

Antipyretic Activity of the Root Extracts of *Desmodium gangeticum*

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Article History:

Received on: 15 May 2018
Revised on: 16 May 2018
Accepted on: 27 May 2018
Published on: 28 Jun 2018

Volume: 8 Issue: 2

Keywords:

Desmodium gangeticum,
Pyresis,
yeast method.

ABSTRACT

Fevers are considered as the most important parameters to evaluate and diagnose most of the disease conditions like inflammations, wounds and other infections. There are effective drugs that treat and control the fevers out of which NSAID's are most important ones. They cause notable side effects like gastric ulcers, gastric mucosal perforations etc. which make the use of those drugs limited. Herbs are used to treat various diseases, starting from the evolution of the human race. During this, herbs had been introduced to many types of tests and scientific investigations to prove the activities that herbs possess. The diseases that the herbs are used for are notable in the medical systems like Ayurveda and other systems. The need for the validation of the activities of the herbs and medicinal plants is utmost important these days. The extracts of the plant leaves of *Desmodium gangeticum* were extracted with ethanol and then investigated for the antipyretic activity in yeast induced pyretic method. The extract was tested in two doses 200 and 400mg/kg. This was found significant when compared to the standard drug.

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eISSN: 2231-010X

DOI: <https://doi.org/10.26452/ijrpp.v8i2.1305>



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INTRODUCTION

Herbs are used to treat various diseases, starting from the evolution of the human race. During this, herbs had been introduced to many types of tests and scientific investigations to prove the activities that herbs possess. The diseases that the herbs are used for are notable in the medical systems like Ayurveda and other systems. The need for the validation of the activities of the herbs and medicinal plants is utmost important these days [1]. Plants offered us a lot of lead molecules till now, and these leads have been used to treat many dangerous dis-

eases that are incurable with synthetic drugs. Few of those diseases have not yet been discovered treated with any synthetic drugs till now. They are CHF and other cancer-related diseases that tend to become dreadful to human beings [2]. So, herbs were considered very important in the treatment of diseases.

Fevers are considered as the most important parameters to evaluate and diagnose most of the disease conditions like inflammations, wounds and other infections. There are effective drugs that treat and control the fevers out of which NSAID's are most important ones. They cause notable side effects like gastric ulcers, gastric mucosal perforations etc. which make the use of those drugs limited [3, 4]. Other selective drugs inhibit COX-II enzyme that is noted to cause the heart and related problems [5, 6]. There also some medications that are causing psychological issues and some neurological problems like medication addiction, bacterial drug resistance in case of infection-related fevers and even dependence of the drugs [7, 8].

The plant *Desmodium gangeticum*, belonging to family Fabaceae was investigated for many activities like inflammatory, analgesic and antioxidant activi-

ties [9]. In this research, the plant had been investigated for the antipyretic activity using various extracts.

HERBAL PROCESSING

Fresh plants of the *Desmodium* were collected and identified in native farmland in Nellore district. These were dried, and herbaria were prepared too. The plant was authenticated with a local botanist and confirmed the taxonomy of the plant. After collection, the plant leaves were dried in an oven at 50°C and 50 % relative humidity for four days. The leaves were dried, and the dried leaves were pounded into powder using a ball mill, and the powder was made into a fine powder using the sieve. This powder was packed in a pouch and extracted using Soxhlet. The powder was weight to 10gm and packed and fitted in the thimble of the Soxhlet. Then ethanol was used for extraction of the chemical constituents. After the siphon ran a clear solvent, the extract was collected and filtered using a filter paper. This was evaporated using a water bath, and then the crude extract that is collected was stored in a desiccator. The percentage yield was 21.2%w/w, and the colour of the extract was a greenish-brown colour. This was investigated directly for antipyretic activity in 2 doses 200mg and 400mg/kg of the weight of rats.

PHARMACOLOGICAL INVESTIGATION

Lab animals

Swiss albino rats were used when the extracts were investigated for the antipyretic activity, and they weighed about 155-175gm. The rats were kept in the separate cages for about two days before induction of the experiments. They were kept in the air controlled lab which had a 12 hrs cycle of day and dark. The rats were allowed to eat pellet food freely, and water was given in the cages. The humidity was also controlled according to the comfort of the rats.

Pyrexia Induced by Yeast

The animals were brought out of the cages, and the rectal temperature was noted via rectal route with a digital thermometer. The induction of the pyrexia was caused by the brewer's yeast and is infection type. The yeast was mixed with 10% v/v acetic acid to make 20%w/v solution. This was injected peritoneal route into rats, and they were left to rest for 12hrs for the induction of pyrexia. All the animals were induced for pyrexia, and the rats were continued for experiments further [10].

