IAMJ

INTERNATIONAL
AYURVEDIC
MEDICAL JOURNAL

Research Article | ISSN: 2320 5091 | Impact Factor: 5.344

# AN EXPERIMENTAL EVALUATION OF RASA PANCHAKA (ATTRIBUTES) OF FOLK MEDICINAL PLANT *Andrographis Macrobotrys Nees*

**Ranjitha S[1], Chandrakanth Bhat[2], Sudhakar Bhat[3], Rejukrishnan[4]**

[1]PG Scholar, Department of Dravyaguna, MIAMS, Manipal- 576104, Udupi, Karnataka, India
[2]HOD and Professor, Department of Dravyaguna, MIAMS, Manipal- 576104, Udupi, Karnataka, India.
[3]Research officer, SDM centre for research in Ayurveda and allied health sciences, Kuthpady, Udupi-574118, Karnataka, India.
[4]Associate professor, Department of Dravyaguna, MIAMS, Manipal- 576104, Udupi district, Karnataka, India

**Corresponding Author:** ranjithasrao9.rs@gmail.com

https://doi.org/10.46607/iamj1308082020

**(Published online: August 2020)**



**Article Received:** 27/00/2020 - **Peer Reviewed:** 07/08/2020 - **Accepted for Publication:** 07/08/2020

Check for updates

## ABSTRACT

**Background and Objective:** Folk medicinal plants are densely found in India which needs to be thoroughly studied and documented. *Andrographis Macrobotrys* (Nees) is an erect, stout herb of Acanthaceae family is used in the treatment of snake bite, diarrhea, muscle pain, fever, jaundice, liver disorders and skin disease by the tribes of Kerala. According to the principles of Ayurveda, basis for use of drug is by analysing its *Rasapanchaka* (attributes) namely *rasa* (taste), *guna* (qualities), *vipaka* (taste after digestion), *virya* (potency), and *prabhava* (special action). Hence assessment of *Rasapanchaka* is necessary for thorough knowledge of the drug. Aim of the present study is to evaluate the *Rasa, Guna, Virya*, *Vipaka* and *prabhava* of *Andrographis Macrobotrys* Nees.

**Methods:** *Rasa* of whole plant was assessed by direct perception by administering test drug to 25 volunteers. *Virya* was assessed by exothermic and endothermic reaction of the drug with water in different concentrations. *Vipaka, guna* and *prabhava* were determined through animal experimental study by administering drug to 12 Wistar Albino rats.

**Result and Conclusion:** The assessment of study on *rasapanchaka* reveals that test drug possess *Tiktha* (bitter) *rasa, Kashaya* (astringent) *anurasa, laghu* (light), *ruksha* (dry), *ushna* (hot) *guna, katu* (pungent) *vipaka, sheetha* (cold) *virya, pachana* (digestive), *lekhana* (scraping) *karma* (action).

**Keywords**: *Andrographis Macrobotrys* Nees., Acanthaceae, *Rasapanchaka*, animal experimental study

## INTRODUCTION

Indian subcontinent possesses natural vegetation with abundant medicinal herbs. Upgradation of information of such extra pharmacopeial drugs through research is very much necessary for the development of information gained from folk use into knowledge which will be useful for mankind. *Andrographis Macrobotrys* Nees., is one such drug which is distributed in semi-evergreen forest of southern India and Srilanka. It is in folk use by tribes in Kerala for the treatment of snake bite, diarrhea, muscle pain, fever, jaundice, liver disorders and skin ailments. Ayurvedic basis for analysing a drug for its medicinal action is by its five attributes which is called as *rasapanchaka.* Those five attributes of drug are *rasa, guna, vipaka, virya* and *prabhava.* For further use of above drug in Ayurveda, the present comprehensive study for the assessment of these attributes has been taken up.

**Materials and Methods**

**1. Assessment of *rasa*(taste)**

Rasa is the entity of a substance which is perceived by *Rasanendriya* (tongue)[1]. Hence taste can be assessed by local action with tongue and system action in body. The following method for assessment of rasa with tongue was adopted.

