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"An Experimental Evaluation Of *Shanapushpi* (*Crotalaria verrucosa* L.) For Its Antipyretic Property"

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Abstract-

Current study was carried out to evaluate the antipyretic activity of *Crotalaria verrucosa* L. plants in Brewer's yeast induced pyrexia in Albino rats. Brewer's yeast solution was injected subcutaneously at the region of thigh in all the rats in the dose of 1ml/100gms body weight.After 1 hour of injection of yeast, corresponding test drug was administered for all the groups. Rats of Group 1 which was administered with distilled water 1ml/100gms of body weight. Animals of Group 2 were administered with paracetamol suspension at the dose of 0.75ml/100gm of the body weight by using feeding syringe. Similarly rats of Group 3 were administered with decoction of trail drug at the dose of

1ml/100grms of body weight. After administering corresponding drugs to each group hourly rectal temperature of each rat was noted till successive 14 hours. The result was analysed statisticallywith repeated measures of one way ANOVA test.The analysis suggested that the *Shanapushpi* (*Crotalaria verrucosa* L.) had significant antipyretic activity.

KEYWORDS: *Shanapushpi, Crotalaria verrucosa* L., Antipyretic, Brewer's yeast, Pyrexia.

INTRODUCTION

Antipyretics, (from anti-'against' and pyretic 'feverish') are substance that reduce fever. Antipyretics cause the hypothalamus to override a prostaglandin- induced increase in temperature. Body then works to lower the temperature, which result in a reduction in fever. To evaluate the effect of drug in reducing the temperature, the pyrexia is induced in experimental animals by subcutaneous injection of pyrogens and then the test drugs are screened to see their effect in lowering the temperature by using a rectal or implanted thermocouple. The trial drug *Shanapushpi* (*Crotalaria verrucosa* L.) is selected and the antipyretic effect of test drug was accessed by preparing its *Kashaya* (Decoction) and then compared with the control and standard drug.

The drug *Crotalaria verrucosa L*. is a shrub growing upto a meter height. Belongs to Fabaceae family found in the hot climate regions of India, it is commonly seen in wastelands and growing on the sea coast [1].In Nighantus this plant is indicated in *Ajeerna*, *Jwara*, *Raktadosha*, *Kantaroga*, *Mukharoga*, *Hridroga* [2,3]. The decoction of leaves is traditionally used for *Jwara* in and around rural areas of Tumkur and Shivamogga [4].As we need to explore and substantiate folklore/traditional uses of plant which will help to add useful drugs available around us, the present study was undertaken to evaluate *Crotalaria verrucosa* L. experimentally for its Antipyretic property.

MATERIALS AND METHODS

The drug selected for this experimental work was *Crotalaria verrucosa* L. Decoction of leaf of trial drug was prepared as per classical reference and evaluated for its antipyretic effect experimentally.

Method and Methods

Materials utilised for the present study are

- Albino rats
- Instruments- Syringe, Needle, and Stop watch, Lenses, Digital thermometer, Glows, Cotton, Band aid.

Collection of the Trial Drug

The drug collected for the experimental study was obtained from Udupi and Dakshina Kannada District authenticated and stored at department of Dravyaguna vijnana AAMC, Moodbidri.

Preparation of Decoction

Kashaya was prepared according to the procedure mentioned in *Sharangadhara Samhita*[5].The leaves of drug were made *Yavakutachoorna* by using powder making machine. Then one part of drug was taken, 16 parts of water taken and reduced into 1/8th part by boiling. This decoction was collected in a clean vessel and used for the experiment.

Dose Fixation of the Trial drug

Human dose of *Kashaya* according to Ayurvedic classics is 2 *pala* (96gms). This dose is converted into rat dose by using the formula. (Paget and barne's et. al)[6]

Rat dose/kg body weight = Human dose x 0.018 x 5

After calculation rat dose is fixed as 1ml.

Brewer's yeast

20% of suspension of Brewer's yeast is prepared in normal saline. This suspension was used to induce pyrexia in all the groups. Dose of Brewer's yeast suspension is 1ml /100mlgms of the body weight.

Standard Drug

Paracetamol Suspension is used as standard drug for the experiment Calpol suspension was procured from the market. The suspension was administered orally. After the referring the human dose, rat dose was fixed as 0.75ml/100gms of body weight.

Selection of Animals

Healthy albino rats of either sex weighing 150-200gms were selected and grouped into three. Each group containing 6 rats and each group were kept in separate cages. Each group named as Group 1, Group 2 and Group 3. Rats of different group marked with marker for their individual identification.

Group 1 - Control group

Group 2 – Standard group

Group 3 – Test group

Statistical analysis

The data were statistically analysed with repeated measures of one way ANOVA test. In the present study 3 groups of Albino rats were used. The result was assessed statistically in different aspects for the better understanding such as comparison within group, between groups. Each group rectal temperature is assessed at 1st hour, 4th hour and 8th hourly.

