



Review article

## A review on plant with anti-inflammatory therapeutic activity

Pradeep Kumar Patel

Department of Pharmacy, Kushabhau Thakare District hospital, Shahdol, Madhya pradesh, India

**Corresponding author:** pradeep.pharmabu@gmail.com, **Orcid Id:** <https://orcid.org/0009-0003-1011-647X>

© The author(s). This is an open access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by-nc/4.0/>). See <https://ijtinnovation.com/reprints-and-permissions> for full terms and conditions.

Received - 02-05-2023, Revised - 11-07-2023, Accepted - 12-09-2023 (DD-MM-YYYY)

### Refer this article

Pradeep Kumar Patel. A review on plant with anti-inflammatory therapeutic activity, September - October 2023, V 1 - I 2, Pages - i – iii. Doi: <https://doi.org/10.55522/ijti.V1I2.0001>.

### ABSTRACT

Several synthetic anti-inflammatory drugs are available in the market. Out of them, few have promising activity and most of them have quite more undesirable effects. Herbal sources are most often used from ancient times to solve the root causes of numerous diseases & also they have potent as well as potential results with quite less adverse effects. Various extracts of plants (i.e. leaves, stem, root, bark, rhizome, etc.) have been found to possess anti-inflammatory activity due to the presence of several known & unknown phyto constituents. As we know inflammation is a common protective response but if it occurs beyond the limit in our body then it may be harmful. Investigation of plant sources for diseases is always beneficial for counteracting the undesirable effect that is happening in the case of synthetic drugs. In this article, we are trying to find some important plants which have potent anti-inflammatory active moiety.

**Keywords:** Therapeutic Effect, Active Ingredients, Medicinal plants, Phytochemicals

### INTRODUCTION

Herbal drugs are the are usually obtained from the plant source. It has been found that every plant in the universe has some kind of medicinal activities due to the presence of a wide variety of medicinal constituents i.e. carbohydrates, proteins, amino acids, lipids, tannin, alkaloids, saponin, flavonoids, etc. A successful isolation of these constituents may possess a wide variety of pharmacological activities. The same kind of medicinally active compound can also obtained through synthetic methods but obviously, natural compounds are a little less harmful to any living body. Herbal medicines, as compared to synthetic pharmaceuticals have greater advantages in terms of safety, economy, and disease-curable capacity. If we go back to history as well as in the present scenario most of the people basically from rural areas believe in herbal medicine for the treatment of all diseases. Odisha is an extensive tree-covered state of India, rich in millions of medicinal plants.

### Inflammation

Many different inflammatory cells are involved in different stages of different kinds of inflammatory responses, they are basically eosinophils, neutrophils (e.g. acute bacterial infections), mast cells and lymphocytes (e.g. in asthma), macrophages, monocytes& lymphocytes.

The progression of Inflammation is a very common, defending, automatic feedback to tissue injury caused by physical injury, hazardous chemicals, or microbes. Inflammation is the body's process to destroy or inactivate extraneous body organisms, discard irritants, and prepare the stage for tissue repair. When healing is complete, the inflammatory process is usually automatically reduced. However, inappropriate activation of our immune system can result in inflammation leading to rheumatoid arthritis (RA).

### Pharmacological review of plant having anti-inflammatory activity

Several researchers have been worked for finding the solution of inflammation. Basing on the suitability on

our body many of them have been rejected. Researchers worked on synthetic as well as natural sources for development of anti-inflammatory moiety. As we know herbal sources have huge potential of wide spectrum of pharmacological activities. Few of them from natural sources (i.e. plant extracts), which have significant anti-inflammatory activity investigation done by several researcher are listed as below.

J Narayan.<sup>[1]</sup> investigated in vitro anti-inflammatory property of *L-asparaginase* extracted from fungus *Aspergillus tamarii* by albumin denaturation assay, proteinase inhibitory activity and membrane stabilization. The results indicated that 50 µg/ml of *L-asparaginase* showed significant inhibition values possesses anti-inflammatory property apart from being an anti-tumor drug.

