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Analgesic and Anti Pyretic Activities of Aqueous and Methanol Leaf Extracts of *Pergularia Daemia (Frosk.) Chiov*

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A B S T R A C T

The aim of the project is to evaluate the Analgesic and Anti pyretic activity of methanolic and aqueous extract of *Pergularia daemia*. Progressive increase in the screening and research of medicinal plants with analgesic and antipyretic activity but only few of them only included in health care system after clinical research. So this is the time for systemic study of plant, isolate the active phytoconstituents, investigate their therapeutic, toxic dose and work towards tapping their utility.

Keywords: Pyrexia, Diclofenac, Anti-pyretic, ANOVA test, Yeast induced pyrexia.

A R T I C L E I N F O

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1. Introduction

Since, ancient times nature has been an important source of medicinal agents and a large number of natural products have been identified and developed from natural sources based on their use in traditional medicine [1]. Numerous medicinal plants are of global interest today because of their therapeutic and economic significance. According to World Health Organisation, approximately 80% of world's population currently uses directly as teas, decocts are extracts with easily accessible liquids such as water or milk or alcohol. The use of alternative medicinal therapy has increased the interest of pharmacologist and herbalist over the past decades. Historically, plants have provided a source of inspiration for novel drug, as plant derived medicine [2].

Although, ancient human beings were closely associated with domestic animals, plants found in and around their close dicinity and other plants used for their daily necessities like food, shelter, clothing and medicines, there is no authentic record of the veterinary use of plants in the ancient literature. Therefore, it is difficult to trace the ailments of animals. But, the "Rigveda", which is the oldest describes a lot regarding the close association of human beings with palnts for treatment of their kith and kin (Ayurveda) and their animals (Mrigayurveda) or today's Ethno-Veterinary treatment (EVT). This might be due to decreasing interest of the traditional / herbal healers (Pashu Vaidyas) in the society, less availability of the medicinal plants due to rapid urbanisation and industrialization [3-4]. Active constituents from plant sources directly used as therapeutic agent and phytoconstituents are also served as lead molecule for synthesis of various drugs [5-6].

2. Materials and Methods

Extraction of Plant Material

The leaves of the plant were collected in the month of January and dried in the shade. The shade dried leaves were powdered separately to get coarse powder. About 500g of dried and coarsely powdered leaves was extracted first with methanol and water by continuous hot percolation, using soxhlet apparatus. The extraction was carried out, by using solvents of increasing polarity starting from methanol and water respectively. The extraction was continued for 48 hr. The methanolic extract was filtered and concentrated to a dry mass by using vacuum distillation. A dark green residue was obtained (8g). A dark brownish green residue was obtained (15g). The mark left after the aqueous extract was taken and subsequently extracted with chloroform upto 72h. The extract was then filtered and concentrated to a dry mass [7-8].

Pharmacological Studies

Swiss albino mice weighing about (20-25g) of either sexes were obtained from Venkateswara traders, Banglore and maintained in the animal house. They were properly housed in separate cages and fed with standard diet and water at libitum.

Analgesic activity

Analgesic activity of aqueous and methanol extract of *Pergularia daemia (Forsk.) Chiov* was studied by eddy's hot plate and heat conduction method.

Eddy's hot plate method

Swiss albino mice were divided into 6 groups, each of five animals. Group I was served as control, group II served as standard and were injected Diclofenac sodium (20 mg/kg)I intraperitonially. Group III and IV were treated orally with aqueous extracts of 75 and 125 mg/kg body weight respectively. Group V and VI were treated orally with methanol extract of 75 and 125 mg/kg body weight respectively. The animals were individually placed on the hot plate maintained at 55^{o}C, one hour after their respective treatments[9]. The response time was noted. As the time at which animals reacted to the pain stimulus either by paw licking or jump response, whichever appeared first. The cut off time for the reaction was 15 seconds.

Heat conduction method

The animals were divided into six groups of five animals each. Group I was served as control (received 2% tween 80). Group II served as standard and were injected Diclofenac sodium (20 mg/kg) I intraperitonially. Group III and IV were treated orally with aqueous extracts of 75 and 125 mg/kg body weight respectively. Group V and VI were treated orally with methanol extract of 75 and 125mg/kg body weight respectively. After one hour, the tip of tail was dipped upto 5 cm into hot water maintained at 58^{0}C. The response time was noted as the sudden withdrawal of the tail from the hot water. Cut off time of 10 sec was maintained to avoid damage to the tail for all groups [10]. The time required for flicking of the tail was recorded, to assess response to noxious stimulus.

Yeast induced pyrexia

Screening model for anti-pyretic is yeast induced pyrexia [11-12]. Yeast induced pyrexia was induced by subcutaneous injection of 20 % w/v of brewer's yeast (10ml/kg) in distilled water. Basal rectal temperature was measured before the injection of yeast, by inserting digital clinical thermometer to a depth of 2 cm into the rectum. The rise in rectal temperature was recorded 18 h after yeast injection. Diclofenac 20mg/kg body weight was used as the standard antipyretic drug. Rectal temperature of animals was noted at regular intervals following the respective treatments. The temperature was measured at 1st, 2nd, and 3rd hour after drug administration.

