



PHYTOCHEMICAL SCREENING AND PHARMACOLOGICAL ACTIVITY OF CASSIA ANGSTIFOLIA BARK

A. S. Dongarwar*

Manoharbai Patel Institute of B. pharmacy Gondia, 441614, Maharashtra, India. *Corresponding Author

N. H. Indurwade

Manoharbai Patel Institute of B. pharmacy Gondia, 441614, Maharashtra, India.

T. P. Nimbekar

Bajiraoji Karanjekar College of Pharmacy, Sakoli, Dist- Bhandara, 441802

Pallavi Sonwane

Manoharbai Patel Institute of B. pharmacy Gondia, 441614, Maharashtra, India.

Shubham Selokar

Manoharbai Patel Institute of B. pharmacy Gondia, 441614, Maharashtra, India.

ABSTRACT

Cassia angustifolia vahl. (Leguminosae), commonly known as 'Senna' or 'sonamukhi' is employed in various indigenous system of medicine against several disease and almost every part of the plant has diverse medicinal properties. The bark and stem are used as an anti-inflammatory and antipyretics and treat skin diseases and abdominal troubles. According to the Ayurveda it has a property of reducing "kapha" and "vatta". The current communication provide a detailed account of pharmacognostical investigation carried out on the bark of *Cassia angustifolia*. The study includes macro and microscopical details physiochemical studies florescence study of the bark powder, TLC and HPTLC fingerprint. The study reveal that bark of samples procured from the different places have similar morphological and physiochemical values. These observations are supported by TLC profile.

KEYWORDS : *Cassia Angustifolia*, Pharmacognostical Investigation, Ayurveda, Physiochemical Values.

INTRODUCTION

Pharmacognosy which is science of the knowledge of plant is one of the important subject in the overall curriculum of the pharmaceutical education in India and world. Pharmacognosy is an important link between pharmacology and study of medicinal plant. Pharmacognosy is vital link between Ayurvedic and Allopathic system of medicine. It provides a system where in the active principle of crude drug derived from the natural origin can could be dispense, formulated and manufactured in dosage form acceptable to Allopathic system of medicine. In nutshell pharmacognosy forms an important bridge between the pharmaceutical and basic science.

ABOUT PLANT

Cassia is a large genus of around 500 species of flowering plants in the family Leguminosae (Lodha et Al 2010). *Cassia* species are annual under shrub, the genus *cassia* comprises of 580 species of herb, shrubs and trees, which are widely distributed throughout the world of which only 20 species are indigenous to India (Anonymous 1950). Medicinally, *Cassia angustifolia* vahl is an important plant (Harnischfeger and stilze 1983) is systematically placed in to the division- Magnoliophyta, class- Magnoliopsida subclass Rosidae, order -Fabales, Family- Caesalpiniaceae.

Taxonomical classification of Senna

Kingdom	Plantae
Subkingdom	Tracheobiota
Super division	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Rosidae
Order	Fabales
Family	Fabaceae
Genus	<i>Cassia</i>
Species	<i>angustifolia</i>

Synonyms of *Cassia angustifolia*

Language	Names
English	Indiansenna Tinnevely Senna
Hindi	Senna ki patti
Sanskrit	Svarnapatri
Telugu	Nela tangedu
Malayalam	Sunnamukhi
Kannada	Nelavarika

Senna is one of the most commonly used laxative drugs in the Eastern and Western countries for the treatment of constipation. Commonly available consist of the dried leaflet of Alexandria Senna (*Cassia acutifolia* Delile) Tinnevely Senna (*Cassia angustifolia* vahl) belongs to plant family Leguminosae. *Cassia angustifolia* is an ayurvedic herb more popularly known as Senna. Senna is an Arabian name but it is native to Sudan. It was brought into used by Arabian physician for removing capillary congestion. It is small herb growing to a height of 2-3 feet. In India it is cultivated in Tamil Nadu, Andhra Pradesh and Karnataka. It is commercially cultivation as recently come up in Kutch (Gujarat) and Jodhpur (Rajasthan). It is mainly used as a blood purifier, laxative for relieving constipation and to treat skin diseases. It contains a powerful natural laxative called Anthraquinone and is approved by the world health organization (WHO). *Senna* consist of the leaflet are golden brown in colour after drying. *Cassia angustifolia* is one of the most widely used herbal laxatives (Dermarderosian, 2005). *Cassia* species well known in folk medicine for their laxative and purgative uses. They are also used for treating skin diseases such as ring worm, scabies, eczema and wounds.

