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A Brife Review On Senna Plant

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ABSTRACT

The multifaceted aspects of Cassia angustifolia, commonly known as Indian or Tinevelly senna, focusing on its cultivation, chemical composition, medicinal properties, and therapeutic applications. Cultivated primarily in Indian states like Rajasthan, Maharashtra, Gujarat, Telangana, Andhra Pradesh, and Tamil Nadu, Indian senna exhibits adaptability to diverse soil and climatic conditions, contributing significantly to India's economy with an estimated annual production of 7500 tons. The plant's laxative properties stem from anthraquinone glycosides found in its leaves and pods. Beyond its economic importance, senna has been extensively studied for its medicinal applications, including treating asthma, skin conditions, and leprosy. Research into different parts of the plant has revealed its diverse nutritional compositions and pharmacological activities, such as Antidiabetic, antimicrobial, antifungal, and even mosquitosidal effects. Efforts to standardize senna leaf extracts and synthesize its compounds have led to valuable insights into their structural activities and therapeutic potential. Clinical studies have highlighted senna's efficacy in treating constipation and gastrointestinal disorders, underscoring its relevance in modern medicine. The comprehensive exploration of Cassia angustifolia underscores its importance as a versatile botanical resource with diverse applications in agriculture, medicine, and beyond. Continued research and innovation hold promise for unlocking further benefits and expanding our understanding of this remarkable plant.

KEYWORDS: Cultivation, Extract, Sennosides, Exportation, Adultration

HIGHLIGHTS

Economic Impact: Cassia angustifolia contributes significantly to India's economy with an annual production of about 7500 tons, grown across multiple states.
Medicinal Uses: The plant is valued for its laxative properties from sennosides and is also used to treat asthma, skin diseases, and leprosy, along with exhibiting antimicrobial, antifungal, and antidiabetic effects.
Nutritional Value: Senna leaves, seeds, and roots are rich in essential minerals like iron, zinc, calcium, and magnesium, along with fatty acids and triterpenes.
Research Insights: Extensive studies have highlighted senna's diverse bioactivities, including its potential against malaria, antibacterial, and antioxidant properties, with ongoing efforts to standardize its extracts.

Quality Challenges: Issues such as adulteration and quality control necessitate advanced analytical methods like NMR and UPLC-MS for accurate authentication and purity, highlighting the need for continued research and innovation.

INTRODUCTION

Grown for its leaves and immature pods, Cassia angustifolia, often known as Indian senna, is a plant used in laxatives. Tinevelly Senna (C. angustifolia) is grown in the Indian states of Gujarat, Rajasthan, Maharashtra, Telangana, Andhra Pradesh, and Tamilnadu. It can be grown in absolute wastelands and composting requires little water. It can be grown on sandy loam, red loam, and alluvial soils. The majority of the time, senna is grown as a rain-fed crop, being sown as a second crop on residual moisture at the end of the rainy season, which runs from the end of September. Most of the places where senna is grown, it is grown without growth. Fully-grown, bluish-colored leaves and immature, golden-yellow pods are manually peeled 90–100 days after seeding. After the initial harvest, another one is taken 30 to 45 days later. Per hector, 1.0 to 1.5 tons of leaves and roughly 300 kg of pods can be harvested under irrigation.

The range of export revenue is Rs. 35.0–36.0 crores. About 600 species of Cassia previously included species from Senna (Irwin and Turner, 1960).The amount of total anthraquinone glycosides present determines the laxative action. According to Morinaga et al. (2000), ennosides are among the most significant medicinal preparations derived from plants. C. mimosoides grows to a height of 1.5 meters and is a low- to medium-diffuse shrub that is found in open grasslands. Anthraquinones have reportedly been found in all of its sections. It has historically been used as a laxative to cure leprosy and other skin conditions (1995). It grows in open grasslands at low to medium elevations. Anthraquinones have reportedly been found in all of its sections. 15 carefully chosen species from three genera were examined morphologically and anatomically using their leaves.2016). There are numerous synonyms at the species level in the taxonomy of plants in the genera Cassia, Chamaecrista, and Senna. For accurate leaf identification, morphological and anatomical characteristics are helpful diagnostic characteristics.Useful diagnostic characteristics of the leaf for accurate identification are its morphological and anatomical characteristics.

