JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Phytochemical constituents and pharmacological aspects of Cassia auriculata.

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Abstract: Because of their effectiveness, safety, and lack of adverse effects, Herbel formulations are much sought after for primary healthcare in the developed world. Because *Cassia auriculata* has a great therapeutic significance in traditional Indian medical systems like Ayurveda and Siddha, that is why we chose it. This tree is a legume and is a member of the *fabaceae* family. A wide variety of bioactive substances, including alkaloids, sugars, proteins, flavonoids, phenols, reducing sugars, steroids, and tannins, have been discovered in Cassia auriculata extract. Numerous pharmacological actions, including antibacterial, antidiabetic, antioxidant, anti-inflammatory, antihyperlipidemic, anticancer, antiulcer, antipyretic, anthelmintic, and immunomodulatory properties, are exhibited by the extracts from its various parts and their isolated components. The goal of this review is to provide a comprehensive and current overview of the phytochemical and pharmacological aspects of Plant.

Keyword: Cassia auriculata, Phytochemical constituents, Pharmacological activity.

Introduction:

In the current world, herbal remedies have become more significant primarily because they are safer and more effective than synthetic medication [1]. New safe, renewable, and biodegradable medications can be made from plants. Plants have long been used not only as food but also as medicinal agents. Despite the fact that early humans used plants for therapeutic purposes lack justifications from science [2]. Both demand and popularity for herbal remedies are growing daily. The World Health Organization (WHO) promotes and advises the use of herbal medicines in the treatment of a variety of illnesses. This resulted in the beginning of specific ongoing research to create effective standardized extracts and separate fresh lead components of plants. But insufficient quality assurance and Standardization has made it more difficult for herbal therapies to be accepted in the industrialized nations. Herbal remedies have the potential to pollution and deterioration that could result in differences in their active ingredients that diminish the effectiveness of treatment [3].

The medicinal plant *Cassia auriculata L*, also referred to as *"Tanner's Cassia"* (Family: *Caesalpiniaceae*), is widely distributed throughout India.[4]. Traditionally, leprosy, diabetes, liver disorders, jaundice, and ulcers have all been treated with Cassia auriculata leaves.[5]. It also has antispasmodic, antipyretic, and antiviral properties [6].

Morphology: [7]

The Avaram tree, or Cassia auriculata Linn, belongs to the Caesalpiniaceae family. Its leaves are a paripinnate compound that alternates and stipulates. incredibly numerous, densely packed, 8.8–12.5 cm long rachis, thin, pubescent, slightly wrinkled, and possessing an erect leaflets 16-linear gland between each pair of leaflets 24-short stalks measuring 2-2.5 cm in length and 1-1.3 cm in width, oval, oblong, obtuse, and slightly overlapping at both ends, mucronate, dull green, glabrous or minutely downy, paler below, large, reniform-rotund stipules

Created at the base on the side of the subsequent petiole, a filliform precise and tenacious.

Its pedicels are 2.5 cm long, glabrous, and have irregular, bisexual, bright yellow flowers that are almost 5 cm across. The racemes are short, upright, with few flowers. densely packed in the upper leaf axils to create a big terminal inflorescence, in which all leaves—aside from stipules—are inhibited at the higher nodes). There are five distinct sepals. glabrous, concave, membrane-like, uneven, and imbricate the two outer ones being significantly bigger than the inner ones. The petals, number five as well, are crisped, free, and imbricate. orange-veined bright yellow veining along the edge. The tenth anther is distinct and has three upper. The ovary is superior and unilocular, with barren stamens. ovules marginale.

The fruit is a short legume that is 1.5 cm wide, 7.5–11 cm long, oblong, and obtuse. It is also flat, thin, papery, crimpled undulatingly, pilose, and pale brown. At the tip is a long style base. Each fruit has 12–20 seeds, each of which is carried in its separate cavity [8].

Phytoconstituents of *Cassia auriculata:*

Secondary metabolites or Phytoconstituents are the compounds which are responsible for a particular therapeutic activity. There are several such compounds isolated from the different morphological parts of the plant which shows several pharmacological activities.

