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PRECLINICAL STUDY OF ANTINOCICEPTIVE ACTIVITY OF VARIOUS AYURVEDIC DOSAGE FORMS OF AVANTI (*Tridax Procumbens*)

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ABSTRACT
Tridax procumbens (Tridax) is a weed abundantly found in all parts of India, commonly known as Avanti, Akal Kohdi, Pardesi Bhringraj, Kambarmodi etc. It is traditionally being used for wound healing, haemostatic purpose. Different Ayurvedic dosage forms *Tridax* like Swarasa, Ghana, Kshara and Taila were prepared and tested for their analgesic activity by animal experiment. Drugs were administered orally to Wistar Albino rats and Tail flick method with analgesiometer was used to evaluate the analgesic activity. Results were significant and encouraging, the Ghana of *Tridax* showed statistically highly significant activity, followed by Taila and Swarasa. Thus the different dosage forms of *Tridax* possess variable analgesic properties out of which Ghana is most appreciable one. Further study is necessary to understand the exact mode of action of the drugs.
Keywords: *Tridax procumbens*, Avanti, Analgesic, Dosage forms, Ayurveda

INTRODUCTION

Pain is a disabling accompaniment of many medical conditions, and pain control is one of the most important therapeutic priorities. Many ailments of the body cause pain. Furthermore, the ability to diagnose different diseases depends to a great extent on a physician's knowledge of the different qualities of pain.

From ancient time Ayurveda has given various drugs like Dashamula, Nirgundi, Guggulu etc and many procedures like different types of Snehana, Swedana, Vasti, Raktamokshana, etc for the effective management of pain. There are many more drugs that can be used for relieving pain.

Tridax procumbens (Tridax) is commonly known as Akal Kohdi[1], Pardesi Bhringraj[2], Avanti[3], Raktarodhi, Kambarmodi etc. It is traditionally being used for wound healing[1,4], haemostatic purpose [1, 5, 6]. Also it is useful in bronchitis [7], diarrhea[1], hyperglycemia[8] etc. It is a time tested drug for complete management of wound healing. On this ground, the hypothesis is that, the *Tridax* has got some analgesic property and this experiment is designed to check out the same.

AIMS AND OBJECTIVE

The aim of the study is to evaluate analgesic activity of various dosage forms of *Tridax* as listed below.

- Ghana (Aqueus extract) 80mg/ml DW, 1ml/100gm rat wt.
- *Tridax* Kshara (Water soluble Ash) 20mg/ml DW, 1ml/100gm rat wt.
- *Tridax* Taila (medcated sesame oil) 1ml/100gm rat wt.
- *Tridax* Swarasa (Fresh juice) 1ml/100gm rat wt.

MATERIALS AND METHODS

Materials

Identity of *Tridax* was confirmed by expert botanist of Herbarium, department of botany, Rajasthan University, Jaipur and authenticated with Herbarium Voucher specimen number 'RUBL 20597'. To evaluate the analgesic activity of *Tridax* its different dosage forms viz. Ghana, Taila, Kshara and Swarasa were prepared [9] in Department of Rasashastra and Bhaishajya Kalpana, NIA, Jaipur and tested on adult healthy Wistar Albino rats. The experiment was conducted by Tail flick method[10] at the Apollo College of Veterinary Medicine, Jaipur. Due approval of Animal ethics committee was obtained for this experiment by the Apollo College of Veterinary Medicine. Other materials used are Adult Wistar Albino rats -24, weighing 150-200 gm, Radiant heat Analgesiometer, Rat holder, Syringes, Gavage needles, weighing balance, stop watch, cages etc.

Table1: Prepared dosage forms of *Tridax* with reference of preparation.

Sl. No.	Dosage form	Reference
1	Ghana	Sharangdhara Samhita./Madhyama Khanda/2/1
2	Kshara	Sharangdhara Samhita./Madhyama Khanda 11/101
3	Taila	Sharangdhara Samhita./Madhyama Khanda /9/1,2
4	Swarasa	Sharangdhara Samhita./Madhyama Khanda /1/2

Method

- Healthy adult Albino rats weighing 150-200gm of either sex were randomly selected from the rat population in animal house.
- 6 rats were kept in each cage for each group and were marked with picric acid for identification.
- Animals were weighed and noted down the weights. Doses were calculated according to the weights of the animals.
- Latent period of each animal to pain stimulus by radiant heat on tail was tested as follows.
- A rat was pushed in the rat holder so that the tail comes out of the holder through the slot in the lid.
- The tail of rat was placed through the slot in the water jacket over the heating element of the Analgesiometer.
- Water was allowed to run freely through the water jacket.
- The analgesiometer was connected to the mains and put the main switch on. Now the things were observed to be in order specially the tail, which should be horizontally placed over the heating element but without touching it and the pilot switch were put on.
- The latent time period before the tail was withdrawn with a jerk was recorded and immediately the pilot switch was put off.

