

Lesson no. 25 Senna.



1-Morphology	
Color:	Green.
Insertion:	Cauline.
Phyllotaxis:	Alternate.
Leaf base:	
Stipules :	Stipulate.
Leaf petiole:	Petiolate.
Lamina:	
▪ Composition:	▪ Compound paripinnate.
▪ Shape:	▪ Lanceolate – ovate.
▪ Apex:	▪ Mucronate.
▪ Margin:	▪ Entire.
▪ Base:	▪ Asymmetric.
▪ Venation:	▪ Pinnate reticulate.
▪ Surface:	▪ Pubescent (hairy).
▪ Texture:	▪ Papery.

Senna is a very famous & useful herb all around the world; very famous in Unani & Ayurvedic medical science for its health benefits & been used as folk medicine since long; it is famous for its stimulant laxative action relieving constipation & much more; its whole plant is full of medicinal properties & are used in different forms; also it is mentioned in books of Hadith as Prophet Muhammad (s.a.w) mentioned it to be used for constipation & Prophet Muhammad (s.a.w) said about senna that if there would be any cure for death it would be senna, this guides us that if it a super herb & it is also mentioned to be used with sanoot (may be dill seeds) for detail Islamic study read my English book Tibb e Nabawi page 137 onwards lesson no. 48 in part 2; or visit my website www.tibb-e-nabi-for-you.com or direct link to my website lesson on Senna at <http://www.tibb-e-nabi-for-you.com/senna.html> it belongs to Fabaceae family.

• NAMES: -

1. In Hadees it is called as Sanna (senna) (السنا)
2. In Latin it is called as Cassia angustifolia.
3. In Hindi it is called as Sanaya & in Hindi sana.
4. In Sanskrit it is called as svarnapatri.
5. In English it is called as Senna.
6. It belongs to Fabaceae family.

It is mentioned in following books of Hadith (names of book of Hadith & reference are also given): -

Tirmizi & Ibn Majah also Kanzul-ummal : 28269.

Sanoot mentioned in Hadith to use with senna may be: -

There are various opinions on what is Sanoot & there is difference in understanding. It may be anyone amongst the following or combination of any following: 1. Dill (sowa) 2. Honey 3. Ghee 4. Dates 5. Saunf 6. Kirmani-jeera 7. Dates & honey both mixed in ghee. 8. Senna mixed in honey than mixed in ghee. 9. Sabt (sowa seeds) 10. Rai 11. A black substance found on upper layer of stored ghee.

Among the above 11 points Dill is believed to be the Sanoot. Dill is sowa. In Hindi it called as soa or sowa or savaa & Anethum graveolens in Latin. In Marathi it is called as Shepu. In Sanskrit it is called as Shatapusha.

Basic encyclopedia of senna: -

• Senna tree: -



Senna plants are of many types; there are mainly two types of senna (*Cassia senna* and *Cassia angustifolia*); cassia senna is cultivated in Northern Africa mainly; the leaves of the plant were usually exported from Alexandria on the Nile delta to other places all over the world; the leaves and fruits from both *Cassia senna* and *Cassia angustifolia* are used and are grown in various tropical and subtropical regions. Dried senna leaves and fruits are drunk in tea or consumed in products containing a standard-regulated senna extract that can help relieve constipation. But main is *Cassia angustifolia*.

Senna alexandrina (Alexandrian senna, in Arabic عشرق or سنمكي and see below) also known as Indian senna or *Cassia agustifolia* is an ornamental plant in the genus *Senna*. It is a small shrub of 1.5 meters in height; it is used in herbalism. It grows natively in Egypt especially in the Nubian region, and near Khartoum (Sudan), where it is cultivated commercially. It is also grown elsewhere, notably in India and Somalia. Alexandrian Senna is a shrubby plant that reaches 0.5–1, rarely two, meters in height with a branched, pale-green erect stem and long spreading branches bearing four or five pairs of leaves. When cultivated, the plants are cut down semi-annually, dried in the sun, stripped and packed in palm-leaf bags.

Senna crop is taken after rice crop on the same land same season; in India it is cultivated mainly in Tinnevely (Ramnathapuram district in South India); it needs red loamy or coarse gravelly soil or alluvial loamy soil to grow.

