



Research Article

**PHYTOCHEMICAL EVALUATION OF *CHLORIS BARBATA* LEAVES**

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**ABSTRACT**

The leaves of *Chloris barbata* leaves were collected locally, shade dried and extracted with water, ethanol, methanol, acetone, chloroform, benzene and petroleum ether by using Soxhlet apparatus. The yields of different extracts of leaves were 3.6%, 8.4%, 12.5%, 1.9%, 1.2%, 0.9% and 2.6% respectively. The preliminary phytochemical screening was carried out for the presence of alkaloids, flavonoids, carbohydrate glycosides, tannins, and saponins for different extracts of *Chloris barbata* (leaves). The physicochemical evaluation was carried out for the determination of ash values, includes total ash, acid insoluble ash and water-soluble ash, and moisture content, extractive values and fluorescence analysis for leaves of *Chloris barbata*.

**KEY WORDS:** *Chloris barbata*, total ash, acid insoluble ash, water-soluble ash, phytochemical screening

**INTRODUCTION:**

*Chloris barbata* (SW), commonly called as swollen finger grass (Family: Poaceae) is a tufted annual grass about 70cm high, internodes are longer at the top and shorter at base; leaves lanceolate, narrowly linear, acuminate; spikes 6cm long, floral glumes densely hair, awned, grains oblong. Frequently found along cultivated fields and in forest hilly areas<sup>1, 2</sup>. The whole plant is used in treating Rheumatism<sup>3</sup>. The

juice from the plant is used in treating various skin disorders and possesses anti-diabetic, antimicrobial properties<sup>4</sup>. Traditionally *Chloris barbata* has been used in treatment of many types of pain and inflammatory conditions<sup>6</sup>. The present study is designed to explore the preliminary phytochemical and physicochemical analysis of *Chloris barbata* leaf, which is responsible for its pharmacological properties.

## MATERIALS AND METHODS

### Plant material

The plant of *Chloris barbata* has been collected from in and around Ananthagiri village. The plant has been authenticated by Dr. P. Jayaraman, plant taxonomist, (PARC/2011), Chennai, India.

### Preparation of the leaves extract

The leaves of the plants are properly washed in tap water and then rinsed in distilled water. The rinsed leaves are dried in an oven at 35°C for 2 days. It was then passed through the 40 mesh sieve. The powdered plant leaf material was subjected to successive solvent extraction taking from polar to non polar solvents like water, ethanol, methanol, acetone, chloroform, benzene and petroleum ether. 75gms of powdered plant material was subjected to Soxhlet extraction for 8 hrs with 250ml of the various solvents. The extracts obtained were kept for evaporation to remove the excessive solvents. The different physiochemical parameters mentioned in WHO guidelines like ash values, extractive values, florescence analysis (ordinary light and 366nm) and preliminary phytochemical screening tests were carried out in both powders and extracts.

### Phytochemical Screening

Phytochemical screening for major constituents was undertaken using standard qualitative methods as described

by Harborne, (1992). Saponins, tannins, flavonoids, volatile oils, glycoside, alkaloids, phenols and resin tests were conducted in all the fractions. Results are shown in Table 1.

## RESULTS

All the results generated from the present study are represented in the respective tables. The powdered leaf of *Chloris barbata* was subjected to Preliminary physicochemical and phytochemical analyses which were found to be very promising. The determination of ash value was carried out which gives an idea of the earthy matter or the inorganic composition and other impurities present along with the drug. The percentage of total ash, acid insoluble ash, sulphated ash and water soluble ash are carried out and results are as tabulated in the Table 1. Extractive values were also determined which are primarily useful for the determination of exhausted or adulterated drugs. The preliminary phyto-profiling for the leaves extracts of *Chloris barbata* was carried out wherein the consistency was found to be sticky in the non polar to not so polar solvent extracts whereas the polar solvent extracts were found to be non-sticky. The percentage yield w/w of the extracts was also analysed wherein the highest yield was found to be in the ethanolic extract- 8.05 %, the water soluble and alcohol soluble extractive values were also

determined which are as tabulated in the Table 2. The fluorescence characteristics was also studied under ordinary and UV light (366nm) showed the visibility of varying colours which are as tabulated in

the Table 3. The preliminary phytochemical screening revealed the presence of carbohydrates, tannins, flavonoids, mucilage and proteins.

**Table 1:** Physicochemical characters of leaf of *Chloris barbata*

WHO Parameters	Average values (%w/w)
Total ash	15.86
Acid insoluble ash	2.39
Water soluble ash	7.81
Sulphated ash	4.52
Alcohol extractive value	32.67
Water extractive value	24.48
Loss on drying	9.3

**Table 2:** Preliminary phyto-profile for leaves of *Chloris barbata*

Sl. No.	Solvent used	Color	Consistency	% Yield (w/w)
1.	Petroleum ether	Green	Sticky	2.6
2.	Benzene	Dark green	Sticky	0.7
3.	Chloroform	Dark green	Sticky	1.2
4.	Acetone	Dark green	Sticky	1.9
5.	Methanol	Dark green	Non-sticky	12.5
6.	Ethanol	Dark green	Non-sticky	8.4
7.	Water	Brown	Non-sticky	3.6

**Table 3:** Florescence characteristic of leaf extract of *Chloris barbata*

Sl.no.	Extract	Under ordinary light	Under UV light (366 nm)
1.	Petroleum ether	Green	Yellowish green
2.	Benzene	Dark green	Red
3.	Chloroform	Dark green	Red
4.	Acetone	Dark green	Red

