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ANTIPYRETIC ACTIVITY STUDY OF *SARCOSTEMMA ACIDUM* VOIGT

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Keywords:

Sarcostemma acidum Voigt, Antipyretic activity, Brewer's yeast, Aqueous extract, Acute toxicity

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ABSTRACT: *Sarcostemma acidum* Voigt is a xerophytic plant of the family Apocynaceae. Plant is locally known as Somlata. It is a traditional medicinal plant used to prepare Somras. The plant is mainly found in Bihar, West Bengal, Odisha and South India. It is mostly grown in dry rocky places. *S. acidum* is a shrub, more branched but no leaves. The stems are jointed with each other. These are green, cylindrical having 2 to 4 meter in length and 0.5 cm. to 1 cm. in diameter. The leaves are present opposite but are reduced to scales. So, the plant is leafless in nature. The flowers are actinomorphic, light yellowish white in nature. The roots are branched and each root contain 3 to 5 sub-root branches. The plant extract of *S. acidum* contains carbohydrates, glycosides, alkaloids, tannins, flavonoids, proteins, steroids, triterpenoids, and fixed oils. Ethnomedicinally the *S. acidum* was used in otitis, dog bite, snake bite, rabies, emesis, arthritis and leprosy. The juice of this plant having some medicinal value, so used as natural restorative for health. *S. acidum* stem extract inhibits spermatogenesis and reduce the sperm count. Also, the extract of *S. acidum* shown antipsychotic effect. This study was taken to know about the other therapeutic property of *Sarcostemma acidum.* So, here the evaluation of antipyretic activity study of stem extract of *S acidum* was taken and it was taken by using Brewer's yeast induced pyrexia rat model. The result showed that the aqueous extract of *S. acidum* has significant antipyretic effect.

INTRODUCTION: *Sarcostemma acidum Voigt* (Somlata) is a shrub having the branched stem grown in dry rocky places. The stems are green, cylindrical in nature, 2 to 4 meter in length. The roots have a number of sub- root branches. The flowers are light yellowish white in colour. The plant is found in India, Pakistan, Sri Lanka, and European countries. In India it is mostly found in Odisha, Bihar, West Bengal and Tamil nadu [3, 4]. The plant *Sarcostemma acidum* has some ethnomedicinal uses. The juice of this plant (somras) is used as a natural restorative for health. The *S. acidum* was used in otitis, dog bite, snake bite, rabies, emesis, leprosy, arthritis and on wound. The extract of the plant has number of psychopharmacological effects like anxiolytic, antipsychotic effect. *S. acidum* extract reduces the spermatogenesis [1, 2].

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Plant Profile:

FIG. 1: *SARCOSTEMMA ACIDUM* PLANT WITH FLOWERS

Botanical Name: *Sarcostemma acidum* Voigt

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

Bengal: Kula Thar, Soma, Somlatha

Odia: Somlata, Borohwi, Notasiju

Tamil: Kodikklli, Somamum

Telugu: Kondapaala, Somlatha

Malaylam: Somam, Somavalli

Antipyretics are the agents which reduce pyrexia or fever. Pyrexia or fever is the rise of body temperature from the normal. It mostly happens during an infection, and occurs in trauma, inflammatory condition, autoimmune diseases. During this condition, prostaglandin is formed from the destroyed tissue. Which stimulates the temperature regulating center present in the hypothalamus of brain, so the body temperature is raised, or fever occurs.

To reduce the fever or pyrexia, the antipyretic drugs are given. Antipyretics block the cyclo-oxygenase (COX) enzyme inhibit the prostaglandin synthesis and reduce the fever. Some of the analgesic-Antipyretics drugs block both COX-1 and COX-2 enzyme and some selectively block COX-2 enzyme [5]. The currently available standard drugs for fever are mainly used for managing and treating the fever. Paracetamol is mostly used.

But these drugs are associated with many side effects and toxicity. The analgesic-antipyretic drugs cause the side effects like gastric irritation, gastric ulcer and toxic effect like respiratory depression, hepatotoxicity [5].

In view of this, research must be taken on medicinal plants to know their effectiveness in fever. So, in this study the aqueous extract of *S.acidum* was taken to know its effectiveness to reduce the fever. This evaluation of antipyretic study of stem aqueous extract of *S. acidum* was taken by using Brewer's yeast induced pyrexia rat model.

MATERIAL AND METHOD:

Materials: Healthy albino rats, Aqueous extract of *Sarcostemma acidum*, Brewer's yeast, Paracetamol, 1% w/v carboxy methyl cellulose (CMC) solution, Feeding tube, Digital thermometer.

Collection of Plant: The plant was collected from the Gandhamardan hill of balangir district of Odisha, and it was collected in the month of September.

Authentication of Plant: The plant was identified and authenticated by the scientist of Botanical survey of India, Central national herbarium, Howrah, Kolkata. (CNH/Tech II/2016/34)

Drying and Pulverization: The collected stem of *Sarcostemma acidum* was dried at room temperature, then ground it to get the coarse powder. Then the powder was passed through the sieve no. 44.

Preparation of Aqueous Extract of *Sacostemma acidum*: 500 gm. of drug powder was taken in the round bottom flask. Distilled water was added in it and shaked for proper mixing of drug powder with water. The mouth of the flask was covered by aluminum foil. It was kept for 24 hours for maceration. After 24 hours it was filtered. The filtrate was taken for evaporation in hot plate at 80^0 C to get the aqueous extract.

