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Pharmaceutical Sciences **Research Article……!!!**

ANTI-INFLAMMATORY ACTIVITY OF *CASSIA AURICULATA* BY CARRAGEENAN INDUCED PAW EDEMA IN RATS

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KEYWORDS:

Carrageenam, *Cassia auriculata*, Paw edema, Anti-inflammatory, Indomethacin.

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ABSTRACT

Inflammation serves to destroy, dilute, or wall off the injurious agent and the tissue cells that may have been destroyed later. The second factor of the inflammatory response sets into motion. It is complex series of events, which helps to heal and reconstitute the damaged tissue. Repair begins during the active phase of inflammation, but reaches completion usually after the injurious influence has been neutralized. Destroyed cells and tissues are repaired thereby. Both inflammation and repair generally serve useful purpose. Without inflammation, bacterial infections would remain unencountered, wounds would never heal, and injured tissues and organs might be permanently defected. But inflammation may be potentially harmful. Inflammatory reactions underlie the genesis of crippling rheumatoid arthritis, life threatening sensitivity reaction and some forms of fatal glomerular diseases.

INTRODUCTION:

Inflammation is a complex process, which is frequently associated with pain and involves occurrences such as: the increase of vascular permeability, increase of protein denaturation and membrane alteration. Protein denaturation id a process which proteins lose their tertiary structure and secondary structure by application of external stress or compound, such as strong acid or base, a concentrated inorganic salt, an organic solvent or heart. Most biological proteins lose their biological functions when denatured (1,2). Denaturation of protein is a well documented cause of inflammation. As part of the investigation on the mechanism of the anti-inflammatory activity, ability of plant extract to inhibit protein denaturation was studied (3).

Traditionally leaf extracts has benn used to treat various ailments such as joint pain, head ache, arthritis, fever and has got antimicrobial and antifungal properties (4,5,6). The traditional uses show that the plant is a good candidate for antioxidant related activity such as anti-inflammatory. This is leading as to the requirements of anti-inflammatory activity studies.

MATERIALS AND METHODS:

The experiment was carried out by male wister albino rats weighting (150-175g) and were procured form the small animals breeding statio, mannuthy, kerala, india. The animals were housed under standard conditions of temperature (23 ± 1^0C), trlssyibr humifity (55 ± 1^0 C), 12 h/ 12 h light/dark cycle and fed with standard pellet diet (Pranav Agro Industries Ltd., Sangli, India) and water *ad libitum.* Animals described as tested were deprived of food for atleast 18 h. and allowed free access to water. All the experimental procedures and protocols used in the study were received by the institutional animal ethics committee (Reg.No.ML-EA-CPCSEA/01-2013/05) and were in accordance with the guidelines of the CPCSEA.

SAMPLE PREPARATION:

Coarse powder form the shade dried plant material was exhaustively extracted with ethanol to yield a dark greenish semisolid residue. The dried extract was dissolved in distilled water right before use.

EXPERIMENTAL DESIGN:

GROUP-I : Served as a control which received vehicle (1% CMC, 1ml kg^{-1} , P.O.) only.

GROUP-II : Served as negative control(only carrageenan)

GROUP-III : Served as standard which received indomethacin(10 mg kg-1, P.O.).

GROUP-IV : Served as test sample which received ethanolic leaf extract of 200 mg kg-1 P.O of *Cassia auriculata.*

GROUP –V : Served as test sample which received ethanolic leaf extract of 400 mg kg-1 P.O. of *Cassia auriculata.*

CARRAGEENAN-INDUCED PAW EDEMA IN RATS:

Group II and Group I received control vehicle orally. Group III received Indomethacin (10 mg kg^{-1} PO) and group IV and V animals received the proteases (1.1%) along with plant extract *Cassia auriculata* 200mg and 400mg respectively. After 30min, the rats were challenged with subcutaneous injection of 0.1ml of 1% w/v solution of carrageenan into the sub planter region of left paw. The paw was marked with ink at the level of lateral malleolus and immersed in mercury up to the mark.

The paw volume used measured at 1,2,3,4,5 and 6h after carrageenan injection using digital plethysmometer. The difference between initial and sub sequent reading gave the actuval edeama volume.

RESULTS AND DISCUSSION:

Inflammation is a complex patho-physiological response to different stimuli. The inflammatory process involves the activity of inflammatory mediators such as neutrophil derived free radical reactive oxygen species (ROS), Nitric oxide (NO), prostaglandins and cytokines (8). This over production leads to tissue injury by damaging macromolecules. Lipid peroxidation of membrane and tissue damage play important role in pathogenesis of many inflammatory diseases. Thus the free radicals are important mediators that provoke or sustain inflammatory process and consequently, their neutralization by antioxidants and radical scavengers can attenuate inflammation (9). (Table-1)

During the course of inflammatory response, large amount of no formed by nitric oxide synthase (inos) in activated macrophages surpass the physiological amount of no, which are usually made by neuronal form of NOS (n NOS) or constitutive form of NOS (e NOS), these NO ntirosylates macromolecule. It also causes increased vaseular permeability, vaso dilation, tissue, and endothelial damage leads to inflammation (10,11).

Table 1: Anti inflammatory activity ethanolic leaf extract of *Cassia auriculata* leaf[a]

Hours	Control	Standard		*Cassia auriculata*			
				200mg kg^{-1}b.w.p.o		400mg kg^{-1}b.w.p.o	
		Mean	% Inhibition	Mean	% Inhibition	Mean	% Inhibition
1	0.680^{e} ± 0.11062073	0.3583333^{a}± 0.2138613	47.30	0.6266667^{f}± 0.2674073	7.84	0.5066667^{d} ± 0.1512173	25.49
2	1.000^{d}± 0.139714	0.3433333^{b}± 0.2752938	65.67	0.8916667^{c}± 0.3204632	10.83	0.655^{a}± 0.2286263	34.50
3	0.988333^{f}± 0.2426864	0.2533333^{c}± 0.2009643	74.37	0.845^{e}± 0.1298845	14.50	0.563333^{c}± 0.1448677	43.00
4	1.421667^{b}± 0.2133933	0.120^{d}± 0.1479189	91.56	1.193333^{a}± 0.229405	160.06	0.5816667^{b} ±0.1894642	59.09
5	1.421667^{a}± 0.3286588	0.07166667^{e}± 0.06369197	94.96	1.148333^{b}± 0.1491867	19.23	0.4383333^{e}± 0.1509194	67.76
6	1.121667^{c}± 0.244983	0.03333333^{f}± 0.02503331	97.03	0.8766667^{d}± 0.2667333	21.84	0.2666667± 0.1672922	76.20

[a] Values are expressed as mean ± SD for 6 animals (n=6) significant at $p<0.05$ level.

One way ANOVA followed by Duncan's Multiple Range Test

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