Ashima Gakhar<sup>[2]</sup> studied the *G. hanburyi* extract for the anti-inflammatory activity by proteinase inhibitory activity, membrane stabilization, and albumin denaturation assay at various concentrations. Results showed that the extract from *G. hanburyi* at a concentration from 100 to 500 µg/ml protects protein denaturation.

Joseph et. al.<sup>[3]</sup> investigated anti-inflammatory activity of *Clerodendrum paniculatum* Linn extract. They used many solvent such as Petroleum ether, chloroform, ethyl acetate, and alcohol and aqueous for isolation of active constituent from the leaves. They used in vitro human red blood cell membrane stabilization method for confirmation of anti-inflammatory activity. They concluded petroleum ether and chloroform extracts showed, best in vitro anti-inflammatory activity.

Pal S. C. et. al.<sup>[4]</sup> investigated anti-inflammatory activity of methanolic extract of *Ixora coccinea* flowers (ICF-ME). They performed in-vivo anti-inflammatory in rats by using an acute anti-inflammatory model i.e. carageenan-induced paw oedema model. They determined quantitative estimation of total polyphenolic content of *I. Coccinea* flowers by ICF-ME (100mg/kg) which was found decreased paw volume, after oral administration of ICF-ME in carageenan injection. ICF-ME also displays substantial analgesic action. They recorded the response of licking or jumping latency using hot plate method. They concluded that presence of phytochemical like flavonoids, tannins, glycoside in the ICF-ME might subsidise to the analgesic and anti-inflammatory action.

Md Syed Ali Adnan et. al.<sup>[5]</sup> Investigate the anti-inflammatory potential of an aqueous leaf extract (ALE) of *Ixora coccinea* (Rubiaceae) in rats after oral administration (500, 1000 and 1500 mg/kg). They studied using cotton pellet granuloma tests (chronic inflammatory model) and carageenan-induced paw oedema (acute inflammatory model). In the later test, ALE pointedly weakened both premature and mature stages of the inflammatory response. In the first test, it pointedly inhibited granuloma formation. From the above collective data they confirmed promising anti-inflammatory activity against both acute and chronic inflammation.

W.D. Ratnasooriya et. al.<sup>[6]</sup> studied *Erythroxylum cuneatum* leaf extract .they evaluated anti-inflammatory property of the extract on rat's model of carageenan induced paw model. Rats treated with the different concentration of the extract & it was found that a dose dependent reduction in paw oedema. The highest dose (50 mg/kg) of extract displayed comparable effects to aspirin in relations of falling paw thickness, disruption of collagen leucocytes infiltration. Finally they concluded that leaf extract *E. cuneatum* alkaloid possesses anti-inflammatory properties.

Lim Seow Li et. al.<sup>[7]</sup> evaluated anti-inflammatory activity of methanolic extract of leaves of *Bougainvillea spectabilis*. They found significant anti-inflammatory activity of methanol extract of leaves at concentration 50 mg/kg. For Acute anti-inflammatory activity was calculated by carageenan and dextran however chronic anti-inflammatory activity was evaluated by Freund's adjuvant-induced arthritis model.

Gautam Mandal et. al.<sup>[8]</sup> confirmed anti-inflammatory activity of the aqueous and ethanolic extracts of the leaves of *Albizzialeb beck* Benth. (Mimosaceae) from cotton pellet-induced granuloma & carageenan-induced paw oedema models. They found significant anti-inflammatory activity of plant *Albizzialeb beck*.

Girish Gulab Meshram et. al.<sup>[9]</sup> evaluated methanolic extract of stem, bark the plant *Millingtonea hortensis* for anti-inflammatory. They used carageenan induced rats paw oedema model and Indomethacin as standard drug. The result showed substantial decrease in paw volume and increase in % inhibition in paw volume in dose dependent fashion.

J V C Sharma et.al. [10] Tested for anti-inflammatory activity in aqueous extract of *Mangifera indica* leaves. They used carrageenan induced paw oedema and Formalin induced paw oedema animal models for their study. They concluded a significant dose dependent anti-inflammatory activity of aqueous extract of *Mangifera indica* leaves.

