

**EXPERIMENTAL EVALUATION FOR ANALGESIC ACTIVITY OF
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ABSTRACT

Siddha Yoga Sangraha of Yadavji Trikamji Acharya, states about Mamsyadi kwatha, an Ayurvedic formulation which is said to be effective in minor mental disorders. The ingredients of Mamsyadi kwatha are Jatamamsi (*Nardistachys jatamansi* DC), Ashwagandha (*Withania somnifera* Linn) and Parasika yavani (*Hyoscyamus niger* Linn), in 8:4:1 ratio respectively. The test formulation was subjected to assess its analgesic effect. The model selected for the assessment of analgesic effect was tail flick test, in albino mice. The test formulation possesses analgesic effect, which is mainly due to its component Parasika yavani.

Key words: Mamsyadi kwatha, Jatamamsi, Ashwagandha, Parasika yavani, tail flick test.

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INTRODUCTION

The international association for the study of pain defines pain as the sensory and emotional experience associated with actual or potential tissue damage. Thus pain includes not only the perception of an uncomfortable stimulus but also the response to that perception. Experiencing pain is influenced by a great number of interacting physical, biochemical, physiological, psychological, social, cultural and emotional factors. All of these interactions are dynamic and constantly changing. As a symptom, pain demands instant relief and in practice dramatic relief of pain by drugs highly impresses a layman. Pain receptor organs are distributed throughout the body. Clinically, pain can be considered as:

1. Superficial or cutaneous pain
2. Deep non visceral pain from muscles, joints, ligaments and bones.
3. Visceral pain
4. Referred pain
5. Psychogenic pain or functional pain.

Analgesics are drugs which relieve pain without causing loss of consciousness. Analgesics are classified into opioid and non opioid. Opioid analgesics provide relief

from pain and depression of the CNS, both of which are reversed by naloxone. Non opioid analgesics do not interact with opioid receptors and relieve pain without depression of CNS. All analgesics produce adverse effects too. It is necessary to search a modality which eradicates pain without any other adverse effects. Ayurveda, the ancient treasure of health, provides solution for above said problem. Mamsyadi kwatha, an Ayurvedic formulation mentioned in Siddha Yoga Sangraha of Yadavji Trikamji Acharya¹, is said to be possessing very good effect in all mental disorders. Keeping this view in mind it was predicted that Mamsyadi kwatha² is having effect on CNS. Here an effort has been made to evaluate the efficacy of Mamsyadi kwatha and its components on tail flick test to elicit analgesic effect. With this idea aforesaid research work was undertaken.

OBJECTIVES

1. To evaluate the analgesic effect of Mamsyadi kwatha.
2. To assess the role of ingredients of Mamsyadi kwatha in its analgesic effect.

MATERIALS AND METHODS

Animals

Swiss albino mice of either sex weighing between 20g – 40g were randomly selected & maintained in the animal house attached to the pharmacology laboratory of I.P.G.A & R.A. They were maintained on 'Amrut' brand mice pellets. Both food & tap water were given ad libitum. Animals were exposed to natural day & night cycle. 60-85% of humidity was maintained. The drugs under trial were administered orally with help of a specially prepared catheter.

Grouping

Albino mice were divided into 5 groups each containing 6 mice.

Control group:- Mice of this group were administered with 80ml/kg/day of distilled water each.

Jatamamsi kwatha group- Jatamamsi kwatha of 80ml/kg/day was administered to each mouse of this group.

Ashwagandha group- Ashwagandha kwatha was administered in the dose of 80ml/kg/day for each mouse of this group.

Parasika yavani group- Each mouse of this group was administered with the decoction of Parasika Yavani in the same dose as stated as above.

Mamsyadi kwatha group-80ml/kg/day of the Mamsyadi kwatha was administered for each mouse.

Route of administration, duration & dose

Freshly prepared decoction of above mentioned drugs administered orally in a dose of 80 ml per kg per day, with the help of specially prepared catheter. The duration was 7 days for chronic study & one day for acute study.

Statistical analysis

Done by employing student 't' test for paired & unpaired data & also by non parametric methods, A 'p' value of less than 0.05% was considered as statistically significant.

Experimental procedure³

Experiments were carried with 2 dosing schedules.

