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PHTYOCHEMICAL SCREENING AND PHARMACOLOGICAL EVALUATION OF PODAPATRI (GYMNEMA SYLVESTRE)

[1]Kanuri Lehari Aparana Sriyani, [2]Kesa Harika, [3]Kommala Rupa, [4]Boosavara Naveen Reddy, [5]Korada Jayasri, [6]Kosana Jahnavi, [7]Mahanthi Gayathri, [8]Masa Samuel Raj, Chandaka madhu

[1]Avanthi Institute Of Pharmaceutical Sciences, Cherukupally, Near Tagarapuvalasa Bridge, Vizianagaram – 531162 AP, India.

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Abstract:

In the present study, the anti-inflammatory and analgesic effect of the aqueous extract of gymnema sylvestre whole plant was investigated. The aqueous extracts of gymnema sylvestre whole plant were ingested orally (p.o.) in two different doses, 200 and 400 mg/kg body weight). The anti-inflammatory effect of gymnema sylvestre was tested in: carrageenin-induced paw oedema in wistar albino rats and compared with the standard, diclofenac (10 mg/kg body weight). The analgesic effect was evaluated inSwiss albino mice by Eddy • fs hot plate method and compared with the standard, aspirin (25 mg/kg body weight). The results showed that gymnema sylvestre has significant reduction (p.0.01) in inflammation (200 mg/kg body weight) and (400 mg/kg body weight) as compared to the standard drug, indomethacin,. In assessing analgesic effects, there is a significant (p<0.01) reduction in the paw licking for (400 mg/kg) and diclofenac (10 mg/kg) when compared to control. These results indicate that the extracts could possess analgesic and anti-inflammatory properties. All these effects and the changes in the behavioural activities could besuggested as contributory effects to the use of gymnema sylvestre whole plant in the management of inflammation and painful conditions.

Keywords: *gymnema sylvestre, Anti-inflammatory, Analgesic, Indomethacin,*

Corresponding author:

Chandaka madhu,

Asst.prof, Dept of pharmacology

Email id: pharmamadhuphd@gmail.com

QR code

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INTRODUCTION:

Plants are one of the most important sources of medicines. India is known as the "Emporium of Medicinal plants" due to availability of several thousands of medicinal plants in the different bioclimatic zones anti-inflammatory diseases including rheumatoid arthritis are still one of the main health problems of the world's population1. Severalmodern drugs are used to treat these disorders but, theirprolonged use may cause severe adverse side effects 2, the most common being gastrointestinal bleeding and pepticulcers3. Consequently, there is a need to develop new antiinflammatoryagents with minimum side effects. The use of natural remedies for the treatment of inflammatory andpainful conditions have a long history, starting with Ayurvedic treatment, and extending to the European and other systems of traditional medicines. Plant drugs are knownto play a vital role in management of inflammatory diseases is a moderate size treewith small leaves, which falls earlier on the dry season 4. Leaves of the plant are used intraditional and tribal medicine of Andhra Pradesh to treatpainful inflammatory conditions. A perusal of the literaturerevealed that although of gymnema sylvestre is widely usedin traditional medicine as an anti-inflammatory and analgesicagent5,6,7, these properties have not been scientifically evaluated5.Therefore, the present study is an attempt to investigate the anti-inflammatory and analgesic properties of the aqueous extract of of gymnema sylvestre whole plant in experimental animals8,9.

MATERIALS AND METHODS:

Collection and authentication of plant material:

The plant material i.e Gymnema sylvestre was collected in the month of August 2011 from Wonder Herbals Pvt Ltd, Vanastalipuram, Hyderabad, 500076, Andhra Pradesh. Around 1kg of plant was collected. The plant material was taxonomically identified by Dr S.K Mahmood, Department Of Botony, Nizam University-Hyderabad and a specimen was deposited in their Herbarium against issue of Voucher no: 51236.

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.