Procedure

Healthy Albino rats were kept in standard laboratory condition in the animal house. These rats were selected randomly of either sex. 18 rats were classified into three groups containing 6 rats in each group and weights were recorded of each rat. Rats were marked for their individual identification and all groups were kept in separately. All the healthy albino rats which were selected for the experiment were kept under fasting for 18 hours before to the commencement of the experiment. By using a digital thermometer, rectal temperature of each rat was recorded before the commencement of the experiment.

Fever was induced by using 20% of brewer's yeast solution was injected subcutaneously at the region of thigh in all the rats in the dose of 1ml/100gms body weight and were replaced in the cages. Then the rectal temperature was noted to confirm the pyrexia. After 1 hour of injection of yeast, corresponding test drug was to be administered for all the groups. Rats of Group 1 which was administered with distilled water 1ml/100gms of body weight. Animals of Group 2 were administered with paracetamol suspension at the dose of 0.75ml/100gm of the body weight by using feeding syringe. Similarly rats of Group 3 were administered with decoction of trail drug at the dose of 1ml/100grms of body weight. After administering corresponding drugs to each group hourly rectal temperature of each rat was noted for till successive 14 hours.

RESULT

Table No. 1: Mean temperature measured at different intervals of time

	Initial temperature	1st hr	4th hr	8th hr
Control	36.97+0.28	39.55+0.11	39.13+0.08(1.05)	38.53+0.10(2.57)
Paracetamol	36.67+0.18	39.05+0.07	38.32+0.05(1.88)	36.73+0.16(5.93)
Shanapushpi	36.82+0.24	39.183+0.14	38.25+0.10(2.38)	37.13+0.10(5.23)

NB: Values are expressed as Mean+SEM(Relief percentage)

The administration of Paracetamol suspension and *Shanapushpi* reduced the rectal temperature significantly. The effect of trial drug was almost similar to that of

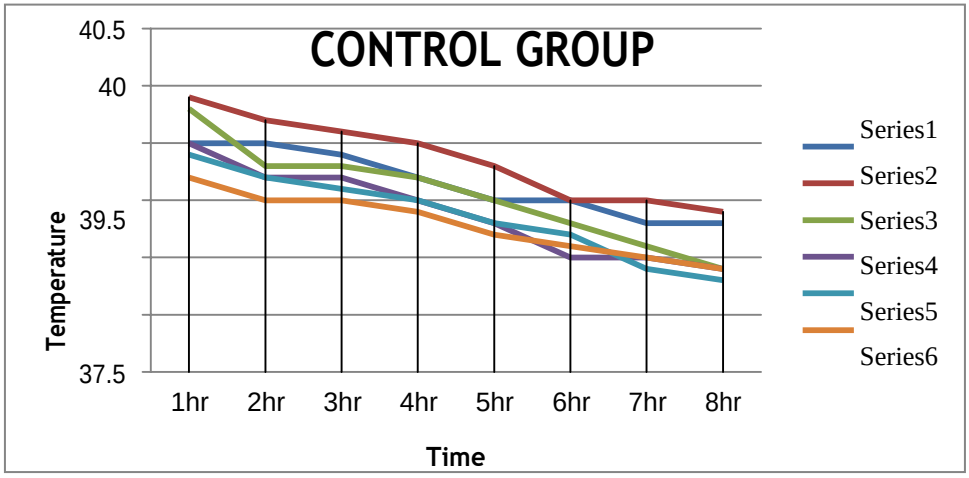
Standard drug Paracetamol.

Table No. 2: Repeated measures of ANOVA test showing comparison of treatment effects between the groups and within the group.

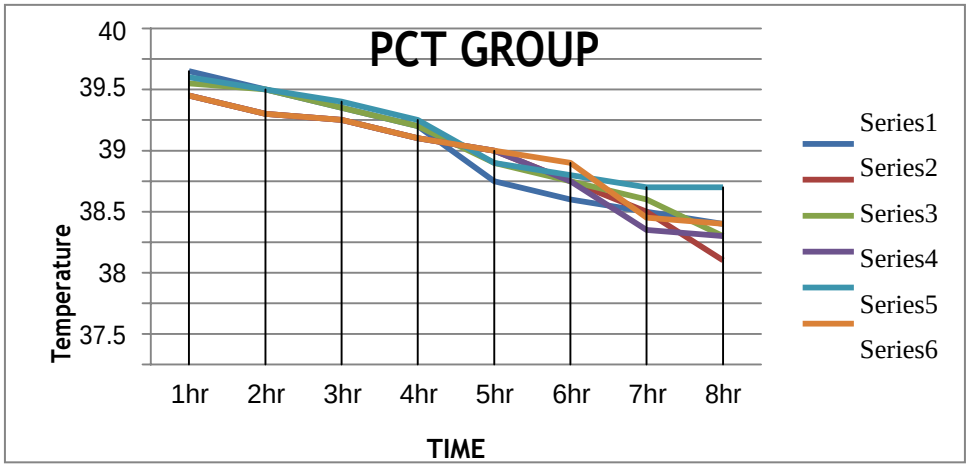
Source	SS	d.f	MS	
Between treatments	10.72	2	5.36	F=57.42857
Within treatments	1.4	15	0.0933	
Total	12.12	17		