- **Senna leaves: -**



These leaves form complex, feathery, mutual pairs. The leaflets vary from 4 to 6 pairs, fully edged, with a sharp top. The midribs are equally divided at the base of the leaflets. It leaves are compound, paripinnate, each left has 3-5-7 pair of leaflets; leaves lanceole shaped, entire, apex is acute with spine at the top; base of leaflet is asymmetrical with transverse lines (more prominent on lower surface), trichomes are present on both surfaces.

- **Senna flower: -**



The flowers are in raceme interior blossoms, big in size, coloured yellow that tends to brown.

- **Senna pods: -**



Pod are flat, thin, broadly oblong; apex is round with slightly projecting point formed by base of the style; pods contain seeds in it, seeds are 6 in number; shape is obovate with bluntly pointed projection at hilum end; pods do not contain mucilage & have less gripping action on colon; its legume fruit are horned, broadly oblong, compressed and flat and contain seeds in it.

- **Adulteration: -**

It done by using Dog senna (*C. obovate*), Palthe senna (*C. auriculata*) & wild varieties of senna are used as adulteration. Dog senna leaves are obovate in shape, tapering apex, they contain only 1% of anthraquinone glycosides (sennosides).

Palthe senna leaflets show long hair & when the leaves are boiled with chloral hydrate solution it shows crimson colour; in it anthraquinone glycosides (sennosides) are absent.

Wild varieties leaflets are brownish greenish in colour; leaves are more elongated & narrow shaped.

- **pH, calories & glycemic index & load** of senna is not known & does not matter much because we use senna in medicinal doses only & not in large doses.

- **Gross health benefits of: -**

A good natural herb for constipation, irritable bowel syndrome, piles to easy stool passing, it is antiviral, anti microbial, good for weight loss, good for hair & skin complexion when its water applied on hair or on skin.

- **Clinical pharmacology of senna: -**

The anthraquinone glycosides (sennosides) of senna are absorbed first in intestinal tract & after this the aglycone part is separated (aglycones are rhein dianthrone-sennidin A and B) & excreted in colon, this irritates & stimulates the colon-to which peristalsis movement is increased resulting in reduced of water absorption in colon leading to soft & bulky faeces (stools). The gripping effect is due to resin or emodin present in senna.

Senna leaves and pods show laxative activity. Leaves contain glycosides, sennoside A, B, C and D. Two naphthalene glycosides have been isolated from leaves and pods Anthraquinone gives the medicinal action of Senna by separating aglycone portion in colon & it is responsible for its action.

The extracts of *Cassia angustifolia* showed anti-microbial activity. Different extracts (ethanol, methanol, and aqueous solutions) of *Cassia angustifolia* plant are extracting out. Antimicrobial efficacy of various extracts was assessed by disc diffusion method against Gram positive bacteria *Staphylococcus aureus*, Gram negative

Escherichia coli. The methanol extract shows more inhibition than ethanol and water extracts. Staphylococcus aureus shows more inhibition zone than Escherichia coli.

Senna is an anthranoid type stimulating laxative. The laxative effect is due to the action of sennosides and their active metabolite, rhein-anthrone, in the colon. There are two different mechanism of action:

1. An influence on the motility of the large intestine: The laxative effect is realized by the inhibition of water and electrolyte absorption from the large intestine, which increases the volume and pressure of the intestinal contents. This will stimulate colon motility resulting in propulsive contractions.

2. An influence on secretion processes: Stimulation of active chloride secretion increases water and electrolyte content of the intestine. These changes in active electrolyte transport are dependent on calcium in serosal surface. The laxative action of Senna is partially via stimulation of colonic fluid and electrolyte secretion, and this secretion is mediated by stimulation of endogenous prostaglandin E2 formation. They also change colonic absorption and secretion to cause fluid accumulation. Enhanced permeability is the result of disruption of the tight junctions between the colonic epithelial cells. Sennoside A, one of the sennosides present in the laxative medication, has recently proven effective in inhibiting the ribonuclease H (RNase H) activity of human immunodeficiency virus (HIV) reverse transcriptase

- **Modern uses of it: -**

- **For constipation: -**

Take 1 teaspoon of pure senna powder (leaves, pod etc mix) mix it with 1 spoon honey & lick the paste than drink 1 cup water on it at night before sleep; clean the mouth properly before sleeping. Use it till complete relief.

