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PHARMACOGNOSTIC AND PRELIMINARY PHYTOCHEMICAL EVALUATION OF *SARCOSTEMMA ACIDUM* STEM EXTRACTS

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ABSTRACT The plant *Sarcostemma acidum (*Roxb). Voigt is a member of the Asclepiadaceae family, popularly known as somalata. The plant is having a wide range of medicinally important properties. The present paper provides morphological, histological, physicochemical, florescence characteristics and preliminary phytochemical detailing of the stem. The preliminary phytochemical analysis of stem extracts namely methanol, ethanol, distilled water, ethyl acetate, and petroleum ether is evaluated.

SUMMARY: This information can act as reference information for correct identification of the plant and also will be useful in making a monograph of the plant. Further, it will act as a tool to detect adulterants and substituent and will help in maintaining the quality, reproducibility and efficacy of natural drugs.

KEYWORDS : Phytochemical analysis, *Sarcostemma acidum*, Ash Analysis, Flourescence studies

INTRODUCTION

Medicinal plants are plant species which have active role in the treatment of various human or animal diseases. Now a days, large number of World population depends on medicines obtained from natural origin as they are considered safe. They are considered less harmful than synthetic drugs. Therapeutic efficacy of medicinal plants depends upon the quality and quantity of chemical constituents (Manju & Sheeja, 2017). As demand increases there is always a chance for adulteration. Pharmacognostic study includes parameters which will help and prevent adulteration (Chand, 2014).

Sarcostemma acidum (Roxb.) Voigt commonly called as Somlata is an important endangered medicinal plant which is a member of Asclepiadaceae family and is typically found in the valleys and sub tropical mountains in the Himalayas (Suresh *et al*., 2017).The plant is religiously related to Hinduism and is believed to be a major ingredient of the soma in ancient India. Members of *Sarcostemma* genus are also known as "climbing milkweeds" because the plant yields an abundance of a mildly acidulous milky juice and travelers suck its tender shoots to allay thirst (Bhavesh *et al* .,2014). It was said that was used to prepare 'Somras' Rejuvenating drink by Aryans(Bhavesh *et al* .,2014). The plant possess many medicinal uses like acrid, cooling, narcotic, emetic, antiviral and rejuvenaing, useful in vitiated conditions of pitta, dipsia, hydrophobia, psychopathy and general dibility, the plant is used by the various tribal communities of India in the treatment of various diseases and disorders (Gulshan *et al* .,2017 Suresh *et al*., 2017). Objective of the present study is to prepare pharmacognostic profile of *Sarcostemma acidum.* This is carried out by macroscopic studies, microscopic studies, physicochemical analysis, preliminary phytochemical analysis of five extracts methanol, ethanol, distilled water, ethyl acetate, and petroleum ether & fluorescence screening of powder.

MATERIALS AND METHODS

Sarcostemma acidum (Roxb.) Voigt plant was collected from the Urapakkam Scrub Jungle, Kancheepuram District Chennai. Macroscopic study the morphological description of the plant parts which are seen by naked eye or magnifying lens is reported (Chanda, 2014).Transverse section of stem were prepared and stained as per standard procedure (Chanda, 2014).

Sarcostemma acidum was collected and shade dried. The dried plant material was powdered using a mixer grinder. Physio-chemical parameters such as total ash, acid-insoluble ash and extractive values were determined as per the standard Indian Pharmacopoeia methods. Fluorescence characteristics of the powder is studied with different reagents in different radiations [Kokoski,1958].

For phytochemical analysis, 10 g of dried, ground plant materials were soaked in distilled water, ethanol, methanol, petroleum ether or ethyl acetate for one week. The soaked material was stirred and the final extracts were passed through Whatman filter paper No.1. The filtrates obtained were concentrated by keeping in the hot water bath. The extractive values of various solvents water, Ethanol, methanol, Petroleum Ether and Ethyl acetate were determined by standard procedure. The extraction yield is expressed as the percentage of total mass of extracts (*Mext*) with respect to the mass material used (*Mo*) (Yang *et al*., 2012). Yield percentage (%) = (*Mext* / *Mo*) x 100. Extract is dissolved in minimum solvent to do the preliminary phytochemical analysis. Preliminary phytochemical screening was carried out following standard procedure (Kokate, 2009).

RESULTS AND DISCUSSION

Ethnomedically, *Sarcostemma acidum* is widely used in the treatment of verity of diseases and disorders(Bhavesh *et al*.,2014). Moreover, *Sarcostemma acidum* (somlata) needs to be conserved because it is categorized in threatened vulnerable plant species .

Pharmacognostic study helps in the standardization of a crude drug as it form an integral part for establishing its correct identity. Microscopic and macroscopical characters is one of the simplest and cheapest methods to start with for establishing the correct identity of the source materials (Prakash *et al.,* 2012). Macroscopic features clearly shows that *S acidum* is a perennial leafless, jointed trailing shrub, fleshy glabrous, twining branches having milk white latex, leaves reduced to scales, opposite, color - green, shape - cylindrical, length – 2 to 4 meter, diameter of stem 0.5 to1cm. Microscopic characters of *S. acidum* stem revealed dicot stem characteristics. Vascular bundles are arranged in a ring, conjoint and collateral. It consists of phloem, cambium and xylem thus macroscopic and microscopic features can serve as diagnostic parameters.