- 1) Acute Study – Test drugs administered one hour prior to experimentation. On the same day experiments were conducted.
- 2) Chronic Study – Trial drugs were administered for 7 days, on 8th day morning experiments one hour after the administration of test drug.

Test formulation: Mamsyadi kwatha

Reference: Siddha Yoga Sangraha

- Ingredients: 1) Jatamamsi – 1 part
2) Ashwagandha – 1/4 parts
3) Parasika yavani – 1/8 parts

Preparation of medicine

- 1) Jatamamsi Kwatha: decoction prepared by boiling 1 part of coarse powder of jatamamsi in 16 parts of water & reducing into 1/4th part
 - 2) Ashwagandha Kwatha – Prepared as mentioned above
 - 3) Parasika Yavani Kwatha – Prepared as mentioned above
 - 4) Mamsyaadi Kwatha – Prepared as mentioned above
- For each experimentation, fresh decoction was prepared. Here 1ml of decoction consists of the water extractable material of 500 mg of the drug. (Tab No. 1)

Experimental model

To determine whether the test drugs possess central analgesic activity or not they were evaluated with radiant heat test. It was done as described by Gujral and Khanna (1956).

This experiment was conducted with the help of "Tail Flick Analgesimeter". The procedure is as follows. The tail of restrained animal was placed on the heated nichrome wire (The intensity of which was maintained at a constant level) in such a manner that it is exposed to the radiant heat of the nichrome wire without actually touching it. The animal tries to avoid the radiant heat by vigorously flicking its tail. The time interval between placing of the tail over nichrome wire and observation of tail flick was considered as reaction time. Significant prolongation of reaction time, one hour after drug administration in comparison to control group values indicated presence of analgesia. For accuracy, four trials were conducted in 15 minutes interval of time.

Observations

Data pertaining to the effect of test drugs on Tail flick response in albino mice during chronic administration is tabulated above. There was an apparent increase in the latency of Tail flick response in Jatamamsi⁴, Ashwagandha and Mamsyadi kwatha administered group. However it was not statistically significant. However (P<0.05) increase in latency of tail flick response observed in Parasika yavani administered group was found to be statistically significant. (Tab No. 2)

DISCUSSION

On chronic administration, elevation of pain threshold for tail flick response was observed in all the three ingredients and the test drug formulation. However the elevation was significant only in Parasika yavani administered group. This shows that the test drug may produce the central analgesic activity. The exact mechanism of this elevation needs to be evaluated. It may be due to the release of endogenous peptides or direct stimulation of opioid receptors. Modulation of the formation and metabolism of endogenous peptides

(Endorphins/Enkephalins) may also be involved⁵. It is also possible that the observed analgesic effect may be due to modulation of non-opioid pathways⁶. Further detailed studies would help in arriving at an unequivocal conclusion.

CONCLUSION

- Mamsyadi kwatha is having analgesic activity.
- The analgesic effect of Mamsyadi kwatha is mainly due to Parasika yavani an ingredient of it.
- Acute and chronic study of Mamsyadi kwatha on tail flick response test is ideal one to elicit the analgesic activity.

- Parasika yavani is having very good analgesic activity.

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Table 1: Ingredients, properties and part used

Sl. No	Sanskrit name	Botanical name	Family	Guna	Part used
1	Jatamamsi	<i>Nardostachys jatamamsi</i> , DC.	Valeria naceae	Samjna Sthapana	Rhizome & oil
2	Ashvagandha	<i>Withania somnifera</i> , Linn.	Solanaceae	Balya Brumhana Vishagna Shothahara Ropana	Roots
3	Parasika yavani	<i>Hyoscyamus niger</i> , Linn.	Solanaceae	-	Dried leaves with flowering tops, seeds

Table 2: Effect of test drugs on "tail flick response" in albino mice Chronic study

Group	Dose ml/Kg.	Time of Tail Flick Response (Sec.) Mean ± SEM
Control	80	1.28 ± 0.196
Jatamamsi	80	1.94 ± 0.214
Ashvagandha	80	1.829 ± 0.296
Parasika yavani	80	1.887 ± 0.109*
Mamsyadi Kvatha	80	1.84 ± 0.257

* P<0.05

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