

Preliminary Phytochemical and Physicochemical analysis on *Strobilanthes ciliatus* Nees

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ABSTRACT

In present investigation, the detailed physicochemical study of the whole plant of *Strobilanthes ciliatus* was carried out to lay down the standards which could be useful in future experimental studies. Preliminary phytochemical investigation shows the presence of carbohydrates, flavonoids and phenolic compounds in aqueous as well as alcoholic extracts. In addition to preliminary phytochemical screening the plant was also subjected to ash value, extractive value and fluorescence analysis.

1. Introduction

Evaluation of Pharmacognostic aspects on a particular plant is very important during the authentication. Pharmacognostic parameter helps us to prevent the adulteration and substitution of crude drugs up to a greater extent. Since the therapeutic efficacy of medicinal plants depends upon the quality and quantity of chemical constituents, the adulteration of crude drugs has to be prevented. *Strobilanthes ciliatus*, (Acanthaceae), is an important plant in ayurveda. The whole plant is reported to be an antidiabetic¹, and also utilised in treating various neurological disorders like paraplegia and sciatica^{2,3}

2. Material and Methods

The whole plant *Strobilanthes ciliatus* was collected from Edapal, Malappuramdist, Kerala, India during the month of August 2007. Its botanical identity was confirmed by botanist Dr. Gopalakrishna Bhat, Professor of Botany, Poorna Prajna College, Udipi, Karnataka. The voucher specimen No (PP557) has deposited at the Department of Pharmacognosy, Manipal College of Pharmaceutical Sciences, Manipal

5. Results

Preliminary phytochemical screening

Table 1. Preliminary phytochemical screening of the whole plant of *Strobilanthes ciliatus*

No	Test	P. Eth (60-80°)	C ₆ H ₆	CHCl ₃	Acetone	EtOH	H ₂ O
1.	Alkaloids	-	-	+	-	-	-
2.	Carbohydrates	-	-	-	-	+	+
3.	Phytosterols	+	+	-	-	-	-
4.	Fixed oils and fats	+	+	-	-	-	-
5.	Saponins	-	-	-	-	-	-
6.	Phenolic compounds and tannins	-	-	-	+	+	+
7.	Proteins and amino acids	-	-	-	-	-	-
8.	Gums and mucilages	+	-	-	-	-	+
10	Flavonoids	-	-	-	-	+	+

Preliminary phytochemical studies carried out on the extract showed the presence of steroids, triterpenoids, flavonoids, tannins, carbohydrates and phenolic compounds. The study revealed that the triterpenoids are present in petroleum ether and benzene soluble parts, flavonoids in alcohol and water soluble parts, phenolic compounds in acetone, alcohol and water soluble parts while mucilage is only in water soluble part.

Physicochemical Constants

The results showed that water soluble extractive of *Strobilanthes ciliatus* determined by hot extraction is more. Moisture content of the drug was found to be 1.4 % w/w. Swelling index 6ml, mucilage content- 7.38% w/w and tannin content - 4.2 % w/w.

Table 2 Successive solvent extractive value of whole plant of *Strobilanthes ciliatus*

Sl No	Solvent	Colour and Consistency	Extractive value (w/w)
1	Petroleum ether (60-80)	Yellowish brown (sticky semi solid)	0.608%
2	Benzene	Greenish black (sticky, semi solid)	0.55%
3	Chloroform	Greenish black (sticky, semi solid)	0.37%
4	Acetone	Brownish black (Greasy, semi solid)	0.36 %
5	Ethanol (95%)	Brownish black (sticky solid)	5.41%
6	Chloroform water	Brownish black (sticky solid)	7.024%

