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Pharmacopoeial wild medicinal plants

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***Senna alexandrina* Mill.** سنا مكي

1. Names & Synonyms (1-3)

***Senna alexandrina* Mill.**

Family: Leguminosae (Caesalpinioideae).

Syns.: *Cassia acutifolia* Delile, *Cassia senna* L., *Cassia lanceolata* Forssk.

Arabic: Sanna Mekki سنا مكى , Salamekki سلامكى

English: True Senna, Alexandrian Senna

2. Geographical distribution

The Nile region, desert east of the Nile including that of Sinai as well as the Red Sea and Gebel Elba regions (3).

3. Parts used for medicinal purposes

Leaves and pods (3).

4. Major chemical constituents

- **Anthraquinones**: Sennoside A and sennoside B , sennosides C and D (4), gluco aloe-emodin, rhein-8-monoglucoside, rhein 8-diglucoside, sennidin (5-7).
- **Naphthalene glucoside:** 6-Hydroxymusicin glucoside (8).
- **Flavonoids:** Mostly as mono- and di-*O*-glycosides of quercetin, kaempferol and isorhamnetin (5).

5. Medicinal uses

Well-established uses

A. Purgative (9) for short term use in occasional constipation (10).

Traditional medicinal uses

B. Stimulant laxative (11).

***S. alexandrina* is a traditional medicinal plant for use in the specified indications exclusively based upon long-standing use.**

6. Herbal preparation correlated to medicinal use

1. Liquid extract (alcoholic 30%) (12).
2. Infusion (13).
3. Decoction, dried extract, elixir, granules (pharmaceutical), oral solution, powder, rectal suppositories and tablets (14-15).
4. The boiled tea of leaves, sweetened with black honey, is taken in the morning before breakfast for treatment of constipation (11).

7. Posology and method of administration correlated to medicinal use

Adult oral dose:

- **Powdered drug:** 0.5-3gm (12).
- **Liquid extract:** 0.5-3ml (12).
- **Senna preparations expressed in terms of total sennosides calculated as sennoside B:** The usual adult dose is 15 to 30 mg given by mouth once or twice daily (15).

Children younger than 12 years of age: under medical supervision (14).

- Children over 6 years of age: one-half the adult dose (15).
- Children aged 2 to 6 years: one-quarter the adult dose (15).
- Not to be used by children younger than 2 years of age (15).

Elderly patients: Should initially take half of the normal prescribing dose (13).

8. Contraindications

- Hypersensitivity to active substances and to other plants of the same family.
- Children younger than 2 years of age (13).
- It should not be used by persons with intestinal obstruction, ulcerative colitis, gastrointestinal bleeding, appendicitis, nausea, vomiting, congestive heart failure, or an acute condition in the abdomen caused by surgery (14).
- Patients with suspected stricture, inflammatory bowel disease, or impending obstruction should not receive a bowel stimulant, to reduce the risk of colonic perforation (15).
- Senna should not be given to patients with undiagnosed abdominal pain (15).
- Prolonged use should generally be avoided (15).

9. Special warnings and precautions for use

- If the symptoms worsen during the use of the medicinal product, a doctor or a pharmacist should be consulted.
- Hypersensitivity reactions manifesting as asthma and rhinoconjunctivitis have been reported in those manufacturing or dispensing Senna products (15).
- This herb should not be used for longer than 1-2 weeks without medical advice (14).
- Children younger than 12 years of age should not be used unless prescribed by a physician (14).

10. Interactions with other medicinal products and other forms of interaction (14)

- Cardiac glycosides (digoxin): Chronic use of Senna may potentiate cardiac glycosides.
- Disulfiram: Do not use Senna with disulfiram.
- Laxatives /stimulant laxative herbs: Avoid the concurrent use of Senna with other laxatives; additive effect can occur.
- Jimson weed (*Datura stramonium* L.): The action of Jimson weed is increased in cases of chronic use or abuse of Senna.

11. Fertility, pregnancy and lactation

- The use of Senna should be avoided during pregnancy (13) and lactation due to its content of anthraquinones (16) which is distributed into breast milk (15).
- No fertility data available.

12. Effects on ability to drive and use machines

No studies on the effect on the ability to drive and use machines have been performed.

