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IN VIVO SCREENING OF *CORALLOCARPUS EPIGAEUS* TUBER FOR ITS ANALGESIC, ANTI-PYRETIC AND ANTI-INFLAMMATORY ACTIVITIES

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ABSTRACT

Previous phytochemical analysis of methanolic extract of *Corallocarpus epigaeus* tuber (MCET) has indicated the presence of steroids, flavonoids, glycosides and terpenoid types of compounds. Since these compounds are of pharmacological interest, coupled with the use of this plant in traditional medicine, prompted us to check *Corallocarpus epigaeus* tubers for possible analgesic anti-inflammatory and anti-pyretic activities. The analgesic activity of MCET was studied using tail immersion method in mice. While the efficacy of the MCET (150 and 300mg/kg.p.o) was compared with pentazocaine 30 mg/kg. MCET recorded 79.88 % inhibition with the highest dose and 81.21% with pentazocaine. The antipyretic activity of MCET was studied in Brewer's yeast-induced pyrexia in rats. MEBG showed more significant activity. MCET were also subjected to evaluate anti-inflammatory activity by carrageenan induced rat paw edema. Indomethacin (100mg/kg) was taken as standard drug. MCET produced dose-dependent of oedema, which was comparable to Indomethacin and found to be 48.32% and 42.32 % inhibition in carrageenan induced rat paw edema model. Findings from the present study showed MCET to possess central and peripheral analgesic activity, anti-inflammatory property similar to steroidal and non-steroidal agents as well as antipyretic effect.

Key words: *Corallocarpus epigaeus* tubers, Analgesic, Anti-inflammatory, Anti-pyretic activity.

INTRODUCTION

Corallocarpus epigaeus Rottl (Cucurbitaceae) is a prostrate or climbing monoecious plant found in tropical and temperate regions of India , Ceylon , Deccan and South Maratha country .The plant is Indigenously known as 'Akasgaddah' in Hindi and 'Akashagarudan' in Tamil (Kirtikar and Basu, 1935). The plant is reported to contain a sesquiterpene lactone-corallocarpenoyl ester and an aliphatic C32 keto diol (Kirtikar and Basu, 1996). The roots and rhizomes are especially useful in syphilitic cases, old venereal complaints, and chronic dysentery (Nadkarni, 1982). It is also an effective remedy for rheumatism and snake bite. Decoction of the tuber has given benefit in cases of chronic mucous enteritis and also anthelmintic (Ali and Gupta, 1996). In spite the numerous uses and pharmacological activity attributed of *Corallocarpus epigaeus* tubers but no pharmacological information regarding the tubers of this plant. Hence, the present investigation is an attempt in this direction and includes evaluation of analgesic and anti-pyretic activity of methanolic extract.

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MATERIALS AND METHODS

Collection and authentication of plant material

The fresh *Corallocarpus epigaeus* tubers were collected in the fields near Kakinada and authenticated by Taxonomist and the voucher specimen was kept for future use.

Extraction of plant drug

The collected tubers were washed, shade dried and converted into moderately coarse powder by mechanical grinder. The powdered material was extracted with methanol by using soxhlet apparatus. The solvent was removed under reduced pressure which yields respective extracts in the form of semisolid mass.

Animals

The study was conducted on male Wister rats (175-200gm) housed in polypropylene cages under standard conditions of temperature (22 ± 2°C), relative humidity (60 ± 5%) and light (12h light/dark cycle) were used. They were fed with standard diet and water. The food was withdrawn 18 hours before the experiment but allowed free access of water. All animal experiments were carried out in accordance with the guidelines of CPCSEA. The experimental protocol is duly approved by the institutional ethical committee.

Acute oral toxicity studies

Acute toxicity was carried out according to Organization of Economic Co-Operation and Development (OECD) no 425 guidelines[8] and LD_{50} values was estimated to be >5000mg/kg. Based on the results obtained from this study, the doses of further pharmacological studies were fixed to be 150 and 300mg/kg (Anonymous, 2001).

