



IJPPR

INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals

ISSN 2349-7203



Human Journals

Research Article

August 2023 Vol.:28, Issue:1


© All rights are reserved by Sonali Diwate et al.

Formulation and Development of Syrup Showing Antiurolithiatic Activity



IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals

ISSN 2349-7203



Sonali Diwate, Sarita Gholve, Rupali Matkar, Asma Bargir, Vishnu Sanap, Sujata Sarnaik, Ruturaj Kagale

Sarojini College of Pharmacy, Kolhapur, Maharashtra, India.

Submitted: 25 July 2023
Accepted: 18 August 2023
Published: 30 August 2023

Keywords: Antiurolithiatic Activity, Urolithiasis, urinary tract infection

ABSTRACT

Urolithiasis is considered as the third most common affliction of the urinary tract. Urolithiasis is the deposition or formation of stones in any part of urinary system. A stone is an aggregation of calcium, oxalate, phosphate and uric acid which form stone. Antiurolithiatic activity is that they have ability to reduce or remove the kidney stone. The present research work is planned to address these exiting issues by applying modern pharmaceutical techniques to the herbal medicines to get heal from the illness. The herbal Syrup having the *Phyla nodiflora* Linn as an active constituent. *Phyla nodiflora* Linn is also called as Frog fruit. *Phyla nodiflora* Linn having the antiurolithiatic Activity they help to remove or reduce the kidney stone. This particulate natural drug which have Antiurolithiatic property are made in the form of syrup. These are non-toxic, not harmful, does not show any side effects on human body. The syrup along with this extract of phyla shows the adequate stability and near about 98% of the antiurolithiatic activity. From the present study it may be conclude that the herbal syrup containing above herbal extracts, helps to dissolve the kidney stones and shows Antiurolithiatic activity.



HUMAN JOURNALS

ijppr.humanjournals.com

01. INTRODUCTION

From ancient era people depend on herbal medicines to treat the diseases. Herbal medicines are product which are made from botanicals, or plants that are used to cure diseases or to maintain health. Since ancient time, herbal, or plant medicines used for the prevention, cure and mitigation of disease. Some herbs have potent ingredients and should be taken with the same level of caution as pharmaceutical medications.

In fact, many pharmaceutical medications are based on manmade versions of naturally occurring compounds found in plants. Some natural remedies may be more affordable and accessible than conventional medicines, and prefer this on a large scale by using them because they align with their personal health ideologies. By using medicinal chemistry and combinational chemicals and biosynthetic technology, novel natural product needs will be optimized on the basis of their biological activities to yield effect formulations.

Herbal medicines have many advantages like harmless, low cost, and compare to Homeopathy it has lesser side effects. Herbs grow in common places so they are available easily, and for consumption or buying no need of prescription. As well as there are some disadvantages of the herbal medicines. Also, herbal medicines having another disadvantage is the risk of self-dosing of herbs. Herbal and plants can be taken in different ways and forms, and they include the whole herb, teas, syrup, essential oils, ointments, capsules and tablets that contain a ground and powdered form of a raw herb or its dried extract.

The use of herbal medicines and phytonutrients or continues to expand rapidly across the world with many people now resorting to these products for treatment of various health challenges in different national health care setting (WHO*,2004). This past decades have obviously witnessed a tremendous surge in acceptance and public interest in natural therapies both in developing and developed countries, with these herbal remedies being available in drug stores, also in food stores and supermarkets. It is estimated that up to four billion people (representing 80% of the world population) living in the developing world rely on herbal medicinal products as a primary source of healthcare and traditional medical practice.

Urolithiasis is considered as the third most common affliction of the urinary tract. Urolithiasis is the deposition or formation of stones in any part of urinary system. A stone is an aggregation of calcium, oxalate, phosphate and uric acid which form stone. In case of renal stones the juice of the Tulsi (*Ocimum sanctum*) leaves and honey, if taken regularly then it will help to expel them from urinary tract.

In this research article herbal syrup formulation contains the natural drug is *Phyllanthus niruri* was formulated and evaluated. This particulate combinations of natural drug which have Antiurolithiatic property are made in the form of syrup. These are non-toxic, not harmful, dose not show any side effects on human body. The herbal syrup containing above herbal extracts, helps to dissolve the kidney stones and shows Antiurolithiatic activity.

