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# Analgesic and anti-inflammatory effect of different extracts of *Ocimum canum*

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## ABSTRACT

The term analgesic derived from the Greek word algesia- means pain, is an ill defined unpleasant sensation, usually evoked by an external or internal noxious stimulus. Anti inflammatory are the agents that reduce the inflammation by inhibiting prostaglandin synthesis at the site of injury. Inflammation is the result of concerted participation of a large number of vasoactive, chemotactic and proliferative factors at different stages. Though different type of analgesics and anti-inflammatory drugs are available for treatment there is increasing demand by patients to use the natural products with analgesic and anti-inflammatory activity. Synthetic drugs cannot be used orally or parentrally continuously because of their side effect and toxicity. So the present work has been undertaken to study the effect of whole plant extract on experimental animal models of pain and inflammation. Ocimum canum (Lamiaceae), a native of Indian subcontinent is a highly esteemed tree for the treatment of different ailments as antibacterial, expectorant, carminative and stimulant. Dried leaf powders are used for cough, cold, joint pains and wound healing. Other uses include burning during micturation and engorgement in the mammary gland.

**Keywords**: Ocimum canum, Tail immersion, Hot plate, Tail flick, Writhing, Hind Paw Edema.

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## INTRODUCTION

Pain is the unpleasant and aversive feeling common to such experiences as a stubbed toe, a headache, a burnt finger, and salt in a wound. Typically, pain is characterized by its intensity, location and duration [1], [2]. It is initiated by stimulation of nociceptors in the peripheral nervous system, or by damage to or malfunction of the peripheral or central nervous systems. Pain is broadly classified as acute or chronic [3], [4]. The drugs that relieve pain due to multiple causes, at multiple sites are called Analgesics. Analgesics are classified as [5].

1. Narcotics, which act on CNS and cause drowsiness and sleep e, g.opioids.

2. Non-narcotics, which basically act on peripheral parts of body and do not produce sleeping effect. The non steroidal anti-inflammatory drugs fall in this group.

Inflammation (Latin, inflammation, a setting on fire) is 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 as well as initiate the healing process for the tissue. Inflammation can be classified as either acute or chronic. The anti-inflammatory drugs are classified as Salicylic acid derivatives, Para aminophenol derivatives, Indole and Indene acetic acids, Hetero aryl acetic acids, Aryl propionic acids, Anthranilic acids (Fenamates), Enolic acid, Alkanones and Cox2 inhibitors [7].

Drugs used in therapy are derived either from natural or synthetic sources. Natural ones are from plants, animals or minerals. Synthetic substances owe their origin due to advancement in modern organic chemistry, and can be synthesized in laboratory. Synthetic drugs are used widely now a day as mentioned above, even then more and more researches are going on herbal drugs as because synthetic drugs have more side effects, just to avoid those side effects herbal drug researches are going on more and more. Since time immemorial man is in search of remedies for pain and inflammation. Pain and inflammation are the commonest of symptoms that men suffer and analgesics and anti-inflammatory drugs are commonly used.

So the present work has been undertaken to study the effect of whole plant extract of Ocimum canum on experimental animal models of pain and inflammation.

## MATERIALS AND METHODS

### Plants:

Plants were collected in the month of October 2009 from its natural habitat from nearby Mohuda village, Berhampur, Ganjam district of Orissa. It was identified /authenticated by taxonomist Prof. S. K. Das (H.O.D. P.G. Department of Biosciences, Mohuda). A voucher specimen of the collected sample was deposited in our institutional herbarium for the

reference. The plant was cleaned and air dried at room temperature for 3 weeks to get consistent weight. The dried plants were later ground to powder. They were mechanically powered and sieved through sieve no-10. About 500 gm of powder was subjected to successive soxhlation using different solvent according to their polarity. Solvents used were petroleum ether, methanol and water. The extracts were dried and powdered. The extracts were subjected to phytochemical study as well as pharmacological activity.

**Animals:**

After necessary approval from Institutional animal ethics committee (IAEC) of Royal college of Pharmacy and Health Sciences, Berhampur (RCPHS), the work was undertaken during October-2009 to May-2010.

Sixty numbers of healthy albino rats weighing between 150-200 grams and 78 numbers of Swiss mice weighing between 25-30 grams, of either sex, were selected for the study and obtained from animal house facility of RCPHS, Berhampur. These animals were kept in the P.G.laboratory of Department of pharmacology, RCPHS, Berhampur. All the animals were housed in polypropylene cages with husk bedding and maintained at room temperature and relative humidity with a 12:12 light: dark cycle. The animals were fed with standard diet recommended by ICMR and water ad. libitum.

