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EVALUATION PHYTOCHEMICAL SCREENING, ANALGESIC AND ANTI-INFLAMMATORY ACTIVITY (SYNERGIC ACTIVITY) OF HYDROALCHOLIC EXTRACT OF COCCONA GRANDIS

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Abstract:

In the present study, the anti-inflammatory and analgesic effect of the hydroalcholic extract of coccinia grandis whole plant was investigated. The hydroalcholic extracts of coccinia grandis whole plant were ingested orally (p.o.) in two different doses, 200 and 400 (mg/kg body weight). The anti-inflammatory effect of coccinia grandis 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 in Swiss albino mice by Eddys hot plate method and compared with the standard, aspirin (25 mg/kg body weight). The results showed that coccinia grandis 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, diclofenac. 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 be suggested as contributory effects to the use of coccinia grandis whole plant in the management of inflammation and painful conditions.

Key words: *coccinia grandis , Anti-inflammatory, Analgesic, Indomethacin,*

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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. Several modern drugs are used to treat these disorders but, their prolonged use may cause severe adverse side effects 2, the most common being gastrointestinal bleeding and pepticulcers3. Consequently, there is a need to develop new anti-inflammatory agents with minimum side effects. The use of natural remedies for the treatment of inflammatory and painful conditions have a long history, starting with Ayurvedic treatment, and extending to the European and other systems of traditional medicines. Plant drugs are known to play a vital role in management of inflammatory diseases is a moderate size tree with small leaves, which falls earlier on the dry season 4. Leaves of the plant are used in traditional and tribal medicine of Andhra Pradesh to treat painful inflammatory conditions. A perusal of the literature revealed that although of *coccinia grandis* is widely used in traditional medicine as an anti-inflammatory and analgesic agent5,6,7, these properties have not been scientifically evaluated5.Therefore, the present study is an attempt to investigate the anti-inflammatory and analgesic properties of the hydroalcholic extract of *coccinia grandis* whole plant in experimental animals [8,9].

MATERIALS AND METHODS:

Collection and authentication of plant material:

The plant material i.e *Coccinia grandis* was collected in the month of August 2013 from Wonder Herbals Pvt Ltd, Vanastalipuram, Hyderabad, 500070, Andhra Pradesh. Around 1kg of fruit was collected. The plant material was taxonomically identified by Dr. B.Prathiba Devi, Department of Botany, OSMANIA University-Hyderabad and a specimen was deposited in their Herbarium against issue of Voucher no: 71238

Preparation of powder:

The plant material of *Coccinia grandis* 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 hydroalcholic extract:

HYDROALCHOLIC EXTRACT: The hydroalcholic extract (70/30 %) of the plant was prepared using Maceration process. The coarse powder of plant (100g) was taken in a beaker with the water and alcohol quantity of 700ml and 300ml 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) The extracted undergone for evaluation of phytochemical screening [11,12].

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) were grouped and housed in polyacrylic cages (six animals per cage) and maintained under standard laboratory conditions (temperature 24-28°C, RH, 60-70% and 12 h light dark 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 hydroalcholic extract of *Coccinia grandis* .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)

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 *Coccinia grandis* for each Rat was calculated. Later after two days inflammation was induced to rats by using Carrageenan as 1% suspension . 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 *Coccinia*

grandis was studied on specified groups as divided below. (*Coccinia grandis* was given orally).

GROUP	DRUG GIVEN
GROUP I	SALINE (Control)
GROUP II	DICLOFENAC (Standard-10mg/kg)
GROUP III	LOW DOSE OF COCCINIA GRANDIS (200mg/kg)
GROUP IV	HIGH DOSE OF COCCINIA GRANDIS (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]:
36 Albino mice (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 25-40mg and as per the weight the standard dose of Diclofenac (10mg/kg) and Coccinia grandis for each Rat was calculated. Both Diclofenac and Coccinia grandis 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 55±0.5ºC.

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

The analgesic activity and anti-inflammatory with time was tabulated.

RESULTS AND DISCUSSIONS:

Phytochemical screening:

Table:1

Carbohydrates	Glycosides	Alkaloids	Proteins	phytosteroids	Flavoids	Tannins	Saponins
+	+	+	+	+	+	+	+

Table 1: Data showing phytochemical screening of hydroalcholic extract of Coccinia *grandis*
NOTE: + (Present) ; - (Absent)

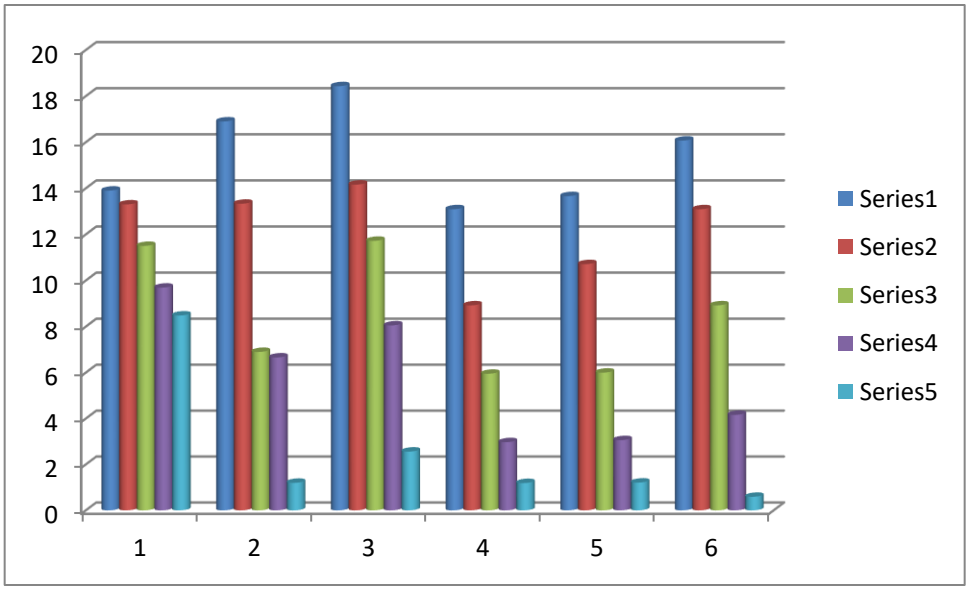
Anti-inflammatory activity:

