

“AN EXPERIMENTAL EVALUATION OF JWARAGANA PROPERTY OF MASHAPHARNI (TERAMNUS LABIALIS) WITH RESPECT TO ANTIPYRETIC ACTIVITY”

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ABSTRACT

The explanation concerned to recognition and understanding of elaborated concept of *Jwara* with the perspectives of it, is mentioned with signs as well as a separate disease. These mentioning's dates back to the multi-dimensional dealing of *Jwara* in various *Samhitas* in Ayurveda. Fever is said to be prime threat to mankind. As at least once in a lifespan person gets affected by fever, irrespective of class, creed, age, gender and communal grade. The history of mankind has been repeatedly attacked by epidemics, which have the capacity to take thousands of lives at a time; most of them are characterized by Fever. Ayurveda has also many formulations for *Jwara*, but it is essential to carry out experimental study and to find out potent and safer medicine from the bulk of formulations. The formulations were analyzed physico-chemically, qualitatively. Ash value, Hardness, Acid insoluble ash, Moisture quantity, Water and Alcohol soluble extract were marked out. The Trial drugs showed significant anti-pyretic effect when compared with Control group. The Trial drugs exposed similar anti-pyretic effect when statistically compared with each other.

Key words: *Jwara*, Pyrexia, Anti-pyretic, *Mashaparni Kwatha*, Physico- chemical analysis, Brewer's yeast.

INTRODUCTION

Ayurveda is one of the most ancient science of the world has pioneered

may concepts which are relevant even now a days, the entire science of

Ayurveda is based on three pillar's **Hetu, linga** and **Oushadha**.

Jwara is most common problem of every one from birth to death, **Jwara** produces the **santappato Deha, Indriya** and **Mana**.¹

Pyrexia is from the Greek word Pyretos meaning Fire, having synonyms like Febrile (Latin- Febris- Fever). Fever is a common medical sign characterized by an elevation of temperature above the normal range of 36.5–37.5 °C (98–100 °F) due to an increase in the body temperature regulatory set-point. Pyrexia is mainly characterized as a symptom associated with many diseases but it's fatality as a separate disease like Malaria, Typhoid etc.. Antipyretic drugs such as Paracetamol, Ibuprofen, Diclofenac sodium etc. are being used increasingly in spite having many adverse reaction such as Gastric irritation, Acute and chronic renal failure etc.²

In our Ayurveda Different technique are used to preparation different type of medicine like **Kalka, Kwatha or Kashaya, Choorna, Vati** etc, so I had selected the one of most common drug called **Mashaparni**, is available locality. The drug having an Antipyretic activity which had been

explained by our **Acharyas** in many of the available reference. The Root & **panchanga** of **Mashaparni**, both are mentioned as **Jwaraghana**. It bears **Tiktarasa**. Thus **Tikta rasa dravya** usually indicated for its **Jwaraghana** property to roll out the effect of the drug and efficiency of the drug, an animal experiment is carried out on Albion Rats.

MATERIALS AND METHODS

PHARMACEUTICAL STUDY:

The trial drugs contains-

- *MashaparniPanchangaChroona*
- *Jala*

PRACTICAL NO.I

Name of the practical: Preparation of **MashaparniKwatha**³

Date of starting : 11/11/2018

Date of completion : 11/11/2018

Apparatus : Pounding machine (disintegrator), Gas stove, containers, Tray, clean fine cloth, spatula (ladle).

Ingredients-

- **Mashaparni Panchanga Choorna** : 100 grams
 - **Jala** : 800 ml.
- Volume of **MashaparniKashaya** obtained = 250ml.

Collection and authentication of plant material

The Drug ***Mashaparni*** had been collected From the Around the city of Kalaburgi and drug was identified and Authenticated **by Dr.G.MVidyasagar**, Chairman and HOD of Dept of Botany, Gulbarga University Kalaburgi. Has a Mashaparni (TeramnusLabialius) Family Fabeaceae.

ANALYTICAL STUDY : For the present study an effort is made to set these parameters right from collection of drugs to the execution of drugs on albino rats. The pharmacognostical evaluation has been separately dealt under same headings while analytical study covered the following aspect as⁴:

. Organoleptic Parameters

- a. Colour
- b. Odour
- c. Taste
- d. Consistency

2. Physico-chemical Parameters

Analytical Parameters for ***Kashaya***

1. Total Ash
2. Water soluble ash
3. Acid insoluble ash
4. Water soluble extractive
5. Alcohol soluble extractive
6. Total solid content

EXPERIMENTAL STUDY

Ayurveda has now given more importance to ***Pratyakshapramana*** in the form of Experimental studies.

Experimental study is of two types.

-In Vitro studies, done on specific organs of experimental models.

-In Vivo studies, done on live experimental models.

Source of animals

The whole study was carried out in the Animal House attached with the Institute.

Inclusive criteria - Healthy and active albino rats of both sex selected randomly.

- Rats weighing 180 g - 200 g.

Exclusive criteria -

- Rats below 180 g & above 200 g.
- Diseased and infected rats.
- Pregnant rats.
- Rats which are under trial for other experiments.

