EMPRO

Current Research in Pharmaceutical Sciences

Available online at www.crpsonline.com

crps online CRPS

ISSN 2250 – 2688

Received: 27/06/2013
Revised: 15/07/2013
Accepted: 22/07/2013

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Microscopical and Phytochemical Evaluation of Stem of *Kalanchoe pinnata* Pers

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ABSTRACT

Kalanchoe pinnata (Crassulaceae) commonly known as Jakh me hayat. *Kalanchoe pinnata* pers is present naturalized throughout the hot and moist parts of India, particularly common in West Bengal. The plant has antibacterial, Anticancer, Antiparasitic, Anti-insecticidal, Anti-allergic properties. In the present study Microscopic and Phytochemical parameter of the plant has been determined which revealed the internal structure and presence compounds like alkaloids, flavonoids, triterpenes, glycosides, steroids and lipids.

Keywords: *Kalanchoe pinnata* pers. stem, ,Microscopic study, phytochemical study, Extractives.

1. INTRODUCTION

India is one of the richest floristic regions of the world and has been a source of plants and their products, since antiquity, man uses them in different way according to his needs, particularly as food and medicine. Among the entire flora, 35000 to 70000 species have been used for medicinal purposes . *Kalanchoe pinnata pers.* is a succulent herb upto 1.2 m in height with obtusely 4-angled stems, younger parts reddish speckled with white; leaves opposite, decussate, the lower usually simple,the upper usually 3-7 foliolate, long-petioled, petioles united by a ridge round the stem,crenatures at the extremities of the lateral nerves furnished with rooting vegetative buds; flowers reddish purple, pendent, in large spreading panicles ; fruits membranous follicles enclosed in persistent papery calyx and corolla, seed smooth, ellipsed. The leaves are astringent,sour,sweet, refrigent, emollient, mucilaginous, haemostatic, vulnerary, depurative, constipating, anodyne, carminative, anti-inflammatory, disinfectant and tonic. They are useful in vitiated conditions of *pitta* and *vata*, heamatemesis, haemorrhoids, menorrhagia, cuts and wounds, discoloration of the skin, boils, sloughing ulcers, ophthalmia, burns, scalds, corn, diarrhea, dysentery, vomiting and acute inflammation. Phytochemical evaluation of drug refers to determine quality and purity, such as through Ash value it refers to the adulterants and impurity. Extractive value shows to estimation of specific constituents, soluble in that particular solvent used for extraction. [1-2]

2. MATERIALS AND METHODS

Stem of *Kalanchoe pinnata* pers collected from local area of Bhopal, M.P, India, in November-December. The plant was identified and authenticated by Dr. ZIia Ul Hasan, HOD, Department of Botany, Saifia Science College Bhopal. (Specimen No.-133/Bot/Saifia /11).

2.1 Chemicals and Equipments

Compound microscope, Camera lucida (mirror type), Stage and eye piece micrometer and other basic equipments and glass wares are used for the present study. Solvents like Methanol, Acetone, Petroleum ether and Distilled water were used.

2.2 Phytochemical Studies

The powder stems of *Kalanchoe pinnata* determined the Ash value, Extractive value, Phytochemical screening.

2.2.1 Total Ash

To determine the total ash place about 2 gm of ground air dried drug, accurately weight in a previously ignited and crucible of silica. Spread the material in an even layer and ignite it by gradually increasing the heat to 500-600^{0}C until it is white, indicating the absence of carbon. Cool in a dessicator and weight. Then, we calculated the percentage of ash with reference to air-dried drug.

2.2.2 Acid Insoluble Ash

To determine the acid insoluble ash boil the ash with 25 of dilute HCL for 5 minutes, collected the insoluble matter in a sintered glass crucible, washed with hot water, ignited, cool in a dessicator and weight. Then, we calculated the percentage of acid-insoluble ash with reference to the air dried drug.

2.2.3 Water Soluble Ash

To determine water soluble ash total ash boil with the 25 ml of water for 5 minutes. Insoluble ash was collected in a sintered glass crucible. Washed with hot water and ignited in a crucible for 15 minutes at a temperature not exceeding 450oC cool and weight. Then, we calculated the percentage of water soluble ash with reference to the air dried drug.

