



INTERNATIONAL JOURNAL OF PHARMACEUTICAL RESEARCH AND NOVEL SCIENCES

IJPRNS

ANTI-INFLAMMATORY ACTIVITY OF *GYMNEMA SYLVESTRE* ON WISTAR RATS

K.Sivaji*, A.S.P.Ayyappa, A.D.S.Sai Lakshmi, K.Sravani, K.Ganga Bhavani, K.Vanitha

Department of Pharmacology, JITS College of Pharmacy, Kalgampudi, Andhra Pradesh, India.

ABSTRACT

The investigations on *Gymnema sylvestre* were found to produce positive results towards the evidence of anti-inflammatory. The data obtained from anti-inflammatory, of *Gymnema sylvestre* were dose dependent. It also can be noted that the combination of *Gymnema sylvestre* and Diclofenac had a synergistic effect in curing inflammation. Finally our studies concluded that *Gymnema sylvestre* had both anti-inflammatory, hence it is worth drug in quick wound healing of diabetic patient.

Keywords: *Gymnema sylvestre*, anti-inflammatory activity

Author for correspondence

K.Sivaji,

Department of Pharmacology,
JITS College of Pharmacy, Kalgampudi,
Andhra Pradesh, India.

Email- siva.bpharm09@gmail.com

INTRODUCTION

Inflammation (Latin, *īnflammō*, "I ignite, set alight") is part of the complex biological response of vascular tissues to harmful stimuli, such as pathogens, damaged cells, or irritants. Inflammation is a protective attempt by the organism to remove the injurious stimuli and to initiate the healing process. Inflammation is not a synonym for infection, even in cases where inflammation is caused by infection. Although infection is caused by a microorganism, inflammation is one of the responses of the organism to the

pathogen. However, inflammation is a stereotyped response, and therefore it is considered as a mechanism of innate immunity, as compared to adaptive immunity, which is specific for each pathogen. Without inflammation, wounds and infections would never heal. Similarly, progressive destruction of the tissue would compromise the survival of the organism. However, chronic inflammation can also lead to a host of diseases, such as hay fever, periodontitis, atherosclerosis, rheumatoid arthritis, and even cancer (e.g. gall bladder carcinoma). It is for that reason that inflammation is normally closely regulated by the body. Inflammation can be classified as either *acute* or *chronic*. *Acute inflammation* is the initial response of the body to harmful stimuli and is achieved by the increased movement of plasma and leukocytes (especially granulocytes)

from the blood into the injured tissues. A cascade of biochemical events propagates and matures the inflammatory response, involving the local vascular system, the immune system, and various cells within the injured tissue. Prolonged inflammation, known as *chronic inflammation*, leads to a progressive shift in the type of cells present at the site of inflammation and is characterized by simultaneous destruction and healing of the tissue from the inflammatory process.

Anti-inflammatory refers to the property of a substance or treatment that reduces inflammation. Anti-inflammatory drugs make up about half of analgesics, remedying pain by reducing inflammation as opposed to opioids, which affect the central nervous system. Many steroids, to be specific glucocorticoids, reduce inflammation or swelling by binding to glucocorticoid receptors. These drugs are often referred to as corticosteroids.

A study of the process by which traditional or more plant based molecular drugs or the new breed of herbal drugs came to be used in present day medicine reveals that, in over 70% of the cases, the starting point has been some reference to the use of that plant as an indigenous cure in a folklore or traditional system of medicine of one culture or the other, it is clear that herbal industry has to make great strides in India, with the cooperation between drug regulatory authorities, scientists and industry. Standardization of methods, quality control data on safety and efficacy are need for proper understanding for the use of herbal medicines (1-3).

MATERIALS AND METHODS

Materials

The plant material *Gymnema sylvestre* was collected in the month of Feb 2016 Andhra Pradesh. Around 1kg of plant was collected.

Preparation of Powder

The plant material of *Gymnema sylvestre* were shade dried and then powdered with a grinder to form a coarse powder. The powder was passed through sieve no 40 and was stored in an air tight container until further use. The powder was used for the extraction

process (Fig-1).



Fig-1 Dried aqueous extract powder of *Gymnema sylvestre*

Preparation of Aqueous Extract

The aqueous extract of the plant was prepared using Maceration process. The coarse powder of plant (100g) was taken in a beaker with the water quantity of 1000ml and was Macerated for 72hrs. During the Maceration occasional stirring and warming were carried out. After 72 hrs, the suspension was filtered through a fine muslin cloth. The solvent was removed by heating it and a greenish black residue was obtained (Yield:9.14% w/w w.r.to dried plant material)

Anti-inflammatory activity (4-6)

36 Albino rats (Wistar Strain) were taken and divided into 6 groups i.e.6 in each group (Head, Body, Tail, Head-Body, Body-Tail, Head-Tail).Every rat in each group was weighed and their weights were in the range of 150-200mg and as per the weight the standard dose of Diclofenac (10mg/kg) and Podapatri for each Rat was calculated. Prior to the experiment diabetes was induced to rats by using Alloxan orally. Later after two days inflammation was induced to rats by using Carrageenan as 1% suspension. Before inducing diabetes and inflammation the rats were made to fast the overnight. Carrageenan is given by sub patal injection. After inflammation was induced the anti-inflammatory activity of Podapatri was studied on specified groups as divided below (Podapatri was given orally).

RESULTS AND DISCUSSION

The phytochemical screening of aqueous extract of *Gymnema sylvestre* showed the presence of flavanoids, saponin, phenolic compound which were considered to be responsible for its pharmacological activity.

