WJPMR, 2026, 12(3), 280-285 Research Article Impact Factor: 7.555

WORLD JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.wjpmr.com

ISSN (O): 2455-3301
ISSN (P): 3051-2557
Coden USA: WJPMBB

AN EXPERIMENTAL STUDY TO EVALUATE THE ANTI HYPERURICEMIC ACTIVITY OF *DHANVAYASA* (*FAGONIA CRETICA* LINN.) ON WISTAR ALBINO RATS

[1]*Dr. Anandakumar, [2]Dr. Nandan S. Hodlur, [3]Dr. Shashidhar S. Sarawad, [4]Dr. Gururaj S. Kulkarni, [5]Dr. Mallappa Shalawadi

[1]Final Year PG Scholar, [2]Professor, [3]Professor, [4]Professor and Head, Department of PG Studies in Dravyaguna, BVVS AMC&H, Bagalkot.
[5]Professor, BVV Sangha's HSK College of Pharmacy, Bagalkot.

***Corresponding Author: Dr. Anandakumar**

Final Year PG Scholar, Department of PG Studies in Dravyaguna, BVVS AMC&H, Bagalkot.

DOI: https://doi.org/10.5281/zenodo.18802468

How to cite this Article: [1]*Dr. Anandakumar, [2]Dr. Nandan S. Hodlur, [3]Dr. Shashidhar S. Sarawad, [4]Dr. Gururaj S. Kulkarni, [5]Dr. Mallappa Shalawadi. (2026). An Experimental Study to Evaluate the Anti Hyperuricemic Activity of Dhanvayasa (Fagonia Cretica Linn.) On Wistar Albino Rats. World Journal of Pharmaceutical and Medical Research, 12(3), 280–285.

Article Received on 28/01/2026 **Article Revised on 18/02/2026** **Article Published on 01/03/2026**

ABSTRACT

Fagonia cretica Linn. is known for its medicinal properties in traditional *Ayurveda* practices. This plant, commonly called Dhamas in Hindi, belongs to the Zygophyllaceae family. *Dhanvayasa* has been traditionally used to treat various ailments and improve overall health naturally. *Fagonia cretica* Linn. is a source drug for the plant *Dhanvayasa*. *Vatarakta* is one such disease where the *kashaya* of *Dhanvayasa Panchanga* is used. A contemporary scientific correlation for *vatarakta* is gout, which is characterized by Hyperuricemia. *Dhanvayasa (Fagonia cretica* Linn.*)* drug will be collected from authorized raw drug suppliers, Purnaksha Ceuticals, Nashik (Maharashtra). The macro-microscopic features, Physico-chemical test and Preliminary phytochemical tests done as per authentic text book. The anti-hyperuricemic activity has been assessed by Potassium oxonate induced hyperuricemic model. The experimental research indicates that the whole plant demonstrates significant effectiveness in anti hyperuricemic activity. The study has indicated that *Dhanvayasa kashaya* possesses potential activity against hyperuricemia.

KEYWORDS: *Dhanvayasa*, Zygophyllaceae, *Vatarakta*, Hyperuricemia, Potassium oxonate.

INTRODUCTION

Every *dravya* found in nature is regarded as *aushadhi* in *Ayurveda*. India has over 3000 year old medicinal heritage whose main resource base is medicinal plants. *Dhanvayasa* is a plant which its botanical source is identified as *Fagonia cretica* Linn. belongs to the family Zygophyllaceae. Hyperuricemia is caused by Purine metabolism disorder, characterized by elevated serum uric acid levels (i.e. >6.8mg/dl). Hyperuricemia is the chief etiological cause for Gout.[1] *Vatarakta* is a disease which is known since *Puranas.*

Dhanvayasa is a drug which its properties are mentioned as *Madhura, Kashaya and Tikta rasa, Laghu* and *Sara guna, Sheeta virya* and *Madhura vipaka*. Considering the above mentioned properties *Dhanvayasa kashaya* can have a good result on *Vatarakta*. Hyperuricemia is the important risk factor for gout, which can be correlated to the disease *Vatarakta.* Hence, the present study was intended to see the efficacy of *Kashaya* of *Dhanvayasa* (*Fagonia cretica* Linn.) in potassium oxonate induced Hyperuricemia on wistar albino rats. In this research work *Kashaya* of *Dhanvayasa* (*Fagonia cretica* Linn.) showed significant (P<0.01) results in potassium oxonate induced Hyperuricemia when compared to the control group.

