



Antipyretic activity of ethanolic extract of an Indian based herbal drug-amaranthus spinosus

Manisha Mishra², S.Tarunkumar¹, B.Venkatesan¹, K.Suriaprabha⁴,
A.R.Mullaicharam³, P.Muthuprasanna*¹

¹Dept. of Pharmaceutics, Vels College of Pharmacy, Chennai, (INDIA)

²CARISM, SASTRA, Tanjore, Tamilnadu, (INDIA)

³Principal, Periyar College of Pharmaceutical Sciences for girls, Trichy, Tamilnadu, (INDIA)

⁴Dept. of Pharmaceutics CL Baid Metha College of Pharmacy, Chennai, (INDIA)

E-mail : p_ra2000@yahoo.com

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ABSTRACT

The claims of folk medicine was enormous were the ailment untreated by allopathic medicines are also been claimed to be cured by our ancient folk medicine. In this experiment a systematic approach has been made to ensure the reliability of antipyretic activity of an herbal- amaranthus spinosus towards proving its efficacy. Various extract viz chloroform, petroleum ether, water, ethyl acetate has been prepared using the shade dried leaves and phytopharmaceutical constituent were studied. The ethanolic extract were subjected to antipyretic study to the rabbits having water for injection as the negative control and standard drug-paracetamol as the positive control. The body temperature were elevated using brewers yeast. The rectal temperature were taken as the data towards evaluating the antipyretic activity. The extracts 200 and 400mg/kg were considered as the test samples. The results were promising which showed similar reduction in the elevated body temperature by these extracts to that of standard paracetamol. Thus this extract of the plant could be a suitable candidate for antipyretic activity. © 2007 Trade Science Inc. - INDIA

KEYWORDS

Ethanolic extract;
Antipyretic activity;
Amaranthus spinosus;
Folk medicine;
Prickly amaranthus.

INTRODUCTION

Life is nature's gift and it's the nature takes care for its well being. The treatment of disease by herbal based preparations was the mainstay of the therapeutic arsenal until the nineteenth century; this aspect gradually gave way to active constituents of medicinal plants which had a specific or precise pharmacological activity. Screening for biological activity is the first step in the research for new drugs from medicinal plants. The nature plant product often serve as chemical models or leads for the design and total synthesis of new drug entities. For ex-

ample the belladonna alkaloids(atropine), quinine, physostigmine, cocaine, opiates(morphine and codeine) and salicylic acid have served as model for design and synthesis of anti-cholinergic, anti-malarial and anti-cholinesterase's, benzocaine, procaine, and other local anesthetics and aspirin respectively. The growing concern in the recent past over the toxic effects various synthetic drugs has forced the researchers, academicians, and physicians towards herbal drugs. The occurrence of side effect after a long term use of synthetic drugs is always feared during the treatment of chronic diseases possibility is experienced to be of negligible

extent in case of herbal drugs and other medicines obtained from natural sources. These are the reasons which led the authorities in the field to reconsider the use of herbal medicines and to give enough attention to the development of science of phytopharmaceuticals. The medicinal plant selected for this project work is "Amaranthus spinosus" (A.S), family-amaranthaceae^[1].

This plant is known by the following names in the languages mentioned again, Tamil-Mullukirai; English-Prickly amaranth; Telugu-Ettamulugorant; Sanskrit-Alpamarisha; Hindi-Cholai; Bengal-Kautamairs; Marathi -Chanalai

EXPERIMENTAL

Phytochemical studies^[2]

Collection and extraction of plant material

The plant material of *Amaranthus spinosus* (fam-Amaranthaceae) was obtained during the month of February. It was identified by a botanist. The leaves of *Amaranthus spinosus* were shade dried and then powdered and 1kg material was macerated successively with petroleum ether(60-80), Chloroform, Ethyl acetate and ethanol for 72 hours^[5]. Then the extracts were concentrated by distillation on a water bath. Preliminary phytochemical screening was carried out as per the following methods

1. Liebermann burchard test for sterols

To a little portion of each of the extracts was dissolved in few drops of acetic acid, 3ml of acetic anhydride was added following by few drops of concentrated sulphuric acid. Appearance of bluish green colour showed the presence of sterols.

2. Test for phenolic compounds

To a little portion of each of the extracts neutral ferric chloride solution was added, violet colour formation showed the absence of phenolic compound.

3. Test for triterpenoids

Salkowski test

A little of each of the extract was warmed gently with tin an thionyl chloride. As there was no pink colour, it showed the absence of triterpenoids.

4. Test for flavones

A. Anthocyanins

A small amount of each of the extract treated with aqueous sodium hydroxide solution. No characteristic reaction shows the absence of Anthocyanins.

B. Flavones

To a small portion of each of extract treated with sodium hydroxide gave yellow-colour and with conc. Sulphuric acid showed yellow colour showed the presence of flavones.

C. Shinodis test

The extract is dissolved in alcohol. To that a piece of magnesium, followed by addition of conc. Hydrochloric acid drop wise was added and heated. Appearance of magenta colour showed the presence of flavanoids.

5. Test for reducing sugars

To the extract, anthrone and sulphuric acid was added, warmed gently green colour showed the presence of reducing sugars

6. Test for coumarin

With 0% sodium hydroxide solution-no yellow colour produced show the absence of coumarin

7. Test for quinines

Extracts treated with conc. Sulphuric acid. No characteristic reaction and hence absence of quinines.

8. Test for lignin

Extracts treated with alcoholic solution of phloroglucinol and hydrochloric acid. No characteristic reaction and hence absence of lignin.

10. Test for tannin

Extracts treated with lead acetate solution. No characteristic reaction shows the absence of tannin.