ANALGESIC ACTIVITY

Tail immersion method (Hasan *et al*., 2009)

Mice were divided into four groups each consisting of six mice. The treatment regimen was as follows:

Group I (Control): Vehicle (2ml/kg, p.o), 1% suspension of tween-80.
Group II (Standard): Pentazocaine (30mg/kg, p.o)
Group III (Test 1): MCET (150mg/kg, p.o)
Group IV (Test 1): MCET (300mg/kg, p.o)

The distal part of the tails of the animals was immersed in hot water maintained at 55ºC. The time taken to with drawl the tail was noted as the reaction time. A cut-off time of 10s was maintained at 55ºC to prevent tissue damage. The reaction time was checked at 0, 15, 30, 45 and 60 min respectively after treatment.

Antipyretic activity

Yeast induced pyrexia method (Ghule *et al*., 2007)

Rats were divided into four groups each consisting of six Rats. The treatment regimen was as follows:

Group I (Control): Vehicle (2ml/kg, p.o), 1% suspension of tween-80.
Group II (Standard): Paracetamol (20mg/kg, p.o)
Group III (Test 1): MCET (150mg/kg, p.o)
Group IV (Test 2): MCET (300mg/kg, p.o)

The test was performed in rats by injecting 10ml/kg, s.c, of the 10% aqueous solution of brewer's yeast to induce pyrexia. The rectal temperature of each animal was taken before and 24hr after the yeast injection using a digital clinical thermometer. Animals did not show a minimum increase of 0.7C in the temperature 24h after the yeast injection was discarded. The rectal temperature of each animal was given recorded at 0, 1, 2, 3, 4,5hr after treatment.

Anti-inflammatory activity

Carrageenan induced rat paw edema (Aiyelero *et al*., 2009)

Rats were divided into four groups each consisting of six Rats. The treatment regimen was as follows:

Group I (Control): Vehicle (2ml/kg, p.o), 1% suspension of tween-80.
Group II (Standard): Indomethacin (20mg/kg, p.o)
Group III (Test 1): MCET (150mg/kg, p.o)
Group IV (Test 2): MCET (300mg/kg, p.o)

The drugs were given orally. After one hour, a sub plantar injection of 0.1ml of 1% carrageenan was administered in the right hind paw to all the three groups. The paw volume was measured plethysmographically at 0 min, 60 min, 120 min and 180 min. The average paw of swelling in a group of extract treated rats was compared with control group (treated with vehicle) and the positive control (Indomethacin).

Statistical analysis

The result were express as Mean ± SEM. Statistical analysis was carried out using one way ANOVA followed by Student-t test.

RESULTS AND DISCUSSION

The results obtained showed that the methanolic extracts possess a significant analgesic effect on tail immersion model. The results were tabulated in table 1. This suggests that the analgesic effect of the extract may be peripherally mediated and it might be centrally acting. The methanolic extract caused a better hypothermal activity against yeast-induced pyrexia in rats. The subcutaneous injection of yeast induces pyrexia by increasing the synthesis of prostaglandin and is used to screen agents for an antipyretic effect. The results were tabulated in table 2.

Carrageenan induced paw edema was taken as prototype of exudation phase of inflammation where development of edema being described as biphasic. The initial phase which occurs between 0 and 2h after injection of carrageenan has been attributed to release of histamine, serotonin and bradykinin. Inflammation volume reaches its maximum approximately 3h post treatment after which it begins to decline. A more second

Table 1. Analgesic activity of MCET by tail immersion model in mice

Group	Treatment	Reaction time (S)	Latency (%)
I	Control (2ml/kg, p.o)	2.81±0.42	--
II	Standard (Pentazocaine:30mg/kg, p.o)	4.91±0.21	81.21
III	MCET (150mg/kg, p.o)	3.01±0.51	49.34
IV	MCET (300mg/kg, p.o)	4.7±0.42	79.88