**Procedure[2]:** Selection of 25 healthy volunteers, Ayurvedic students preferably who perceive rasa and may not mistakes in expressing was done. They were asked to wash their mouth. Five minutes gap was given between washing mouth and tasting the test drug. Blind method was followed, in which volunteers were not told about the identity of the drug. 5g of powder of *Andrographis Macrobotrys* Nees., whole plant was given. They were instructed to keep it in mouth for 2-3 minutes and note down rasa perceived immediately after drug administered as *Pradhana Rasa* and the later perceived one as *Anurasa*.

**2. Assessment of *vipaka* (taste after digestion) and *guna* (qualities)**

*Vipaka* is the final outcome of digestion and metabolism of a substance where biotransformation of *rasa* (taste) occurs[3]. Drug which is formed by a composition of *panchamahabhoota* undergoes transformation. At the end, composition of drug may remain same or change depending which action of the drug may differ. Hence *vipaka* is assessed by the action of the drug in the body[4]. *Guna* is qualities or properties of drug which is difficult to be assessed by a single parameter due to its varied characteristics[5]. In this animal experimental study, *vipaka* and *guna* of the drug *Andrographis Macrobotrys* Nees., is assessed.

**Experimental Procedure**

- 12 Wistar Albino rats were selected, weighted, divided into 2 groups with 6 rats each and marked.
- Each rat of both the groups were kept in a separate metabolic cage which was provided constant amount of water and food per day for five days which serve as control.
- Each rat was administered with 100gm of food and 200ml of normal filter water per day for 15 days.
- After every 24 hours weight of faecal matter, Urine output, weight of the remaining food and quantity of remaining water was noted. The wet faecal matter was weighed and kept for drying in drier for 24 hours. Next day, weight of dry faeces was noted, and the record was maintained for further statistical analysis.
- All 6 rats of trial group which were separately kept in metabolic cage were weighed on 6$^{th}$ day and dosage of the *Swarasa* of test drug *Andrographis Macrobotrys* Nees., leaves were calculated by dose conversion formula according to weight of each rat.
- Dosage of the test drug to each rat was started on 6$^{th}$ day of the study and continued same for further 10

days which is considered as therapeutic phase. Keeping each rat in separate metabolic cage and were provided with constant amount of food and water per day.

- As before after every 24 hours weight of faecal matter, Urine output, weight of the remaining food and quantity of remaining water was noted for all the 12 rats. The wet faecal matter was weighed and kept for drying in drier for 24 hours. Next day, weight of dry faeces was noted, and the record was maintained for further statistical analysis.
- Last day of the study, i.e. on the 16th day weight of each rat was noted.
- Analysis of *virya, guna* and *vipaka* was done on the basis of food and water consumption, fecal matter and urine quantity.

Parameters considered here are: Food consumption, water consumption, faecal wet weight, faecal dry weight (wet fecal matter kept in drier for 24 hours), urine output, Food conversion ratio (Food intake/Fecal dry), faecal water, body weight [% of body weight= (final weight – initial weight)/ initial weight*100].

**3. Assessment of *virya* (potency)** *Virya* is that force or energy responsible for action of a drug. It is the essence of *Panchamahaboota* (5 material elements) which is present in drug performing action, without which any action from drug is impossible.[6]

Determination of *Virya* was done with 2 methods i.e. by varying concentration of drug.

**3.1. Method 1:** *Swarasa* of the test drug *Andrographis Macrobotrys* Nees., is freshly prepared from its leaves and *Swarasa* was taken 5 ml each separately in 3 conical flask. 5 ml and 10 ml of distilled water with room temperature was added to 2nd and 3rd flask. Industrial thermometer was kept in each conical flask and variation in temperature was noted every 5min once for 30 minutes.

**3.2. Method 2:** 10 ml of distilled water with room temperature was taken in 3 conical flask. *Swarasa* of leaves of test drug *Andrographis Macrobotrys* Nees., 2ml, 4ml and 6ml is added to consecutively in conical flasks. Variation in temperature was noted with the help of industrial thermometer with 5 minutes interval for 30 minutes.

**4. Assessment of *prabhava* (Specific action)**

*Prabhava* is a special action of drug which is impossible to explain by quality or any attribute of the drug[7]. Drug action differs in accordance with change in *panchaboutika* (5 material elements) composition of the drug which cannot be understood and explained by *rasapanchaka* (fundamental attributes of drug).

