fluid balance in the body) in the intestine.
- ✓ Senna leaf is a strong purgative that is commonly used for constipation.
- ✓ It may also be used to detoxify the body, expel worms or act as a diuretic.
- ✓ Senna Leaf is blended with other herbs to make a laxative beverage.
- ✓ We supply the best quality of Senna Leaf extract in China, which is good in shape and free of chemicals.

1.10 Pharmacology of Cassia Senna:

Senna leaves and pods have been shown to have laxative activity. It is useful in habitual constipation. Pharmacological investigations show that sennosides A and B account for the entire activity of the senna leaves and pods. Leaves contain glycosides, sennoside A, B, C and D. Two naphthalene glycosides have been isolated from leaves and pods. The medicinal action of Senna can be attributed mainly to the anthraquinone glycosides, especially sennoside A and B. It appears that the aglycone portion is responsible for its action. The breakdown of the anthraquinone glycosides in the digestive tract can occur in one of two ways. The bowel flora can directly hydrolyze them in a similar way to that of free active aglycone. Alternatively, in the presence of bile and the sugar moiety, the free aglycone can be absorbed into the blood stream and secreted later into the colon. The final result is stimulation of the Auerbach plexus resulting in increased intestinal muscle contraction. In addition, its mucilage content decreases bodily absorption of fluid leading to an enhancement of the final laxative action.

1.11 Constipation

Taking senna orally is effective for short-term treatment of constipation. Senna is an FDA-approved nonprescription drug for adults and children ages 2 years and older. However, in children ages 3-15 years, mineral oil and a medication called lactulose might be more effective. In elderly people, senna plus psyllium is more effective than lactulose for treating ongoing constipation.

1.12 Bowel preparation before colonoscopy

Taking senna by mouth might be effective for bowel cleansing before colonoscopy; however, sodium phosphate or polyethylene glycol are more effective.

1.13 Pregnancy and Breast-Feeding:

Senna is **Possibly Safe** during pregnancy and breast-feeding when used short-term. It is **Possibly Unsafe** when used long-term or in high doses. Long-term, frequent use, or use of high doses has been linked to serious side effects including laxative dependence and liver damage. Although small amounts of senna cross into breast milk, it doesn't seem to be a problem for nursing babies. As long as the mother uses senna in recommended amounts, senna does not cause changes in the frequency or consistency of babies' stools.

1.14 Interactions with Medications:

1.14.1 Digoxin (Lanoxin)

Senna is a type of laxative called a stimulant laxative. Stimulant laxatives can decrease potassium levels in the body. Low potassium levels can increase the risk of side effects of digoxin (Lanoxin).

1.14.2 Warfarin (Coumadin)

Senna can work as a laxative. In some people, senna can cause diarrhea. Diarrhea can increase the effects of warfarin and increase the risk of bleeding. If you take

warfarin, do not take excessive amounts of senna.

1.14.3 Water Pills (Diuretic Drugs)

Senna is a laxative. Some laxatives can decrease potassium in the body. "Water pills" can also decrease potassium in the body. Taking senna along with "water pills" might decrease potassium in the body too much. Some "water pills" that can decrease potassium include chlorothiazide (Diuril), chlorthalidone (Thalitone), furosemide (Lasix), hydrochlorothiazide (HCTZ, Hydrodiuril, Microzide), and others.

1.14.4 Laxative

Children over the age of two years and adults can orally take senna to treat constipation, but only on a short-term basis, which is about two weeks. If you take it any longer than that, you could cause your bowels to become dependent on it, and they might stop functioning properly. Overuse of senna can also cause an electrolyte imbalance that could worsen heart disease. Another use for senna is to cleanse the bowels before a colonoscopy.

1.14.5 Losing Weight

To lose weight using senna typically means taking the product for longer than the recommended two weeks and possibly taking more than the recommended dosage of 17.2 milligrams daily. Overuse of this herb is considered senna abuse and can cause serious problems. Drugs.com reported a case of an anorexia nervosa patient who took up to 100 tablets of senna daily. When you take more than the dosage recommended on the package, you run the risk, as this patient did, of developing nephrocalcinosis, or too much calcium in the kidneys; finger clubbing, a deformity of the fingers; and osteoarthritis, a bone and joint disease.

