Scientific Name: *Senna angustifolia* Batka.

Synonym: *Cassia angustifolia* Vahl, *Cassia senna*

Local Name: Holoul,

Arabic Name(s): Senna, Sanna Makkah, sénemúkkki,

Common Name: Arabian Senna, Senna, Indian Senna, Tinnvelly Senna

Family: Fabaceae (Leguminosae)

Description:
Erect to ascending-spreading branched shrub, to 1 m high. Leaves paripinnate with 3-6 pairs of lanceolate, acute, leaflets which are 1.5-3 cm long, up to 1 cm wide. Flowers racemous, on pedicels 3-5 mm long; petals yellow with dark veins, 10 1.7 cm long. Pod flat, curved-oblong, 3-5 cm long, 1-1.8 cm wide, obtuse, pubescent. Seeds 5-7, compressed, obovate, dark brown and nearly smooth.

Habitat & Distribution:
Distributed throughout the tropical regions of the world, in deserts, semi deserts and grasslands regions. It is now cultivated in many countries. The plant is widespread in UAE, found in valleys, lower slopes of mountains, and road sides, along the sand and gravel.

Part(s) used:
Leaves & Pods, seeds and roots

Traditional & Medicinal Uses:
Cathartic, expectorant, used for gastritis; to be taken mixed with aromatic herbs like anise, ginger etc
In U.A.E the powdered leaves or decoction of leaves and fruits, mixed with sugar and lemon to treat constipation.
The plant used for hemorrhoids headache, itchy skin, hair fall and coloring, scabies and pimples.

Pharmacognosy and Phytochemistry

Microscopical Description:
A transverse section of the lamina shows an isobilateral structure where the upper and lower epidermises are similar in appearance. The epidermal cells are polygonal but those over the veins are more elongated and have striated cuticle. The epidermal cells have thin straight cell walls and some of them contain mucilage. The paracytic stomata are numerous and they are distributed on both epidermises. Attached to the epidermal cells are unicellular, conical, warty, covering trichomes and some are curved or appressed to the epidermis. The palisade cells underlying the upper epidermis are longer and larger than those underlain by the lower one and they have straight cell walls. The spongy mesophyll is composed of loosely held parenchyma cells of different shapes some of which are incompletely surrounded by a sheath of fibers accompanied by rows of cells containing calcium oxalate prisms. The vascular strands comprise phleom and xylem tissues; the xylem vessels are spirally thickened or border pitted. The fibres are found in groups and they are thick-walled and lignified (DPS ZCHRTM Unpub. Results).

(a). TS of a the leaf showing the general aspects of it isobilateral nature with upper and lower palisade layers. (b). Surface view of the upper epidermis of the leaf showing the upper epidermal cells with oval paracytic (mostly) stomata and a cicatrix of a detached covering trichome. (c). Surface view of the lower surface of the leaf showing the lower epidermal cells with oval paracytic stomata and a cicatrix of a detached covering trichome. (Magnifications: x 100, x 400, and x 400, respectively)
Organoleptic characteristics:

Solid powder: Appearance
Light green: Colour
Aromatic: Smell
Tasteless: Taste

Physicochemical constituents:

Loss of weight drying at 105° ( % ): 4.20

Solubilities (%)
  - Alcohol solubility: < 3
  - Water solubility: < 25

Ash values (%)
  - Total ash: > 14
  - Acid insoluble ash: > 2

Successive extractives (%)
  - Petroleum ether (60-80): 5.2
  - Chloroform: 2.0
  - Absolute alcohol: 11.10

pH values
  - pH of 1% aqueous solution: 6.23
  - pH of 10% aqueous solution: 5.84

The above results are under process of publication (DPS ZCHRTM Unpub. Results).

Chemical constituents:
Anthracene derivatives, sennoside A and sennoside B, C and D, rhein, alol-emodin, aloe emodin. (Bruneton 1999; DPS, ZCHRTM Unpub. results).

