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PHYTOCHEMICAL ANALYSIS AND ANTI-INFLAMMATORY ACTIVITY OF THE EXTRACT OF ANNONA SQUAMOSA

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ABSTRACT

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This article presents the anti-inflammatory activities of natural products. Many review articles were published in this regard; Moreover, this review pinpoints some interesting traditionally used medicinal plants that were not investigated yet. The egg white was used to induce rat paw inflammation, with inadequate references to explain its mechanism. Its contained protein was identified as an allergen was suspected to trigger an inflammatory reaction. This research was aimed to evaluate the use of egg white as an inflammatory inductor in inflammation animal models through edema profile and histological change. Male Wistar rats were divided into three groups, which were given fresh takes of the hen's egg white, and sterile saline solution. Edema was induced by subcutaneous injection of 0.1 ml of (1%), egg white, and sterile saline solution as the control in the hind paw of rats. Paw volume was measured before and then at 1, 2, 3, 4, 5, 6, and 24 h after the inductor injection. The data were analyzed by one-way ANOVA followed by TURKEY test. The results of the study showed that the egg white could induce rat paw inflammation. Edema formation began in the 1st h and reached the peaks in the 2nd h after the subcutaneous injection of egg white. Egg white was potential as an edema inductor for animal models of inflammation for the evaluation of new drugs or natural product with anti-inflammation activity. The plant extract at a dose level of 300 mg/kg was used as a test drug showed a significant anti-inflammatory activity when compared to that of the standard drug indomethacin.

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INTRODUCTION:

Nature always stands as golden mark to exemplify the outstanding phenomena of symbiosis. Nature serves humans with medicines which were used to maintain health,

to treat and heal many ailments. For the treatment of human diseases basic products from Natural products like plant, animal and minerals were used [1]. Medicinal plants are of great importance to the health of individuals

and communities. Medicinal plants has a potential source of therapeutic aid has attended a significant role in health system all over the world for both human and animals not only in the diseased condition but also has potential material for maintaining proper health [2]. Man ever since his first appearance on earth, has used plant throughout his historical development as a source of medicines. Herbal medicine is a triumph of popular therapeutic diversity [3]. The world is now moving towards the herbal medicine or system, which can then properly fight foreign invaders, and help to destroy offending pathogens without toxic side effects [4]. The world health organization in the early 1970's had encouraged government to effectively utilize local knowledge of herbal medicines for disease prevention and health promotion [5]. WHO has showed great interest in documenting the use of medicinal plants used by tribal's from different parts of the world [6]. The plant kingdom still holds many species of plants containing substances of medicinal values, which have yet to be discovered. We are all aware that India is one of the richest sources of medicinal plants. Interest in medicinal plants has increased enormously over the last two decades. The use of modern isolation techniques and pharmacological testing procedures means that new plant drugs usually find their way into medicine as purified substances rather than in the form of galenical preparations. For these new drugs it is important that the pharmacist, rather than be fully conversant with the macroscopically and histological characters of

the dried plant, is able to carry out the chromatographic and other procedures necessary for the identification and determination of purity of the preparation supplied. The plants used in the traditional system of medicine of India and China as now receiving much scientific attention [7]. The main aim of present research work was focused on determination of anti-inflammatory activities of the methanolic extract of the flowers of *Annona squamosa* by use of egg white as an inflammatory inductor in inflammation animal models through edema profile and histological change.

MATERIALS AND METHODS:

PLANT MATERIALS:

Annona squamosa is one of the most economically and ecologically important tree species in arid and semi-arid zones of the world. *Annona squamosa* belongs to the family Annonaceae and it having 44 species of which 40 are native to the Americas, three to Asia and one to Africa. The tropical Andean region is home to six species and eight species are found in the texas area, seven of them being endemic [8]. These species are having the several properties such as soil binders, sand stabilizers, as well as its ability to grow in the poorest soils. The tree is believed to have existed in the Vanni and Mannar regions for a long time [9]. In the western extent of its range in Ecuador and Peru, *Annona squamosa* readily hybridizes with *Prosopispallida* and can be difficult to distinguish from this similar species or their interspecific hybrid strains [10].



Fig.No.1: Plant of *Annona squamosa* with flowers

RESULTS AND DISCUSSION

The various chemical agents that are present in it show the medicinal value that may alters certain physiological actions in the human body. The several biochemicals present in the plant are terpenes, alkaloids, flavonoids and phenolic compounds. Terpenes are used as insecticides and their pharmacological properties include antibacterial, antifungal, anthelmintic, antimalarial and molluscicidal [11]. Extracts of *Annona squamosa* flowers and leaves have several *in vitro* pharmacological effects such as anti-bacterial, anti-fungal and anti-inflammatory properties.

Since it is a main source of fuel for both urban and rural poor in the country, this plant provides more than 90% of the fuel wood in some Indian villages because *Annona squamosa* wood has excellent burning qualities. Thus, it is called wooden anthracite. It also has high calorific value. The wood obtained from this plant doesn't need storage and drying process [12].

