



Journal of Medicinal Plants Studies

Preliminary Phytochemical Studies Of *Kalanchoe pinnata* (Lam.) Pers

Shashank Matthew*¹, K.K.Khosla², Cathrin Matthew³, Debjit Bhowmik

1. Department of Pharmaceutical Sciences, Sardar Patel College Of Technology, Balaghat, India
[E-Mail: debjit_cr@yahoo.com]
2. Government District Hospital, Balaghat, India
3. Karpagam University, Coimbatore, India

Kalanchoe pinnata is somewhat of a panacea to the indigenous people of the Amazon; the creoles use the lightly roasted leaves for cancer and inflammation, and a leaf infusion is a popular remedy for fevers. The root is also prepared as an infusion and used for epilepsy.

The dried stem of *kalanchoe pinnata* (LAM.) PERS. on successive extraction gives a high percentage yield of alcoholic extract 5.03 % w/v as compare to aqueous extract 4.30 % w/v. The phytochemical screening of the Ethanolic and Aqueous extracts of stem of plant *kalanchoe pinnata* (LAM.)PERS. yielded showed the presence of alkaloids, flavonoids, carbohydrates, saponins, triterpines, phytosterols, tannins, glycosides, protein, and amino acid and phenolic compounds.

Keyword: *Kalanchoe pinnata*, Preliminary Phytochemical Studies

1. Introduction

Herbal drugs play a role in the management of various disorders; most of them speed up the natural healing process of humans. Numerous medicinal plants and their formulations are used for various disorders in ethno medical practices as well as traditional system of medicine in India. Since pre-historic days attempts are being made to find out suitable drugs from natural sources for treatment of different diseases. The rational approaches, experience of folk medicine provide a valuable approach in the search for the development of new and useful therapeutic agents. Gradually keeping in pace with the scientific interpretations of the drug actions, the causes of the diseases, and the development in the

field of pharmacology and screening methods to find new natural herbs for various treatments of human beings. The aim of the research is to find out new drug from indigenous plant, which is potent and nontoxic agent. These plants are traditional medicinal plants. Their chemical characterization, mode of action and toxicity studies is yet to be established. Present study deals with phytochemical evaluation of stem of *kalanchoe Pinnata* (LAM.)PERS. (Family: Crassulaceae). In Brazil plant is used as sedative, wound-healer, and diuretic, anti-inflammatory and cough suppressant. It is also employed for kidney stones, gastric, ulcers, skin disorders and edema of the legs. Externally a leaf infusion or the leaf juice is used for headaches, toothaches, earaches, eye, infection, wounds, ulcer, boils, burns, and insect bites. Fresh leaf juice or

infusion is used for leishmaniasis and applied externally and taken internally for various bacterial, viral, and fungal infections.

2. Materials and Methods

2.1 Extraction of Plant Material:-

The dried stem of *Kalanchoe pinnata* was extracted with solvent of increasing polarity by Soxhlet apparatus whereas aqueous was obtained by cold maceration. The percentage yield of plant extract as follows

- Petroleum ether - 3.63 %
- Ethanol - 5.03 %
- Aqueous - 4.30 %

The percentage yield of ethanolic extract of stem of *Kalanchoe pinnata* was found to be greater (5.03%) than other extract.

2.3 Preliminary Phytochemical Studies

The various extract of dried stem were subjected for phytochemical screening which shows the presence of different compound in plant extract such as alkaloids, carbohydrates, flavonoids, saponins, triterpenes, phytosterol, tannins, glycosides, protein, amino-acids and phenolic compound.

- **Petroleum ether extract:** Glycoside, carbohydrate, flavonoids, fixed oil & fat.
- **Ethanolic extract:** Alkaloid, glycoside, flavonoids, carbohydrate, saponin, triterpen, tannins, phenolic compound, fixed oil & fat, protein and amino acid, phytosterol.
- **Aqueous extract:** Alkaloid, glycoside, flavonoids, carbohydrate, saponin, triterpen, tannins, phenolic compound, protein and amino acid.

2.4 Collection and authentication of plant material:

The specimen copy (Herbarium) of selected plant collected in month of July-2007 from ABS

Botanical garden, Karripatty, Distt. - Salem, Tamil Nadu Mr. A .Balsubramnian. (Consultant-central siddha research) Executive Director ABS botanical garden, Salem, authenticated the plant as *Kalanchoe Pinnata (LAM.)PERS.* (Family-Crassulaceae).

2.5 Preparation of Extract:

The stem of *Kalanchoe Pinnata (LAM.)PERS.* Were dried under shade and then powdered with a mechanical grinder. The powder was passed through sieve No. 30 and stored in an airtight container for further use.

2.6 Solvent for Extraction:

- Petroleum Ether (60-80° C)
- Alcohol (95% v/v)
- Distilled water with chloroform (0.25%)

2.7 Extraction procedure:

The dried powders of stem of *Kalanchoe pinnata* were defatted with petroleum ether (60-80°C) in a Soxhlet Apparatus by continuous hot-percolation. The defatted powder material (marc) thus obtained was further extracted with ethanol (95% v/v) with same method and fresh powder used for aqueous extraction by Cold maceration method. The solvent was removed by distillation under low pressure and evaporation. The resulting semisolid mass was vacuum dried by using rotary flash evaporator. The resultant dried extracts were used for further study. (Pulok, K. Mukherjee 2002)

2.8 Test for Alkaloids:

A small portion of the solvent free pet. Ether, alcohol extracts were stirred separately with few drops of dil. hydrochloric acid and filtered. The filtrate was tested with various reagents for the presence of alkaloids.

