

Herbal Syrup By Kalanchoe Pinnata

Yogita Gotu Salunke^{1*}, Samruddhi Daulat Ramole², Sanjana Yogendra Rajput³, Roshan M. Chaudhary⁴, Hitendra S. Chaudhary⁵, Dr. S.P. Pawar⁶

^{1,2,3}Student department of pharmaceutics, P.S.G.V.P.Mandal's college of pharmacy, shahada, Maharashtra, India

^{4,5}Assistant professor department of pharmaceutics, P. S. G. V. P. Mandal's college of pharmacy, shahada, Maharashtra, India

⁶Principal department of pharmaceutics, P. S. G. V. P. Mandal's college of pharmacy, shahada, Maharashtra, India

***Corresponding Author:**

E-mail ID:- samruddhiramole@gmail.com

ABSTRACT

Kidney stones are associated with chronic kidney disease. Kidney stones may cause extreme pain and blockage of urine flow. Kidney stones are a risk factor for chronic kidney disease and progression to end-stage renal disease. Traditional practitioners prescribe the whole plants of *kalanchoe pinnata* (Crassulaceae) and Silk (Bombycidae) for the treatment of renal calculi. This study was aimed to design, develop and to characterize the herbal syrup using maceration of the Leaves of *kalanchoe pinnata* and Fibers of silk and to evaluate its efficacy against renal calculi. Kidney stone, as a third important urinary tract disease, is a common disease affecting 10-15% of the world population.

Keywords: Kidney stone, herbal medicine, herbal therapy, nephrolithiasis, renal calculi Urolithiasis

INTRODUCTION

The development of urinary calculi or kidney stones is known as urolithiasis or nephrolithiasis.

Kingdom: Plantae (Plants)

Subkingdom: Tracheobionta (Vascular plants)

Super division: Spermatophyta (Seed plants)

Division: Magnoliophyta (Flowering

plant)

Class: Magnoliopsida (Dicotyledonous)

Crassulaceae Stonecrop family Subclass:

Rosidae

Order: Saxifragales

Family: Crassulaceae Stonecrop Genus:

Kalanchoe

Species: *Kalanchoe pinnata* (Lam.)



Fig.1:-Kalanchoe pinata

- **Synonyms:** Bryophyllum calycinum, B. germinans, B. pinnatum, Cotyledon calycina, C. calyculata, C. pinnata, C. rhizophilla, Crassuvia floripendia, Crassula pinnata, Sedum madagascariense, Vereia pinnata.
- **Regional Names:** Hindi: zakhm-hayat Arabic: kushnulhayat Bengal: koppata Sanskrit: asthi-bhaksha Telgu: simajamudu Tamil: ranakalli Kannad: ganduklinga Malayalam: elamurunga Persian & Urdu: Chubehayat^{1,2}

DESCRIPTION

It is a glabrous shrub 0.3-1.2m. High; Stems with four obtuse angles; the older parts are light in color, while the younger parts are reddish and white-flecked. Variable decussate leaves with petioles joined by a ridge around the stem; the lower leaves are typically 8-12 and 6-8 cm in length, and the upper leaves are typically 3-5 or sometimes 7 folios long and pointed.

Panicles axillary or elliptic, crenate or serrate. The leaves frequently produce, on their crenature at the furthest points of the sidelong nerves, buds outfitted with root, stems and leaves, which drop off and without a moment's delay become new plants. Reddish-purple flowers are pendent and appear in large, spreading panicles with opposing strong branches; pedicel thin. The triangular teeth on the reddish-green calyx at the base are striated and pale green above. The corolla is reddish-purple at the base, constricted in the middle, and swollen. Green at the base and pinkish below the anther of the filaments. Anther is black and hastate. The fruit is enclosed within the long-lasting, papery corolla and calyx. Small, smooth, oblong-ellipsoid seeds that are barely striate and smooth.

LITERATURE REVIEW

Plant part Popular Use Preparation Reference
Leaves, stem Otitis, skin diseases – Cos et al. (2002) Leaves Healing – Fonseca-Kruehl and Peixoto (2004)

Leaves Bronchitis, flu and sore Juice, syrup and poultice Medeiros et al. (2004)

Ideal Characteristics Of Syrup :

Physiologically inert. Physiologically Stable.

Do not impart any undesired taste, colour and odour. Non-toxic, non-irritant and non-sensitizing.

Effective in low concentration. Free from microorganism.

Not interfere with bioavailability of the drug. Accepted by regulatory authorities.

Phytochemical Analysis :

The plant contains alkaloids, flavonoids, phenolic compounds, tannins, macro elements; magnesium, calcium, potassium, phosphorus, sodium, microelements; iron, zinc, vitamins; ascorbic acid, riboflavin, thiamine, niacin.