- The current was adjusted about 4 ampere in such a way that it radiates about 55 ºC temperature to tail.
- Always the central zone of tail was used for the pain stimulus.
- The respective drugs were administered to rat per orally with gavage needle and disposable syringe. After each 30 minutes, the latent period was observed. Such readings were repeatedly observed for 2 hours. Under no circumstances the rat tail was exposed to the heat for more than 30 seconds.
- All the experiments were repeated in triplets. The constant readings were identified and tabulated as follows for the statistical calculations.

Image 1: Oral administration of the trial drug to rat by Gavage needle and syringe.
Image 2: Evaluation of latent period of response to pain by tail flick method

OBSERVATIONS

Following tables exhibits the observations of the experiment in the form of mean ± Standard deviation (S.D.). The paired t - test was applied to data using the 95% confidence level, and results were tabulated to show comparison between the t-value and P value of the respective groups when compared with the control. The control is the self latent period of the rats without consumption of any medicine.

Table 2: Latent period in the form of Mean ± S.D. at different time interval post drug consumption for drugs Ghana, Kshara, Taila and Swarasa of *Tridax*.

Group	0 min:	30 min	60 min	90 min	120 min
Ghana	3.217±0.232	7.333±0.350	10.417±0.382	3.883±0.286	3.150±0.207
Kshara	3.2 ±0.21	3.283±0.248	3.267±0.250	3.167±0.273	3.133±0.175
Taila	3.183±0.172	3.267±0.186	5.100±0.237	3.283±0.194	3.167±0.242
Swarasa	3.167±0.273	3.300±0.228	4.283±0.331	3.317±0.172	3.067±0.250

Table 3: Comparison of *t* and P values of different dosage forms of *Tridax* against the post dosing time interval

Time	*Tridax* Ghana		*Tridax* Kshara		*Tridax* Taila		*Tridax* Swarasa	
	T	***P***	***t***	***P***	***t***	***P***	***t***	***P***
30 min.	41.99	< 0.0001	1.75	0.1412	1.38	0.2242	1.02	0.3548
60 min.	84.07	< 0.0001	1.08	0.3276	20.26	< 0.0001	6.15	0.0016
90 min.	8.30	0.0004	0.37	0.7210	1.29	0.2532	1.56	0.1780
120 min.	1.0	0.3632	0.79	0.4650	0.23	0.8220	1.94	0.1106

RESULTS

From the above comparative study of statistical data it can be said that,

1. *Tridax* Ghana when administered orally to rats in dose 800mg/Kg body weight produces statistically extremely significant analgesia in 30 minute, 60 minute and 90 minute post dosing time. However on 120 minute post dosing time it could not produce significant analgesia. Among all, analgesia was observed highest at 60 minute post dosing time followed by 30 minute.
2. *Tridax* Kshara when administered orally to rats in dose 200mg/Kg body weight did not produced statistically significant analgesia.
3. *Tridax* Taila when administered to rats in a dose 10ml/Kg body weight produced statistically extremely significant analgesia at 60 minute post dosing time. However it did not showed significant analgesia at other post dosing time.
4. *Tridax* Swarasa when administered to rats in a dose 10ml/Kg body weight produced statistically very significant

analgesia at 60 min post dosing time. However it did not showed significant analgesia at other post dosing time.

5. Among all the dosage forms of *Tridax* tested, *Tridax* Ghana in dose 800mg/Kg body wt. produced highest levels of analgesia, followed by *Tridax* Taila and Swarasa. Though the results of *Tridax* Taila and Swarasa are statistically significant, the analgesic activity of Ghana is more competent one.

DISCUSSION

The present study is a pilot one to evaluate whether different Ayurvedic dosage forms of *Tridax* possess any analgesic activity. The base behind the selection of study is the popularity of *Tridax* in traditional system of medicine for wound, haemorrhage and inflammation management. As no work has been done on analgesic activity of Ayurvedic dosage forms of *Tridax*, screening was essential.

The dose of dosage forms of *Tridax* were decided by different trials. Dose of liquids like Swarasa and Taila were administered keeping stomach capacity of rats. As the rats showed high variability in responding to the pain stimulus in study, each experiment was repeated 6 tomes to identify the constant reading.

Further research work is essential to understand the mechanism of analgesic action of different dosage forms of *Tridax*. Also the dose- activity relation of the studied drugs is open for further research.

CONCLUSION

Tridax procumbens is traditionally used for the treatment of wound, inflammations, haemorrhage, dysentery etc. Analgesic activity of different Ayurvedic dosage forms of *Tridax* has not been done earlier. The animal experiment to evaluate analgesic activity if various dosage forms of *Tridax* such as Swarasa (fresh juice), Ghana (Reduced decoction), Kshara (Water soluble ash) and Taila medicated with *Tridax* reveals that all the dosage forms of *Tridax* possess significant analgesic activity, that of Ghana 800mg/Kg Rat body weight is highly appreciable. Further study is essential to understand mode of action and dose action relationship of these dosage forms.

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