EVALUATION OF ANTI-INFLAMMATORY ACTIVITY ON VITEX NEGUNDOLINN

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ABSTRACT

The anti-inflammatory activity of Vitex Negundo Linn was studied in carrageenan induced paw edema & cotton pellet granuloma in albino rats. The anti-inflammatory activity of the Ethanolic and aqueous extracts (100 & 200mg/kg) were evaluated against the carrageenan induced paw edema of rats were compared with the standard drug Indomethacin. The extract at the test doses of 100 and 200 mg/kg body weight reduced the paw edema induced by Carrageenan by 48.13% and 57.18% respectively, where as the standard drug showed 61.16. The paw edema suppressant effect was significant (P < 0.05) in the dose of 100&200mg/kg ethanol and aqueous extracts. When compared between control and two extracts, Ethanolic extract shows maximum anti-inflammatory activity. Thus it can be concluded that the extract of Vitex Negundo. Linn extract posses the anti-inflammatory activity.

Keywords: Anti-inflammatory activity, Vitex Negundo, paw edema, ethanolic extract, Cotton pellet granuloma.

INTRODUCTION

Vitex Negundo L. (Verbenaceae) is a hardy plant, flourishing mainly in the Indian subcontinent. All parts of the plant from root to fruit possess a multitude of phytochemical secondary metabolites which impart an unprecedented variety of medicinal uses to the plant1-2. It is interesting to note that a single plant species used for treatment of a wide spectrum of health disorders in traditional and folk medicine, some of which have been experimentally validated3-4. The plant is a component of a number of commercially available herbal formulations and has also shown potential as an effective bio-control agent5. Employment of techniques such as cell and tissue culture would provide means of rapid propagation, conservation of the plant species, give scope for enhancement of the quality and quantity of the bioactive secondary metabolites occurring in the plant. It is frequently used in folk medicine to treat antiinflammatory, antiarthritic, antioxidant, pesticidal & insecticidal activity, bronchial smooth muscle relaxant activity, antiuratic activity, hepatoprotective, anti fertility, anti malarial, anti bacterial, anti filarial,laxative activity, and analgesic activity7-10.

MATERIALS AND METHODS

Plant Material

The plant Vitex Negundois collected at the month of September in Tirupathi, Chittoor district, A.P. The plant was authenticated by Dr. USHA RANI, Professor of Botany, B.T. College, Madanapalle and the plant specimen herbarium reference no 02/2011 preserved in Sri Krishna Chaithanya College of Pharmacy for future references.

Drugs and reagents

Indomethacin [Marketed Product], n-Hexane, Ethanol, Chloroform, Glacial acetic acid were used in this study.

Preparation of Plant Extracts

The plant VitexNegundoLinnis dried under shade air and coarsely powdered (1kg), extracted by hot continuous extraction for 72hr. The extract is concentrated in vacuum. The extracts are done with solvents [Hexane, Ethyl acetate, Chloroform & Ethanol]. The extract is studied for anti-inflammatory activity11-12 with ethanolic extract of V.NegundoLinn, using albino rats of either sex.

Animals

Adult wistar albino rats (180-230 gms) of either sex are used for pharmacological activities. For this experiment the animals were kept in poly propylene cages (3 per cage) at 25±2°C with relative humidity 45-55% under 12 hr light and dark cycles. All the animals were acclimatized to laboratory condition for a week before use. They were fed with standard animal feed and water ad libitum.

Anti-inflammatory activity

Carrageenan Induced Paw Edema

Anti-inflammatory activity was evaluated by using the Carrageenan induced rat paw edema method13-14. After 16 hr of fast the rats were divided into four groups of three each.

Group I - served as control group, received 1% CMC w/v.
Group II - served as standard, received Indomethacin (10 mg/kg)
Group III - served as test, received VNE (100 mg/kg)
Group IV - served as test received VNE (200 mg/kg)

After one hour the respective treatment 0.1 ml of 1% w/v Carrageenan suspension was injected subcutaneously into the plantar surface of the right hind paw. The paw volume was measured by using a plethysmometer immediately after 1, 2, 3, 4 h of carrageenan treatment. The anti-
Inflammatory effect of VNE was calculated by following equation:\textsuperscript{15}

\[
\text{The anti-inflammatory (\%) inhibition} = \frac{(A-B)}{A} \times 100
\]

\[
(\text{ie}) = \frac{(1-B)}{A} \times 100
\]

Where,\n
\begin{itemize}
  \item A- Represents the paw volume of control group.
  \item B- Represents the paw volume of treated group.
\end{itemize}

Cotton pellet granuloma

Albino rats of either sex with an average weight of 200 g were anaesthetized with ether. The back skin is shaved and disinfected with 70% ethanol. An incision is made in the lumbar region by using a blunted forceps, subcutaneous tunnels are formed and a sterilized cotton pellet 10 mg is placed on both sides in the scapular region. The cotton pellets inserted rats was randomly divided into 4 groups of (n=3 rats per group)\textsuperscript{16}.