1.14.6 Pregnancy

Constipation is a common problem that affects about half of all pregnant women at some point. Although senna is FDA-approved, it is approved as an herbal supplement, which falls under a different criterion than a medicine. Herbs, including senna, can come in different formulations and strengths, making them unsafe to take during pregnancy, according to the American Pregnancy Association. Senna has not been associated with abnormalities or birth defects, according to Drugs.com. However, not enough information is available to confidently deem senna safe for pregnant women, so it is best to avoid it while pregnant and breastfeeding.

1.14.7 Hemorrhoids

The herb of senna is quite popular as chief ingredient in many teas and colon cleansing products prescribed to heal hemorrhoids. Senna contains special components known as sennosides that act on the lining of the bowel causing a laxative effect. Constipation or hard stools is one of the triggering factors for causing and worsening hemorrhoids. Other folk medicine uses are for skin diseases, gonorrhoea, fever and upset stomach

1.15 Dyspeptic Syndrome

Senna contains natural enzymes that help in regulating the bowel movements and also restoring the gastric juice secretion in stomach. It is therefore, the herb is found effective in treating dyspeptic syndrome. Senna supplements, if used in proper dosage for certain period, have shown potential role in reducing the irritability in intestines by improving overall digestion.

1.16 Gastrointestinal Conditions

Senna possesses natural anti-inflammatory properties due to its compound called resveratrol and hence is used in various

gastrointestinal conditions where inflammation is one of the symptoms. Furthermore, component found in senna called barakol is used for counteracting aconitine poisoning in the gastrointestinal tract.

Senna, in some cases, has been used to empty the stomach and intestines so as to relieve from acidity and constipation. The herb specifically acts on lower bowel alleviating the symptoms of constipation. In addition, various products containing senna as their main ingredient have been prescribed to get rid of abdominal cramps, pains, sprains and discomfort.

1.17 Obesity, as Dietary Supplement

In most of the dieter's tea, the herb of senna is found as primary ingredient. Due to the combination of acting as laxative and stimulant, regular intake of senna tea is found to reduce the appetite without disturbing other body systems. It is also revealed that its quick gastric and intestinal emptying property augments overall therapy of weight loss as food moves through the systems quite earlier than many calories get absorbed. However, this may lead to even dangerous weight loss and hence, before taking senna supplement it is important to fix the dosage and period.

1.18 Usual Dosage

The herb or its extracts may be taken in several forms - capsules, tablets, and decoction as well as tea. A number of people take capsules and tablets prepared from the senna extract to alleviate constipation. Normally, capsules and tablets containing 10 mg to 60 mg of sennosides are taken daily for a period of 10 days. However, it is not advisable to continue using the medication for more than 10 days. In case there is no relief from constipation even after taking the medication for 10 days, one should consult a physician for necessary actions. In addition

to this, consuming a mint tea prepared with the herb is effective for curing cramps. While the dose for the adults is 10 mg to 60 mg of senna daily for 10 days, children above the age of six years may be administered half the adult dose. However, the herb should never be given to children below the age of six as it may prove to be detrimental. It is best to take senna after consulting a physician.

1.19 Side Effects

- Senna can cause mild abdominal discomfort including colic cramps. Prolonged or over use of senna product can lead to severe diarrhea

that, in turn, results in loss of electrolytes causing weakness, giddiness and lethargy.

- If left untreated, loss of electrolytes especially potassium may result in cardiac problem and muscular weakness. In certain cases, the use of senna has caused atonic non-functioning intestines.
- Excessive use or abuse of Senna has been reported to develop reduced serum globulin concentration and in worse cases, development of cachexia and clubbing of the fingers.



Fig 1: Senna Leaves

2. Conclusion

India has rich dietary resources and a combination of different foodstuffs can provide adequate quantity of nutrients and medicinal values in sustainable manner. In this context, less familiar crops like Senna have a vital role to play as their economic value is beyond dispute. These crops generally are rich source of sennosides, glycosides and other nutrients and can provide a solution to the problem of

malnutrition and other diseases to a great extent. It is considered one of the world's most useful crop as almost every part of the senna can be used

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