IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals
ISSN 2349-7203
HUMAN

Human Journals
Research Article
June 2023 Vol.:27, Issue:3

Evaluation of In-Vitro Anti-Inflammatory Potential of *Hippeastrum puniceum* Bulbs

IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals
ISSN 2349-7203
HUMAN

Priya Kurian[1*], Anjali Aravind[2], Ajumal H[2], Joel Seemon[2]

[1]*Department of Pharmacognosy, Grace College of Pharmacy, Palakkad, India.*

[2]*Bachelor of Pharmacy, Grace College of Pharmacy, Palakkad, India.*

Submitted: 27 May 2023
Accepted: 03 June 2023
Published: 30 June 2023

Keywords: Anti-inflammatory, Ethanolic, *Hippeastrum puniceum*, Protein Denaturation

ABSTRACT

A perennial bulbous plant called *Hippeastrum puniceum* is well recognized for treating swelling, wounds, and illnesses that go along with it. Alkaloids, flavonoids, terpenoids, carbohydrates, mucilage, starch, saponins, proteins, and amino acids were the phytochemicals that were initially screened. The ethanolic extract of *Hippeastrum puniceum* bulb was tested for anti-inflammatory effects using an in vitro technique. The method of measuring protein denaturation inhibition is used to assess anti-inflammatory effectiveness.

HUMAN JOURNALS
www.ijppr.humanjournals.com

INTRODUCTION

The perennial bulbous plant known as *Hippeastrum puniceum* is indigenous to South America. Due to its orange-colored, extremely alluring blossoms, it is grown as an ornamental plant all over the world. It is an ephemeral shrub. The plant is dormant for several months after setting flowers in the summer and losing its aerial components. The plant is a member of the Amaryllidaceae family.[1,2] The structural similarities between this family of alkaloids and the essential amino acid phenylalanine and its associated metabolites make them one of the most significant alkaloids. From this plant family, 500 alkaloids have been identified, with a wide spectrum of pharmacological effects.[3,4]

Inflammation is a pathophysiological response of vascular tissue to infection and damaged tissue that brings cells and molecules of host defence from the circulation to the site where they are needed, in order to eliminate the offering agent. It is caused by release of chemicals from tissue and migrating cells. Inflammation can be categorized as acute or chronic inflammation.[5,6]

MATERIALS AND METHODS

Collection of plant materials:

The plant *Hippeastrum puniceum* was collected from Palakkad, Kerala. The plant material was identified and authentication was carried out by Dr. M.U. Sharief, Scientist E and Head of Office, Botanical Survey of India, Southern Regional Centre, Coimbatore, Tamil Nadu (BSI/SRC/5/23/2023/Tech/67).

Preparation of Extract:

The best-sized fresh bulbs were shade-dried and ground into a coarse powder. Using ethanol as the solvent using the maceration process, the drug powder was extracted, yielding an ethanolic extract. A conical flask was filled with 40 g of powdered bulb, and then menstruum was added on top, covering the coarse powder entirely. After that, the container is sealed and preserved for a minimum of three days. To make sure that all of the content has been extracted, the container is shaken or swirled occasionally. The micelle and menstruum are separated from one another after extraction by evaporation in a water bath. After that, the concentrated extract was weighed and stored in an airtight container.[7,8]

Preliminary Phytochemical screening

The extract was subjected to preliminary screening of phytoconstituents present.[9,10,11]

INVITRO ANTI-INFLAMMATORY STUDY

Protein Denaturation Inhibition

The study was carried out using fresh hen's eggs. The test sample contains 200, 400, 600, 800, and 1000 mcg/ml of various test extract concentrations, 2 ml of phosphate buffered saline (pH 6.4), 0.2 ml of freshly acquired hen's egg albumin, and 2.8 ml of phosphate buffered saline. Use a comparable volume of egg albumin, PBS, and 2 ml of distilled water as a control. After 15 minutes of incubation at 37˚C in a BOD incubator, the mixtures were then heated for 5 minutes at 70˚C. After cooling, their optical density was evaluated at 660 nm using a vehicle as a reference. When evaluating absorbance, diclofenac sodium was used as the reference and handled similarly, with final concentrations (mcg/ml) of 200, 400, 600, 800, and 1000. The percentage inhibition of protein denaturation was calculated by using the following formula.[12,13]

$$\text{Percentage inhibition} = 100 \times [\, Vt/\, Vc - 1]$$

Where,

Vt – Absorbance of test sample

Vc – Absorbance of control

RESULTS

The ethanolic extract of *Hippeastrum puniceum* bulb used in the current investigation was found to contain the various phytocompounds with potential medical use. The presence of alkaloids, glycosides, phenolic, flavonoids, terpenoids, carbohydrates, mucilage, starch, tannins, steroids, saponins, proteins, and amino acids was evaluated for in the bulb extract's phytochemical composition.