**Chemicals**

For phytochemical study, the required chemicals procured from college chemical store supplied by Himedia and Loba chemicals. For analgesic study Diclofenac sodium, brand name Voveran (Mfgd, by NOVARTIS), Pentazocine, brand name Fortwin (Mfgd, by Ranbaxy) and acetic acid from Loba chemicals purchased from Noble enterprises, Berhampur. For anti-inflammatory study indomethacin brand name Indocid (Mfgd, by Cipla), Carrageenan from Himedia and Freund's adjuvant from Ge-Nei Bangalore.

**Phytochemical Screening** [8-9]

Phytochemical screenings were performed by using standard procedures [Table-1].

**Evaluation of Analgesic Activity**:

**Tail immersion method** [10-11]

In present study analgesia was assessed according to the method of Luiz et al. Total of 30 mice divided in the groups of five each, and six groups were made .One group was given only distilled water and observed as a control. The second group was given pentazocine and treated as standard. Other 4 groups were given test drugs i.e. AEOC and MEOC of 200 & 400 mg/kg respectively. All the drugs administered through p.o. route. They were held in position in a suitable restrainer with the tail extending out. 3-4 cm area of the tail was marked and

immersed in the water bath thermo-statistically maintained at 51°±5ºC. The withdrawal time of the tail from hot water (in seconds) was noted as the reaction time or tail flick latency. The maximum cutoff time for immersion was 15 seconds to avoid the injury of the tissues of tail. The initial reading was taken immediately before administration of test and standard drugs and then 30, 60, 90, 120, 180and 240 minutes after the administration. The criterion for analgesia was post drug latency which was greater than two times the pre-drug average latency as reported by Janssen et al. Tail flick latency difference or mean increase in latency after drug administration was used to indicate the analgesia produced by test and standard drugs.[Table-2],[Figure-1].

**Hot plate method** [12-13]

Analgesic activity was tested in mice using the hot plate method of Janssen and Jagneau (1957). 30 numbers of mice were divided in to six groups (n=5).One group was given only distilled water and observed as a control. The second group was given pentazocine and treated as standard. Other 4 groups were given test drugs i.e. AEOC 200 & 400 mg/kg and MEOC 200 & 400 mg/kg. Swiss mice were placed in aluminum hot plate kept at a temperature of 55 ± 0.5 degree centigrade for a maximum time of 15 seconds. Reaction time was recorded when animals licked their paws or jumped. The responses were taken at different time interval i.e. 0,30,60,90,120,180 & 240 minutes after oral administration of methanolic and aqueous extracts with dose of 200 and 400 mg/kg respectively. Acetyl salicylic acid 100 mg/kg was used as a reference drug. Cut off time in the absence of a response was 15 sec to prevent the animals from being burnt (Sharma et al., 1982) [Table-3], [Figure-2].

**Tail flick method** [14-15]

The pre screened animals were divided in to 6 groups. Total of 30 rats divided in the groups of five each, and six groups were made .One group was given only distilled water and observed as a control. The second group was given pentazocine and treated as standard. Other 4 groups were given test drugs i.e. AEOC 200&400 mg/kg and MEOC 200 & 400 mg/kg Diclofenac sodium was taken as standard drug. All the drugs were given intraperitonially. The tail flick latency was assessed by analgesiometer (INCO, INDIA).The strength of the current passing through the naked nichrome wire was kept constant at 6 amperes. The distance between the heat source and tail skin was 1.5 c.m. The site of application of the radiant heat in the tail was maintained at2.5c.m.measured from the root of the tail. The cutoff reaction time was fixed at 10 seconds to avoid tissue damage [Table-4], [Figure-3].

**Acetic acid writhing test** [16]

Antinoociceptive response of the extract Ocimum canum ( 200 and 400 mg/kg) was assessed by counting number of writhes (constriction of abdomen, turning of trunk and extension of hind legs) induced by 1% acetic acid solution (1mL:100 g) in mice . Number of writhes per animal was counted during 30 min test period, beginning 3 min after the injection of acetic acid. Acetyl salicylic acid 100 mg/kg body weight was used as a reference drug. Total

of 30 mice divided in the groups of five each, and six groups were made .One group was given only distilled water and observed as a control. The second group was given Diclofenac and treated as standard. Other 4 groups were given test drugs i.e. AEOC 200 & 400 mg/kg and MEOC 200 & 400 mg/kg [Table-5],[Figure-4], [FIGURE-4.1], [FIGURE-4.2].

