



**INTERNATIONAL JOURNAL OF
PHARMACEUTICAL SCIENCES**
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: <https://www.ijpsjournal.com>



Research Article

Investigating The Antithrombotic Activity Of Natural Extract (Lentils) *Lens culinaris*

**Shubhangi Deshpande*, Prapti Gaulkar, Neetu Choudhary, Vaishanvi Hemade,
Sakshi Deshmukh, Aniket Dhanwe**

*AISSMS College of Pharmacy (Affiliated with SSPU), RB Kennedy Road, near RTO Pune, Sangamvadi, Pune,
Maharashtra, 411001*

ARTICLE INFO

Published: 11 Oct 2025

Keywords:

Lens culinaris,
Antithrombotic, Herbal
Drug, Thrombolytic Activity

DOI:

10.5281/zenodo.17326560

ABSTRACT

The current research looks at using lentils, or *Lens culinaris*, to prevent and treat blood clot-related illnesses and examines their antithrombotic properties. Thrombosis is a major health risk linked to blood clots in the vascular system, leading to heart attacks and strokes. The study evaluates how effective *Lens culinaris* is as a natural antithrombotic agent by examining its bioactive compounds, which might help prevent platelet clotting and blood formation. In this research, *Lens culinaris* underwent systematic extraction to pinpoint the active compounds that contribute to its healing effects. A series of biochemical tests was performed to assess the extract's ability to inhibit platelet aggregation. The findings suggest that *Lens culinaris* could be a safer alternative to existing antithrombotic medications. This research creates a strong foundation for future studies on how *Lens culinaris* works and its potential uses in preventing and treating thrombosis. It highlights the importance of exploring plant compounds as possible sources for developing new therapies for blood clot disorders.

INTRODUCTION

Lentils, or *Lens culinaris*, are a legume that is grown all over the world and is valued for its high nutritional content and historical application in the treatment of metabolic and cardiovascular diseases. Polyphenols, flavonoids, tannins, and

alkaloids are among the many bioactive substances found in this legume that have been shown to have anti-inflammatory, antithrombotic, and antioxidant properties that are essential for preventing disease. These phytochemicals support lentils' ability to reduce inflammation and oxidative stress, two factors that underlie several chronic illnesses, including thrombosis [2-4].

***Corresponding Author:** S. D. Deshpande

Address: AISSMS College of Pharmacy (Affiliated with SSPU), RB Kennedy Road, near RTO Pune, Sangamvadi, Pune, Maharashtra, 411001

Email ✉: shubhangi_deshpande@aissmscop.com

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



These health advantages are maximized when lentil consumption is improved through different processing methods, including fermentation and germination, which have demonstrated an elevated functional profile.

The pathological development of blood clots in vessels, known as thrombosis, is a major global health concern that can result in cardiovascular events like myocardial infarction and stroke. Traditional thrombolytic treatments, such as tissue plasminogen activator and streptokinase, have drawbacks because of the possibility of serious adverse effects, such as allergic reactions and bleeding. This risk profile has increased interest in natural substances produced from lentils, which target the pathways that lead to platelet aggregation, fibrin breakdown, and clot disintegration and show promising antithrombotic properties.[1,3]

According to studies, lentil extracts high in phenolic and flavonoid compounds can cause clot lysis in vitro in a dose-dependent manner with efficacies that are on par with several common thrombolytic medications. These extracts' diverse cardiovascular preventive actions are further demonstrated by their reduction of oxidative and inflammatory mediators that are essential to thrombogenesis. In addition to their direct antithrombotic properties, lentils improve cardiovascular health by positively regulating glycaemic management and lipid metabolism, which addresses significant thrombotic risk factors. [1,5]

The nutritional and anti-nutritional makeup of protein isolates and lentil flour suggests that processing has an impact on the bioavailability and preservation of bioactive chemicals, which in turn influences their antithrombotic potential. The development of functional food items based on lentils is supported by optimised processing

techniques that lower anti-nutritional substances and increase antioxidant capacity [3-5].

All things considered, recent studies support the positive effects of *Lens culinaris* in preventing cardiovascular disease and promoting antithrombotic therapy, establishing lentils as a useful natural supplement to prescription medications [1–5]

MATERIALS AND METHODS

Lens culinaris seeds extract

It is an analyte whose effect on blood clot formation is being measured and studied, and belongs to the family of Fabaceae. Legumes are grown for their lens-shaped edible seeds or pulses, also called lentils. It's an ethanolic extract, sourced from Shamantak Enterprises, Pune.

Chemical reagents :

250 mL of 0.1 M phosphate buffer at pH 7.4 was prepared in order to replicate the circumstances found inside the human body. 1.70 g of disodium hydrogen phosphate (Na_2HPO_4) and 0.675 g of sodium dihydrogen phosphate (NaH_2PO_4) were first dissolved in roughly 200 mL of distilled water for 250 mL of a 0.1 M solution. Using either diluted NaOH or HCl, the pH was carefully brought down to 7.4 before the volume was adjusted to 250 mL. This buffer is a helpful tool for biological and pharmacological research since it accurately replicates the body's natural environment.