%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 Graph 1



%inhibition

Groups

Note: Series = Hours

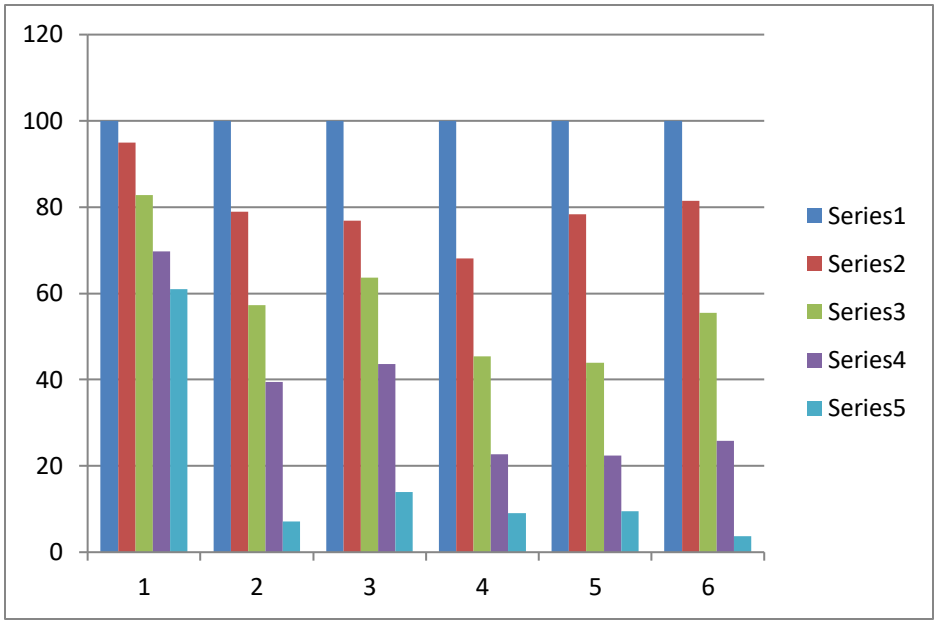
The above graph illustrates that %inhibition of edema was more in groups V and VI, when compared with the other groups. It also infer that Coccinia grandis itself acts as Antiinflammatory agent but not as good as the standard drug (Diclofenac). Coccinia grandis shows synergistic effect when given in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

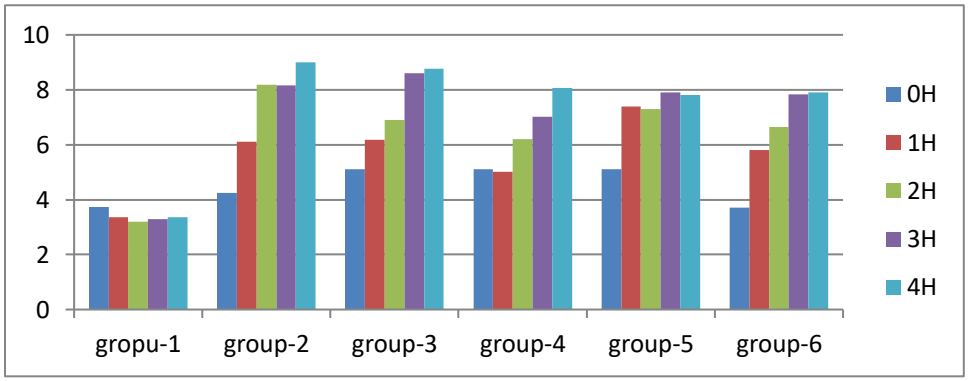
Analgesic activity:

Hours	Group I	Group II	Group III	Group IV	Group V	Group VI
0H	3.74±0.02	4.24±0.01	5.1±0.01	5.1±0.1	5.1±0.02	3.7±0.01
1H	3.36±0.01	6.10±0.02	6.18±0.02	5.02±0.1	7.38±0.03	5.8±0.01
2H	3.2±0.1	8.18±0.01	6.9±0.2	6.2±0.02	7.29±0.01	6.64±0.01
3H	3.28±0.02	8.16±0.03	8.6±0.02	7.03±001	7.9±0.01	7.84±0.01
4H	3.36±0.01	9±0.1	8.77±0.03	8.06±0.01	7.8±0.01	7.9±0.02

Note: Readings in min

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

Time taken for Paw licking Graph 3



Paw licking Time (min)

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 Coccinia grandis 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 hydroalcholic extract of *Coccinia grandis* showed the presence of Saponins which were considered to be responsible for its pharmacological activity.(Antidiabetic, Antiinflammatory, Analgesic activities). Therefore *Coccinia grandis* was considered to possess both anti-inflammatory and analgesic activities.

The literature clearly suggest that *Coccinia grandis* has been widely used as antidiabetic . Inorder to evaluate its Antiinflammatory, Analgesic activities, invivo studies of hydroalcholic extract of *Coccinia grandis* were conducted on rats.

The investigations on *Coccinia grandis 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 Coccinia *grandis were* dose dependent. It lso can be noted that the combination of Coccinia *grandis and* Diclofenac had a synergistic effect in curing inflammation and algesia.

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

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