Group I - served as control group, received 1\% CMC w/v.

Group II - served as standard, received Indomethacin (10 mg/kg)

Group III - served as test, received VNE (100 mg/kg)

Group IV - served as test received VNE (200 mg/kg)

On the \textsuperscript{8} day cotton pellets was removed, weighed and dried at 60°C for 6 hr.

Then dry weight was calculated after deducting cotton pellet weight was taken as granuloma tissue formation.

The anti-inflammatory (\%) inhibition = \frac{(A-B)}{A} \times 100

\[
(\text{ie}) = \frac{(1-B)}{A} \times 100
\]

Where,\n
\begin{itemize}
  \item A- Represents the wet weight of the cotton pellet.
  \item B- Represents the dry weight of the cotton pellet.
\end{itemize}

Statistical Analysis

The results were presented as Mean\pmS.E.M. One way analysis of variance (ANOVA) was followed by Dunnett’s test for multiple comparisons statistical evaluation, \textit{P}-values less than 0.05 were considered significant\textsuperscript{17-19}.

RESULT AND DISCUSSION

The result of anti-inflammatory activity by Carrageenan induced paw oedema method was tabulated in Table No.1. The extract found to have significant (\textit{P} < 0.05) anti-inflammatory activity in rats. The extract at the test doses 100 and 200 mg/kg body weight reduced the oedema induced by Carrageenan by 48.13\% and 57.18 \% respectively, where as the standard drug showed 61.16\% 5 h in table no.1 and figure 1. Thus it can be concluded that the extract of \textit{Vitex Negundo}.Linn extract posses the anti-inflammatory activity. It was well known that Carrageenan induced paw edema was characterized by biphasic event with involvement of different inflammatory mediators. In the first phase chemical mediators such as histamine and serotonin play role, while in second phase kinin and prostaglandin were involved. In the present study, results revealed that administration of ethanolic extract of \textit{Vitex Negundo}.Linn reduced the edema starting from the first hour and during all phases of inflammation. The result of anti-inflammatory activity by cotton pellet method was tabulated in Table No- 2 and figure 2.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{image1.png}
\caption{Effect of \textit{Vitex Negundo}.Linn extract in Carrageenan induced paw oedema in rats}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{image2.png}
\caption{Effect of ethanol extract of \textit{Vitex Negundo}.Linnin cotton pellet granuloma}
\end{figure}
Effect of *VitexNegundo* Linn on various biochemical changes in cotton pellet granuloma model VNE treatment significantly decreased the increased level of lysosomal enzymes activity with which transaminase (namely SGOT, SGPT) and alkaline phosphatase. There was an increase evidence that lysosomal enzyme play an important role in development of acute and chronic inflammation. VNE in cotton pellet granuloma. Indomethacin was the standard drug elucidated inflammatory effect on both excudatory and granulatory phases of Indomethacin. The VNE treated animals inhibited both excudatory as well as granulatory phases of inflammation the degree of anti-inflammatory activity was dose dependent at 100 and 200 mg/kg body weight. Thus the inhibitory activity of VNE shows comparatively significant as that of standard. Most of the anti-inflammatory drugs exert their beneficial effects by inhibitory either release of lysosomal enzyme or by stabilising the lysosomal membrane which is one of the major event responsible for anti-inflammatory process.

**CONCLUSION**

The *VitexNegundo* Linn extract found to have significant (P < 0.05) anti-inflammatory activity in rats. In the present study, the results revealed that administration of ethanolic extract of *VitexNegundo* Linn inhibited by edema starting from the first hour and during all phases of inflammation. VNE in cotton pellet granuloma the standard Indomethacin elucidated inflammatory effect on both excudatory and granulatory phases of Indomethacin. The VNE treated orally inhibited both excudatory as well as granulatory phases of inflammation, the degree of anti-inflammatory activity was dose dependent at 100 and 200 mg/kg body weight. Thus the inhibitory activity of VNE shows comparatively significant as that of standard. The results of present study indicates that anti-inflammatory activity further studies on *Vitex Negundo* Linn with varying dose level will establish its therapeutic value as well as Mechanism of Action.

**REFERENCES**


