Phytochemical Screening of Tanner's Cassia

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ABSTRACT

Plants are rich source of effective and safe medicines. Herbal medicines have been main source of primary healthcare in many nations. Medicines derived from plants are widely famous due to their safety, easy availability, and low cost. *Cassia auriculata*, commonly called Tanner's Cassia, Avaram Senna, or Matura Tea Tree, is a shrub found in India and Sri Lanka belonging to the Cucurbitaceae family. It is found in India, Sri Lanka, Ethiopia, and Western Malaysia. It is used in Ayurvedic and Siddha medicine to treat diabetes, skin diseases, and eye disorders. The results obtained showed that methanolic extract of *Cassia auriculata* flowers have interesting pharmacological active compounds such as alkaloids, flavonoids, saponins, tannins, phenolic compounds, glycosides, and steroids could be used in ethnomedicine for treatment of several infections and ailments.

KEYWORDS: *Cassia auriculata*, Herbal medicines, Phytochemicals, Methanol

INTRODUCTION

Natural products from plants, animals and minerals are the basis for treating human diseases [1]. Phytotherapy is the science that deals with the treatment and prevention of diseases through medicinal plants and herbal products [2]. Medicinal plants represent the most ancient form of medication, used for thousands of years in traditional medicine in many countries around the world. Medicinal plants are presently in demand and their acceptance is increasing progressively [3]. Medicinal plants have been transformed into one of the oldest sciences in countries such as China, Greece, Egypt, and India. currently, a number of modern drugs which are derived from traditional herbal medicine are used in modern pharmacotherapy [4]. Currently, in addition to more traditional techniques, modern extraction methods are being utilized, such as ultrasound-assisted and supercritical fluid extraction methods [5]. The development of advanced tools for the qualitative and quantitative assessment of phytochemicals, such as high-performance liquid chromatography and liquid chromatography/mass spectrometry, significantly improve phytochemical investigation [6]. Many scientific reports show that crude extracts and extensive numbers of phytochemical constituents isolated from *Cassia auriculata* have activities like antimicrobial, antioxidant, anticancer, gastroprotective, anti-inflammatory and various other important medicinal properties. The flowers *Cassia auriculata* are known for their antioxidant and liver-protective properties. The leaves and seeds help regulate blood sugar levels. Avaram Senna flower tea is a popular herbal drink that helps in detoxification. The dried flowers and leaves are used in face packs for glowing skin. The bark and pods are used in leather tanning, hence the name "Tanner's Cassia." It is a drought-resistant plant commonly used for soil conservation. The Plant profile, organoleptic characters, macroscopic and microscopic features of *Cassia auriculata* shown in table 1-4.

Fig 1: *Cassia auriculata* flower

Table 1: Plant profile of *Cassia auriculata*

Species	*Cassia auriculata*
Kingdom	Plantae
Subkingdom	Tracheobionata
Super division	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Rosidae
Order	Fabales
Family	Fabaceae

Table 2: Organoleptic characters

Taste	Bitter and astringent
Smell	Slightly sweet and earthy
Colour	Flowers of Cassia auriculata are bright yellow in colour, while the pods are brownish-black.
Texture	Leaves of Cassia auriculata are smooth and thin, while the pods are flat and smooth.
Shape	Leaves of Cassia auriculata are pinnate and oblong, while the flowers are small and round.
Size	Leaves of Cassia auriculata are about 4-6 cm long, while the flowers are about 1-1.5 cm in diameter

Appearance	Plant has a bushy appearance, with a small to medium-sized tree with a straight trunk and a spreading crown
Overall sensory profile	Overall sensory profile of Cassia auriculata is bitter and astringent, with a slightly sweet and earthy aroma.

Table 3: Macroscopic features

Nature	*Cassia auriculata* is a small to medium-sized tree, growing up to 10-15 meters in height.
Leaves	The leaves of *Cassia auriculata* are compound, alternate and pinnate. They are about 4-6 cm long and have 4-6 pairs of leaflets. The leaflets are oblong and about 1.5-2 cm long.
Flowers	The flowers of *Cassia auriculata* are yellow and have five petals. They are about 1-1.5 cm in diameter and are arranged in axillary racemes.
Fruits	The fruits of *Cassia auriculata* are long, flat, and brownish-black pods. They are about 7-15 cm long and contain several seeds
Bark	The bark of *Cassia auriculata* is dark brown and rough with vertical cracks

Table 4: Microscopic features

Leaf	*Cassia auriculata* has a single layer of epidermal cells with thick cuticles. The mesophyll consists of two layers of palisade cells and two to three layers of spongy parenchyma cells. The vascular bundles are collateral and open.
Flower	*Cassia auriculata* has five sepals and five petals. The petal contains a single layer of epidermal cells with stomata, followed by a layer of mesophyll consisting of two to three layers of parenchyma cells.
Stem	Stem of *Cassia auriculata* has an outer layer of epidermal cells, followed by a cortex consisting of collenchyma and parenchyma cells. The vascular bundles are scattered throughout the stem.