02. REVIEW OF LITERATURE

1. **R.A. Sharma, Renu Singh (2013)**- Comprehensive review on *Phyllanthus niruri* Linn. Presence of large no. of phytochemicals suggested the biological activity. The present study clearly showed the antiurolithiatic activity.
2. **Ali Esmail Al-Snafi, Vol. 9, Issue 8 (2019)**- Review discussed the chemical constituents, pharmacological and therapeutic properties of *Lippia nodiflora* as a promising medicinal plant with wide range of pharmacological activities which could be used in several medical applications because of its effectiveness.
3. **Faheem Amir. et.al.**^[2]**Vol. 2, Issue 3, (2011)** - Comprehensive review on chemical constituents and biological application of *Lippia nodiflora*

03. RATIONALE BEHIND SELECTION OF TOPIC

The rationale behind the topic is to focus the attention towards the medicinal plant to cure the disease. But using herbal material instead of allopathy medicine is rarely done. So the present research work is planned to address this exiting issues by applying modern pharmaceutical techniques to the herbal medicines to get heal from the illness.

04. AIM & OBJECTIVES

AIM:

Formulation And Development Of Herbal Syrup Showing Antiurolithiatic Activity.

OBJECTIVES:

1. To develop suitable dosage form, from the active chemical moiety extracted from plant by using modern pharmaceuticals approach.
2. To exploit medicinal uses of herbal extracts under study Phyla nodiflora Linn.
3. To standardize innovative and effective herbal product.
4. To dissolve kidney stone with the help of Herbal Syrup.

05. PLAN OF WORK

1. Choice of topic
2. Selection of herbal plant and excipient⁹
3. Procurement of herbal plants
4. Process selection and development
5. Preparation of Plant Extract
6. Evaluation and validation for presence of secondary metabolite
7. Preparation of syrup dosage formulation
8. Preparation of Calcium oxalate crystals
9. Testing of Antiurolithiatic Activity

10. Stability study of formulation
11. Compilation of data and analysis of result

06. MATERIALS & EQUIPMENTS

6.1 List of Materials

Table 1: List of Drug and materials used in dissertation work

Sr. No.	Drug and Material	Particulars
1	Beaker	J-SIL, Agra
2	Funnel	J-SIL, Agra
3	Measuring Cylinder	J-SIL, Agra
4	Burner	Comet
5	Filter Paper	Praveen Filters, Thane
6	Butter Paper	S.D Paper Products Kolhapur
7	Methanol	Loba Chemie Pvt. Ltd.
8	Mayer's Reagent	Otto Chemie Pvt. Ltd.
9	HCL	Molychem
10	Magnesium	Molychem
11	Gelatin	Ozone International Mumbai
12	Ammonia	Loba Chemie Pvt. Ltd.
13	Methyl Paraben	Ozone International Mumbai
14	Propyl Paraben	Ozone International Mumbai
15	Glycerol	Ozone International Mumbai
16	Sodium Oxalate	Loba Chemie Pvt. Ltd
17	Calcium chloride	Molychem
18	Raspberry	Ozone International Mumbai

List of Apparatus

Table 2: Apparatus used in dissertation work

Sr. No.	Apparatus	Manufacturer
1	Digital weighing balance	Shimadzu, Japan
2	Soxhlet Apparatus	Bio techniques India
3	Heating Mantle	Bio techniques India

07. EXPERIMENTAL WORK

7.1 Drug and excipient profile:

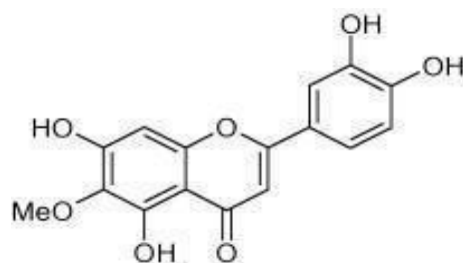
7.1.1 *Phyla nodiflora* Linn.



Fig.1 *Ocium sanctum*

Kingdom	Plantae
Order	Lamiales
Family	Verbenaceae
Genus	Phyla
Species	<i>P. nodiflora</i>
Binomial name	Phyla nodiflora Linn
Active Pharmaceutical Ingredient	Eupafolin

- **Structure of Eupafolin-**



- **properties-** Antiuro lithiatic, Antidiuretic, Antidiabetic, Antimicrobial

7.2 Experimental Work

7.2.1 Collection and Authentication of plants

The Fruit of *Phyla nodiflora* is collected from lake of Kandalgaon, Kolhapur

Mentioned plant are authenticated at Department of Botany, Shivaji university, Kolhapur.