Preparation of aqueous extract:

AQUEOUS EXTRACT: The aqueous extract of the plant was prepared using Maceration process. The corse powder of plant (100g) was taken inn a beaker with the water quantity of 1000ml and was Macerated for 72hrs. During the Maceration occasional stirring and warming were carried out.11 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)

Chemicals required:

Carrageenan (1%w/v suspension) , Diclofenac (10 mg/kg-standard dose)

Instruments required: Analgesiometer, Vernier caliper,Heating mantles

Experimental animals:

Wistar albino male rats (150 g) and Swiss albino mice 25-30 g, were grouped and housed in polyacrylic cages (twoanimals per cage) and maintained under standard laboratory conditions (temperature 24-28°C, RH, 60-70% and 12 h lightdark cycles). They were fed commercial rat feed (LiptoIndia Ltd, Mumbai) and boiled water, ad libitum. All experiments involving animals were done according to NIH guidelines, after getting the approval of the institute's animal Ethics committee (No.1330/ac/10/CPCSEA).

Acute toxic studies [10]:

The toxic studies has performed upto the range from 100-2000mg/kg of aqueous extract of podapatri.we have observed that there is no sedation, convulsions&no death.But weight loss is observed.So according WHO guidelines 1/5th &1/10th. of the extract.

1/5th (400mg), 1/10th (200mg)

For Anti-inflammatory activity [13]:

36 Albino rats (Whister 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. 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 over night. 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).

GROUP	DRUG GIVEN
GROUP I	SALINE (Control)
GROUP II	DICLOFENAC (Standard-10mg/kg)
GROUP III	LOW DOSE OF PODAPATRI (200mg/kg)
GROUP IV	HIGH DOSE OF PODAPATRI (400mg/kg)
GROUP V	LOW DOSE +DICLOFENAC
GROUP VI	HIGH DOSE+DICLOFENAC

The %inhibition of inflammation was studied in specified groups with time as follows. Inflammation of paw was measured by Vernier Calipers in cm.

Analgesic activity [14]
(Note: This experiment was conducted after a recovery period of 1 week)

36 Albino rats (Wister 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.Both Diclofenac and podapatri were given orally.Analgesic activity was studied by using Eddy's Hot Plate. The time for paw licking was noted in different groups as given below. The temperature in Eddy's Hot Plate was maintained at 60ºC.

GROUP	DRUG GIVEN
GROUP I	SALINE (Control)
GROUP II	DICLOFENAC (Standard-10mg/kg)
GROUP III	LOW DOSE OF PODAPATRI (200mg/kg)
GROUP IV	HIGH DOSE OF PODAPATRI (400mg/kg)
GROUP V	LOW DOSE +DICLOFENAC
GROUP VI	HIGH DOSE+DICLOFENAC

The analgesic activity with time was tabulated.

RESULTS AND DISCUSSIONS:

Phytochemical Screening11,12
Table:1

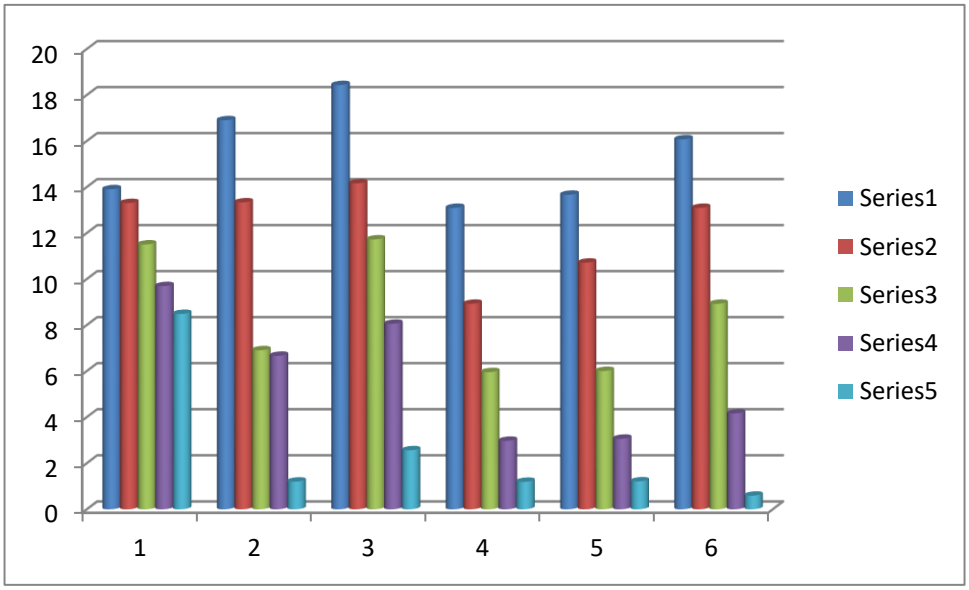
Carbohydrates	**Glycosides**	**alkaloids**	**Proteins**	**phytosteroids**	**Flavoids**	**Tannins**	**Saponins**
+	+	+	+	+	+	-	+

