



Asian Journal of Research in Chemistry and Pharmaceutical Sciences

Journal home page: www.ajrcps.com

<https://doi.org/10.36673/AJRCPS.2020.v08.i03.A31>



PHYTOCHEMICAL AND ANTI-INFLAMMATORY ACTIVITY OF MEDICINAL PLANTS

C. V. Aswathi Sreenivasan*¹ and T. Angayarkanni¹

¹Department of Biochemistry, Biotechnology and Bioinformatics, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Tamil Nadu, India.

ABSTRACT

Traditional medicines derived from medicinal plants are used by about 60% of the world's population. This review focuses on Indian herbal drugs and plants used in the treatment of various diseases, especially in India. Phytochemical analysis of extract revealed the presence of flavanoids, steroids, furan, alkaloids, anthraquinone, tannins and saponins but negative result was observed in aqueous extract except tannins. This study showed vital information regarding pharmacological and phytochemical activities of medicinal plants. The Present review article overview the phytochemical and pharmacological properties of medicinal plant and in this article attempt has been made to summarize the anti-inflammatory property of the plant.

KEYWORDS

Medicinal plants, Phytochemicals and Anti-inflammatory activity.

Author for Correspondence:

Aswathi Sreenivasan C V,
Department of Biochemistry,
Biotechnology and Bioinformatics,
Avinashilingam Institute for Home Science and
Higher Education for Women,
Coimbatore, Tamil Nadu, India.

Email: aswathisrnvs67@gmail.com

INTRODUCTON

Herbal medicine, also called botanical medicine or phytomedicine, mainly used for medicinal purpose in which use of any plant's seeds, berries, roots, leaves, bark, or flowers for the same. After a long practiced, researchers identified that conventional medicine, herbalism is becoming more mainstream as up-to-date analysis and research work show their value in the treatment and prevention of disease. (Ang-Lee, Moss, 2000). In the last few years there has been an exponential growth in the field of herbal medicine and these drugs are gaining popularity both in developing and developed countries because of their natural origin and less side effects. Most of the traditional medicines in use are derived from

medicinal plants, minerals and organic matter. A large number of medicinal plants, traditionally used for over 1000 years named rasayana are present in how to prepare herbal medicine of Indian traditional health care systems. In Indian systems of medicine both ayurvedic and allopathic most practitioners prepare and dispense their own recipes. The World Health Organization (WHO) has listed 21,000 plants, which are mainly used for medicinal purposes around the world. Among these 2500 species are in India, out of which 150 species are used commercially on a fairly large scale for medicine preparation. India is the biggest producer of medicinal plants and is called as botanical garden of the world. The current review mainly focuses on herbal drug preparations and plants used in the treatment of various diseases like inflammation and diabetes mellitus, a major crippling disease in the world leading to huge economic losses (Barret, *et al*, 1999).

The World Health Organization (WHO) identified that 80% of the population of developing countries still relies on traditional medicines for cure diseases and plant drugs, for their primary health care (Fransworth *et al*, 1985)¹. Plant products also play an important role in the healthcare systems of the remaining 20% population, mainly residents of developed countries. The scientific data generated by research on the plants serves as a valuable tool for identifying plant species and for characterization of the pharmacological active constituent for their biological activities. In the search for new plant it is always important to screen for its activity as first step. Once the plant is identified for useful biological activity it is imperative to collect supporting scientific data generated for the analysis through pharmacognostic and phytochemical properties of plant under investigation.

For herbs contain many ingredients and it is likely that they work together to produce the desired medicinal effect. The type of environment (climate, bugs, soil quality) in which it effect plant growth and its components, as will how and when it was harvested and processed. Most herbs, the specific ingredient that present in it contribute a therapeutic effect is not known. Whole plant extracts have many

components. These components work together to produce therapeutic effects like “Tiphala” and also to lessen the chances of side effects from any one component. Several herbs are often used together to enhance effectiveness and synergistic actions and to reduce toxicity (D’ Epiro, 1999)². Herbalists must take awareness in many things into account when prescribing herbs. For example, the species and its medicinal property, variety of the plant species, the plant's ecosystem, how it was stored and processed, and whether or not there are contaminants (Fugh-Berman, 2000).

Inflammation is a disorder that affects a wide range of people throughout the world. This Medicinal herb has been used for many years for gallstones and gall bladder infections and may improve the symptoms of jaundice. It is indicated in congestive jaundice, inflammation of the gall bladder and gallstones. External application of medicinal plant has been recommended to reduce the inflammation and pain of bruises, aches and sprains. Numerous traditionally used plants exhibit pharmacological properties with great potential for therapeutic applications in the treatment of inflammation disorders. Hence the study was carried out to investigate the anti-inflammatory effect of medicinal plants.

Inflammation plays an important role in associated various diseases with high prevalence with in populations such as rheumatoid arthritis, atherosclerosis and asthma. Here we demonstrate the anti-inflammatory activity of various medicinal plants like fruits, herbs and spices. These compounds acted by reduction of pro-inflammatory interleukin (IL)-6 or tumour necrosis factor (TNF)-alpha production, enhancement of anti-inflammatory IL-10 production, or reduction of cyclooxygenase-2 or inducible nitric oxide synthase expression. The highest anti-inflammatory potential was detected with chili pepper. Among the plants that improved the secreted cytokine profile were allspice, basil, bay leaves, black pepper, licorice, nutmeg, oregano, sage and thyme etc. The compounds apigenin, capsaicin, chrysin, diosmetin, kampferol, luteolin, naringenin, quercetin and resveratrol moderately decrease IL-6 and TNF-

alpha secretion. Resveratrol and rosmarinic acid increased secretion of IL-10. Our findings further reveal the idea that a diet rich in fruits, herbs, leaves and spices may contribute to the reduction of inflammation and related diseases.