MATERIALS AND METHODS

Collection of raw material

Dhanvayasa (Fagonia cretica Linn.) drug will be procured from authorized raw drug suppliers Purnaaksha Ceuticals, Nashik (Maharashtra).


Test drug preparation

Preparation of *Kashaya*: *Kashaya* of *Dhanvayasa (Fagonia cretica* Linn.) was prepared at Pharmacy of BVVS Ayurved Medical College & Hospital, Bagalkot, as per the standard method. i.e. 50 g of prepared *kwatha churna* is weighed and taken, In that 8 parts of water is added i.e. 400ml of water is added to the *kwatha churna* and it is reduced to $1/4^{th}$. i.e. the *kashaya* obtained was 100 ml.

Experimental study – Anti hyperuricemic activity

Test Drug

Kashaya of *Dhanvayasa (Fagonia cretica* Linn.)

Standard Drug

Allopurinol Tablet

Animals: The study was carried out in Wistar albino rats of body weight ranging from 200 - 300 gm. They were obtained from well-established animal house H.S.K College of Pharmacy, Bagalkot, Karnataka. They were maintained on feed of food and tap water was given. The temperature and humidity were kept at optimum, and animals were exposed to natural day night cycles. Experimental procedures were undertaken according to the principle guidelines of animal care with prior permission from Institutional Animal Ethical Committee (**IAEC/HSKCOP/Feb2025/PG26**).

Inclusion criteria

- Healthy albino rats of either sex.
- Weighing about 250 ± 50 grams.

Exclusion criteria

- Rats weighing less than 200 grams and more than 300 grams.
- Pregnant and diseased rats.
- Rats which were under the trial of other experiments.

Dose Fixation

$1/10^{th}$ (9ml/kg) of lethal dose (90ml/kg) taken for study as per OECD guidelines 425.

Route of drug administration: Oral.

EVALUATION OF ANTIHYPERURICEMIC ACTIVITY

All the animals were quarantined for 10 days under standard conditions of temperature 25 ± 2^0 c and light (12h light/dark cycle) and fed a standard diet and tap water ad libitum. 24 Wistar albino rats of either sex weighing 250 ± 50 g were selected and grouped into 4 different categories. Then the body weight is taken. There after rats were numbered on tail and the dose calculation is made by considering the body weight of each rat. Group I administered orally with normal food and water and served as normal control. Group II administered with normal water and diet for 7 consecutive days served as positive control. Group III administered with Allopurinol 180mg/kg orally for 7 consecutive days and served as standard group. Group IV administered with test drug at therapeutic dose for 7 consecutive days and served as trial group. On 7^{th} day for group 2, 3 and 4 after an hour of administration of group specific drug Potassium oxonate 250 mg/kg is given intraperitonially and the rats are kept in a metabolic cage for collecting the urine sample. Then, all rats will be anaesthetised to collect blood from retro-orbital plexuses after 3 hours of drug administration for investigation. Urine sample should be collected after 24 hours of introducing to metabolic cage. Then the rats are re-anaesthetised and blood should be drawn from retro orbital plexus, after which the rats of each group are selected alternatively for organ histopathological study and sacrificed.

Table no. 01: Animal grouping.

Grouping	Drugs	Dose	Route of administration of drug
1. Normal	No drug (Normal diet)	-	-
2. Positive Control	Potassium oxonate **(Only on 7^{th}day)**	250mg/kg	Intraperitoneal
3. Standard	Allopurinol **(Daily for 7 days)**	180mg/kg	Orally
	Potassium Oxonate	250mg/kg	Intraperitoneally

	(Only on 7th day)		
4. Test	*Dhanvayasa (Fagonia cretica* Linn.*) Kashaya* **(Daily for 7 days)**	9ml/kg	Orally
	Potassium Oxonate **(Only on 7thday)**	250mg/kg	Intraperitoneally

Study duration: 15 days.