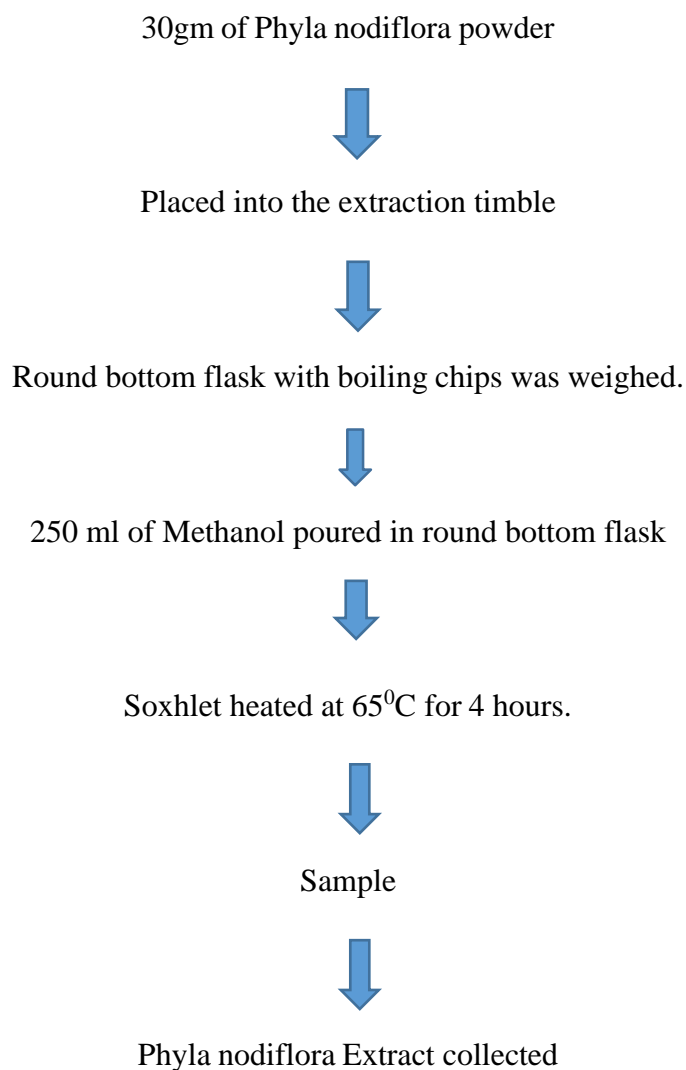
7.2.2 Cleaning and Drying the part of plant

The Fruit of *Phyla nodiflora* washed with clarify water and kept for dehydrated to remove excess water.

7.3 Preparation of extract by using following methods

7.3.1 *Phyla nodiflora*

Soxhlation Method -



Evaluation test for Extract

7.3.2 Evaluation test for presence of Secondary Metabolite for Phyla nodiflora

Test for alkaloids –Dragendorff test

0.5 gm extract was taken and to that 5 mL of 1% hydrochloric acid was added carefully along the sides of the test tube and then boiled and filtered. To 1 mL of filtrate, 2 drops of Dragendorff's reagent added. The formation of reddish brown precipitate indicates the **presence of alkaloid**.



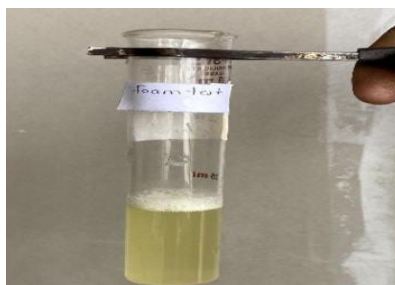
Test for flavonoids Ferric chloride test

Extracts were treated with few drops of 10% ferric chloride. Formation of green precipitate indicates the presence of flavonoids.



Test for saponins (Foam test)

1 ml of extract diluted with distilled water to 20ml. Shaken in graduated cylinder for 15 min. Persistent stable foam formation.



7.5 Formulation of Syrup

7.5.1 Formulation of Syrup batches F1, F2 and F3

Sr.no.	Ingredient	F1	F2	F3
1	<i>Phyla nodiflora</i> extract	2 ml	3 ml	1.2 ml
2	Methyl paraben	0.025 g	0.025 g	0.025 g
3	Propyl paraben	0.0025 g	0.0025 g	0.0025 g
4	Propylene glycol	6 ml	6 ml	6 ml
5	Sorbitol	2 ml	2 ml	2 ml
6	Sodium saccharine	0.025 g	0.025 g	0.025 g
7	Sucrose	8.75 g	8.75 g	8.75 g
8	Glycerine	2.5 ml	2.5 ml	2.5 ml
9	Raspberry syrup	1 ml	1 ml	1 ml
10	Water	QS	QS	QS

7.6 Formulation of Calcium Oxalate crystals (Renal calculi):

An equal molar concentration solution of calcium chloride dehydrates and sodium oxalate was dissolved separately in 10 ml of distilled water, after formation of separate solution, the calcium chloride solution added drop wise into sodium oxalate solution with continuous stirring and formation of precipitate obtained. The resulted precipitate was calcium oxalate. The precipitate was filtered via filter paper and dried.



