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Phytochemical investigation of *Boswellia serrata* plant

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Abstract

Boswellia serrata plant was collected from Pachmarhi district Hoshangabad Madhya Pradesh. The methanolic extracts of leaves and flowers of *Boswellia serrata* have exhibited significant broad spectrum antimicrobial activity. Further work is being carried out to isolate and identify the active constituents of the plant responsible for antimicrobial activity. The purpose of our research was methanolic extract of the plant was qualitatively investigated for phytochemicals using standard procedures which revealed the presence of various important bioactive chemical entities.

Key words: bioactive, phytochemicals, *Boswellia serrata*.

Introduction

Traditional medicines for human diseases have been widely used in many parts of the world. Herbal plants are usually the primary source of medicine in many developing countries. Natural product compounds from plants provide biologically active compounds.

Boswellia serrata (Family: Burseraceae) is a deciduous middle sized tree, which is mostly concentrated in tropical; parts of Asia and Africa. In India it occurs in dry hilly forests of Rajasthan, Madhya Pradesh, Gujarat, Bihar, Assam, Orissa as well as central peninsular regions of Andhra Pradesh,

Assam etc. *B. serrata* gum resin has been reported to have analgesic, anti-inflammatory, antiarthritic and anti-pyretic activity.

Materials and Method

The plant used in the study was collected from Pachmarhi district Hoshangabad Madhya Pradesh. The collected plant materials were cleaned, shade dried, powdered coarsely in a blender and then stored in air-tight containers for further use.

Preparation of extracts :

A known weight (25 g) of the powdered plant

part was extracted with 70% methanol for 30 hours in a Soxhlet apparatus. The obtained extracts were then filtered to remove residual parts of the precipitate. It was then evaporated at room temperature to get a crude dried extract. The dried extracts were weighed to determine the yield. It was stored in a deep freezer at -20°C to prevent the loss of biological activity until used.

Preliminary qualitative phytochemical investigation:

Qualitative phytochemical analysis of the methanolic extract was carried out using standard procedures to identify alkaloids (Mayer's test), steroids and terpenoids (Lieberman-Burchard and Salkowski tests), cardiac glycosides (Keller-Kiliani test), saponins (foam test), flavonoids (Shinoda test), tannins and phenols (Ferric chloride test).

Test	Experiment	Observation	Inference
Keller-Kiliani test.	4 ml of each extract was mixed with 2 ml of glacial acetic acid and a drop of ferric chloride solution. Concentrated sulphuric acid was added along the sides of the test tube	Reddish brown colour at the junction of two liquids and bluish green on upper layer	Presence of cardiac glycosides.
Test	Experiment	Observation	Inference
Ferric chloride test	150 mg of the powdered plant samples were boiled in 8 ml of water and then filtered. A few drops of freshly prepared 0.2% ferric chloride were added to 4 ml of the filtrate.	Appearance of a blue-black colour	presence of tannins
Test	Experiment	Observation	Inference
Liebermann-Burchard's test	4 ml of acetic anhydride was added to 1 ml of ethanolic solution of each extract and acidified with 4 ml of concentrated sulphuric acid.	colour change from violet to blue or green	Presence of steroids.
Test	Experiment	Observation	Inference
Salkowski's test	6 ml of each extract was mixed with 3 ml of chloroform. To this mixture, 4ml of concentrated sulphuric acid was carefully added along the sides of the test tube.	A reddish brown band in the chloroform layer	Presence of terpenoids.
Test	Experiment	Observation	Inference
Mayer's reagent test	1 ml of the extract solution, 4 drops of dilute hydrochloric acid and 0.5 ml of potassium iodide solution were added.	cream precipitate	Presence of alkaloids.

Test	Experiment	Observation	Inference
Shinoda's test	In a test tube, 10mg of the extract was dissolved in 1ml of ethanol, to which 5 drops of dilute hydrochloric acid and 0.5 mg of magnesium turnings were added.	The formation of pink, reddish pink or brown colour	presence of flavonoids
Test	Experiment	Observation	Inference
foam test	About 150 mg of the powdered sample was boiled with 8 ml of distilled water and filtered. 1 ml of the filtrate was mixed with 6 ml of distilled water and shaken vigorously till frothing.	Formation of stable persistent foam	presence of saponins

Result and discussion

The curative properties of medicinal plant are due to the presence of various secondary metabolites. Thus, the preliminary investigation tests may be useful in the detection of the bioactive principles and subsequently may lead to drug discovery and development. The result of the phytochemical investigation of methanolic extract of the plant parts is given in Table.

The phytochemical investigation of methanolic extract of the leaves and flowers of *B. serrata* revealed the presence of cardiac glycosides, saponins, flavonoids, tannins and phenols. Terpenoids and alkaloids have been reported in the stem bark extract of *B. serrata* in addition to the above phytochemicals.

Table - Phytochemical investigation of methanolic extracts of plant parts

Secondary metabolites	Methanolic extract of the plant parts	
	<i>Boswellia serrata</i> (leaves)	<i>Boswellia serrata</i> (flowers)
Glycosides	+	+
Tannins and phenols	+	+
Steroids	+	+
Alkaloids	+	+
Flavonoids	+	+
Saponins	+	+

Conclusion

The phenolic compounds are very important plant constituents. Because, they exhibit antioxidant activity by inactivating lipid free radicals.

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