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Research Article

**PHYTHO CHEMICAL CONSTITUENTS AND THEIR
BIOLOGICAL ASPECTS OF SENNA AURICULATA****Dr. Vustelamuri Padmavathi**Assistant Professor in Chemistry, Neil Gogte Institute of Technology, Kachavanisingaram,
Uppal, Hyderabad-500088, Telangana, padma1202@gmail.com**Abstract:**

*In our tradition, natural medicines are believed to strengthen the inner immune system of the human body without adverse effects. Hence, herbal drugs are believed to act more effectively than modern medicines. We selected S.auriculata because of its high medicinal value in traditional Indian systems of medicine, such as Ayurveda and Siddha. It is a legume tree belongs to the family fabaceae . It is commonly known by its native names **matura tea tree, ranawara or avaram**, (Kannada (avarike), Telugu(tamgeḍu,) Tamil (avarai) or the English version **avaram senna**.The Cassia auriculata (Tangedu) is Telangana state flower, which has huge traditional uses beside numerous diseases. It is also used for the treatment of fever, urinary tract disorders, rheumatism, conjunctivitis, ulcers and liver disease. This plant is said to contain a cardiac glucoside (sennapicrin) and sap, leaves and bark to yield anthraquinones, tannins. The root is used in decoctions against fevers, diabetes, diseases of urinary system and constipation. The leaves have laxative properties. The dried flowers and flower buds are used as a substitute for tea in case of diabetes patients. It is also believed to improve the complexion in women. The powdered seed is also applied to the eye, in case of chronic purulent conjunctivitis. In Africa the bark and seeds are said to give relief in rheumatism, eye diseases, gonorrhoea, diabetes and gout. Unripe fruit are used for treatment, especially in Ayurveda and Siddha medicine.*

Key Words: *Senna auriculata, Phyto chemical constituents, biological aspects.***Corresponding Author:****Dr. Vustelamuri Padmavathi**Assistant Professor in Chemistry,
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INTRODUCTION:

Plants produce a wide variety of phytochemical constituents, which are secondary metabolites and are used either directly or indirectly in the pharmaceutical industry. For centuries, man has effectively used various components of plant extracts from the treatment of many diseases, including bacterial infections. In the present study reveals the presence of phytochemicals and their biological activities of *Senna auriculata*. Plants are considered not only as dietary supplement to living organisms but also traditionally used for treating many health problems and the medicinal value of many plants still remains unexplored investigations in to plants are carried out to find novel drugs or templates for the development of new therapeutic agents [1,2]. Over 60% of the world human population, 80% in developing countries depends directly on plants for their medicinal purposes. Plant parts used for the treatment of diabetes, rheumatism, asthma, and skin diseases in the Ayurvedic system of traditional Indian medicine [3-7].

PLANT HISTORY:

Senna auriculata (L.) Roxb.

Synonyms: Cassia auriculata L., Cassia densistipulata

Burmese : Peikthingat

Chinese : Er ye jue ming.

English : Avaram senna, Matara tea, Styptic weed,

Tanners'cassia, Tarwar (India).

French : Avaram.

Hindi : Tarwar.

Portuguese : Avul .