**Evaluation of anti-inflammatory activity**:-

**Carrageenan induced hind paw edema** [17]

Edema was induced by sub-planter injection of 0.1 ml of 1 % freshly prepared suspension of carrageenan into the right hind paws of the rats of all groups. The volume of the injected paws and contra-lateral paws were measured at 0, 30, 60, 120,180 & 240 minutes intervals using Plethysmometer. The Ocimum canum ( 200 and 400 mg/kg) extracts was administered to three groups of animal and remaining two groups of animals received distilled water.(Control 10 ml/kg) and indomethacin 5 mg/kg as standard drug respectively[Table-6],[Table-6.1], [Table-6.2] and [Figure-5].

The percentage inhibition of inflammatory edema in test and standard animal was by the formula described by Newbould (1963).

$$I=100[1-(a-x)/(b-y)]$$

I=% inhibition
a=mean right hind paw volume of test/standard after carrageenan administration
b= mean right hind paw volume of control after carrageenan administration
x= mean right hind paw volume of test/standard before carrageenan administration
y= mean right hind paw volume of control before carrageenan administration.

**Freund's adjuvant induced arthritis** [18]

Arthritis like condition is induced by CFA (complete Freund's adjuvant) in the rat foot. Group of pathogen free rats weighing approximately 200 grams were used. All the animals were induced chronic inflammation by injecting complete Freund's adjuvant, 0.05 ml s.c. on the plantar region by means of 20 number needle. Freund's adjuvant is a mixture of dead micro bacteria in liquid paraffin and a variety of acid fast bacilli produced arthritis like syndrome. Total of 30 rats divided in the groups of five each, and six groups were made .One group was given only distilled water and observed as a control. The second group was given indomethacin and treated as standard. Other 4 groups were given test drugs i.e. AEOC 200 & 400 mg/kg and MEOC 200 & 400 mg/kg [Table-7], [Table-7.1],[Figure-6] and [Figure-6.1].

Different extracts, standard drugs and distilled water were administrated in respective group of animals until twenty day. The severity of secondary lesions, such as swelling of the left hind foot, of the fore paws, of the ears and of the tail, is estimated as nil, mild, moderate and severe.

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$$I=1oo\ [1-(a-x)/\ (b-y)]$$

I=% inhibition
a=mean right hind paw volume of test/standard after adjuvant administration
b= mean right hind paw volume of control after adjuvant administration
x= mean right hind paw volume of test/standard before adjuvant administration
y=mean right hind paw volume of control before adjuvant administration

**Statistical analysis:**

Data are expressed as mean ± SEM (standard error of mean) for five animals. The difference among means has been analyzed by student- t test. Differences were considered statistically significant at the value of probability less than 5% ($p<0.05$).

## RESULTS AND DISCUSSION

### Phytochemical Study

The [Table-1] shows that flavones and flavonoids are mostly present in methanolic as well as aqueous extract but this particular constituent is absent in petroleum ether extract. As flavones and flavonoids are responsible for antioxidant, analgesic and anti inflammatory activity, further in-vivo study was carried out with methanolic and aqueous extract.

**TABLE 1: Result of Phytochemical Study**

| SL NO. | PHYTOCONSTITUENTS | PET.ETHER | METHANOL | AQUEOUS |
|---|---|---|---|---|
| 1 | Alkaloid | + - - - | + ++ - | + + + - |
| 2 | Carbohydrate | - + + | - - + | - - + |
| 3 | Glycoside | + - | + + | + + |
| 4 | Tannins | - | + - - | + + |
| 5 | Protein & Amino acid | + + + | - - - | - - - |
| 6 | Gum and Mucilage | + + - | - - - | + + + |
| 7 | Flavones & Flavonoids | - - | + + | + + |
| 8 | Saponins | - | + | + |
| 9 | Steroids & Sterols | + | + | + |
| 10 | Triterpenoids | - | + | + |

