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ANALGESIC ACTIVITY OF THE ROOTS OF *BALIOSPORMUM MONTANUM LINN*

S. NAYAK*, AMAN SAHAI*, AND A. K. SINGHAI **
***** VNS Institute of Pharmacy, VNS Campus, Neelbud, Bhopal (M.P)
** Department of Pharmaceutical Sciences, Dr. H.S. group Vishwavidyalaya, Sagar (M.P).

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ABSTRACT: The ethanolic extract and its chloroform soluble and chloroform insoluble fractions of the roots of *Baliospermum montanum* were investigated in albino rats to evaluate the analgesic activity. Tailo – flick animal model was employed to test analgesic activity and compaired with a standard drug, Diclofenac sodium. The results indicate that the ethanolic extract and its chloroform soluble fraction are significantly effective ($p<0.05$) with respect to standard. The activity was found to be dose dependant. Results of present study justify the folklore use of *B.montanum* as analgesic drug.

Keywords: Baliospermum montanum, Analgesic activity, Danti.

INTRODUCTION

Baliospermum montanum (Willd)[1], commonly known as Danti or Dantimul usually monoecious under-shrub is found almost throughout India. It belongs to family Euphorbiaceae; the leaves are small, lanceolate, ovate, palmately lobed, petioles with a pair of stipular glands. Bark is light brown in colour, fracture difficult. The flowers are small, green in colour, in axillary recemes or panicles. Seeds are oblong, smooth and shiny about 0.6 – 0.8 cm long. The roots are black in colour with thick bark; dried roots vary from 0.6 – 3.8 cm in diameter. The plant is common in shady place and often reproduces by root suckers[2-3].

The plant is reported to use for the treatment of abdominal tumours and cancer. The leaves are purgative, and also used for dropsy and poulticing wounds. The powdered seeds are used as purgative. In large doses they act as an acronarcotic poison. They are used as stimulant and rubefacient, externally. Seed oil resembles croton oil and is a powerful hydragouge. It is also applied in rheumatism as a counter initant. In Ayurveda roots are used as pungent, heating, diuretic, antihelmenthic and found to be useful in piles, wounds, skin diseases and enlarged spleen. It is used as thermogenic purgative, diaphoretic, rubefacient, febrifuge and tonic. It is also administered in jaundice, dropsy and found to be useful for stones. Ethanolic extract of the roots exhibited good activity against p.388 Lymphocytic leukemia, in *vivo.*

Seed oil of B.montanam[4-5-6] contains a new hydroxyl fatty acid, axillarnic acid as a minor component of the oil. Ethanolic extract of the roots shown the presence of five new pherbol esters-montanin (0.018%), baliospermin (0.003%), 12-deoxyphorbol 13-plmitate, (0.021%), 12-deoxy-16-hydroxypherbol 13-palmitate (0.001%) and 12 deoxy s-8-

hydroxyphorbol 13-myristate (6.007%). Leaves contain 8-sitosterol 8-D-glucoside and hexacosanol. The presence of steroids, terpoids and flavanoids is also reported from the plant[7-9].

The plant *Baliospermum montanum* is well reputed in Ayurvedic system of medicine to treat various ailments. It's latex is used by local tribals of Andhra Pradesh for the body ache and pain of joints and in the treatment of some common diseases. Present investigation was carried out to justify its uses in traditional system of medicine.

MATERIALS AND METHODS:

Plant Material:

The plant *Baliospermum montanum* was collected from Tilli village of Sagar district (M.P) in the month of February. The collected plant was identified from the Department of Botany, Dr. H.S. Gour University, Sagar. The roots were separated from the plant, washed, dried in shade and crushed into coarse powder.

Extraction and fractionation[-10]:

Powdered drug was subjected to defatting with petroleum ether ($40\text{-}60^0$) in a soxhlet apparatus, after complete defatting, defatted material was air dried and extracted with ethanol (95%) in a soxhlet apparatus, for about 40 – 45 cycles to get ethanolic extract. Excess of solvent was removed by distillation under reduced pressure and air dried in a desiccator. Thus obtained ethanolic extract was weighed (yield 10.22% w/w) and stored in an air tight container.

Ethanolic extract (10 gms) was refluxed in a round bottom flask with chloroform, thrice. Complete refluxing gave rise to chloroform soluble (yield 37.5% w/w) and chloroform insoluble (62.5% w/w) fractions of the ethanolic extract.

