



## A Review Article on *Senna italica* Mill.

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### ABSTRACT

*Senna italica* Mill. is a diffuse perennial herb or small shrub belonging to the family Fabaceae. It is also called as *Cassia italica*, Italian senna, Senegal senna, Port royal senna. This plant grows about 50 to 75 cm height and has 4 to 8 pairs of leaflets and a flat and curved pods with 5 to 8 seeds. In traditional system of medicine, different parts of this plant such as leaves, flowers, roots, seeds and pods are used for the treatment of various ailments. Leaves, pods and unmaturing seeds of *Senna italica* Mill. are used to treat fever, stomach complaints, jaundice, skin disease, venereal diseases, and used as purgative. Leaves and seeds are used against intestinal worms and as abortifacient. Leaves are particularly used as neutral henna which gives yellow glossy hair. The *Senna italica* Mill. also suggested to possess anti-inflammatory, analgesic, antineoplastic and antiviral activities. The chemical constituents of *senna italica* Mill. are glycosides, tannins, flavonoids, carbohydrates, sterols and so on. This article summarizes the review which has been reported and therefore helps in further research on this plant.

**Keywords:** *Senna italica*, Purgative, Phytochemistry, Anti-inflammatory, Anti-neoplastic.

### INTRODUCTION

Plants have been used extensively in the traditional system of medicine by humans to treat various diseases. Herbal medicines draw attention from the people of both the developed and developing countries because of their safety and biological activities without side effects. Leaves, root, pods and seeds of *Senna italica* Mill. (family: Fabaceae) has been used for various medicinal purposes. This plant is widely distributed in African countries, Iran, Iraq, Pakistan and from India to Sri Lanka. *Senna italica* Mill. is a Perennial herb or small shrub and grows about 50 to 75 cm in height with herbaceous branches from woodstock. Stem is striate with pinnate leaves and the leaflets are about 4-8 pairs (Fig.1). Flowers are yellow in color, five petals and bisexual (Fig.2). Pods are thin, flat and curved with 5-8 seeds (Fig.3). Depending upon the size of inflorescence and the length of the petiole, it has been divided into three sub species viz *italica*, *miracantha* and *aracoides*. The pharmacological activities of *Senna italica* Mill. are antipyretic, antibacterial, antifungal, antiviral, antineoplastic, anti-inflammatory and analgesic.<sup>1-3</sup>



Figure 1: *Senna italica* Mill.



Figure 2: Flowers



Figure 3: pods

### Taxonomical Classification<sup>4</sup>

Kingdom	:	Plantae
Order	:	Fabales
Family	:	Fabaceae
Sub family	:	Caesalpinioideae
Tribes	:	Cassieae
Genus	:	<i>Senna</i>
Species	:	<i>S. italica</i>

### Traditional Uses

Leaves, pods and unmaturing seeds are used as purgative, decoction and maceration are used to cure stomach complaints, fever, jaundice, venereal diseases and biliousness. This plant is also used as abortifacient and against intestinal worms. Leaves fresh or dried or pulverized used to dress skin problems, burns and ulcers. Flowers are made into tea and used as purgative and to induce labour. Maceration of root is used to cure colic and influenza and boiled roots are used to dress wounds. Root infusion is used as eye drops for sore eyes and for the treatment of indigestion, liver complaints, gall bladder, nausea, vomiting and dysmenorrhoea. Young seeds are eaten as snacks or as vegetable. In Mauritania

seeds are smoked. Leaves are traded as neutral henna, hair conditioner which impart yellow colour.<sup>5</sup>

### Phytochemistry

*Senna italica* Mill. Contains anthraquinone glycosides (sennosides and their aglycone sennidin, emodin, aloe emodin, rhein and chrysophanol) and they are responsible for the purgative action. Chrysophanol is the active ingredient of neutral henna. This plant also contains cathartin, phoecretin, oxyanthraquinones and mucilage. The anthraquinone content of the leaves ranges from 1.1 to 3.8. Leaves also contains flavonoids (quercetin, kaempferol, apigenin) and steroids (stigmasterol,  $\alpha$ -amyrin,  $\beta$ -sitostamyrinerol.<sup>6</sup> Tannins and saponins have also been isolated from the leaves.<sup>7</sup> The chloroform extract of pods were investigated and that showed the presence of physcion, chrysophanol, chrysophanol- 10,10'-bianthrone, chrysophanol-physion bianthrone and chrysophanol-isophysion dianthrone. Therefore pods contains not the sennosides but the other bioactive compounds.<sup>8</sup> The root extracts of *senna italica* Mill. reported the presence of stilbene resveratrol which is an antioxidant compound.<sup>9</sup>