**Statistical Calculations**

The values noted were expressed as MEAN±SEM (Standard Error of Mean). The data were analysed by one-way ANOVA followed by Dunnet's multiple comparison t test as post hoc test. Graph pad in stat software is used for this purpose. If $p \leq 0.05$ it is considered statistically significant. Accordingly, level of significance was noted and interpreted.

**Animal ethical committee clearance**

Experimental study was carried out at S.D.M Center for research in Ayurveda and allied health sciences, Kuthpady, Udupi, Karnataka. Approval no.SDMCRA/IAEC/M-DG-17 by 26/03/2018

## Results

**Table 1:** Results of Rasa of *Andrographis Macrobotrys* Nees., whole plant assessed by 25 volunteers:

| *Rasa* | *Pradhana* | *Anurasa* | Total |
|---|---|---|---|
| *Madhura* | - | - | - |
| *Amla* | - | - | - |
| *Lavana* | - | - | - |
| *Katu* | - | - | - |
| *Tiktha* | 25 | - | 25 |
| *Kashaya* | 4 | 16 | 20 |



doi: 10.46607/iamj1308082020 | IAMJ August 2020 | www.iamj.in

Hence, according to the above table no 1, Taste determination by "taste with tongue" shows presence of *Tiktha* as *Pradhana Rasa* and *Kashaya* as *Anurasa*.

**Table 2:** Assessment of *Virya*- Method 1

| Sample | Quantity of distilled water | 0 min | 5 min | 10 min | 15 min | 20 min | 25 min | 30 min |
|---|---|---|---|---|---|---|---|---|
| S1 | 0ml | $32^0$C | $30^0$C | $30^0$C | $30^0$C | $30^0$C | $30^0$C | $30^0$C |
| S2 | 5ml | $32^0$C | $30^0$C | $30^0$C | $30^0$C | $30^0$C | $30^0$C | $30^0$C |
| S3 | 10ml | $32^0$C | $29^0$C | $29^0$C | $29^0$C | $29^0$C | $29^0$C | $29^0$C |

**Table 3:** Assessment of *Virya*- Method 2

| Sample | Quantity of the trial drug | 0 min | 5 min | 10 min | 15 min | 20 min | 25 min | 30 min |
|---|---|---|---|---|---|---|---|---|
| T1 | 2gm | $30^0$C | $30^0$C | $30^0$C | $30^0$C | $30^0$C | $30^0$C | $30^0$C |
| T2 | 4gm | $30^0$C | $30^0$C | $30^0$C | $30^0$C | $30^0$C | $30^0$C | $30^0$C |
| T3 | 6gm | $29^0$C | $29^0$C | $29^0$C | $29^0$C | $29^0$C | $29^0$C | $29^0$C |

This exothermic study of trial drug *Andrographis Macrobotrys* Nees., to find *Virya* shows $2^0$C decrease in temperature which can be interpreted as trial drug has got *Sheetha Virya* in it. Further endothermic reactions are observed in animal study on *Vipaka* of the Trial drug to interpret and confirm *Virya*

**3. Results of animal experimental study to assess *Vipaka***

**3.1. Food intake**

**Table 4:** Effect of *Andrographis Macrobotrys* Nees., leaves *Swarasa* on absolute food consumption with data presented in terms absolute and relative values:

| Group | Food consumption (Absolute) | | | Food consumption (g/100g body weight) | | |
|---|---|---|---|---|---|---|
| | Preliminary phase | Therapeutic phase | % change | Preliminary phase | Therapeutic phase | % change |
| **Control** | 18.07±0.58 | 16.24±0.75# | | 9.49±8.63 | 8.46±0.75 | |
| **Test** | 15.073±2.688 | 12.325±1.549#** | 24.107↓ | 38.35±2.759 | 34.88±2.441 ##*** | 44.85↓ |

Data: MEAN±SEM ***P<0.001 compared with Control

**P<0.01 compared with Control ##P<0.01 compared with preliminary phase

#P<0.05 compared with preliminary phase

The data related to the effect of *Andrographis Macrobotrys* Nees., on food consumption on the basis of absolute value and relative value have been summarized in the above table. The data shows there was decrease in food consumption during therapeutic phase in *Andrographis Macrobotrys* Nees., when compared to the therapeutic phase of Control drug, the observed decrease was found to be statistically very significant in absolute value and extremely significant in relative value. There was decrease in food consumption during therapeutic phase of *Andrographis Macrobotrys* Nees., when compared to preliminary phase of *Andrographis Macrobotrys* Nees., the observed decrease was found to be statistically significant in absolute value and very significant in relative value.