Senna has various medical applications in addition to being used as a coffee substitute. Asthma is treated by brewing seeds into a beverage that resembles coffee**.** The plant Cassia angustifolia, or Indian senna, has 1.5%–3% dianthrone glycosides 63–69. Sennoside an and B, two glasslike glucosides, have been identified from the leaves and units. Cassia angustifolia, often known as Indian senna, is used as a laxative when its leaves are dried. When the stomach is bloated or extended, 1-2 grams of the leaf powder are taken with boiling water. To achieve a pleasing, delicately framed movement, the correct individual piece is all that is needed.

Figure 1. Parts of Senna plant

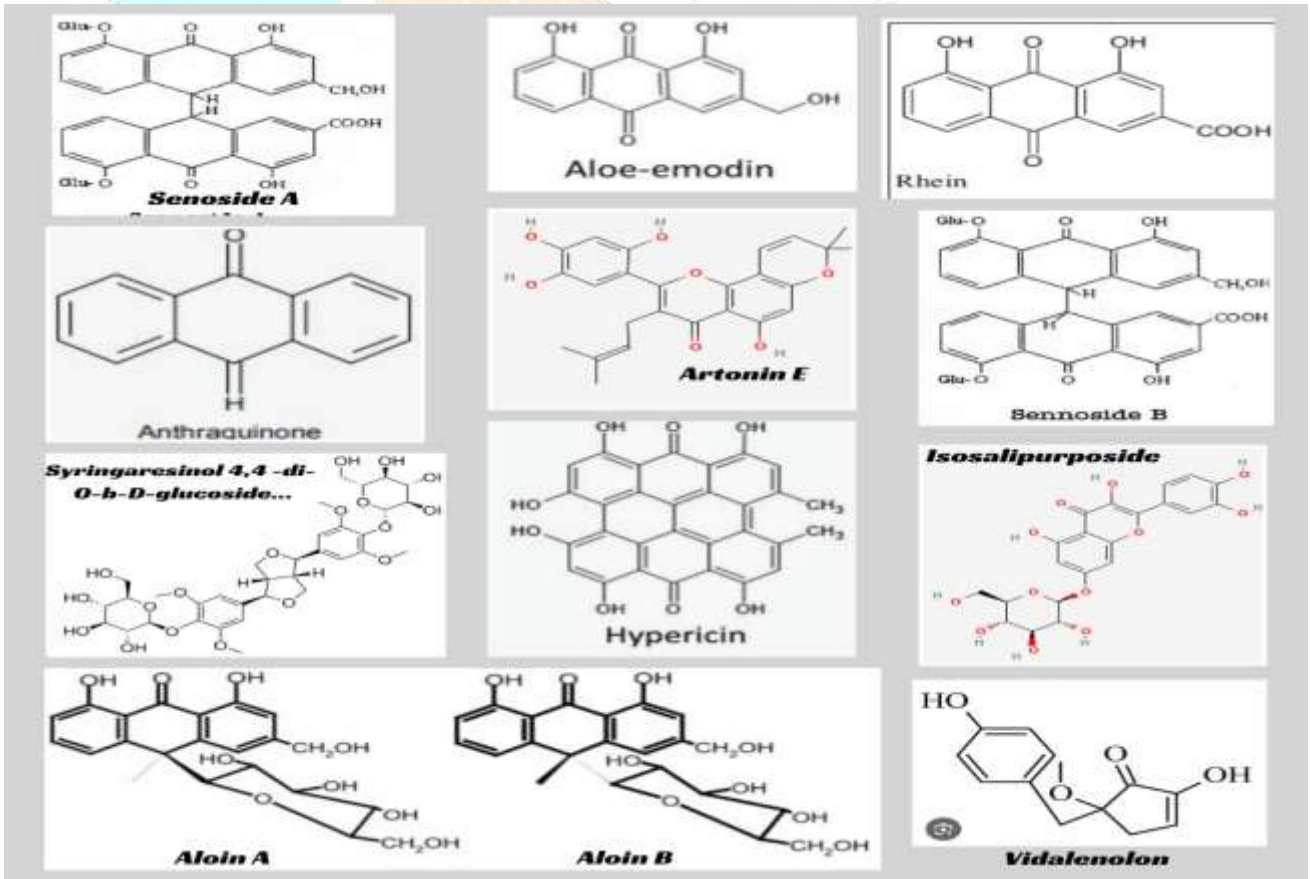

Figure2. Chemicals and their structures of Senna Plant

DERIVATIVES OF SENNA

The organic item 2-chloro-1,3,8-trihydroxy-6-methyl-10H-anthracen-9-one (2a), which shares structural similarities with emodin (1a) that was extracted from the Rheum palmatum L. Chinese medicine plant [17].The SAR analysis of anthrace-none and emodin anthraquinones, as well as the identification of strong ACL inhibitors and their in vitro anticancer properties, are discussed here. Furthermore, we demonstrate that small molecule ACL inhibitors lower the cancer stemness of lung and breast cancer for the first time. Three-dimensional spheroid tests. Lung cancer three-dimensional spheroid tests.

