

ANTI-INFLAMMATORY ACTIVITY OF *CORDIA OBLIQUA* SEED OIL

S.S. Jalalpure,² R. A. Ahirrao,^{1*} A.F. Shaikh,¹ L. B. Borse¹, Sayyed Hamid,¹ and J.K. Patil¹

¹P. S. G. V. P. M's College of Pharmacy, Shahada, Dist- Nandurbar. (MS).

²K.L.E.S's College of Pharmacy, Belgaum, Karnataka

Corresponding author:-E-mail:- rajesh_ahirrao1@rediffmail.com

Summary

The anti-inflammatory activity of petroleum ether extract of seed oil of *Cordia obliqua* was determined in carrageenan induced rat paw edema. The result indicate that petroleum ether extract of seed oil of *Cordia obliqua* inhibited rat paw edema significantly (p<0.01) as compared to standard drug oxyphen butazone (p<0.01) and untreated control group.

Introduction

Cordia obliqua popularly known as Lahsora is common remedy for various ailments leaf juice is used as antidote in snake bite, as laxative & larger dose are given in bilious affection, decoction of stem bark is given as astringent gangle along with coconut oil. It relieves colicky pairs fruit is diuretic, anthelmintic, antipyretic & anti-inflammatory¹.

5, 7, dimethoxytaxifolin in 3 o- α , L-rhamnopyroside and Hespertin, 7 rhamnoside have been isolated from root extract of *Cordia obliqua*^{2,3}. While ethanolic extract of stem bark of *Cordia obliqua* yielded Allantoin and β - sitosterol⁴ and the methanolic extract of fruit mucilage yielded D- galactose rhamnose sugar⁵. In present study we claimed at utilizing easily available plant to investigate the effect on carrageenan induced paw edema in rat and also establish phytopharmacological profile in support of the traditional claim.

Materials and Methods

Collection of Plant Material

Cordia obliqua fruits were collected from the native sources. The seeds from the fruits are separated and it was authenticated by Dr. V. Balasubramanian at Dept. of Natural product, N.D.M.V.P. College of pharmacy, Nashik. The seeds were dried under shade and coarsely powdered.

Preparation of extract⁶

In present study, the petroleum ether extract of air dried seed powdered material (500 g) was prepared in Soxhlet apparatus, concentrated and evaporated to give oily orange liquid. The oily liquid material of petroleum ether extract is carried out for phytochemical and pharmacological studies. The seed oil of *Cordia obliqua* was subjected to qualitative chemical investigation of phytoconstituents such as flavonoids, triterpenoids, sterols and proteins.

Pharmacological Screening

Animals

Albino rats of either sex (weighing 150-200 g) were selected for anti-inflammatory activity. The animals were housed under standard environmental condition & were fed with standard diet & water *ad. Libitum*, maintained at an ambient temperature of $25 \pm 2^\circ \text{C}$ and exposing them to 12 h light / dark cycle.

Acute Toxicity Study

Determination of LD 50 & ED 50 values

According to Miller & Tainter method⁷, LD50 of the compound was determined. Mice were divided into eight groups, each group containing six mice. By hit & trial method least tolerated & most tolerated doses calculated. Dose response curve was plotted from the graph. LD 50 was found to be 8mg/kg b. w & E.D. 50 was found to be 2.5mg/kg b. w. as given in Table-1.

Anti-inflammatory Activity

The method of Winter *et. al.*⁸ was used to evaluate anti-inflammatory activity. The rats were divided into three groups (each group containing 6 animals). The first group was served as control and received normal saline only (1ml/kg, orally.), second group of animals was served as standard and were administered standard drug oxyphen butazone (0.1 ml of 0.1% w/v i. p.). The third group was served as test sample i.e. Seed oil of *Cordia obliqua*. The test sample was administered (0.1 ml of 0.001% w/v of the compound in petroleum ether) subcutaneously after carrageenan challenge.

A mark was made on both the hind paws just below the Tibio- tarsal junction. So that every time the paw could be dipped in the column of the plethysmograph up to the mark to ensure constant paw volume. After 30 min of the above treatment an inflammatory edema was induced in the left hind paw by injecting 0.1 ml of carrageenan 1% w/v in saline, in the planter tissue of all the animals. The paw volume was measured at first hr. and followed by third hr. after administration of carrageenan of each group. The difference between the initial and subsequent reading gave the actual edema volume.