- **For clean boil or for complexion: -**

Take 1 teaspoon of pure senna powder (leaves, pod etc mix) mix in 1 teaspoon of extra virgin olive oil add little smashed watermelon mix all three & apply the paste on face or affected part of the skin at night & wash it in morning apply in daily for 7 days followed by alternative 7 days followed by once a week.

- **For detox: -**

Take little senna powder or leaves & prepare tea by adding little water & boiling & drink it once a day every day for 3 days followed by once a week lifelong.

Pregnant women should not use senna.

It is available in tablets form & can be taken as per recommended dose.

- **Active ingredient of it: -**

Sennosides A & B which is among glycosides anthraquinone, aloe emodin and rhein, a pair of stereo isomers, whose aglycones are rhein dianthrone (sennidin A and B).

- **Contents/constituents of senna:-**

Sennosides A, B 3-3.6%, mainly & little C & D; it contains about 625 types of sennosides; aloe-emodin, resin, rhein, rhein dianthrone, carboxylic acid, kaempferol, isorhamnetin, mucilage, myricyl alcohol, salicylic acid, chrysophanic acid, calcium oxalate, naphthalene glycoside like tinnevellin & hydroxymusizin etc.

- **Each content explained separately: -**

- **Sennoside: -**

It is known as sennoside or senna; it is amongst anthraquinone glycosides (sennosides) present in senna; it is a medication used to treat constipation and empty the large intestine before surgery. The medication is taken by mouth or via the rectum (enema). It typically begins working in minutes when given by rectum (enema) and within twelve hours when given by mouth. It is a weaker stimulant laxative than bisacodyl or castor oil. Common side effects of senna glycoside include abdominal cramps. It is not recommended for long-term use, as it may result in poor bowel function or electrolyte problems. While no harm has been found to result from use while breast-feeding, such use is not typically recommended.

It is not typically recommended in children. Senna may change urine to a somewhat reddish color. Senna derivatives are a type of stimulant laxative and are of the anthraquinone type. While its mechanism of action is not entirely clear, senna is thought to act by increasing fluid secretion within and contraction of the large intestine. Sennosides are absorbed first in intestinal tract & after this the aglycone part is separated & excreted in colon and this irritates & stimulates the colon-to which peristalsis movement is increased resulting in reduced of water absorption in colon leading to soft & bulky faeces (stools). The gripping effect is due to resin or emodin present in senna. Sennoside A, one of the sennosides present in the laxative medication, has recently proven effective in inhibiting the ribonuclease H (RNase H) activity of human immunodeficiency virus (HIV) reverse transcriptase. Sennosides A and B remains unaltered in both the stomach and gut, but is cleaved off in the caecum by the activity of microorganisms, which convert them to dianthrone. The dianthrone that remain in the gut are cleaved again to form an anthrone & after this the aglycone part is separated & excreted in colon, this irritates & stimulates the colon-to which peristalsis movement is increased resulting in reduced of water absorption in colon leading to soft & bulky faeces (stools). Sennosides C and D present in senna are the glycosides of hetero-dianthrone involving rhein and aloe-emodin.

- **Anthraquinones: -**

Anthraquinones are active components of many plant blends which are used as medicines and exhibit laxative, diuretic, estrogenic, and immune-modulatory effects. Anthraquinones are the largest class of naturally occurring quinones and contain some of the most important natural colorants such as alizarin, purpurin, munjistin, emodin, chrysophanol, aloe-emodin, physcion, rhein, etc. They exist in the form of hydroxyanthraquinones and usually have 1–3 hydroxyl groups.

- **Aloe emodin: -**

Aloe emodin (1,8-dihydroxy-3-(hydroxymethyl anthraquinone) is an anthraquinone and a variety of emodin present in aloe latex& senna. It has a strong stimulant-laxative action. Aloe emodin is an anthraquinone compound found in *Aloe vera*, senna & other species of the Asphodelaceae and the Polygonaceae families, which has recently attracted much attention as a prospective anti-neoplastic agent (anti-cancer).

- **Kaempferol: -**

It is a natural flavonol (a type of flavonoid) it is tetra-hydroxy-flavone.

Main sources of kaempferol: -

Fenugreek seeds, green tea, grapes, tomato, broccoli, spinach, raspberries, peaches, green beans, onion, potato etc.

