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Physicochemical Evaluation of *Chakramuni* (*Sauropus Androgynus* (L) Merr) with special reference to its Nutritive Values

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ABSTRACT

Ayurveda the ancient traditional science which deals with maintenance of health of healthy individual and care of the diseased. There are many plants which are not mentioned in Ayurveda but are of great importance as a medicine as well as highly nutritious rich source of proteins and vitamins one such drug is *Chakramuni* (Sauropus androgunus). It is less known traditional herb drug not mentioned in classics but widely appreciated for its rich source of micronutrients and proteins. The presence of proteins, carbohydrates, calories, fat, fibers, minerals make it a Multivitamin Plant. In this article the determination of physico-chemical values with special reference to its nutritive values will be estimated.

Key words: *Chakramuni, Sauropus androgunus, Micronutrients, Multivitamin plant,*

INTRODUCTION

Chakramuni (*Sauropus androgunus*) a perennial shrub growing widely in south Asia, south east Asia and native to south America is highly nutritious has rich source of micronutrients and proteins. Its leaves possess strong anti-oxidant properties probably owing to Vit C and E contents. Using *Chakramuni* as a green leafy vegetable for consumption is not common in India but common in certain places of south India. In view of its rich nutrient composition this shrub can be explored for the development of the health, beneficial food products which can also help in prevention of micro nutrient deficiencies.[1]

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As per the reference of *Acharaya Charaka* जगत्येवनानौषधम (there is no plant in this world which can't be used for medicinal purpose) Even though we can't trace the reference of *Chakramuni* in Ayurvedic classics it has been utilized since times immemorial.

Here, there is an attempt to screen the drug *Chakramuni* (*Sauropus androgynous)* for its physicochemical values special attention will be given to its nutritional value as it is considered as popular super food (Multivitamin Plant).[2]

MATERIALS AND METHODS

The study was conducted under two headings,

- Physico chemical values
- Nutritive values

Collection and Preparation of Drug

Organoleptic Characters of leaves

Colour - Pale Green

Texture - Fine

Odour - Characteristic

Taste - Acrid Bitter

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Macroscopic study

Sauropus androgynous is a perennial shrub that can reach up to 500cm in height[3] with multiple slender stems and has cylindrical or angled branches leaves are ovate or lanceolate measuring 2.0 - 7.5cm and obtuse and acute, pale green on both sides and alternately arranged on long, slender arching branches the leaves are edible with slightly nutty or pea like flavor.

Physical Characters of extracts of Leaf

Sample	Extracts	Color	Odor	Nature	Taste
Leaf	Ethanolic	Dark Green	Characteristic	Sticky	Acrid Bitter

The drug was collected from its natural habitat in Shree Vana of BLDEA'S AVS Ayurveda Mahavidyalaya Vijayapura and was authenticated in the Department of PG Studies in Dravya Guna, BLDEA'S AVS Ayurveda Mahavidyalaya Hospital and research centre.

Physico-chemical values were estimated by Ash value, Acid insoluble ash Ph value, specific gravity and moisture content results of which are given below in Table 1.

Table 1: Physico-Chemical Analysis of Leaf

Parameters	Leaf
Total Ash	18.8 %
Acid Insoluble Ash	2.01%
pH value	6.90
Specific gravity	1.025
Moisture content	64%

Drug extraction was done by using soxhlet apparatus where the drug was proved to be soluble in ethanol. After extraction drug was measured and other tests like pH value, specific gravity and moisture content were done accordingly the values are given below in Table 01. Chemical analysis of drug was done to test the presence of Alkaloids, Flavonoids, Glycosides, Steroids, Tannins and Saponins results of which are given below in Table 02.

Table 2: Chemical Analysis of Leaf

SN	Constituents	Ethanolic (P/A)
1.	Alkaloids	P
2.	Flavonoids	P
3.	Glycosides	P
4.	Steroids	P
5.	Tannins	P
6.	Saponins	P

Nutritive values of *Sauropus androgynous* were done by Determining fiber, Carbohydrates and Quantitative estimation of Protein.