Acute Toxicity Study: Before any pharmacological evaluation of any drug or chemical, the safety of this agent on tested animals or human beings must be first taken into consideration. So, from the safety point of view,

the acute toxicity study of *Sarcostemma acidum* was first taken. As per the Organization for Economic Co-operation and Development (OECD) guideline number 423 this acute toxicity study was taken. This study was taken with the approval of Institute Animal Ethics Committee (IAEC), Gayatri College of Pharmacy, Sambalpur, Odisha. (Regd. No. 1339/PO/Re/S/10/CCSEA).

Method: Healthy albino rats weighing about 200-220 grams were taken. The animals were divided in to four groups having 6 animals in each group. Then the animals were fasted overnight. Then the different doses of extract were given to different groups of animals [6, 7].

Group-I (Control): The animals marked group-I were given orally 1ml/100gm of body weight of 1% w/v CMC solution and they served as control.

Group-II, III, IV (Test): The animal marked test groups II, III, IV were given orally with single dose extract of *Sarcostemma acidum* 300 mg, 1000mg, and 2000mg per kg body weight respectively in 1% CMC solution. Then these tested animals were observed continuously for 24 hours about their physiological changes or mortality and this observation was continued for 14 days.

Antipyretic Activity Study: The antipyretic activity study of stem extract of *Sarcostemma acidum* was taken by using Brewer's yeast induced pyrexia rat model with the approval of Institute Animal Ethics Committee Gayatri College of Pharmacy, Sambalpur, Odisha. (Regd. No. 1339/PO/Re/S/10/CCSEA).

Healthy albino rats weighing about 200-220 gm. were taken. Then they were divided into four groups of six animal each. All animals were fasted overnight before the beginning of the experiment. The rectal temperature of all rats was first taken by inserting the lubricated bulb of thermometer into the rectum of rats. This temperature was taken as the initial temperature. Then pyrexia was developed in all rats by injecting subcutaneously (10ml/kg body weight) of 15% suspension of Brewer's yeast in 0.9% saline at the neck side.

After 24 hours of yeast injection the temperature of all rats was taken to determine the pyretic response of yeast. This temperature was taken as a zero-hour reading. Then the Control, Standard and Test substances were given to different groups of animals orally through feeding tube [8].

Group-I (Control): The animals marked group-I were given orally 1ml/100gm. of body weight of 1% w/v CMC solution and they served as control.

Group-II: (Standard): The animals marked group-II were given paracetamol 150mg/kg body weight in 1% w/v CMC solution and they served as standard.

Group-III and IV (Test): The animals marked as group-III and group-IV were given orally the aqueous extract of *Sarcostemma acidum* 200mg/kg. and 400mg/kg. Body weight respectively in 1% w/v CMC solution.

After the administration of the drugs, the temperature of the rats in different groups were recorded at 1, 2, 3 and 4 hours. Then the mean temperature of tested groups compared with the standard group to evaluate the antipyretic effect of test substance [9, 10].

RESULT: The result of acute toxicity study shown that, on giving the single dose of 2000mg/kg of extract orally, there was no mortality or toxicity seen on tested rats. In antipyretic study, the rectal temperature of rats was expressed as Mean ± SEM.

TABLE 1: RECTAL TEMPERATURE OF RATS

Group	Dose (mg/kg)	Initial Temp. in ^{0}C.	Rectal Temperature in ^{0}C.				
			0 Hour	1 Hour	2 Hour	3 Hour	4 Hour
Group-I (Control)		37.06±0.28	39.10±0.15	39.26±0.32	39.40±0.24	39.26±0.16	39.12±0.13
Group-II (Standard)	150mg/kg	37.13±0.34	39.16±0.31	38.85±0.15	38.13±0.42	37.36±0.21	37.10±0.27
Group-III (Test)	200mg/kg	37.16±0.13	39.23±0.34	39.12±0.42	38.72±0.27	38.23±0.15	37.43±0.21
Group-IV (Test)	400mg/kg	37.02±0.16	39.17±0.45	38.92±0.31	38.32±0.16	37.45±0.14	37.16±0.17

DISCUSSION: In acute toxicity study of *Sarcostemma acidum*, it was seen that no mortality occurs at a dose of 2000mg/kg body weight. Therefore, the approximate lethal dose (LD_{50}) of *S.*

acidum extract was estimated to be higher than 2000mg./kg body weight. So, the aqueous extract of *S. acidum* is safe for pharmacological study in rats.

In antipyretic study the Brewer's yeast induced pyrexia model result showed that the aqueous extract of 200mg/kg and 400mg/kg significantly reduced the pyrexia from 39.23±0.34, 39.17±0.45 to 37.43±0.21, 37.16±0.17 respectively as compared to control. So, it confirmed that the aqueous extract of *Sarcostemma acidum* has significant antipyretic effect.

CONCLUSION: From this study, it concluded that the aqueous stem extract of *Sarcostemma acidum* plant has antipyretic effects in rat. So, further study is required to isolate the active constituent which is responsible for the antipyretic effect.

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CONFLICT OF INTEREST: The authors have no conflict of interest.

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