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## Tail Immersion Method

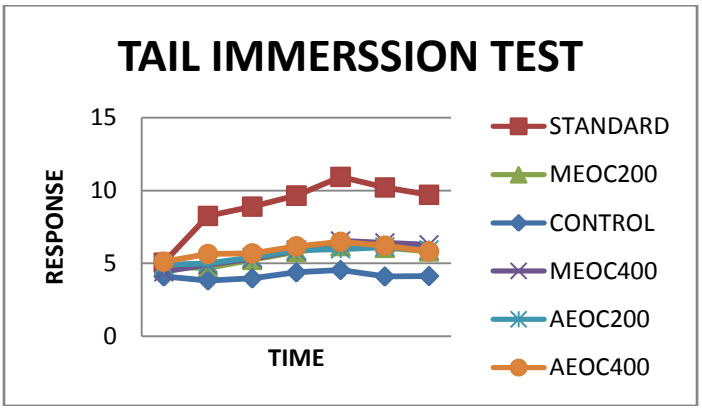
As per the [Table-2] and [Figure-1] there is no change in latency period with distill water treated group. The Pentazocine group showed significant effect as compared to distilled water treated group, also the different extracts of Ocimum canum have significant effects when compared with distilled water treated group.

| Drugs | Dose (mg/ kg) | Mean Basal Time (Seconds) | Mean Response at Various Time Interval (in minutes) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 30 | 60 | 90 | 120 | 180 | 240 |
| Distilled Water | 0.5ml | 4.09± 0.127 | 4.02± 0.195 | 3.96± 0.103 | 4.37± 0.143 | 4.53± 0.129 | 4.09± 0.071 | 4.12± 0.063 |
| Pentazocine | 10 | 5.05± 0.132 | 8.25± 0.068* | 8.89± 0.09* | 9.65± 0.068* | 10.93± 0.034* | 10.21± 0.077* | 9.71± 0.096* |
| MEOC | 200 | 4.76± 0.072 | 4.68± 0.040 | 5.24± 0.048 | 5.79± 0.06 | 6.19± 0.065* | 6.07± 0.046 | 5.82± 0.0628* |
| MEOC | 400 | 4.42± 0.028 | 4.91± 0.033 | 5.31± 0.051* | 5.86± 0.035 | 6.53± 0.057 | 6.39± 0.041 | 6.27± 0.039* |
| AEOC | 200 | 4.894± 0.05 | 5.01± 0.031 | 5.39± 0.027 | 5.91± 0.045* | 5.98± 0.036 | 6.11± 0.047 | 5.92± 0.031 |
| AEOC | 400 | 5.11± 0.032 | 5.63± 0.023 | 5.68± 0.036 | 6.16± 0.038 | 6.47± 0.027 | 6.21± 0.042 | 5.82± 0.045* |

Value are mean ± SEM. Unpaired‘t’ test in reference to Group-1 (control group),
* indicates $p < 0.05$; n = 5 in each group; df =8

**TABLE-2: Mean Response of Tail immersion method at Various Time Interval**

**FIGURE-1**



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**Hot plate method:-**

**Mean Response of Hot plate method at Various Time Interval**

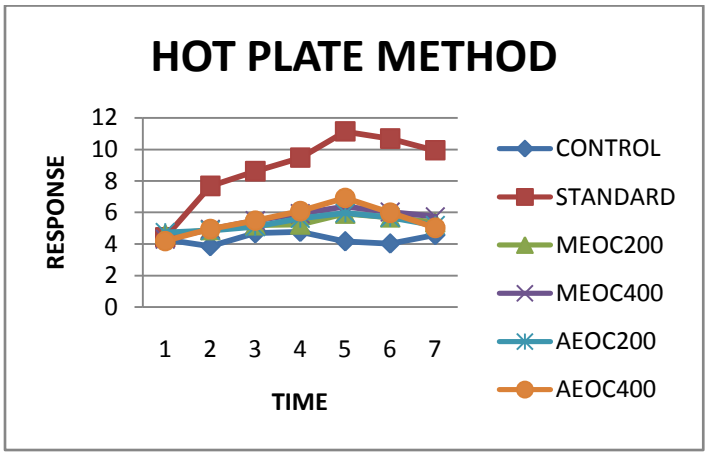
The table [Table-3] and [Figure-2] shows Pentazocine group have significant effect as compared to distilled water treated group, where as the different extracts of Ocimum canum also have significant effects when compared with distilled water treated group, but insignificant to standard one.

