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Formulation And Evaluation of Medicated Syrup Using *Kalanchoe Pinnata* and *Moringaoleifera*

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I. INTRODUCTION

This research focuses on the formulation and evaluation of a herbal syrup containing Kalanchoe pinnata extract, targeting urolithiasis (renal calculus) management. Kalanchoe pinnata, widely recognized for its anti-inflammatory, nephroprotective, and antimicrobial properties, is a promising therapeutic agent for urinary and renal conditions. The objective was to develop a stable, palatable, and patient-friendly dosage form to enhance compliance, particularly for individuals with urinary tract disorders and kidney stones. The syrup formulation was prepared using a standardized ethanolic extract of Kalanchoe pinnata, sucrose, Tri sodium citrate, glycerine and sodium benzoate as key excipients. The formulation underwent rigorous evaluation for physical and chemical stability, viscosity, pH, microbial safety, and overall acceptability1 . Results showed a stable pH (6.97), suitable viscosity for ease of administration, and excellent microbial stability over an extended shelf life. Preliminary findings indicated that the syrup effectively supports urinary health, with potential to dissolve renal calculi and alleviate UTI symptoms. This novel formulation bridges traditional herbal medicine and modern pharmaceutical practices, offering a convenient and effective treatment option for urinary and renal disorders.1 Herbal medicines have gained significant attention in recent years due to their natural origin, minimal side effects, and broad therapeutic potential. Among these, Kalanchoe pinnata (Bryophyllum pinnatum) holds a prominent place in traditional medicine for its diverse pharmacological properties, including anti-inflammatory, antimicrobial, nephroprotective, and wound healing activities. This plant is rich in bioactive compounds such as flavonoids (quercetin, kaempferol), alkaloids, phenolic acids (caffeic acid, ferulic acid), triterpenoids, and bufadienolides, which contribute to its therapeutic potential. Renal calculus (kidney stones) and UTI (urinary tract infection) inflammation of the urinary tract are prevalent health issues that significantly impact quality of life. Existing treatments, while effective, are often associated with high costs and adverse effects, driving the demand for safer, more affordable alternatives. Kalanchoe pinnata has demonstrated significant potential in dissolving renal calculi, reducing inflammation, and providing nephroprotection due to its bioactive components. Traditional preparations of Kalanchoe pinnata, such as teas or Infusions, face challenges in terms of stability, standardization, and patient compliance. Therefore, this study aims to develop a stable and

patient-friendly Kalanchoe pinnata syrup for the management of UTI and Urolithiasis (Renal calculus)2 . Moringa olifera commonly known as drumstick belongs to the Moringaceae family. All parts of plant were used commonly in cooking and various home remedies. A number of medicinal properties attributed to different parts of M. olifera like leaf, fruit, flowers, root, bark and seed oil have been used for mixture of ailments have been recognized by Ayurvedic and unani medicines . There are various biological properties ascribed to different parts of M. olifera have been reviewed in scientific articles .The leaves of Moringa oleifera have been reported to be a valuable source of both macro and micronutrients,rich source of β-carotene, protein, vitamin C, calcium, and potassium and act as a good source of natural antioxidants to this purpose we evaluated diuretic activity of alcoholic extract of Moringa oleifera leaves.

II. METHODS AND MATERIAL

1.KALANCHOE PINNATA COLLECTION OF PLANT MATERIAL

Rainy and early monsoon season are considered best time for collection of kalanchoe pinnata. Because

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during these time active vegetative growth phase. There is higher accumulation of secondary metabolites like flavonoids, alkaloids, phenolic acid, triterpinoid, saponin bufadienolides. It increases the antiurilitholic activity of kalanchoe pinnata
Kalanchoe pinnata leaves were cleaned, cut, and oven-dried at 50°C for 3 days.
The dried leaves were pulverized into a fine powder.
10 g of the dry powder was mixed with 100 mL ethanol (96%) and stirred for 24 hours.
The extract was then filtered and concentrated

2.MORINGA OLIFERA COLLECTION OF PLANT MATERIAL
From the herbal garden, leaves were taken from the Moringa oleifera plant. The plant's health and lack of infection were confirmed. The leaves were properly cleaned and dried after being washed under running water to get rid of dust and other foreign
One Liter of 100 percent pure ethanol was added to 100 grams of the powdered leaves, and it was macerated for 72 hours.
After filtering, the procedure was done twice for 48 and then 24 hours using the same solvent. The resultant pooled extracts were further concentrated using rotational flash, further concentrated using a vacuum desiccator, and then conserved at 4°C.

