Ancient Science of Life Vol. No 17(4) April 1998 pages 300 - 304

ANTI – INFLAMMATORY ACTIVITY OF VOLATILE OIL OF PSIDIUM GUAJAVA

S. KAVIMANI, R. ILANGO AND T. VETRICHELVAN
Department of Pharmacology, Periyar College of pharmaceutical sciences, Trichy – 21, Tamil Nadu

Received: 1 September, 1996 **Accepted: 14 May, 1997**

Abstract: *Volatile oil of psidium guajava leaves obtained by steam distillation was given orally to study its effects on the exudation and proliferative phases of the inflammatory reaction, using te technique of carragenin induced paw edema and cotton pellets in male albino rats. The anti inflammatory activity as compared with ketorolac tromethamine. In carragenin induced edemas,. 0.8ml/kg of the volatile oil ad anti-inflammatory activity as that of ketorolac tromethamine. The oil was also found to be potent in cotton pellet granuom studies. Preliminary investigation revealed that the volatile oil fraction consist sesqueterpene which may be responsible for its anti inflammatory activity.*

INTRODUCTION

The methanolic fraction of the chloroform extract of unripe fruits of *Psidium guajava* have been reported for its anti-inflammatory activity[1]. Potentiation of pentobarbitone induced sleeping time, potent analgesic effect against acetic acid induced writhing and profound reduction in body temperature, residual curiosity and exploratory behavior were considerable decreased. It was found to posses significant antidiarrhoeal activity[2]. Volatile oil isolated from the leaves was rich in sesqueterpenes components3. We investigated the effect of volatile oil of *Psidium guajava* leaves in different phases of inflammation.

MATERIALS AND METHODS

Volatile oil was extracted from the fresh leaves *Psidium guajava* by steam distillation. This oil was used after emulsifying in Gum acacia (5%) for oral administration. Male albino rats weighing between 150-200 gm and bred in King Institute Guindy, Madras were selected for the studies. Anti-inflammatory activity was studied by carragenin induced rat hind paw edemas and cotton pellet granuloma methods.

Carrageenin – Induced Edema

The rats were divided into 5 groups, each group consisting of 10 animals. One group served as negative control (received 5% Gum acacia soln. 5ml/kg). Second group served as positive control (Received Ketorolac tremethamine 10mg/kg) while the other groups received essential oil in different doses of 0.2, 0.4 & 0.8ml.kg orally. Edema was produced by the method described by winter et al[4]. The paw volume was measured 0hr & 3hr after the injection of carrageenin. The apparatus used for the measurement of rat paw volume was that of Buttle et al, modified by Singh & Ghosh[5].

Cotton Pellet Granuloma

After shaving off the fur on the back, the rats were anesthetized with pentobarbitone

(30mg/kg). Through a single middle incision on the dorsal surface, sterilized preweighed cotton pettets were implanted in both axillae and groins according to the methods of *D'Arch et al* slight modification[6]. The drugs were administered daily usually for10 days (0 to 9 days). On t 10th day the pellets were dissected out and dried at 60°C and the dry weight was obtained.

Granuloma weight was obtained by deducting the weight of the cotton pellets on "0" day (ie before start f the experiment) from the weight of t cotton pellet on 9th day (ie, at end of the experiment).

RESULTS

Carrageenin – Induced Edema

Table I shows the effect of drug treatment on carrageenin induced edema. The results were analysed by analysis of variance[7]. Edema suppressant effect of 0.8ml/kg of the oil was 44.01 ± 10.16 which was near equivalent to that of 10ml/kg of ketorolac tromethamine is 5.16 ±10.47. The edema suppressant effect was significant ($P<0.05$) in all dose levels except 0.2ml/kg when compared to control.

Cotton Pellet Test

Table II shows the effect of drug treatment on the mean weights of cotton pellet. The oil at both the dose levels (0.4ml & 0.8ml/kg) inhibited the granuloma tissue formation sowing significant dose-proportionate inhibitor effect on the granuloma weight. The inhibitory effect of oil at the dos level of 0.8ml/kg body weight was found to be similar to that of ketorolac tromethamine 10mg/kg.

DISCUSSION

Carrageenin induced paw edema was taken as a prototype of exudative phase of inflammation. The development of edema has been described as biphasic[8]. The initial phase is attributable to the release of histamin, serotonin, and kinin in the first hour after injection of careening. A more pronounced second phase is related to the release of prostaglandins like substance in 2-3 ours. The significant anti inflammatory effect of oil or *P. guajava* leaves which contains sesquiterpene seems to be related to its histaminic, Kinin and prostaglandins inhibitor effect.

In the cotton pellet granuloma model, inflammation and granuloma develops during a period of several days. This model is the indiction for the proliferative phase of inflammation. Inflammation involves proliferation of macrophages, neutrophils and fibroblasts, which are basic sources for granuloma formation. So, the decrease in granuloma weight indicates the suppression of proliferation phase which was effectively inhibited by *P. guajava* leaf oils.

Table No. I
Effect of volatile oil of *P. guaiava* on Carrageenin induced paw edema

SI.No	Drugs	Dose ml/kg Body weight	Increase in Paw Volume after 3 hrs Mean ± SEM	% Decrease in paw volume Mean ± SEM	P. values	
					Vs Control	Vs Different doses
1	Control 5% Gum acacia	5ml/kg of body wt	0.334 ± 0.00321			
2	Ketorolac Tromethamine	10mg/kg	0.162 ± 0.0301	51.6 10.47	P<0.05*	NS
3	Oil	0.2ml/kg	0.226 ± 0.0511	32.34 ± 9.87	P<0.05	NS
4	Oil	0.4ml/kg	0.208 ± 0.0232	37.72 ± 9.12	P<0.05	NS
5	Oil	0.8ml/kg	0.187 ± 0.0161	44.01 ± 10.10	P<0.05	NS

* Significant difference NS Non Significant

Table No. II
Effect of volatile oil of *P. guaiava* on gramuloma method

SI. No	Drugs	Dose	Granulation weight in mg Mean ± SEM	% Ingranulation weight Mean ± SEM	P. values	
					Vs Control	Vs Different doses
1	Control 5% Gum acacia	5ml/kg of body wt	309 ± 6.522			
2	Ketorolac Tromethamine	10mg/kg	167.18 ± 2.8	45.9 ± 2.1	P< 0.05*	
4	Oil	0.4ml/kg	202.30 ± 4.52	34.53 ± 3.3	P< 0.05*	
5	Oil	0.8ml/kg	187 ± 1.61	44.01 ± 3.1	P< 0.05*	

* Significant difference

REFERENCE:

1. Das A., Sec T., Dutta A.S., Nag Chaudhuri A.K., Indian Journal of Pharmaceutical sciences 56 (4), 163 (1994).

2. Ghosh T.K., Das A., Dutta A.S., Nagchaudhuri A.K., Phytotherapy research 7(6), 431 (1993)

3. Sagrero. M. Bartley, J.P., Provissclwede A., Flower and fragrance Journal 9(3), 135 (1994).

4. Winter C.A., Risley E.A., Nuss G.W., Proc. Soc Exp Biol 111, 544 (1962).

5. Singh, H, and Ghosh M.N. J. Pharm, Pharmacol., 20, 316 (1968).

6. D'Arcy P.D., Howard E.M., Muggleton P.W., and Town send S.B., J. Pharm Pharmacol, 1960, 12, 659.

7. Armitage P., Statistical method in medical research Blackwell scientific publication, 217 (1971).

8. Vinegar, R., Truax J.F., and selph S.L., fed Proc, 23, 267 (1971).