SIDE EFFECTS & SAFETY

Senna is likely safe for most adults and children over age 2 when taken by mouth, short-term. *Senna* is an FDA-approved nonprescription medicine. *Senna* can cause some side effects including stomach discomfort, cramps, and diarrhea. *Senna* is possibly unsafe when taken by mouth long-term or in high doses. Don't use *senna* for more than two weeks. Longer use can cause the bowels to stop functioning normally and might cause dependence on laxatives. Long-term use can also

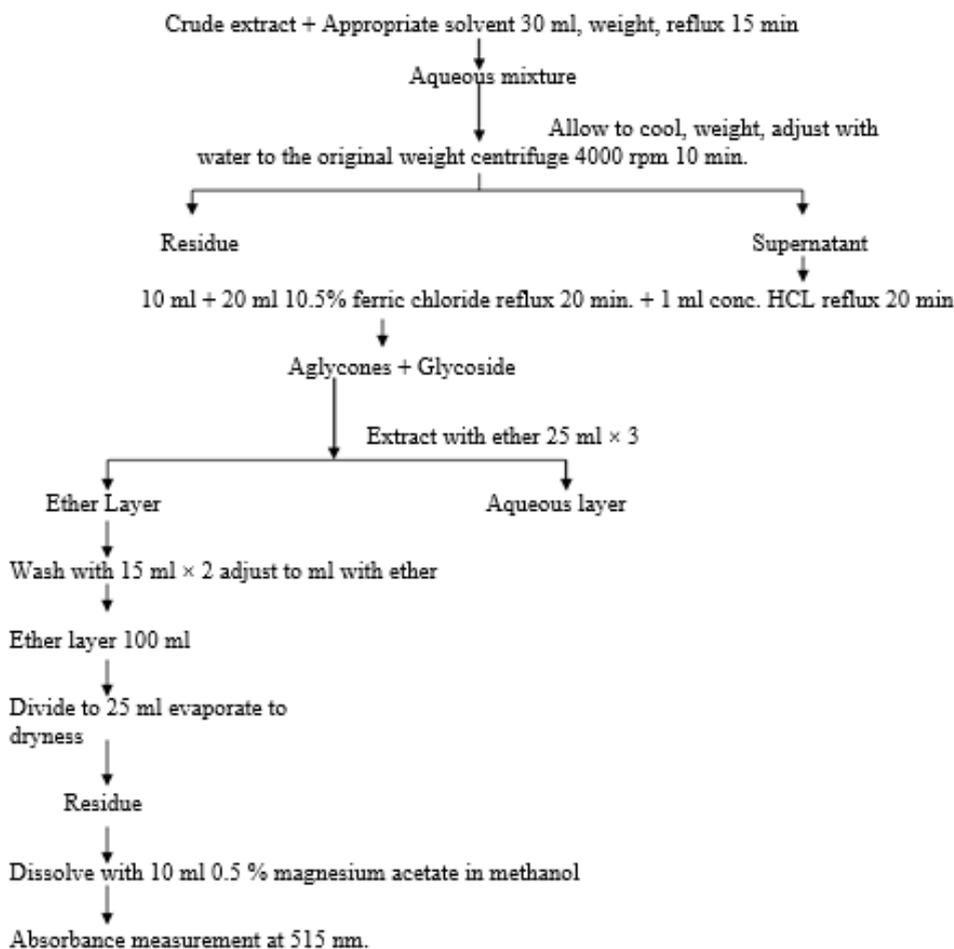
change the amount or balance of some chemicals in the blood (electrolytes) that can cause heart function disorders, muscle weakness, liver damage, and other harmful effects.

SPECIAL PRECAUTIONS & WARNINGS

Pregnancy and breast-feeding: Senna is possibly safe during pregnancy and breast-feeding when taken by mouth, short-term. It is possibly unsafe when taken by mouth long-term or in high doses. Long-term, frequent use, or use of high doses has been linked to serious side effects including laxative dependence and liver damage. Although small amounts of senna cross into breast milk, it doesn't seem to be a problem for nursing babies. As long as the mother uses senna in

recommended amounts, senna does not cause changes in the frequency or consistency of babies' stools. Electrolyte disturbances, potassium deficiency: Overuse of senna can make these conditions worse. Dehydration, diarrhea or loose stools: Senna should not be used in people with dehydration, diarrhea, or loose stools. It can make these conditions worse. Gastrointestinal (GI) conditions: Senna should not be used by people with abdominal pain (either diagnosed or undiagnosed), intestinal blockage, Crohn's disease, ulcerative colitis, appendicitis, stomach inflammation, anal prolapse, or hemorrhoids. Heart disease: Senna can cause electrolyte disturbances and might make heart disease worse.

QUALITATIVE ANALYSIS TOTAL ANTHRAQUINONES



ANTI-PYRETIC ACTIVITY:

Both the methanolic extract and water extract of *cassia angustifolia* showed significant effect on pyrexia induced yeast.

Several test (acute and chronic) were employed in evaluating the analgesic effect of the methanolic and water extracts of *cassia angustifolia*. It is necessary to apply tests which differ with respect to stimulus quality, intensity and duration, to obtain as complete a picture as possible of the analgesic properties of a substance using behavioral nociceptive test. The results obtained indicate that the extracts possess a moderate dose dependent analgesic effect on the various

pain models used. A potent inhibitory effect was extracted by both the extracts on the mouse writhing assay. This suggests that the analgesic effect of the extract may be peripherally mediated. The extracts also had a significant effect in the acid or Indomethacin, only inhibit the late phase. Antipyretic activity commonly mentioned As characteristics of drugs or compounds which have as inhibitory effect on prostaglandin-biosynthesis. Both the methanolic extract and water extract of *cassia angustifolia* showed significant effect on pyrexia induced by yeast. The result obtained in this study indicate that the extract possess mild antipyretic properties. Even if further studies are needed this seems to provide rationale for the use of this plant in pain and inflammatory disorders.