Table 1: Data showing phytochemical screening of aqueous extract of *Gymnema sylvestre*
NOTE: + (Present); - (Absent)

Antiinflammatory activity %inhibition of edema

Hours	GroupI	GroupII	GroupIII	GroupIV	GroupV	GroupVI
0HR	13.9	16.9	18.43	13.09	13.66	16.07
1HR	13.3	13.33	14.16	8.92	10.71	13.09
2HR	11.5	6.9	11.72	5.95	6	8.92
3HR	9.69	6.66	8.05	2.97	3.06	4.16
4HR	8.48	1.2	2.56	1.19	1.21	0.59

Table2: Data showing %inhibition of edema in each group %inhibition of edema



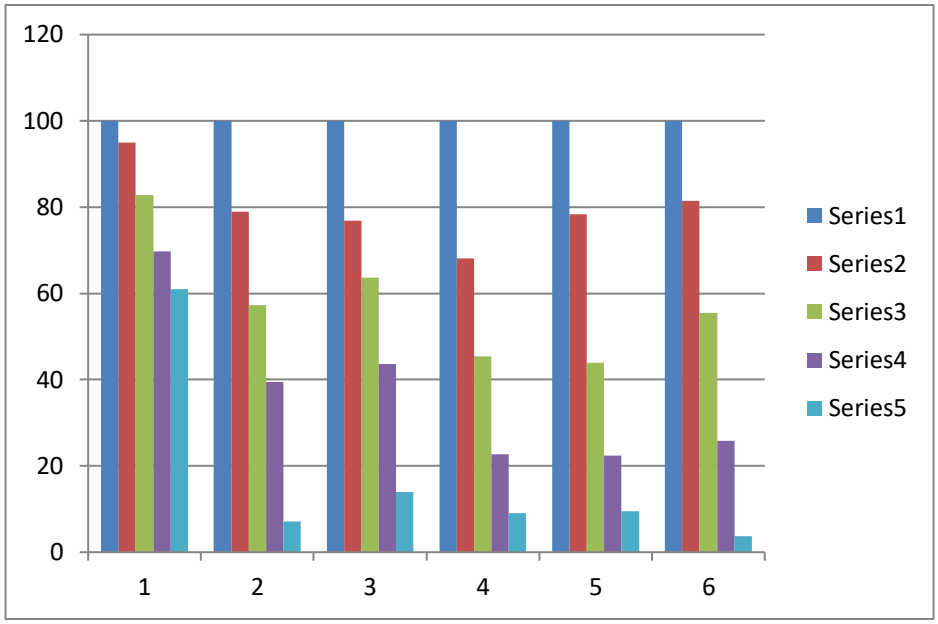
%inhibition Groups Graph 1 Note: Series = Hours

The above graph illustrates that %inhibition of edema was more in groups V and VI, when compared with the other groups. It also infer 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.

Percentile inhibition of Edema

Hours	Group I	Group II	Group III	Group IV	Group V	Group VI
0H	100	100	100	100	100	100
1H	95	78.87	76.83	68.14	78.4	81.45
2H	82.73	57.33	63.59	45.45	43.92	55.5
3H	69.71	39.4	43.67	22.68	22.4	25.88
4H	61	7.15	13.89	9.09	9.45	3.67

Table3:Data showing percentile inhibition of edema. Percentile inhibition of Edema



Percentile Inhibition, Groups **Graph 2 Note: Series = Hours**

The above graph illustrates that %inhibition of edema was more in groups V and VI, when compared with the other groups. It also infer 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.

