ISSN: 0976-7126
Choudhary & Dwivedi, 13(2):17-19, 2022

International Journal of Pharmacy & Life Sciences
Open Access to Researcher

Evaluation of Anti-inflammatory activity of *Artemisia indica*

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Article info

Received: 03/01/2022

Revised: 16/02/2022

Accepted: 27/02/2022

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Abstract

Artemisia indica commonly known as Majtari, Mastaru & Charmarin Hindi and Indian Wormwood, Mugwortin English belongs to family Asteraceae is native of China, Nepal. The plant or its specific parts (root, stem, leaf, bark, flower and seed) is used as Anti-inflammatory, Anti-microbial also used in Diarrhoea and Dysentery. The juice of the plant is used in Nepal to treat diarrhoea, dysentery and abdominal pains. It is used as a eyewash where it is said to relieve the burning sensation in conjunctivitis. A paste of the plant is applied externally to treat wounds. The roots are antiseptic and are a tonic for the kidneys. The present work aims to investigate the anti-inflammatory activity of various parts of Artemisia Indica using Carrageenan induced paw oedema. The results indicate that Methanoluic extract at the dose of 200 mg/kg b.w. showed most significant ($p<0.05$) inhibition of paw edema occurred.

Key-words: Anti-inflammatory Activity, Artemisia Indica, Extracts

Introduction

Artemisia indica is medicinal plant in the Asteraceae family, which is native to India. The plant is used in the treatment of various diseases as described in traditional and folk remedies. Every part of this medicinal plant is used in one or the other way. Also useful in treating malaria, intestinal disorders, urinary discharge, nervous disorders, hysteria, skin diseases etc. The plant has wide therapeutic efficacy but so far, no any systematic studies has been carried out to reveal the anti-inflammatory activity. Therefore, the present work was conceived to determine the anti-inflammatory activity extract.

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Material and Methods

Collection of herbs and their authentication: -

The plant part of *Artemisia indica* were collected in the months of January 2020 from the various local sites of Malwa region of Madhya Pradesh and identified & authenticated by Dr. S. N. Dwivedi, Retd. Prof. and Head, Department of Botany, Janata PG College, A.P.S. University, Rewa, (M.P.) and was deposited in our Laboratory. Voucher specimen number J/BOT/018 for *A.indica* was assigned on date 16/02/2020.

Anti-inflammatory Activity (Carrageenan induced paw oedema)

Animals

Adult albino rats of both sex (200-250 gm) were procured, 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 after scrutinization.

Study Design

The animals were divided into different 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, III & IV served as positive control and received plant extracts (1mL/100g bw) Carrageenin was prepared in normal saline (1%) and 0.1mL wasinjected into the sub-plantar region of left hind paw. The volume of both paws wasmeasured with volume differential meter (520-R, IITC Life Science - USA) after 4hrswith the volume of right paw taken as un-injected paw volume. Percent inhibition wascalculated by taking mean of the difference of right and left paw edema, using the formula of % inhibition.

Anti-inflammatory Screening

The Methanolic extract, Petroleum Ether extract, ethyl acetate extract, ethanolic and aqueous extract of root, stem, leaves and flower of Artemisia Indica and standard drug Diclofenac 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 1, 3 and 5hr after injection paw volume was measured. Reduction in the paw volume compared to the vehicle-treated control animals was considered as anti-inflammatory response.

Statistical analysis

Data is expressed as Mean±S.E.M and statistical analysis is carried out employing the one-way ANOVA followed by Post Hoc Tukey's HSD test and Bonferroni multiple comparison test using SPSS 16 software. Values at $p < 0.05$ are being taken statistically significant.

Results and Discussion

Methanolic extract, Petroleum Ether extract, ethyl acetate extract, ethanolic and aqueous extract of root, stem, leaves and flower of *Artemisia indica* were screened for anti-inflammatory activity in animal models and the results are summarized in Table 1. The result obtained indicates that Methanolic extract and Aqueous extract found to have significant anti-inflammatory activity than Ethyl acetate extract and Petroleum ether extract at the test doses 250-500 mg/kg b.w. when compared to standard drug and control group.

Table 1: Effect of different extracts of *Artemisia indica* on carrageenin induced paw oedema in rats

Groups	Dose (mg/kg bw)	Initial Paw Vol (mL)	Paw Vol after 4h (mL)	Edema(4h)	% Inhibition(4h)
Control	NS	0.95±0.03	1.9±0.04	0.95±0.03^{a}	-
ME	250	1±0.00	1.52±0.05	0.52±0.05^{b}	45.26
EAE	250	0.97±0.05	1.75±0.06	0.77±0.05^{b}	18.95
PEE	250	0.95±0.04	1.87±0.09	0.92±0.07^{ac}	3.16
AQ	250	0.92±0.02	1.6±0.04	0.67±0.05^{bc}	29.47
Diclofenac	20	1.07±0.07	1.52±0.05	0.45±0.03^{c}	52.63

Values along the same column with different superscripts are statistically significant to each other using Tukey's HSD test ($p<0.05$).ME- methanolic extract; EAT- ethyl acetate extract; PEE- petroleum ether extract; AQ-aqueous extract.

Conclusion

The result obtained indicates that Methanolic extract and Aqueous extract found to have significant anti-inflammatory activity than Ethyl acetate extract and Petroleum ether extract at the test doses 250-500 mg/kg b.w. when compared to standard drug and control group.

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Cite this article as:
Choudhary S. and Dwivedi S. (2022). Evaluation of Anti-inflammatory activity of *Artemisia indica*. *Int. J. of Pharm. & Life Sci.,* 13(2): 17-19.

Source of Support: Nil
Conflict of Interest: Not declared
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