Seed:

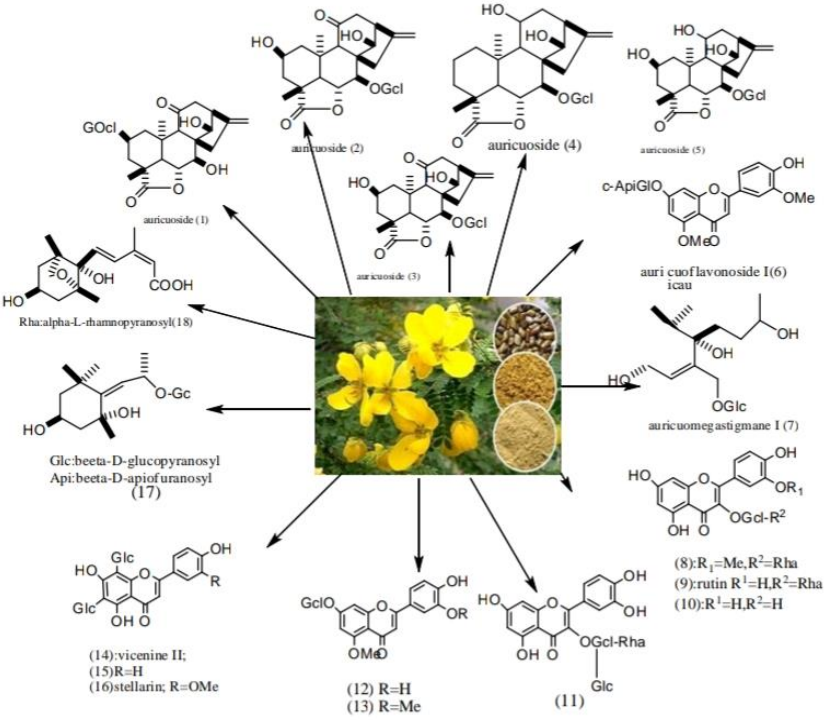

Fig.1: CHEMICAL CONSTITUENTS FROM THE SEEDS OF *SENNA AURICULATA*

auricuosides I ,II , III , IV , V [9]auricuoflavonoside I [9], and a new megastigmane glycoside, auricuomegastigmane I [9], together with isorhamnetin-3-O-rutinoside [9] rutin [10], quercetin 3-O-b-glucopyranoside [10],quercetin 3-O-b-D-glucopyranosyl (1,2) [a-L-rhamnopyranosyl b-D-glucopyranoside[11], 5-methoxyluteolin 7-O-b-D-glucopyranoside [12],7,4'-dihydroxy-5,3'-dimethoxyflavone 7-O-b-D-glucopyranoside[13], vicenin II [14] apigenin 6, 8-Cdiglucoside),19 lucenin II [15], stellarin 2 [16], (3S, 5R, 9S)-megastigma-6, 7-dien-3, 5, 9-triol 9-O-b-D-glucopyranoside [17], 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 [18],and adenosine [18]

Leaves:

Twenty-nine compounds were identified in the leaves of C. auriculata. The main constituents are 3-O-Methyl-dglucose (48.50%), α- Tocopherol-β-D-mannoside (14.22%), Resorcinol (11.80%), n-Hexadecanoic acid (3.21%), 13-Octadecenal, (Z) - (2.18%) and 1, 2, 3, 4-Tetrahydroisoquinolin-6-ol-1-carboxylic acid (1.98%)[19].

Flower:

The CAFMET showed the significant amount of flavonoids and phenols, followed by tannin, terpenoids, alkaloids, carbohydrates and steroids [20]

Pharmacological Activity:

Antibacterial Aspects

Leaves from Cassia auriculata exhibited antibacterial activity against Vibrio cholorae and Staphylococcus aureus C in methanol extract. [21]

potential inhibitory action against bacterial strains (Staphlococcus aureus, Bacillus subtilis, Pseudomonas aeruginosa) and fungal strains (Candida albicans, Candida tropicalis, and Aspergillus niger)[22]

Fresh flower methanol extract demonstrated an inhibition zone against Proteus mirabilis and Staphylococcus aureus [23].