Mayer's reagent	-	Cream ppt
Dragendorff's reagent	-	Orange brown ppt
Hager's reagent	-	Yellow ppt
Wagner's reagent	-	Reddish brown ppt

2.9 Test For Phytosterol

The extract was refluxed with solution of alcoholic potassium hydroxide till complete saponification has taken place. The mixture was diluted and extracted with ether. The ether layer was evaporated and the residue was tested for the presence of phytosterol.

2.10 Libermann Burchard Test

The residue was dissolved in few drops of dil. Acetic acid; 3 ml of acetic anhydride was added followed by few drops of Con. sulphuric acid. Appearance of bluish green color shows the presence of phytosterol.

Table 1: Data Showing the Extractive Values of extracts of stem of Kalanchoe Pinnata (LAM.) PERS

Plant name	Parts used	Solvent system	Method of extraction	% yield
<u>Kalanchoe pinnata</u> (LAM.)PERS.	Dried stem	Petroleum ether	Continuous hot-- percolation	3.64
		Alcohol	Continuous hot-- percolation	5.03
		Distilled water	Cold maceration	4.30

2.11 Tests for Fixed Oils:

a) Spot test

Small quantities of various extracts were separately pressed between two filter papers. Appearance of oil stain on the paper indicates the presence of fixed oil. Few drops of 0.5N alcoholic potassium hydroxide were added to a small quantity of various extracts along with a drop of phenolphthalein. The mixture was heated on a water bath for 1-2 hours. Formation of soap or partial neutralization of alkali indicates the presence of fixed oils and fats.

b) Test for Gums and Mucilages

Small quantities of the extracts were added separately to 25 ml of absolute alcohol with

constant stirring and filtered. The precipitate was dried in air and examined for its swelling properties for the presence of carbohydrates.

c) Test For Saponins:

The extract was diluted with 20 ml of distilled water and it was agitated in a graduated cylinder for 15 minutes. The formation of 1 cm layer of foam shows the presence of saponins.

d) Test For Proteins And Free Amino Acids

Small quantities of the extracts were dissolved in few ml of water and treated with following reagents.

- **Million's reagent-** Appearance of red color shows the presence of protein and free amino acid.

- **Ninhydrin reagent-** Appearance of purple color shows the presence of proteins and free amino acids.
- **Biuret test-** Equal vol. of 5% sodium appearance of pink or purple color shows the presence of proteins and free amino acids.

Table 2: Preliminary Phytochemical Studies of Extracts of Stem of *Kalanchoe Pinnata (LAM.)PERS*

Sr. no.	Phytochemical constituents	Petroleum ether	Alcohol	Aqueous
1	Alkaloids	-	+	+
2	Glycosides	-	+	+
3	Flavonoids	+	+	+
4	Carbohydrate	+	+	+
5	Saponins	-	+	+
6	Triterpens	-	+	+
7	Phytosterols	-	+	-
8	Tannins	-	+	+
9	Fixed oil & fat	+	+	-
10	Phenolic compound	-	+	+
11	Gun and mucilage	+	-	+
12	Protein and amino acid	-	+	+

(+)----Positive

(-)----Negative

3. Conclusion

The dried stem of *kalanchoe pinnata (LAM.)PERS.* on successive extraction gives a high percentage yield of alcoholic extract 5.03 % w/v as compare to aqueous extract 4.30 % w/v. The phytochemical screening of the Ethanolic and Aqueous extracts of stem of plant *kalanchoe pinnata (LAM.)PERS.* yielded showed the presence of alkaloids, flavonoids, carbohydrates, saponins, triterpines, phytosterols, tannins, glycosides, protein, and amino acid and phenolic compounds.

4. References

1. Ayurvedic pharmacopoeia of India; 1st edition, part -1, Vol.-I, P. XXI.
2. B.D.Basu, Indian medicinal plants; page no.- 404-406.
3. Briickman G and Wertheimer E., Diabetogenic action of alloxan derivatives.
4. Bailey C J and Day, Traditional treatment for diabetes. Diabetes care.
5. Banerjee S, Sengupta A, Banerji J, Adhikary P, Chatterjee A, Studies on hypoglycemic effect of indigenous herbs, Indian Journal of Pharmacology 1994; 26; 229-230.
6. Charles R.Craig; Modern Pharmacology, 4th edition, P. 802-808.
7. Diabetes Mellitus-Information.com
8. Dr. K.M.Nandakarni's; Indian Material Medica; Vol-I, P.1xi-1xii
9. D.R. Laurence, P.N. Bennett; clinical pharmacology, 7th edition, P.8-12.
10. Dhanurkar R A, Kulkarni N N, Pharmacology of medicinal plants and natural products. Ind. J Pharmacology; 2000; 32: s 81-s118.
11. D.R Laurence, P.N. Bennett; clinical pharmacology, 7th edition, P.211-212.
12. D.R Laurence, P.N. Bennett; clinical pharmacology, 7th edition, P.229-233.
13. Goodman & Gilman's; 10th edition, P.1687, 1701-1707.

14. Gupta S.S., Prospects and perspective of natural plant products in medicine. Indian J of pharmacology 1994;26: 1-12
15. Ethnomedicine used in Trinidad and Tobago for urinary problems and diabetes mellitus.
16. H.R. Rang, M.M. Dale, J.M. Ritter; Clinical Pharmacology, 3rd edition, P. 409-416.