Basic pharmacokinetics of kaempferol (based on human intake in natural food products): -

It is ingested as a glycoside, absorbed in small intestines usually by passive diffusion; it is metabolized in various parts of the body. In small intestine it is metabolized to glucuronide & sulfo-conjugate by intestinal enzymes & it is also metabolized by colon micro-flora (bacteria) which can hydrolyze the glycosides to aglycones or form simple phenolic compounds. It is mainly metabolized in liver to glucurono-conjugated & sulfo-conjugated form. It is mainly excreted in urine.

Basic clinical pharmacology of kaempferol: -

It is anti oxidant, anti inflammatory, anti microbial, anti cancer, cardio protective, neuro microbial, anti diabetes, estrogenic, analgesic, anxiolytic, anti allergic, anti viral etc.

- **Salicylic acid: -**

Salicylic acid is a phenolic phyto-hormone and is found in plants with roles in plant growth and development, photosynthesis, transpiration, ion uptake and transport. It is involved in the systemic acquired resistance in which a pathogenic attack on one part of the plant induces resistance in other parts. It is when applied on skin is keratolytic (peeling agent). Salicylic acid causes shedding of the outer

layer of skin. Salicylic acid topical (for the skin) is used in the treatment of acne, dandruff, seborrhea, or psoriasis, and to remove corns, calluses, and warts. This makes senna helpful for skin disorders.

- **Rhein: -**

Rhein, also known as cassic acid, it comes in the anthraquinone group obtained from rhubarb or senna; rhein is a cathartic; it is commonly found as a glycoside such as rhein-8-glucoside or glucorhein; it was first isolated in 1895; Rhein has been reevaluated as an antibacterial agent against *Staphylococcus aureus* in 2008. Synergy or partial synergy has been demonstrated between rhein and the antibiotics oxacillin and ampicillin.

Rhein has been shown to inhibit the fat mass and obesity-associated protein, an enzyme responsible for removing the methylation from N⁶-methyladenosine in nucleic acids. This makes senna helpful in obesity. The pharmacokinetics of rhein have not been intensively studied in humans, but at least one study in healthy male volunteers found that rhein was better absorbed from oral administration of rhubarb than from a retention enema. Rhein (at an oral dose of 50 mg twice per day) was shown to be safe when administered for five days to elderly patients with chronic congestive heart failure. It is antioxidant, anti-tumour, anti-viral & is under research.

- **Carboxylic acid: -**

Carboxylic acid is an organic compound that contains a carboxyl group (C(=O)OH). The general formula of a carboxylic acid is R-COOH, with R referring to the alkyl group. Carboxylic acids occur widely. Important examples include the amino acids and acetic acid. It is present in many vegetables & eatables naturally; it is antimicrobial & has lot of other benefits.

- **Mucilage: -**

Mucilage is a thick, gelatinous substance, gluey substance produced by nearly all plants; mucilages are polysaccharides constituted by large molecules of sugars and uronic acids linked by glycosidic bonds; it is edible; used in medicine as it relieves irritation of mucous membranes by forming a protective film. It is known to act as a soluble, or viscous, dietary fiber that thickens the fecal mass. It is present in senna, aloe vera, fenugreek, liquorice, flex seeds etc.

- **Isorhamnetin: -**

Isorhamnetin is the methylated metabolite of quercetin. Quercetin is an important dietary flavonoid with in vitro antioxidant activity. However, it is found in human plasma as conjugates with glucuronic acid; it is the principal yellow colouring matter is present in the dried fruits and flowering stem of Asparg, *Delphinium zalil* Aitch. and Hemsl., and in red clovner, *Trifolium pratense* L., in the leaves of Senna; it is soluble in hot water. Isorhamnetin help to improve hearthealth. They improve the endothelial function through their antioxidant action and reduce the oxidation of HDL, resulting in a decreased risk of arteriosclerosis also prevent diabetes & cancers.

- **Myricyl alcohol: -**

Myricylalcohol (1-Triacontanol) is a fatty alcohol of the general formula C₃₀H₆₂O, also known as melissylalcohol; it is found in plant cuticle waxes and in beeswax. It is a growth stimulant for many plants, most notably roses, in which it rapidly increases the number of basal breaks which can act as a photosynthesis enhancer. It is under research.

