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EXPERIMENTAL EVALUATION OF ANTI-INFLAMMATORY ACTIVITY OF HYDROALCOHOLIC EXTRACT OF MANSOA ALLIACEA (LAM.) LEAF

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ABSTRACT

Objective: The Hydroalcoholic extract of *Mansoa alliacea* (Lam.) leaves were investigated for anti-inflammatory activity in albino rats. **Material and Methods:** The Hydroalcoholic extract of *Mansoa Alliacea* (Lam.) leaves were screened for the presence of anti-inflammatory activity of Hydroalcoholic extract of *Mansoa alliacea* (Lam.) leaves were evaluated by induced paw edema animal model. Different concentrations of Hydroalcoholic extract of *Mansoa alliacea* (Lam.) leaves namely 100 mg/kg and 200 mg/kg, respectively were used. **Result and Conclusion:** Hydroalcoholic extract of *Mansoa alliacea* leaves were able to inhibit the induced edema in experimental animals in a graded fashion. In carrageenan induced paw edema (acute model), the standard anti-inflammatory drug (Indomethacin 10 mg/kg, p.o.) as well as the test drug *Mansoa alliacea* leaf (100 & 200 mg/kg) exhibited significant reduction ($P<0.001$) in the volume of paw edema in rats as compared to the control rats.

Keywords: Hydroalcoholic, *Mansoa alliacea*, Anti-inflammatory, Paw edema.

INTRODUCTION

Mansoa alliacea Lam. (Family Bignoniaceae) is a native plant from Amazonian basin. This plant is mainly found in Southern America but it is also found tropical rain forest region in India. There are total 11 species. *Mansoa alliacea* have several vernacular names like Fake garlic in English[1], Wild garlic in English[1], Ajos sacha in Span[1], Garlic Vine in English [2], Other -Bejuco de ajo, Mata de ajo ;Garlic vine[2], Bejuco De Ajo in Spanish[2], Lasun Vel, Lasnya in Marathi[3], Lashun Bel in Hindi[3] .

Mansoa alliacea is a native Amazonian plant belonging to the family of Bignoniaceae, its scientific name is *Mansoa alliacea* (Lam.) A. Gentry but has been classified with several synonyms.[4] The name ajo sacha means 'false garlic', due to the characteristic garlic smell molecules present into the leaves.[5] Generally leaves are used in the preparation of infusion or decoction. Roots are used in preparation of cold maceration and tincture and generally taken as a whole body tonic.[6,7]

AIM AND OBJECTIVES

The present investigation deals with the anti-inflammatory evaluation of Hydroalcoholic extract of *Mansoa alliacea* (Lam.) leaf.

MATERIAL & METHODS

Collection of the plant: *Mansoa alliacea* (Lam.) leaves were collected from Herbal Garden of Govt. Ayurved College Raipur (C.G.) in India.

Authentication of the Drug

Taxonomic identification of collected material was done in the Raw Material Herbarium & Museum, Delhi (RHMD), National Institute of Science Communication and Information Resources (CSIR-NISCAIR).

Pharmacological study

1. Hydroalcoholic extraction of Plant materials[8]

The coarse powder (500 gm) of leaf of *Mansoa alliacea* (Lam.) has been used for extraction process following Maceration method. Coarsely ground powder of the

Mansoa alliacea (Lam.) leaf has been placed in one large glass container and approximately 1550 ml of 80% ethanol has been added to it for maceration in order to get a hydro-alcoholic extract. The glass container shall be closed with a glass lid to prevent evaporation of the menstruum and this system has been allowed to stand for 7 days with occasional stirring. The liquid i.e. the menstruum has been then strained and the solid residue, called marc, has been pressed to recover as much occluded solution as possible. The strained and expressed liquid thus obtained will be mixed and clarified by filtration. The filtration has been carried out in a beaker using a Whatman's filter paper no 1. China dishes have been used for evaporation of the menstruum. These China dishes containing the menstruum have been placed on a water bath. After evaporation of the menstruum of the Hydroalcoholic extract has been collected. These extract has been stored in a dark coloured pre-sterilized airtight container. It has been then stored in a refrigerator at 4° C in a dark coloured pre-sterilized airtight container until its further use.

2. Acute toxicity study[8]

Acute oral toxicity study was performed as per Organization for Economic Cooperation and Development-423 [OECD-423] guidelines (acute toxic class method). Albino rats (n=6) of either sex was selected by random sampling technique. The animals were kept fasting for overnight, had access only to water. The Hydroalcoholic extract of *M. alliacea* leaf was administered orally at the initial dose 5 mg/kg body weight by intra gastric tube and observed for 14 days. The animals are observed individually after dosing once during the first 30 min, periodically during the first 24 h with special attention given during the first 4 h, and daily thereafter, for a total of 14 days. Since there was no mortality with 5 mg/kg for 14 days, the procedure was repeated for next higher doses such as 50, 200 and 2000 mg/kg.

3. Anti-inflammatory activity[9]

Method: Carrageenan induced edema method.

Animals: Wistar albino rats.

