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# Evaluation of Anti-Inflammatory Activity of Seed Oil Extracts of *Balanites Aegyptiaca* (L) Delile

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## Abstract

*Balanites aegyptiaca* (L) Delile commonly known as Desert date is an medicinal plant belongs to Zygopyllaceae family. The plant has numerous medicinal values as claimed by traditional and folk lore. The seed oil extract of *Balanites aegyptiaca* was evaluated for anti-inflammatory activity in animal models and the results indicates that the seed extract at the dose of 600 mg/kg bw found to have significant anti inflammatory activity in rats when compared to standard drug and control group.

**Key-words**: *Balanites aegyptiaca*, Anti-inflammatory activity, Seed Extract oil

## Introduction

*Balanites aegyptiaca* (L) Delile Zygopyllaceae, commonly known as Desert date, Egyptian balsam, and heglig in Arabic, is one of Africa's most extensively spread trees. Balanites aegyptiaca is a common desert plant with multiple uses. It is distributed over most of Africa, the Middle East, and South Asia. Its seed kernel is utilized to extract oil. It is a multibranched, evergreen tree indigenous to Africa's Sudano-Sahielian region, the Middle East, and South Asia. This plant is known by different vernacular names by different persons in different parts of the country, For example, Arabic names include Heglig (tree) and Lalob (fruit); trade names include zaccone, zachun, and desert date (dried fruit); The Hindi name is Hingot, the English name is thorn tree/desert date, and the Amharic name is Bedeno in Ethiopia. According to B. aegyptiaca is a thorny species, prickly shrub or tree growing to a height of 10 m. Flowers are greenish-white and fragrant, measuring 5-6 mm in diameter, and are axillary in a few flowers' cyme or fascicle. October is the month for flowering and fruiting. Pendulous and ex-albuminous seeds. The leaves are alternating, two-foliate, and have petioles that are 3-6 mm long. The leaflets are elliptic and have broadly pointed petioles that can be up to 5 mm long. (1-3)

Therefore, the present work was conceived to determine the anti-inflammatory activity of seed oil extract of *Balanites aegyptiaca* (L) Delile

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## Material and Methods

### Procurement and authentication of Plant Material

*Balanite aegyptiaca*, commonly known as desert date was obtained from the local market. After collection of the plant, they were sundried and after proper drying the shells were cracked opened with help of hammer to get the seeds. These dried seeds were powdered by trituration using motor and pestle in order to weaken the cell wall to release fats for extraction. The collected seeds were authenticated by Dr. Jitendra, Scientist, Rani Dullaiya Smriti Ayurved P.G. College & Hospital, Jabalpur (M.P.) and Voucher specimen no. RDSACSH/1040/21 was allotted.

### Evaluation of anti-inflammatory activity in extract (Carrageenan induced paw oedema) (4-5)

### Animals

Female Wistar rats of (200-250 gm) were procured and maintained under ideal feeding and management practices in the laboratory. The animals were fed with standard pellet diet (Hindustan lever Ltd. Bangalore) and water *ad libitum*. All the animals were housed in polypropylene cages. The animals were kept under alternate cycle of 12 hours of darkness and light. The animals were acclimatized to the laboratory condition for 1 week before starting the experiment. The experimental protocols were approved by Institutional Animal Ethics Committee Oriental University Indore Approval No. IAEC/2019-20/RP-06 after scrutinization.

### Study design

The animals were divided into 4 groups (Control, treated with different extract & Standard) each containing six animals. Group I served as untreated control and received 0.9 normal saline, group II served as positive control and received Indomethacin (10 mg/kg, i.p.) and others group were treated with different doses of *Balanites aegyptiaca* seed oil.