### 3.2. Water intake

**Table 5:** Effect of *Andrographis Macrobotrys* Nees., leaves *Swarasa* on absolute water consumption with data presented in terms absolute and relative values

| Group | Water intake (Absolute) | | | Water intake (g/100g body weight) | | |
|---|---|---|---|---|---|---|
| | Preliminary phase | Therapeutic phase | % change | Preliminary phase | Therapeutic phase | % change |
| **Control** | 20.66±1.11 | 21.16±0.90 | | 10.32±0.95 | 10.45±0.57 | |
| **Test** | 38.35±2.759 | 34.88±2.441*** | 64.83↑ | 6.186±0.4475 | 4.666±0.2076* | 35.08↑ |

Data: MEAN±SEM ***P<0.001 compared with Control *P<0.05 compared with Control

The data related to the effect of *Andrographis Macrobotrys* Nees., on water consumption on the basis of absolute value and relative value have been summarized in the above table. The data shows there was increase in water consumption during *therapeutic* phase in *Andrographis Macrobotrys* Nees., when compared to the therapeutic phase of Control drug, the observed increase was found to be statistically extremely significant in absolute value and significant in relative value. There was decrease in water consumption during therapeutic phase of *Andrographis Macrobotrys* Nees., when compared to preliminary phase of *Andrographis Macrobotrys* Nees., the observed decrease was found to be statistically not significant in both absolute and relative value.

### 3.3. Urine Output

**Table 6:** Effect of *Andrographis Macrobotrys* Nees., leaves *swarasa* on absolute urine output with data presented in terms absolute and relative values

| Group | Urine output (Absolute) | | | Urine output (g/100g body weight) | | |
|---|---|---|---|---|---|---|
| | Preliminary phase | Therapeutic phase | % change | Preliminary phase | Therapeutic phase | % change |
| Control | 2.01±0.43 | 1.75±0.18# | | 2.10±0.43 | 0.82±0.10# | |
| Test | 5.52±1.11 | 4.33±1.11* | 147.17↑ | 2.363±0.529 | 1.967±0.609 | 139.29↑ |

Data: MEAN±SEM *P<0.05 compared with Control # P<0.05 compared with preliminary phase

The data related to the effect of *Andrographis Macrobotrys* Nees., on urine output on the basis of absolute value have been summarized in the above table. The data shows there was increase in urine output during *therapeutic* phase in *Andrographis Macrobotrys* Nees., when compared to the therapeutic phase of Control drug, the observed increase was found to be statistically significant in absolute value and not significant in relative value. There was decrease in urine output during therapeutic phase of *Andrographis Macrobotrys* Nees., when compared to preliminary phase of *Andrographis Macrobotrys* Nees., the observed decrease was found to be statistically not significant in both absolute and relative value.

### 3.4. Wet fecal matter

**Table 7:** Effect of *Andrographis Macrobotrys* Nees., leaves *Swarasa* on absolute Wet fecal matter with data presented in terms absolute and relative values:

| Group | Wet fecal matter (Absolute) | | | Wet faecal matter (g/100g body weight) | | |
|---|---|---|---|---|---|---|
| | Preliminary phase | Therapeutic phase | % change | Preliminary phase | Therapeutic phase | % change |
| Control | 4.86±0.26 | 8.06±0.30 | | 4.86±0.26 | 3.81±0.11# | |
| Test | 6.895±0.409 | 5.068±0.366 #*** | 37.12↓ | 2.81±0.2670 | 1.94±0.1309#*** | 49.06↓ |

Data: MEAN±SEM ***P<0.001 compared with Control #P<0.05 compared with preliminary phase



doi: 10.46607/iamj1308082020 | IAMJ August 2020 | www.iamj.in

The data related to the effect of *Andrographis Macrobotrys* Nees., on Wet faecal matter on the basis of absolute and relative value have been summarized in the above table. The data shows there was decrease in Wet faecal matter during therapeutic phase in *Andrographis Macrobotrys* Nees., when compared to the therapeutic phase of Control drug, the observed decrease was found to be statistically extremely significant in both absolute and relative value. There was decrease in Wet fecal matter during therapeutic phase of *Andrographis Macrobotrys* Nees., when compared to preliminary phase of *Andrographis Macrobotrys* Nees., the observed decrease was found to be statistically significant in both absolute and relative value.