ASSESSMENT CRITERIA: Blood Urea, Serum Uric acid and Serum Creatinine was checked at 3rd and 24th hourly and Urine Uric acid and Urine Microscopy was checked 24th hour during 7th day of experimental study followed by Histo-pathological study of kidneys.

HISTOPATHOLOGY[2]

The kidney of 3 rats which is selected alternatively from each group was examined for histopathological study. Immediately after the excision from animals, the kidneys were transferred into 10% formalin. Sections of 5µm thickness of tissues were prepared using microtome and stained with haematoxyline and eosin for microscopic observations. All slides were then evaluated under light microscope (ZEISS Axio lab A1 India).

RESULTS

EXPERIMENTAL STUDY[3,4,5,6]

The test group rats were treated with oral administration of *Kashaya* of *Dhanvayasa (Fagonia cretica* Linn.*)* 9ml/kg. Normal group rats were given only plain water and standard laboratory food; Positive control group Received 250mg/kg of Potassium oxonate IP only on 7th day and Standard group was given Tab. Allopurinol 250mg/kg PO Daily for 7 days.

All the values were expressed as MEAN ± SEM. The data were analyzed by one way Graph pad instant software one-way ANOVA followed by Dunnet's multiple comparison t-test as post-hoc test if P<0.05. A level of P<0.05 was considered as statistically significant. Level of significance was noted and interpreted accordingly.

STATISTICAL ANALYSIS OF ANTI HYPERURICEMIC ACTIVITY

Table no. 2: Effect of *Dhanvayasa kashaya* on serum Uric acid measured 3 hours and 24 hours after administration of Potassium oxonate.

Sl.No.	Groups	Mean (3 hours)	Mean (24 hours)
1.	Group I (Normal group)	1.440 ± 0.08	1.322 ± 0.058
2.	Group II (Positive control group)	2.883 ± 0.06***	2.130 ± 0.223*
3.	Group III (Standard group)	0.081 ± 0.03***	1.400 ± 0.179*
4.	Group IV (Test group)	2.427 ± 0.12**	1.260 ± 0.191**

Data: MEAN ± SEM, ** P<0.05

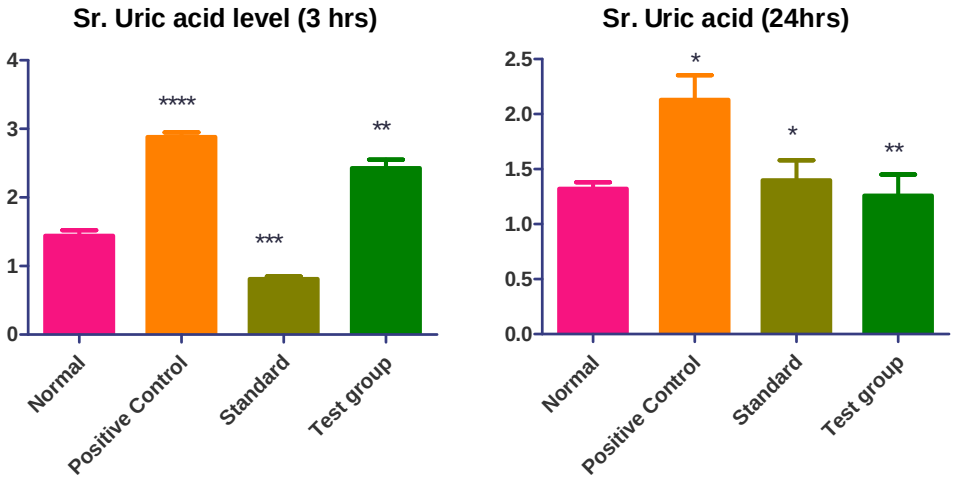


Table no. 03: Effect of *Dhanvayasa kashaya* on Serum Creatinine measured 3 hours and 24 hours after administration of Potassium oxonate.

