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Research Article

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Evaluation of Anti-inflammatory activity of herbal product Hemoclean-H

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Abstract
The present study investigates the anti-inflammatory potential of poly herbal formulation which contains *Rubia cordifolia, Acacia arabica.* Carrageenan induced hind paw oedema method was used and indomethacin was used as standard drug. Herbal formulation Hemoclean-H possess significant anti-inflammatory activity against experimentally induced paw oedema in rats.

Keywords: Anti-inflammatory activity, Hemoclean-H, *Rubia cordifolia, Acacia arabica*

1. Introduction

Inflammation is a defensive mechanism that has developed in more complex organisms as a response to harmful stimuli, such as microbial infection, tissue damage, and other harmful situations. The host's immune response is crucial for eliminating unwanted stimuli and promoting tissue healing. Acute inflammation is regarded as a component of innate immunity, which serves as the initial defense mechanism of the host against foreign invaders and harmful chemicals. The classical symptoms of inflammation, including redness, discomfort, swelling, and heat, have been recognized by humanity for centuries. [1].

Inflammation is observed in individuals with bacterial, viral, fungal, or parasitic infections, anaphylaxis, environmental diseases (such as smoke inhalation or asbestos exposure), rheumatoid arthritis, gout, autoimmune diseases, intestinal diseases, endocrinological or autoimmune diseases, and chronic diseases like diabetes (as described in any textbook on internal medicine) [2].

The primary stages of an inflammatory cascade include the commencement of the reaction, advancement, and conclusion, subsequently leading to the resolution of inflammation. Past research has revealed a connection between inflammation and the advancement of certain prevalent diseases in humans. In the majority of these cases, inflammation has been identified as a primary factor in the promotion and exacerbation of an existing disease. The user's text is "[3]."

Rubia cordifolia, often known as Manjistha, is a plant species.

Researchers worldwide are still drawn to doing studies on the ethnobotanical and ethno-pharmacological aspects of Rubia cordifolia. Rubia cordifolia, often known as Manjistha or Indian madder, is a significant medicinal plant that may be found growing at elevations of up to 3500 meters. Rubiae Radix, which consists of dried roots from the

Rubia cordifolia plant of the Rubiaceae family, is known for its abundant anthraquinones. These compounds are responsible for the plant's traditional, phytochemical, and pharmacological properties. Currently, there is a high demand for clinical studies on herbal formulations and their commercial preparations due to their superior safety and effectiveness, with few or no adverse effects. This review provides a concise overview of the concept of discovering novel strategies for treating cardiac diseases, building upon prior studies conducted on this particular plant [4].

Rubia cordifolia Linn., commonly referred to as 'Indian Madder', is its popular name. Roots have long been utilized for their anti-inflammatory, astringent, tonic, antiseptic, deobstruent, antidysenteric, and blood purifying properties. It is a crucial component in numerous ayurvedic formulations. The roots possess natural red pigment and exhibit high efficacy in blood purification. Chemical components such as anthraquinones, iridoid glycoside, naphthoic acid esters, bicyclic hexapeptides, and triterpenes have been separated and identified from Rubia cordifolia Linn. This review article specifically examines the phytochemical, pharmacological, and other significant elements of manjishtha [5-6].

Herbs and their mixtures have a lengthy history of being utilized in the treatment of human ailments. Herbal extracts have been widely recognized as a valuable and beneficial source of novel medications [7].

Acacia arabica is the scientific name for a specific species of tree.

The utilization of herbal medications for the prevention and treatment of many health conditions has been in existence since ancient times. Acacia arabica has demonstrated efficacy in treating various diseases, including diabetes, skin diseases, and notably, cancer [8].

Acacia arabica is a commonly chosen tree for decorative purposes along roads or pathways. Babool, also known as Acacia nilotica, is a widely used medicinal plant in India. It has been utilized in the Indian System of Medicine for centuries to prevent and treat numerous health conditions. The efficacy of Acacia arabica bark has been documented in treating a range of disorders. The tannin percentage in bark exhibits significant variation, ranging from 12% to 20%. Various polyphenolic substances have been discovered in the bark. The stem bark undergoes phytochemical screenings which indicate the presence of terpenoids, alkaloids, saponins, and glycosides [9].