ANALGESIC ACTIVITY[11-12] :

Analgesic activity of ehtanolic extract and its chloroform soluble and insoluble fraction was carried using albino rats as test animal. Albino rats (Sprage dwaley) of either sex (weight 140.50g) were divided in seven groups (I-VII) each consisting of six animals. All the animals were housed in standard environmental condition pellet diet and water ad-libitum.

Preparation and administration of doses:

To assay the analgesic activity of test drug all the doses were prepared in 1% carboxyl methyl cellulose (CMC) and administered orally using oral cannula fitted with a 5 ml syringe. Group I was kept as control with CMC 1 ml, Ethanolic extract was administered to group II orally, while chloroform soluble fraction and insoluble fraction were administered to Group V and Group VI in the dose of 25 mg/kg body weight. Standard drug Diclofenac sodium was administered to the group VII in 20 mg/kg body wt.

To observe the analgesic activity by tail flick method the reaction time was recorded at 0 hr before the administration of doses. Then the test drug ethanolic extract (50,100 and 200 mg/kg), its chloroform soluble and insoluble fraction (50 mg/kg) and standard drug (Diclofenac sodium) was administered to respective group, again the reaction time was recorded at 1,2 and 3 hours. The percent analgesic activity was calculated by following formula-

% Analgesic activity (AA)-

$AA\ (\%) = T_2/T_1 \times 100$

Where T_1 is the reaction time(s) before treatment T_2 is reaction time(s) after treatment.

Results were expressed as mean ± SD. The significance of difference was determined by student't' test ($p<0.05$).

RESULTS AND DISCUSSION:

The results of present studies to observe analgesic activity of the ethanolic extract and its chloroform soluble and insoluble fraction of the roots of *Baliospermum montanum* are presented in table-1, Fig.1. From the results it can be concluded that the ethanolic extract is significantly effective in the doses of 100 mg/kg body weight and 200 mg/kg body weight when compared with standard Diclofenac sodium 20 mg/kg body weight. The activity of these extracts were found to be 217.23%, 253.73% and 297.87% ($p<0.05$), respectively, while ethanolic extract in 50 mg/kg have shown less activity i.e 225.04%, 202.91% after one and two hours. Results of these finding suggests the ethanolic extract is significantly ($p<0.05$) effective, and the activity is found to be dependent.

Chloroform soluble fraction shown 256.28% and 284.24% activity in 25 mg/kg orally after 1 hr 2 hrs after the administration of drug. The result were shown significant activity ($p<0.5$) when compared with standard group while chloroform insoluble fraction have not shown significant activity in the dose of 25 mg/kg. Results clearly indicate the chloroform soluble fraction is having significantly potent ($p<0.05$) analgesic activity. Decrease in activity was observed after three hours in every groups.

Diclofenac sodium inhibits PG synthesis resulting the formation of pain introducing substance; bradykinin is also suggested to play an important role in the pain process[13]. B.*montanum* contains a number of active constituents including, steroids, terpenoids and flavanoids. It may be correlated that the analgesic activity may be due to one or presence of either combined effect of some of these compounds in tail flick animal model. Indigenous drug systems can be a good source of variety of new drug which can provide relief to pain but their claimed reputation in ancient and folk system has to be verified on a scientific basis. In some cases indigenous drugs may be the only answer. The present study revealed that the plant *B.montanum* has a significant analgesic activity in tail flick analgesic activity animal model.

These results tend to substantiate the folklore use of this plant for analgesic activity. Further research work is needed to know the detailed mechanisms of action and for the drug development.

