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Anti-diarrhoeal and cardiotonic activity of extracts of *Elephantopus scaber* linn in experimental animals.

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ABSTRACT

The present investigation was carried out to evaluate the antidiarrhoeal activities of *Euphorbia indica* Linn. Dried aerial parts of extracts of *Elephantopus scaber* Linn was extracted withy petroleum ether, benzene, chloroform and ethyl acetate using Soxhlet apparatus. All extracts were screened for its anti-diarrhoeal activity, by using Gastrointestinal motility test method. The percentage inhibition and percentage activity were determined and compared with standard Atropine sulphate. The ethyl acetate extract showed significant antidiarrhoeal activity compared with other extracts. The petroleum ether extract showed significant cardio tonic activity on the hypodyanamic frog heart.

Keywords – Anti- diarrhoeal activity, Cardio tonic, Activity, *Elephantopus scaber*

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INTRODUCTION

Elephantopus scaber Linn, Family *Compositae*, Geographial source throughout the warmer parts of India, tropical Asia, Australia and America. The whole plant used as Cardiotonic, astringent, febrifuge, diuretic, antidote for snakebite, Root used as antiodotalgic, anti emetic , Leaf used in ulcers, eczema, Root and leaf emollient, anti-diarrhoeal, in dysuria and other urethral complaints, swelling or pain in stomach. Erect, 15-38cmHigh, root stock short, giving off many stout fibrous roots, stem usually dichotomously branched, strigose, with appressed white hairs. Leaves mostly radical, 12.5-20 by 3.8-5,7cm.,forming a spreading rosette on the ground, obovate oblong, rounded or subacute, coarsely serrate-dentate, more or less hairy on both surface, base tapering into an abscure petiole; main nerves numerous, prominent beneath, with reticulate veins between, cauline leaves smaller that the radical, sessile or nearly so. Heads numerous, sessile, closely packed, forming a large at and topped terminal inflorescence nearly 2.5cm across and surrounded at the base by large stiff broadly-ovate cordate conduplicate conspicuously nerved leafy bracts. Involucral bracts in 2 series enclosing 4 flowers, bracts of the outer row half as long as those of the inner, 1-nerved, bracts of inner row usually 3 (rarely 5)nerved, scaruious, linear, cuspidate. Corolla violet, exserted, tube long, slender, limb deeply cleft on one side, causing the 5- liner lobes to present a palmate appearance. Style much exserted, the arms recurved. Pappus white, 1-serrate, consisting of 5(rarely 4) rigid bristles dilated at the base [1-5].

MATERIALS AND METHODS

Plant material

The plant parts of *Elephantopus scaber* were collected from Madurai during May 2008. It was authenticated by Dr. Stephen, Department of Botany, The American College, Madurai-2.

Extraction procedure

The leaves of *Elephantopus scaber* Linn were dried in shade. Then the shade dried leaves were powdered to get coarse powder. About 600gm of dry powder was extracted first with the petroleum ether by continuous hot percolation using Soxhlet apparatus. The extraction was continued for 72 hors. The petroleum ether extract was filtered and concentrated to a dry mass by using vaccum distillation. A brownish black waxy residue was obtained (8.23gm). The marc left after the petroleum ether extract was taken and subsequently extracted with chloroform, which was then filtered and concentrated to a dry mass. A dark brown residue was obtained (5.6gm). The marc left after the chloroform extraction was taken and dried to get a dry mass and it was again extracted with ethyl acetate up to 72 hours in Soxhlet apparatus. The ethyl acetate extract was filtered. After concentrating the ethyl acetate extract, a brownish green residue was obtained (4.3). Finally the marc left after the ethyl acetate extraction was extracted with distilled water for 24 hours and filtered. The coloured filtrate was used for the examination.

Preliminary phytochemical screening

The qualitative chemical test of various extracts of *Elephantopus scaber* was carried out using standard procedure [6-9]. Carbohydrate, sterols, Coumarins, Flavonoids and Alkaloids are present in the extracts.

Anti-diarrhoreal activity [10, 11]

Gastrointestinal Motility Test

Preparation of charcoal meal

3% deactivated charcoal was prepared and it was transferred into a 10% aqueous tragacanth solution.

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Preparation of test solution

The leaves of *Elephantopus scaber* Linn were shade dried. These dried leaves were coarsely powdered an subsected to successive solvent extraction with pet.ether (60-80°C), chloroform and ethyl acetate in a Soxhlet apparatus. Those extract was vacuum dried and it was suspended with 1% SLS solution. This suspension was used as a test solution.