Sl.No.	Groups	Mean (3 hours)	Mean (24 hours)
1.	Group I (Normal group)	0.393 ± 0.044	0.391 ± 0.019
2.	Group II (Positive control group)	3.042 ± 0.041***	0.766 ± 0.039***
3.	Group III (Standard group)	0.433 ± 0.064***	0.336 ± 0.092***
4.	Group IV (Test group)	1.743 ± 0.0628**	0.480 ± 0.040**

Data: MEAN ± SEM, ** P<0.05

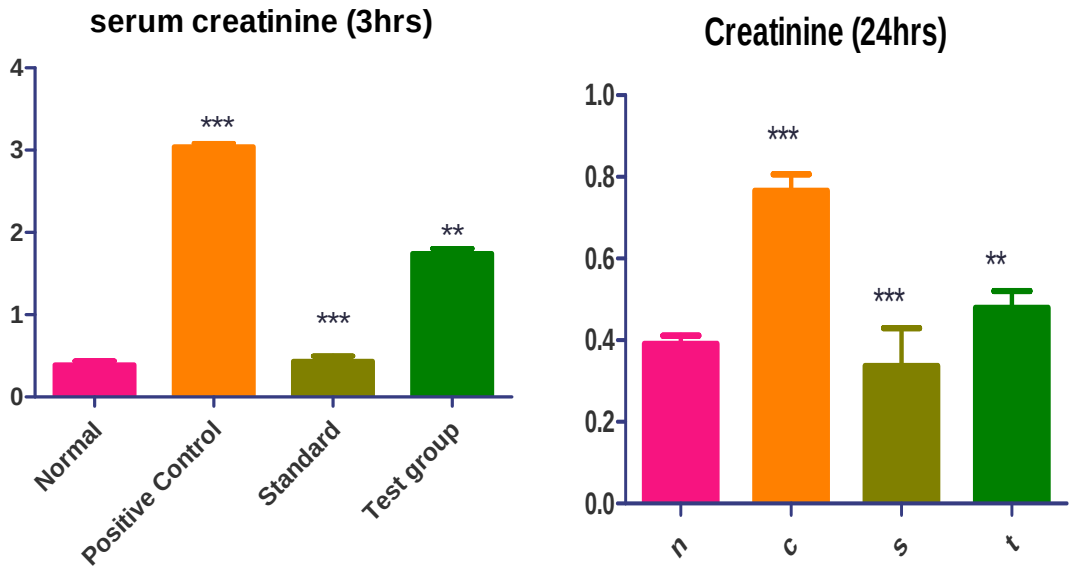


Table no. 04: Effect of *Dhanvayasa kashaya* on Blood urea measured 3 hours and 24 hours after administration of Potassium oxonate.

Sl.No.	Groups	Mean (3 hours)	Mean (24 hours)
1.	Group I (Normal group)	23.77 ± 0.454	18.43 ± 0.210
2.	Group II (Positive control group)	40.25 ± 0.906***	23.83 ± 0.636***
3.	Group III (Standard group)	21.37 ± 0.630***	19.05 ± 0.373***
4.	Group IV (Test group)	26.35 ± 0.437**	21.07 ± 0.301**

Data: MEAN ± SEM, ** P<0.05

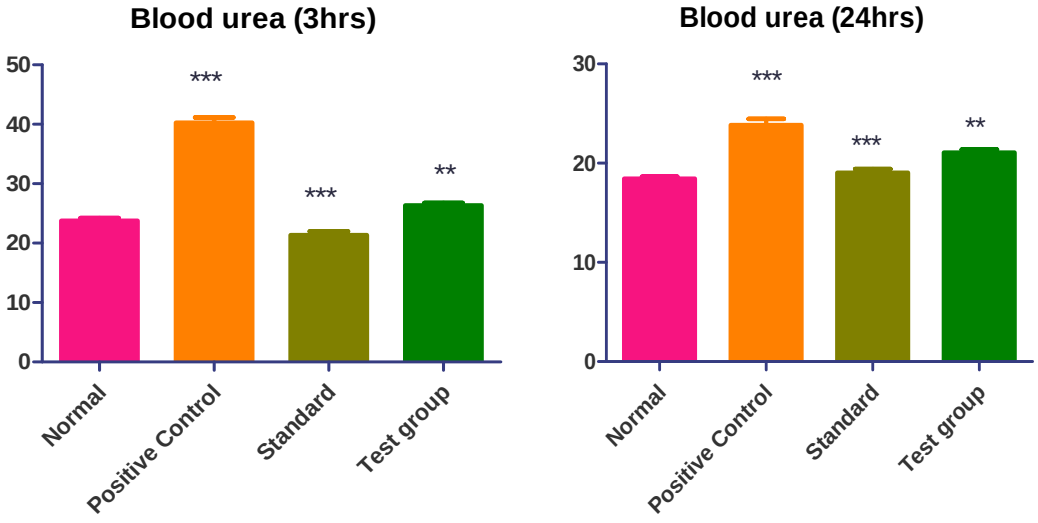
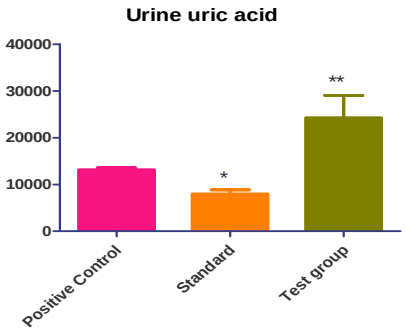


