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Qualitative Phytochemical Screening of Leaf and Flower Extract of *Senna auriculata* (L.) Roxb. – A Natural Antidiabetic Plant

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A B S T R A C T

Medical practitioners in Ayurveda use herbal plants extensively for their medicinal potential. The medicinal plant Sennaauriculata L. Roxb. (Tamil: Aavarai) belongs to the Caesalpinioideae family. The primary goal of this work was to identify phytochemical elements in S. auriculata leaves and flowers. Using the Soxhlet apparatus, shade dried plant materials were extracted with petroleum ether, chloroform, and methanol until the solvents decolorized. Standard methods were used to screen for phytochemicals, which revealed the presence of alkaloids, flavonoids, terpenoids, steroids, tannin, phenols, and saponins. To assess their pharmacological potential and identify the structures of the bioactive chemicals responsible for their activities, more research with these plants is required.

Keywords: Medicinal plants, *Senna auriculata, Cassia auriculata,*, Secondary metabolites, Alkaloids, Antirheumatic

1. Introduction

Even among those who have access to western care, the number of people who use complementary or alternative medicine is growing over the world1. Plants with therapeutic properties are becoming increasingly popular in both homoeopathic and allopathic medicine. These medicinal herbs have important public health implications, and their therapeutic qualities do not cause intoxication2, 3. Medicinal herbs are mostly made up of flavonoids, tannins, glycosides, anthraquinones, steroids, antimicrobial, and antioxidant natural compounds, among other things. Medicinal herbs are a valuable source of compounds that have a wide range of physiological effects in humans and can be used to treat a variety of ailments4. Many of the plant components utilized in traditional medicine are abundantly available in rural regions and cost significantly less than modern treatments. Plants produce a vast range of bioactive compounds, making them an important source of many pharmaceuticals. Natural or semi-synthetic versions of natural substances make up the majority of drugs used in traditional medicine today5. Sennaauriculata L. Roxb. (Family: Caesalpiniaceae), often known as Tanners Senna, is found across India's hot deciduous forests and is revered in Ayurveda and Siddha medicine7, 8. Antipyretic, hepatoprotective, antidiabetic, antiperoxidative, antihyperglycemic, and microbicidal properties have been identified for the plant. Urinary discharges, nocturnal emissions, hyperglycemia, and throat discomfort are all treated with the flowers8, 9. The primary goal of this study was to look into the preliminary phytochemicals of S. auriculata leaf and flower extracts.

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1.1. Plant Description

Sennaauriculata L. Roxb. (Cassia auriculata L.) is a legume shrub that belongs to the Caesalpinioideae subfamily of the Fabaceae family. Tanner's Cassia, Avaramsenna, Ranwara, Avaram, and Tarwar are some of the other names for it. It is a perennial plant that grows 30 to 60 cm tall. The stem is sturdy and strong, with multiple branches and a brown tint. The leaves are yellowish-green in color, complex and stipulated. The plant produces a massive golden bloom. The fruit, which is a legume, contains seven to ten seeds. Tanner's Cassia gets its name from its bark, which is one among the most valuable tannin-containing Indian tans.

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2. Materials and Methods

2.1. Plant material selection and extracts

Sennaauriculata (L.) Roxb. (Fig. 1) leaves and flowers were gathered from the Coleroon Riverbank in Kumbakonam, Tamil Nadu, India. The plants were identified and deposited in the Department of Botany at Kumbakonam's Government Arts College (Autonomous). The plant components were shade dried for one week before being pulverized for further research. 100g of powdered C. auriculata leaves and flowers were extracted using a soxhlet extractor with 250 ml petroleum ether, chloroform, and Methanol, and the extracts were kept at 4°C in an airtight container for future analysis.

2.1.1. Analysis of alkaloids

A fraction of the extract was treated with 3-5 drops of Wagner's reagent (1.27g iodine and 2g potassium iodide in 100 ml water) and the formation of a reddish brown precipitate was noticed (or coloration).

2.1.2. Analysis of flavonoids

In this experiment, 2 mL of extracts were treated with a few drops of a 20% sodium hydroxide solution. The presence of flavonoids is indicated by the formation of a bright yellow color that fades to colorlessness when dilute hydrochloric acid is added

2.1.3. Analysis of terpenoids

In each extract, 1 ml chloroform was added to 2 ml, followed by a few drops of concentrated H2SO4. The presence of terpenoids was quickly identified by a reddish brown precipitate.

2.1.4. Analysis of phenols

A portion of the extracts were treated with aqueous 5% ferric chloride and the production of a deep blue or black color was seen .

2.1.5. Analysis of tannin

In this experiment, 2 mL of extract was treated with a 10% alcoholic ferric chloride solution and the production of a blue or greenish color solution was noticed.

2.1.6. Analysis of steroids

The extracts were treated with 5 mL chloroform and an equal volume of concentrated H2SO4 along the edges of the test tubes, resulting in a yellowish green color that indicated the presence of steroids.

2.1.7. Analysis of saponins

In a test tube with 2 ml of extracts, 6 ml of water was added. The combination was forcefully agitated, and the presence of saponins was confirmed by the production of persistent froth.

3. Result and Discussion

In the present study, leaf and flower extracts of *S. auriculata* was analysed for the phytochemical constituents using petroleum ether, chloroform and methanol extracts. The presence of alkaloids, flavonoids, terpenoids, phenols, tannins, steroids and saponins was determined (Table. 1). The alkaloids are present in all the extract of leaf and flower of *S. auriculata* except petroleum ether extract. In, flavonoids are present in methanolic leaf extract and petroleum ether and methnolic flower extract. Terpenoids are present in petroleum ether and methanolic extract of leaves and flowers of *S. auriculata*. Phenols are present in all the extracts, except chloroform extract of leaf and flower of *S. auriculata*. Tannins are present in methanolic leaf extract and also chloroform and methanolic extract of *S. auriculata*. Steroids are present in petroleum ether and methnolic flower extracts of *S. auriculata*. While steroids are absent in all the leaf extracts. Saponins are recorded at leaves (petroleum ether and methanolic extract) and flowers (only on petroleum ether) of *S. auriculata*. Similar results were found in *A. indica*[10], *Croton bonplandianus*[11],*Phylanodiflora*[4]and *P. amarus*[12]. Alkaloids have great potential to anti-malaria, anti-inflammatory and antimicrobial activities[13]. The flavonoids are naturally occurring large group of phenolic compounds and found in root, stem, leaves, flowers, barks, grains, vegetables and fruits[14]. The steroids compounds are used to stress relive, decrease cholesterol level, induce immune system and increase memory power[15]. The saponins served as natural antibiotics and heterogeneous group of natural products occur in many medicinal plants[16].

4. Conclusion

The phytochemical elements found in medicinal plants have the potential to be a source of valuable medications for improving human health. Phytochemical surveys are increasingly used as the first stage in the search for effective medications. The current study paves the path for additional investigation into the isolation and identification of active compounds from chosen plants utilising chromatographic and spectroscopic techniques

Fig 1. Habit of *Senna auriculata*

Table 1: Preliminary Phytochemical Screening of *Senna auriculata*

S. No.	Phytochemicals	Leaves			Flowers		
		PE	C	M	PE	C	M
1	Alkaloids	-	+	+	-	+	+
2	Flavonoids	-	-	+	+	-	+
3	Terpenoids	+	-	+	+	-	+
4	Phenols	+	+	+	+	-	+
5	Tannins	-	-	+	-	+	+
6	Steroids	-	-	-	+	-	+
7	Saponins	+	-	+	+	-	-

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