5.	Methanol	Dark green	Deep red
6.	Ethanol	Dark green	Brown
7.	Water	Brownish green	Blackish brown

**Table 4:** Phytochemical analysis of different extracts of *Chloris barbata*

Sl. No	Name of the Test	Procedure	Observation	P*	B*	C*	A*	M*	E*	A*	
1	Alkaloids	Drug +	Dragondroffs reagent	Orange colour	-	-	-	-	-	-	-
			Mayer's reagent	White ppt.	-	-	-	-	+	+	+
			Hager's reagent	Yellow ppt.	-	-	-	-	-	+	+
2	Glycosides	Drug + Anthrone + H <sub>2</sub> SO <sub>4</sub> + Heat	Purple or green	+	+	+	+	+	+	+	
3	Carbohydrates	Drug +	Molish reagent + conc.H <sub>2</sub> SO <sub>4</sub>	Purple colour	+	+	+	+	+	+	+
			Fehling's solution A&B	Brick red colour	+	+	+	+	+	+	+
4	Phytosterols / triterpenoids		Liebermann Test	Bluish green	-	-	-	-	+	-	+
			Salkowski Test	Red & fluorescent	-	-	-	-	+	-	+
			Noller's test	Pink colour	-	-	-	-	+	-	+
5	Proteins & Amino acids		Biuret test	Violet colour	-	-	+	+	-	-	+
			Xanthoprotein test	Orange colour	-	-	+	+	-	-	+
			Millon's reagent test	White ppt	-	-	+	+	-	-	+
			Lead acetate test	White ppt	-	-	+	+	-	-	+
			Ninhydrin test	Pink colour	-	-	+	+	-	-	+
6	Saponins froth	Drug + water + shaking	Formation of honey comb like	+	+	+	+	+	+	+	
7	Flavonoids		Shinodaw's Test	Red colour	+	+	+	+	+	+	+
			Zn+HCl acid reduction Test	Magenta colour	+	+	+	+	+	+	+
8	Fixed oils & Fats	Spot test	Stains appear after drying	-	-	-	-	-	-	-	
9	Gums/Mucilage	Drug + water	No thickening of the substance	-	-	-	-	-	-	-	
10	Volatile oil			+	-	-	-	-	-	-	
11	Phenolics /Tannins	Drug +	FeCl <sub>3</sub>	Intense colour	+	-	+	-	-	+	-
			lead acetate + water	Formation of white ppt	+	-	+	-	-	+	-

## DISCUSSION

The present study is completely based on the phytochemical investigation leaves of *Chloris barbata*. On the basis of phytochemical screening of different successive extracts of leaves of *Chloris barbata* we conclude that this plant has a number of phytochemical constituents like: alkaloids, flavonoids, glycosides, fats, carbohydrates, (as shown in table 4). Flavonoids have been shown to exhibit their actions through effects on membrane permeability, and by inhibition of membrane-bound enzymes such as the ATPase and phospholipase<sup>6,7</sup>. Flavonoids serve as health promoting compound as a results of its anion radicals<sup>15</sup>. These observations support the usefulness of this plant in folklore remedies in the treatment of stress related ailments and as dressings for wounds normally encountered in circumcision rites, bruises, cuts and sores<sup>[8,9]</sup>. Whereas, on the basis of various physical evaluation we conclude that the plant have total ash value (15.86% w/w), acid-insoluble ash value (2.39%w/w), water soluble ash value (7.81%), sulphated ash value (4.52%w/w), alcohol soluble extractive value(32.67%w/w), water soluble extractive value (24.48%w/w) and loss on drying (9.33%w/w) are shown in table 1. Further study is in progress to isolate more compounds

## REFERENCES

1. Pullaiah T, Surya Prakash Babu P. Flora of Andhra Pradesh **1963**; 1845.
2. Rolla Seshagiri Rao, Venkanna P, Appi Reddy T. Flora of West Godavari **1920**; 438.
3. Madhava Chetty K, Sivaji K, Tulasi Rao K. Flowering plants of Chittoor District, Printed and published by students offset printers, Tirupati, 1st Edition **2008**; 398.
4. Algesboopathi C. Ethanomedicinal plants and their utilization by villagers in Kumaragiri hills of Salem district of Tamil Nadu. *Afr. J.Traditional. Complementary and Alternative Medicines* **2009**; 6 (3): 222-227.
5. Swathy B\*, Mohana Lakshmi S and Saravana Kumar A. Evaluation of Analgesic and Anti inflammatory properties of *Chloris barbata* (Sw). *International Journal of Phytopharmacology* **2010**; 1(2): 92-96.
6. Li H, Wang Z, Liu Y: Review in the studies on tannins activity of cancer prevention and anticancer. *Zhong-Yao-Cai* **2003**; 26(6): 444-448.
7. Hausteen B: Flavonoids, a class of natural products of high pharmacological potency. *Biochem Pharm* **1983**; 32: 1141-1148.
8. Ferguson LR: Role of plant polyphenols in genomic stability. *Mutat Res* **2001**; 475: 89-111.

9. Grierson DS, Afolayan AJ: treatment of wounds in the Eastern Cape. *S Afr J Ethnopharmacol* **1999**, 66:103-106.
- Antibacterial activity of some indigenous plants used for the