Table no. 05: Effect of *Dhanvayasa kashaya* on Urine uric acid measured after administration of Potassium oxonate.

Sl.No.	Groups	Mean
1.	Group II (Positive control group)	13136 ± 421.2
2.	Group III (Standard group)	7981 ± 877.6*
3.	Group IV (Test group)	24298 ± 4765**

Data: MEAN ± SEM, ** P < 0.05,



group revealed tubular dilation, cell infiltration, proteus changes and few crystals in the tubules. Shown in **Fig.1.**

Standard group – In Allopurinol administered group tubular dilation, cell infiltration, proteus were found to be comparatively less. Shown in **Fig.2.**

Test group – Examination of kidney sections from this group exhibited mild to moderate degenerative changes mainly in the form of fatty degenerative changes and tubular dilation. Stone formation was mild in comparison to the positive control group. Shown in **Fig.3.**

HISTOPATHOLOGY

Positive control group – Microscopic examination of the kidney sections from potassium oxonate control

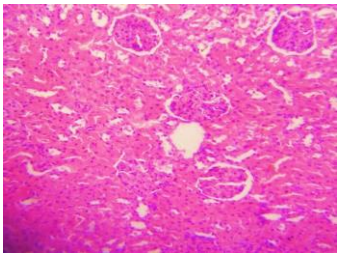


Fig.1.

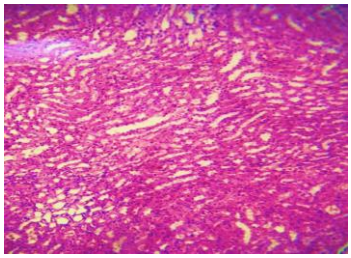


Fig.2.

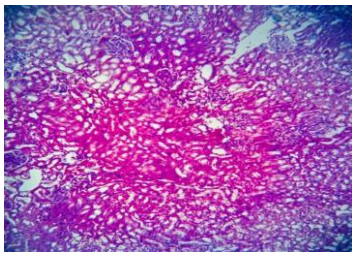


Fig.3.

DISCUSSION

The present research works "An experimental study to evaluate the anti-hyperuricemic activity of *Dhanvayasa (Fagonia cretica* Linn.) on Wistar albino rats." has been carried out in order to provide scientific validation based on the information gathered from ancient textbooks. This study evaluated the effect of the test drug on potassium oxonate-induced hyperuricemia in wistar albino rats to establish a reliable model for assessment. Potassium oxonate 250 mg/kg single IP injection significantly elevated uric acid level in serum as compared to normal control and it was maintained upto 24 hours. The *Kashaya* of *Dhanvayasa* is pre-treated for 7 consecutive day's.

