

A comparative Phytochemical studies on the leaf of Swertiachirata and Zizyphusmauritiana leaf extracts.

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Abstract

Swertiachirata is a genus in the gentian family and Zizyphusmauritiana is also known as Indian jujube is a tropical plant belonging to family Rhamnaceae. Both these plants have widespread use in traditional medicines for the treatment of malaria, loss of appetite, cancer, diabetes, wound healing, antioxidant etc.

Objective: Phytochemical Chemical Analysis of leaf extracts of Swertiachirata and Zizyphusmauritiana was carried which shows the presence of various active constituents like carbohydrates, alkaloids, glycosides, in this work a comparative phytochemical study was carried on both the leaf extracts.

Materials: Leaf extracts of both the plants were prepared by using Soxhlet extraction method using ethanol and evaporated. The crude extract obtained was subjected to various phytochemical using several reagents.

Results:Phytochemical screening of both the extracts shows the presence of various active constituents like alkaloids,glycosides,flavonoids,saponins,carbohydrates ,proteins,steroids and tannins.

Conclusion:This studies shows both these plants shows a number of active constituents responsible for treatment of various kinds of ailments.

Keywords: Chemicalconstituents,phytochemistry,active constituents

Introduction

Our country has a vast knowledge base of Ayurveda whose potential is only being realized in the recent years. However, the drug delivery system used for administering the herbal medicine to the patient is traditional and out-of-date, resulting in reduced efficacy of the drug.. Herbs are staging a comeback, herbal ‘renaissance’ is happening all over the globe and more and more people are taking note of herbal therapies to treat various kinds of ailments in place of mainstream medicine. There are three main reasons for the popularity of herbal medicines:

- There is a growing concern over the reliance and safety of drugs and surgery.
- Modern medicine is failing to effectively treat many of the most common health conditions.
- Many natural measures are being shown to produce better results than drugs or surgery without the side effects^{2,3}.

Also there is increasing evidence that many current drug therapies simply suppress symptoms and ignore the underlying disease processes. In contrast, many natural products appear to address the cause of many diseases and yield superior clinical results. Unfortunately, most physicians and patients are not aware that these natural alternatives exist. Some drugs have an optimum concentration range within which maximum benefit is derived, and concentrations above or below this range can be toxic or produce no therapeutic benefit at all⁴.

Additionally, after the approbation made by WHO on diabetes mellitus, exploration on hyperglycemic agents from medicinal plants has become more significant. India being diabetic capital of the world is in a need to develop some new and reliable herbal potent dosage forms, because of the health complications and side effects of the synthetic diabetic compounds.

Medicinal herbs have been of use for thousands of years in one form or another under the indigenous systems of medicine like Ayurveda, Siddha and Unani. Since independence in 1947, Most of the biologically active constituents of plants are polar or water soluble molecules⁹⁻¹¹.

In this we are studying a comparative phytochemical studies of two plant drug having antidiabetic activity namely Swertiachirata and Zizyphusmauritiana.

Plant Profile

Swertiachirata:

- Hindi Name:Chirayata
- Family:Gentianacece
- Unani Name:Chirata
- AyurvedicName:Kiratatikta

Swertiachirata(Gentianaceae), a popular medicinal herb indigenous to the temperateHimalayas is used in traditional medicine to treat numerous ailments such asliver disorders, malaria, and diabetes and are reported to have a wide spectrumof pharmacological properties. Its medicinal usage is well-documented in Indianpharmaceutical codex, the British, and the American pharmacopeias and in differenttraditional medicine such as the Ayurveda, Unani, Siddha, and other conventionalmedical systems¹⁸

Zizyphusmauritiana:

- *Family:Rhamnaceae*
- Hindi Name:Ber
- Sanskrit Name:Badri

Ziziphus mauritiana (Rhamnaceae) used as a folk remedy for a long time for several ailments and diseases. The leaves of the plant have shown a hypoglycemic effect

Comparative Phytochemical studies of Swertiachirata and Zizyphus mauritiana

❖ Phytochemical screening of plant extract.

The crude extract obtained by solvent extraction was subjected to various qualitative tests to detect the presence of common chemical constituents as: alkaloid, glycoside, carbohydrate, phytosterol, saponin, tannin, flavonoid and protein etc.

Tests for Alkaloids

Dragendorff's test

In the pipette 1 ml of extract and 1 ml of Dragendorff's reagent (potassium bismuth iodide solution) was added. An orange-red precipitate were appeared which indicated the presence of alkaloids.

Mayer's test

In the pipette 1 ml of extract and 1 ml of Mayer's reagent (Potassium mercuric iodide solution) were added. Whitish yellow or cream colored precipitate indicated the presence of alkaloids.

Wagner's test

In the pipette 1 ml of extract and 1 ml of wagner's reagent (Iodine potassium iodide solution) were added. Reddish brown precipitate indicated the presence of alkaloids.

Tests for Glycosides

Killer-killani test

Dissolved 2 ml of extract in Glacial acetic acid and then added one drop of 5% FeCl₃ and conc. H₂SO₄. Reddish brown color appeared at the junction of the two liquid layers and upper appeared bluish green indicated the presence of glycosides.