Table 2. Anti-pyretic activity of MCET in yeast induced pyrexia in rats

Group	Dose (mg/kg)	Rectal Temperature in °C at time (hr)						
		18 hr after yeast injection	0	1	2	3	4	5
Control	2 ml/kg (p.o)	37.2±0.02	37.1±0.02	36.7±0.04	36.4±0.02	36.0±0.01	35.8±0.03	35.4±0.02
Paracetamol	20 (mg/kg.p.o)	37.1±0.02	36.8±0.08	36.5±0.01	36.2±0.07	36.0±0.03	35.5±0.06	35.0±0.01
MCET	150 (mg/kg.p.o)	37.5±0.03	37.5±0.08	37.1±0.05	36.7±0.07	36.5±0.04	36.2±0.06	36.1±0.04
	300 (mg/kg.p.o)	37.3±0.02	73.0±0.01	36.6±0.08	36.1±0.03	35.9±0.06	35.3±0.01	35.1±0.02

Table 3. Anti-inflammatory effect of MCET in carrageenan induced paw edema in rats

Groups	Treatment	% Increase in paw volume				% inhibition in paw volume
		0	60	120	180	
I	Control (2ml/kg, p.o)	29.41±1.21	65.32±1.31	95.24±1.42	102.24±2.1	--
II	Standard (Indomethacin 20mg/kg, p.o)	28.21±1.71	55.22±3.1	74.31±0.31	56.21±1.2	42.32
III	MCET (150mg/kg, p.o)	25.42±0.62	44.21±2.3	65.32±0.21	49.23±2.1	60.23
IV	MCET (300mg/kg, p.o)	27.31±2.12	53.21±2.1	71.11±0.21	54.31±1.2	48.32

Values are expressed as Mean± S.E., n=6 by students't' test

phase is related to release of prostaglandin like substances. The knowledge of these mediators involved in different phases is important for interpreting mode of drug action. The carrageenan induced paw edema model in rats is known to be sensitive to cyclooxygenase inhibitors. Based on this report it was concluded that the inhibitory effect of MCET on carrageenan induced inflammation in rats could be due to inhibition of the enzyme cyclooxygenase leading to inhibition of prostaglandin synthesis. Pre-treatment of rats with the extract (50-200 mg/kg) significantly inhibited the paw oedema induced by carrageenan when compared with the control group and 300 mg/kg produced a better efficacy comparable to Indomethacin-treated group. The results were tabulated in table 3.

CONCLUSION

Hence the present study concluded that methanolic extract of *Corallocarpus epigaeus* tubers possess analgesic, pyrexia and inflammatory activities may be due to the presence of flavonoids.

REFERENCE

Aiyelero OM, Ibrahim ZG and Yaro AH. Analgesic and anti-inflammatory properties of the methanol leaf extract of *Ficus ingens* (moraceae) in rodents. *Nig Journ Pharm Sci*. 8(2), 2009, 79-86.

Ali M, Gupta J. *Journal of Medicinal and Aromatic plant sciences*. 18(4), 1996, 791-794.

Anonymous. Organization for economic Co-operation and development Guidance Document on Acute toxicity testing. Environment Directorate, OECD. Peris: 2001, 1-24.

Ghule BV, Murugananthan G, Yeole PG. Analgesic and Antipyretic effects of Capparis Zeylanica leaves. *Fitoterapia*. 78, 2007, 365-9.

Hasan SMR, Jamila M, Majumder M, Akter, Hossain M, Mazumder M, Alam M, Jahangir, Rana and Rahman M. Analgesic and antioxidant activity of the Hydro methanolic extract of *Mikania scandens* Willid leaves. *Am J Pharm Tox*. 4, 2009, 1-7.

Kirtikar KR and Basu BD. Indian Medicinal Plants, Vol IV, Reprinted Edn, Lalit Mohan Basu Allahabad, 1996, 1664.

Kirtikar, KR and Basu BD. Indian Medicinal Plants, Vol II, 2nd Edn, Lalit Mohan Basu Allahabad, 1935, 1166.

Nadkarni KM, The Indian Materia Medica, Vol I, Popular Prakashan, Bombay, 1982, 377.