Sanskrit: Aavartaki, Aadaari

Unani: Tarwar

Tamil : Avarai, Avaram,

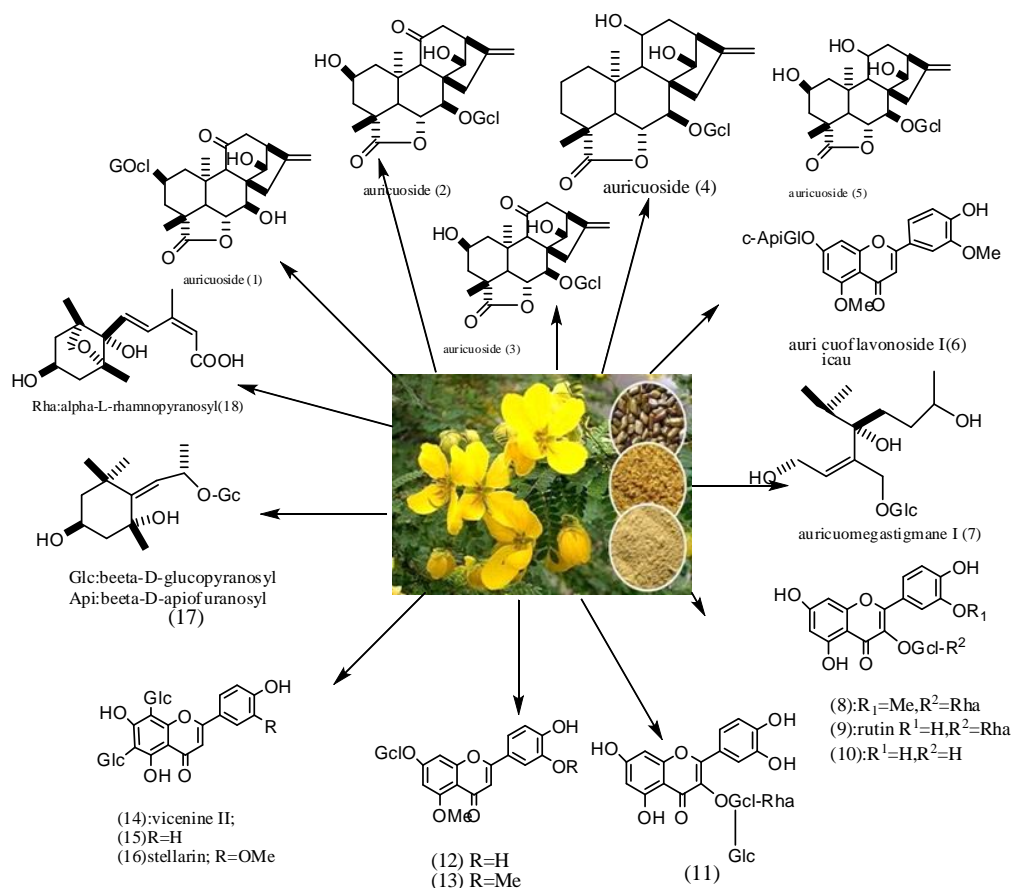
Telugu : Tangedu,

TREADITIONAL USESE:

Senna auriculata is a multipurpose plant. The bark can be used for tanning heavy hides and goat and sheep skins, giving a buff-coloured leather of good quality, which tends to darken to black-red on exposure to light. To prevent this darkening the leather is often finished by a tannage using myrobalans from *Terminalia chebula* Retz. In

southern India the flowers are used as a fast yellow dye for leather. In Gujarat the flower buds are used in the galling process prior to dyeing cotton cloth and chintzes red, pink or purple with madder roots (*Rubia cordifolia* L.). Boiled seeds are an important ingredient in indigo vats, where specific bacterial fermentation ensures the reduction of insoluble indigo into the soluble leuco-indigo, allowing textile fibers to be impregnated by the dye solution. The seeds of *Senna auriculata* serve as a source of sugars to keep the fermentation process going.

Branches are used as chewing sticks and toothbrushes. The bark fiber can be made into rope, and a fermented mixture of pounded bark and dissolved molasses serves as an alcoholic beverage in some parts of India. *Senna auriculata* does not reach a volume adequate for timber, but sometimes handles of small tools are made from the wood. It is used for revegetating erodible soils and as a green manure, and has also proved very effective in reclaiming sodic soils which have been dressed with gypsum. The leaves are sometimes used to make tea, dried flowers serve as a coffee substitute, and in times of food scarcity the young tender pods, young leaves and flowers are eaten as a vegetable. The quantity eaten is critical since *Senna auriculata* is considered not well suited as fodder for goats and cattle because of the poisonous substances in the plant. The stem bark is used in India to stupefy fish. Uses in traditional medicine are numerous. The roots and bark are astringent and are used for gargles, as an alternative, and to cure skin diseases, eye troubles and rheumatism. A decoction of the flowers and the seeds is recommended for diabetes, seeds are used to cure eye diseases, gonorrhoea and gout. In Tanzania the plant is used to treat impotence, which may be related to diabetes. Leaves and fruits serve as an anthelmintic and diuretic. Sometimes *Senna auriculata* is cultivated as an ornamental. A most curious use of *Senna auriculata* is reported from India. It is believed that branches were formerly used in the fabrication of wootz Damascus steel. They were added to the crucible and heated with the ore to obtain the chemical composition that gave the steel its beautiful patterning.