Rat maintenance

- All animals were maintained at the Animal House of, under identical condition of place light, temperature, food and other condition.
- All 4 cages used for the experiment was cleaned before the commencement of the experiment, and once in 3 days and there after till the end of experiment.
- All the cages were washed with detergent followed by disinfectant

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phenol solution to maintain the hygiene.

- After cleaning of cages, the bedding material was prepared using paddy husk and it was changed once in three days till the end of experiment.

Feeding schedule

The quantity of food for rats weighing 180-200g was about 15-20g / day. Water was provided as required. Readymade rat feed prepared by Amrut feeds, Pranav Agro Industries Ltd, was procured and used.

Study on normal body temperature

Rats of either sex were divided into three groups, comprising six in each group for this experiment. The body temperature of each rat was measured rectally at predetermined intervals before and for 5 h after administration of either 2% aqueous CMC solution (control) or *Mashaparnikwatha* at doses of 1.2 ml/ 200g/kg, BW orally.

Study design - purpose and rationale

The subcutaneous injection of Brewer's yeast suspension is known to produce fever in rats. A decrease in temperature can be achieved by administration of compounds with antipyretic activity.

Materials

1. Digital Clinical thermometer [Buzzer type] - Obtained from animal house MTRIPS Kalaburgi. This thermometer has thermo-sensitive and digital display screen for displaying temperature in Celsius scale. Glycerin applied thermo sensitive tip is inserted into the rectum of the rat and should be kept for one minute for obtaining the accurate temperature.
2. Brewer's yeast [Baker's yeast] - 50g of dried Brewer's yeast was purchased from Kamadhenugrossary shop, Kalaburgi
3. Calpol [Paracetamol] suspension (5ml containing 120mg of Paracetamol) - Manufactured by Glaxo Smith Kline Pharmaceuticals Limited was purchased from Adharsh medicals Gulbaraga.

Brewer's yeast induced pyrexia method

This is as per the standard reference from 'Drug discovery and evaluation, pharmacological assay' by GerhaldVagel. This method is explained by Gujral et al. 1995 and also by Poonam et al 1989. In this procedure yeast known as Brewer's yeast is used as a pyrogen. 20% yeast solution is prepared in normal saline

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and injected subcutaneously with the dose of 1ml / 100gm body weight⁵. It induces pyrexia in 1 hr. This method is adopted if the experimental animals are albino rats.

The normal body temperature of each rat was measured rectally at predetermined intervals and recorded. The rats were acclimatized to remain quiet in a restraint cage. A thermister probe was inserted 3–4 cm deep into the rectum and fastened to the tail by adhesive tape. The temperature was measured on a thermometer. After measuring the basal rectal temperature, animals were given a subcutaneous injection of 10 ml/kg BW of 15% (w/v) yeast suspended in 0.5% (w/v) methyl cellulose solution. Rats were then returned to their

housing cages. After 19 h of yeast injection, the animals were again restrained in individual cages for the recording of their recta temperatures.

Pyrexia Inducing Action of Yeast

Brewer's yeast is a fungi containing lipo-polysaccharide, which is a cell wall component of gram negative bacteria. This binds with macrophages, releases cytokines, interleukin - 1 etc. into the blood circulation, leading to antigen-antibodyreaction. Then it reduces blood brain barrier and releases Arachidonic acid mediated by the enzymes phospholipase, prostaglandin E2 synthase, and cyclo-oxygenase. Finally synthesis and release of PGE2 into anterior hypothalamus result in pyrexia.⁶

Table no: 1.1 Name of the Group

Group	Drug	DOSE	Route of administration
Group G1	Control.(CMC) Normal saline	Normal	Oral
Group G2	Standard group. Paracetamol	5ml susp/125mg- 1.6ml/200g body weight (0.75ml/100g body weight)	Oral
Group G3	Trial- Drugs <i>Mashaparnikwatha</i>	1.2ml/200g body weight	Oral

Mode of Administration of the Trial drugs

The Trial drug *Mashaparnikwatha* is to be administered in the form of decoction. The dosage is fixed as 1.2 ml / 200 g body wt orally to Group C.

Procedure:

- Animals were kept on fasting overnight, but were provided with drinking water.
- Next morning, the initial rectal temperatures of all rats were recorded.
- Suspension of 20% dried Brewer's yeast in normal saline was injected subcutaneously (in thigh region) in a dose of 1 ml / 100 g body weight.
- After two hours of induction of fever, the respective trial drugs were administered.
- Group I- Control- This group received 2ml/200g body. Wt. of Distilled water.
- Group II-Standard. The Standard drug, Paracetamol suspension 1.6 ml/200g body wt. was administered.
- Group III, were Trial groups. *Mashaparnikwath* 1.2ml/ 200g Trial drugs
- Rectal temperatures recorded at a regular interval of 0hr to 24 hr.

- The readings were tabulated & subjected to Statistical analysis.