11. Test for glycosides^[3]

A few ml of the extract is dissolved in glacial acetic acid and few drops of ferric chloride solution is added followed by conc. Sulphuric acid. Appearance of red ring at the junction of 2 liquids shows presence of glycosides

12. Test for proteins

Full Paper

Biuret test

To few ml of extract add 3ml of 5%NaOH and 4 drops of copper sulphate solution. Appearance of purple colour shows the presence of proteins.

13. Millons test

To few ml of extract add 1ml of 10% mercuric sulphate in 10% sulphuric acid.

Boil gently for 1min, cool and added 2-3 drops of 1% sod. Nitrite soln. Appearance of red colour shows the presence of proteins.

14. Xanthoproteic test^[4]

To few ml of extract add 1ml of conc. Nitric acid, boiled for 1min., cool and added conc.

Ammonia solution till the reaction is alkaline. Yellow colour intensified and turns orange when the solution was made alkaline, showed the presence of proteins.

Antipyretic activity

The shade dried leaves of *Amaranthus spinosus* was powdered and successively macerated with the solvents such as petroleum ether(60-80), chloroform, ethyl acetate and hanol. In order to carry out the antipyretic activity, the ethanolic extract of A.S was taken arbitrarily. The concentrated Ethanolic extract of A.spinousus prepared at 2 dose level viz. 200mg/kg body weight and 400mg/kg body weight by dissolving in water for injection. Rabbits of either sex weighing between 1.5-2.0kg were used.Eight rabbits of either sex were taken and weighed. Rabbits having weight between 1.5-2.0 kg were selected. These animals were kept in galvanized cage separately i.e in isolated cage these animals were divided into 4 groups each of 2 animals.

GROUP I : First group served as control in which only pyrexia was induced

GROUP II : Second group was kept at standard in which the paracetamol injection dose of 100mg/kg body weight was injected intraperitoneally.

GROUP III : Third group animal's received the ethanolic extract solution of *A.spinousus* at a dose of 200mg/kg body weight intraperitoneally.

GROUP IV : Fourth group animals received the ethanolic extracts solution at a dose of 400mg/kg body weight intra peritoneally.

After thirty mins of injection of test and standard paracetamol drugs, all the group animals received 12% w/v suspension of brewers yeast 1ml/100g subcutaneously into loose connective tissue between the shoulder blades^[6]. The normal rectal temp of each animals were recorded using telethermometer (Digitech model sb 112324)before administering the drug using a rectal thermometer. After giving brewers yeast the temp. were recorded at 0, 30, 60, 90, 120, 150 240 and 300 minutes interval. The results were shown in TABLE 2.

RESULTS

The phytoconstituents of various extract was found and depicted in the following TABLE 1

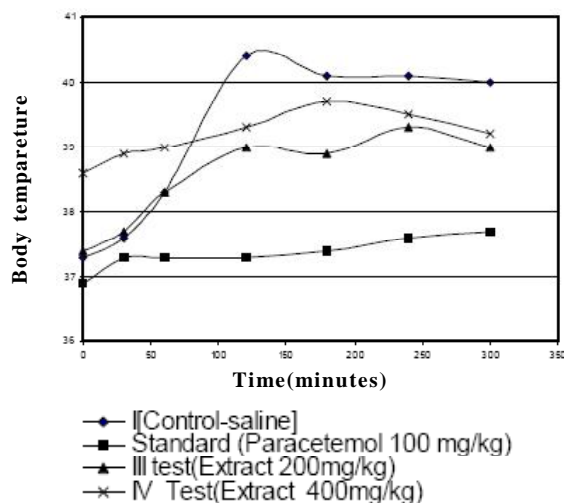
The animal study were carried out for the antipyretic activity and the results and graph were given in the lowing TABLE 2 and graph I respectively.

TABLE 1 : Phytochemical constituents of various extracts

S.no	Chemical tests for	Pet-ether	Chloroform extract	Ethyl acetate	Ethanol extract
1.	Steroids	+	+	-	-
2.	Phenolic compounds	-	-	-	-
3.	Triterpenoids	-	-	-	-
4.	Flavones	+	+	-	-
5.	Reducing sugars	-	-	+	+
6.	Coumarin	-	-	-	-
7.	Quinones	-	-	-	-
8.	Lignin	-	-	-	-
9.	Alkaloids	-	-	-	-
10.	Tannin	-	-	-	-
11.	Glycosides	-	-	-	+
12.	Proteins	-	-	+	+

TABLE 2: The antipyretic activity of ethanolic extract of *amaranthus spinosus*

Group	Para meter	Drug	Time (min)						
			0	30	60	120	180	240	300
I	Rectal temperature	Control-water for injection	37.3	37.6	38.3	40.4	40.1	40.1	40
		Standard (Paracetamol 100 mg/kg)	36.9	37.3	37.3	37.3	37.4	37.6	37.7
III	Rectal temperature	Test(Extract 200mg/kg)	37.4	37.7	38.3	39	38.9	39.3	39
IV		Test(Extract 400mg/kg)	38.6	38.9	39	39.3	39.7	39.5	39.2



Graph I: Change in body temperature versus time (Minutes)

DISCUSSION

Amaranthus spinosus belongs to the family amaranthaceous. It has been used in traditional systems of Indian medicine for its antipyretic activity. In order to prove its reliability, a systematic scientific pharmacological study has been carried out. Antipyretic activity was carried out by using the ethanolic extract of *A. spinosus* at 2 dose levels viz. 200mg & 400 mg/kg body weight respectively and the results showed promising conclusions. The antipyretic activity were found in the ethanolic extract and that may be due to some glycosides. At the extract dose of 200 and 400mg/kg the antipyretic effect was evident and showed a comparable response with that of the standard drug paracetamol. Thus this extract of *amaranthus spinosus* may be a good candidate for the antipyretic activity.

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