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Research Article

EVALUATION OF THE ANTIPYRETIC & ANALGESIC ACTIVITY OF AQUEOUS & CHLOROFORM EXTRACT OF PHYLLOSTACHYS BAMBUSOIDES LEAVES

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Abstract

The study was conducted to screen the antipyretic activity & analgesic activity of water & chloroform extract of the leaves of *Phyllostachys bambusoides*. Healthy rats weighing between 120-150 gm were divided into five groups five in each group. The initial temperature of each animal recorded with digital temperature. 15% suspension of Brewer's yeast in 0.9% saline is prepared .The animals are fevered by injection of 10 ml/kg of Brewer's yeast suspension subcutaneously in the back below the nape of the neck. The difference in temperature between 0 hr & respective time interval was found out by statistical method. The potency of both extract to bring down the temperature was compared with that of the control group. The extract exhibited marked analgesic effect by reduction of writhing induced acetic acid at a dose of 200 mg/kg orally .The inhibition of writhing was calculated in respective to control (vehicle). The test sample at a dose of 200mg/kg body weight of experimental animals where Diclofenac at a dose of 150 mg/kg body weight was used as a standard drug in this study.

Keywords: - Phyllostachys bambusoide, Brewer's yeast; Antipyretic, Analgesic

Introduction

Now it has very important to screen plant for its efficacy, Bamboo is a group of perennial evergreens in the true grass family Poaceae, subfamily Bambusoideae, tribe Bambuseae. Giant bamboos are the largest members of the grass family[1-2]. Phyllostachys genera belonging to bamboos, which are perennial grasses distributed widely in Asian countries including Korea, China and Japan. The bamboo leaves (Bambusae Folium) originating from Phyllostachys nigra var. henonis, P. bambusoides, Sasa borealis, S. kurilensis, and S. quelpaertensis have been used in traditional medicine for their anti-inflammatory, and diuretic properties. In addition, clinical use of bamboo leaves for treating hypertension, arteriosclerosis; cardiovascular disease and cancer have been described.

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Cellular damage by free radicals has been considered as one of the major factors in the development of age-related human diseases. Antioxidants are known to play an important role in preventing such diseases Several studies have been carried out to identify the antioxidants from bamboo leaves belonging to the genus Phyllostachys that could be associated with the traditionally known medicinal effects [3].

Traditional use of Bamboo leaves have long history as both food & medicine in China, which is recognized by Chinese ingredient such as flavones, phenolic acid , anthracene quinone, lactone, amylose, amino acid and trace elements, which have effects on anti-free-radicals, anti-oxidation, anti-aging, anti-fatigue, and anti-cancer, preventing cardio-cerebro-vascular diseases, protecting the liver, widening capillary vessels, smoothing micro-circulation, vitalizing the brain, improving memory and sleep, and improving the texture of skin. It is reported that at the Second International Natural Antioxidants Conference many experts from home and abroad reported on the effects of natural and biological flavones on controlling the toxicity brought by anti-cancer

medicine to the marrow and inhibition to the immune system, improving micro-circulation and platelet's function and preventing cardiac muscles of people with coronary heart diseases from bleeding [4]. Flavonoids in bamboo leaves, according to documents, around 20% of traditional Chinese herbs have flavonoids. Much research has shown that flavonoids possess a lot of biological vitalities, having obvious effect on antibiosis, diminishing inflammation, anti-mutation, reducing blood pressure, detoxicification, sedation, diuresis, anti-oxidation, and anti-cancer, preventing cancer and containing lipase [5]. Flavonoids can be obtained directly from food such as beans, oranges, onions and also be extracted from plants containing rich flavonoids, and made into various health foods and snacks [6].

Materal & Method

Plant material

The leaves of plant *Phyllostachys bambusoides* was collected from the field of Department of Silviculture, Nauni University, Solan. After collection of the plant, botanical identity was confirmed by Dr. R. Raina, qualified taxonomist from the Department of Forest Products, Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan (H.P.). Voucher specimens were deposited with the Herbarium at Nauni and are entered in the UHF-Herbarium Field book no. 12530.

Drying and powdering

The leaves are dried in shed for about two weeks. After drying leaves are powdered in a grinder, care should be taken that powder should not be very much fine. After drying it was stored in an air tight container to avoid moisture.

