

Evaluation of antipyretic activity of *Capsicum annuum* by Brewer's yeast method

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ABSTRACT

Plants are being used in medicine and treatment of diseases from years in the evolution. During the development of science, investigations to establish eh scientific proof and validation for the activities and mechanism of herbs to treat diseases. *Capsicum annuum* has anti-cancer properties, analgesic properties, anti lithogenic and thermogenic properties. It is used to alter the gastrointestinal function and boost metabolism. Many formulations are enriched with capsaicin which is a crucial ingredient in *Capsicum* to exhibit its weight loss properties. Based on the anti-inflammatory and analgesic properties of the plant and taking into consideration, the current research will focus on the investigation and comparison of the antipyretic activity of *Capsicum* in fruits and leaves. Results show that the leaves have similar chemical constituents that had antipyretic potential compared to the fruits. Overall, the *Capsicum* showed a comparatively same activity with the standard drug, paracetamol.



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INTRODUCTION

Plants are being used in medicine and treatment of diseases from years in the evolution. During the development of science, investigations to establish eh scientific proof and validation for the activities and mechanism of herbs to treat diseases. Herbs have been the source of chemical constituents for the synthesis of drugs of dangerous illnesses. Various diseases like cardiac failure, cancers etc. have been relying on thoroughly herbs as drugs of choice currently [1].

Capsicum annuum is the plant that is seen in every

kitchen all over the world and is known for its heat and bitter principles. It is used in every cuisine across the globe. Apart from the culinary applications, the plant has been used to treat many diseases too. It is used as an anti-inflammatory drug. It has anti-cancer properties, analgesic properties, anti lithogenic and thermogenic properties. It is used to alter the gastrointestinal function and boost metabolism. Many formulations are enriched with capsaicin which is a crucial ingredient in *Capsicum* to exhibit its weight loss properties. *Capsicum* has hypocholesterolemic features. It is used as a digestive stimulant. It is used to treat arthritis, neuralgia and as a diuretic too [2].

Fruits are used to extract the capsaicin from the *Capsicum* plant. But others parts of the plant are also being reported to contain chemical constituents that are used to treat the diseases as mentioned earlier. Parts, like leaves, are also used and claimed to contain principles that are present in the fruits [3].

Based on the anti-inflammatory and analgesic properties of the plant and taking into consideration, the current research will focus on the investigation and comparison of the antipyretic activity of *Capsicum* in fruits and leaves.

Table 1: In-vivo Antipyretic activity of Capsicum

Group	Normal temperature 0c	Temperature after administration 0c			
		12hr after yeast	1hr after drugs	2hr after drugs	3hr after drugs
Control	37.54±	41.31±	40.49±	40.52±	41.51±
Saline 5ml/kg	0.24	0.57	0.99	0.51	0.48
CML	37.69±	40.63±	40.34±	39.27±	38.22±
200mg/kg	0.68	0.45	0.81	0.07	0.42
CML	38.17±	40.15±	40.08±	38.86±	37.98±
400mg/kg	0.92	0.41	0.27	0.46	0.73*
CMF	36.09±	41.09±	40.95±	39.14±	38.62±
200mg/kg	1.01	0.69	0.57	0.82	0.70
CMF	37.39±	40.71±	40.09±	38.65±	37.57±
400mg/kg	0.87	0.81	0.67	0.66	0.09*
Paracetamol	38.62±	40.78±	39.52±	38.41±	37.61±
150mg/kg	0.54	0.42	0.81	0.31	0.18*

Research method

Plant parts

Leaves and fruits of red Capsicum that is Capsicum annum were procured from the native farm in December and they are dried entirely under shade. Ambient temperature and humidity were the drying conditions. The dried material is powdered and sieved through the mesh. 100gm of drug power was measured and extracted with methanol using a Soxhlet apparatus. The filtrate was dried and reduced to get a semi-solid paste. The percentage yield was 8.54% with leaves (CML) and 5.93% for fruits (CMF). These were used to test the antipyretic activity at two doses.

Antipyretic screening

Adult albino wistar rats, both female and male which are weighing about 160-200g, were used in the study. They were maintained under normal room temperature and air conditioning in cages with feed and water access. 6 animals were grouped into 6 groups.

Brewer's yeast method

In this research, 0.5% of methylcellulose was suspended in saline solution. 15% of yeast was mixed in the methylcellulose suspension and is used to induce hyperpyrexia.

The body temperatures of the rats were noted before the experiment for every 6hrs for two days. On the day of the animal experiments, the rats were injected with 10ml of previously prepared yeast via the subcutaneous route. These animals were rested in their cages for 12hr, and then a vehicle, extract

doses and standard drug (Paracetamol-150mg/kg) were administered orally. The temperature was measured rectally after 1hr, 2hr, 3hr after drugs administration [4].

DATA ANALYSIS

The data was taken as replicates and the values were given as means and their standard deviations from means. The comparison was performed between each group with the vehicle group using Dunnet's test and $P < 0.01$ were considered significant [5].

RESULTS

The Methanol extract of fruits and leaves of Capsicum were compared for their antipyretic activity using the yeast method. There was a successful induction of hyperpyrexia within 12hr of yeast administration and it continued to last till 3hrs post starting of experiments. There was an increase in 3-4 degrees on average. In the normal group which received the only saline, the temperature was not lowered and it was left elevated till 4hrs. (Table 1)

With the administration of extracts and standard drug that is paracetamol, there was a significant lowering in the rectal temperature only after 3hr. But the temperature change was not significant after 1hr of administration of extract and it was evident in paracetamol. This may be due to the transit delay of extract in the gastric medium of rats. Since paracetamol is a refined tablet powder, it started showing its activity before 1hr of the administration.

Comparing the plant parts, leaves showed activity

less than the fruits. Both the extract showed a dose-proportional activity where when the increase in activity is observed in a higher dose of extract and increase in activity was noticed in fruits compared to leaves. But this was not that significantly different compared to the normal vehicle. This shows that the leaves have similar chemical constituents that had antipyretic potential compared to the fruits. Overall, the Capsicum showed a comparatively same activity with the standard drug, paracetamol.

CONCLUSION

Based on the documented evidence of anti-inflammatory activity and analgesic activity of Capsicum, antipyretic activity was tested and compared with leaves and fruits of the plant. The overall plant showed a better activity and fruits showed a comparatively significant antipyretic activity.

CONFLICT OF INTEREST

Authors declared no conflict of interest.

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