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Research Paper

Anti inflammatory activity of *Cynodon dactylon* Linn. In carrageenan induced paw edema in rats and its comparison with some standard flavonoids

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The aim of present investigation is to evaluate Anti-inflammatory activity of hydroalcohol extract of whole plant of *Cynodon dactylon* Linn. In carrageenan induced paw edema in rats. Treatment with *Cynodon dactylon* hydro alcohol extract at two different dose 200 mg/kg and 400 mg/kg and its comparison with standard drug diclofenac sodium at dose of 12.5 mg/kg and some flavonoids i.e. quercertin, kaempferol and epicatichin each at dose of 100mg/kg after induction of inflammation by carrageenan 1% solution at dose of 10 mg/kg , caused significant produce inflammation in rats hind paw It is furthermore *Cynodon dactylon* at dose of 200mg/kg and 400mg/kg shows more significant result than some of standard flavonoids. Thus, whole plant of *Cynodon dactylon* Linn. may have potential anti inflammatory activity.

Key words: *Cynodon dactylon*, Carrageenan, Flavonoids, Anti-inflammatory.

INTRODUCTION

Inflammation is complex reaction to injurious agents such as microbes and damaged, usually necrotic cells that consist of vascular responses, migration and activation of leukocytes and systemic reactions[1]. Acute Inflammation is a short term process, usually appearing with in a few minutes or hours and ceasing upon the removal of the injurious stimulus[1]. It is characterized by five cardinal signes[1]. Rubor (redness), calor (increased heat), tumor (swelling), dolor (pain) and function laesa (loss of function).

Due to variety of pharmacological activites in the mammalian body, flavonoids are referred as nutraceuticals[2]. Flavonoids are defined as a food or part of food that provide medical or health benefits, including the prevention and treatment of diseases[2]. Over 8,000 flavonoids have been identified many of which occurs in fruits, vegetables and beverages. Flavonoids perform many functions for the plant, such as providing taste, smell, colors and protection against microbes and insects[2]. They have been reported to have antiviral, antiallergic, antidiabetic, antiplatalets, anti-inflammatory, antitumor, hepatoprotective, antiulcer and antioxidant activities[3]. Due to obscure etiology, short term efficacy and limiting contraindications and side effects of

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available drugs, the treatment is not satisfactory and thus there is a demand for search of new and safer ones[4]. Raw material cultivation and processing is environmental friendly

A large section of world's population relies on traditional remedies to treat a plethora. Medicinal herbs are an indispensable part of traditional medicine practiced all over the world due to low costs, easy access and ancestral experience[5].

*Cynodon dactylo*n Linn. belonging to family Gramineae/Poaceae commonly known as doob, durwa or bermuda grass. Leaf, roots and the rhizomes of the plantshave been used in folk medicine of different countries as anti-inflammatory, anticystitis, antihypertensive, antihysteria, antigonorrheal infection, antiviral as well as hypolipidemic, hypoglycaemic agent.[6,7,8,9].

Doob grass is valuable herbal medicine and used as first aid for minor injuries[10].Farmers traditionally apply crushed leaves to minor wounds as a styptic to stop bleeding [11].

MATERIAL AND METHOD

Male or female Wistar albino rats-with a body weight between 175 to 225 g are used. The animals are starved overnight. To insure uniform hydration, the rats receive 5 ml of water by stomach tube (controls) or the test drug dissolved or suspended in the same volume. Thirty minutes later, the rats are challenged by a subcutaneous injection of 0.1 ml of 1% solution of carrageenan into the plantar side of the right hind paw[12]. The paw is marked with ink at the level of the lateral malleolus and immersed in mercury up to this mark. The paw volume is measured by using plethysmograph immediately after injection, and procedure was repeated at 1, 2, 3, 4, hours after carrageenan injection. Rats were divided into eight groups containing six rats each.

Group I

Rats were given only vehicle (only water)

Group II

Rats were given carrageenan (0.1 ml of 1% mg /kg, bw, p.o.)

Group III

Animal were given carrageenan (0.1 ml of 1% mg /kg, bw, p.o.) single dose plus drug diclofenac (12.5 mg/kg bw, p.o.)