### Anti-inflammatory Screening

The *Balanites aegyptiaca* seed oil and standard drug Indomethacin were administered in prescribed doses. Control received 0.1 ml of 1% carrageenan in normal saline. The administration of extract and drug was 30 min prior to injection of 0.1 ml of 1% carrageenan in the right hind paw sub platar of each rat. The paw volume was measured plesthysmometrically (model 7140, Ugo Basil, Italy). Prior to injection of carrageenan, the average volume of the right hind paw of each rat was calculated. At 0, 60, 12 & 180 mts after injection paw volume was measured. Reduction in the paw volume compared to the vehicle-treated control animals was considered as anti-inflammatory response. First group of animals were given 0.2ml of 2% carboxy methyl cellulose solution orally for 7 days and kept as control group.Second group were given with extract from the seeds of *Balanites aegyptiaca* for seven days with a dose of 300 mg/kg per day. Third group of animals were

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given with the same extract but with a dose of 600 mg/kg per day. Fourth group received 10 mg/kg of body weight of indomethacin intraperitoneally for seven days as a standard drug.(82)

On seventh day, paw volume was measured using plethysmometer. Mean reduction in the paw volume was measured and percentage inhibition was calculated.

$$\text{Percentage inhibition} = 100\ (\frac{1-V_t}{V_c})$$

Where, $V_c$= Edema volume in control and $V_t$= Edema volume in test / standard compound.

**Statistical analysis**

All the values ware statistically analyzed by one-way analysis of variance (ANOVA) followed by Dunnett's test. Comparison between control and drug treated groups were considered to be significant (*P<0.01). All values are expressed as mean ± SEM.

**Results and Conclusion**

Anti-inflammatory evaluation study conducted on 4 different group of male wistar rat by carrageenan induced paw edema method. Reduction in the edema was evaluated by calculating the mean paw volume after induction of solution to different group for 0 min, 60 min, 120 min and 180 mins. The result obtained in form of reduced paw volume is been summarized in table 1.

Results indicates that the *B. aegyptiaca* seed oil at the dose of 600 mg/kg produce significant and maximum percentage inhibition 63.88 % when compared with dose 300 mg/kg which produce 51.70 % inhibition. (Graph 172)

**Table 1: Anti-inflammatory effect seen on carrageenan induced paw edema**

| Group | Dose | Mean Paw volume in ml | | | | Percentage Inhibition |
|---|---|---|---|---|---|---|
| | | 0 min | 60 min | 120 min | 180 min | |
| Group I | 2% CMC solution | 1.75 ± 0.18 | 1. 74 ± 0.14 | 1.74 ± 0.12 | 1.73 ± 0.15 | 1.14 % |
| Group II | 300 mg/kg extract | 1.76 ± 0.15** | 1. 41 ± 0.14*** | 1.05 ± 0.12** | 0.85 ± 0.15*** | 51.70% |
| Group III | 600 mg/kg extract | 1.80 ± 0.23*** | 1. 31 ± 0.14** | 0.95 ± 0.12*** | 0.65 ± 0.15** | 63.88% |
| Group IV | 10 mg/kg indomethacin | 1.77 ± 0.15** | 1. 01 ± 0.12*** | 0.75 ± 0.12*** | 0.35 ± 0.15*** | 81.14% |

All values are expressed as mean ± S.E.M (n=6), ***P<0.001 as compared control, **P<0.01 as compared control, One-way ANOVA followed by Dunnett's test

