



## Experimental Measurement Of Katu Rasa

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*Ras(taste) is considered as one of the important pharmaco-dynamic principles. Ayurvedic classics mentioned six rasa i.e., madhura, amla, lavana, katu, thikta and kashaya. It is to be assessed by tongue only. Present study was undertaken to develop a scale and unit for evaluation of rasa of the drug & assessment of threshold with reference to katu rasa. For this project 22 dravyas of katu rasa alone in the decoction form were included. This study is based on kwath kalpana and taste of various dilutions of katu rasa dravyas were administered to volunteers (organoleptic parameters) and observations were noted.*

**Key Words** – Rasa, Katu Rasa, Experimental measurement, Unit of Rasa.

### Introduction -

Rasa is the object of gustatory sense organ which is located in tongue. It is not only perception of taste but is an indication of composition, properties and probable action of drug.

Rasas are of six types. Madhura (sweet), Amla (sour), Lavan (salty), Katu (Pungent), Tikta (bitter) & Kashaya (Astringent). Now-a-days in fast food world people are consuming in excess spicy, pungent food & suffering its negative health consequences like hyperacidity, ulceration etc. Some research works were carried out to evolve objective methodology for assessment of degree of variation of taste through taste threshold method. Dr Shiv Charan Dhyani (Ex. Prof & H.O.D. of D.G.V. dept Gujarat Ayu Uni., Jamnagar) has worked on primary, comparative & superlative degrees of rasas for eg. Madhura – madhuratara – madhurtama and has fixed taste thresholds. But he has not prepared a scale for measurement of rasa.<sup>4</sup> Scientists are busy in developing electronic tongue to replace biological organ ie tongue. Keeping this in view it was felt that a scale for evaluation of any rasa is necessary, also the Rasagyana (knowledge of Rasa) is a subjective feeling so far, and according to our knowledge no objective parameter has been fixed to measure it quantitatively. Again rasa is understood by Pratyaksha praman, Anuman praman and Aptopdesha, pratyaksha praman being the best praman hence this experimental study has been carried out.

### Aims & Objectives -

To prepare the unit & scale for quantitative measurements of katurasa.

### Material & Methods -

**Study in Healthy volunteers** - This research was an observational, single blind open study in healthy volunteers. Human volunteers who didn't know the substance of decoction and also its rasa were selected. Decoction & in some cases swarasa of dravyas were prepared by standard Ayurvedic methods & they were serially diluted. Distilled water was used for preparation of decoction & dilution<sup>5</sup>.

Rasa of each of them was tasted starting from that of its maximum possible dilution till no taste is understood. Beginning from this point, gradually concentrated solutions of decoction was made & were tasted. The dilution at which Katu rasa was noted for the first time of all decoctions was noted.

The Dravyas whose Katurasa is expressed for the first time in maximum dilution can be said to have **weakest katurasa** whereas the dravyas whose rasa expressed at the first in relatively minimum

concentration as **strongest katurasa**. The other rasas shall stand between these two extreme categories of rasa.

Supposing the rasa of drug A understood for first time in dilution ratio of 1:50 & is the weakest in Katu rasa series then that will form UNIT of katu rasa.

If the ratio of sub B understood for first time in dilution ratio of 1:1200, calculated as

1:50 = 1 unit

1:1200 = 1200/50 = 24 units.

This ultimately means sub B is 24 units Katu or strength of its Katu rasa is expressed as

Katu x 24.

In this way we measure the strength & intensity of Katu rasa of each dravya was measured.

### Criteria For Preparation Of Decoctions -

Medicinally useful parts of substances collected in their flowering seasons when the parts have max taste contents. Decoction has been prepared in a Pyrex glass container & all apparatus used also been of it and not of any metal to avoid chemical action<sup>5</sup>.

### Criteria For Inclusion Of Volunteers -

Ten healthy volunteers of same age group from II year B.A.M.S. class of College of Ayurved, Akurdi were selected. Before starting the trial approval of I.E.C. and written informed consent of each volunteer had been taken up.

### Criteria For Exclusion -

Volunteers having digestive complaints.

Addicted to eating pan or tobacco.

### Observations -

Katutwa (unit) of that Dravya i.e. Rasa pratyakshya was observed & these observations have been recorded in tabular form of each Dravya as follows-

Volunteer no	1:10	1:100	1:90	1:80	1:79	1:78
1	/	X	X	/	/	X
2						

/=feeling of taste X = no feeling

22 dravyas of katu rasa were tested for the study

### List Of Drugs -

Sr.No.	Drug <sup>6</sup>	Botanical name <sup>7</sup>
1	Akarkarabh	<i>Anacyclus pyrethrum</i>
2	Chakramarda (leaves & seed)	<i>Cassia tora</i>
3	chavya	<i>Piper retrofractum</i>
4	Danti	<i>Baliospermum montanum</i>
5	Dravanti	<i>Croton tiglium</i>

6	Hingu	<i>Ferrula narthex</i>
7	Jeerak	<i>Cuminum cyminus</i>
8	Kampillak	<i>Mallotus phillepinensis</i>
9	Krishna jeerak	<i>Carum bulbocastanum</i>
10	Khubakalan	<i>Sisymbrium irio</i>
11	Lanka	<i>Capsicum annum</i>
12	Maricha	<i>Piper nigrum</i>
13	Malay vacha	<i>Alpinai galangi</i>
14	Methika	<i>Foenum greecum</i>
15	pippali	<i>Piper longum</i>
16	putiha	<i>Mentha spicata</i>
17	Rajika	<i>Brassica juncea</i>
18	Shunthi	<i>Zinziber officinalis</i>
19	Adrak	<i>Zinziber officinalis</i>
20	Snuhi	<i>Euphorbia nerifolia</i>