Distilled water: Used for various purposes such as preparation of stock solution of *Lens culinaris*, phosphate buffer solution, reconstitution of streptokinase (1500000 I.U), etc

Lyophilized streptokinase (1,500,000 I.U.): as the reference standard, since it is well-known to



work well as a thrombolytic agent. This made it possible to compare the antithrombotic activity of *Lens culinaris*.

Plant Extract



Figure No. 1. *Lens culinaris* (lentil) seeds extract



Figure No. 2. Certificate of *Lens culinaris* drug extract



Figure No. 3. -Freshly collected blood sample



Figure No. 4 - Blood sample showing plasma (yellow layer) and red blood cell fraction after sedimentation /centrifugation

PROCEDURE:

Before mixing (PBS), 5 ml of the commercially available lyophilised streptokinase (15,00,000 I.U.) was added. To assess thrombolytic activity, the suspension served as a stock from which suitable dilutions were prepared. As previously stated, clot lysis studies were conducted. To summarise, ten preweighed sterile microcentrifuge tubes, one for each gender (test and standard), were filled with 2 ml of venous blood drawn from healthy individuals. The tubes were then incubated for 45 minutes at 37°C [7]. After the clot formed, the serum was completely removed (aspirated out without rupturing the clot), and the weight of each tube holding the clot was recalculated (clot weight = weight of clot-containing tube – weight of tube alone) [8,9]. To each microcentrifuge tube containing a pre-weighed clot, 100, 200, 300, 400, and 500 µl of *Lens culinaris* extract (1 mg/ml) were added, respectively. To achieve the standard, streptokinase was used. The tubes were then incubated at 37°C for 90 minutes while clot lysis was monitored [10]. The tubes were weighed again after the fluid released during incubation was withdrawn to determine the weight difference after clot breakup. The proportion of clot lysis in both males and females was calculated from the weight

difference measured before and after clot lysis [11].

RESULT :

The extract of *Lens culinaris* shows good activity in the male and female blood samples. The weight of the clot decreased more in the male blood sample than in the female. This shows that the

extract has better activity in male blood samples than in female blood samples. The difference in clot weight in standard (Streptokinase) treatment is significantly better.

Comparing the two, it can be seen that the activity of *Lens culinaris* is not significantly better than Streptokinase.

Table No. 1.- Effect of *Lens culinaris* (Drug Extract) extract on clot weight in Male and Female blood samples

	Weight of clot before treatment	Weight of clot after treatment	Difference
Female			
1	4.94	3.23	1.71
2	4.59	3.13	1.46
3	5.13	3.53	1.6
4	4.87	3.23	1.64
5	4.81	3.43	1.38
Male			
1	5.17	3.13	2.04
2	5.05	3.33	1.72
3	5.04	3.33	1.71
4	4.87	3.43	1.44
5	5.06	3.23	1.83

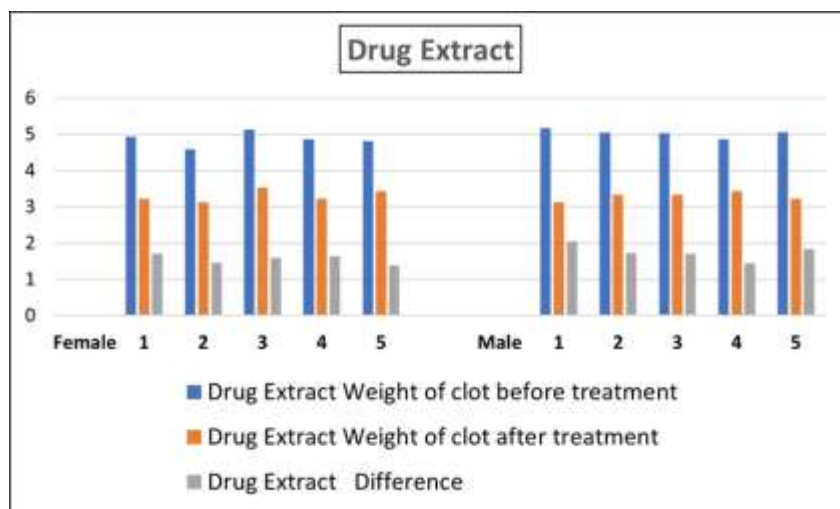


Figure No. 5-Effect of *Lens culinaris* extract on clot weight (After treatment)

Table No. 2 - Effect of Standard drug on clot weight in Male and Female blood samples

	Weight of clot before treatment	Weight of clot after treatment	Difference
Female			
1	5.12	3.23	1.89
2	2.03	3.03	2
PBS-3	4.72	3.03	1.69
4	4.81	3.03	1.78
5	4.82	3.03	1.79