Root	*Cassia auriculata* has an outer layer of epidermal cells with root hairs. The cortex consists of parenchyma cells, while the central region consists of many xylem and phloem vessels.
Seed	Seed of *Cassia auriculata* has a thick outer seed coat with a single layer of epidermal cells. The endosperm consists of two to three layers of cells, while the embryo consists of cotyledons and the embryonic axis.

MATERIALS AND METHODS

Collection and extraction of plant material

Fresh flowers of *Cassia auriculata* were collected from the local areas, Namakkal, Tamilnadu. They were washed under the running flashing of tap water and then with distilled water three times, shaded, dried, and then powdered with the help of blender. Weigh 45gm of *Cassia auriculata* flower powder was extracted with 80% aqueous methanol at 55˚C using Soxhlet apparatus [7-9] by hot percolation method. The soluble part was concentrated over water bath maintained below 60˚C and dried in a vacuum oven to obtain free flowing reddish-brown colour.

Fig 2: Collection of Fresh flowers of *Cassia auriculata* under shade dry

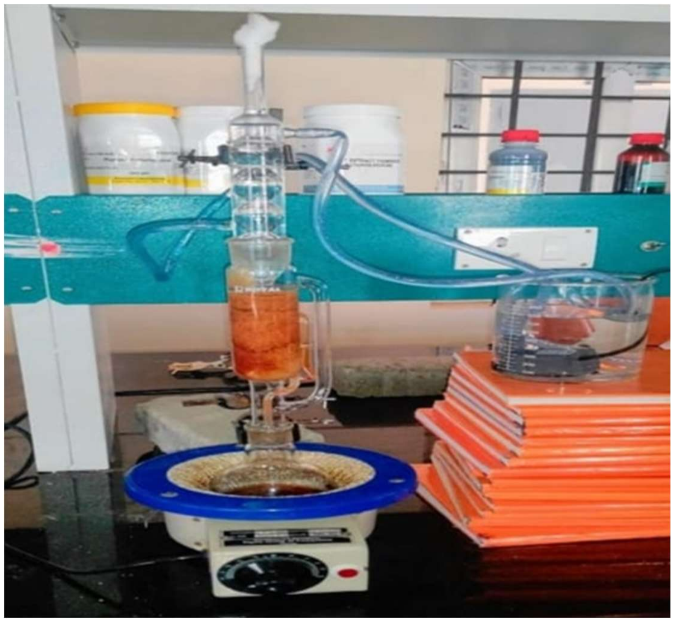

Fig 2: Extraction process of flowers of *Cassia auriculata* by using Soxhlet apparatus

Phytochemical screening

The extract was subjected to qualitative chemical analysis for the detection of various phytochemical constituents [10, 11] viz., flavonoids, carbohydrates, tannins, saponins, steroids, phenols, proteins, alkaloids and terpenoids using standard procedure. [12-18]

RESULTS

Preliminary Phytochemical screening of *Cassia auriculata*. revealed the presence of following phytoconstituents shown in table 2.

Table 2: Phytochemical constituents present in *Cassia auriculata*

S.NO	Test	Methanolic extract of *Cassia auriculata*
1.	Carbohydrates	+
2.	Alkaloids	+

3.	Flavonoids	+
4.	Saponins	+
5.	Tannins	+
6.	Terpenoids	+
7.	Amino acids	+
8.	Glycosides	+
9.	Steroids	+

(-) indicates the absence of compounds; (+) indicates the presence of compounds

CONCLUSION

Medicinal plants are a rich source of bioactive phytochemicals or bionutrients. The quality of herbal medicines is believed to be directly related to its active principles. Studies carried out during the past 2–3 decades have shown that these phytochemicals have an important role in preventing chronic diseases like cancer, diabetes, and coronary heart disease. The major classes of phytochemicals with disease-preventing functions are dietary fibre, antioxidants, anticancer, detoxifying agents, immunity-potentiating agents and neuropharmacological agents. The *Cassia auriculata* has many traditional as well as potential uses and has some medicinal properties to cure various diseases. The phytoconstituents present in *Cassia auriculata* are alkaloids, flavonoids, saponins, tannins, phenolic compounds, glycosides, and steroids is provided to help further studies discover chemicals critical for therapeutic usage. However, more pharmacological research is necessary to assess the safety, efficacy, and optimal dosage of *Cassia auriculata* phytochemicals.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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