

PHARMACOGNOSTIC EVALUATION OF *KALANCHOE PINNATA* ROOTS

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ABSTRACT

The plant *Kalanchoe pinnata* is widely used in ayurvedic system of medicine as astringent, analgesic, carminative and also useful in diarrhea and vomiting. It is naturalized throughout the hot and moist parts of India. And lots of phytochemical and pharmacological work has done on leaves of plant but the root part is not focused. Hence we have selected roots for pharmacognostic analysis which will support further studies on the root. In this first roots are subjected to microscopic and macroscopic evaluation after which physical parameters were evaluated.

KEYWORD: *Kalanchoe pinnata*, pharmacognostic, physical parameters

INTRODUCTION

Various species of *Kalanchoe* are used medicinally in Indo-China and Philippines Islands, whereas *Kalanchoe pinnata* Pers. (Family Crassulaceae) is naturalized throughout the hot and moist parts of India. The leaves and bark is bitter tonic, astringent to the bowels, analgesic, carminative, useful in diarrhoea and vomiting¹. Antiulcer², anti-inflammatory^{3,4} and antimicrobial activity⁵ of leaf extract was reported. Oral treatment with leaf extract significantly delayed onset of disease in BALB/c mice infected with *Leishmania amazonensis* as compared to untreated mice or mice receiving *K. pinnata* by the intravenous or topical routes⁶. Potent cytotoxic compounds bersaldegenin-1,3,5-orthoacetate⁷ and bufadienolide-bryophyllin B⁸ were isolated. Other chemical constituents from this plant are bryophyllol, bryophollone, bryophollone, bryophynol and two homologous phenanthrene derivatives 2(9-decenyl)-phenanthrene (I)⁹ and 2-(undecenyl)-phenanthrene (II) from leaves⁹. Isolation and structure elucidation of 24-epiclerosterol [24(R)-stigmasta-5, 25-dien-3 β -ol], 24(R)-5 α -stigmasta-7, 25-dien-3 β -ol, 5 α -stigmast-24-en-3 β -ol and 25-methyl-5 α -ergost-24 (28)-en-3 β -ol from aerial parts was done¹⁰. This species is also included in the plants species, which are used by the tribals of Kerala for treating cancer symptoms¹¹. Juice of the fresh leaves is used very effectively for the treatment of jaundice in folk medicines of Bundelkhand region of India, but no systemic study to assess this activity has been carried out. And lots of phytochemical and pharmacological

work has done on the aerial parts of plant but the root part is not focused. Hence we have selected roots for pharmacognostic analysis which will support further studies on the root.

MATERIALS AND METHODS**Collection of plant material**

The roots of *Kalanchoe pinnata* was collected from Satpuda hills near Akkalkuwa, Dist: Nandurbar, Maharashtra, India, in June 2010, cleaned and dried at room temperature in shade and away from direct sunlight. The plant authenticated by T. Chakraborty, Deputy Director Botanical Survey of India, Koregaon Road Pune, by comparing morphological features and a sample voucher specimen of plant was deposited for future reference (Voucher specimen number QMAKP1).

Preparation of extract

The root of *Kalanchoe pinnata* was collected and dried in the shade and then pulverized in a grinder. The powdered drug was utilized for extraction. Material was passed through 120 meshes to remove fine powders and coarse powder was used for extraction. A method described in Mukherjee was used for extraction of powdered drug. Extraction was done by Pet. Ether, Chloroform, Methanol and water.¹²

Macroscopic evaluation

Different parameters were studied in macroscopic evaluation of the root of *Kalanchoe pinnata*, which are color, odor, size and shape.

Microscopic evaluation

Thin transverse section of middle part of fresh root was taken, stained with phloroglucinol-HCL, concentrated H₂SO₄, and iodine solution and observed under 10X and

45X. The transverse sections were studied. The microscopic powder characteristics of the root of *Kalanchoe pinnata* were performed.¹³

Evaluation of Physical parameter

In Physical parameter foreign organic matter, loss on drying, ash value, Total ash, sulphated ash, acid - insoluble ash were determined.¹⁴

Determination of Extractive value

Different extractive values like alcohol soluble extractive, water soluble extractive values were performed by standard method.¹⁴

Preliminary Phytochemical analysis

The extracts were then subjected to preliminary phytochemical screening to detect the presence of various phytoconstituent.⁴

RESULTS AND DISCUSSION

The root has dark brown in colour, odorless, bitter in test, varying in size. The transverse section shows Vascular bundles, Epidermis, Endodermis Cortex, cork etc. Powder characteristics shows calcium oxalate crystals, fiber, xylem vessels, cork cells etc. Evaluation of physical parameter shows significant results while water soluble extractive value is more than other.

In Preliminary phytochemical petroleum ether extract contain steroids, the chloroform extract contain steroids and alkaloids, the methanolic extract contain Steroids, Saponins, Alkaloids, Glycosides, Flavonoids, Tannins, Carbohydrates, Proteins and aqueous extract contain Saponins, Glycosides, Flavonoids, Tannins, Carbohydrates, Amino acids.