Baljet's test

To 1ml of the test extract, 1ml of sodium picrate solution was added and the yellow to orange color revealed the presence of glycoside.

Foam test

0.5gm extract vigorously shaken with water than formation of a layer of foam. It's indicated the presence of glycosides

Tests for Carbohydrate

Benedict's test

To 5ml of Benedict's reagent, 1ml of extract solution was added and boiled for 2 minutes and cooled. Formation of red precipitate indicated the presence of sugars.

Molisch's test

A small fraction of extract was taken in ethanol separately and a few drops of 20% w/v solution of α -naphthol in ethanol (90%) were added to it. After shaking well, about 1 ml of concentrated sulphuric acid was allowed to flow carefully by the side of the test tube. A reddish violet ring at the junction of the two layers indicated the presence of carbohydrates.

Fehling's test

Extract heated with dil. HCL than neutralized with NaOH than added fehling's solution A & B. Brick red precipitate was formed. It's indicated the presence of carbohydrates.

Tests for Steroids

Salkowski test

The extract was dissolved in chloroform and equal volume of conc. H_2SO_4 was added. Formation of bluish red to cherry color in chloroform layer and green fluorescence in the acid layer represents the steroidal components in the tested extract.

Liebermann-Burchard test

A small portion from extract was taken with about 1 ml of acetic anhydride and dissolved by warming. The contents were cooled and a few drops of concentrated sulphuric acid were added in each case by the sides of the test tube. Appearance of blue colour indicated the presence of sterols.

Test for Proteins

Biuret test

Add 1ml of 40% sodium hydroxide solution and 2 drops of 1% $CuSO_4$ solution till a blue color is produced, and then add to the 1ml of the extract. Formation of pinkish or purple violet color indicates the presence of proteins.

Tests for Saponins

Froth test

A little fraction of extract was boiled with about 1 ml of distilled water and shaken. Appearance of a characteristic foam formation indicated the presence of Saponins. Aqueous and alcoholic extract were tested directly.

Foam test

A little fraction of extract was taken with about 2 ml of distilled water. A small quantity of sodium carbonate was added to each and shaken. The characteristic foam formation indicated the presence of Saponins. Aqueous and alcoholic extract were tested directly.

Test for Phenolic Compounds and Tannins

- i) Take the little quantity of test extract and mixed with basic lead acetate solution. Formation of white precipitates indicates the presence of tannins.
- ii) To 1 ml of the extract, add ferric chloride solution, formation of a dark blue or greenish black colour product shows the presence of tannins.
- iii) The little quantity of test extract is treated with potassium ferric cyanide and ammonia solution. A deep red colour indicates the presence of tannins.
- iv) To the test extract, add strong Potassium dichromate solution, a yellow colour precipitate indicates the presence of tannins and phenolics.

Tests for Flavonoids

Shinoda test

To the test solution add few magnesium turnings and concentrated hydrochloric acid drop wise, pink scarlet, crimson red or occasionally green to blue colour appears after few minutes.

Alkaline reagent test

To the test solution add few drops of sodium hydroxide solution, intense yellow color is formed which turns to colorless on addition of few drops of dilute acid indicate presence of Flavonoids.

Lead acetate Test

Extract was treated with few drops of lead acetate solution. Formation of yellow colour precipitate indicates the presence of flavonoids.

Results and Conclusion

❖ Phytochemical analysis of Swertiachirata

S.NO.	Identification Test	Test name	Present	Absent
1	Alkaloids	Mayer's test	+	
		Dragendorff's test	+	
		Wagner's test	+	
2	Glycosides	Killer-killani test		-
		Baljet test		
		Foam test	+	
3	Carbohydrates	Molisch's test		
		Fehling test	+	
		Benedict test		
4	Tannins	Vanillin-HCL test		
		Lead acetate test	+	
		Ferric chloride test		
5	Flavonoids	Lead acetated test		-
		Shinoda test		
		Alkaline reagent test		-
6	Steroids	Libermamm-Burchard test		
		Salkowski test		-
7	Protein and amino acid	Biuret test		
9	Saponins	Froth test	+	
		Foam test	+	

❖ Phytochemical analysis of Zizipusmauritiana

S.NO.	Identification Test	Test name	Present	Absent
1	Alkaloids	Mayer's test	+	
		Dragendorff's test	+	
		Wagner's test		
2	Glycosides	Killer-killani test	+	
		Baljet test		
		Foam test	+	
3	Carbohydrates	Molisch's test		
		Fehling test		-
		Benedict test		-
4	Tannins	Vanillin-HCL test		
		Gelatin test		
		Ferric chloride test	+	
5	Flavonoids	Lead acetated test		
		Shinoda test		
		Alkaline reagent test	+	
6	Steroids	Liebermann-Burchard test		
		Salkowski test		
7	Protein and amino acid	Biuret test		-
		Precipitation test		
		Xanthoproteic test		
8	Resins	Colour detection with ferric chloride		
		Turbidity test		
9	Saponins	Froth test	+	
		Foam test	+	

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