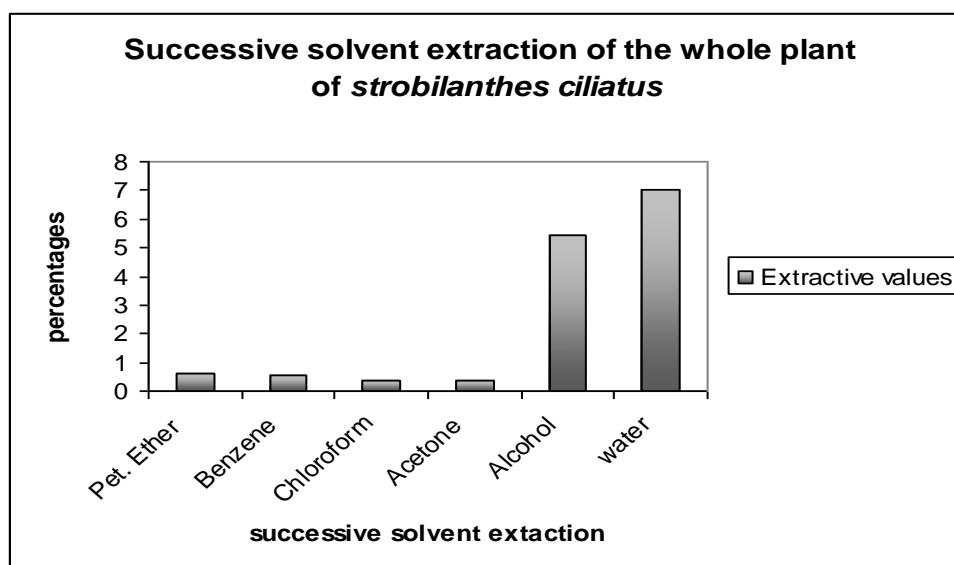


Fig.1 Successive solvent extraction of the whole plant of *Strobilanthes ciliatus*

Table 3 Extractive values of the whole plant of *Strobilanthes ciliatus*

Parameters	Values % (w/w)
i. Hot extraction (H ₂ O)	17.1 % w/w
ii. Cold maceration	
a) Water soluble extractive	14.1 % w/w
b) Ethanol soluble extractive	3.5% w/w
c) Non volatile ether soluble extractive	3.2%w/w

Table 4 Ash values of the whole plant of *Strobilanthes ciliatus*

Parameters	Values % (W/W)
Total ash	11.63
Acid insoluble ash	1.68
Water soluble ash	4.27
Sulfated ash	17.11
Nitrated ash	8.53
Carbonated ash	8.6

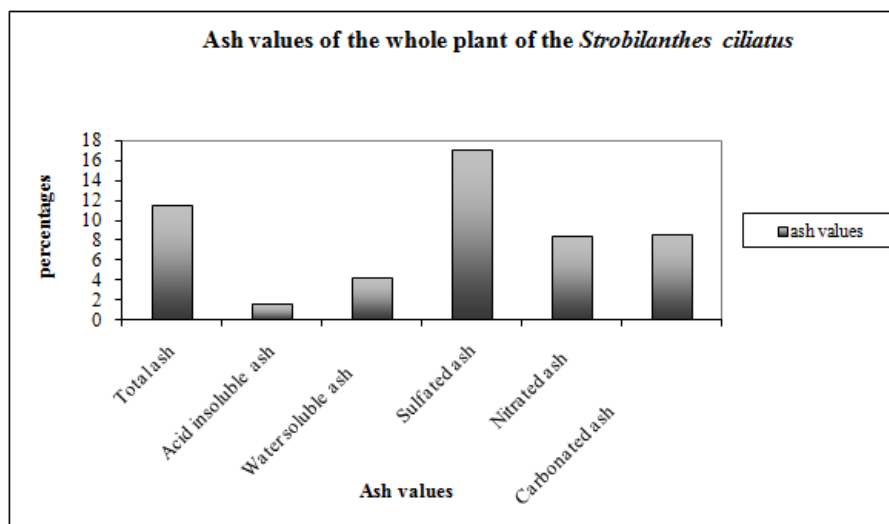


Fig. 2 Ash values of the whole plant of *Strobilanthes ciliatus*

Table 5 Fluorescence analysis of extracts of whole plant of *Strobilanthes ciliatus*

Sl.No.	Extract	White light	UV light (254 nm)
1	Pet. Ether (60-80°)	Greenish black	Green fluorescence
2	Benzene	Greenish black	No fluorescence
3	Chloroform	Dark green	No fluorescence
4	Acetone	Reddish brown	Light green
5	Ethanol	Reddish brown	Light green
6	Water	Dark brown	Green

Systematic study of plant drug includes an investigation of both primary and secondary metabolites derived as a result of plant metabolism. The different qualitative chemical tests are to be performed for establishing profile of a given fraction for its nature of chemical composition. The determination of physicochemical parameter is important in the determination of adulterants and improper handling of drugs.

Ash values are mainly carried out to confirm the quality and purity of plant drugs. The ash value determination helps in removing the organic matters adheres to the plant drug. If these organic matters are not removed, it may interfere with the qualitative and quantitative analysis which is to be carried out on the plant drug. The ash which is obtained after the complete incineration consists of silicates, carbonates and phosphates of calcium, magnesium, sodium and potassium.

Extractive values of plant drugs are carried out when the constituents of a drug cannot be readily estimated by any other means. It also indicates the nature of the constituents present in a plant drug. Certain plant drugs show fluorescence when it is exposed to ultraviolet radiation. This type of evaluation is usually unreliable due to variation in the fluorescence effects.

Further research has to be done in the isolation, purification and characterisation of therapeutically significant secondary metabolites from the plant.

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