### 3.5. Dry fecal matter

**Table 8:** Effect of *Andrographis Macrobotrys* Nees., leaves Swarasa on absolute dry faecal matter with data presented in terms absolute and relative values:

| Group | Dry faecal matter (Absolute) | | | Dry fecal matter (g/100g body weight) | | |
|---|---|---|---|---|---|---|
| | Preliminary phase | Therapeutic phase | % change | Preliminary phase | Therapeutic phase | % change |
| Control | 4.31±0.22 | 5.45±0.41 | | 2.32±0.91 | 1.93±0.05# | |
| Test | 3.186±0.238 | 2.585±0.205*** | 37.21↓ | 1.315±0.0932 | 1.03±0.0599 *** | 46.79↓ |

Data: MEAN±SEM ***P<0.001 compared with Control

The data related to the effect of *Andrographis Macrobotrys* Nees., on dry faecal matter on the basis of absolute and relative value have been summarized in the above table. The data shows there was decrease in dry faecal matter during therapeutic phase in *Andrographis Macrobotrys* Nees., when compared to the therapeutic phase of Control drug, the observed decrease was found to be statistically extremely significant in both absolute and relative value. There was decrease in dry faecal matter during therapeutic phase of *Andrographis Macrobotrys* Nees., when compared to preliminary phase of *Andrographis Macrobotrys* Nees., the observed decrease was found to be statistically not significant in both absolute and relative value.

### 3.6. Food conversion ratio

**Table 9:** Effect of *Andrographis Macrobotrys* Nees on absolute Food conversion ratio with data presented in terms absolute and relative values:

| Group | Food conversion ratio (Absolute) | | | | | |
|---|---|---|---|---|---|---|
| | Preliminary phase | Therapeutic phase | % change | Preliminary phase | Therapeutic phase | % change |
| Control | 4.27±0.08 | 3.96±0.15 | | 2.11±0.03 | 3.98±0.10 | |
| Test | 5.923±1.231 | 5.11±0.462* | 28.07↑ | 6.068±1.342 | 5.891±1.060 | 47.68↑ |

Data: MEAN±SEM *P<0.05 compared with Control

The data related to the effect of *Andrographis Macrobotrys* Nees., on Food conversion ratio on the basis of absolute and relative value have been summarized in the above table. The data shows there was decrease in Food conversion ratio during therapeutic phase in *Andrographis Macrobotrys* Nees., when compared to the therapeutic phase of Control drug, the observed decrease was found to be statistically significant in absolute and not significant in relative value. There was decrease in Food conversion ratio during therapeutic phase of *Andrographis Macrobotrys* Nees., when compared to preliminary phase of *Andrographis Macrobotrys* Nees., the observed decrease was found to be statistically not significant in both absolute and relative value.

### 3.7. Fecal water

**Table 10:** Effect of *Andrographis Macrobotrys* Nees., leaves *Swarasa* on absolute Faecal water with data presented in absolute and relative values:

| Group | Fecal water (Absolute) | | | Fecal water (g/100g body weight) | | |
|---|---|---|---|---|---|---|
| | Preliminary phase | Therapeutic phase | % change | Preliminary phase | Therapeutic phase | % change |
| Control | 4.71±0.25 | 3.96±0.15 | | 4.29±0.09 | 1.92±0.02# | |
| Test | 3.708±0.336 | 2.106±0.228##*** | 46.88↓ | 1.598±0.189 | 1.223±0.186 ** | 36.53↓ |

