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Anticough Activity of Psidium Guajava L. (Myrtaceae) Leaf Extract in Ayurveda

Sanjay

Director Ankur High School

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ABSTRACT

The anticough activity of Psidium guajava L. (MYRTACEAE) leaf extract was evaluated in animal modules rat. The results showed that water extract of leaves at doses of 2 and 5 gm/kg decreased the frequency of cough induced by capsaicin aerosol by 35% and 54% respectively, as compared to the control within 10 minutes at injection of the extract, (P<0.01). However, the anticough activity is less potent than that of 3 mg / kg dextromethorphan which decreased frequently of cough by 78% (P<0.01). An experiment on isolated rat tracheal muscle showed that the extract directly stimulated muscle contraction. This effect was antagonized by an atropine. These results suggest that guava leaf extract is well-suited for the treatment of cough.

INTRODUCTION

The *Psidium guajava* Linn. (MYRTACEAE) is a much-branched moderate - sized tree, with dropping branches. The plant parts are used as raw material by the pharmaceutical companies to prepare drug for prevention and treatment of scurvy in African countries (Watt and Branehwizk, 1969; CSIR 1969). Its leaf juice possessed hypoglycemic activity in both mice and human beings (Cheng and Yang, 1983). In addition, guava leaves have been used to treat many ailments including cough and pulmonary diseases (Batick, 1984). The foliage leaf extract is used in India as a remedy against cough (Khan and Ahmad, 1985). In Mexico, its leaf extract is extensively used to stop diarrhea, with quercetin and glycosides to be the active ingredients (Lozoya *et al.* 1994). In this study, the leaf extract of *Psidium quaja*va has been investigated for pharmacological activities i.e anticough effect.

MATERIALS AND METHODS

Fresh leaves of *Psidium guajava* were collected and thoroughly washed, air dried for 1 hour and cut into pieces. After grinding in a blender in distilled water (= Leaves 1 kg + 650 ml water), the extract was filtered twice through filter paper, with the aid of suction pump. The obtained filterate was lyophilized and the dry extract was kept in an air tight bottle for further use. Prior to the experiment, the extract was redissolved in distilled water to the desired closes.

The water extract was prepared by heating the powder with water (1:10) at 50°C overnight, filtered twice and lyophilized. The methanol and chloroform extract was prepared by maceration (powder 1 : solvent 10) for 7 days. The macerated product was then filtered, evaporated in a Rotavapor and the dry extract was kept in an air tight bottle.

- Cough induction by capsaicin :

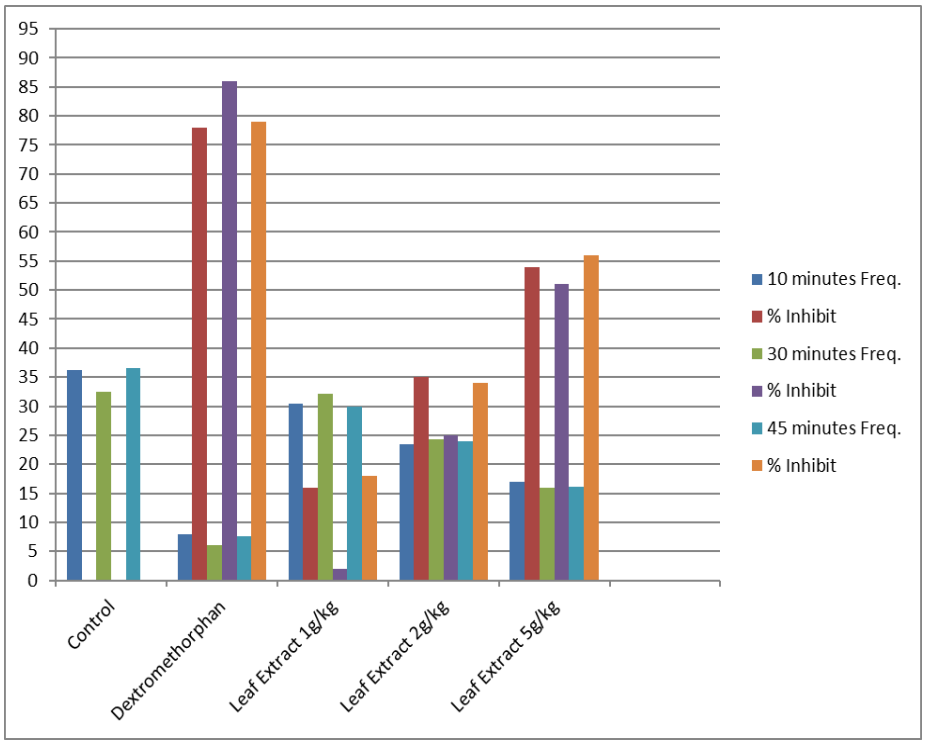
The capsaicin was dissolved in a mixture of 10% ethanol and 10% Tween 80 before further dilution with distilled water before use. To induce cough, each mice was exposed to capsaicin aerosol with the aid of ultrasonic nebulizer for 3 minutes. Each mice was intraperitoneally injected with pentobarbital at a subthreshold dose of 25 mg / kg for rat. The rats were then placed individually in a closed box and the chest was wrapped with penrose tubing connection with recorder via the volumetric pressure transducer for recording frequency of breathing and or coughing .

RESULTS AND DISCUSSIONS

Water extract of *Psidium guajava* leaf decreased the frequency of cough in rats (Table : 1) and after 10 minutes cough induction, the effect was more pronounced in rats receiving 5 gm / kg than in those receiving 2 gm / kg. which are significantly different from the control group ($P < 0.01$). The extract at a dose of 5 mg / Kg suppressed cough induced by capsaicin by 54% while dextromethorphan, used as reference antitussive, suppressed cough by 78% percentage cough inhibition by dextromethorphan was fairly consistent from 10 minutes till 60 minutes after injection while inhibition by the extract increased with respect to time after the injection table -1.

Table-1: Showing effect of leaf extract on the frequency of cough induced by capsaicin in rats.

Group	10 minutes		30 minutes		45 minutes	
	Freq.	% Inhib.	Freq.	% Inhib.	Freq.	% Inhib.
	36.3±4.1	0	32.5±2.5	0	36.5±4.4	0
Dextromethorphan	8.0±2.2	78	6.1±1.5	86	7.6±2.7	79
Guava leaf extract 1 g / Kg	30.4±0.5	16	32.2±0.8	2	29.9±1.9	18
2 g / Kg	23.5±1.4	35	24.3±2.8	25	24.0±2.9	34
5 g / Kg	16.9±1.7	54	16.0±1.0	51	16.1±0.9	56



Our results showed a marked anticough activity of 5 mg / Kg P. O. water extract, although the effect was less potent than that of 3 mg / Kg dextromethorphan. This may be due to several factors : the intrinsic anticough activity of dextromethorphan could be higher than that of the extract of *Psidium guajava* . In addition, it is known that the potency of dextromethorphan as an antitussive is enhanced by anaesthetic drugs (Kase, 1968) Guava leaf extract contains the flavonoid quercetin and some of its glycoside derivatives which have been hydrolyzed in the gastrointestinal tract before it can exert its activity to stop diarrhoea (Lozoya *et al*. 1994). Its mode of action in the treatment of diarrhoea could by partly due to relaxation of the smooth muscle of the gastrointestinal tract (Lutterodt, 1989).

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