1. Considering the serum uric acid level after 3 hours and 24 hours of drug induction, there was decreased level of uric acid in test group when compared to positive control was statistically **significant.**
2. In Serum Creatinine assessed after 3 hours and 24 hours of drug inducing, the test group showed decrease in the values which was statistically **significant** when compared to the positive control. The reason for the changes in Serum Creatinine is not known. It is possible that Potassium oxonate affects its formation in the skeletal muscle there by reducing the load available to the kidney.
3. The blood urea assessed after 3 hours and 24 hours shows decrease in test group which was statistically **significant** when compared to positive control.
4. The urine uric acid shows decrease in standard group when compared to positive control but the data was found to be statistically **non-significant.** And the data was found to be increase in Test group where data is **statistically extremely significant.** Increased level in urine may represent uricosuric effect – a desirable trait in the treatment of conditions like gout. Since it has both uric acid lowering in the serum and excretion in urine – it may be an ideal combination of two types of mechanism of action. However, exact correlation of these activities with the dose level was not observed. This requires further evaluation.
5. Histopathological examination revealed that the toxicant induced degenerative changes were only mild to moderate in test group in comparison to positive control. This can be taken as evidence for presence of moderate to good nephro-protective effect against the toxicant induced changes.

Probable mode of action

Action of every drug depends on its *Rasa*, *Guna*, *Virya*, *Vipaka* and *Pravbhava*. *Dhanvayasa* is a drug which shows properties like *Madhura*, *Kashaya* and *Tikta rasa*, *Laghu* and *Sara guna*, *Sheeta virya* and *Madhura vipaka*. Among these *Madhura rasa* is responsible for the decrease in *Vata* and *Pitta doshas* and *Kashaya rasa* is having the properties of *Rakta prasadana*, *amaharatva* and *mutra sangrahaniya* in its *ruksha bhava*. Here in the present study increased Uric acid crystals were seen in Urine thereby decreasing the level of Uric acid in serum. The *Mutra sangrahaniya* property of *Kashaya rasa* may be the cause for this action by detaching the uric acid

crystals from the tissue and the same was eliminated through urine, which is considered as one of the *malas* according to *Ayurveda*. The *Sheeta virya* of the drug have the action to increase the amount of urine and thereby helps to expel the formed uric acid crystals from the body through urine. *Laghu guna* is having the property of *amaharatva* hence attaining the action accordingly.

Phytoconstituents present in *Dhanvayasa* may exhibit activity against gout. Phytoconstituents such as Tannins, alkaloids, and flavonoids exhibit potent antioxidant, anti-inflammatory, and analgesic properties, making them valuable in the management of inflammatory disorders. Among these, the alkaloid colchicine has long been employed in the modern system of medicine for the treatment of gout. Flavonoids demonstrate a direct inhibitory effect on xanthine oxidase, thereby contributing to the regulation of uric acid levels. Flavonoids have been shown to inhibit xanthine oxidase activity, thereby decreasing oxidative stress and protecting against tissue damage. Hence, from these findings, it can be concluded that the *kashaya* of *Fagonia cretica* Linn. holds potential as a therapeutic agent in the management of *Vatarakta*.

CONCLUSION

Among all treated group test drug *Dhanvayasa kashaya* 9 ml/kg which was given in the therapeutic dose on 24th hour had shown excellent anti-hyperuricemic activity in potassium oxonate induced hyperuricemia in wistar albino rats.

REFERENCES

1. Masram PR, Ade V, Ayurvedic management of hyperuricemia: A case report, Annals Ayurvedic Med., 2022; 11(2): 181-187. DOI:10.5455/AAM.141215.
2. D.W. Hawkins, W.R. Daniel, Pharmacotherapy: a Pathophysiological Approach. 3rd ed., Black well Scientific Public, London, 1997; 1755.
3. Katrin Basah, Berna Elya, Juheini Amin, dan Muhammad Iqbal Julian, Activity of Ethalonic extract from Justicia gendarussa Burm, leaves on decreasing the uric acid, MAKARA, SAINS, 2011; 15: 67–70.
4. D.W. Hawkins, W.R. Daniel, Pharmacotherapy: a Pathophysiological Approach. 3rd ed., Black well Scientific Public, London, 1997; 1755.
5. L.D Kong, C. Yang, F. Ge, H.D. Wang, Y.S. Guo, J. Ethopharmacol, 1993; 241: 133.
6. Dr. Sandhu G Joseph – An experimental study on Ashwattha (Ficus religiosa Linn.)in the management of Vatarakta w.s.r. to Hyperuricemia, S D M College of Ayurveda, Kuthpady, 2014.