

## **LAXATIVES**

Laxatives (Latin: Laxare: to-loosen) are the drugs which loose the bowels (intestine) or the drugs producing, increasing and hastening intestinal evacuation, or the drugs which promote defecation (push out the excreta from the body through the anus).

Depending upon the intensities of drug effects they are categorized as follows:

- i) **Laxatives** suggest the elimination of soft formed stools (mild purgatives) e. g., bran, karaya gum, carboxy methyl cellulose, senna, Isapgol, liquid-paraffin etc.
- ii) **Purgatives** suggest more fluid evacuation, e.g. castor oil, aloe, cascara sagrada, rhubarb etc.
- iii) **Drastics** act intensely by irritating the mucous membrane of the intestine, e.g., jalap, colocynth, podophyllum.
- iv) **Hydrogogues** produce fluid motions, e.g. croton oil, colocynth etc.

The mechanism of action of laxatives may be either bulk forming, irritant or emollient depending upon the chemical nature of active constituent.

## **ISPAGHULA**

**Synonym:** Isapgol, isabgol

The word isapgol is derived from the Persian word 'ISAP' which means the horse and 'Ghol' means the ear. Thus, the literal meaning of word isapgol is the ear of the horse. The seeds, as well as husk of the seeds are used in medicine since 18<sup>th</sup> century. Seeds are very small in size. A thousand seeds weigh about 1.5 g isapgol has high export potential value.

**Biological source:** It consists of dried seeds of the plant known as *Plantago ovata* Forskal, (Family: Plantaginaceae). In the pharmaceutical field, seeds as well as the dried seed coats, known as isapgol husk, are used.

**Geographical Distribution:**

The plant is cultivated largely in Gujarat, Punjab and South Rajasthan. The factory for preparation of husk is located at Sidhpur in North Gujarat. In Maharashtra, it is found to be grown successfully near Pune. About 30 thousand hectares of area is said to be under cultivation for the drug in India.

#### **Chemical Constituents:**

- Isapgol husk and seeds contain mucilage which is present in the epidermis of the seed.
- Chemically, it consists of pentosan and aldobionic acid.
- The products of hydrolysis are xylose, arabinose, galacturonic acid and rhamnose.
- Fixed oil and proteins are other important constituents of the drug.

Swelling factor is supposed to be criterion of purity of the drug. Swelling factor of the drug is a quantitative swelling due to mucilage present in the drug. It is determined by putting 1 g of the drug in the measuring cylinder (25 ml capacity) in 20 ml water with occasional shaking. The volume occupied by the seeds after 24 hours of swelling is measured. Swelling factor for seeds is 10 to 14.

#### **Chemical Tests:**

1. To dry seeds of Isapgol add one drop of Test solution of Chinese-ink, mucilage shows transparent, spherically dilated fragments on black background.
2. Being mucilage chemically, isapgol gives pink color with the solution of ruthenium red.
3. To dry seeds add a drop of Thionine test solution, wait for 10 minutes, wash with alcohol mucilage turns violet-red.

#### **Uses:**

- Seeds, as well as, the husk are used as demulcent, laxative, emollient and in the treatment of chronic constipation, amoebic and bacillary dysentery.
- Isapgol preparations are used to assist the product of smooth solid fecal mass.
- Isapgol husk is preferred to the seeds as the husk contains more mucilage and seeds are said to be irritant as compared to the husk.
- Mucilage of the isapgol is used in the preparation of tablets and also as a stabilizer in the ice cream industry.
- The crushed seeds are, many a times, used in the form of poultice for rheumatic pains.

## **SENNA LEAVES**

**Synonyms:** Tinnevelly Senna, Indian Senna

**Biological Source:** It consists of dried leaflets of *Cassia angustifolia*, Vahl belonging to family Leguminosae. It contains not less than 2.0 % of hydroxyanthracene derivatives calculated as sennoside B.

**Geographical Distribution:** Indian Senna is cultivated and collected in India. Its cultivation is mainly done in Tinnevelly, Madurai and Ramnathpuram districts of Tamil Nadu. Cultivation is attempted in Cudappa district of Andhra Pradesh, and to some extent it is collected from Kutch in Gujarat State. It has been successfully tried in Maharashtra.

### **Chemical Constituents:**

- Senna contains anthraquinone derivatives, which are the active constituents of the drug. They are sennoside A, sennoside B, sennoside C and sennoside D. Sennosides C and D are the minor constituents.
- The sennosides constitute about 2 to 3% of the drug in commercially available samples.
- Additionally, leaves also contain rhein, kaempferol, aloë-emodin, and isorhamnetin. Myricyl alcohol, phytosterol, salicylic acid, mucilage resin and calcium oxalate are the inactive constituents of the drug. The aglycone of sennoside is known as sennidin, which is a dianthrone of rhein. Senna yields 30 to 40 % of water-soluble extractive.

### **Standards:**

Foreign organic matter: Not more than 1.0 %

Stalks: Not more than 2.0 %

Sulphated ash: Not more than 12 %

Acid insoluble ash: Not more than 2.0 %

### **Chemical Test:**

Senna leaves can be tested for their chemical constituents. The test is known as Borntrager test, which is as follows.

- Boil the powdered leaves with dilute sulphuric acid.
- Filter immediately, separate the filtrate and cool.
- Mix the filtrate with double volume of any one of the water insoluble organic solvents like benzene, chloroform or carbon tetrachloride.
- Shake it well and separate the organic solvent layer.
- To the layer of organic solvent, add equal quantity of dilute ammonia.
- The ammoniacal layer becomes pink and finally red indicating the presence of anthraquinone derivatives.

**Uses:**

Senna leaves are used as laxative, Senna is an irritant purgative due to presence of anthraquinone derivatives. Senna is free of astringent effect due to absence of tannin. Purgative effect of senna is not followed by the constipation. The only disadvantage of senna is that it causes gripping, but it is overcome by admixing powdered senna with carminatives.