The present study investigates the anti-inflammatory potential of herbal formulation Hemoclean-H.

Table 1: Composition of Hemoclean- H Tablet

Sr. No.	Ingredient	Latin name	Part of plant	Quantity
1	Majeeth	Rubia cordifolia	Root	240 mg
2	Babool Gond	Acacia arabica	Niryas	10 mg

2. Materials & Methods

Animals

Albino rats (150-250 gm. Each) of either sex kept under standard environmental conditions (25±2ºC under 12 h light & 12 h dark cycles) in polypropylene cages. Standard pelleted feed & drinking water were provided ad libitum throughout the experimental period. The animals were acclimated to laboratory conditions one week prior to the initiation of experimental work. The protocol was approved by the Ethics committee & the CPCSEA under the no.- IAEC/CPCSEA-385.

3. Anti-inflammatory Studies

Carrageenan induced hind paw oedema

The animals were divided into four groups of six animals each and were fasted for a period of 24 h prior to the study. Group 1 was treated as control, Group 2 received indomethacin 10mg./kg/ml. suspended in 1% sodium carboxymethyl cellulose. Group 3 and 4 were treated with 20 and 40 mg./kg/ml. of ethanolic extracts of formulation suspended in Tween 80/ ethanol / saline (1:1:10). Oedema was induced by injecting 0.1 ml. of a 1% solution of carrageenan in saline into the subplantar region of the right hind paw of the rats. The vehicle, extracts and the standard drugs were administered 60 min. prior to the injection of the phlogestic agent. The volumes of oedema of the injected and the contralateral paws were measured at 1, 2, 3, 4, 5 h after the induction of inflammation using a plethysomgraph to calculate the percentage of paw oedema inhibition11.

4. Evaluation of Anti-inflammatory Activity

Determination of Inhibition of Paw oedema

The percentage inhibition of rat paw oedema was calculated and compared with that of standard indomethacin. Indomethacin produced a 76.79% inhibition of paw oedema when observed after 3 hours of carrageenan injection. The alcoholic extract (high dose) of *Rubia cordifolia* and *Acacia arabica* significantly inhibited the paw oedema 39.13% inhibition when compared to the saline group after three hours of carrageenan injection. In case of (Low dose) of alcoholic extract of *Rubia cordifolia* and *Acacia arabica*, which gave a 29.01% inhibition of paw oedema, however they didn't attain the statistically significant value compared to saline treated group.

5. Statistical Analysis

The values are expressed as mean ± S.E.M. Statistical Analysis was performed using ANOVA (one way) followed by Student's t-test $p < 0.05$ was considered to be significant or we can say that the values are significantly different from the control or saline group at $P < 0.05$.

6. Results & Discussion

The herbal formulation has been tested for their possible anti-inflammatory activity in Albino rats of four groups, each group containing six animals of either sex weighing between 150-250 gm. The first group received saline which served as control. The second group was given standard NSAID indomethacin drug (10mg./kg./ml/) orally, which served as standard anti-inflammatory agent. The third & fourth groups received the low dose (20mg./kg./ml.) and high dose (40mg./kg./ml.) of alcoholic extract suspension of test drug Rubia cordifolia respectively, orally. The percentage inhibition of rat paw oedema was calculated and compared with that of standard indomethacin. Indomethacin produced a 76.79% inhibition of paw oedema when observed after 3 hours of carrageenan injection. The alcoholic extract (high dose) of Rubia cordifolia significantly inhibited the paw oedema 39.13% inhibition when compared to the saline group after 3 hours of carrageenan injection.

7. Conclusion

It is concluded that herbal formulation possess significant anti-inflammatory activity against experimentally induced paw oedema in rats. This may be due to the presence of reported active Phytoconstituents & their influence on the prostaglandins pathway. Further research, to isolate anti-inflammatory principle & exact mechanism involved, is needed.

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