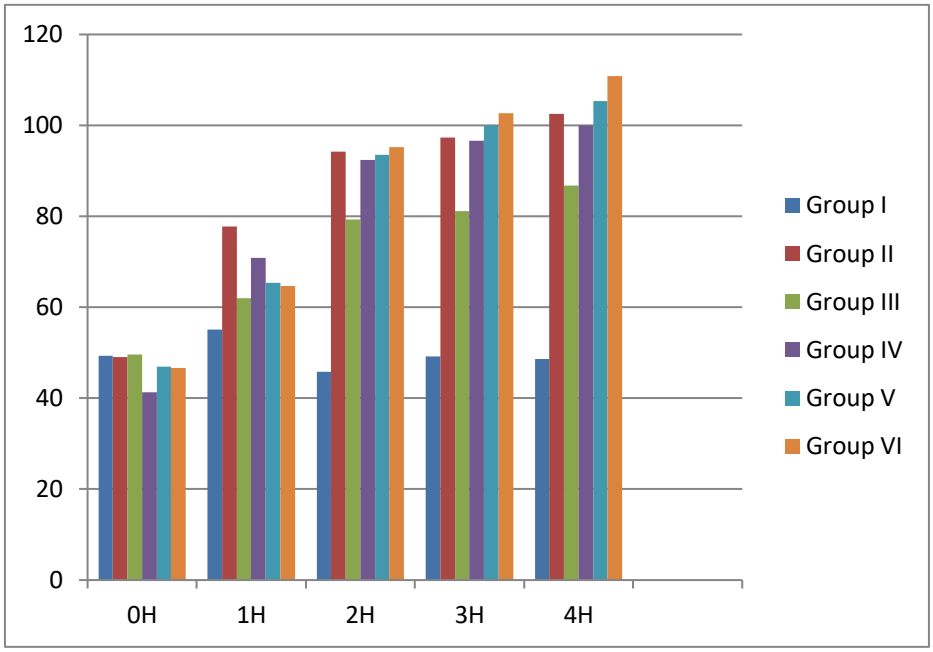
For Analgesic Activity

Hours	Group I	Group II	Group III	Group IV	Group V	Group VI
0H	49.33	49	49.66	41.33	47	46.66
1H	55.16	77.83	62	70.83	65.33	64.66
2H	45.83	94.16	79.33	92.33	93.5	95.1
3H	49.16	97.33	81.16	96.66	100	102.66
4H	48.66	102.5	86.83	100	105.33	110.83

Note: Readings in seconds

Table4:Data showing averages of time taken for paw licking.

Time taken for Paw licking



Paw licking ,Time (sec) Time interval

Graph 3

The above graph illustrates that there is a delay in paw licking in Groups V and VI when compared to other groups which also infer that Podapatri itself also acts as analgesic agent.

CONCLUSION:

A diabetic patient generally reports delayed wound healing. He suffers from prolonged pain and inflammation. Since ages experiments are being conducted to cure Diabetis and to decrease the time period for wound healing simultanuosly.

The phytochemical screening of aqueous extract of *Gymnema sylvestre* showed the presence of Saponins which were considered to be responsible for its pharmacological activity.(Antidiabetic, Antiinflammatory, Analgesic activities). Therefore *Gymnema sylvestre* was considered to possess both anti-inflammatory and analgesic activities.

The literature clearly suggest that *Gymnema sylvestre* has been widely used as antidiabetic . Inorder to evaluate its Antiinflammatory, Analgesic activities, invivo 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 Antiinflammatory, Analgesic activities. The data obtained from Antiinflammatory, Analgesic activities experiments clearly suggested that the anti-inflammatory and analgesic activities of *Gymnema sylvestre* were dose dependent. It lso can be noted that the combination of *Gymnema sylvestre* and Diclofenac had a synergistic effect in curing inflammation and algesia.

Finally our studies concluded that *Gymnema sylvestre* had both Antiinflammatory, Analgesic activities , hence it is worth drug in quick wound healing of diabetic patient.

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