Acute toxicity & lethality test

S.No.	Dose of plant extract (mg/kg)	OBSERVATION	INFERENCE
I	200	00000	$LD_{50} \leq 2000$ mg/kg
II	500	00000	
III	750	00000	
IV	1000	00000	
V	2000	Toxicity	

TABLE 1: table showing results for acute toxicity studies.

The LD50 of the chloroform extract was determined in albino mice using the method of Lorke (1983) [7]. The acute studies revealed an oral LD50 greater than 2000 mg/kg.

Extraction

Aqueous & Chloroform Extract

The aqueous & chloroform extract of leaves of Phyllostachys bambusoides was prepared by the method of Soxhlet extraction.

Procedure

The sample (powder of Phyllostachys bambusoides 40gm.) was weighed and placed in the thimble made from thick filter paper, which was then loaded into the main chamber of the Soxhlet extractor. The extractor was then placed onto a flask containing the extraction solvent (water 500ml& Chloroform 500ml).The Soxhlet was then equipped with a condenser. The solvent was heated to reflux. The chamber containing the solid material was slowly filled with warm solvent to dissolve some of the desired compound. When the Soxhlet chamber was almost full, the chamber was automatically emptied by a siphon side arm, with the solvent running back down to the distillation flask. This cycle was allowed to repeat many times, over 36 hrs. During each cycle, a portion of the non-volatile compound dissolved in the solvent. After many cycles the desired compound was concentrated over the hot water bath to remove the solvent**.**

Antipyretic activity

Both water and $CHCl_3$ extract was suspended in 1% acacia solution to make a stable suspension. The dose of both of the extract is 200mg/kg so suspension of 20mg/ml concentration is made. A 15% suspension of Brewer's yeast in 0.9% saline is prepared. Groups of rats with a body weight of 120-150g are used. By insertion of a digital thermometer to a depth of 2 cm into the rectum the initial rectal temperatures are recorded. The animals are fevered by injection of 10 ml/kg of Brewer's yeast suspension subcutaneously in the back below the nape of the neck. The site of injection is massaged in order to spread the suspension beneath the skin. The room temperature is kept at 22–24 °C. Immediately after yeast administration, food is withdrawn. 18 h post challenge, the rise in rectal temperature is recorded. The measurement is repeated after 30 min. Only animals with a body temperature of at least 38 °C are taken into the test. The animals receive the test compound (Aqueous & Chloroform extract of *Phyllostachys bambusoides*) or the standard drug (Paracetamol) by oral administration. Rectal temperatures are recorded again 30, 60, 120 and 180

in test group it may have significant antipyretic activity.[8-9]

Analgesic activity

Method

Animals are divided into three groups having body weight approx. 120-140gm. Diclofenac 150mg/kg is used as standard and test solution is used 200mg/kg, control is treated with 1% acacia solution. Acetic acid 0.6% solution is injected 1ml to produce writhing after 5-10min. To control group injected acetic acid and noted down the no. of writhes. To second and third group administered test and standard drug and injected 1 ml acetic acid after 30 min. And note down the no. of writhes produce. If there is decrease in no of writhes in test group it may have significant analgesic activity. [10]

Antipyretic activity

RECTAL TEMPERATURE**					
Group*	Initial temp	After 18 hr	After 30 min	After 60 min	After 120 min
Vehicle	37.54± 1.032	39.35±0.045	39.48± 0.78	39.45± 0.085	39.15± 1.250
Paracetamol Treated	37.12±0.004	39.24±1.62	38.34±0.85	37.04± 1.25[a]	37.06± 0.024[a]
AEPB	37.57±0.604	40.32±0.065	40.12±1.204[b,c]	40.08±0.62 a,b,c	39.12±0.075 a,b,c
CEPB	38.18±0.084	40.14±1.014	39.10±0.504[a,b]	38.21±0.142[a,b]	37.42±1.074[a,b]

Table no. 2. Antipyretic activity of *Phyllostachys bambusoides*

CEPB:- chloroform extract of *Phyllostachys bambusoides.*

AEPB:- aqueous extract of *Phyllostachys bambusoides*

*- Each group consists of 5 animals

**- Data is in Mean ± SEM.

[a]-Significant decrease in temperature as compared to vehicle treated group

[b]_Nonsignificant difference in temperature as compared to paracetamol treated group