Syringic acid, caffeic acid, 4-hydroxy-3-methoxy-cinnamic acid, 4-hydroxybenzoic acid, p-hydroxycinnamic acid, para-coumaric acid, ferulic acid, protocatechuic acid, phosphoenolpyruvate, protocatechuic acid isolated from aerial parts of plants. Leaves contain astragalin, 3, 8-dimethoxy-4, 5, 7-trihydroxyflavone, friedelin, epigallocatechin-3-O-syringate, luteolin, rutin, kaempferol, quercetin, quercetin-3-O-rhamnoside-L-arabinofuranoside, quercetin-3-O-di-arabinoside, and kaempferol-3-glucoside.

Pharmacological Review :

a) Diuretic and antiurolithic activity :

Male Wistar rats received oral and intraperitoneal administrations of hydroalcoholic extract of the leaves of *Kalanchoe pinnata* (Crassulaceae) at doses of 100, 300, 500, and 800 mg/kg, respectively. Comparing the volume of urine collected from each individual animal while they were kept in metabolic cages was used to determine the effect of urine output.

b) Hepatoprotective activity :

The leaf juice (concentrated) and the ethanolic part of the juice (EX) was taken for the movement. Both in vitro and in vivo model were taken for evaluation of action. Chloroform's metabolite, ccl3, is a free radical that binds to lipoprotein and causes per oxidation of lipids in the endoplasmic reticulum, resulting in hepatotoxicity. Plant concentrate decreased bilirubin levels by 105.50%, and plant extract decreased SGPT levels by 92.47 and 87.43 percent, respectively, as a result of this experiment. These information alongside histopathological concentrates obviously show the Hepatoprotective movement of kalanchoe pinnata.

c) Immunomodulatory effect :

For the experiments, male BALB/c mice and Lou-M rats were used. Eosinophil counts, OVA specific igE, T cell proliferation, cytokine production, and the histamine release assay, among other parameters, were taken into account. The findings demonstrate that the plant extract and its quercetin flavonoids effectively protect mice from anaphylactic shock.

d) Nephroprotective activity :

Harlalka et al report that the aqueous extract of leaves of Kalanchoe pinnata possesses potent nephroprotective against gentamicin induced nephrotoxicity in rats and in vitro antioxidant activity.

1] Following Are Ingredients Used In Formulation :

Kalanchoe pinnata : It consist of leaves of plant kalanchoe pinnata ; belonging to family Crassulaceae Stonecrop. It is used as renal calculi (kidney stone) ,urolithiasis or nephrolithiasis Kalanchoe is a medicinal plant largely used in folk medicine for the treatment of kidney stones, gastric ulcer, pulmonary infection, rheumatoid arthritis etc.

Jatamansi : It consists of dried rhizomes of plant Nardostachus Jatamansi belonging to family valerianaaceae. It is used as diuretics, anti spasmodic and sedative.

Methyl paraben : It is used in small quantities of preservatives.

a) Sugar: It act as preservative and uses to increases shelf life of product.

b) Tragacanth : It is used as thickening agent and acts as natural gum.

c) Water : It is used as vehicle.

ROLE OF INGREDIENTS IN HERBAL SYRUP

Sr. No	Ingredients	Category
1	Kalanchoe pinnata	Renal calculi
2	Jatamansi	Diuretic
3	Methyl paraben	Preservatives
4	Sugar	Sweetning agent
5	Tragacanth	Thickening agent
6	Water	Vehicle

MATERIALS AND METHODS

• Preparation of herbal syrup a)Formulation No. 1(F3):for 100ml

Sr. No	Ingredients	Quantity
1	Kalanchoe pinnata	60ml
2	Jatamansi	10ml
3	Methyl paraben	5ml
4	Sugar	15gm
5	Tragacanth	5gm
6	Water	q. s

2] Procedure :

The herbal syrup is prepared by following method . Steps are as follows :

- a) 7 to 8 leaves of kalanchoe pinnata were taken and wash it with water.
- b) The leaves were added into 100 ml of water and then heated into 100 c .
- c) The extract got was filtered and then cool. 40 ml , 30 ml and 20ml of solution is measured.
- d) Jatamansi is added in 100ml of water and maceration upto 3 days in 24 hours. The extract got was filtered and then cool. About 5ml, 7ml, and 10ml solution is measured.
- e) Weight accurately 5 gm of methylparaben is added into 10ml of water and then added into syrup.
- f) Weight accurately 33.3 ml of sugar is added into syrup.
- g) Weight accurately 5 gm of Tragacanth into 10ml of water dissolved and added into syrup.
- h) Add water in quantity sufficient.

3] Advantages of herbal syrup:

- No side effects
- No Harmless
- Easily available
- Easy to adjust the dose for child's weigh
- Herbs Grow in common place.