13. Undesirable effects

- If adverse reactions occur, a doctor or a pharmacist should be consulted
- Senna may cause mild abdominal discomfort such as colic or cramps (15), nausea, vomiting, anorexia, cramping, diarrhea, flatulence, hypocalcemia, enteropathy, alkalosis and hypokalemia (14).

14. Overdose

- Prolonged use or over dosage can result in diarrhoea with excessive loss of water and electrolytes, particularly potassium; there is also the possibility of developing an atonic non-functioning colon. Anthraquinone derivatives may colour the urine yellowish-brown at acid pH, and red at alkaline pH. Reversible melanosis coli has been reported following chronic use (15).
- Prolonged use or abuse of Senna laxatives has been associated with reversible finger clubbing, hypokalaemia and tetany, hypertrophic osteoarthropathy, intermittent urinary excretion of aspartylglucosamine, hypogammaglobulinaemia, reversible cachexia, and hepatitis or hepatic failure (15).

15. Relevant biological activities

-The laxative action and the laxative potency of Alaxandria and Tinnevelley senna in mice were studied using a standardized procedure. The results indicated that the laxative potency of various grades have been found to be reasonably uniform, the variations in potency not exceeding 25 per cent of the mean (17-18).

- The effect of repeated administration of the doses of Alexandria or Tinnevelly senna on mice over many weeks were studied. Two sets of experiments were conducted. In the first set of experiments no tolerance to either Tinnevelly or Alexandria senna developed. In the second set of experiments, 31 out of 40 mice survived the twenty-three-week period. It would therefore seem that mice may be used once a week for quantitative assay of laxative activity of senna and the repeated administration of the doses over many weeks did not cause any tolerance (19).

-Intravenous and intraperitoneal injection of Senna infusion produced negligible cathartic response compared to the same dose after oral administration (20).

- The effect of repeated administration of the doses of Alexandria Senna on mice over many weeks was studied. It would therefore seem that mice may be used once a week for quantitative assay of laxative activity of Senna and the repeated administration of the doses over many weeks did not cause any tolerance (19).

-Purgative action of Senna depends on the amount of hydroxyanthraquinone existing in the plant (21-22) but the effect is not due to the presence of sennoside A and B only (23), rather a synergistic action of different components (24), because Senna extracts are more potent laxatives than the pure active principles (25). Oral Senna-pod extract reverses net absorption of water, sodium and chloride to net secretion, and increases potassium secretion and stimulates output of PGE2 into the colonic lumen (26). The purgative action of Senna has been attributed, in part, to the release of histamine in the gut (27).

- Senna extract (SE) causes diarrhea and enhances gastrointestinal motility through digestive tract administration. Long-term gastric administration of SE induces inflammatory changes and cell damage in the whole gastrointestinal tract. The differential proteins screened from the colonic tissues of the model mice might mediate the enhancing effect of SE on gastrointestinal motility (28).

16. Additional information

Senna preparations may be used for bowel evacuation before investigational procedures or surgery, prior to X-ray examination or in mechanical preparation in the evening before elective colonic or rectal resection, as a colon cleansing, for elective colonoscopy (15, 29-32).

- The *β*-*O*-linked glycosides (e.g. sennosides and rhein 8-*O*-glucoside) are neither absorbed in the upper gut nor split by human digestive enzymes. They are converted by the bacteria of the large intestine into the ultimately active metabolite (rheinanthrone) (10, 33). The Aglycones are absorbed in the upper gut.

- Animal experiments with radio-labeled rheinanthrone administered directly into the caecum demonstrated absorption < 10%. In contact with oxygen, rheinanthrone is oxidised into rhein and sennidins, which can be found in the blood, mainly in the form of glucuronides and sulphates.

- After oral administration of sennosides, 3 - 6% of the metabolites are excreted in urine; some are excreted in bile (10). However, most of the sennosides (ca. 90%) are excreted in faeces as polymers (polyquinones) together with 2 - 6% of unchanged sennosides, sennidins, rheinanthrone and rhein. (10.)

- In human pharmacokinetic studies with Senna pods powder (20 mg sennosides), administered orally for 7 days, a maximum concentration of 100 ng rhein/ml was found in the blood, but an accumulation of rhein in blood was not observed. Small amounts of rhein pass into breast milk (10).

- Animal experiments demonstrated that placental passage of rhein is low.

17. Date of compilation/last revision

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