[c]- Comparable decrease in temperature as compared

min post dosing. If there is decrease in the temperature

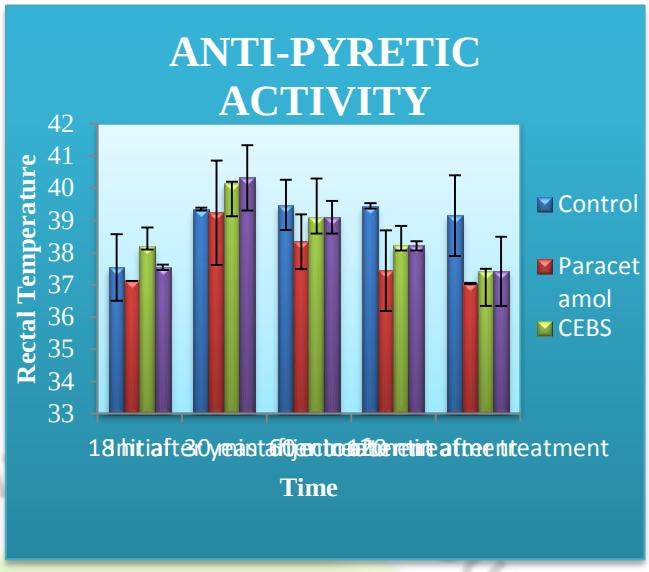


Fig.1: Effect of antipyretic activity of *phyllostachys bambusoides* in rats

Analgesic activity

ANALGESIC ACTIVTY**			
*Group**	*DOSE*	*No. of writs*	*% inhibition*
Control	-------	*38.69*±1.128	---------
Standard drug(diclofenac)	*4mg/kg*	11.23 ± 0.388[a]	*70.9*
AEPB	*200mg/kg*	32.43± 0.269[c]	*0.016*
CEPB	*200mg/kg*	14.03± 0.508[a,b]	*67.13*

Table.3: Analgesic activity of *Phyllostachys bambusoides*

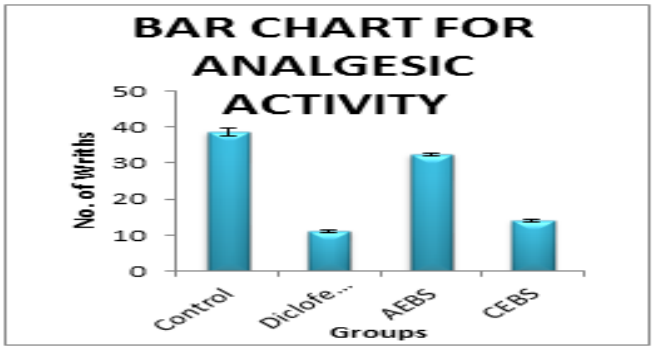
*- Each group consists of 5 animals

**- Data is in Mean ± SEM.

[a]- Significant decrease in no. of writhes as compared to vehicle treated group

[b]-Non significant difference in no. of writhes as compared to Diclofenac treated group

[c]-Negligible effect on no. of writhes as compared to control group.



to *CEBS* treated group

STATISTACL ANALYSIS:-

Data was expressed as mean ± Standard error of mean. The results were analyzed one way ANOVA. $P<0.05$ was considered as statistical significant.

Result & Discussion

The result of antipyretic activity of aqueous and chloroform extract of leaves of *Phyllostachys bambusoides* produced significant antipyretic activity in rats, which was induced by brewer's yeast. The temperature was bought back to normal after 4 hrs of post administration of extracts. The aqueous extract dose 200 mg/kg body weight & chloroform 200 mg/kg was found to have significant effect ($P<0.05$) .The body temperature regulation requires a delicate balance between production and loss of heat and hypothalamus regulate that set point at which body temperature is maintained. It is well established that fever is mediated by release of prostaglandins in hypothalamus, results in increased production of heat and heat loss leading to pyrexia. The aqueous and chloroform extracts of Phyllostachys bambusoides significantly decreased temperature suggesting that extracts might have antagonized prostaglandins and produce its effect.

The analgesic property of Phyllostachys bambusoides can also probably to the blockade of the effects or the synthesis and/ or release of PGs and/or other endogenous substance that excite pain nerve endings. The inhibition percentage of writhing at 200mg/kg of AEPB & CEPB were respectively 0.016% & 69% .The maximum inhibition was 69% And was comparable to that obtained by a Diclofenac (150mg/kg) The chloroform extract show more analgesic effect than aqueous extract.($P<0.05$)

Fig.2: Analgesic activity of *bambusoides* against acetic acid induced wriths

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