FORMULATION OF SYRUP
PREPARATION OF SIMPLE SYRUP
Take a clean, heat-resistant beaker or container.
Heat the mixture gently using a burner until the sucrose is completely dissolved in the water. Stir occasionally to ensure uniform dissolution. Once all the sucrose has dissolved and the solution is clear, remove the container from the heat source. Allow the solution to cool to room temperature.3

1.FORMULATION OF THE SYRUP 3
Once the simple syrup is cooled, measure out 75 ml of the prepared simple syrup.
In a clean container, combine the following:
Kalanchoe pinnata leaf ethanolic extract (containing the active compounds).
Moringa oleifera ethanolic extract (containing the active compounds)
10 ml of tri sodium citrate solution (for pH adjustment and flavor).
2.5 ml of glycerine (Humectant, viscosity enhancer, improves taste)
2.5 ml of sodium benzoate solution (as a preservative) 3 .

2.Mixing
Add the 75 ml of simple syrup to the container with the ethanolic extract, tri sodium
citrate glycerine and sodium benzoate.

3 .Final Volume and Storage
After mixing, ensure the total volume is 100 ml.
Transfer the prepared syrup into an amber-colored glass bottle to protect it from light.
The formulation showed a decrease in calculi size and diuretic effect indicating
potential stone breakdown 3 .

S.NO	INGREDIENTS	ROLE	FORMULATION 1	FORMULATION 2	FORMULATION 3
1	*Kalanchoe Pinnata* Extract	Urolithiasis	10ml	7ml	5ml
2	*Moringa Olifera* Extract	Diruetic	10ml	7ml	5ml
3	Tri sodium citrate solution	pH adjustment and flavor	10ml	10ml	10ml
4	Glycerine	Humectant, viscosity enhancer,	2.5ml	2.5ml	2.5ml
5	Sodium benzoate solution	Preservatives	2.5ml	2.5ml	2.5ml
6	Simple syrup	Sweetening Agent	75ml	75ml	75ml

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EVALUATION[2]

1. Density Procedure:

✓ Take a clean, dry, and calibrated pycnometer or a suitable density bottle.

✓ Weigh the empty pycnometer (W1).

✓ Fill the pycnometer with a known volume of the syrup formulation

Weigh the filled pycnometer (W2).

Calculate the density using the formula: Density=Weight of the syrup (W2 - W1)/Volume of the syrup[2]

2. Viscosity

Ostwald Viscometer:

✓ Ostwald viscometer is clean and dry before use

✓ Set the viscometer vertically using a stand to ensure it is stable.

✓ Check that the capillary tube is not obstructed or damaged[2]

Filling the Viscometer:

✓ Fill the Ostwald viscometer with the syrup sample. Make sure the liquid level is above the upper bulb but below the marked upper graduation.

✓ Avoid any air bubbles in the capillary tube[2].

Timing the Flow:

✓ Using a stopwatch or timer, allow the syrup to flow between the two marked points (upper and lower marks) in the capillary tube.

✓ Start the timer as the meniscus passes the upper mark, and stop it once the meniscus reaches the lower mark.

✓ Repeat the measurement two to three times to obtain an average time.[2]

Calculation of Viscosity:

The viscosity can be calculated using the formula:

$$\eta=(ts/tstd) \times \eta std$$

Where:

✓ η = viscosity of the sample (in cP)

✓ ts= time taken for the syrup to flow between the two marks

✓ tstd= time taken for a standard liquid (usually water) to flow between the same marks under identical conditions

✓ ηstd= viscosity of the standard liquid (in cP)[2]

3 .PH TEST

Determine the pH of syrup by suitable means ; It should be 6.0 to 7.0

PROCEDURE[3]

1 .Calibration of pH Meter:

✓ Calibrate with standard buffer solutions (usually pH 4.0 and 7.0).