**TABLE- 3: Mean Response of Hot plate method at Various Time Interval**

| Drugs | Dose (mg/kg) | Mean Basal Time (Seconds) | Mean Response at Various Time Interval (in minutes) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 30 | 60 | 90 | 120 | 180 | 240 |
| **Distilled Water** | **0.5** | 4.29± 0.019 | 4.16± 0.186 | 4.68± 0.028 | 4.77± 0.041 | 4.17± 0.035 | 4.03± 0.047 | 4.57± 0.035 |
| **Pentazocine** | 10 | 4.43± 0.037 | 7.68± 0.042* | 8.61± 0.025* | 9.47± 0.047* | 11.13± 0.038* | 10.68± 0.038* | 9.94± 0.041* |
| **MEOC** | 200 | 4.62± 0.037 | 4.87± 0.031 | 5.18± 0.035* | 5.23± 0.044* | 5.92± 0.046 | 5.68± 0.042* | 5.37± 0.020 |
| **MEOC** | 400 | 4.31± 0.038 | 4.93± 0.028 | 5.48± 0.025* | 5.92± 0.052* | 6.37± 0.024 | 6.03± 0.020 | 5.73± 0.027 |
| **AEOC** | 200 | 4.73± 0.024 | 4.86± 0.038 | 5.09± 0.043* | 5.62± 0.029 | 5.97± 0.034 | 5.69± 0.038* | 5.18± 0.032* |
| **AEOC** | 400 | 4.19± 0.037 | 4.95± 0.057 | 5.48± 0.027* | 6.08± 0.040* | 6.92± 0.020 | 5.98± 0.031 | 5.03± 0.035* |

Value are mean ± SEM. Unpaired‘t’ test in reference to Group-1 (control group),
* indicates $p < 0.05$; n = 5 in each group; df =8

**FIGURE-2**




**Tail flick method:-**

**Mean TFL of Tail flick method at Various Time Interval**

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The table [Table-4] and [Figure-3] shows significant effect when compared to distilled water treated group. There is no change in latency period with distill water treated group. But the Pentazocine treated animals have significant effects at different time interval.

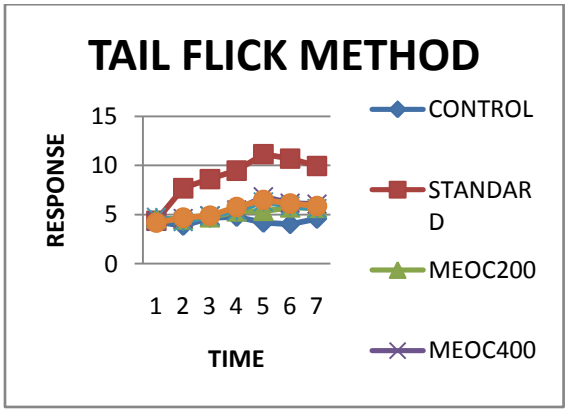
**TABLE-4: Mean TFL of Tail flick method at Various Time Interval**

| Drugs | Dose (mg/kg) | Mean Basal TFL(Seconds) | Mean TFL at Various Time Interval (minutes) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 30 | 60 | 90 | 120 | 180 | 240 |
| **Distilled Water** | 0.5 | 4.29± 0.019 | 3.86± 0.041 | 4.68± 0.046 | 4.77± 0.041 | 4.17± 0.035 | 4.03± 0.047 | 4.57± 0.037 |
| **Pentazocine** | 10 | 4.39± 0.045 | 7.68± 0.042* | 8.61± 0.042* | 9.47± 0.046 * | 11.13± 0.036* | 10.68± 0.037* | 9.94± 0.041* |
| **MEOC** | 200 | 4.62± 0.037* | 4.51± 0.010 | 4.72± 0.034* | 5.32± 0.013 | 5.37± 0.020 | 5.72± 0.022* | 5.68± 0.041* |
| **MEOC** | 400 | 4.31± 0.008 | 4.59± 0.016 | 4.89± 0.005 | 5.48± 0.025 | 6.82± 0.012 | 6.16± 0.010 | 6.07± 0.035* |
| **AEOC** | 200 | 4.73± 0.027* | 4.27± 0.012 | 4.84± 0.012 | 5.39± 0.016 | 6.28± 0.008 | 5.86± 0.023 | 5.58± 0.020* |
| **AEOC** | 400 | 4.19± 0.007 | 4.69± 0.012 | 4.91± 0.317 | 5.79± 0.010 | 6.49± 0.013 | 6.12± 0.01 | 5.87± 0.016* |