CHEMICAL CONSTITUENTS FROM THE SEEDS OF *SENNA AURICULATA*Fig.1: CHEMICAL CONSTITUENTS FROM THE SEEDS OF *SENNA AURICULATA*

auricuosides I (1), II (2), III (3), IV (4), V (5)⁸, auricuoflavonoside I (6) [8], and a new megastigmane glycoside, auricuomegastigmane I (7) [8], together with isorhamnetin-3-O-rutinoside (8)⁹, rutin (9) [9], quercetin 3-O-b-D-glucopyranoside (10) [9], quercetin 3-O-b-D-glucopyranosyl (1,2) [α-L-rhamnopyranosyl(1,6)β-D-glucopyranoside (11) [10], 5-methoxyluteolin 7-O-b-D-glucopyranoside (12) [11], 7,4'-dihydroxy-5,3'-dimethoxyflavone 7-O-b-D-glucopyranoside (13)¹², vicenin II (14)¹³, apigenin 6, 8-Cdiglucoside, 19 lucenin II (15) [14], stellarin 2 (16) [15], (3S, 5R, 9S)-megastigma-6, 7-dien-3, 5, 9-triol 9-O-b-D-glucopyranoside (17) [16], 5-[(1R, 3R, 5R, 8S)-3, 8-dihydroxy-1,5-dimethyl-6-

oxabicyclo [3,2,1]oct-8yl]-3-methyl-(2Z,4E)-2,4-pentadienoic acid [17], and adenosine [17].

BIOLOGICAL ACTIVITIES OF *SENNA AURICULATA*:

The plant has been reported to possess Anticancer [18], Antibacterial [19], Bronchorelaxant effect [20], Antidiabetic [21], Anti fungal [22], Choleric effect [23], Antioxidant [24], Antimicrobial [25], Anti-inflammatory [26], Wound healing [27], Anticorrosion activity [28], Anticryptococcus activity [29], Skin infections [30], Antimalarial [31], Antimutagenic [32], Anticancer [33], Antiallergic [34], Antigenotoxic effect [35], Analgesic activity [36], Insecticidal [37] and Hypoprotective [38].

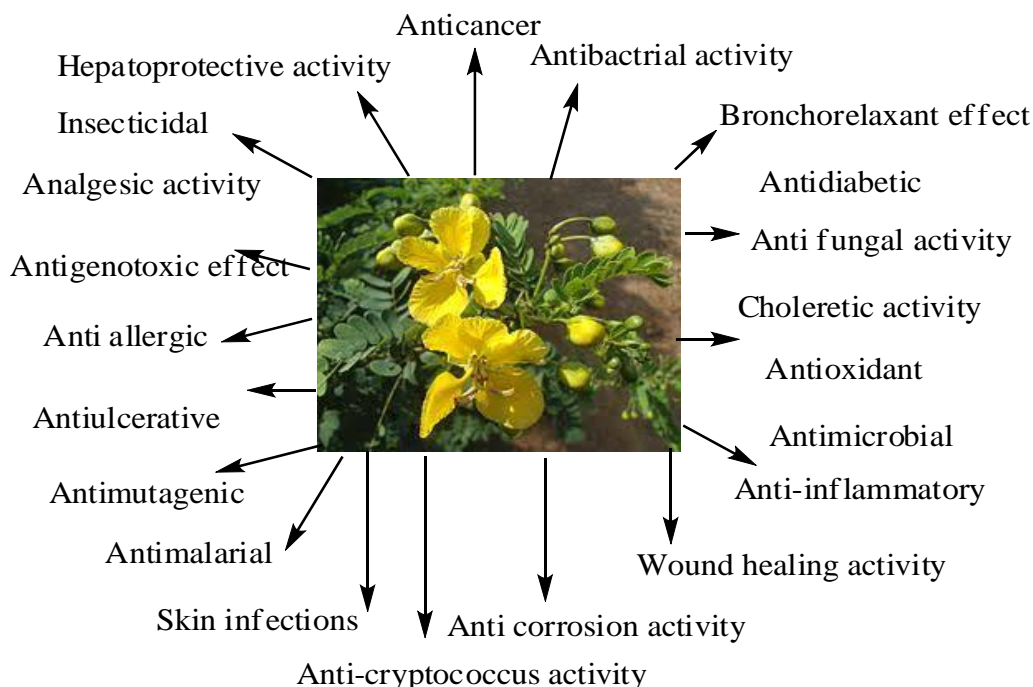


Fig.2 : Biological activities of senna auriculata

CONCLUSION:

Nature has been a powerful source of powerful medicines for thousands of years and number of modern drugs has been extracted and exploited from natural sources, for its use in traditional medicine. Traditional herbal medicines have a long history of use and are generally considered to be safer than synthetic drugs. Over 50% of all modern clinical drugs are natural products that play an important role in drug development in pharmaceutical industries. Basing on this Literature survey senna auriculata seeds and leaves were rich sources of loids,phenols, glycosides, tannins, saponins, proteins, carbohydrates, flavonols, flavanol dimers, fatty acids and anthraquinone, *To the best of our knowledge, there is no report about the Chemical constituents and their biological activities of Senna auriculata Flowers, Leaves, Stem bark and root bark, so our aim and future work on senna auriculata plant parts .Already we have proved that Semicarpus anacardium L.f is a rich source of Essential fatty acids, biflavonoids, bhavanol and triacylglycerides in our laboratory*³⁹⁻⁵⁰.

REFERENCES:

- 1.Perumal S.R and Ignacimuthu S. Antibacterial activity of some folklore medicinal plants used by tribes in Western chats of India. J. Ethanopharmacol. 2000; 69:63-71.
- 2.WHO. WHO traditional medicine strategy 2002-2005. WHO, Geneva, 2002
- 3.Bandawane, D. D.; Beautikumari, S.; Gate, S. S.; Patel, A. N. Biomed Aging Pathol. 2014, 4, 105–115.
- 4.Habtemariam, S. Phytother. Res. 2013, 27, 152–155.
- 5.Abesundara, K. J. M.; Matsui, T.; Matsumoto, K. J. Agric. Food Chem. **2004**, 52, 2541–2545.
- 6.Thabrew, M. I.; Munasinghe, T. M. J.; Senarath, S.; Yapa, R. M. S. C. DrugMetabol. Drug Interact. **2004**, 20, 263–272.
- 7.Pari, L.; Latha, M. Singapore Med. J. **2002**, 43, 617–621.
- 8.Yi Zhanga,b, Seikou Nakamuraa, Souichi Nakashimaa,c, Tao Wangab, Chemical stuctures of Constituents from seeds of Cassia auriculata, Tetrahedron, 2015,1-19.
- 9.Chaurasia, N.; Wichtl, M. Planta Medica **1987**, 53, 432–434.
- 10.Aquino, R.; Behar, I.; D'Agostino, M.; De Simone, F.; Dini, A.; Pizza, C.Essenze Deriv. Agrum. **1987**, 57,51–57.
- 11.Mansour, R. M. A.; Zahran, M. A.; Saleh, N. A. M. Egypt. J. Bot. **1989**, 29–30,161–166.
- 12.Ozawa, T.; Sakuta, H.; Negishi, O.; Kajiura, I. Biosci. Biotechnol. Biochem.**1995**, 59, 2244–2246.