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Table 1- Morphology of *Kalanchoe pinnata* roots

Sr. No.	Character	Observation
1	Colour	Dark Brown
2	Odor	Odorless
3	Taste	Bitter
4	Size	Varying in size

Table 2- Physical Parameter of *Kalanchoe pinnata* roots

Sr. No.	Parameters	Values (%w/w)
1	Foreign inorganic matter	0.1
2	loss on drying	11.0
3	Total ash	11.8
4	Water- soluble ash	4.5
5	Acid insoluble ash	2.7
6	Sulphated ash	17.0

Table 3 Extractive Values of the *Kalanchoe pinnata* roots

Sr.No.	Extractive	Color	Extractive value (%w/w)
04	Petroleum Ether	Dark brown	5.0
03	Chloroform	Brown	6.48
02	Alcohol soluble	Yellowish green	8.28
01	Water soluble	Yellowish	12.56



Fig 1 Morphology of *Kalanchoe pinnata* root

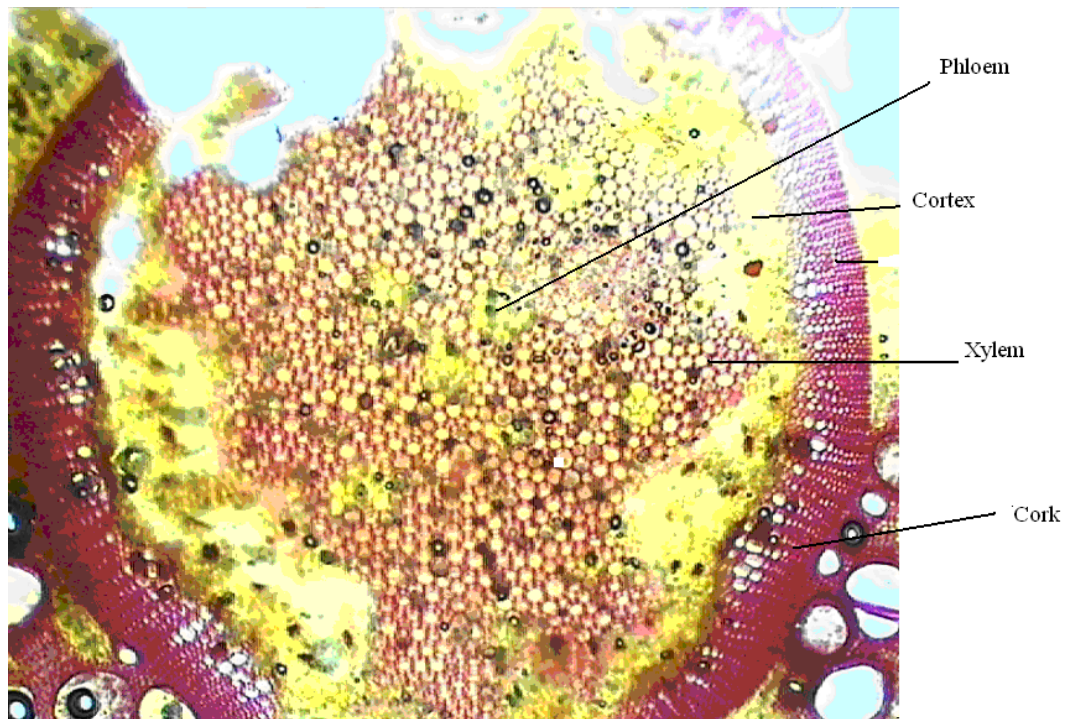


Fig 2 Transverse section of *Kalanchoe pinnata* root

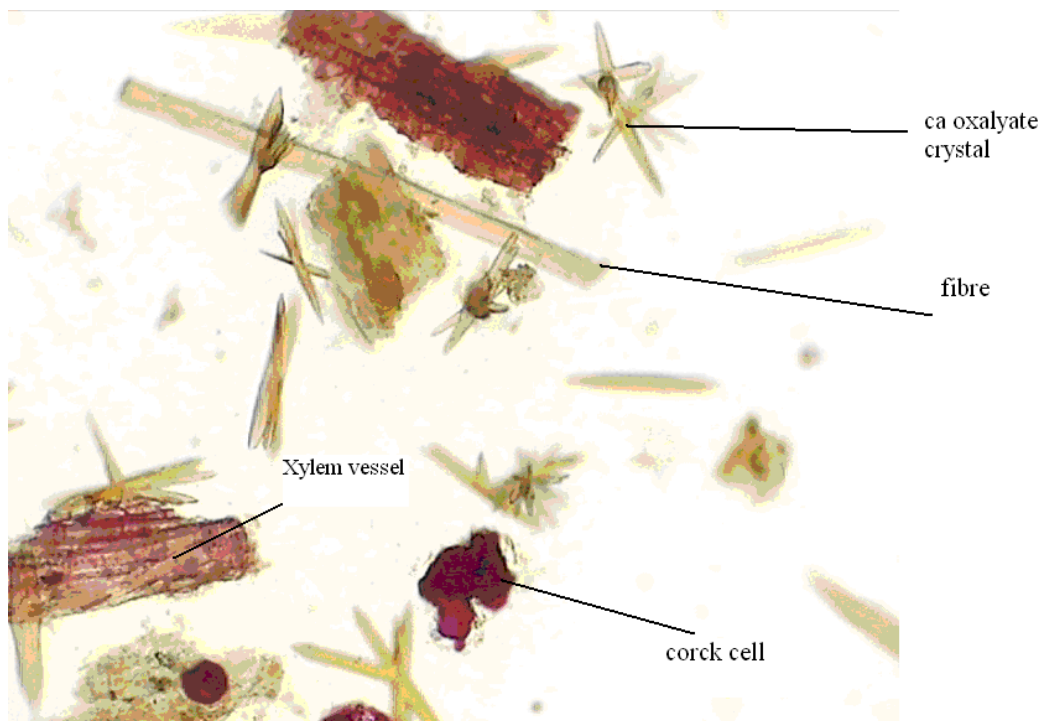


Fig 3 Powder characteristic of *Kalanchoe pinnata* root

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