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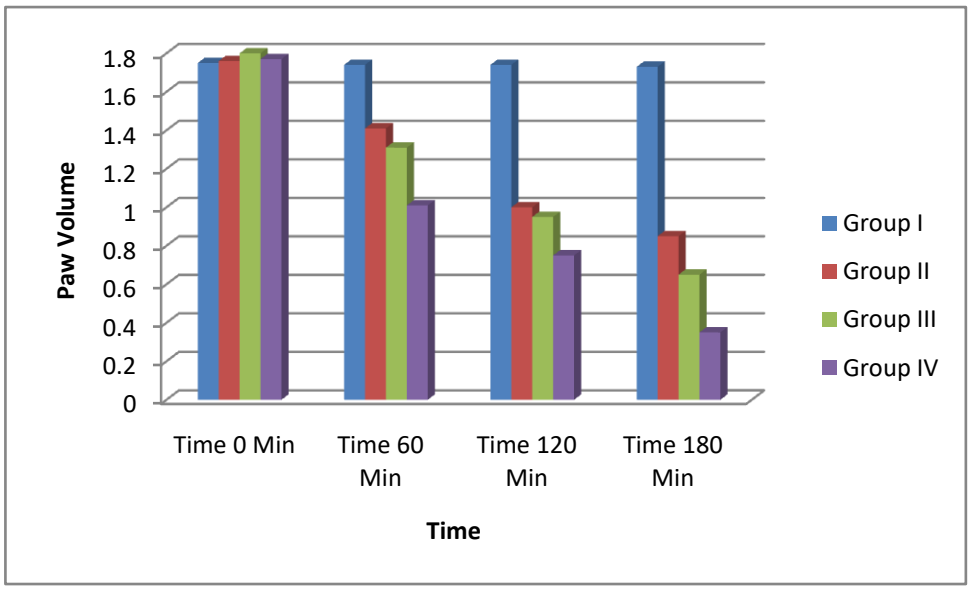


**Figure 1: Paw Volume of *B. aegyptiaca* seed oil on carrageenan induced paw edema**

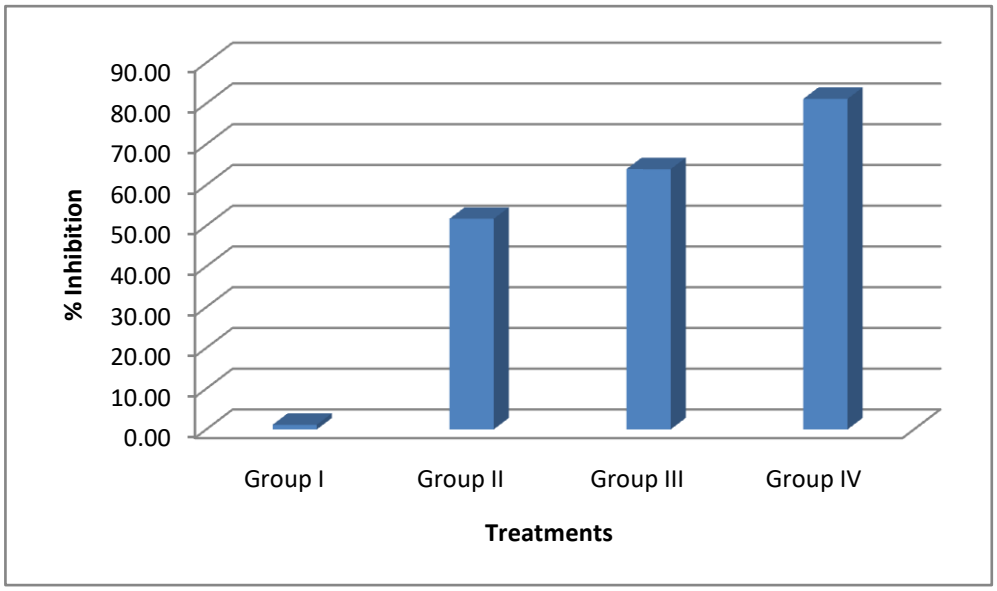


**Figure 2: % Inhibition of *B. aegyptiaca* seed oil on carrageenan induced paw edema**

## Conclusion

The results obtained from the evaluation showed 51.70% reduced edema after 180 mins of giving 300mg/kg/day dose of extract to the animals, were as the reduction in edema seen was 63.88% in case of animals given which extract dose of 600mg/kg/day. Results proved to be satisfactorily reducing edema, hence showing remarkable anti-inflammatory activity as compared to standard indomethacin drug been used for its anti-inflammatory properties.

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