ROOT

NEUTRITIONAL COMPOSITION OF SENNA

Stomach aches can be relieved by combining oatmeal with the ash from the burned roots. While leaves are eaten as a vegetable, pods can be eaten either way. The elemental analysis result reveals that the plant components contain iron (Fe), zinc (Zn), copper, calcium (Ca), and magnesium (Mg) in varying amounts. The elements are vital to human and animal health and are widely used in chemotherapy, all within safe limits, according to W.H.O. (1996).

ISOLATION AND CHEMICAL STRUCTURE CHAEACTERISTIC OF A COMPOUND OF THE ROOT OF SENNA

While some senna species from Vanda, South Africa, are thought to have strong antibacterial properties. S.italica is recommended for the treatment of STIs in South Africa. Three chemical components found in the genus Senna are alkaloids, quinines, and antheraquinone, according to a review of the literature.

ANTIPLASMODIAL ACTIVITY OF ROOT

Plantae ivorensis Senna siamea (Lam) Irwin and Barneby's root (Fabaceae) and A. Chev (Combretaceae). Utilized as a malaria treatment (Burill, 1985; Chandan et al). Additionally, ulcers are treated with the herb (Chanda et al. 2011; Burkill 1985). Local name for Senna siamena, family Lageninosae, voucher specimen number GK05 portion utilized root, local name Zangara Ti. In many underdeveloped nations, using medicinal plants to cure diseases like malaria is a prevalent practice.

STEAM

ANALYSIS OF STEM BARK EXTRACT

In Southeast Asia and India, cassia alat is commonly utilized in traditional therapies. The leaves' ethyl acetate extract has hypoglycemic properties.

PHYTOCHEMICAL PROPRETY AND IN-VITRO ANTIFUNGAL ACTIVITY OF STEAM BARK:

These antibiotics have a number of very harmful side effects as well. An herbaceous plant, like S. alata L. Remedies for ringworm and other ailments include the use of stem bark. It is frequently found as a component in shampoos, conditioners, and lotions because of its antifungal properties. It's possible that the ethanolic extract has fungicidal qualities that cause cell death and lysis.

GAMBA LOCALITY

1] First plant species: Senna siamea (lam) Irvin; local name: Acassia; frequency of citation: % 53; mode of preparation: leaves Application mode for decoction; oral accession number: HNC,n 25661.
2] Species of plants in the Fabaceae family: Senna javanica and Cassia javanica; local names: Gamoye; frequency

of citation: 40; bark used as a preparation method: maceration; application method: oral accession number HNC.n 45 764.

LEAVES

Table 1. Acids fatty composition of Leaves of SENNA Singueana

Fatty acid	Fatty acid in %
16-octadecenoic acid, methyl ester	26.01
Pentadecenoic acid , Methyl ester	3.64
Tetracosanoic acid M.E.	970
Acid palmaceum M.E	1.515
Oleic acid M.E	1.986
Methyl ester of eicosanoic acid	4.17
Methyl ester of octacosanoic acid	.770
Acid stearic M.E.	5.330
Methyl ester of tricosanoic acid	.430
Acid behenic M.E.	3.06
Acid tricosanoic M.E.	1790

ANTIDIABETIC, ANTIHYPERLIPIDAEMIC AND ANTIOXIDANT ACTIVITY

Diabetes Around the world, traditional plant medicines are utilized to treat a variety of diabetes manifestations. Indian traditional medicines frequently employ Senna auriculata (L.) Roxb (Family: Fabaceae), and flowers are used to treat diabetes. Using flowers and leaves to cure skin conditions. Leaf juice is applied to lower body temperature. Cassia auriculate flower +AGNO3 – silvernanoparticles - invitro characterization of the silver nanoparticals and streptozotocin - acute toxicity studies and histology

STANDARDIZE SENNA ALATA LEAF EXTRACT

S. alata has been utilized as traditional medicine in numerous nations to treat skin conditions, ringworm, gastrointestinal discomfort, and constipation5, 6.The leaves of nine Cassiae species—were collected in the summer, winter, and rainy seasons from Central Thailand were examined by Gritsanapan et al. (2011) for their total anthraquinone glycoside content.