Statistical analysis

All the values were statistically analyzed by one-way analysis of variance (ANOVA) followed by Turkey-Kramer multiple comparison test. Comparison between control and drug treated groups were considered to be significant. All values are expressed as mean + or – SEM.

3. Results and Discussion

Preliminary Phytochemical Analysis

The results of the preliminary phytochemical analysis of aqueous & methanolic extracts were shown in the table No.1. The methanolic and aqueous extract showed the presence of various phytochemical constituents like carbohydrates, phytosterols, saponins, tannins, terpenoids and alkaloids.

Table 1: Analgesic activity of aqueous and methanol leaf extract of *Pergularia daemia (Forsk.) Chiov by Eddy's hot plate method*

S.No	Groups	Response of time (Mean ± S.E.M.)
1	Control	4±0.5780
2	Standard (20mg/kg)	13±0.5774
3	Aq extract (75mg/kg)	7.66±0.3337
4	Aq extract (125 mg/kg)	10.3±0.8851
5	Meth extract (75mg/kg)	9±0.5774
6	Meth extract (125 mg/kg)	11.66±0.3337

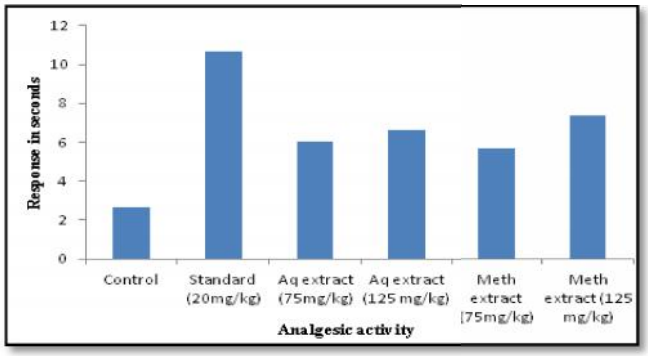

Figure 1: Analgesic activity of aqueous and methanol leaf extract of *Pergularia daemia (Forsk.) Chiov by Eddy's hot plate method*

One-way Analysis of variance ANOVA: p value found to be 0.0001 is considered extremely significant. The data were expressed as mean ± S.E.M.; Tukey Kramer multiple comparison test: p<0.001, p<0.01 (Extracts vs. Control).

Table 2: Analgesic activity of aqueous and methanol leaf extract of *Pergularia daemia (Forsk.) Chiov by hot conduction method*

S.No	Groups	Response of Time (Mean ± S.E.M.)
1	Control	2.66±0.3337
2	Standard (20mg/kg)	10.66±0.2406
3	Aq extract (75mg/kg)	6±1.156
4	Aq extract (125 mg/kg)	6.66±0.3337
5	Meth extract (75mg/kg)	5.66±0.3337
6	Meth extract (125 mg/kg)	7.33±0.4742

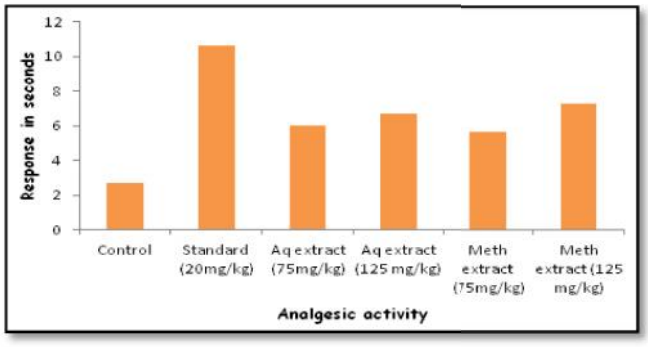

Figure 2: Analgesic activity of aqueous and methanol leaf extract of *Pergularia daemia (Forsk.) Chiov by hot conduction method*

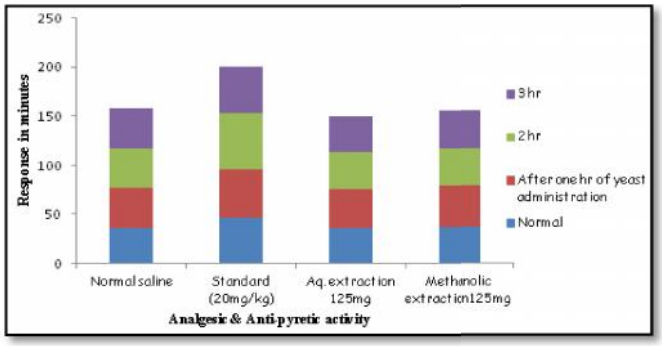

Figure 3: Anti Pyretic Activity of methanol and aqueous extracts of *P.Daemia* on yeaset induced mice

The figure No.3 indicates the antipyretic and analgesic activity in mice, which was induced by yeast. The temperature was noted in time interval before and after pyrexia induction, it results aqueous extract and alcohol extract has great control in temperature. The values are given as mean ± SEM, n=5, p>0.01, p>0.001 using student 't' test.