Per cent inhibition of inflammation was calculated using the formula,

$$\% \text{ inhibition of paw edema} = [(V_{\text{control}} - V_{\text{test}}) / V_{\text{control}}] \times 100$$

Where V_{control} and V_{test} are the increase in edema volume of control group and treated group respectively. The results have been shown in Table 2.

Statistical Analysis⁹

The experimental results are represented as Mean \pm SEM. The data were statistical analyzed by one-way ANOVA followed by Dunnet's test. P values < 0.01 were considered significant value.

Results and Discussion

There was significant and dose dependent anti-inflammatory activity of petroleum ether extract in acute carrageenan induced rat paw model. Orally administered petroleum ether extract of seed produced 62.06 % after 3 hr. as compared to standard drug Oxyphen butazone which show 70.68 % inhibition after 3 hr. as shown in table 2.

Prostaglandins and Bradykinins were suggested to play an important role in carrageenan induced paw edema^{10,11}. As the phytochemical tests showed the presence sterols, triterpenoids, flavonoids and tannins in petroleum extract, they might suppress the formation of prostaglandins and bradykinins or antagonize their action and exerts its activity. Further studies are needed to explore mechanism by which seeds of *Cordia obliqua* produce anti-inflammatory activity.

Table-1 LD-50 determination of *Cordia obliqua* seed oil.

Sr. No	% mortality	Probit	Log dose
1	0	-	0.7075
2	0	-	0.7853
3	0	-	0.8633
4	50	5.00	0.9030
5	66.6	5.416	0.9720
6	100	7.326	1.3802
7	100	7.326	1.4060
8	100	7.326	1.4913

Table-2 Anti-inflammatory activity of seed oil of *Cordia obliqua* on Carrageenan Induced Paw Oedema in Rats

Sr. no	Groups	Body weight in gm	Dose in mg/ml	Total (Mean) increase in paw volume after 3 hr (ml)	% oedema inhibition
1.	Control	150	-	0.29±0.01	-
2.	Test Compound	155	0.418±	0.11±0.01*	62.06 %
3.	Standard Compound (oxyphen butazone)	160	0.431	0.085±0.01*	70.68 %

N=6 per group. Values are mean ± SEM. *P<0.01 Significant

Acknowledgement

Authors are thankful to P. S. G. V. P. M's College of Pharmacy, Shahada-425409. (MS) for providing necessary facilities to the work.

References

1. Chopra, R.N., Nair, S.I. and Chopra, I., **Glossary of Indian Medicinal Plants** (CSIR), New Delhi, 1956, p. 37.
2. Shrivastav, S.K., Shrivastav, S.D. and Nigam, S.N., **J. Indian Chem Soc.**, 1983, 60 (2), 202.
3. Chauhan, J.S., Shrivastav, S.K. and Sultan, M.N., **Phytochemistry**, 1978, 17 (2), 334.
4. Tiwari, K.P. and Shrivastav, S.D., **Planta Medica**, 1979, 36 (2), 191.
5. Verma, Y.S., Saxena, V.K. and Nigam, S.S., **Planta Medica**, 1977, 32 (2), 188.
6. Kokate C.K. **Practical Pharmacognosy**, 3rd ed. Vallabh Prakashan, New Delhi, 1984, p. 107-113.
7. Miller, L.C. and Tainter, M.L., **Proc. Soc Expt. Biol. Med.**, 1944, 57, 261.
8. Winter, C.A., Risley, E.A. and Nuss, G.W., **Proc. Soc Expt. Biol. Med.**, 1962, 111, 544.
9. Kulkarni, S.K., "**Handbook of experimental pharmacology**", 2nd. Edn, Vallabh Prakashan, Mumbai, 1993, p.172.
10. Vinegar, R., Schriber, M. and Higo, R., **J. Pharmacol. Exp. Ther.**, 1969, 166.
11. Dray, A. and Perkin, M., **Trends neurosci.**, 1993, 16, 99.