Method

Male albino rats weighing about 180-250gm were selected; then the animals were divided into three groups. The first group of animals (three animals) received 1% SLS solution (control) by oral route. The second group of animals (three animals) received the tropine sulphate 5g/kg by i.m route. The third group of animals (9animals) again divided into 3 sub groups each of 3 animals. In it each sub groups of animals received pet ether, chloroform, ethyl acetate extract respectively in the concentration of 500mg/kg.Half an hour after above treatment (vehicle, atropine sulphate and extract), individual rat was administered with 1ml of charcoal meal by oral route. Thirty minutes after this treatment, each rat was sacrificed and intestinal distance moved by the charcoal mean from pyrolus was measured to express as a percentage of distance from pyrolus to caecum. All the experimental data's available in the present study were statistically analyzed by student't' test. (Table 1)

Cardiotonic activity

Preparation of extracts: About 1gm of extracts were suspended in 1% SLS solution and filtered filtrate was used for the activity.

Method

Cruciform incision was made on the ventral side of the frog at the tip of the cruciform cartilage. Lateral incision was made from the tip of cruciform cartilage towards the root of upper limb. From this point medial incision was made towards the midline and a diamond shaped flap of cartilage was removed to expose the heart. The pericardium was cut and the heart was exposed out. A hook was passed through the apex of the ventricle and it was connected to the heart lever. The base of the heart was fixed and a Normal cardiogram was recorded at a medium speed. After recording normal cardiogram 0.1 ml of digoxine injected into the ventricle. Action of digoxine was recorded. After the pause of 15 minutes the following extracts (0.1ml) were administered with the time gap of 15 minutes between each extracts.(FIG 1) It was followed by petroleum ether extract, chloroform extract, ethyl acetate extract and their corresponding action has been recorded.

Statistical analysis [12-13]

This test is applied to assess the statistical significance of difference between two independently drawn sample means (unpaired means) obtained from two series of data with an assumption that the two means are from normally distributed populations, with no significant variations. The value of't' determined by following formula

$$t = \frac{X1-X2}{\sqrt{(SE_1)^2+(SE_2)^2}}$$

Where X1 abd X2 are the mean of the two set of data and SE1 and SE2 are the standard errors of the two means respectively. Higher the 't'value greater would be the chance of significant. It is related to the total number of observations. The comparable numbers are expressed as number of degrees of freedom (df) which is computed

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a s n1+n2-2. The p-value (probability) for a given‘t’ value against the appropriate degrees of freedom can be read from the table of‘t’ distribution. The p-value indicates whether the observed difference is the means is rationally significant or not.

RESULTS AND DISCUSSION

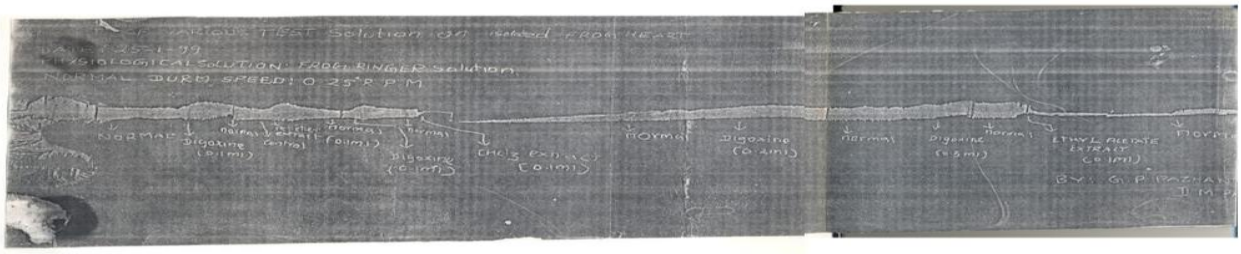
Preliminary Phytochemical screening of the extract showed the presence of alkaloids, coumarins, glycosides, flavonoids, sterols and tannins. Thus further work can be carried on the isolation procedure for finding out the exact moiety responsible for the biological activity. Diarrhoea results from an imbalance between the absorptive and secretory mechanisms in the intestinal tract, accompanied by hurry, resulting in an excess loss of fluid in the faeces. The pharmacological screening of petroleum ether, chloroform and ethylacetate extract showed anti-motility activity. The anti motility activity of ethylacetate extract was significant when compared with standard. The petroleum ether showed significant cardio tonic activity in isolated frog heart.

Table 1: Anti diahhoreal activity of *Elephantopus scaber*

Sl,No	Average body weight	Drug dose mg/kg	Mean% Movement of charcoal ±SEM
T1	185	--	87.5±1.71
T2	220	5mg/kg	26.3±0.673*
T3	200	500mg/kg	33.6±0.86*
T4	210	500mg/kg	42.6±1.02**
T5	200	500mg/kg	44.8±1.15**

T1 control, T2-Std, T3-ethyl acetate extract, T4-chloroform extract, T5-petether extract. Each rule represent mean ± SEM of at least for observations *p<0.05 and **p<0.5 compared to control treated group the ethyl acetate extract of *Elephantopus scaber* Linn has significant activity.

Fig 1 Cardiotonic activity



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