- 13.Sato, S.; Akiya, T.; Nishizawa, H.; Suzuki, T. Carbohydr. Res. **2006**, 341,964–970.
- 14.Rao, K. V.; Damu, A. G.; Jayaprakasam, B.; Gunasekar, D. Indian J. Nat.Prod. **1998**, 14, 20–22.
- 15.Bouillant, M. L.; Ferreres de Arce, F.; Favre-Bonvin, J.; Chopin, J.; Zoll, A.;Mathieu, G. Phytochemistry, **1979**, 18, 1043–1047.
- 16.Yamano, Y.; Watanabe, Y.; Watanabe, N.; Ito, M. J. Chem. Soc. Perkin Trans.1 **2002**, 2833–2844.
- 17.Zeevaart, J. A. D.; Milborrow, Barry V. Phytochemistry, **1976**, 15, 493–500.
- 18.Salah W N et al. Polyphenolic flavonoids as scavenger of aqueous phase radicals and chain breaking antioxidants. Arch. Biochem 1995; 2: 239-346.
- 19.SupriyaDeshpande et al. Antimicrobial activity of Saponins rich fraction of *Cassia auriculata* Linn against various microbial strains.International Current Pharmaceutical Journal 2013; 2(4): 85-7.
- 20.Ouédraogo M et al. Evaluation of the Bronchorelaxant, Genotoxic and Antigenotoxic Effects of *Cassia alata* L. Evidence-Based Complementary and Alternative Medicine 2013;11.
- 21.Venkatachalam M et al. PTP 1B inhibitory action of a phytochemical propanoic acid,2-(3-acetoxy-4,4,14-trimethylandro-8-en-17-yl)current science 2013; 105(6):827.
- 22.SouwalakPhongpaichit,NongyaoPujenjob, VatcharinRukachaisirikul and MettaOngsakul. Antifungal activity from leaf extracts of *Cassia alata* L, *Cassia fistula* L. and *Cassia tora*L. Songklanakarin J. Sci. Technol 2004, 26(5):741-8.
- 23.Djipa et al. Antimicrobial activity of bark extract of *Syzygiumjambos* (Myrtaceae). Journal of Ethnopharmacol 2000; 71(1-2):307–13.
- 24.Thambidurai M et al. In-vitro anti-oxidant and anti-microbial study on *cassia auriculatalinn*. International Journal of Pharma and BioSciences 2010;1(2):327-30.
- 25.SupriyaDeshpande et al. Antimicrobial activity of Saponins rich fraction of *Cassia auriculata* Linn against various microbial strains.International Current Pharmaceutical Journal 2013; 2(4): 85-7
- 26.Antiinflammatory activity of Heat-treated *Cassia alata* Leaf extract and its flavonoid glycoside 2001; 121: 817-20.
- 27.Meenakshi et al. Antimicrobial Wound Healing and Antioxidant Activity of *Plagiochasma Appendiculum*LehmLind. Journal of Ethnopharmacology 2006; 107: 275-89.
- 28.Sirajunnisaa A et al. Green Approach To Corrosion Inhibition of Aluminium By *Sennaauriculata* Leaves Extract In 1 N NaOH Solution .International Journal of Science Engineering and Advance Technology 2014;2(1)23-31.
- 29.Sirajunnisaa A et al. Green Approach To Corrosion Inhibition of Aluminium By *Sennaauriculata* Leaves Extract In 1 N NaOH Solution .International Journal of Science Engineering and Advance Technology 2014;2(1)23-31.
- 30.Moriyama H et al. Antiinflammatory activity of Heat-treated *Cassia alata* Leaf extract and its flavonoid glycoside 2001; 121: 817-20.
- 31.Vieira R F and Skorupa L A Brazilian medicinal plants gene bank ActaHort1993;330: 51-58.
- 32.Indira S and Lakshmi M .Antibacterial activity of *Cassia auriculatalinn* against some pathogens isolated from wound.International Journal of Chemical and Pharmaceutical Sciences 2013; 4(2):74-7
- 33.Mohammed Fazil Ahmed et al. Anti-ulcer activity of *cassia auriculata* leaf extract Pharmacognosy 2010; 2(16) 53–7.
- 34.Somchit M W.et al. Journal of Ethnopharmacology2003; 84:1-4.
- 35.Indira S and Lakshmi M .Antibacterial activity of *Cassia auriculatalinn* against some pathogens isolated from wound.International Journal of Chemical and Pharmaceutical Sciences 2013;4(2):74-7.
- 36.Irene M. Villaseñor et al. Bioactivity studies on *Cassia alata*Linn. leaf extracts. Phytotherapy 2002; 16(S1):93-6.
- 37.Ravi Kant upadhyay et al. Toxic effects of solvent and aqueous extracts of *Cassia alata* against biomolecules and enzymatic parameters of *Callosobruchuschinensis* L. (Coleoptera: Bruchidae:). Advances in Applied Science Research 2011; 2 (2): 367-81.
- 38.Varghese GK et al. Antidiabetic components of *Cassia alata* leaves: identification through α -glucosidase inhibition studies. Pharm Biol 2013; 51(3):345-9.
- 39.Padmavathi. V & Kesava Rao. B*. Proceedings on “FT-IR Studies in Designing and Discovering the Potent molecules as drugs From *Semecarpus anacardium* L.f “, 2013, [DDD-2013], Kolhapur, ISBN: 978-93-5126-349-4, RA-1, (pp 14- 17).
- 40.Padmavathi .V and Kesava R.B *New dimensions in isolation, anti Inflammatory, Antimicrobial, multimetal analysis of *Semecarpus anacardium* L.f Stem barks. Proceedings of International Conference on New Dimensions in Chemistry and Chemical Technologies-Applications in