Preparation of Plant Extract: We have collected methanolic extract of *Annona squamosa* through Soxhlet apparatus by hot continuous extraction method. The use of commercially available Soxhlet apparatus is a convenient way to prepare crude plant extract. The dried and powered drug was packed [13]. Soxhlet apparatus is an automatic, continuous

method that does not require further manipulation. This method is not time-consuming, as, for a standard-sized sample (50 g), extraction time is 48 h. The yield of methanolic extract was 9.52%. The extract was stored in refrigerator until further studies [14].

Drugs: Loperamide, castor oil, acetic acid (ASES Chemical Works, Jodhpur), and Sodium chloride (ASES Chemical Works).

Procurement of Animals: Male Wistar rats weighing (100–150 g) were obtained. They were housed in ventilated cages and fed with a normal pellet diet and water ad libitum [15]. All experiments were in agreement with ethical guidelines for investigations of experimental plant in conscious animal. Research protocol was approved by the Institutional Animal Ethics Committee.

ANTI-INFLAMMATORY ACTIVITY:

The anti-inflammatory potential of the methanolic extract of flowers of *Annona squamosa* was investigated using egg white induced hind paw edema method. The results of methanolic extract of flowers of *Annona squamosa* in egg white induced hind paw edema were presented in table. The results revealed that the methanolic extract of flowers of *Annona squamosa* at 300Mg/kg exhibited 55.80% inhibition; while indomethacin showed 56.09%.

Table 1: Anti-inflammatory activity of methanolic extract of flowers of *Annona squamosa* against egg white induced paw oedema in albino Wistar rats.

Treatment	% Increase in paw volume Mean \pm S.E (n = 6) Post insult time of assay (min)					% Inhibition in paw vol.
	0	60	120	180	240	
Control	19.53 \pm 1.20	81.83 \pm 5.22	88.93 \pm 3.92	95.20 \pm 7.7	99.03 \pm 7.21	-
MEVN (300 mg/kg ⁻¹)	19.28 \pm 0.83	70.38 \pm 4.73	63.2 \pm 2.50	58.8* \pm 3.83	55.8 \pm 2.81	55.8 \pm 2.81
Indomethacin (4 mg/kg)	14.2 \pm 0.88	33.5 \pm 1.83	38.9 \pm 2.81	41.8* \pm 3.2	58.82 \pm 2.90	56.09

*p < 0.001 Vs Control by student's 't' test. MEAS: Methanolic extract of flowers of *Annona squamosa*

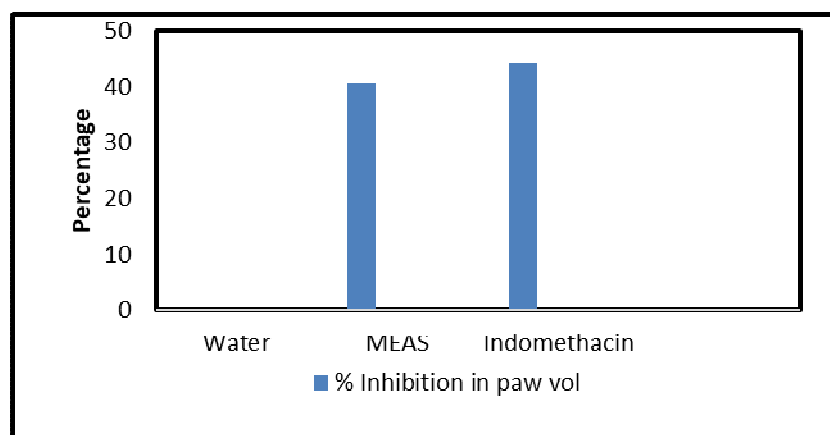


Fig.No. 2: Representation of Percentage of protection of methanolic extract of Flowers of *Annona squamosa*

DISCUSSION

Egg white was content allergens protein, was suspected to contribute to edema formation. However, egg white contained proteins with unique pro- and/or anti-inflammatory properties, and therefore need further research to determine the protein fraction that plays a role as an edema inductor is necessary. The results of the study showed that the egg white could induce edema of the rat's paw. Edema formation began in the 1st h and reached the peaks in the 2nd h after the subcutaneous injection of egg white. Possible mechanism of egg white induced edema mediated by released histamine and serotonin. The previous study has shown that the peak of edema in rat's paw has occurred in 1 h after an injection of histamine, During the acute inflammatory response, histamine and serotonin were the main mediators that caused the increased vascular permeability and edema formation. The plant showed the decrease in the edema formation and this was compared with that of the standard drug indomethacin which reduced the release of the local neurotransmitters.

CONCLUSION:

Traditional medicines as natural therapeutic remedies have been used in all over the world for thousands of years, and it is widely accepted that multiple constituents are responsible for their efficacy. This experimental result indicated that MEAS anti-inflammatory effects, and usage is safe. These

pharmacological activities provide pharmacological evidence for the folk use of for treatment *Annona squamosa* screening of flowers of indicates the presence of steroids, triterpenoids, flavonoids, tannins, reducing sugar and saponins. The steroids, alkaloids and triterpenoids present in the extract may be responsible for this anti-oedematous effect. Thus, further work is essential to fractionate, purify and identify the active principle(s) pre-setting this extract, as well as to understand the precise mechanism of action in anti-inflammatory activities by the methanolic extract of flowers of *Annona squamosa*.

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