- **Chrysophanic acid: -**

Chrysophanol, also known as chrysophanicacid, is a fungal isolate and a natural anthraquinone. Chrysophanol blocks the proliferation of colon cancer cells *in vitro*. It induces the necrosis of cells via a reduction in ATP levels. Chrysophanol attenuates the effects of lead exposure in mice by reducing hippocampal neuronal cytoplasmic edema, enhancing mitochondrial crista fusion, significantly increasing memory and learning abilities, reducing lead content in blood, heart, brain, spleen, kidney

and liver, promoting superoxide dismutase and glutathione peroxidase activities and reducing malondialdehyde level in the brain, kidney and liver.

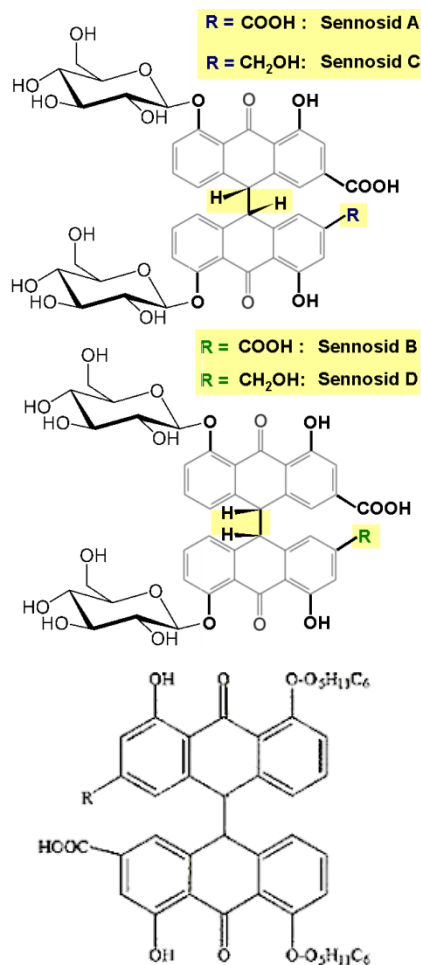
- **Calcium oxalate:** -

Natural calcium oxalates present in plants are bio-mineral; found in crystal with various shapes & structures; it is present in many cells & organs of plants; it protects the plant from grazing animals & insects; it also helps the plant in photosynthesis.

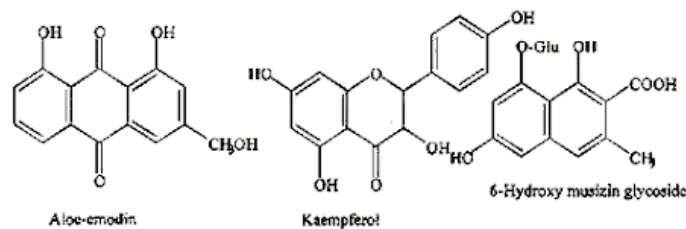
- **Tinnevellin& hydroxy musizin:** -

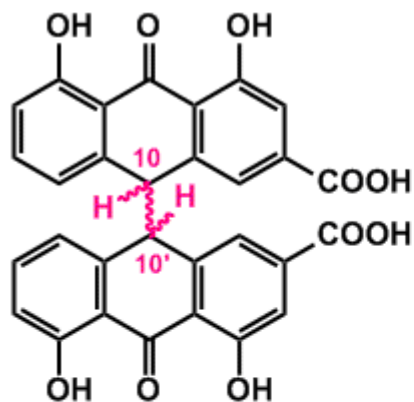
Tinnevellin & hydroxy musizin are glucoside, a naphthalene glycoside, isolated from *Cassia senna* leaves and pods. Both are under research.

- **Main chemical structures of senna:** -



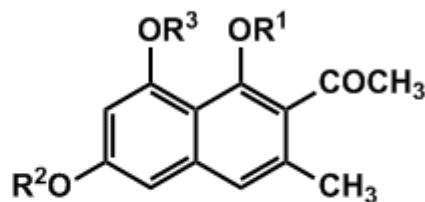
S. No.	Compound	R	10-10'
1	Sennoside A	-COOH	Trans
2	Sennoside B	-COOH	Meso
3	Sennoside C	-CH ₂ OH	Trans
4	Sennoside D	-CH ₂ OH	Meso





Sennidin A (10S, 10'S)
Sennidin A (10R, 10'R)
Sennidin B (meso form i.e. 10R, 10'S or 10S, 10'R)