Value are mean ± SEM. Unpaired't' test in reference to Group-1 (control group),

* indicates $p < 0.05$; n = 5 in each group; df =8

**FIGURE-3**




**Acetic acid writhing test:-**

The table [Table-5], [Figure-4] and [Figure-4.1] shows significant effect when compared with distilled water treated group. The extract treated groups showed the effect as per dose dependent manner. Diclofenac treated group showed 62.73% percentage of inhibition where as

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MEOC and AEOC at 400 mg/ kg showed 59.49% and 56.32% respectively as compared to distilled water treated animals.

**TABLE-5: Mean writhes of Acetic acid writhing test**

| DRUGS | Dose (mg/kg) | No. of Writhes | % inhibition |
|---|---|---|---|
| **Distilled Water** | 10ml/Kg | 76.66±1.55 | _ |
| **Diclofenac** | **5** | 28.57±0.69* | 62.73%* |
| **MEOC** | 200 | 42.14±1.09* | 45.03%* |
| **MEOC** | 400 | 31.05±0.98* | 59.49%* |
| **AEOC** | 200 | 48.61±1.12* | 36.59%* |
| **AEOC** | 400 | 33.48±2.32* | 56.32%* |

Value are mean ± SEM. Unpaired'*t*' test in reference to Group-1 (control group),
* indicates $p < 0.05$; n = 5 in each group; df =8

**FIGURE-4: Comparison between acetic acid induced writhing by various extracts of Ocimum canum.**

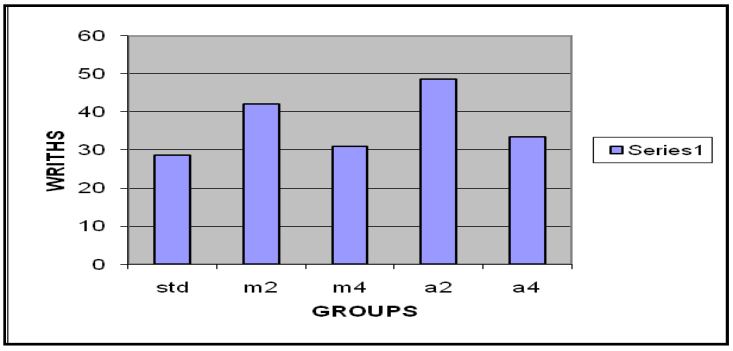
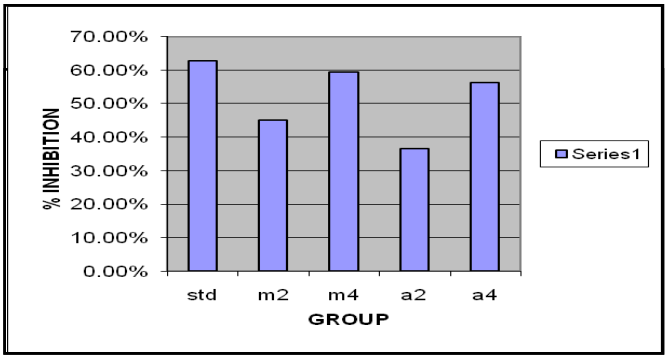



**FIGURE-4.1: Comparison between % inhibitions of acetic acid induced writhing by various extracts of Ocimum canum.**



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**Evaluation of anti-inflammatory activity**:-

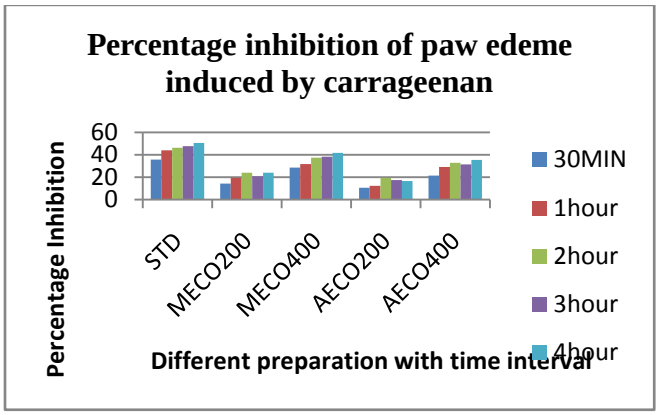
**Acute inflammation study by Carrageenan induced hind paw edema:**

The table [Table-6] and [Figure-5] shows significant effect when compared with distilled water treated group. The extract treated groups showed the effect as per dose dependent manner. Indomethacin treated group showed 50.63% percentage of inhibition where as MEOC and AEOC at 400 mg/ kg showed 41.77% and 35.44% respectively as compared to distilled water treated animals.