ANTIPALSMODIAL EFFECT OF LEAF EXTRACT

Previous studies have looked into a number of plants that are used to treat malaria infection. In Nigeria, S. alata leaves are frequently used to cure malaria in rural areas. Malaria has also been treated with D. tripetalla leaves, often known as pepper fruit, particularly in southeast Nigeria.Senna alata fresh leaves were purchased from the UNIPORT botanical garden on the University of Port Harcourt campus in Abuja. The levels of sennoside in native Senna plants were comparable to those of plants growing abroad (Babash et al., 1985). Sennoside A and Sennoside B are the glycosides that give senna its laxative properties; however, the plant has also been found to contain Sennosides C and D.

A variety of packaging materials and storage times were used for the Sennoside analysis. In leaves selected at 90%, 110%, and 130% DAS, respectively, the maximum contents of Sennoside A and B were 0.123 and 0.067%, 0.110 and 0.063%, and 0.113 and 0.064% in a black polythene bag.In order to obtain the highest concentration of Sennosides, it is advised that the senna leaves be picked ninety days after sowing. It was discovered that polyethylene bags, were the best packaging materials for storing Senna leaves.

The purpose of this work is to examine the theoretical understanding of structural activities and in vitro antibacterial characteristics of natural compounds extracted from S. alata as well as their synthesized

variants.characteristics seen in pharmaceuticals, such as antibacterial, antifungal, antimicrobial, anticancer, or antidiabetic effects. Secofrie-delane 5 were subjected to in vitro antibacterial testing against eight gram-positive and
bacteria strains that are negative. To calculate the bactericidal and bacteriostatic effects of the antibacterial activity, the ratio MBC/MIC was used.Senna alata air-dried leaf methanolic extract yielded six secondary metabolites.The three triterpenes exhibited good and moderate bactericidal effectiveness in in-vitro antibacterial tests.
And improved outcomes were shown for secofriedelane 5 and its di-methylated derivative (5a), however allyl groups were reported to reduce the antibacterial qualities.

IDENTIFICATION OF AUTHENTICITY OF MICROBES

The purpose of this study is the use of Alexandrian senna (leaves) in traditional medicine by examining its antibacterial activity .The antibacterial results of methanolic extract of Senna alexandrina showed a poor activity against isolated bacteria

MOSQUITOSIDAL ACTIVITY

Worldwide, traditional medicines employ Senna occidentalis (Caesalpiniaceae) as a pan-tropical plant species. This plant is widely spread throughout India, ranging from Jmmu and Kashmir to Kanyakumari, and it can be found up to 1500 meters above sea level (Khare 2007). Both plant extracts were tested for their ability to inhibit the malaria parasite P. falciparum's.

Figure 3. Phytochemicals Activity of Senna

FLOWER

ANTIOXIDANT AND ANTIBACTERIAL ACTIVITIES

The flower have antioxidant & antibacterial activity.

EXTRACT PREPARATION OF MICROBIAL ANALYSIS:

Each powdered sample was individually soaked in 100 mL of either distilled water or ethanol (99.7%) for extraction. The mixture was then well stirred using a magnetic stirrer and allowed to sit at room temperature for three hours. Following filtration, the residues were once more immersed in 100 milliliters of the solvent for a 12-hour reextraction.Under room atmospheric pressure, the resulting alcoholic filtrates were concentrated using a rotary vacuum 50 C. The semi-solid components of each crude extract were dissolved in the extraction solvent to create a stock solution of 100 mg/mL, which was then kept at 20 C until needed for the disk diffusion test. Kept cold until needed for the disk diffusion experiment.

FRUITS

EFFECT OF ASSIA SENNA FRUIT

Sennoside or senna glycosides are glucosides that are classified as active components in cassia and senna, along with derivatives of antheraquinone.Adulteration of herbal items may rise due to the increased demand for natural products. Among the therapeutic plants, chamaecrista, senna, and cassia are commonly used as laxatives in India and are exported widely as raw or processed herbal preparations. This may not be the case for other herbal species that are readily available, but it is clearly the case for some, including senna and cassia.

SEEDS

NEUTRITIONAL COMPOSITION OF SEEDS

Acidity of fat proportion of fatty acids (%)
Acid myrisolergic cis-10-Pentadecenoic M.E. 0950 M.E. 5060
Pentadecenoic M.E. 0940: Acid palmitoleic M.E. 2770
Acid palmaceum M.E. 1.515 Heptadecenoic Acid (Cis-10). M.E. 3230
Acid oleic M.E. 1.986
Acid elliadic 1.245 M.E. Arachidnoic acid M.E. 1.798

Element of Senna seed in Ppm Cu-0.1965, Fe-2.038, Mn-0.2272, Zn-0.1796, Ca-8.3620, and Mg-55.6

CLINICAI TRIL

Phytochemical Screening

The aqueous extract was subjected to various qualitative chemical assays using standard operating protocols to determine the contents, as outlined by Sofawara (1993), Trease and Evans (1989), Harborne (1973), and Edeoga (2005) [5]. According to conventional procedures, phytochemical analyses were performed on each extract [5], [9].