Difference Between Alexandrian and Indian Senna



6-hydroxymusizin glucoside

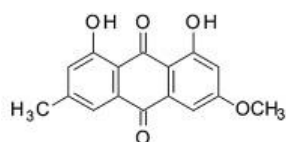
($R^1 = R^2 = H$ and

$R^3 = \beta\text{-D-glucopyranosyl}$)

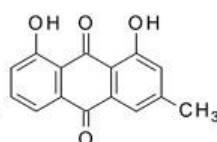
Tinnevellin glucoside

($R^1 = H, R^2 = \beta\text{-D-glucopyranosyl}$

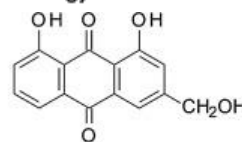
$R^3 = CH_3$)



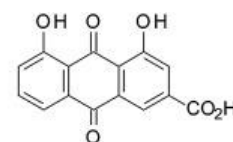
Physcion



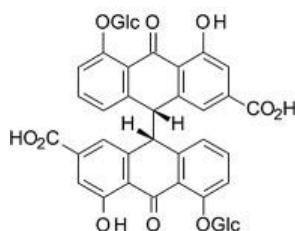
Chrysophanol



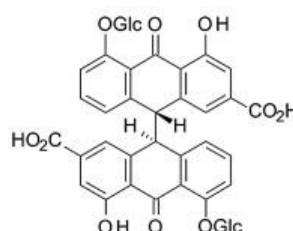
Aloe-emodin



Rhein



Sennoside A



Sennoside B

• Reference/research: -

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- **Research: -**

SCIENCE & HADEES REGARDING SENNA: -

Senna Makki (senna leaves) is a true miracle of Allah's creations & it is one of the valuable herbs of Tib-e-Nabwi, In Hadees of Ibrahim Ibn Abi Laila (r.a) narrates that Rasoolullah ﷺ says necessarily use Senna and Sanoot; because there is a cure in both of them from every disease except the "saam" someone asked ya Rasoolullah ﷺ what is saam? He Replied, Death. (Reference Ibn Majah Hadees: 3457).

When you take senna alone, it may create pain in the stomach which is caused due to contraction of stomach / intestinal walls, the contraction itself results in separation of old toxins & layers of putrefied un-digested food. Prophet ﷺ directed to take Sana with "SANOOT". About Sanoot there is several opinions (1) honey. (2) Zeera (3) sonf/badiyan. So the best is to take with honey which is mixed with butter. This results into separation of old toxins & layers of putrefied un-digested food. It leaves are very effective laxative and purgative and are particularly useful remedy for the occasional bout of constipation and is useful for evacuation relief in cases of fissures, hemorrhoids, after recto anal operations, and in preparation of diagnostic intervention in the gastrointestinal tract. It irritates the lining of the large intestine, causing the muscles to contract strongly resulting in bowel movement in about 10 to 12 hours after ingestion and also stops fluid being absorbed from the large bowel helping to keep the stool soft. It is sure and safe even for children (over 12 years of age) and weak and elderly persons. To prevent griping pains in the intestines, it is best when combined with a smaller amount of a warming stimulant and antispasmodic such as ginger or some other suitable herb. Senna leaves are approved by the World Health Organization (WHO) for short-term use in occasional constipation. Senna is also approved in the United States and in European countries as an ingredient in over-the-counter and prescription laxative preparations. The herb is approved by the German government for any condition in which alleviating constipation or softening stools is desirable Clinical studies suggest that Senna is effective in managing constipation associated with a number of causes including surgery, childbirth, and use of narcotic pain relievers. A study in the medical journal Diseases of the Colon and Rectum showed that Senna was able to prevent or treat postoperative constipation after proctologic surgery. The South African Medical Journal shows that treatment with senna was successful in 93%-96% of women suffering from postpartum constipation. By comparison, only 51%-59% of women in the placebo group experienced relief. Senna is considered to be one of the more effective agents for relieving constipation caused by such narcotic pain relievers as morphine. In another study published in the Journal of Pain and Symptom Management, researchers recommended the use of senna in terminal cancer patients with opiate-induced constipation, citing the effectiveness of the herb and its relatively low cost. A study published in the medical journal Pharmacology suggests that a combination of senna and bulk laxatives can alleviate chronic constipation in geriatric patients. It is also useful in intestinal worms, rheumatism, sciatica, gout, hip pain and lumbago.

- **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