The rats were divided into 5 groups of with they contained five animals in every group. After making sure the rectal temperature was elevated using the yeast, and those animals were selected for the study.

The elevated temperatures were noted, and the recordings were stored. The group I was received with 0.9%w/v of 1.6ml of the saline solution in the oral route, and the animals were rested in their respective cages. Group II received only standard drug paracetamol at a dose of 100mg/kg of the rat. The paracetamol tablets were crushed, and the weighed quantity of the powder was taken equivalent to the dose of paracetamol and administered orally to the rats [11]. Group III and group IV were administered with the extracts at doses of 200 and 400mg/kg body weight. This was selected as per the toxicity study of the extracts on rats. The rectal temperatures were noted in the rats for every 30mins, 1hr, 1.5hr and 2hr interval [12].

TEST RESULTS

The ethanol extract of the plant leaves was investigated for the antipyretic activity in two doses of 200 and 400 mg of the bodyweight of rats. The extracts showed significant activity in the yeast induced pyrexia method. The induction of the yeast into the body, the elevation of the rectal temperature was notably seen in all the animals. This was almost 4-5°C higher than the normal temperature. Then this was reduced due to the extract of the plant leaves. This lowering was done on an hourly basis.

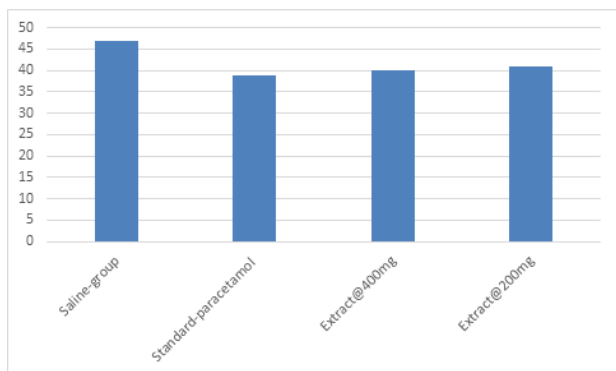
The extracts at dose 400 mg gave a better activity compared to the standard drug and other doses of 200mg. The extract dose-dependant was controlling of the rectal temperature. The pyrexia induced by yeast was related to the infection, based induction of the pyrexia.

There were different doses of extracts that were studied for the activity they are 200,400 and 600mg. Out of which, 600mg/kg showed a better activity compared to 400 compared to 200, and the least activity was demonstrated by 200 mg which denotes that there is a dose-dependent lowering of the pyrexia that is induced by the yeast. The pyrexia induced by yeast means it is an infection caused by yeast which resulted in the induction of inflammation of elevated temperature, which was called as fever. Figure 1, Table 1

The standard drug paracetamol controlled this fever significantly, and the inhibition was compared to the earlier investigation on the drug. The mechanism was found to be the inhibition of prostaglandin synthesis and cytokinin synthesis [13]. When the extract controlled the fever, it means that the extract also had a similar mechanism of action which was attribute to the anti-inflammatory activity of the plant leaves [14]. But the controlling of fever was delayed and which is due to the fact that the extract took time to get digested by the gastric juice and

Table 1: Antipyretic Activity of Desmodium Extracts

Group	Baseline Temp.	Rectal Temperature			
		30min	1hr	1.5hr	2hr
Saline-group	42.46±1.29	44.59±1.04	46.25±0.61	47.63±0.82	47.37±1.30*
Standard-paracetamol	39.61±1.52	45.76±1.36	44.09±1.43	42.37±1.27	41.50±1.68
Extract@400mg	41.35±1.02	43.46±0.93	44.20±0.57	40.53±0.74	39.03±1.19*
Extract@200mg	38.23±1.44	43.67±1.05	42.04±1.38	41.31±1.16	40.45±1.37

**Figure 1: Effect of Desmodium extract after 2 hrs of the treatment**

then showed its pharmacological activity.

CONCLUSION

The extracts of the plant leaves of *Desmodium gangeticum* were extracted with ethanol and then investigated for the antipyretic activity in yeast induced pyretic method. The extract was tested in two doses 200 and 400mg/kg. This was found significant when compared to the standard drug.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

FUNDING SUPPORT

The authors declare that they have no funding support for this study.

ACKNOWLEDGEMENT

The authors are thankful to all who have extended their constant support for the completion of the work.

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Cite this article: K Raja Sheker, B Naveen, A Anil kumar, G Abhilash. **Antipyretic Activity of the Root Extracts of *Desmodium gangeticum***. *Int. J Res. Phy. Pharmacol*. 2018; 8(2): 20-23.

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