Male			
1	5.11	3.03	2.08
2	5.17	3.23	1.94
PBS-3	4.99	3.13	1.86
4	5.08	3.13	1.95
5	5.08	3.13	1.95

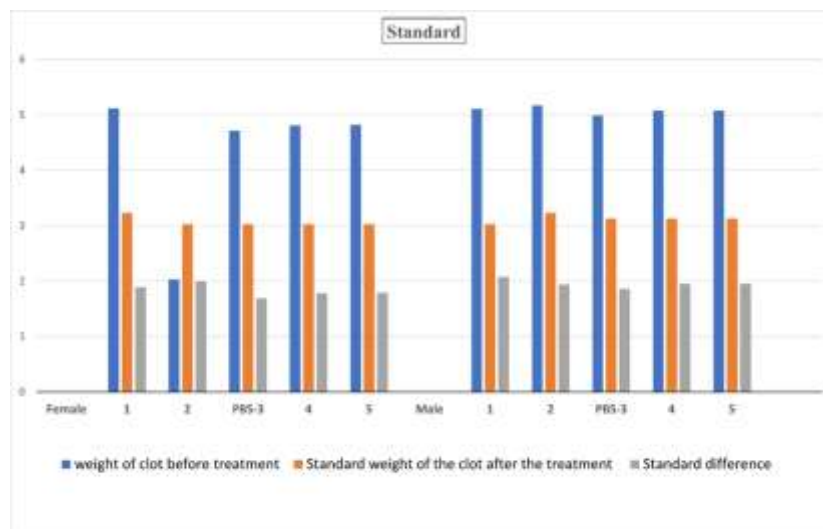


Figure No. 6. - Effect of standard drug on clot weight in male and female blood samples

CONCLUSION:

In conclusion, we can say that the effect of the test drug is not significantly better than the standard treatment, but it shows good activity on the clots. Looking at the result, the activity of the drug is better in the Male Blood Sample than the Female Blood Sample. The overall activity of *Lens culinaris* can be called effective, but not significantly better than the standard drug treatment.

REFERENCES

1. Al-Bari MA, Sayeed MA, Rahman MS, Mossadik MA. Characterization and antimicrobial activities of a phenolic acid derivative produced by *Streptomyces bangladeshensis*, a novel species collected in Bangladesh. Res J Med Med Sci. 2006;1:77–81.
2. Zy EA, Area A, Aam K. Antimicrobial activity of some medicinal plant extracts in Palestine. Pak J Med Sci. 2005;21:187–93.
3. Adriana B, Almodóvarl ANM, Pereiral CT, Mariângela TA. Antimicrobial efficacy of *Curcuma zedoaria* extract as assessed by linear regression compared with commercial mouthrinses. Braz J Microbiol. 2007;38:440–5.
4. Vijaya K, Ananthan S. Microbiological screening of Indian medicinal plants with special reference to enteropathogens. J Altern Complement Med. 1997;3:13–20.
5. Silver LL. Discovery and development of new antibiotics: the problem of antibiotic resistance. Antimicrob Agents Chemother. 1993;37:377–83.
6. Ferrero-Miliani L, Nielsen OH, Andersen PS, Girardin SE. Chronic interleukin-1 β -driven inflammation: importance of NOD2 and NALP3 in its generation. Clin Exp Immunol. 2007;147(2):227–35.



7. Hannoodde S, Nasuruddin DN. Acute inflammatory response. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 [cited 2025 Sep 22]. PMID: 32310543.
8. Vogel WH, Berke A. Brief history of vision and ocular medicine. Amsterdam: Kugler Publications; 2009. p. 97. ISBN: 978-90-6299-220-1.
9. Porth C. Essentials of pathophysiology: concepts of altered health states. 2nd ed. Hagerstown (MD): Lippincott Williams & Wilkins; 2007. p. 270. ISBN: 978-0-7817-7087-3.
10. Brown JH, Mackey HK. Inhibition of heat-induced denaturation of serum proteins by mixtures of nonsteroidal anti-inflammatory agents and amino acids. *Proc Soc Exp Biol Med*. 1968;128(1):225–8.
11. Grant NH, Alburn HE, Kryzanasuskas C. Stabilization of serum albumin by anti-inflammatory drugs. *Biochem Pharmacol*. 1970;19(3):715–22.

HOW TO CITE: Shubhangi Deshpande, Prapti Gaulkar, Neetu Choudhary, Vaishanvi Hemade, Sakshi Deshmukh, Aniket Dhanwe, Investigating The Antithrombotic Activity Of Natural Extract (Lentils) *Lens culinaris*, *Int. J. of Pharm. Sci.*, 2025, Vol 3, Issue 10, 1058-1063. <https://doi.org/10.5281/zenodo.17326560>