Fig 1. *Sarcostemma acidum* plant

Fig 2. *Sarcostemma acidum* twig

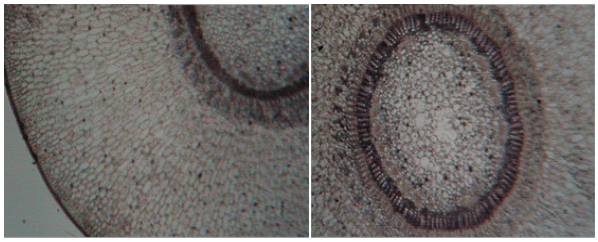

Fig 3-7. Sarcostemma acidum -T S of stem and stelar region of stem portion

Ash values (Table 1) and extractive values (Table 2) of Sacrcostemma stem powder is analysed. It can be used as reliable aid for detecting adulteration. Ash values are used to determine quality and purity of crude drug (Kokate, 2009). It indicates presence of various impurities like carbonate, oxalate and silicate. The water soluble ash is used to estimate the amount of inorganic compound present in drugs. The acid insoluble ash consist mainly silica and indicate contamination with earthy material.

Table: 1 Powder characteristics and Percentage of ash values in *Sarcostemma acidum*

Parameters	Observations
Colour	Greenish
Odour	Characteristic
Taste	Bitter
Total ash	9.32%
Water soluble ash	4.09%
Acid insoluble ash	3.06%

The extracts obtained by exhausting plant materials with specific solvents are indicative of the approximate measures of their chemical contents (Bhattacharya and Kamaruz, 2009). These extractive values are also useful to find out the adulterated drugs (Shrivastava and Leelavathi, 2010).

Table 2. Percentage of extractive values in *Sarcostemma acidum*

Parameters	Observations
Water Soluble extractives	11.9%
Ethanol Soluble Extractive	6.0%
Methanol Soluble Extractive	5.9%
Petroleum ether Soluble extractive	5.0%
Ethyl acetate soluble extractive	6.2%

In the present study fluorescence analysis (Table 3) was used to characterize the crude stem powder. Abere *et al,* 2009 suggests that the medicinal value of the plants lies in some chemical substances. Fluorescence is the phenomenon exhibited by various chemical constituents present in the plant material (Bhattacharya and Kamaruz, 2009). If the substance themselves are not fluorescent, they can be often converted into fluorescent derivatives by applying different reagents. Some drugs can be often assessed qualitatively in this way and it is an important parameter of pharmacognostic evaluation.

Table 3: Fluorescence analysis of powdered *Sarcostemma acidum*

POWDERED DRUG	VISIBLE/DAY LIGHT	UV 365 nm (LONG)	Fluorescent Light
Powder + 1M NaOH(Alcoholic)	Light brown	Green	Light green
Powder + 1M NaOH(Aqueous)	Pale Yellow	Pale Green	Pale Yellow
Powder + Picric Acid	Yellow	Fluorescent Green	Fluorescent Yellow
Powder + Ammonia	Yellow	Dark Green	Yellow
Powder + 50%HCl	Colourless	Colourless	Colourless
Powder + Petroleum Ether	Colourless	Colourless	Colourless
Powder + 50% H2SO4	Black	Dark Green	Dark Green
Powder +Ethyl Acetate	Light Brown	Light Brown	Light Brown
Powder + Ethyl Alcohol	Light Brown	Colourless	Colourless
Powder + Methanol	Brown	Light Brown	Light Brown

In the present study, the preliminary phytochemical screening of the various extracts has confirmed the presence of primary and secondary metabolites (Table 4). Suriyavathana *et al*.,2010 in their studies on selected medicinal plants has stated that phytochemical is a natural bioactive compound found in plants such as vegetables fruits, medicinal plants, flowers, leaves and root that work with and fibres to act as s defense system aganist diseases of more accurately to protect aganist diseases. In this study, Saponin, phenols and tannins, alkaloids, steroids, flavonoids were found present in different extracts. Phenols were present in all the extracts whereas steroids were present in all extract except methanol.

Table No:4 Preliminary screening of primary and secondary metabolites from *Sarcostemma acidum*

Phytochemical Constituents	TEST	EXTRACTS				
		Methanol	Ethanol	Distilled Water	Ethyl Acetate	Petrolium Ether
PRIMARY METABOLITES						
Carbohydrates	Molish	+	+	+	++	+
Starch	Iodine	-	-	-	-	-
Sugar	Benedicts	-	+	-	-	-
Protein	Biuret	+	+++	++	+	+
Amino acid	Ninhydrin	-	_	-	-	-
SECONDARY METABOLITES						
Saponin	Foam Test	+++	+	-	-	-
Phenol & Tannin	Bromine water	+	+	++	++	+
	Acetic acid	-	-	-	-	-
	folin	+	-	+	-	-
Alkaloids	meyers	-	+	-	+	++
Steroids	Salkowski	-	++	+	++	+
Flavonoid		+	-	-	-	++

+ indicates the intensity of occurrence of the compound tested
- absence of metabolite

Thus the process of standardization can be achieved by stepwise pharmacognostic studies as stated above. These studies help in identification and authentication of the plant material. Such information can act as reference information for correct identification of particular plant and also will be useful in making a monograph of the plant. Further, it will act as a tool to detect adulterants and substituent and will help in maintaining the quality, reproducibility and efficacy of natural drugs.

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