Discussion

The preliminary phytochemical study revealed the presence of alkaloids, carbohydrates, phytosterols, tannins, flavanoids. Both extracts showed the analgesic activity when compared with control and analysed ANOVA Test. On the basis of these findings, it may be inferred that *Pergularia daemia (Forsk.) Chiov*. is an effective agent for analgesic activity. This study provides evidences for the analgesic activity of *Pergularia daemia (Forsk.) Chiov*. in general, non-steroidal anti-inflammatory drugs produce their antipyretic action through inhibition of prostaglandin synthesis within the hypothalamus. The antipyretic effect of the test drug may be due to the presence of flavonoid compounds, as some flavonoids are predominant inhibitors of cyclooxygenase or lipoxygenase.

4. Conclusion

Herbal drugs are the option of treatment of disease which carries less side-effect and toxicity. Preliminary phytochemical studies revealed that the presence of phytosterols, saponins, tannins, terpinoids and alkaloids teatment with aqueous and methanolic extract of *pergularia daemia* at the doses of 75 mg/kg and 125 mg/kg showed a significant analgesic activity by eddy's hot plate method and heat conduction method. The result of present study indicates the aqueous and methanolic leaf extracts of *pergularia daemia(Forsk) Chiov.* possesses analgesic effect, which is in accordance with its medical use. Analgesic effect of the extracts was demonstrated in the experimental models using Eddy's hot plate and Heat conduction method using thermal stimuli, an increase in reaction time is generally considered an important parameter of analgesic activity. *Pergularia daemia* shown significant result for antipyretic activity in milk induced pyrexia method. The methanol and aqueous extracts of dose 125mg/kg easily combats the pyrexia further research on antipyretic activity of *P.daemia* may be helpful in treatment of fever with less side effect and toxicity. Thus by above results we conclude that *Pergularia daemia* has analgesic and antipyretic activity which partly contributes ethnomedical use.

5. References

[1] Bhaskar HV, Balakrishnan N. Analgesic,anti-inflammatory and antipyretic activities of Pergularia daemia and Carissa carandas India.Int.J. Health Res., 2009, 2: 123-128.

[2] Bhaskar, H.V. and N. Balakrishnan. *In-vitro* antioxidant property of laticiferous plant species from western ghats Tamilnadu, India. Int. J. Health Res., 2009, 2: 163-170.

[3] Dhar ML, Dhar MN, Dhawan BN, Mehrotra BN, Srimal RC, Tandon JS.Screening of Indian plants for biological activity.Part IV. Indian J Exp Biol., 1993; 11: 43-54.
[4] Eddy NB, Leimbach DJ. Synthetic analgesics: II Dithienyl butenyl and Dithienyl butylamines (Retracted by Turner RA. Screening methods in PharmacologyI, 1 ed .New York. London Academic Press 1965; 105-109.
[5] Hajare SW, Chandra S, Tondon SK, Sharma J, Lal J,Telang AG. Analgesic and antipyretic activities of Delbergia sissoo leaves. Indian J pharmacal., 2000; 357-60.
[6] Mian-Ying W,Brett JW,Jensen CJ,Nowicki D,Chen S,Palu AK,Anderson G: Morinda citrifolia (Noni) A literature review and recent advances in Noni research. Acta Pharmacological Sinica, 2002: 23; 1127-1141.
[7] Qureshi S, Rai MK, Agarwal SC. *In-vitro* evaluation of inhibitory nature of extracts of 18-plant species of Chhindwara against 3-keratinophilic fungi. Hindustan Antibiot. Bull., 1997, 39: 56-60.
[8] Jalalpure SS. insecticide activity against Periplaneta Americana, Blatella germanicsa and Ancopeltus fasciatus, Indian Journal of Pharmaceutics Sciences, 1990, 64(5), 493-495.
[9] Shah BS,Nayak BS, Seth AK,Jalalpure SS, Patel KN,Patel MA, Mishra AD: Search for medicinal plants as a source of anti-inflammatory and anti-arthritic agents-a review. Pharmacognosy Magazine 2006;2:77-86.
[10] Singh A,Malhotra S, Subban,R:Anti-inflammatory and analgesic agents from Indian medicinal plants.International Journal of Integrative Biology 2008;3:57-72.
[11] Suresh Kumar, S.V. and S.H. Mishra, 2007.Hepatoprotective activity of extracts from Pergularia daemia (Forsk.)aganist carbon tetrachloride-induced toxicity in rats. Pharmacog Magazine, 3:187-191.
[12] Suresh Kumar, S.V and S.H.Mishra, 2008. In-vitro evaluation of hepatoprotective activity of Pergularia daemia Forsk. Pharmacog Magazine, 4: 298-302.