




Pharmacognosy, Phytochemical and Pharmacological Potential of *Sarcostemma acidum* Voigt

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Article History	Abstract
Received on: 23 Sep 2023 Revised on: 14 Nov 2023 Accepted on: 16 Nov 2023	 <p><i>Sarcostemma acidum</i> Voigt, commonly known as Somlata, belongs to the Apocynaceae family and is a leafless plant with significant traditional medicinal use. Found mainly in Bihar, West Bengal, Odisha, and South India, it thrives in dry rocky areas. The shrub, characterized by numerous branches and an absence of leaves, features green, cylindrical stems ranging from 2 to 4 meters in length and 0.5 cm to 1 cm in diameter. The plant's leaves, though present in opposite positions, are reduced to scales, rendering it leafless. The flowers are actinomorphic, displaying a light yellow or white hue. Microscopic analysis of the stem of <i>Sarcostemma acidum</i> reveals three primary components: the outer epidermis layer, cortex, and vascular bundles. The outermost epidermis consists of a single layer of cells, and the cortex comprises collenchyma and parenchymal cells. The aqueous extract of <i>S. acidum</i> contains a diverse array of compounds, including carbohydrates, glycosides, alkaloids, tannins, flavonoids, proteins, free amino acids, steroids, triterpenoids, fixed oils, fats, mucilage, gums, and waxes. Different parts of <i>S. acidum</i> are utilized for various purposes, such as a natural restorative for health, ear drops in otitis, and application on wounds and cuts. The stem extract exhibits antipsychotic effects and inhibits spermatogenesis. Recent studies also highlight its analgesic, antipyretic, and antidiabetic properties. This plant holds promise for further research in isolating active constituents with therapeutic effects.</p>
<p>Keywords</p> <p><i>Sarcostemma acidum</i> Voigt, Medicinal plant, Ethnomedicinal uses, Aqueous extract, Pharmacological effect</p>	

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INTRODUCTION

Sarcostemma acidum Voigt (Somlata) is a perennial shrub with green, cylindrical, branches containing milky white latex. The stem has several branches without leaves. The plant flowers between July to February and bears light yellow or white flowers [1].

Botanical name: *Sarcostemma acidum* Voigt

The plant is widely distributed in India, Sri Lanka, Pakistan and European countries [2]. In India, it is mostly found in rocky dry places of Karnataka,

Tamil Nadu, Andhra Pradesh, Odisha, Bihar, West Bengal [3][4].

Taxonomical classification

- Kingdom: Plantae
- Order: Asterids
- Family: Apocynaceae
- Genus: Sarcostemma
- Species: acidum
- Synonyms: *Asclepias acida* Roxb., *Cynanchum acidum* (Roxb.), *Sarcostemma brevistigma*.

Vernacular names

- English: Moon plant, Moon creeper
- Hindi: Soma, Somlata
- Sanskrit: Soma, Somlata, Somavalli
- Bengali: Kula Thar, Soma, Somlatha
- Odia: Somlata, Borohwi, Notasiju
- Tamil: Kodikklli, Somamum
- Telugu: Kondapaala, Somlatha
- Malayalam: Somam, Somavalli



Figure 1: *Sarcostemma acidum* plant with flowers

Macroscopy

Sarcostemma acidum Voigt (Somlata) is a leafless perennial shrub with jointed stems. The stems are green, cylindrical, measuring 2 to 4 meters in length and 0.5 cm to 1 cm in diameter. Though leaves are present in an opposite arrangement, they are reduced to scales, rendering the plant leafless in nature. The actinomorphic flowers are light yellow or white, comprising 5 sepals, 5 petals, 5 stamens, and 2 ovaries. The androecium and gynoecium are fused together with 5 stigmas. The plant produces fruit with flat and ovate seeds. The

roots are brownish, and each root has 3 to 5 sub-root branches [3].

Microscopy

The outermost epidermis consists of single layer of cells. The cortex consists of collenchyma and

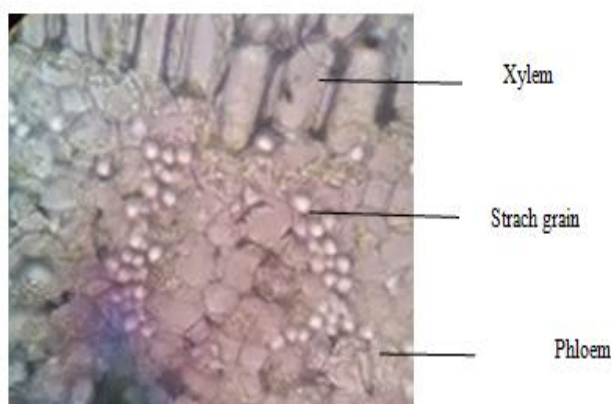
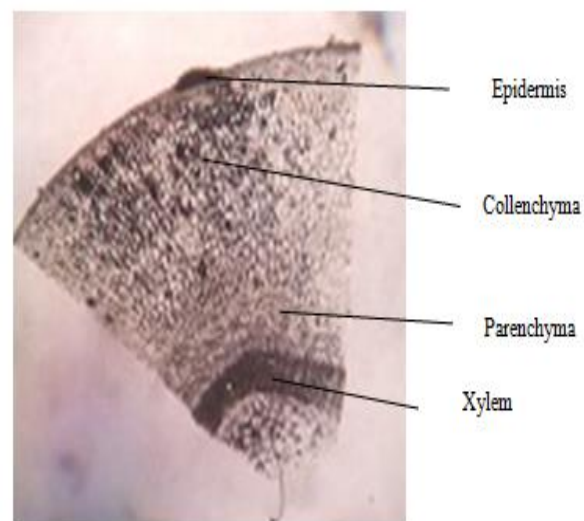


Figure 2: Microscopy of stem

The microscopy of the stem of *Sarcostemma acidum* is primarily divided into three parts [3]:

Outer Epidermis Layer:

- The outermost epidermis consists of a single layer of cells.