Pharmacological and Toxicological studies:

The effects of 0.5%, 0.3% and 0.1% w/w concentrations of Senna occidentalis seeds mixed with commercial ration were studied in different groups of 32 broiler chicks each, from 1 day to 49 days of age. Degenerative changes were found in the striated skeletal muscle in the chest, in the myocardium and in the liver in the animals that received the higher concentrations of such seeds (Haraguch et. al., 2003).

Senna containing laxatives in young children reported to cause severe diaper rash, blisters, and skin sloughing. (Spiller et. al., 2003).

The pharmacological effects of Fu Kean Tablet on gastrointestinal tract were studied. The results showed cured the diarrhea induced by rhubarb or Senna, prominently reduced the quantity of faces and delayed the time of excreting charcoal powder in the
diarrhea induced by *rhubarb* or *Senna* (Zhou et. al., 1999). The toxic effects of diet containing 10% of *Senna* fruits or 10% of *Nerium oleander* leaves or their 1:1 mixture (5% 5%) on male Wistar rats treated for 6 weeks showed decrease in body weight gains, inefficiency of feed utilization, dullness and enterohepatonephropathy. These findings accompanied by leukopenia and anemia were correlated with alterations of serum aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphatase (ALP) activities and concentrations of total protein, albumin, urea and other serum constituents. In both toxicology studies, the ability of the liver to excrete bilirubin remained unchanged (Al-Yahaya et al., 2002). The laxative potency of *Senna* was reported reasonably uniform (Grote and Wods. 1944). Oral dose caused informed feces (Collier et. al., 1948). The purgative action of *Senna* has been attributed, in part, to the release of histamine in the gut (Erspamer 1946).

The pharmacological and toxicological studies carried out in ZCHRTM laboratory and the results in brief, on *Cassia angustifolia* (Aqueous extract) have been given below. The results presented without references showed unpublished data (UPD, ZCHRTM, DBMS):

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-inflammatory activity - Rat paw oedema</td>
<td>Failed to produce anti-inflammatory activity.</td>
</tr>
<tr>
<td>Metabolic activity - Faeces output</td>
<td>Increased faeces output showed laxative potency.</td>
</tr>
<tr>
<td>Metabolic activity - Food intake</td>
<td>Increased food intake.</td>
</tr>
<tr>
<td>Metabolic activity - Water intake &amp; Urine output</td>
<td>Water intake &amp; urine output not affected.</td>
</tr>
<tr>
<td>Cardiotonic activity &amp; HR- Isolated rat atria</td>
<td>Increased force of contraction.</td>
</tr>
<tr>
<td>Effect on uterine muscle- Isolated rat uterus</td>
<td>Produced slight contraction.</td>
</tr>
<tr>
<td>Effect on GIT smooth Muscle- Isolated rat jejunum</td>
<td>Reduced amplitude of contraction.</td>
</tr>
<tr>
<td>Gross behavioral studies- Tremor/Twitches</td>
<td>No tremors observed.</td>
</tr>
<tr>
<td>Gross behavioral studies- Writhing</td>
<td>No writhings observed.</td>
</tr>
<tr>
<td>Gross behavioral studies- Diarrhea, Urination</td>
<td>Less severe diarrhea observed.</td>
</tr>
</tbody>
</table>
Mortality

No mortality recorded.

Motor co-ordination (String & Platform test)

Motor co-ordination not affected.

Acute toxicity studies

No toxic symptoms observed; No mortality recorded.

LD₅₀ evaluation

0.8- 6.4/Kg., p.o.

Summary of the results:
The plant showed laxative activity. The laxative property was found reasonably uniform. No mortality reported at the dose tested. No toxic signs and symptoms observed.

References

- Department of Biomedical Sciences, Zayed Complex for Herbal Research and Traditional Medicine, Unpublished results.
- Department of Pharmacognostic Sciences, Zayed Complex for Herbal Research and Traditional Medicine (ZCHRTM), unpublished results.


• **Western, A. R.** The Flora of United Arab Emirates, an introduction. (1986) Publication of the UAE University.