Anti-inflammatory activity

The investigations on *Gymnema sylvestre* were found to produce positive results towards the evidence of anti-inflammatory (Table-1).

Table-1 Data showing averages of inhibition of edema of all groups with standard deviation and % inhibition of edema

Groups	0H	1H	2H	3H	4H
I	3.13±0.25	3.11±0.23 (95%)	3.06±0.21 (82.73%)	3.10±0.21 (69.71%)	2.98±0.21 (61%)
II	3.21±0.20	3.28±0.32 (78.87%)	3.01±0.13 (57.33%)	3.26±0.49 (39.40%)	2.78±0.17 (7.15%)
III	3.23±0.20	3.16±0.23 (76.83%)	3.05±0.25 (63.59%)	2.95±0.20 (43.67%)	2.86±0.19 (13.89%)
IV	3.16±0.22	3.05±0.16 (68.14%)	2.96±0.13 (45.45%)	2.88±0.13 (22.68%)	2.81±0.14 (9.09%)
V	3.21±0.23	3.13±0.16 (78.40%)	3±0.16 (43.92%)	2.91±0.17 (22.40%)	2.86±0.16 (9.45%)
VI	3.2±0.28	3.15±0.21 (81.45%)	3±0.14 (55.50%)	2S.85±0.21 (25.88%)	2.75±0.07 (3.67%)

The above graph illustrates that %inhibition of edema was more in groups V and VI, when compared with the other groups. It also infers that Podapatri itself acts as Antiinflammatory agent but not as good as the standard drug (Diclofenac). Podapatri shows synergistic effect when given in combination with standard drug (Fig-2).

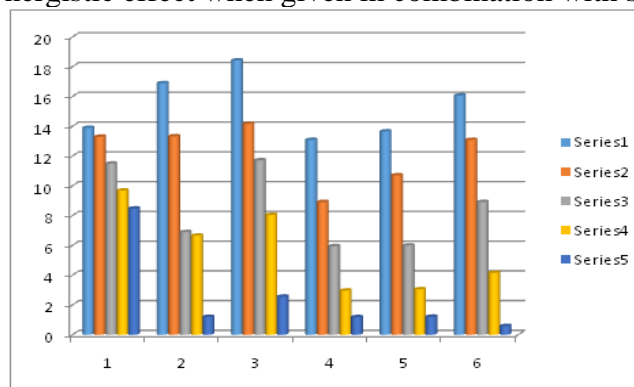


Fig-2 %inhibition of edema

The above graph illustrates that %inhibition of edema was more in groups V and VI, when compared with the other groups. It also infers that Podapatri itself acts as Anti-inflammatory agent but not as good as the standard drug (Diclofenac). Podapatri shows synergistic effect when given in combination with standard drug (Fig-3).

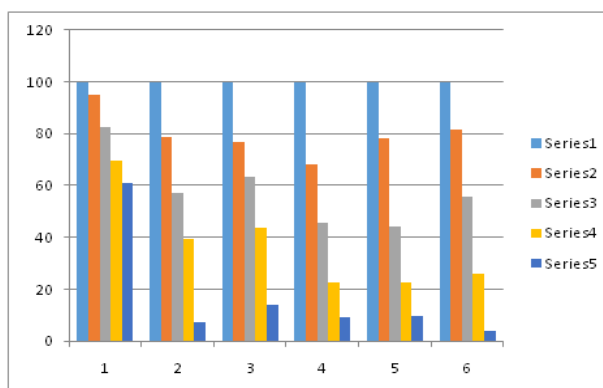


Fig-3 showing % inhibition of edema

CONCLUSION

A diabetic patient generally reports delayed wound healing. He suffers from prolonged pain and inflammation. Since ages experiments are being conducted to cure Diabetes and to decrease the time period for wound healing simultaneously. The phytochemical screening of aqueous extract of *Gymnema sylvestre* showed the presence of flavanoids, phenols and saponins which were considered to be responsible for its pharmacological activity (Antidiabetic, Anti-inflammatory, Analgesic activities). Therefore *Gymnema sylvestre* was considered to possess both anti-inflammatory activities. The literature clearly suggests that *Gymnema sylvestre* has been widely used as antidiabetic. In order to evaluate its Anti-inflammatory, in vivo studies of aqueous extract of *Gymnema sylvestre* were conducted on rats. The investigations on *Gymnema sylvestre* were found to produce positive results towards the evidence of anti-inflammatory. The data obtained from anti-inflammatory, of *Gymnema sylvestre* were dose dependent. It also can be noted that the combination of *Gymnema sylvestre* and Diclofenac had a synergistic effect in curing inflammation. Finally our studies concluded that *Gymnema sylvestre* had both

anti-inflammatory, hence it is worth drug in quick wound healing of diabetic patient.

REFERENCES

1. K.D. Tripathi. *Essentials of Pharmacology*, 6th edition.
2. Acacia melanoxyton Porter, Terry (2006). *Wood: Identification and Use*. East Sussex, GB: Guild of Master Craftsman Publications Ltd. pp.37.
3. This species was first named and described in *Bijdragen tot de Flora van Nederlandsch Indie* 13: 657. 1826 "Plant Name Details for *Sambucus javanica*".
4. Ozaki, Y; Kawahara, N; Harada, M (1991). "Anti-inflammatory effect of Zingiber cassumunar Roxb. And its active principles". *Chemical & pharmaceutical bulletin*.
5. Kokate CK, Purohit AP, Gokhale Sb, Pharmacognosy, 3rd edition, NiraliPrakashan, Pune
6. Khare AK, Tondon RN, Tewari P., *Indian J Physiol Pharmacol* 1983 Jul-Sep;27(3):257-8.