Group IV

Rats were given carrageenan (0.1 ml of 1% mg /kg, bw, p.o.) Plus drug Quercertin (100 mg/ kg/ day, bw, p.o.)

Group V

Rats were given carrageenan (0.1 ml of 1% mg /kg, bw, p.o.) Plus drug kampferol (100 mg/ kg/ day, bw, p.o.)

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Table-1: Effect of flavonoids, extracts on Carrageenan induced paw edema (% of edema inhibition) of rats

Group	Treatment	Dose (mg/kg)	Normal	0 Hr.	1 Hr.	2 Hrs.	3 Hrs.	4 Hrs.
I	Normal	Vehicle	3.45 ± 0.07	3.46 ± 0.07	3.45 ± 0.07	3.45 ± 0.06	3.45 ± 0.05	3.40 ± 0.05
II	Only carrageen	10	3.43 ± 0.05	3.95 ± 0.06^{++}	4.56 ± 0.08^{++}	5.25 ± 0.07^{+++}	5.46 ± 0.06^{+++}	5.28 ± 0.06^{+++}
III	Carrageen + Diclofenac	12.5	3.48 ± 0.04	3.83 ± 0.04	4.13 ± 0.06**	3.61 ± 0.07**	3.45 ± 0.04**	3.41 ± 0.06** (54.83%)
IV	Carrageen + Quercetin	100	3.35 ± 0.06	3.83 ± 0.06	4.15 ± 0.06*	3.71 ± 0.07**	3.53 ± 0.06**	3.36 ± 0.04** (57.14%)
V	Carrageen + Kaempferol	100	3.30 ± 0.05	3.83 ± 0.08	4.18 ± 0.06*	3.78 ± 0.09**	3.60 ± 0.05**	3.36 ± 0.05** (57.14%)
VI	Carrageen + Epicatechin	100	3.38 ± 0.06	3.76 ± 0.08	4.21 ± 0.13*	3.96 ± 0.08**	3.68 ± 0.06**	3.43 ± 0.06** (53.93%)
VII	Carrageen + *Cynodon dactylon*	200	3.35 ± 0.08	3.81 ± 0.07	4.25 ± 0.07^{NS}	4.00 ± 0.06**	3.81 ± 0.07**	3.48 ± 0.07** (51.72%)
VIII	Carrageen + *Cynodon dactylon*	400	3.36 ± 0.07	3.86 ± 0.07	4.18 ± 0.07*	3.86 ± 0.06**	3.58 ± 0.07**	3.38 ± 0.06** (57.61%)

All values are represented as Mean ± SEM (n=6); values in parentheses are represents percentage of inhibition
P Value : +++ <0.001; ++ <0.01; + <0.05 When compared with control untreated animals.
*** <0.001; ** <0.01; * <0.05 When compared with glucose treated model.

Group VI

Animal were given carrageenan (0.1 ml of 1% mg /kg, bw, p.o.) Plus drug Epicatchin (100 mg/ kg/ day, bw, p.o.)

Group VII

Rats were given carrageenan (0.1 ml of 1% mg /kg, bw, p.o.) Plus drug *Cynodon dactylon* Linn. (200 mg/ kg/ day, bw, p.o.)

Group VIII

Rats were given carrageenan (0.1 ml of 1% mg /kg, bw, p.o.) Plus drug *Cynodon dactylon* Linn. (400 mg/ kg/ day, bw, p.o.)

RESULT AND DISCUSSION

The tested extract of Cynodon dactylon and flavonoids significantly reduce the increase in hind paw edma induced by carrageenan, with effects starting from 1 h except Cynodon dactylon-200 start from 2 h and lasting for 4 h. at the end of 4 h Cynodon dactylon at dose of 200 mg/kg shows 51.72% inhibition and at dose of 400 mg/kg its showed inhibition 57.61% which is higher than standard diclofenac (54.83%) and other tested flavonoids Quercertin showed inhibiton at dose of 100mg/kg was 57.14% which is less than Cynodon dactylon 4000mg/kg dose effect .

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