Fig.2. Calcium Oxalate Crystals

7.7 Evaluation Test

7.7.1 Physical Appearance

1) **Color Examination** - 5 ml of syrup was taken and viewed against a white light to check its tint/color by naked eye.

2) **Odour Examination** – The final syrup was tested for its odour by smelling 2 ml of the syrup individually.

3) **Taste Examination** – A drop of final syrup was placed on tongue and inspected the taste.

7.7.2 **Determination of pH** – pH of syrup determined by using pH paper.

7.7.3 Stability Testing–

The samples were tested for all physicochemical parameters, turbidity of the solution at interval of 24 hr, 48 hr, 72 hr the changes observed and noted.

7.7.4 Determination of Antiuro lithiatic activity –

The calcium oxalate crystals were added in the syrup. Calcium oxalate dissolving property shows the presence of Antiuro lithiatic activity.

RESULTS AND DISCUSSION

Table 3 – Result for physicochemical parameter

Batch	Colour	Odour	Taste	pH
1	Brown	Slightly pungent	Sweet	5
2	Brown	Slightly pungent	Sweet	5
3	Brown	Slightly pungent	Sweet	5

Table 4 - Stability Study of syrup dosage form

Batch	Time Duration(hr)	Temperature 0C	Colour	Odour	Taste	pH
1	24 hrs	R.T*.23 ⁰ C	NC*	NC	NC	5
		30 ⁰ C	NC	NC	Bitter	5
2	48 hrs	R.T.23 ⁰ C	NC	NC	NC	5
		30 ⁰ C	NC	NC	NC	5
3	72 hrs	R.T.23 ⁰ C	NC	NC	NC	4
		30 ⁰ C	NC	NC	NC	5

Table 5 – Antirolithiatic activity testing -

Batch	Turbidity	Antirolithiatic activity(in %)
F1	Yes	70
F2	No	98
F3	Yes	80

□

□ **Discussion-**

The results of organoleptic properties (displayed in Table 8.1) indicated that there was no change in its colour, odour, taste, pH.

Table 8.2 review that there are some changes were observed in Batch 1 and 3 the tested physicochemical parameter such as during the stability studies and observed after a time duration of 24 hrs, 48 hrs, 72 hrs and 96 hrs.

Batch 1 and 3 become turbid but, batch 2 syrup did not switch its cloudiness and also displayed highest percentage of antirolithiatic activity.

08. SUMMARY AND CONCLUSION

Various studies and experiences proved that chemical formulations are more prone to adverse and hazardous effects. Hence, we have prepared the herbal syrup from herbal

extracts. Firstly we collected the required part of medicinal plant as fruits of *Phyla nodiflora*. At last we carried out stability test for formulated syrup. Due to presence of antiurolithiatic activity of the herbal extract this formulation has ability to dissolve kidney stone.

CONCLUSION

In conclusion the presence of flavonoid glycoside having the antiurolithiatic activity. This activity supported to the formulation which help to dissolve the calcium oxalate crystals which are kidney stone. The syrup is useful to dissolve small size kidney stones where as the size of larger kidney stones is reduced which help to remove stones from body.