Table 1: Chemical tests

SL No.	PHYTOCONSTITUENTS	RESULTS
1	Alkaloids	+
2	Glycosides	-
3	Phenolic	-
4	Flavonoids	+
5	Terpenoids	+
6	Carbohydrates	+
7	Proteins & Amino acids	+
8	Mucilage	+
9	Starch	+
10	Tannins	+
11	Steroids	-
12	Saponins	+

(+) Presence, (-) Absence

IN VITRO ANTI-INFLAMMATORY STUDY

Inhibition of Protein denaturation

Table 2: Inhibition of protein denaturation

CONCENTRATION (mcg/ml)	% INHIBITION (DICLOFENAC SODIUM)	% INHIBITION (TEST SAMPLE)
200	27.58	24.13
400	41.37	37.93
600	56.89	53.44
800	77.50	70.68
1000	87.93	82.75

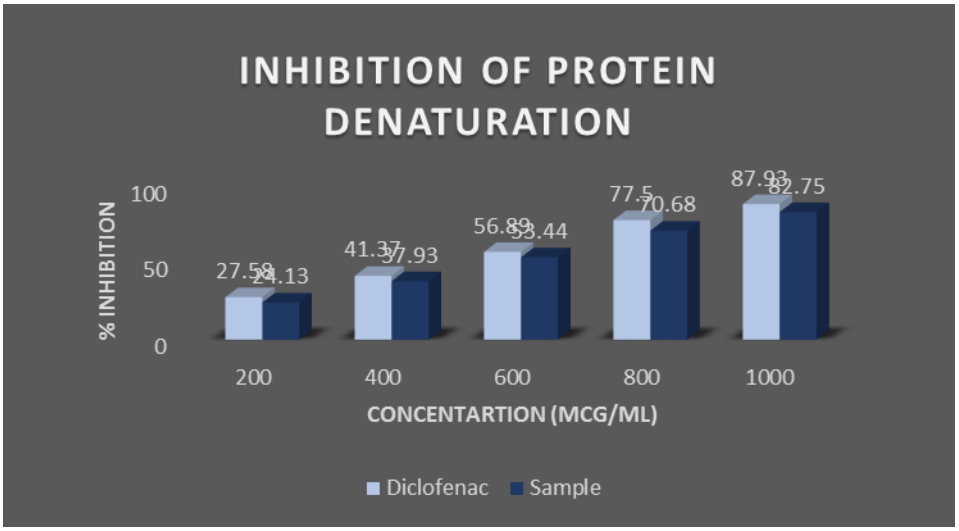

Fig 1: Anti-inflammatory study chart

CONCLUSION

Hippeastrum puniceum was subjected to a preliminary phytochemical screening for the current investigation. The study also evaluates the anti-inflammatory property of the ethanolic extract of *Hippeastrum puniceum* bulb. Protein denaturation inhibition was used to assess the anti-inflammatory efficacy. The effects of the test were contrasted with those of regular Diclofenac. Various concentrations were used to measure the inhibition. High doses of the extract exhibit a considerable proportion of inhibition, which is dose dependent. At a concentration of 1000 mcg/ml, the result indicated an inhibition of 82.75 percent. The extract has proven to have strong anti-inflammatory properties.

Acknowledgments:

We are thankful to Grace College of Pharmacy, Palakkad for the support and encouragement rendered in carrying out this work.

REFERENCES

1. C. K. Kokate, A. P. Purohit, S. B. Gokhale*;* Edition, 40; Publisher, Nirali Prakashan, 2007; ISBN, 8185790094, 9788185790091
2. Evans WC, Trease and Evans Pharmacognosy,14th ed., W.B. Sounders Company Ltd., London,1996,545-548
3. Crinum; An endless source of bioactive principles; A review part biological profile, John Refaat, Mohamed S. Kamel et al, International Journal of Pharmaceutical Sciences and Research, IJPSR 2013, Vol 4, Issue 4(4): 1239-1252.
4. Santana O, Reina M, Anaya AL, Hernández F, Izquierdo ME, González-Coloma A. 3-O-Acetyl-narcissidine, a bioactive alkaloid from Hippeastrum puniceum Lam.(Amaryllidaceae). Zeitschrift für Naturforschung C. 2008 Oct 1;63(9-10):639-43.
5. Good man and Gilman (2009), Manual of pharmacology and therapeutics. 12th edition 1037-1045.

6. Harshmohan (2010), Textbook of pathology 2010 6th edition.
7. Abubakar AR, Haque M. Preparation of Medicinal Plants: Basic Extraction and Fractionation Procedures for Experimental Purposes. J Pharm Bioallied Sci. 2020 Jan-Mar;12(1):1-10. doi: 10.4103/jpbs.JPBS_175_19. Epub 2020 Jan 29. PMID: 32801594; PMCID: PMC7398001
8. Singh J. Maceration, percolation and infusion techniques for the extraction of medicinal and aromatic plants. Extraction technologies for medicinal and aromatic plants. 2008; 67:32-5.
9. Sofowra, A. 1993. Medicinal Plants and Traditional Medicine in Africa. Spectrum Books Ltd., Ibadan, Nigeria, pp. 191-289.
10. Trease, G.E., Evans, W.C. 1989. Pharmacognosy, 11th edition., Bailliere Tindall, London, pp. 45-50.
11. Harborne, J.B. 1973. Phytochemicals Methods. Chapman and Hall Ltd., London, pp. 49-188.
12. Douglas Bosco aidoo, Daniels konja, Isaac tabiri henneh, and martins ekor. protective effect of bergapten against human erythrocyte hemolysis and protein denaturation in vitro. international journal of Inflammation volume 2021, article id 1279359, 7 pages https://doi.org/10.1155/2021/1279359.
13. Sangita Chandra, Priyanka Chatterjee, Protapaditya Dey, Sanjib Bhattacharya, Evaluation of in vitro anti-inflammatory activity of coffee against the denaturation of protein, Asian Pacific Journal of Tropical Biomedicine, Volume 2, Issue 1, Supplement,2012, Pages S178-S180, ISSN 2221-1691, https://doi.org/10.1016/S2221-1691(12)60154-3.