### Analysis Of Observations -

These calculations were made as per the method mentioned above

The katu rasa of **Khubakalon** was first noted in 1:18 dilution & so it was as the weakest in the katu rasa series that form the unit of katu rasa so **1:18=1 unit**

Hence the calculated Katurasa units of other remaining katu rasatmak dravyas are given in tabular form as follows

Sr.No.	Drug	Rasa noted in dilution	Calculated katurasa unit
1	Akarkarabh	1:36	2
2	Adraka	1:840	46.66
3	Chakramarda seed	1:64	3.55
4	Chakramarda leaves	1:6600	366.6
5	Chavya	1:500	27.77
6	Chitrak	1:260	14.44
7	Danti	1:26	1.44
8	Dravanti	1:600	33.33
9	Hingu(purified)	1:7200	400
10	Hingu (unpurified)	1:8600	<b>477.77</b>
11	Jeerak	1:42	2.33
12	Kampillak	1:340	18.88
13	Krishna jeerak	1:680	37.77
14	Maricha	1:380	21.11
15	Lanka	1:400	26.2
16	Malay vacha	1:56	3.11
17	Methika	1:440	24.4
18	Pippali	1:660	36.60
19	Putiha	1:900	.50
20	Rajika	1:860	47.77
21	Shunthi	1:740	41.11
22	Snuhi	1:40	2.22

## Discussion -

For this study Rasavichar & Katu rasavichar (information about rasa & katurasa) are important. The definition of rasa, lakshana, panchbhautik constitutions & uplabdhi hetu, Rasopdesha Rasa-Ritu relation etc, these points were discussed under the Rasavichar & katu rasa lakshan, properties, action on dosha, dhatu, mala & systemic actions, diseases caused by excessive intake (ati yoga lakshana) were discussed under it<sup>8</sup>.

With reference of above siddhanta the present study was undertaken to decide tar-tamatwa (relativity of taste intensity) of certain katu rasatmak dravya. The study was based on kwath kalpana & taste of various dilutions of dravyas was tested by volunteers. Observations were noted & analysis of these observations is presented here.

The katutwa of each dravya (units of katurasa) & again the symptoms of it felt by volunteers confirm the properties (Gunas) & Panchabhautikatwa of each Dravya of Katu rasa series. Katu rasa dravya acts as irritant of tongue (tingling sensation, burning sensation along with excessive secretions from mouth, nose & eyes). Also it causes headache after sometimes which is because of the relationship between symptoms & properties of it. From this observation of similar properties (concluded & textual) it seems that with the help of dilution experiment we can use the unit of dilution, unit to express the tartamatwa of katu rasa of that matter. Further this is helpful to decide the probable site of action of drug & so select single appropriate drug from the vast list of drugs included in skandhas of each rasa<sup>9</sup>.

The granthas have mentioned that the rasa of Methika is katu as it is mentioned in Katuk skandha, but after tasting the decoction some volunteers felt Tikta rasa at first rather than katu. Hence it is proved that Charak has constructed Katu skandha of dravyas of not only single katu rasa but of katu veepaka – anurasa and ushna virya also<sup>10</sup>.

It was observed that swarasa of Aadraka (fresh form) is strongest katu than decoction of Shunthi (dry form). So it is proved that fresh forms of dravyas have more rasa than dry forms. Also panchbhautik constitution of Aadraka is Agni (main) & Vayu.

The rasa of unpurified Hingu is more katu than that of purified, hence it can be proved that unpurified Hingu is more Agneya and having ushna – tikshna properties so its prolonged use or overdose creates the symptoms of pitta prakopa.

Hence to overcome this; Hingu must be purified for the use in diet & therapeutics. Hingu may be applied in severe kapha diseases because of its **katutamatawa**.

Based on these observations the katurasa of khubakalan is the **weakest** (means it has not so match tikshna and ushna guna) hence it can be applied in the Kaphaj diseases having less symptoms including pediatric & old age group also.

## Conclusion -

The present study was undertaken to develop a scale & unit for evaluation of rasa of drug with specific study of katu rasa can be concluded as;

Jala Mahabhuta is the basic constituent of rasa & is expressed when a drug comes in contact with Rasanendriya, hence to evaluate the particular rasa of majority of drugs the water soluble extracts i.e. Kwath kalpana & concept of dilution is the criteria for assessment of Katu rasa.

The rasa of unpurified Hingu is strongest katu than that of purified.

In some katu rasatmak dravyas like Chakramarda leaves, Aadrak, Putiha which are to be used when they are fresh the media should be Swarasa.<sup>11</sup>

It is observed that the juice (swaras) & fresh form is strongest than that of decoction & dry form.

It is concluded that the Khubakalan is the 'weakest' katu in katu rasa series. (1:18dilution)

It is concluded that the Unpurified Hingu is 'strongest' katu in the series (1:8600 dilution).The katu rasa of purified hingu is noted first time in 1:7200 dilution – less than unpurified form.

It is observed that unpurified Hingu has strongest katu rasa (477.77 units) than Lanka (Capsicum)(22.2 units) so the synonym Katuveera of this dravya is under quation<sup>12</sup>.

In the therapeutics where the katu rasa in indicated drugs of specific katu rasa should be prescribed according to severity & stage of disease. Hence the present study of standardization of katu rasa will certainly help in successful management of disease.

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