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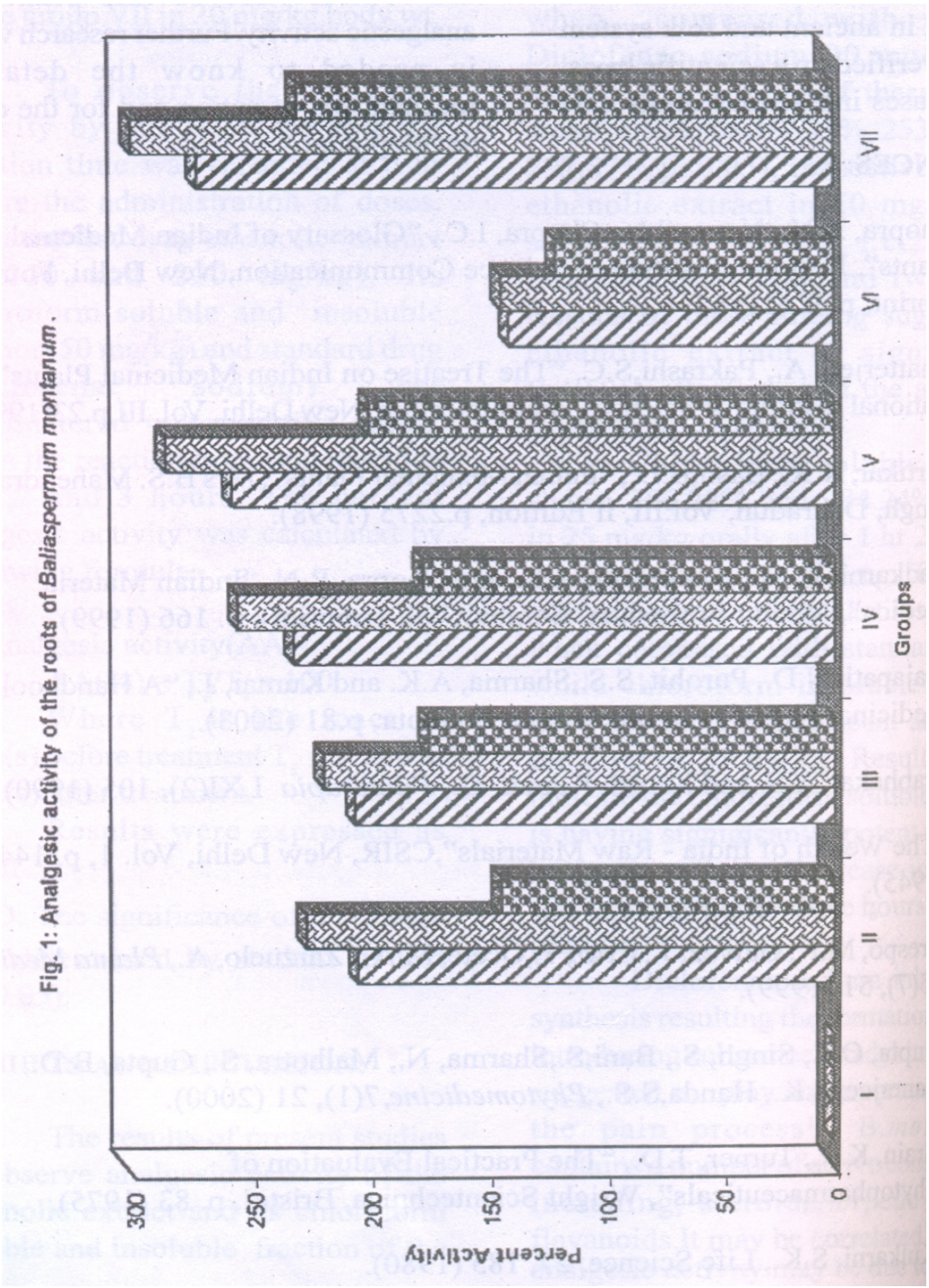

Fig. 1: Analgesic activity of the roots of *Baliaspermum montanum*.

Table 1: Analgesic activity of the roots of *Baliospermum montanum*.

S. No.	Groups	Dose mg/kg bw	Reaction Time in Seconds ± SD						
			0hr	1hr	% Activity	2hr	% Activity	3hr	% Activity
1	Control I	1 % CMC 2 ml	6.16 ± 0.937	6.48 ± 0.407	-	6.14 ± 0.242	-	6.25 ± 0.388	-
2	Ethanolic extract II	50 mg	5.83 ± 0.152	1.83 ± 0.752	202.91	13.12 ± 0.239*	225.04	9.26 ± 0.06	142.46
3	Ethanolic extract III	100 mg	6.50 ± 0.547	13.25 ± 0.270	203.84*	14.12 ± 0.241*	217.23	11.23 ± 0.044*	172.76
4	Ethanolic extract IV	200 mg	6.83 ± 0.283	15.72 ± 0.270*	230.16*	17.33 ± 0.243*	253.73*	11.96 ± 0.024	175.10
5	Chlorofom soluble fraction V	25 mg	5.32 ± 0.408	14.66 ± 0.225*	256.28*	15.25 ± 0.120*	284.24*	10.34 ± 0.168	197.74
6	Chlorofom insoluble fraction VI	25 mg	6.16 ± 0.552	8.56 ± 0.137	138.28	8.72 ± 0.392	141.55	7.28 ± 0.076	118.18
7	Standard Diclofenacr sodium VII	20 mg	5.64 ± 0.408	15.25 ± 0.246	270.39*	16.80 ± 0.178*	297.87*	12.86 ± 0.056	228.01

*$p<0.05$, Significant as compared to control, n = 6