Determination of percentage of fiber

2 gm of moisture and fat- free material were treated with 200 ml of 1.25% H2SO4. After filtration and washing, the residue was treated with 1.25% NaOH. Similarly, the residue was filtered and washed again with hot distilled water and subjected to 1% HNO3 treatment. The residue was ignited and the ash was weighed after filtration and washing of the residue. The loss in the weight gives the weight of crude fiber.

Determination of percentage carbohydrates

Total carbohydrate content in medicinal plants had been calculated by calculating the difference between other constituents. In this study, the other constituents in the medicinal plants (protein, fat, moisture, ash content) were determined individually, summed and subtracted from the total weight of the food. This is referred to as total carbohydrate by difference and is calculated by the following formula:

% of carbohydrates = 100 (Protein + Ash + Moisture + Fat).

Quantitative estimation of Protein

Different dilutions of sample solutions were prepared by mixing BSA stock solution (1mg/ml) and water in the test tube. The final volume of each test tube was made up to 5 ml. The value of BSA ranges from 0.05 to 1.0 mg/ml. From these different dilution, 0.2 ml protein

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solution was pipette out to different test tubes and 2 ml of Analytical reagent was added (alkaline copper sulfate reagent). After mixing the solution it was incubated at room temperature for 10 min. Then 0.2 ml of Folin-Ciocalteau reagent solution was added to each tube and incubated for 30 min. The optical density of the blank was taken in the colorimeter (measure the absorbance) At 660 nm. The values of absorbance were plotted against protein concentration to get a standard calibration curve. The absorbance of the unknown sample was checked and the concentration of the unknown sample was determined using the standard curve

Determination of nutritive value

Nutritive value is calculated by, an appropriate amount of crude sample was taken and weighed. Protein, carbohydrate, fats were analyzed by the methods which are discussed earlier in this study. The nutritional value of the plants was calculated as per the formula used by Nile *et al.*

Nutritive value= 4 × percentage of protein + 9 × percentage of fat + 4 × percentage of carbohydrate

Results of estimation of Total nutritive value of *Chakramuni (Sauropus androgynous*) is shown in the Table no. 3.

Table 3: Estimation of Total Nutritive values of the *Chakramuni (Sauropus androgynous)*

Each 100 grams of leaf powder contains

Calories	37cal
Protein	3.9gm
Fat	0.92gm
Carbohydrates	6.3gm
Fiber	3.5gm
Minerals	1.3gm

Discussion

Sauropus androgynus is an herb with high nutritional and therapeutic potential. The presence of proteins carbohydrates, calories, fat, fiber and minerals makes it an important medicinal and edible herb. Though this drug is not mentioned in Ayurvedic classics but is used as vegetable in day-to-day life. *Chakramuni* can be considered as highly nutritious green leafy vegetable and must be made mandatory to include it in our diet in order to achieve good health. Other important factors like its significant antioxidant, anti-cancerous, anti- diabetic, antimicrobial, and anti-inflammatory, anti-obesity, and lactation inducing[3], anti-fungal, anti-tussive, analgesic and antiulcer activities. Scientific research on its cultivation, development of varieties that are nutritionally superior should also be attempted, further extensive in vivo and clinical studies are required to validate its medicinal activities.

Conclusion

The leaves of the *Chakramuni* (*Sauropus androgynous*) were collected from its natural habitat. They were screened for the physico-chemical analysis and nutritive values. It showed the presence of Alkaloids, flavonoids, glycosides, tannins, saponins by the physico-chemical analysis. It showed the presence of proteins, carbohydrates, fats, fibers, minerals and also it is rich source of vitamin A, vitamin C. By this we can include *Chakramuni* in our diet as a nutrient and vitamin rich food which can act as a great food supplement.

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