



PHARMACOGNOSTIC AND PHYTOCHEMICAL EVALUATION ON THE ROOT OF *CHROMOLAENA ODORATA* (L) KING AND ROBINSON

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ABSTRACT

Chromolaena odorata (L) belonging to the family Asteraceae. It has been reported for several pharmacological properties including antimalarial, anthelmintic, analgesic, antiantipyretic, inflammatory, antispasmodic, antigonorrhoeal, antioxidant, insecticidal, antimycobacterial, fungicidal, diuretic, wound healing, blood coagulation and antibacterial. This study deals with the Pharmacognostical and phytochemical evaluation of the root of *Chromolaena odorata* (Linn). Pharmacognostical studies includes macroscopic, microscopic and physicochemical evaluation of the root. The transverse section of root showed the presence of cork cells, phloem, cambium, xylem and medullary rays. Physicochemical constants showed the values of total ash (2.1%), acid insoluble ash

(0.5%), water soluble ash (1.2%), sulphated ash (0.8%), nitrated ash (1.5%), water soluble extractive (10.6%), ethanol soluble extractive (1.4%), ether soluble extractive (.4%), loss on drying (18.8%), and swelling index(0.66) w/w. The preliminary phytochemical screening of the alcoholic extract showed presents of alkaloids, phenolic compounds, tannins, terpenoids and flavanoids. The study helps to development of standard parameters of the plant which help the identification and authentication of the plant.

KEYWORDS: *Chromolena odorata* (Linn.), Pharmacognostical, Phytochemical, Root.

INTRODUCTION

The plants and plant products has been used for medicinal purposes, is an age-long practice in traditional communities and is becoming prominent globally. All over the world especially in developing countries, approximately 80% of population continues to use traditional medicine in primary medical problems.^[1] *Chromolaena odorata* (L) King and Robinson (family: Asteraceae) also known as Siam weed is a fast-growing perennial and invasive weed which is native to south and Central America, has been introduced into the tropical region of Asia, Africa and other parts of the world.^[2]

The common name include Siam Weed, Christmas Bush, Devil Weed, Siam kraut, Agonoi, Pokok kapal, Terbang etc.^[3] It is known as Communist Pacha in Malayalam.

The medicinal usage of *Chromolaena. odorata* has been reported in the traditional systems of medicine such as Ayurveda, Siddha, and Unani. It have wide variety of ethnomedicinal and pharmacological properties. The medicinal values of plants is due to their phytochemical components such as alkaloids, tannins, flavonoids and other phenolic compounds, which produce a definite physiological action on the human body.^[2]

MATERIALS AND METHODS

Collection and Authentication of plant

C. odorata roots were collected within the locality of Kozhikode, kerala, and were identified in the Department of Botany, Sir syed college Thaliparamba, Kannur, A voucher specimen of the plant was deposited for future reference. The root were separated from plant, washed thoroughly, cut shade dried and powdered in an electric grinder.

Pharmacognostical studies

Morphology of dried root of *Chromolaena odorata* (Linn).was studied. Free hand transverse sections of Root was studied, using Phloroglucinol and hydrochloric acid (1:1) as staining agent.^[4] Photomicrography was performed. The dried root powdered, sieved to 60#, stored in airtight containers and used for powder study and quantitative microscopy.

Physicochemical parameters

The moisture content, total ash, sulphated ash, nitrated ash, water soluble ash, acid insoluble ash, alcohol, water, ether soluble extractive values, hot extraction, foaming index, swelling index, mucilage content were determined as a part of its physicochemical characters.^[5,6,7]

Phytochemical screening

30g powder was extracted with 150 ml each of methanol at 76°C until solvent become colourless. Various phytoconstituents present in the root was detected by their respective chemical tests using methanolic extract.^[8]

RESULTS AND DISCUSSION

Pharmacognostical study



Fig. 1: *Chromolaena odorata* (L).

Scientific classification

Kingdom: Plantae

Subkingdom: Tracheobionta

Superdivision: Spermatophyta

Division: Magnoliophyta

Class: Magnoliopsida

Subclass: Asteridae

Order: Asterales

Family: Asteraceae

Genus: *Chromolaena*

Species: *Chromolaena odorata*(L)

Macroscopy

Characters	Root
Size	Variable
Shape	Irregular
Colour	Pale brown
Odour	Aromatic



Fig. 2: Root of *chromolaena odorata*(L).

Microscopy

Transverse section of the root is circular in outline with wavy margin. The following are the important tissues seen from the periphery to the centre which are also shown in Figure 3.

Cork:- Few layered, thick, cells are tangentially elongated and arranged in radial rows which are filled with brownish matter.

Cortex:- Which consist of many layers of parenchyma cells.

Secondary phloem fibres:- A wide zone of secondary phloem was found. phloem fibre were arranged in bundles.

Secondary xylem vessels: Xylem parenchyma and group of xylem fibers are seen. Large rounded vessels which are occasionally isolated but mostly in groups.

Medullary rays: 2-3 cell wide uniseriate lignified medullary rays were observed. They did not show the presence of starch grains and calcium oxalate crystals.

Pith:- Absent.