### Pharmacological activities of *Senna italica* mill

#### Pharmacological investigations

The whole plant of *Senna italica* Mill. (leaves, roots, pods, seeds) was extracted with ethanol. This ethanolic extract was investigated for anti-inflammatory, antipyretic, analgesic and prostaglandin release activity on rat. The extract reduced the carrageenin induced paw swelling (100mg/ml) and fever (100mg/ml) in rat, the extract showed the weak analgesic activity on writhing effect induced by acetic acid. The prostaglandin release effect by using the rat peritoneal leukocytes was observed and that reported the dose-dependent inhibition of prostaglandin release.<sup>10</sup>

#### Potential Hypoglycemic and Antiobesity effects

The acetone leaf extracts of *Senna italica* Mill. was evaluated for its cytotoxic, antiglycation, lipolytic and glucose uptake activities. The extract had no adverse effect on 3T3 L1 preadipocyte cells viability. The antiglycation activity of *Senna italica* acetone extract was determined by bovine serum albumin assay. An increased antiglycation effect was attained at 10  $\mu$ g/ml. lipolysis assay was carried out on the adipocyte cells and showed that the lipolytic activity of the extract decreases with increase in concentration (25-200 $\mu$ g/ml). The glucose uptake analysis of 3T3-L1 adipocytes with the extract (50-100 $\mu$ g/ml) stimulated the glucose uptake through P13K-dependent pathway. The antidiabetic activity is due to the presence of flavonoids. The extract decreases the expression level of obesity associated adipokines in type 2 diabetes. The extract (100 $\mu$ g/ml) showed the slight increase of GLUT4 (Glucose Transporter 4) translocation on the plasma membrane of the 3T3-L1 adipocyte in the

absence of insulin and in the presence of insulin (1 $\mu$ M) the extract showed significant increase.<sup>11</sup>

### Acaricidal activity

Fouche and his co workers studied the acaricidal activity (anti ticks) on the acetone and ethanolic extracts of root, leaves and fruits of *Senna italica* Mill. and ethyl acetate, hexane, chloroform, dichloromethane and methanol extracts of roots of *Senna italica* Mill. The acetone extract of *Senna italica* Mill. showed slight in increase acaricidal activity than ethanolic extract. The ethyl acetate extract of root had the acaricidal activity against adult *Hyalomma marginatum rufipes* among hexane, chloroform, dichloromethane and methanol extracts. The ethyl acetate extract of root contains 1,2-benzenedicarboxylic acid, dibutyl esters, 1,8-dihydroxy-3-methyl anthraquinone and hexadecanoic acid.<sup>12</sup>

### Antioxidant activity, Antibacterial and Antiproliferative activities

The antioxidant activity of the acetone extract of the roots of *senna italica* Mill. was evaluated by using the DPPH (2,2- Diphenyl-2-picrylhydrazyl) assay. The free radical scavenging compound was recorded in TLC. The same extracts showed the antibacterial activity against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Enterococcus faecalis* and *Escherichia coli*. The minimum inhibitory concentration (MIC) was determined by using serial dilution method. MIC values of the extract against *P. aeruginosa*, *E. faecalis*, *E. coli* and *S. aureus* were 0.16, 0.078, 0.16 and 0.078 mg/ml. The acetone extract of roots of *senna italica* Mill. showed the antiproliferative activity on Jurkat T cells. This activity was evaluated by using the Trypan blue dye exclusion method. The arrest of cell growth had been observed with dose and time dependent manner.<sup>13</sup>

### Insecticidal activity

The oil compounds present in the n-hexane extract of *Senna italica* Mill. such as 2,6-di-sec-butylphenol (36.96%), di-n-octylphthalate (12.6%), eicosane (5.46%), tetratriacontane (4.87%), 2,2'-methylenebis (4.18%) were isolated and evaluated for the insecticidal activity. These oily compounds exhibited the potent insecticidal activity against *Callosbluchus analis*.<sup>14</sup>

### Cytotoxic activity

New cytotoxic compound cycloartane triterpene [ (22e)-3- $\beta$ -hydroxycycloart-22-en-24-one] together with eight known compounds were isolated from *Senna italica* and evaluated for the cytotoxic activity using 45178Y and PC12 cell line and the other compounds are for free radical scavenging activity.<sup>15</sup>

### CONCLUSION

*Senna italica* Mill. commonly known as Italian senna is having various pharmacological activities like analgesic, antipyretic, anti inflammatory, antidiabetic cytotoxic and so on. Some phytochemical compounds have been



isolated and reported to have such pharmacological actions. *Senna italica* is famously known as 'neutral henna' which gives yellow glossy hair. In traditional system of medicine all parts of the plants (leaves, root, pods, seeds, flowers) are used for various ailments. Hence this review article on *Senna italica* Mill. is hoped to be a strong stimulus for research and further pharmacological investigations.

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