4] Evaluation :-**1) Procedure to determine density:-**

Clean thoroughly the specific gravity bottle with chromic acid or nitric acid. Rinse the bottle at list two or three times with distilled water.

If required, rinse the bottle with organic solvent like acetone and dry . A Take the weight of empty dry bottle with cappillary tube stopper (W1).

Fill the bottel with unknown liquid and place the stopper, wipe out excess liquid from outside the tube using tissue paper. Weight bottle with unknown liquid on analytical balance (w2) Calculate weight in grams of unknown liquid (w3).

Formula for density: Density of liquid under test (syrup) = weight of liquid under test/volume of liquid under test = w_3/v

2. Procedure to determine Specific gravity :

- 1) Clean thoroughly the specific gravity bottle with chromic or nitric acid.
- 2) Rinse the bottle at least two to three times with purified water.
- 3) If required, rinse the bottle with an organic solvent like acetone and dry.
- 4) Take weight of empty dry bottle with capillary tube stopper.
- 5) Fill the bottle with distilled water and place stopper; wipe out excess liquid from side tube using tissue paper (w2).
- 6) Weight bottle with stopper and water on analytical balance (w2).
- 7) Repeat the procedure for liquid under test by replacing the water after emptying and drying as mentioned in step 4 to 6.

Weight bottle with stopper and liquid under test on analytical balance (w3). Formula for specific gravity: Specific gravity of liquid under test (syrup) = weight of liquid under test /weight of water = w_5/w_4 .

3. Procedure to determine Viscosity:

- 1) Thoroughly clean the Ostwald viscometer with warm chromic acid and if necessary used an organic solvent such as acetone.
- 2) Mount viscometer in vertical position on a suitable stand.
- 3) Fill water in dry viscometer up to mark G.
- 4) Count time required, in second for water to flow from mark A to mark B.
- 5) Repeat step 3 at least 3 times to obtained accurate reading.
- 6) Rinse viscometer with test liquid and then fill it up to mark A, find out the time required for liquid to flow to mark B.
- 7) Determination of densities of liquid as mentioned in density determination experiment.

[Formula for viscosity Density of test liquid × Time required to flow test liquid Viscosity]= [Viscosity of water Density of water × Time required to flow water]

4. pH determination:

The pH determination of syrup by using two techniques. – pH paper.

5] Result

Sr. No	Parameters	F1	F2	F3
1	Density	1.01gm/ml	1.06gm/ml	1.06gm/ml
2	Specific gravity	0.5080	0.5295	0.5081
3	Viscosity	2.70cp	2.60cp	2.99cp
4	PH determination	4	5	4.5
5	Organoleptic characteristics			
a	Color	Dark Brown	Yellowish Brown	Yellowish Brown
b	Odor	Aromatic	Plesant	Aromatic
c	Taste	Pungent	Sweet	Sweet
d	Apperance	Turbid	Clear	Clear

CONCLUSION

The final formulation, F4, is more stable than the previous formulations, F1, F2, and F3. By minimizing the error in formulations F1, F2, and F3, the formula (F4) was obtained. The Plan (F4) having cancer prevention agent property.

REFERENCE

1. Afzal M, Gupta G, Kazmi I, Rahman M, Afzal O, Alam J, Hakeem KR, Pravez M, Gupta R, Anwar F. Anti-inflammatory and Analgesic potential of a novel steroidal derivative from Bryophyllum Pinnatum. Fitoterapia, 2012a; 83: 853-858.
2. Afzal M, Kazmi I, Anwar F. Antineoplastic potential of Bryophyllum pinnatum Lam. On chemically induced hepatocarcinogenesis In rats. Pharmacognosy Res, 2013; 5: 247-253.
3. Afzal M, Kazmi I, Khan R, Singh R, Chauhan M, Bisht T, Anwar F. Bryophyllum pinnatum: A review. Int J Res Biol Sci, 2012b; 2: 143-149.
4. Kirtikar K.R. & Basu B.D., Indian Medicinal Plants with illustrations. Volume-5, Second edition, Oriental enterprises. 2003: 1394-1396.
5. The Wealth of India A Dictionary of Indian Raw Materials and Industrial Products, (Volume-5)(H-K) First Supplement Series, National Institute of
6. Science Communication and Information Resources, Council of Scientific and Industrial Research, New Delhi;1997: 31.
7. Plants.usda.gov.
8. www.raintree.Com.
9. Kirtikar K.R. & Basu B.D., Indian Medicinal Plants with illustrations. Volume-5, Second edition, Oriental enterprises. 2003: 1394-1396.
10. The Wealth of India A Dictionary of Indian Raw Materials and Industrial Products, (Volume-5)(H-K) First Supplement Series, National Institute of
11. Science Communication and Information Resources, Council of Scientific and Industrial Research, New Delhi;1997: 31.
12. Plants.usda.gov
13. www.raintree.Com
14. Ghasi S, Egwuib C, Achukwu PU, Onyeausi JC (2011). Assessment of The medical benefit in the folkloric use of Bryophyllum Pinnatum leaf Among the