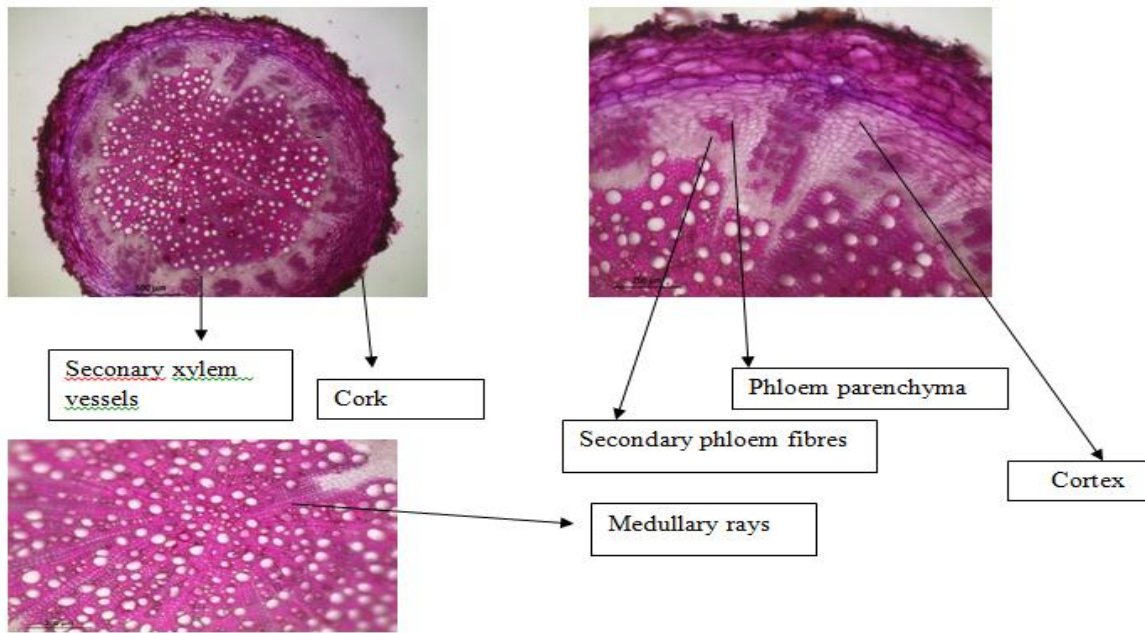


Fig. 3: Transverse sections of *Chromolaena odorata(L)*. Root.

Powder characteristics

Colour-pale brown



Fig. 4: Powder form of *Chromolaena odorata(L)* root.



Fig. 6: Pitted vessel.

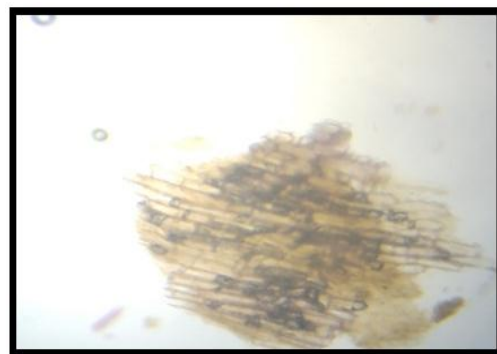
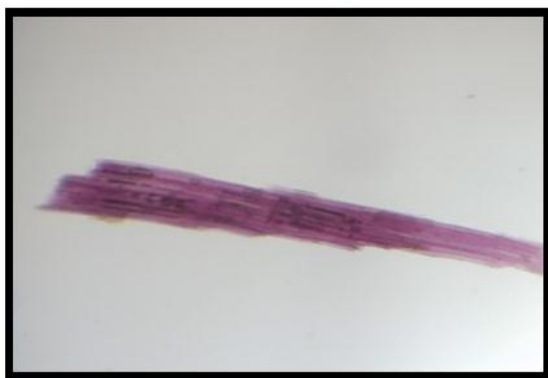


Fig. 7: Cork cell.

**Fig. 8: Fibers.****Fig. 9: Vessels.**

Physicochemical parameters	Results
Ash value	
(a) Total ash	2.1%
(b) Acid insoluble ash	0.5%
(c) Water soluble ash	1.2%
(d) Sulphated ash	0.8%
(e) Nitrated ash	1.5%
Extractive values	
(a) Water soluble extractive	2%
(b) Ethanol soluble extractive	1.4%
(c) Ether soluble extractive	0.4%
Loss on drying	18.8%
Foaming index	Nil
Swelling index	0.66 ml
Mucilage content	Nil

Physicochemical parameters

Physicochemical parameters are important parameters in detecting adulteration and are adopted to confirm the purity and quality of drug. Ash values are particularly important parameter as it shows the presence and absence of foreign matters like metallic salts or silica etc.

Phytochemical evaluation

Phytochemical screening showed the presence of alkaloids, flavonoids, tannins, mucilage and phenolic compounds.

Tests for constituents	Methanolic extract
Alkaloids	+
Carbohydrates	-
Steroids	+
Glycosides	+
Fats and Oils	-

Saponins	-
Phenolic compounds	+
Protein & Amino acid	-
Starch	-
Terpenoids	+
Flavanoids	+
Gum & Mucilage	-
Tannins	-

DISCUSSION

The present work deals with the Pharmacognostical and phytochemical study of the root of the *Chromolaena odorata*(Linn).. Phytochemical analysis showed the presence of important classes of phytoconstituents like alkaloids, steroids, glycosides, flavanoids, phenolic compound and terpenoids. This indicates that the root can be useful for treatment of different diseases because the therapeutic activity of a plant is due to the presence of particular class of compounds. The present work can be useful in standardizing the herbal formulations containing root of *Chromolaena odorata*(Linn).

CONCLUSION

It is concluded that the above parameters are very useful for the identification and authentication of the species. The results of the present study will also be helpful in preparation of monograph. It will also help in further isolation and purification of its active constituents as this will be stepping stone towards drug development and successful therapy in various diseases and ailments.

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