Materials: Hydroalcoholic extract of *Mansoa alliacea* (Lam.) leaf suspended in 2% CMC orally and indomethacin suspended in 2% CMC intraperitoneally employed as standard drug. 0.2 ml of 2% v/v caboxy methyl cellulose suspension orally was used as control vehicle.

Plethysmograph: Indigenously prepared graduated plethysmograph was used for the study. The mercury displacement due to dipping of the paw was directly read form the scale attached to the mercury column.

Experimental protocol

1. Group I- received 0.2 ml of 2% w/v Carboxy methyl cellulose suspension orally as a control group.
2. Group II received 100 mg/kg body weight of Hydroalcoholic extract of *Mansoa alliacea* leaf orally.
3. Group III received 200 mg/kg body weight of Hydroalcoholic extract of *Mansoa alliacea* leaf orally.
4. Group IV received 10 mg/kg of body weight of Indomethacin suspended in 2% CMC intraperitoneally as a standard drug.

A mark was made on both the hind paw (right and left) just beyond tibio tarsal joint, so that every time the paw is dipped in the mercury column upto the fixed mark to ensure constant paw volume. The initial paw volume (both right & left) of each rat were measured by mercury displacement. After 30 min of drug administration, 0.1 ml of 1% w/v carrageenan is injected in the right hind paw subplantar region of each rat. The left paw served as reference (non-inflammatory paw) for comparison. The paw volumes of both legs of control and test compound treated rats were measured at 1 h, 2 h and 3 h after carrageenan administration. The results of the anti-inflammatory effects of the test compounds are presented. The percentage inhibition for each rat and each group was obtained by using the formula C-T/C x 100, where C is the edema rate of control group and T as that of treated group.

Statistic: The results are expressed as mean ± SEM. The statistical difference between control and treated groups were tested by Student's't' test. In all cases, a difference was considered significance when $p<0.05$.

RESULT & DISCUSSION

I. Acute toxicity studies

Administration of 2000 mg/kg, p.o. of the Hydroalcoholic extract of *M. alliacea* leaf did not produce any behavioral abnormalities and mortality and was considered as safe (OECD-423 guideline unclassified). Acute toxicity test of Hydroalcoholic extract of *M. alliacea* shown in Table No.1.

Table 1: Acute toxicity test of Hydroalcoholic extract of *M. alliacea* leaf

S. No.	Extracts 2000 mg/kg, p.o.	No. of animals dead/survived
1.	Hydroalcoholic extract	0/6

II. Anti-inflammatory activity

Anti-inflammatory activity of *Mansoa alliacea leaf* Hydroalcoholic extracts are shown in Table No.2.

Table 2: Anti-inflammatory activity of *Mansoa alliacea leaf* Hydroalcoholic extract

Treatment	Dose	Paw volume after induction		
		1h	2h	3h
Group I	0.2 ml/kg	0.66±0.01	0.76±0.02	0.78±0.02
Group II	100 mg/kg	0.50±0.02 (22.72)	0.36±0.02 (52.62)	0.26±0.02* (64.66)
Group III	200 mg/kg	0.48±0.02 (26.24)	0.32±0.01 (58.20)	0.18±0.1** (76.90)
Group IV	10 mg/kg	0.34±0.02 (46.94)	0.26±0.02 (64.76)	0.14±0.02*** (80.74)

All values represented as Mean±SEM and values are overall significant. One way ANOVA; n=6 in each group in seconds. * P<0.05; **P<0.001; ***P<0.0001. In carrageenan induced paw edema (acute model), the standard anti-inflammatory drug (Indomethacin 10 mg/kg, p.o.) as well as the test drug *Mansoa alliacea* leaf (100 & 200 mg/kg) exhibited a significant reduction (P<0.001) in the volume of paw edema in rats as compared to the control rats. All the drugs showed maximum inhibition of the carrageenan induced rat paw edema at the end of 3h. Their % inhibition of edema is written within parenthesis. Indomethacin showed maximum of 80.74% inhibition of edema. *Mansoa alliacea* leaf 100 & 200 mg/kg produced 64.66 & 76.90 % inhibition respectively.

CONCLUSION

In the present investigation it could be concluded that the Hydroalcoholic extract of *Mansoa alliacea* (Lam.) at tested doses exhibited the pharmacological activities. In anti-inflammatory activity, the Hydroalcoholic extract of *Mansoa alliacea* (Lam.) leaf shows the anti-inflammatory activity in acute inflammation. The possible mechanism of action may involve inhibition of inflammatory mediators release (histamine, serotonin, bradykinin, prostaglandins and TNF-α) in acute phases. Based on these results, it is clearly that the Hydroalcoholic extract of *Mansoa alliacea* (Lam.) leaf possesses anti-inflammatory activities in experimental animal models which support the traditional uses of *M. alliacea* (Lam.) leaf in pain and inflammation of arthritis and rheumatism. The poultice of bark mainly use on bumps swelling and inflammatory condition of the skin and leaf decoction used in rheumatic arthritis, cold, uterine disorder and epilepsy.

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