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Phytochemical screening of *Sarcostemma acidum* W. & Ar.

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Abstract

Plants offer a large range of natural compounds belonging to different molecular families which have various properties to humans. These molecules possess interesting biological activities which attracted several researchers to their elucidation to provide knowledge that will lead to advancement medicine. The present paper deals with the screening of various phytochemical present in various extract viz., Aqueous, Ethanolic , chloroform and petroleum ether of *Sarcostemma acidum* Wight. & Arn.

Keywords: *Sarcostemma acidum,* phytochemical screening, ethanolic extract

Introduction

The use of medicinal plants as raw materials in the production of new drugs is ever increasing because of their potentials in combating the problem of drug resistance in micro-organisms. Demand for medicinal plants is increasing in both developing and developed countries. Research on medicinal plants is one of the leading areas of research globally[1-2]. However, there is a need to pay closer attention to the issue of bioactivity-safety evaluation of medicinal plants. Sarcostemma species like acidum(Asclapiadacea) commonly know as soma and somlata is a leafless ,trailing Shrub. *Sarcostemma acidum* Wight. & Arn. is a folk medicinal plant and it contain varies active constituent which have some pharmacological activity. However, there is a need to play closer attention to the issue of bioactivity safely evaluation and formulation of these medicinal plant[3-6].The aim of present study is to perform the bioactivity safely evaluation and formulation of suitable dosage form.

Material & Methods

Collection of plant material

The plant *Sarcostemma acidum* were collected from medicinal nursery of State Forest Research Institute, Jabulpur Madhya Pradesh in the month of Jan-Feb, 2010 and were identified by the Department.

Preparation of plant powder

The plant were dried under shade and then powdered with a mechanical grinder. The powder was passed through sieve No. 40 and stored in an airtight container for further use.

Preparation of extracts

The dried powder of plant was extracted with various solvents. Aqueous extract was prepared by cold maceration process. Ethanolic , chloroform and petroleum ether petroleum ether extract were obtained using Soxhlet apparatus. The solvents were removed by distillation under reduced pressure and the resulting semisolid mass was vacuum dried using rotary flash evaporator to obtain the extract. Further, the extract was subjected to preliminary phytochemical screnning.[7]

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Preliminary Phytochemical Screening[8-12]

1.Tests for carbohydrates and glycosides

Molisch's test

Sample was treated with 2-3 drops of 1% alcoholic - napthol solution and 2 ml of conc. sulphuric acid was added along the sides of the test tube. Appearance of brown ring at the junction of two liquids shows the presence of carbohydrates.

Legal's test

To the sample add 1 ml of pyridine and few drops of sodium nitropruside solutions and then it was made alkaline with sodium hydroxide solution. Appearance of pink to red colour shows the presence of glycosides.

Borntrager's test

Sample was treated with chloroform and then the chloroform layer was separated. To this equal quantity of dilute ammonia solution was added. Ammonia layer acquires pink color, showing the presence of glycosides.

2. Test for alkaloids

A small portion of the sample was stirred separately with few drops of dilute hydrochloric acid and was tested with various reagents for the presence of alkaloids. The reagents are

- Dragendroff's reagent - Reddish brown ppt
- Wagner;s reagent - Reddish brown ppt
- Mayer's reagent - Cream color ppt
- Hager's reagent - Yellow color ppt

3. Test for proteins and free amino acids

Small quantities of the sample was dissolved in few ml of water and treated with following reagents.

- Million's reagent: Appearance of red color shows the Presence of protein and free amino acid.
- Ninhydrin reagent: Appearance of purple color shows the Presence of Proteins and free amino acids
- Biuret's test: Equal volumes of 5% sodium hydroxide solution & 1% copper sulphate solution was added.

Appearance of pink or purple color shows the presence of proteins and amino acids.

4. Test for tannins

A small quantity of the sample was taken separately in water and test for the presence of phenol compounds and tannins was carried out with the following reagents.

- Dilute Ferric chloride solution (5%) - Violet color.
- 10% lead acetate solution - White ppt

5. Test for flavonoids

Alkaline reagent test

To the test solution add few drops of magnesium hydroxide solution, intense yellow colour is formed which turns to colourless on addition of few drops of dilute acid indicates presence of flavonoids.