✓ Ensure the temperature is noted or auto-compensated.

2 .Sample Preparation:

✓ Take about 10 mL of the syrup.

✓ If it's highly viscous, dilute with distilled water (1:1 or 1:2 ratio).

✓ Mix gently to ensure homogeneity.

3 . Measurement:

✓ Immerse the electrode in the sample.

✓ Wait until a stable reading is obtained.

✓ Record the pH value.

4.Cleaning:

✓ Rinse the electrode with distilled water after each measurement

4.VISUAL INSPECTION

✓ With the visual inspection, the ingredient & the final product are carefully examined for purity &for appearance Physical appearance of product for patient adherence compliance is critical so that it should be good looking & elegance in appearance[2].

5.**PHYSICAL STABILITY**

Physical stability of syrup is evaluated by monitoring organoleptic properties (color, odor, taste), clarity, pH, viscosity, and specific gravity over time, typically at observing for sedimentation, crystal growth, or microbial growth over 1 months.[2]

III. RESULTS AND DISCUSSION

1.PHYSICAL APPERANCE

In this test syrup was observed for colour,odour and appearance

S.NO	PARAMETERS	F1	F2	F3
1	COLOUR	GREEN	GREEN	**GREEN**
2	ODOUR	AROMATIC	AROMATIC	**AROMATIC**

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3	APPERANCE	CLEAR, NON-TRANSPARENT, HOMOGENEOUS	CLEAR, NON TRANSPARENT, HOMOGENEOUS	**CLEAR, NON-TRANSPARENT, HOMOGENEOUS**

2.DENSITY

S.NO	OBSERAVATION	F1	F2	F3
1	Density	1.0471	1.0468	**1.316**

Density of the syrup should be 1.320 ,Here formulation F3 was found be 1.316

3. PH

S.NO	OBSERAVATION	F1	F2	F3
1	PH	4.53	3.14	**6.7**

Sucrose syrups are closer to neutral (pH 6.5–7.5).The PH of F3 was found to be 6.7

4.Viscosity

S.NO	OBSERAVATION	F1	F2	F3
1	VISCOSITY	12.1cps	11.5cps	**20.62 cps**

60-70% sugar solutions acting as viscous liquids around 15-40cps.Here F3 viscosity was found to be **20.62 cps**

5.PHYSICAL STABILITY

S.NO	OBSERAVATION	F1	F2	F3
1	Crystallization	Absence	Presence	**Absence**
2	Sedimentation	Miscible	Immiscible	**Miscible**

The F3 stable physically e.g., its appearance (no crystallization) Color must be completely soluble with other ingredients Odour and taste (palatable) Solid material is completely miscible in liquid.

FORMULATION (F3) RESULTS

S.NO	PARAMETERS	OBSERVATIONS
1	COLOUR	**GREEN**
2	ODOUR	**AROMATIC**
3	APPERANCE	**CLEAR, NON-TRANSPARENT, HOMOGENEOUS**
4	DENSITY	**1.316**
5	PH	**6.7**
6	VISCOSITY	**20.62 cps**
7	CRYSTALLIZATION	**Absence**
8	SEDIMENTATION	**Miscible**

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IV. CONCLUSION

The present study highlights the potential of Kalanchoe pinnata and moringa olifera ethanolic extract in the formulation of a syrup with promising anti-urolithiatic and diuretic effect .

The syrup exhibited favorable organoleptic and physical characteristics, including an optimal pH, viscosity, and clarity, making it suitable for oral administration.

The bioactive compounds in Kalanchoe pinnata and moringa olifera are known for their anti-microbial, anti-inflammatory, and litholytic activities, which may contribute to the prevention and management of urinary calculi.