Data: MEAN±SEM **P<0.01 compared with Control ***P<0.001 compared with Control

#P<0.05 compared with preliminary phase ##P<0.01 compared with preliminary phase The data related to the effect of *Andrographis Macrobotrys* Nees., on Faecal water on the basis of absolute and relative value have been summarized in the above table. The data shows there was decrease in Faecal water during therapeutic phase in *Andrographis Macrobotrys* Nees., when compared to the therapeutic phase of Control drug, the observed decrease was found to be statistically extremely significant in absolute and very significant in relative value. There was decrease in Faecal water during therapeutic phase of *Andrographis Macrobotrys* Nees., when compared to preliminary phase of *Andrographis Macrobotrys* Nees., the observed decrease was found to be statistically very significant in absolute and not significant in relative value.

3.8. Body weight

**Table 11:** Effect of *Andrographis Macrobotrys* Nees., leaves *Swarasa* on body weight of rats:

| Group | %change in body weight Mean±SEM | % change |
|---|---|---|
| Control | 14.21±2.571 | |
| Test | 1.04±0.4092*** | 107.318↓ |

Data: MEAN±SEM ***P<0.001 compared with Control

The data related to the effect of *Andrographis Macrobotrys* Nees., on %change in body weight have been summarized in the above table. The data shows there was decrease in % change in body weight in *Andrographis Macrobotrys* Nees., group when compared to control group, the observed decrease was found to be statistically extremely significant.

## DISCUSSION

**1. Study on Rasa:** For the taste determination of *Andrographis Macrobotrys* Nees., Powder of *Panchanga* (whole plant) was administered to 25 volunteers. According to the identification of volunteers it was observed that *Tiktha* as *Pradhana Rasa* (primary taste) and Kashaya as *Anurasa* (secondary taste).

**2. Study on *Vipaka*:** The basic premises are if Agni *Deepana* is the effect, this should get reflected in modulation in food consumption, water consumption, faecal excretion, food conversion ratio and also water content in faecal matter. If *Agni Deepana* is present in the drug it should get reflected in the form of increased *Deepana* and *Pachana*. Determination of *Deepana* activity is done on the basis of quantity of food consumed and by the quantity of faecal matter and urine collected from the rats. *Pachana* activity is determined on the basis of food conversion ratio.

**Concluding the Results of The *Vipaka* Study:**

**Table 12:** Effect of *Andrographis Macrobotrys* Nees., on metabolic parameters of therapeutic absolute and relative phase.

| Parameters | Absolute | Relative |
|---|---|---|
| Food Intake | SD | SD |
| Water Intake | SI | SI |
| Urine Output | SI | NSI |
| Wet Fecal Matter | SD | SD |
| Dry Fecal Matter | SD | SD |
| Food Conversion Ratio | SI | NSI |
| Faecal Water | SD | SD |
| Body Weight | SD | |

**SI- Significant Increase** **NSI- Non-Significant Increase** **SD- Significant Decrease**

*Agni* (digestive fire) is that which performs functions like digestion, absorption and assimilation. Drug and food both undergo digestion under the action of Agni and get transformed to their respective *Vipaka*. Increase in food consumption without increase in food conversion ratio is considered as *Deepana* effect and with increase in food conversion ratio is to be considered as *Pachana* effect. On administration of *Swarasa* of *Andrographis Macrobotrys* Nees., study shows significant decrease in food intake and increase in food conversion ratio which shows that test drug has *pachana* effect and no *deepana* effect. There was significant increase in water consumption during therapeutic phase of *Andrographis Macrobotrys* Nees., when compared to therapeutic phase of control group. This can be considered as a result of *Ushna, Ruksha Guna, Tiktha rasa and Kashaya anurasa* of the test drug which causes dryness in mouth and body. Significant increase of urine output in therapeutic phase of test drug when compared to therapeutic phase of control group signifies *Sheetha Virya* and *Pachana* effect of *Andrographis Macrobotrys* Nees.,. Decrease in urine output in therapeutic phase when compared to preliminary phase of test drug group. Increased water intake in therapeutic phase of test drug may be the reason for increase in urine output which shows proper excretion for the quantity of water intake. Analysing all these test drug can be considered to have *katu vipaka*. Proper digestion and metabolism give out less by-product i.e. faecal matter. Here, significant decrease in amount of wet faecal matter is observed in therapeutic phase of test drug and increase in amount of wet faecal matter is observed in therapeutic phase of control group. This shows that digestion and metabolism was proper. Faecal water content will be decreased due to enhancement of Agni getting reflected in the form of decreased faecal water content. Study shows significant decrease in faecal water which indicates proper absorption of drug and food material. Finally impact on body weight is the index for maintenance of Agni. Decrease in body weight can be considered as a result of increased metabolism due to *Ushna* and *Laghu Guna. Katu Vipaka, Tiktha rasa* and *Kashaya Anurasa. Tiktha rasa* produce action like dryness, emaciation which could be the cause of decrease in body weight.