1. Alkaloids are found 2. The identification of carbs 3. Cardiac glycoside Detection 4. Saponin detection 5. Phytosterol detection 6. Phenol detection 7. Tannin detection 8. Flavonoid detection 9. Amino acid and protein detection 10. Anthocyanin Detection 11. Steroid Detection 12. Terpenoids Identification 13. Quinone Identification 14. Coumarin Detection 15. Triterpenoids were found 16. Lignin Detection.It demonstrates the existence of a wide range of phytochemicals, including water extracts by maceration, ethanol, methanol, acetone, hexane, alkaloids, flavonoids, quinones, saponins, and sterols.approach. Phytocompounds All five extracts lack anthocyanin, glycosides, and cardiac glycosides.The entire strategy of Sennauniflora's antimicrobial action Processing NMR data and PCA analysis.

Senna and unauthorized Senna differ significantly in their laxative effects, resemble one other physically, and are hard to tell apart using standard techniques. Thus, it is determined that a straightforward, quick, and precise technique for the analysis of Senna's active ingredients is required.utilizing NMR methods without first separating stage, as well as concurrently using hyphenated chromatographic UPLC-MS methods.

Our study set out to verify that the examined historical artifact was, in fact, senna extract and to look into potential deterioration of its main constituents. Senna needs to be shielded from light since sennosides are light-sensitive; if not, the light effect speeds up the isomeric formation of senno-side A to B in the nineteenth century. The components of the combination of sennoside A and sennoside B, the historical residue of senna extract, and the modern therapeutic ingredient of senna were identified.

Constipation is one of the main health issues. Acute or chronic versions affect about 25% of people in the West and 14% of urban Indians.Pakistan and India. Senna is a valuable crop with therapeutic significance mostly due to its cathartic properties and availability as a whole plant.The process of phytochemical extraction involves a number of extraction methods, including traditional methods.The findings demonstrated that MASE and UASE approaches might be a good substitute for traditional extraction methods.In addition to increasing the yield and quality, using these two strategies could save time and energy. The new HPLC method doesn't require complicated sample processing and is quick and easy to use. It was effectively used to estimate SB and SA. In senna-containing polyherbal laxative preparations.
Senna modifies electrolyte transport in the intestinal mucosa and raises intestinal motor activity.16 CKD patients who have constipation are dissatisfied with their treatment due to its ineffectiveness.The effectiveness of lactulose in treating constipation in pre-dialysis chronic kidney disease was examined in our study.
Techniques
Study Design, Study Population, Randomization and Intervention, Measurements of Outcomes, and Statistical Analysis study confirmed that among patients with CKD, senna husk was as beneficial as lactulose. During the study period, no notable adverse responses were noted in the senna and ispaghula husk group.
The active components of cassia and senna are glucosides known as sennosides or sennaglycosides and derivatives of anthraquinone [11].The adulteration of herbal goods may rise due to the increased demand for natural health products.Senna was gathered from various South Indian locales.Among the medicinal plants, Cassia, Senna, and Chamaecrista are commonly used as laxatives in India and exported widely as raw or processed herbal preparations.

CONCLUSION

Cassia angustifolia, or Indian senna, surpasses its role as a mere laxative. Its adaptability to diverse environments makes it invaluable for agriculture and medicine. While contributing significantly to India's economy, its medicinal properties extend to treating conditions like asthma and skin ailments. Research into various parts of the plant reveals diverse nutritional and pharmacological benefits, including antimicrobial and antifungal effects. Efforts to standardize senna extracts and synthesize its compounds offer promising avenues for pharmaceutical development. Despite challenges in quality assurance, senna's efficacy in treating gastrointestinal disorders underscores its relevance in modern medicine. Overall, ongoing exploration promises further insights into this versatile botanical resource.

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AUTHOR CONTRIBUTION

Chavan SD*, Girigosavi AS, Gosavi GB collected the data, involved in original draft preparation, and designed the study. The final editing was done by Prof. Abhijit Shitole and also supervised the work. All authors read and approved the final version of the manuscript

CONFLICTS OF INTEREST

The author declare that they have no competing interests

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