Table: Effect of the *Cassia angustifolia* leaves extract and paracetamol on yeast induced pyrexia in mice.

Material	Dose (mg/kg)	0h	1h	2h	3h
Control	1.16 unit	42.61 ± 0.12	40.63 ± 0.16	39.41 ± 0.11	39.7 ± 0.14
Water extract	10	41.47 ± 0.14	39.83 ± 0.15	39.57 ± 0.15	38.56 ± 0.14
Paracetamol	10	37.63 ± 0.11	37.08 ± 0.15	37.06 ± 0.24	36.93 ± 0.14

ANTIBACTERIAL ACTIVITY:

Natural antimicrobial agent have been more popular due to their efficacy against antibiotic resistant microorganism and campaign for consumption of natural product according to previous reports, various solvent extract of *cassia angustifolia* bark demonstrated antimicrobial activity against different microorganisms. Ethanol extract of Senna bark showed antibacterial activity against *S.aureus* and *E.coli* with zone of inhibition being 23 mm and 9 mm, respectively for 10 micron litre of extract solution. Comparatively, in this study *S. aureus* exhibited lower zone of inhibition (15 mm) for boiled water extract of Senna 10 micron litre of extract solution. The antimicrobial activity of Senna barks anthraquinone glycosides. Polygalacturonase inhibitory proteins in the plant cell wall of senna are suggested to play a role in resistant to bacterial attacks. However, the senna bark extract showed minimum activity against fungal pathogens investigated in present study. The oil has antibacterial activity particularly, *Staphylococcus aureus* and *Escheria coli*. While the overall inhibitory effect of essential oils in the experiment was less than for acetone, methanol and hexane its individual effect on *S. aureus* and *E.coli* was greater and effect of volatile terpenoids on bacteria that is *Staphylococcus aureus* and *Escheria coli*.

	Zone of Inhibition in mm			Zone of Inhibition in mm	
	S. Aureus	E. coli		S. Aureus	E. Coli
Ethanollic Extract	25	8	Water Extract	21	10
	24	7		23	7
	22	5		28	9
	18	3		22	11
	19	4		24	8
	20	5		19	6
Average	21.34	5.34		23	9

CONCLUSION

The present study has helped in demonstrating the potential bioactive compound of natural plant extract that are eco-friendly, economical and available in bulk to the farmers with easy preparation protocols. *Cassia angustifolia* vahl. Plant parts are used for the development of various industrial and pharmaceutical products. In this paper attempt was made to medicinal property of bark of *Cassia angustifolia* vahl. In various solvent extract against human bacterial pathogens. The extracts of senna leaves were shown better result against *S. aureus* than other pathogens. From the result it was concluded that extract of *Cassia angustifolia* vahl. shown effective and efficient result against bacterial pathogen used. *Cassia angustifolia* bark could serve as good source of antibacterial agents.

REFERENCES

- Anonymous (1996): Indian pharmacopoeia, 2nd edition New Delhi, Govt. of India publication pp.367-370.
- Anonymous (1992): The wealth of India II –Raw materials. New Delhi, Publication and Information Directorate, CSIR, pp.354-363.
- Warier, PS (1994): Indian medicinal plants, vol. 2. New Delhi, Orient Longman publication p. 31.
- Gupta R.K. Medicinal and Aromatic plants 1st ed. India, CBS Publishers and distributors: 2010, pp. 116-117.
- Kinjo J, Ikeda T, Watanabe K, Nohara T. An anthraquinone glycosides from *cassia angustifolia* leaves, *Phytochem*, 1994; 37(6):1685-1687.
- Srivastava A, Pandey R, Varma R.K., Liquid chromatographic determination of sennosides in *cassia angustifolia* leaves. *J. AOAC*, 2006; 89(4): 937-941.
- Kokate, C.K, A.P purohit and S.B. Gokhale, Ed. *Pharmacognosy*, 25th Ed. Nirali prakashan: 77, (2003).
- Kokate C.K, A.Purohit, S.B.Gokhale (2000). *Text book of pharmacognosy*, 14th edition, Nirali Prakashan, Pune 123-124.
- Kapoor VP, Farooqi MIH, Kapoor LD, Chemical investigations of seed mucilages from *Cassia species*, *Indian for* 1980; 106(11): 810-812.
- Patel RP, Patel KC. Antibacterial activity of *cassia species* and *Cassia obovata*. *Indian Journal of pharmacy* 1957; 19:70-73.
- K. R. sini, M. Karpakavalli and PT. Sangeetha, Analgesic and antipyretic activity of *cassia occidentalis* Linn.
- K. R. Khandelwal, *Practical Handbook of pharmacognosy, Technique and experiment* by Nirali Prakashan. P.66.
- A.V.Kasture, S. G. Wadodkar, *Textbook of Pharmaceutical Analysis*, Vol.2, P.4.1.