In-vitro anti- inflammatory activity of aqueous extract of leaves of *Plectranthus amboinicus* (Lour.) Spreng

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Abstract: *Aqueous extract of leaves of Plectranthus amboinicus (lour.) Spreng, which is traditionally used in the treatment of cough and cold was screened for its anti- inflammatory activity by HRBC membrane stabilization model. Aqueous extract (500 mcg/ml) showed significant anti-inflammatory activity as compared to that of hydrocortisone sodium.*

Key words: *Plectranthus amboinicus (Lour.) Spreng, aqueous extract, anti- inflammatory, HRBC membrane stabilization.*

INTRODUCTION

Plectranthus amboinicus (lour.) Spreng (Lamiaceae) is a large succulint aromatic perennial herb. Much branched fleshy, highly aromatic pubescent herb with distinctive smelling leaves. It is known as patharcur in Hindi, Karpuravalli in Tamil, Sugandhavalkam in Telugu, Karpurahalli in Kannada, Kannikkurkka in Malayalam and Karpooravalli in sanskrit. The plant is distributed throughout in India.[1,2]

The leaves have reported to used in cough, cold, tonsillitis, catarrh and fever[3, 4.] The plant is used as whole in the indigenous systems of medicine as a carminative, diuretic and anthelmintic. It overcomes diseases due to kapha and vata, cures poisonous affection and stimulates the functions of liver[2]. Salvigenin, cirsimaritin, chrysoeriol, 6-methoxy genkwanin, quercetin, luteolin, apigenin, terpinolene,α-pinene, β-pinene, carvacrol have been reported[5,6,7].

The work on chemical composition of the leaves revealed the presence of flavonoids. Since many flavonoids have remarkable anti-inflammatory activity. The present work aims at evaluating the anti- inflammatory activity of *P.amboinicus* by HRBC membrane stabilization method.

MATERIALS AND METHODS

Plant material

Plectranthus amboinicus (Lour.) Spreng fresh leaves were collected from veppampalayam village, Erode District, TamilNadu, India in the month of January 2007. The plant was identified by local people of that village and authenticated by G.V.S Murthy, Joint Director, Botanical Survey of India, Coimbatore (No. BSI/SC/23/07-08/Tech-704). A herbarium specimen of the plant was preserved in the Department of Pharmacognosy of our Institute for further reference.

Preparation of leaf extracts

The fresh leaves of *Plectranthus amboinicus (L) Spreng* were washed with water, air-dried at room temperature and then reduced to coarse powder. The powdered mass of leaf was macerated separately with water in a closed flask for 24 hours. It was frequently shaken for the first 6 hours and allowed to stand for 18 hours. Thereafter it was filtered rapidly, the filtrate was evaporated to dryness in tarred flat bottomed shallow dish, dried at 105°C and weighed.

IN-VITRO SCREENING FOR ANTI-INFLAMMATORY ACTIVITY

The HRBC membrane stabilization has been used as a method to study the anti-inflammatory activity of aqueous extract of *Plectranthus amboinicus (lour.) Spreng*[8, 9, 10]. Human blood was purchased and mixed with equal volume of sterilized Alsever solution. Alsever solution contains dextrose, sodium citrate, sodium chloride in water.

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TABLE NO:1

In -vitro Anti-Inflammatory activity of the Aqueous extract of the leaves of *P.amboiinicus*

S.no	Concentration of drug (mcg/ml)	Standard (Hydrocortisone sodium)		Test (Aqueous extract of *P.amboinicus*)	
		Optical density at 560 mm	% protection	Optical density at 560 nm	% protection
1	control	1.236	-	1.236	-
2	100	0.422	65.86	0.635	48.63
3	200	0.398	67.8	0.602	51.3
4	300	0.342	72.34	0.59	52.27
5	400	0.297	75.98	0.551	55.43
6	500	0.283	77.11	0.487	60.6

The blood was centrifuged and the packed cells were washed with isosaline and 10% v/v suspension was made with Isosaline. The drug samples were prepared by suspending the residues in hot water. The assay mixture contained the drug, 1 ml phosphate buffer, 2 ml hyposaline, 0.5 ml HRBC suspension, hydrocortisone sodium was used as the reference drug. Instead of hyposaline 2 ml of distilled water used in the control. All the assay mixture were incubated at 37^0C for 30 minutes and centrifuged. The hemoglobin content in the supernated solution was estimated using spectrophotometer at 560nm. The percentage hemolysis was calculated by assuming the hemolysis produced in the presence of distilled water as 100 %.

The percentage of HRBC membrane stabilization was calculated using the formula,

$$\text{Percentage protection} = \frac{100 \text{ Optical density of drug treated sample}}{\text{Optical density of control}} X100$$

RESULTS AND DISCUSSION

The in-vitro anti-inflammatory activity was carried out and results are recorded in Table No.1. From the results it was observed that the standard hydrocortisone sodium has the percentage protection of 65.86, 67.80, 72.34, 75.98, 77.11 and the aqueous extract has 48.63, 51.30, 52.27, 55.43 and 60.66 for 100 mcg/ml, 200 mcg/ml, 300 mcg/ml, 400 mcg/ml and 500mcg/ml respectively. It indicates that aqueous extract (500mcg/ml) shows maximum anti-inflammatory activity and was comparable to standard drug hydrocortisone sodium.

The lysosomal enzymes released during inflammation produce a variety of disorders. The extra cellular activity of these enzymes is said to be related to acute (or) chronic inflammation. The NSAIDS act either by inhibiting these lysosomal enzymes or by stabilizing the lysosomal membranes.

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