Cortex:

- The cortex comprises collenchyma and parenchymal cells.
- Below the epidermis, 2 to 3 layers of collenchyma cells are present.

- Under these, 5 to 6 layers of polyhedral parenchymal cells are observed.
- A single layer of endodermal cells separates the cortex and vascular bundles[5].

Vascular Bundles:

- The vascular bundle is ring-shaped and contains xylem and phloem fibers.
- Starch grains are present near the phloem tissue[6].

Additionally, medullary rays and pith form the central part of the stem.

Powder microscopy

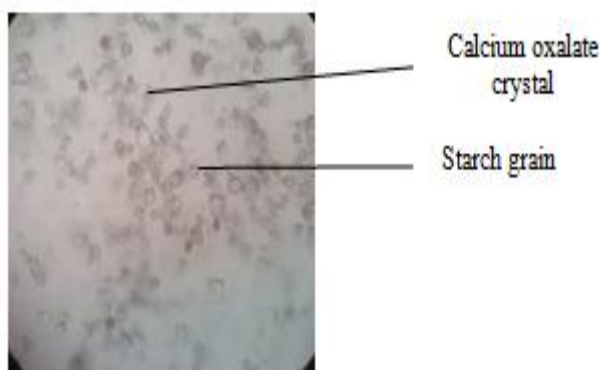


Figure 3: Microscopy of powder

Powder microscopy

In the microscopy of powder, it is found that the powder contains[7][8].

- (1) Starch grain
- (2) Prismatic crystal of calcium oxalate
- (3) Mucilage
- (4) Elongated collapsed fiber

Physical evaluation

Various physical evaluations of *Sarcostemma acidum* were conducted, including assessments of loss on drying, extractive value, ash value, and swelling index [9].

Phytochemical Study

Phytochemicals refer to plant chemicals, which are secondary metabolites naturally formed in the plant [8]. These bio-active, non-nutrient plant

compounds include various classes such as alkaloids, glycosides, tannins, amino acids, flavonoids, saponins, etc. Some of these phytochemicals exhibit pharmacological activities:

- Alkaloids: Analgesic effect
- Glycosides: Cardiac effect
- Tannins and Volatile Oil: Antimicrobial effects
- Flavonoids: Antioxidant effect

The phytochemical study was conducted to identify and understand the different phytochemicals present in *Sarcostemma acidum* [9].

Table 1: Physical evaluation parameters

Parameter	Values (% w/w)
Loss on Drying	0.4
Extractive Value	244
Water Soluble Extractive	12
Methanol Soluble Extractive	8
Ethanol Soluble Extractive	6
Ether soluble Extractive	5
Ethyl acetate Soluble Extractive	7
Ash Value	9
Total Ash	4
Water Soluble Ash	1
Acid insoluble Ash	0
Swelling Index	0

Pharmacological Potential

Based on its ethnomedicinal uses the different parts of *S. acidum* was used in some disease condition like ear drops in otitis, dog bite, snake bite, rabies, emesis, leprosy, arthritis and joint pain. The juice of this plant (samaras) was used as a natural restorative for health. The extract of this plant was reported to have psychopharmacological effects also it reduces spermatogenesis. Recent studies give evidence that the aqueous extract of the stem of *Sarcostemma acidum* shows pharmacological effects like analgesic, antipyretic and anti-diabetic effects [10].

CONCLUSION

These pharmacognostic studies of *Sarcostemma acidum* provide useful information to identify and authenticate of this plant. This study gives details about the distribution, identification and morphological features, microscopic

Table 2: Phytochemical screening result

Test	Power drug	Aqueous extract	Methanolic extract
Test for Carbohydrates			
Molisch's Test	+	+	+
Benedict's Test	+	+	+
Fehling's Test	+	+	+
Test for Starch	+	+	+
Test for Alkaloids			
Mayer's Test	+	+	+
Dragendorff's Test	+	+	+
Wagner's Test	+	+	+
Hager's Test	+	+	+
Test for Protein			
Ninhydrin Test	+	+	+
Biuret Test	+	+	+
Millon's Test	+	+	+
Test with Tannic acid	+	+	+
Test for Glycosides			
Keller-kiliani Test	+	+	+
Legal Test	+	+	+
Baljet Test	+	+	+
Test for Flavonoids			
Ferric chloride Test	+	+	+
Shinoda's Test	+	+	+
Acid Test	+	+	+
Alkali Test	+	+	+
Test for Phenol	-	-	-
Test for Tannins	+	+	+
Test for Saponins	+	+	+
Test for Volatile Oil	+	+	+
Test for Fixed Oils and Fats	+	+	+

characteristics, and physical parameters of the plant. The aqueous extract of *Sarcostemma acidum* contains carbohydrates, glycosides, alkaloids tannins, flavonoids, proteins and free amino acids, steroids and triterpenoids, fixed oils and fats. From this ethnomedicinal use, it seems that the plant has anti-inflammatory properties, antimicrobial properties. The recent studies, it was shown that the aqueous extract of this plant has antipsychotic, analgesic, antipyretic and anti-diabetic effects. This study gives an idea for further research about the isolation of active constituents of this plant which are having therapeutic effects.

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Conflict of Interest

The authors have no conflict of interest.

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