**TABLE-6: Mean paw volume at different time interval in acute inflammation study**

| Treatment groups | Dose (mg/kg) | Initial paw volume | Mean paw volume at different time interval (in ml) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 30min | 1hr | 2hr | 3hr | 4hr |
| Distilled water | 10ml/kg | 1.22± 0.055 | 1.50± 0.033 | 1.63± 0.009 | 1.89± 0.021 | 2.08± 0.012 | 2.01± 0.011 |
| Indomethacin | 4 | 1.25± 0.014 | 1.43± 0.021* | 1.48± 0.008 | 1.61± 0.011* | 1.70± 0.017* | 1.64± 0.005* |
| MEOC | 200 | 1.27± 0.008 | 1.51± 0.030* | 1.60± 0.008* | 1.78± 0.005* | 1.95± 0.0088* | 1.87± 0.013* |
| MEOC | 400 | 1.23± 0.048 | 1.43± 0.021* | 1.51± 0.031* | 1.65± 0.0038* | 1.76± 0.008* | 1.69± 0.016* |
| AEOC | 200 | 1.25± 0.016 | 1.50± 0.023* | 1.61± 0.011* | 1.78± 0.005* | 1.96± 0.006* | 1.91± 0.016* |
| AEOC | 400 | 1.24± 0.013 | 1.46± 0.008* | 1.53± 0.022* | 1.69± 0.016* | 1.83 0.010* | 1.75± 0.011* |

**FIGURE-5**



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**Chronic Inflammation Study By Complete Freund's adjuvant Induced Hind Paw Edema:-**

The table [Table-7], [Figure-6] and [Figure-6.1] shows the paw volume and the thickness across a sagittal section of tibio tarsal joint of right hind foot are found to be significantly lowered in case of animals treated with standard drug like indomethacin when compared with distilled water treated group.

**TABLE-7: Mean Paw edema and joint thickness of right hind paw**

| Groups | Parameters | Initial values | INCREASE IN VALUES ON DIFFERENT DAYS | | | | |
|---|---|---|---|---|---|---|---|
| | | | 4 | 8 | 12 | 16 | 20 |
| **Distilled water** | Paw Volume | 1.26± 0.005 | 0.92± 0.008 | 0.84± 0.013 | 0.84± 0.013 | 0.81± 0.005 | 0.88± 0.006 |
| | Joint Thickness | 5.71± 0.011 | 1.85± 0.017 | 2.24± 0.01 | 2.22± 0.01 | 2.19± 0.009 | 2.23± 0.013 |
| **Indomethacin (4mg/kg)** | Paw Volume | 1.23± 0.008 | 0.74± 0.005* | 0.64± 0.005* | 0.57± 0.005* | 0.50± 0.007* | 0.44± 0.009* |
| | Joint Thickness | 5.65± 0.014 | 1.49± 0.013 | 1.68± 0.008* | 1.28± 0.009* | 1.08± 0.014* | 0.92± 0.008* |
| **MEOC 200** | Paw Volume | 1.22± 0.006 | 0.84± 0.013 | 0.76± 0.009 | 0.70± 0.008 | 0.62± 0.007* | 0.58± 0.007* |
| | Joint Thickness | 5.62± 0.009 | 1.69± 0.009 | 1.84± 0.013 | 1.57± 0.012* | 1.40± 0.011* | 1.29± 0.012* |
| **MEOC 400** | Paw Volume | 1.23± 0.007 | 0.77± 0.012 | 0.69± 0.01 | 0.58± 0.007* | 0.49± 0.015* | 0.46± 0.009* |
| | Joint Thickness | 5.53± 0.012 | 1.55± 0.019 | 1.67± 0.015* | 1.39± 0.007* | 1.12± 0.004* | 0.98± 0.014* |
| **AEOC 200** | Paw Volume | 1.22± 0.005 | 0.88± 0.008 | 0.82± 0.007 | 0.75± 0.005 | 0.69± 0.01 | 0.66± 0.009* |
| | Joint Thickness | 5.42± 0.006 | 1.73± 0.016 | 2.09± 0.02 | 1.69± 0.009* | 1.68± 0.008* | 1.59± 0.013* |
| **AEOC 400** | Paw Volume | 1.24± 0.011 | 0.83± 0.007 | 0.76± 0.008 | 0.68± 0.003* | 0.61± 0.011* | 0.57± 0.005* |
| | Joint Thickness | 5.66± 0.009 | 1.68± 0.008 | 1.89± 0.01 | 1.53± 0.008* | 1.38± 0.005* | 1.31± 0.008* |

