



PHYTOCHEMICAL AND ANTI-INFLAMMATORY STUDIES OF STEM EXTRACTS OF *SPHAERANTHUS INDICUS*

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ABSTRACT

Herbs are widely used as medicines. The stem extracts of *sphaeranthus indicus* show analgesic and anti-inflammatory activities as tested by Rat paw edema method with albino rats. These activities are due to the presence of alkaloids.

Key words : Phytochemical, Anti-inflammatory, *sphaeranthus indicus*

INTRODUCTION

In the forthcoming generation, the body will not respond to any type of drug as tolerance and resistance may develop with the regular use of synthetic drugs because of their resistance. But “Ayurvedic” medicine gives cure by stimulating our body to fight within a short duration i.e. less time consuming without any side effects. In the present times, the medical science is giving more preference to medicinal herbs. At present, WHO is showing more interest in the production, standardization and commercialization of herbal drugs.

EXPERIMENTAL

Materials and Methods

Soxhlet apparatus, petroleum ether LR, chloroform LR, ethanol LR and distilled water were used for the preliminary phytochemical studies.

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Preparation of extracts

Various extracts were prepared by using chloroform, ethanol and distilled water, the powdered drug (100 mg) was used in Soxhlet apparatus. Then the marc left after the petroleum ether extract was dried and extracted with chloroform. This procedure was followed by ethanol as well as aqueous extract.

Table 1. Extractive values

Solvent	Colour of the extract	Yield (%)
Petroleum ether	Dark brown	3.7422
Chloroform	Dark brown	2.5124
Ethanol	Dark brown	2.4620
Aqueous	Dark brown	2.2326

Phytochemical studies

The plants were cleaned thoroughly with running water and dried in shade. Then they were powdered and subjected to various chemical tests.

Table 2. Phytochemical screening of *sphaeranthus indicus*

Extract	Pet. ether	Chloroform	Ethanol	Aqueous
Sterols	+	+	+	+
Terpenoids	-	-	-	-
Carbohydrates	-	+	+	+
Flavanoids	-	+	-	-
Proteins	-	-	+	+
Alkaloids	-	-	-	-
Glycosides	-	-	-	-
Tannins	-	-	-	-
Saponins	-	-	+	-

Cont...

Ectract	Pet. ether	Chloroform	Ethanol	Aqueous
Phenolic compounds	-	-	+	+
Fixed oil fats	+	+	+	-

(+) Presence of constituents
 (-) Absence of constituents

Pharmacological studies

Analgesic activity was screened by Eddy's hot plate method with rats. It was determined by the basal reaction time. The time duration for the basal reaction response was calculated for standard as well as test dose treated animals. Animals were divided into 6 groups with six animals in each groups. All the drugs were administered after 30 minutes.

Group I	-	Control (Vehicle 1% Tween – 80)
Group II	-	Pentazocin (4 mg/kg)
Group III	-	Petroleum ether extract (100 mg/kg)
Group IV	-	Chloroform extract (100 mg/kg)
Group V	-	Aqueous extract (100 mg/kg)
Group VI	-	Ethanolic extract (100 mg/kg)

Anti-inflammatory activity was screened by carrageenin induced rat paw edema in wister albino rats. Diclofenac sodium was taken as a standard drug for the comparison of anti-inflammatory activity of various extracts. The animals are divided into 6 groups each consisting of 6 animals. First 4 groups received pet. ether, chloroform, ethanol and aqueous extracts at a dose level of 100 mg/kg. Group 5 received diclofenac sodium 75 mg/kg and group 6 received solvent 0.5% CMC. All drugs were administered orally after 30 mts. 1 % w/v solution of 1 % carrageenin was injected at a dose of 0.1 mL.

Statistical analysis

The data are expressed as mean \pm SEM and students "t" test was performed for the comparison and $p < 0.05$ was taken as significant.