The extract of the flowers and leaves also revealed the antimicrobial efficaciousness towards Extended Spectrum Beta E. Coli that produces lactamase (ESBL)[24]

The Antidiabetic Aspect

At 200 mg/kg, C. auriculata leaf extract significantly reduced blood sugar levels in both healthy and animals given alloxan to induce diabetes [25]. Aqueous cassia extract auriculata at 400 mg/kg demonstrated a notable decrease glycosylated hemoglobin (GHb) and FBG in Rats given streptozotocin showed improved antihyperglycemic effects. glibenclamide [26] in comparison to methanol extract alpha glucosidase inhibitory (AGH) was the strongest. activity [27] and the floral butanol fraction are having action against hyperglycemia [28]. one potential way that Cassia auriculata flower extract (CFEt) reduces blood sugar levels is by enhancing the effects of insulin secreted by the pancreas from islet β-cells or as a result of

improved blood glucose delivery to peripheral tissues. That is unmistakably demonstrated by the higher insulin levels in diabetics rats given (CFEt) treatment [29]Additionally, CFEt raises the overall insulin binding sites on erythrocyte receptor membranes with a simultaneous rise in insulin plasma [30]

Antioxidant aspect

The cassia auriculata leaf and flower methanolic extract exhibits antioxidant activity
With auriculata being the most active among them, typical rutin, ascorbic acid, and leaves and flowers
being the least active antioxidant [31].Cassie auriculataFlower buds methanolic extract showed increased levels of quercetin, the flavonoid with the highest dietary content[32].

Anti-inflammatory Aspect

Cassia auriculata flowers and leaves in methanolic extract (MECA) [33] demonstrated strong anti-inflammatory effects in animal models, both acute and chronic [34].. Also, it was observed that C. auriculata flower 50% acetone extract demonstrated pronounced anti-inflammatory effects in carrageenin caused rats' oedema [35]
The presence was what caused the effect. 5-O-methylquercetin 7-O-glucoside, a flavonol glycoside and the steroid and tannin found in the leaves and flowers.

antihyperlipidemic effect

C. auriculata ethanolic extract showed hypotriglyceridemic and hypocholesterolemic effects, while
raised the HDL rat concentrations. But it turned out to be more efficient in lowering TG and LDL levels as in contrast to how it affects TC and HDL.30 The. Direct lipase may have the antihyperlipidemic effect. inhibition of the kaempferol-3-O-containing plant constituents luteolin, rutinoside, rutin, kaempferol, and quercetin [36]High NADP+ is produced by C. auriculata aqueous extract. which lowers and causes lipogenesis to be downregulated. the stress caused by oxygen. Lipid peroxidation was reduced. connected to anti-atherosity and naturally existing Antioxidants found in food have an antiatherogenic effect. scavenge without free radicals and superoxide anions, which prevent lipid peroxidation and demonstrating benefits against hyperlipidemia [37]

Anticancer Aspect

The compound 4-(4-chlorobenzyl)-2,3,4,5,6,7-hexahydroEthoxyphenyl -7 benzo[h]8(1H)-triazecinone molecule was identified in a leaf of Cassia auriculata. 50% inhibition of the ethanolic extract within 48 hours development of colon cancer cells in humans[38].Leaf extracts, both fresh and dry, contain flavonoids. plant, but it isn't present in seed extracts. Theirs is a polyphenolic compounds possess anti-cancer properties. [39]

Anti-ulcer Aspect

Comparing the anti-ulcer activity of cassia auriculata leaf methanolic extract with the Famotidine is a standard drug [40].These actions by MECA are ascribed to flavonoids and tannins.

Antipyretic Aspect

It is known that C. auriculata leaf and flower extracts in hexane, chloroform, ethyl acetate, acetone, and methanol exhibit strong resistance to the fourth-instar larvae of the malarial agent Anopheles stephensi and the vector of filariasis [41] C. quinquefasciatus.. Also, the leaf extract revealed promising efficaciousness against the strain of Falciparum plasmodium [42]and flower methanol extract demonstrated antiplasmodial action [43].

Immunomodulator Property

Cassia auriculata flower-derived polyphenols strengthen T cell immunity by boosting T cell counts and their reduced ROS generation and sensitivity to stimulants by neutrophils that might endanger several biological systems in elderly people [44]

CONCLUSION :

It was discovered from the current review that the plant has a number of therapeutic uses. Its antibacterial, antidiabetic, antioxidant, anti-inflammatory, antihyperlipidemic, anticancer, antiulcer, antipyretic, anthelmintic, and immunomodulatory qualities have been demonstrated; therefore, further research is required to fully understand these benefits. potential in the pharmaceutical and medical fields sciences for practical and profitable uses.

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