2.2.4 Determination of Solvent Extractive Values

This method determines the amount of active constituents in a given amount of medicinal Plant material when extracted with solvents. For determination of solvent extractive values 5gm of the air dried, coarsely powdered macerated with 100 ml of water close flask for 24 hours, shaking frequently during first 6 hours and allowing stand for 18 hours. Thereafter, filter rapidly taking precautions against loss of solvent; evaporate 25 ml of the filtrate to dryness in a tarred flat bottomed shallow dish, at 105°C and weight. The percentage of solvent soluble extractive with reference to air dried drug has to be calculated[3-5]

3. RESULTS AND DISCUSSION

Microscopical studies showed the T.S. of stem of *Kalanchoe pinnata* and following tissues are observed (Fig.1). Cortex: Endodermis cortex are present in the T.S. of stem of *Kalanchoe pinnata* (fig. 2 (A). Vascular bundles: Collateral types of vascular bundles are present in the T.S. of stem of *Kalanchoe pinnata* (fig. 2(B). Xylem vessels: Lignified xylem vessels are present in the T.S. of stem of *Kalanchoe pinnata*. In phytochemical evaluation of the plant material a wide variety of important constituents are available in the form of carbohydrates, flavanoids and Tannins which shows remarkable therapeutic potential in various ailments. Further analytical parameters like Ash value (Table No 1), phytochemical screening (Table No 2) Extractive values (Table No 3), were carried out. The above studies enable the identification of the plant material for further investigations and form an important aspect of drug studies.[6]

Fig.1: T.S of stem of *Kalanchoe pinnata*

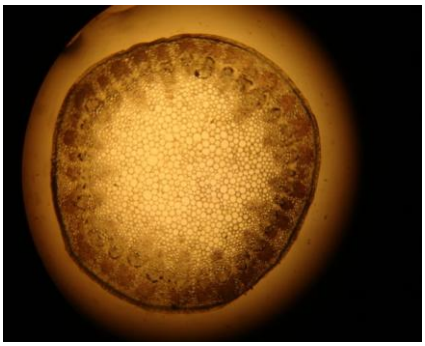

Table No. 1: Determination of Ash Values

Parameter	Determined value % w/w
Total ash	10.5
Acid insoluble ash	7.1
Acid insoluble ash	2.1

Fig. 2 (A): T.S showing epidermis and cortex

(B):T.S showing vascular bundle and pith

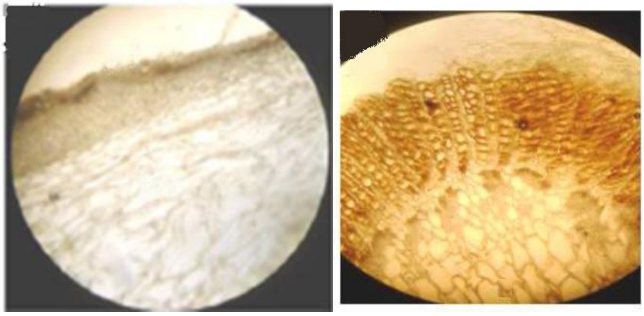

Table No. 2: Phytochemical Profile In Methanolic, Acetone, Pet. Ether And Aqueous Stem Extract Of Kalanchoe pinnata pers[7]

Phytochemicals	Petroleum ether	Acetone	Methanol	Water
Alkaloids	-	-	-	-
Tannins	+	+	+	-
Steroids	-	-	-	-
Flavonoids	+	+	+	+
Glycoside	-	-	-	-
Saponins	-	-	-	-
Carbohydrates	-	-	-	+
Amino acid	-	-	-	-

Table No.3: Extractive Values in Following Solvents[8]

Parameter	Determined value % w/w
Petroleum ether	6.1%
Acetone	11.3%
Methanol	20.2%
Water	15.1%

4. CONCLUSION

The report of phytochemical evaluation of *Kalanchoe pinnata* shows wide variety of phytoconstituents which produces remarkable therapeutic effect in treatment of various disorders and ailments. The Pharmacognostical studies include microscopical parameters, proximate analysis like ash values, extractive values and other analysis gives valuable information about the plant.

5. ACKNOWLEDGEMENTS

I wish to extend my sincere thanks to Mr. Vaibhav Srivastava and Mr. Munesh Bhadoria for providing encouragement and facilities for carrying out this work, and for their excellent supervision and optimistic approach at every step of my research work.

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