The F-ratio value is 57.42857. The p-value is <0.001. The result is significant at P<0.05

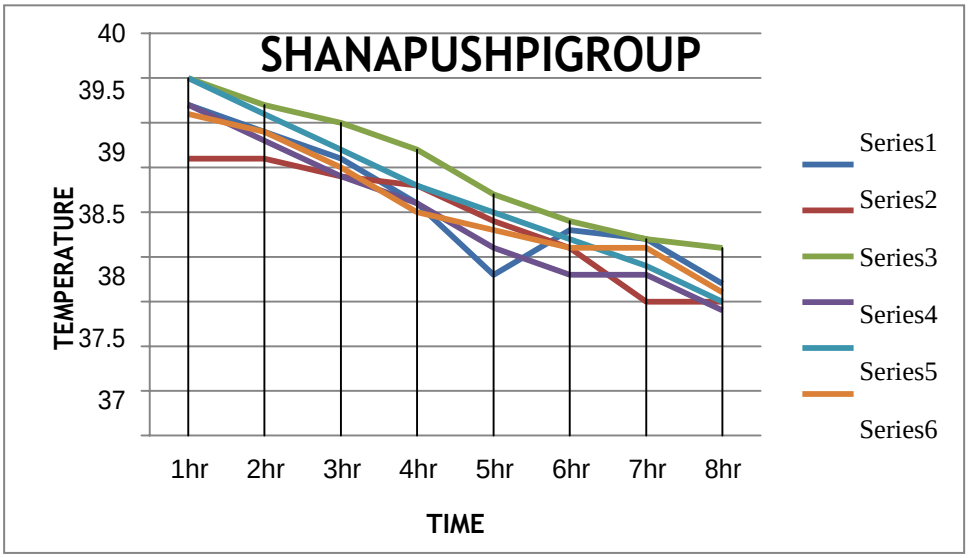
Graph No. 1: Rectal temperature observed at different intervals of time in Control group.



Graph No. 2: Rectal temperature observed at different intervals of time in Standard group.



Graph No.3: Rectal temperature observed at different intervals of time in Trail group.



DISCUSSION

Aim of the present study was to evaluate the Anti-pyretic property of the drug *Crotalaria verrucosa* L. given in the form of *Kashaya* (Deccoction). Overall effects of the treatment in groups were assessed statistically. It was observed that the test showed statistically significant P value <0.05 in all the groups. Overall effects of the treatment between the groups at different intervals of time were also assessed statistically. It was found that test drug showed statistically significant result at 1st hour, 4th hour and 8th hour.

The administration of Paracetamol suspension and *Shanapushpi* reduced the rectal temperature significantly. The effect of trial drug was almost similar to that of Standard drug Paracetamol was observed.

MODE OF ACTION OF THE DRUG ACCORDING TO AYURVEDA PRINCIPLES

The *Rasapanchaka* of *Crotalaria verrucosa* L.*Tikta*, *Katu*, *Kashayarasa* [7] and by *Rasanipatha* method [8] it was found that the leaf of drug has *Tikta* as *pradhanarasa* and *Kashayaanurasa*. *Tikta Rasa* of *Dravya* acts as *Deepana*, *Pachana*, *Dahashamana*, *Vishahara*, *Jwaraghna*, *Krimihara*, *Pittahara* and *Kaphahara*. Because of *Tikta*, *Kashaya Rasa*, *Sheetaveerya* and *Katu Vipaka* it contributes in reducing body temperature and helps in *Samprapthi vighatana*. *Tikta* rasa acts as liver tonic and it corrects metabolic function. So it corrects

the *Agni*, This increases the appetite and brings the *Pittadosha* into normal state. *Panchabhutika* compositions of *Tikta* rasa are *Vayu* and *Akasha*pre dominant. So it enters the *srotas*, does the *Amapaachana* and clears the *srotas*. *Sheetavirya* of *Shanapushpi* can be of help in reducing the temperature. Thus *Tikta*, *Katurasa*, *Sheetavirya* and *Rukshaguna* of *dravya* helps in mitigating the excessive *Pitta* which in turn brings down the increased temperature.

CONCLUSION

It can be concluded that decoction of leaves of *Shanapushpi* (*Crotalaria verrucosa* L.) possess significant antipyretic activity against experimentally induced pyrexia in Albino rats. This may be due to the *Tikta*, *Kashaya Rasa*, *Sheetaveerya* and *KatuVipaka* of the drug and presence of reported active phytoconstituents like Steroids, Tannins, Flavonoids and Phenoilcs and their influence on the prostaglandins. Further studies regarding other pharmacological activities as well as isolation and characterization of the active principle constituent responsible for the observed antipyretic activity was may be undertaken in for further studies.

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