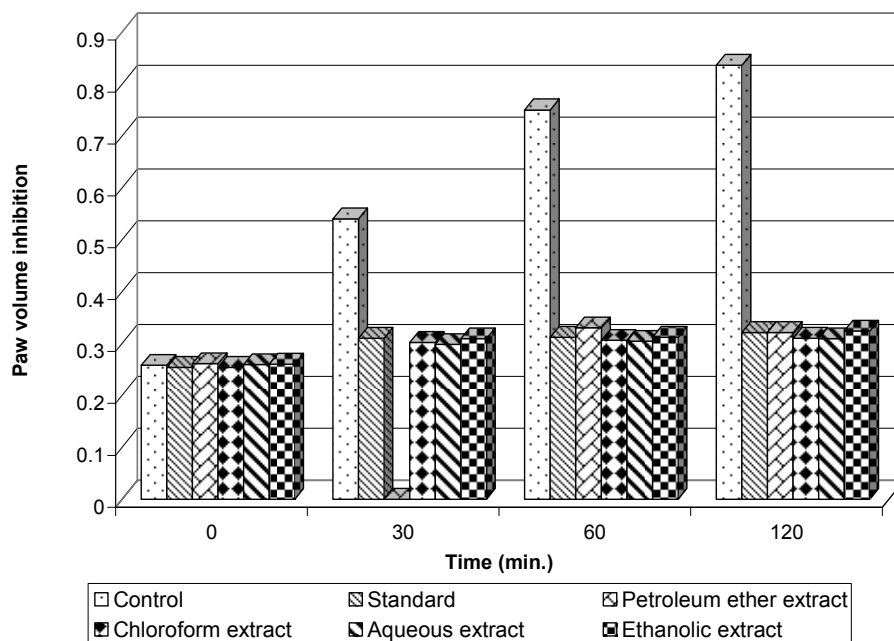


Fig. 1: Anti-inflammatory activity of *Sphaeranthus indicus* extracts in albino rats by Paw edema method

Analgesic activity by Eddy's hot plate method

Table 3. Study of analgesic activity of *sphaeranthus Indicus* extracts in mice (Swiss Albinomice) by hot plate method

Animal group	Drug + Dose	Reaction time in secons (± SEM and % of inhibition)			
		0 min	30 min	60 min	120 min
Control	Vehicle (15 Tween 80) 10 mL/100 gm	6.5 ± 0.005	7.1 ± 0.011	7.5 ± 0.012	7.2 ± 0.004
Standard	Pentazocin 4 mg/kg	5.2 ± 0.001	9.1 ± 0.012 42.22 %	22 ± 0.011 76.36 %	21 ± 0.001 75.23 %

Cont...

Animal group	Drug + Dose	Reaction time in seconds (\pm SEM and % of inhibition)			
		0 min	30 min	60 min	120 min
Petroleum Ether Extract	Extract 100 mg/kg	5.7 \pm 0.012	11.1 \pm 0.021 48.18 %	17.01 \pm 0.054 66.47 %	16 \pm 0.012 64.37 %
Chloroform Extract	Extract 100 mg/kg	6.5 \pm 0.011	15 \pm 0.002 56.66 %	22.1 \pm 0.001 74.45 %	19 \pm 0.051 65.78 %
Aqueous Extract	Extract 100 mg/kg	5.4 \pm 0.012	9.1 \pm 0.031 40.01 %	21.5 \pm 0.021 74.88 %	21.4 \pm 0.012 74.68 %
Ethanollic Extract	Extract 100 mg/kg	5.5 \pm 0.001	8.4 \pm 0.021 34.52 %	17.5 \pm 0.031 52.0 %	17 \pm 0.002 67.64 %

Anti-inflammatory activity by Paw edema method

Table 4. Anti-inflammatory activity of *sphaeranthus indicus* extracts in albino rats by paw edema method

Animal Group	Drug + Dose	Paw volume (mL) (\pm SEM and % of inhibition)			
		0 Min	30 Min	60 Min	120 Min
Control	Vehicle (15 tween 80) 10 mL/100 g	0.258 \pm 0.005	0.540 \pm 0.011	0.750 \pm 0.008	0.836 \pm 0.007
Standard	Diclofenac Sodium 4 mg/kg	0.254 \pm 0.012	0.310 \pm 0.001 42.59 %	0.312 \pm 0.002 58.40 %	0.321 \pm 0.012 61.60 %
Petroleum ether extract	Extract 100 mg/kg	0.261 \pm 0.01	0.31.1 \pm 0.012 42.40 %	0.330 \pm 0.005 56.0 %	0.321 \pm 0.012 61.60 %
Chloroform extract	Extract 100 mg/kg	0.254 \pm 0.001	0.302 \pm 0.012	0.306 \pm 0.011	0.310 \pm 0.005

Animal Group	Drug + Dose	Paw volume (mL) (\pm SEM and % of inhibition)			
		0 Min	30 Min	60 Min	120 Min
			44.07 %	59.20 %	62.91 %
Aqueous extract	Extract 100 mg/kg	0.259	0.298	0.304	0.309
		± 0.040	± 0.013	± 0.022	± 0.004
			44.81 %	59.46 %	63.03 %
Ethanollic extract	Extract 100 mg/kg	0.260	0.309	0.312	0.324
		± 0.001	± 0.015	± 0.011	± 0.014
			42.77 %	58.4 %	61.24 %

RESULTS AND DISCUSSION

This plant contains sterols, carbohydrates, flavanoids, proteins, alkaloids, tannins saponins, fat and oil, phenolic compounds as other chemical constituents. All extracts were used for analgesic and anti-inflammatory activities. Among the extracts, the aqueous extract has little more activity than other 3 extracts.

CONCLUSION

Our pharmacological studies (Both analgesic and anti-inflammatory studies substantiate the use of the plant extracts as an analgesic and anti-inflammatory agent. This may be due to the presence of alkaloids.

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