Shinoda's test

Small quantities of the sample was dissolved in alcohol, to them piece of magnesium followed by conc. hydro chloric acid drop wise added and heated. Appearance of magneta color shows the presence of flavonoids**.**

6. Tests for fixed oils and fats Spot test

- A small quantity of sample was separately pressed between two filter papers. Appearance of oil stain on the paper indicates the presence of fixed oil.
- Few drops of 0.5 N alcoholic potassium hydroxide were added to a small quantity of sample along with a drop of phenolpthlein, the mixture was heated on a water bath for 1-2 hours, formation of soap or partial neutralization of alkali indicates the presence of fixed oils and fats.

7. Tests for steroids and triterpenoids

Libermann-burchard test

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Treat the sample with few drops of acetic an hydride, boil and cool. Then add con. sulphuric acid from the side of test tube, brown ring is formed at the junction two layers and upper layer turns green which shows presence of steroids and formation of deep red colour indicates presence of triterpenoid.

Salkowski test

Treat the sample with few drop of conc. sulphuric acid, red colour at lower layer indicates presence of steroids and formation of yellow coloured lower layer indicates presence of triterpenoids.

8. Test for mucilages and gums

Small quantities of sample was added separately to 25 ml. of absolute alcohol with constant stirring and filtered. The precipitates was dried in oil and examined for its swelling property for the presence of gum and mucilage.

9. Test for waxes

To the test solution add alcoholic alkali solution, waxes get saponified.

(The results are given in Table 1).

Results and conclusion

The plant *Sarcostemma acidum* belonging to the family Asclepediaceae was taken up for the study by us to screen and give a report on the possible preliminary phytochemical screening and exhaustive extraction of the plant material was done with Water, ethanol, chloroform and petroleum ether and the extracts were screened for the presence of various medicinally active phyto constituents. The various extracts of the plant of *Sarcostemma acidum* were subjected to phytochemical screening which reveals the presence of various pharmacological active components. Aqueous extract shows presence of alkaloids, carbohydrates, glycosides, tannins, protein, amino acids, steroids, flavonoids. Ethanolic extract shows presence of alkaloids, carbohydrates, glycosides, tannins, protein, amino acids, steroids, fixed oil, fats, mucilage, flavonoids. Chloroform extract shows presence of carbohydrates, tannins Petroleum ether extract shows presence of alkaloids, carbohydrates, glycosides, protein and amino acids, steroids and Ethyl acetate extract shows presence of alkaloids, carbohydrates, glycosides, tannins, protein, amino acids, steroids, fixed oil, fats, mucilage, flavonoids. Since, the major active constituents are present in ethanolic and ethyl acetate extract, therefore, these were taken for further investigation. The results are shown in Table: 1

Table No. 1 Preliminary phytochemical screening of different extract of *Sarcostemma acidum*

S/No.	Constituents	Test	AE	EE	CE	PE	EA
1.	Alkaloids	Mayer's test	-	+	-	-	-
		Dragendroff' test	+	+	-	+	-
		Hager's test	-	-	-	+	+
		Wagner's test	-	-	-	-	+
2.	Carbohydrates	Molisch's test	+	+	+	+	+
		Fehling's test	+	+	-	-	+
3.	Glycosides	Brontrager's test	-	+	-	-	+
		Legal's test	+	+	-	+	-
4.	Fixed oil and fats	Spot test	+	+	-	-	+
		Soap formation test	-	+	-	-	+
5.	Tannins	$FeCl_3$	-	+	-	-	+
		Vanillin hydrochloride	+	+	+	-	+
		Alkaline reagent	-	+	-	-	-
6.	Protein and amino acid	Million's test	+	+	-	+	+
		Ninhydrin test	+		-	-	+

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		Biuret test	-	-	-	+	-
7.	Flavanoids	With NaOH	-	+	-	-	+
		Shinoda test	-	-	-	-	+
		With H_2SO_4	-	+	-	-	-
8.	Steroids and triterpenoids	Libermann's Burchard test	-	-	-	-	-
		Salkowski's test	+	+	-	+	+
9.	Mucilage and gum	With 90% alcohol	+	+	-	-	+
10.	Waxes	With alc. KOH	-	-	-	-	+

AE: Aqueous Extract; EE: Ethanolic Extract; CE: Chloroform Extract; PE: Petroleum ether Extract; EA: Ethyl acetate Extract (+ Present, - Absent)

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