A.Sudha Madhuri et al. [11] evaluated anti-inflammatory activity using the carrageenan-induced rat paw oedema. They tested ethanol extract (stem, leaf) of the plant *Tiliacora Acuminata*. They used standard drug as indomethacin. In their study they found inhibition of oedema volume in dose dependent manner suggesting has anti-inflammatory activity of *Tiliacora Acuminata*.

## CONCLUSION

In the presented review article we can conclude so many plants have anti-inflammatory moiety which have better activity as compare to various standard drugs available in the market. Yet there may be a numbers of more plants which have anti-inflammatory activity & hence research work for finding more anti-inflammatory moiety from plant source by researcher is still in progression phase for the benefit of the peoples across the globe.

## REFERENCES

1. J Narayanan, V Chitra, 2018. In vitro anti-inflammatory activity of *Garcinia hanburyi* extract. Journal of pharmacy research. 12(4), Corpus ID: 212561426.
2. Ashima Gakhar, 2021. Anti-inflammatory perspectives of diverse natural resources. Jour. of Med. P'ceutical & Allied. Sci. 10(4), Pages 3270 - 3279 Doi: 10.22270/jmpas.V10I4.1379.
3. Jeenu joseph, a. R. Bindhu, n. A. Aleykutty, 2013. In vitro and in vivo antiinflammatory activity of *clerodendrum paniculatum* linn. Leaves. Indian journal of pharmaceutical sciences. Doi: 10.4103/0250-474X.117428.
4. Aher A.N., Pal S. C., Muke S. A., 2013. Analgesic and anti-inflammatory activities of *Ixora coccinea* flowers. Indian Drugs. Doi: 10.53879/id.50.01.p0064.
5. Md Syed Ali Adnan, Md Mamun Al-Amin, Mir Muhammad Nasir Uddin, et al, 2013. Anti-inflammatory and antipyretic effects of *Ixora coccinea*. Journal of Basic and Clinical Physiology and Pharmacology. Doi: 10.1515/jbcpp-2013-0125.
6. W.D. Ratnasooriya, S.A. Deraniyagala, G. Galhena, S.S.P. Liyanage, 2008. Anti-inflammatory Activity of the Aqueous Leaf Extract of *Ixora coccinea*. International Journal of Current Microbiology and Applied Sciences Pharmaceutical Biology. Pages 1744-5116. Doi: 10.1080/13880200590919483.
7. Lim Seow Li, Samaila Musa Chiroma, Thuaibah Hashim; 2020. Antioxidant and anti-inflammatory properties of *Erythroxylum cuneatum* alkaloid leaf extract. *Heliyonjournal*. 6(6), Doi: 10.1016/j.heliyon.2020.e04141.
8. Gautam Mandal, Chandan Chatterjee, Mitali Chatterjee, 2015. Evaluation of anti-inflammatory activity of methanolic extract of leaves of *Bougainvillea spectabilis* in experimental animal models. *Pharmacognosy research*. Doi: 10.4103/0974-8490.147194.
9. Girish Gulab Meshram, Anil Kumar, Waseem Rizvi, et al, 2016. Evaluation of the anti-inflammatory activity of the aqueous and ethanolic extracts of the leaves of *Albizzialeb beck* in rats. *Journal of Traditional and Complementary Medicine*. Pages 172-175. Doi: <https://doi.org/10.1016/j.jtcme.2014.11.038>.
10. J V C Sharma, D Satyavati, G Pitchaiah, et al, 2010. Evaluation of anti-inflammatory and analgesic activity of methanolic extract of stem bark of *millingtonea hortensis*. *International journal of drug development and research*. Corpus ID: 67815027
11. A.Sudha Madhuri, Rajalakshmi Mohanvelu, Ramabhimaiyah S, 2016. Evaluation of anti- inflammatory activity of aqueous extract of *Mangifera indica* leaves in albino rats. *IJBCP*. 5(3) Pages 20. Doi: <http://dx.doi.org/10.18203/2319-2003.ijbcp20161451>.