- Igbos of Nigeria for the treatment of hypertension. Afr. J. Pharm. Pharmacol.
15. Harlalka GV, Patil CR, Patil MR (2007). Protective effect of *Kalanchoe Pinnata* pers. (Crassulaceae) on Gentamycin-induced nephrotoxicity.
16. Kirtikar K.R. & Basu B.D., Indian Medicinal Plants with illustrations. Volume-5, Second edition, Oriental enterprises. 2003: 1394-1396.
17. The Wealth of India A Dictionary of Indian Raw Materials and Industrial
18. Products, (Volume-5)(H-K) First Supplement Series, National Institute of Science Communication and Information Resources, Council of Scientific and Industrial Research, New Delhi;1997: 31.
19. Plants.usda.gov
20. www.raintree.com
21. Nandkarni A.K., Indian Materia Medica, Volume-1, Third edition, Popular Prakashan, Bombay, 2005:1402 & 221.
22. Samim Sofika Begum and Rajib Jogoi, Herbal recipe prepared during Bohag or Rongali Bihu in Assam, Indian Journal of Traditional Knowledge, 2007;6(3): 417-422.
23. S Huissain and DK Hore, Collection and conservation of major medicinal plants Of Darjeeling and Sikkim, Indian Journal of Traditional Knowledge, 2007;6(2): 352-357.
24. Prabal Sen, Mihin Dollo, Manabendra Dutta Chaudhury, Dhrupad Choudhury, Documentation and Traditional Herbal Knowledge of Khampis of Arunachal Pradesh, 2008;7(3): 438-442.
25. DE Okwu and C Josiah. Evaluation of the chemical composition of two Nigerian Medicinal plants. African Journal of Biotechnology. February 2006; 5: 357-361.
26. Anooj Kamboj, Ajay Kumar Saluja. *Bryophyllum pinnatum* (Lam) Kurz. : Phytochemical and Pharmacological Profile: A Review. Pharmacognosy Reviews.2009; 3 (6): 364-374.
27. Michelle F. Muzitano, Luzineide W. Tinoco, Catherine Guette, Carlos R. Kaiser, Bartira Rosi-Bergmann, Soni S.Costa. The antileishmanial activity assessment of Unusual flavonoids from *Kalanchoe pinnata*. Phytochemistry. 2006; 67: 2071-2077.
28. Salimuzzaman Siddiqui, Shaheen Faizi, Bina S. Siddiqui and Naheed Sultana. Triterpenoids and phenanthrenes from leaves of *Bryophyllum pinnatum*. Phytochemistry. 1989; 28 (9): 2433-2438.
29. Unang Supratman, Tomoyuki Fujita, Kohki Akiyama, Hiedo Hayashi, Akira Murakami, Hirofumi Sakai et al . Anti-tumour Promoting activity of Bufadienolides from *Kalanchoe pinnata* and *K. daigremontiana* × *tubriflora*.28)
30. <https://theherbalacademy.com/herbalsyrup>.
31. <https://www.merriamwebster.com/syrup>.
32. <https://en.m.wikipedia.org/wiki/kiwi>.
33. <https://www.food.ndtv.com>
34. Guroo I, Wani SA, Wani SM, Ahmad M, and Masodi FA. A Review of production and Processing of kiwifruit. Journal of food processing and technology, 2017; 8(10): 2.
35. <https://www.healthline.com>
36. <https://www.wikipedia.org/wiki/basil>.
37. Bhateja S, Arora G. Therapeutic benefits of holy Basil in general and oral medicine. A Review of International Journal of Research in Ayurveda and pharmacy, 2012; 3(6): 762.
38. <https://www.wikipedia.org/wiki/orange>
39. Shafiya R, Rajkumari K, Sofi SA, Nadia B. Citrus peel as a source of functional Ingredient. A Review of Journal of the Saudi Society of Agriculture science, 2019; 7(2):355.
40. <https://www.britannica.com/plant/sugarcane>
41. <https://www.srasanz.org/basics-sugar>.
42. <https://www.sciencedirect.com/topics>
43. <https://theherbalacademy.com/herbal-syrup>.
44. More HN and Hajare AA, Practical physical pharmacy. 3rd ed.2016, Career

publication. pp. 12, 13, 142.nal of
Bioscience, Biotechnology and
Biochemistry. 2001; 65 (4): 947-949.