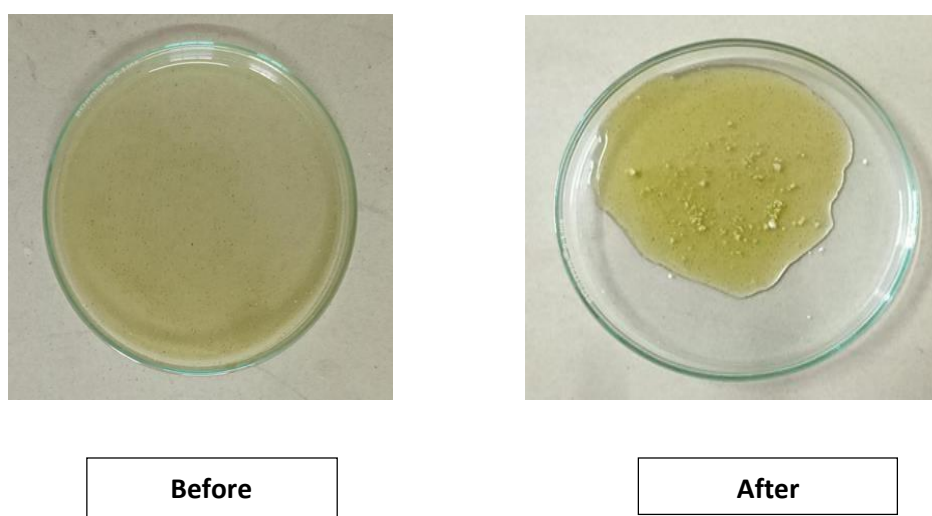


Fig.3. Testing of Antiurolithiatic activity using Calcium oxalate crystals

10. REFERENCES







1. B. S. Siddiqui, F. Ahmad, F. Sattar and S. Begum. Chemical constituents from the aerial parts of *Lippia nodiflora* linn. Archives of Pharmacal Research, 2007; 30(12): 1507-1510.
2. T. Khalil, M. F. Lahloub and O. M. Salama. Phenolic compounds from *Lippia nodiflora*. Journal of Pharmaceutical Sciences, 1995; 11(2): 256-265.
3. S. D. Elakovich and K. L. Stevens. Volatile constituents of *Lippia nodiflora*. Journal of Natural Products, 1985; 48(3): 504- 506.
4. Sujatha doloala, Ranganayakulu Diviti, Bharathi Koganti and K V S R G Prasad : Effect of ethanolic extract of *Phyla nodiflora*(Linn.) Greene against kidney stone producing diet induced urolithiasis. Indian Journal of National Product and Resources
5. Nishi Saxena and Ameeta Argal Study of antiurolithiatic activity of a formulated herbal suspension. Herba Polonica article, 1-5.
6. Kovshilovskaya, B., Chi, hg Miller, J. & Stoller, M. L. Systemic implications of urinary stone disease. Transl. Androl. Urol. PubMed Central Google Scholar 1, 89-96 (2012).
7. Kapilraj, P. K. Prophylactic and Curative Activity of '*Barleria buxifolia*. Linn' on Experimentally Induced calcium Oxalate Nephrolithiasis in Animal Model. Int. J. Pharmacol. Clin. Sci. 4, 68-75 (2015).
8. Selvam, R. Calcium oxalate stone disease: Role of lipid peroxidation and antioxidants. Urol. Res. Article CAS PubMed Google Scholar 30, 35-47 (2002).
9. Bensa tal A, Ouah ran i MR. 2008. Inhibition of crystallization of calcium oxalate by the extraction of

Tamarix gallica L. Urological Research, 36: 283-287

10. Basavaraj DR, Biyani CS, Browning AJ, Cartledge JJ. 2007. The Role of Urinary KidneyStone Inhibitors and Promoters in the Pathogenesis of Calcium Containing Renal Stones. European Association of Urology and European Board of Urology, 5: 126-136126-136

11. Jain SK, Jaiswal M, Mahor A, Bharti JP, et al. A review: Herbal plants used in the treatment of urolithiasis. Int J Pharm Pharm Sci 2011;2:1412-20

12. Singla SK, Tandon C. In vitro inhibition of calcium oxalate crystallization and crystal adherence to renal tubular epithelial cells by Terminalia arjuna. Urolithiasis 2016;44:117-25.

	<p>Ms. Sarita Ghose Sarojini College of Pharmacy, Kolhapur R.S. No. 576, Near Rajendranagar water tank, Rajendranagar, Kolhapur- 416004</p>
	<p>Ms. Rupali Matkar Sarojini College of Pharmacy, Kolhapur R.S. No. 576, Near Rajendranagar water tank, Rajendranagar, Kolhapur- 416004</p>
	<p>Ms. Asma Bargir Sarojini College of Pharmacy, Kolhapur R.S. No. 576, Near Rajendranagar water tank, Rajendranagar, Kolhapur- 416004</p>
	<p>Mr. Vishnu Sanap Sarojini College of Pharmacy, Kolhapur R.S. No. 576, Near Rajendranagar water tank, Rajendranagar, Kolhapur- 416004</p>
	<p>Ms. Sujata Sarnaik Sarojini College of Pharmacy, Kolhapur R.S. No. 576, Near Rajendranagar water tank, Rajendranagar, Kolhapur- 416004</p>
	<p>Mr. Raturaj Kagale Sarojini College of Pharmacy, Kolhapur R.S. No. 576, Near Rajendranagar water tank, Rajendranagar, Kolhapur- 416004</p>