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Antitumour Activity of Poochendurappattai in Albino Rats in Albino Rats

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ABSTRACT: *The water extract of poochendurappattai was screened for antitumour activity at the doss of 5mg, 10mg, 20mg and 50 mg/kg body weight in rats against methylcholanthrene induced fibrosarcoma. There was 63% regression in the tumour weight at the doses of 10mg and 20 mg/kg body weight. This antitumour activity may be due to compounds like royaleanones since royaleanones are known to possess anticancer activity. Te phytochemical investigation of poochendurappattai revealed the presence of royaleanones.*

INTRODUCTION

Poochendurappattai (Plectranthes urtricifolius Hook .f) of the Labiatae is used in the preparation of Arakkutthailam, a Siddha medicine. It is a compound preparation involving 24 ingredients and is used in the treatment of blood diseases, body aches, head ache, asthma, gum inflammation, cough and all types of fevers[1.]

The phytochemical investigation of poochendurappattai revealed 7 – α acetoxy 6 β- hydroxyl royaleanones, 6β,7α dihydroxy royaleanones, 6,7 – dihydro royaleanones, n-octacosanol, compesterol, betulinic acid and oleanolic acid[2].

The antipyretic and anti-inflammatory activity of poochendurappattai is reported[3,4.] The antitumour activity was screened in albinorats and the results are discussed.

MATERIALS AND METHODS

Poochendurappattai was collected from Kodaikanal in Tamil Nadu. About 10g of coarsely powdered bark was boiled in 50 ml of water for half an hour. The extract was filtered and dried on a water bath. The dried mass was reddish brown in colour and the yield was 9.6% The dried extract was suspended in normal saline to given a drug concentration of 20 mg/ml.

ANTITUMOUR SCREENING

Male rats of Wistar strain weighting 150 g to 200g were selected from the Institute's animal colony. Rats bearing methyl cholanthrene induced fibrosarcoma were obtained form the cancer Institute, Madras and maintained in our institute by periodical transfer into rats. 0.5ml of 10% saline suspension of minced tumour fragments was injected into the axillary region.

The transplanted tumour took about a week to become palpable, continued to grow upto

the end of second week after which necrosis developed and the animal died at the end of 4 to 5 weeks.

The tumour bearing animals were divided into five groups of ten rats in each group. The first group served as control and received the vehicle alone while the 2nd . 3rd 4th and 5th groups were injected 5mg, 10mg, 20mg and 50mg/kg body weight respectively of poochendurappattai extract into the tumour site from the 5th day of tumour transplantation upto the 20th day.

The antitumour activity was ascertained by comparison of tumour weight between the drug treated animals and of the control animals as reported earlier[5] with modifications as follows.

The tumour weight was recorded on the 12th, 15th and 20th days. The subcutaneous tumour is considered to be an ellipsoid with one long axis and two short axes. The two short axes were assumed to be equal, the longest diameter (length) and shortest diameter (width) were measured with vernier calipers. Mass in gram was calculated by multiplying the length (cm) of tumour by width (cm) squared and dividing the product by 2. percentage of regression of tumour was calculated as follows[6].

$$= 100 \times \frac{WC-WD}{WC}$$

WC= Average tumour weight of control group

WD= Average tumour weight of drug treated group

RESULTS AND DISCUSSION

The anti tumour activity of Poochendurappattai is shown in Table 1. The 5mg dose showed mild activity on the 12th day but there was no activity on the 20th day. The doses of 10 mg and 20 mg caused 64% and 74% regression respectively on 12th day while on the 20th day both these dose levels showed only 63% activity. There was no activity at 50mg dose level.

The perceptible regression in the first 12 days observed at the dose level of 5mg/kg body weight could be explained as the result of drug action on the developing tumour. But this concentration was probably insufficient to inhibit the growth of tumour when it started activity multiplying. The absence of activity at 50mg dose may be due to high concentration of drug which in not permeable into the tumour.

Table -1
Percentage of Regression of Fibrosarcoma at different periods on treatment with Poochendurappattai at different doses

Dose Mg/kg body wt.	Tumour weight (g) (Days)				% Tumour regression (Days)			
	12	15	18	20	12	15	18	20
Control	1.121	3.233	7.345	12.364	-	-	-	-
5	0.767	3.30	8.39	17.87	31.5	-	-	-
10	0.402	1.350	2.74	4.55	64.13	58.24	62.24	63.19
20	0.239	1.171	2.742	4.573	74.21	63.77	62.66	63.01
50	1.453	3.83	10.5	15.8	-	-	-	-

The antitumour activity of the Poochendurappattai may be due to the royleanones content of the drug because royleanones are reported to possess anticancer activity[7].

There are a number of compounds inhibiting the growth of animal and or human tumours. The mechanison of action of several of these compounds is not definitely established but the may be functioning as antimetabolites[8].

The synthesis of potential anti metabolites as placed an important role in many branches of chemotherapy. Many antimetabolites have proved to be of advantage in the treatment of certain cancers, bacterial, fungal and protozoal infections, Te majority of these agents act at intermediate stages in the formation of ribonucleotides or they prevent the methylation of deoxy ribonucleic acid to thymidylic acid. These are certain antimetabolites which can prevent the incorporation of deoxynibonucleotides into DNA by inhibiting DNA polymerase.

Poochendurappattai may also be acting as antimetabolite thereby causing the reduction in the tumour weight.

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