**FIGURE-6**

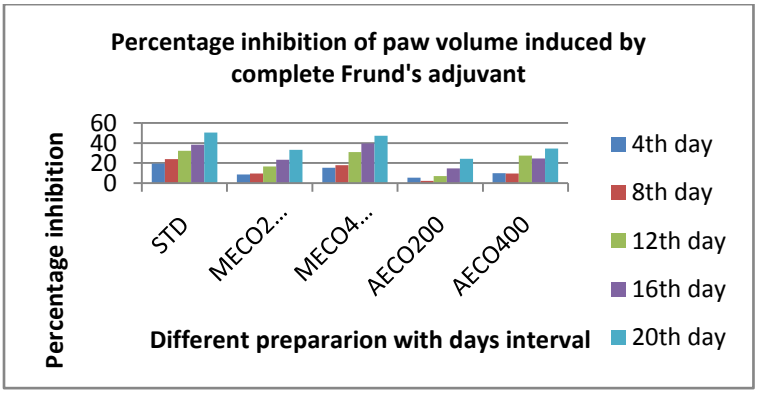

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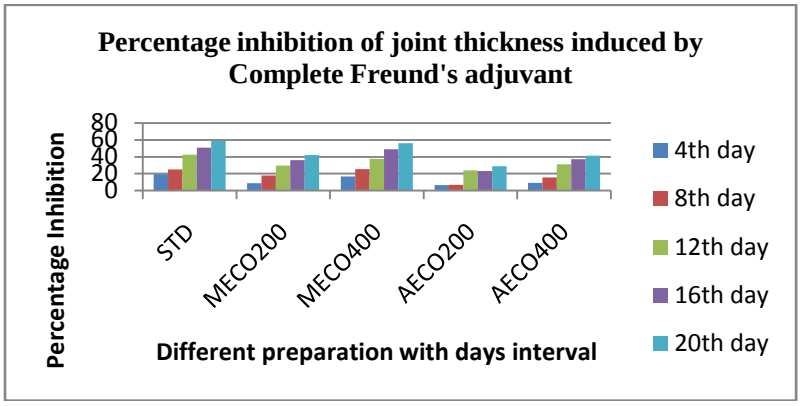
FIGURE-6.1




In case of animals treated with methanolic and aqueous extract of Ocimum canum also shows significant effect when compared with control group.

## DISCUSSION

Ocimum canum (Hoary basil) is an indigenous plant, widely available in India and other tropical and sub tropical areas of the world. Different parts of the plant e.g. leaves, flower, seed, oil etc are reported to have significant pharmacological properties. Though various preparations of other species of the same genus have use in traditional medicine and for treatment of variety of ailments, very few reports are available regarding the Antinoociceptive and anti-inflammatory activity of Ocimum canum.

The chemical mediators like prostaglandins, serotonins, histamines, bradykinin etc are involved in the mediation of pain and inflammation. Petroleum ether, methanol, and water were used as solvent for successive extraction of Ocimum canum. After preliminary phytochemical screening only the methanolic and aqueous extracts were chosen for further studies as it contains maximum amount of alkaloids, glycosides, steroids, tannins, flavones and flavonoids. The preliminary phytochemical screening report shows that the active principles responsible for biological activity are present. The test drug Ocimum canum extract (methanolic and aqueous) has been used in the dose of 200 and 400 mg/kg body weight.

Analysis of tables and figures shows that the activities of aqueous and methanolic extracts are nearer to standard and can be chosen as primary analgesic and anti-inflammatory.

## CONCLUSION

The present study shows that methanolic and aqueous extract of Ocimum canum in the doses of 200 and 400mg/kg are able to produce a consistent reduction in algesia and inflammation. Further the extracts have also shown presence of active constituents responsible for various biological activities. Though they didn't produce effect as their respective standard but they can be chosen as primary analgesic and anti-inflammatory supplement.

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