- Pharma Industry, NDCST-2014, Jun 23-25, 2014, ISBN 978-93-82829-90-4, 422-427.
41. Padmavathi V & Kesava Rao. B*, "Naturally Occurring Biflavonoids from *Semecarpus anacardium* L.f and Their Biological Activities", Proceedings of Andhra Pradesh Academy of Sciences (APAS), Special Issue in Bioactives from Natural Products, 2014, 16, 1, 39-43.
42. Padmavathi V & Kesava Rao. B* Proceedings on Chemical Constituents From Methanolic extract of *Semecarpus anacardium* L.f Flowering Buds, Antimicrobial Activity, Anticancer Activity and their Docking Studies Indian Youth Science Congress, 2015, Jan 19-21, ANU Campus. Which has got Young Scientist Award in this conference.
43. Padmavathi V & Kesava R. B*, Trend Setting Innovations of Biflavonoids from *Semecarpus anacardium* L.f of Docking studies and Biological activities in Pharma Industry, Proceedings in International Conference on Trend setting Innovations in Chemical Sciences and Technology- Applications in Pharma Industry (TSCST-API, JNTUH), 2015, October 16-18, ISBN 978-93-82829- 48- 5, pp 384-388
44. Padmavathi V & Kesava Rao. B*, Physico chemical Properties of *Semecarpus anacardium* L.f Seed Oil, Proceedings of International Conference on Trend Setting Innovations in Chemical Sciences and Technology, JNTUH, Hyderabad, 2016, October 4-6, OP 3, ISBN 978-93-82829-14-0, Pp-224-231.
45. Padmavathi V¹, Kesava R. B^{1*}, Noboru Motohashi², Sridhara Janardhan³ Narahari Sastry G³, "Comparative and Computer Assisted Drug Designing of Fatty Acids Isolated From Flowers, Leaves, Stem bark, Root bark and Nuts of *Semecarpus anacardium* L.f (Anacardiaceae)." Journal of Pharmacy and Pharmacology 2, 582-591, 2014, USA ISSN: 2328-2150.
46. Padmavathi V and Kesava R. B*, "Correlation between Metal Ions and Organic Compounds from *Semecarpus anacardium* L.f., Their Biological Aspects and Docking Studies". International Journal of Recent Scientific Research, Netherland, 2016, 7, 12, 14952-14959.
47. Padmavathi V, Kesava R. B*, Fatty acid Composition of Bhallataka Oil and Their Biological Properties, International Journal of Pharma and Biosciences, Advisory Editors, Nigera, Sweden, 2017, 8(3), 81-92.
48. Jagan Mohan R.S, Padmavathi V, Kesava R. B* and Noboru Motohashi, Text Book on Occurrences, Structure, Biosynthesis and Health Benefits Based on their Evidences of Medicinal Phytochemicals in Vegetables and Fruits"— "Cardenolides and Relates of Mainly Calotropis gigantea and C. Procera in the Family Asclepiadacea" Nova Biomedical, New York, 2015, Vol 4, Chapter-4, pp 109- 180.
49. Padmavathi V and Kesava Rao B*, Special Chapter in the Text Book on Heterocyclic Compounds and Biological Applications, Science PG (Science Publishing Group, "Heterocyclic Compounds and their Biological Applications of *Semecarpus anacardium* L.f, Science Publisher, USA, 2018, ISBN 978-1-940366- 76-0, Book Chapter Number 1202, (In press).
50. Padmavathi V and Kesava Rao B*, Nature Inspired Chemical Constituents and their Pharmacological activities of *Semecarpus anacardium* L.f (Anacardiaceae family), Nova Biomedical, New York, 2018 (In Press).