RESULTS AND DISCUSSION

Isolation and purification of pure, pharmacologically active constituents from plants and study its activity remains a lengthy and important process. For this reason, it is very difficult to have methods available which destroy completely unnecessary separation procedures. Chemical extraction and screening is thus performed to allow localization and targeted separation of new or useful constituents with potential activities. Strong occurrence of phytochemicals in extract has been shown to possess potent anti-inflammatory properties. Analgesic and anti-inflammatory effects have been observed in flavonoids. The results strongly suggest anti-inflammatory effects are shown by plant extract due to its phytochemical constituents.

CONCLUSION

The present study indicates that the plant contains potential anti-inflammatory components such as flavonoids, terpenoids and steroids that may be of use for development of phytomedicine for the therapy of inflammations. Thus, from the present study it can be concluded that the methanolic extract of plant is beneficial to the weight management, which supports its traditional claim.

ACKNOWLEDGEMENT

I bow my head before the "Lord Almighty" for his graceful blessing showered upon me the successful completion of this work. I specially acknowledge with a deep sense of gratitude to my guide Dr. Angayarkanni T, Ph.D., Associate Professor, Department of Biochemistry, Biotechnology and Bioinformatics Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. I sincerely extend my thanks to Dr. Kavitha P, Ph.D., Assistant Professor, Department of Microbiology, Sir Syed Institute for Technical

studies, Taliparamba for her helping hands towards this course. I heartful thanks to my Parents, Brothers and Sisters for their encouragement, blessing, cooperation and support during the entire course of my study.

CONFLICT OF INTEREST

We declare that we have no conflict of interest.

BIBLIOGRAPHY

1. Norman R, Farnsworth. Screening plants for new medicines, *National Academy of Sciences*, 9, 1985, 83-97.
2. D' Epiro N W. An historical, regulatory and medical use perspective on nine common herbs, *The Physician's Guide to Alternative Medicine*, In: Micozzi M S, Bacchus A N, Atlanta, Ga, American Health Consultants, 1st Edition, 1999, 21-30.
3. Agrawal P, Ravi V and Singh R B. Randomized placebo controlled, single blind trial of holy basil Leaves in patients with noninsulin- dependent diabetes mellitus, *International Journal of Clinical Pharmacology and Therapeutics*, 34(9), 1996, 406-409.
4. Chatterjee T K. Herbal options, *Eastern Traders, Calcutta*, 1997, 9-16.
5. Chhanda, Mallick, Rajkumar, Maiti and Debidas, Ghosh. Comparative study on antihyperglycemic and antihyperlipidemic effects of separate and composite extract of seed of *eugenia jambolana* and root of *musa paradisiaca* in streptozotocin-induced diabetic male albino rat, *Iran Jour of Pharma and Therape*, 5(1), 2006, 27.
6. David Nelson L, Michael Cox M, Lehninger. Principals of biochemistry, *Worth Publisher, New York, U.S.A*, 3rd Edition, 2000, 883-884.
7. Macleod, Edwards, Bouchier. Davidson's principles and practice of medicine, *Churchill Livingstone*, 15th Edition, 1987, 841.
8. Deb A C. Fundamentals of biochemistry, *New Central Book Agency (P) Ltd, Calcutta*, 7th Edition, 1998, 243.
9. Gangan V D, Pradhan P, Sipahimalani A T,

- Banerji A. Cordifolisides A, B, C: Norditerpene furan glycosides from *tinospora cordifolia*, *Phytochemistry*, 37(3), 1994, 781-786.
10. Nahar N. Traditional medicine, *Oxford and OBH Publishing Co. Pvt. Ltd, New Delhi*, 18th Edition, 1993, 205-209.
 11. Osaad Sayed Mohamed, Ayman Goudah Mostafa and Rania Helmy Abd El-hameed. Evaluation of the anti-inflammatory activity of novel synthesized pyrrole, pyrrolopyrimidine and spiro pyrrolopyrimidine derivatives, *Pharmacophore*, 3(1), 2012, 44-54.
 12. Pritesh Patel, Pinal Harde, Jagath Pillai, Nilesh Darji and Bhagirath Patel. Antidiabetic herbal drugs a review, *Pharmacophore*, 3(1), 2012, 18-29.
 13. Radha R, Arokiyaraj S, Agastian P, Balaraju R, Mohan kumar R and Bula P. Phytochemical analysis and anti-inflammatory Activity of *Pisonia grandis*, *Biomedical and Pharmacology Journal*, 1(1), 2008, 127-130.
 14. Satoskar R S, Bhandarkar S D, Ainapure S S. Pharmacology and pharmacotherapeutics, *Popular Prakashan, Mumbai*, 16th Edition, 1999, 874.
 15. Smith and Reynard. Essentials of pharmacology, *W.B. Saunders Company*, 1995, 588.
 16. Solomon S, Muruganantham N and Senthamilselvi M M, *Pharmacophore*. Anti-oxidant and anti-inflammatory activity of the *spesia populnea*, *J Ethnopharmacol*, 6(1), 2015, 53-59.

Please cite this article in press as: Aswathi Sreenivasan C V and Angayarkanni T. Phytochemical and anti-inflammatory activity of medicinal plants, *Asian Journal of Research in Chemistry and Pharmaceutical Sciences*, 8(3), 2020, 221-224.