In future we paln to conduct invivo studies for the formulation May be This formulation could serve as a natural alternative to conventional treatments for urolithiasis and urinary tract infections, paving the way for future advancements in herbal medicine.

REFERENCE

[1]. E. a. G. E. a. M. P. J. a. M. A. a. L. E. a. C. L. Quintero, "{Evaluation of the Leaf Extracts of *Kalanchoe pinnata* and *Kalanchoe daigremontiana* Chemistry, Antioxidant and Anti-inflammatory Activity},," {European Journal of Medicinal Plants}, pp. {45-54},, {07} {2021}.

[2]. T. N. M. S. K. D. K. D. Saurabh Dhumane1, "Exploring the Therapeutic Potential: Phytochemistry and Pharmacology of Bryophyllum pinnatum," Journal of Drug Delivery and Therapeutics, 15 2 2024.

[3]. H. V. M. A. S. B. N. G. B. C. Phillips R, "Citrate salts for preventing and treating calcium containing kidney stones in adults.," Cochrane Database Syst Rev. 2015 Oct 6;2015(10):CD010057.

[4]. S. M. J. R. &. I. G. Nayak, "Wound healing potential of ethanolic extract of *Kalanchoe pinnata Lam*. leaf-A preliminary study," (2010).

[5]. P. S. P. S. a. V. S. V. S. A. S. C. Abu Sufiyan Chhipa, "In-vitro antiurolithiatic activity of alcoholic and hydroalcoholic extracts of *Kalanchoe pinnata* leaves," Int J Indig Herb Drug, 2017.

[6]. Somali MA, Bajneid MA, Al-Fhaimani SS, Chemical composition and characteristics of *Moringa peregrina* seeds and seeds oil. Journal of the American Oil Chemists' Society. 1984; 61(1):85-86, View at Publisher.

[7]. Mughal MHS, Ali G, Srivastava PS, Iqbal M, Improvement of drumstick (Moringa pterygosperma Gaertn.) A unique source of food and medicine through tissue culture. Hamdard Medicus, 1999; 42:37-42.

[8]. Farooq Anwar, Sajid Latif, Muhammad Ashraf, Anwarul Hassan Gilani. *Moringa oleifera:* A Food Plant with Multiple Medicinal Uses. Phytotherapy Research. Phytother. Res. 2007; 21:17-25.

[9]. Anwar F, Latif S, Ashraf M, Gilani AH. *Moringa oleifera*: a food plant with multiple medicinal uses, Phytotherapy Research, 2007; 21(1):17-25.

[10]. Ritu Paliwal RP, Veena Sharma VS, Pracheta P. A review on horse radish tree (*Moringa oleifera*): a multipurpose tree with high economic and commercial importance.

[11]. Coppin J. A study of the nutritional and medicinal values of *Moringa oleifera* leaves from sub-Saharan Africa: Ghana, Rwanda, Senegal and Zambia (Doctoral dissertation, Rutgers University-Graduate School-New Brunswick).

[12]. Biswas SK, Chowdhury A, Das J, Roy A, Hosen SZ. Pharmacological potentials of *Moringa oleifera* Lam.: a review. International Journal of Pharmaceutical Sciences and Research. 2012 Feb 1;3(2):305.

[13]. Berkovich L, Earon G, Ron I, Rimmon A, Vexler A, Lev-Ari S. *Moringa Oleifera* aqueous leaf extract down-regulates nuclear factor-kappa B and increases cytotoxic effect of chemotherapy in pancreatic cancer cells. BMC complementary and alternative medicine. 2013 Dec; 13:1-7.

[14]. Elzaawely AA, Ahmed ME, Maswada HF, Xuan TD. Enhancing growth, yield, biochemical, and hormonal contents of snap bean (Phaseolus vulgaris L.) sprayed with moringa leaf extract. Archives of Agronomy and Soil Science. 2017 Apr 16;63(5):687-99.

[15]. Phiri C, Mbewe DN. Influence of *Moringa oleifera* leaf extracts on germination and seedling survival of three common legumes. International Journal of Agriculture and Biology. 2010;12(2):315-7.