Drug administration : Nineteen hour after yeast injection the *Mashapanikwatha* was administered orally at doses of 1.2ml/200g/kg BW to third groups, respectively. A similar volume of (5 ml/kg) 2% aqueous CMC solution was administered orally to the control group. The second group of rat received the standard anti-pyretic drug paracetamol at a dose of 0.75/100 g/kg orally. Rats were restrained for recording the rectal temperatures at the 19th hour immediately before the administration of the Mashapanikwatha, solution or Paracetamol, and again at 1 h intervals upto 23 h after yeast injection.

Duration - Single dose (1 day)

All the experiments were conducted in the same climatic conditions.

Evaluation

- The difference between actual values and starting values were registered for each time interval.
- The maximum reduction in rectal temperature in comparison to the standard positive was calculated and results were compared with the effect of Standard drug, Paracetamol.

Table No. 1.2. Behavioral Observations in Animals

Sl no.	Observations	Before the induction of Pyrexia (-18 hours)	18 hours after induction of Pyrexia (+ 18 hours)
01	Temperature	Normal body Temperature	Raised body temperature above normal when felt with touch
02	Activities	More active	Decreased activities
03	Behavior	Normal with good food and water intake	Dull looking Face bent downwards Looking tired & Scanty micturition Less food and water intake

STATISTICAL ANALYSIS

The mean±S.E.M. values were calculated for each group. The data were analysed using one way analysis of variance followed by Dunnett's t-test. P < 0.05 were considered significant.

RESULTS

EXPERIMENTAL RESULTS:

The present study is undertaken to evaluate the anti-pyretic property of trial drugs *MashaparniKwathon* Wister strain albino rats. Selected 18 rats were divided into 3 groups. Each group contained 6 rats.

Group G1 (Control group) -Given Distilled water.

Group G2 (Standard group) -Given Paracetamol suspension.

Group G3 (Trial group) -Given

MashaparniKwatha.

After injecting yeast to induce pyrexia, hourly temperature of all rats was recorded. Significant result was obtained in Standard and Trial group when compared with the Control group.

EXPERIMENTAL STUDY-

Experimental evaluation of antipyretic effect was been carried out on Wister strain albino rats. A Pilot study was conducted prior to the actual study, to prove the efficacy of collected sample of Brewer's yeast.

□ Group 1 was treated with Distilled water to serve as Control.

□ Group 2 was treated with Standard drug, i.e. Paracetamol suspension.

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□ Group 3 was treated with **MashapaniKashaya**

Before starting the trail, on Group of all 3 three rats normal temperature is recorded for 7 hours, then all rats which has normal temperature are selected for trail.

Rat dose was been fixed by using a standard rat dose conversion formula. All the rats had given with normal food and water before the study, Then After administration of breaker yeast, pyrexia is induced then Rats are kept for observation of from 0 hour to 19 hour, on 19 hour trail drug is administered and hourly rectal temperature is measured up to the pyrexia is reduced. By observing the readings, marked relief was observed in Trial and Standard drugs when compared with the Control. This suggests the positive effect of all the Trial drugs in controlling pyrexia.

The G1 Control group are induced pyrexia and they had kept Observation up to 23rd hour. The G3 Trail group **MashaparniKwatha** induced in 19th hour then hourly temperature is recorded, there Pyrexia is controlled at 23rd hour pyrexia is reduced to normal temp¹³⁰.

The G2 Standard group the drug is induced on 19th hour is also taken the same time to reduce the temp to normal level.

Being **tikta rasa dravya** it is a potent **Agnideepaka** and **Pitta shamaka**.

Tikta is also having the properties of **Deepana** and **Pachana**. Thus by the potency of above said properties **Mashaparni** relieves **Jwara** both symptomatically as well as it does **Samprathivighatana**.

CONCLUSION

1. **Jwara** is one of the most important conditions explained both as a disease and symptom in the Ayurvedic literatures
2. On literary research it is found that the trial drug **Mashaparni** which is selected here for the study is having significant role in pyrexia conditions.
3. **Kwatha Kalpana** is one where in water soluble, therapeutically active constituents of the drugs are extracted.

Pharmacognostical Study

1. This study included Organoleptic, Macroscopic Features and Also Microscopic Features of the sample drug **Mashaparni Kwatha**. When results were compared with Ayurvedic

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Pharmacopoeia of India, no much difference observed.¹⁰

Analytical study:

1. **Mashaparni Kwatha** was subjected to physico-chemical, phyto-chemical analysis study. By physico chemical study it was observed that water soluble extract was 9.5% more than that of alcohol soluble extract 3.1% By Phytochemical study it revealed the presence of Glycosides and Alkaloids.¹¹

Experimental Study: 1. By experimental study the standard drug (Paracetamol) showed Equal antipyretic activity compared to **Mashaparni Kwatha**. An Experimental Evaluation of w.s.r. to its **Jwaraghana** Action.¹²

2. The trial drug **Mashaparni Kwatha** was found to be having significant effect in bringing about antipyretic action, when compared with control group.
3. **Mashaparni** is easily available and does not possess any sort of side effects or toxic effects in its therapeutic dose in rats and hence it is found to be safe remedy.

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