**3. Determination of *Virya* by study of exothermic and endothermic action**

*Virya* of the trial drug *Andrographis Macrobotrys* Nees., was assessed by exothermic and endothermic reactions as parameter. Exothermic reaction recorded shows decrease in temperature by $2^0$ C in various concentration of *Andrographis Macrobotrys* Nees., thus concluded as *Sheetha Virya*. For confirmation of *Virya*, food intake, Urine output was observed in animal experimental study. Decrease in food consumption in test drug group when compared to the control group may be because of increased water intake (because of *Ruksha guna* and *Tiktha, Kashaya Rasa*) or *Sheetha Virya* of the drug. Urine output was increased in the test drug group when compared to the control group which can be analysed as because of *Sheetha Virya* of the drug *Andrographis Macrobotrys* Nees.



doi: 10.46607/iamj1308082020 | IAMJ August 2020 | www.iamj.in

## CONCLUSION

After the experimental study and analysis of results, it was established that the drug *Andrographis Macrobotrys* Nees., has *Tiktha Rasa, Kashaya Anurasa, Katu Vipaka Sheetha Virya* and *Pachana Karma.*

## REFERENCES


1. Acharya Vagbhata, Ashtanga Hridaya, Arunadatta virachita Sarvanga sundari vyakhya and Hemadri virachita Ayurvedarasayana Vyakhya, annotated by Dr, Anna Moreshwar Kunte and Krishna Ramavhandra Shastri Navre, Edited by Hari Sadashiva Sastri Paradakara Bhishagacharya, Chaukambha surabharathi prakashana, Varnasi. Sutrasthana, chapter 1, Page no. 11, Pp.956
2. Dr. S.C. Dhyani, Rasa-panchaka, 1st edition, Varanasi; Chaukamba krishnadas academy, 1994,
3. Acharya Vagbhata, Ashtanga Hridaya, Arunadatta virachita Sarvanga sundari vyakhya and Hemadri virachita Ayurvedarasayana Vyakhya, annotated by Dr, Anna Moreshwar Kunte and Krishna Ramavhandra Shastri Navre, Edited by Hari Sadashiva Sastri Paradakara Bhishagacharya, Chaukambha surabharathi prakashana, Varnasi. Sutrasthana, chapter 9, Page no. 169, Pp. 956
4. Acharya Agnivesha, Charaka Samhita revised by Charaka and Dridabala with Chakradatta Vyakhya, Ed. Trivikramji Acharya, reprint 2017, chapter-26, Pg no. 146, Pp 738
5. Prakash L Hegde, Harini A, A textbook of Dravyaguna vijnana volume 1, reprint-2015, Choukamba publications New Delhi, India; Page no.157, Pp no- 631.
6. Acharya Agnivesha, Charaka Samhita revised by Charaka and Dridabala with Chakradatta Vyakhya, Ed. Trivikramji Acharya, reprint 2017, chapter-26, Pg no. 147, Pp 738
7. Acharya Agnivesha, Charaka Samhita revised by Charaka and Dridabala with Chakradatta Vyakhya, Ed. Trivikramji Acharya, reprint 2017, chapter-26, Pg no. 148, Pp 738


**Annexure**

**Figure 1:** *Andrographis Macrobotrys* Nees. Plant

**Figure 2:** Metabolic cage

**Source of Support: Nil**
**Conflict of Interest: None Declared**

How to cite this URL: Ranjitha S et al: An Experimental Evaluation Of Rasa Panchaka (Attributes) Of Folk Medicinal Plant (Andrographis Macrobotrys Nees). International Ayurvedic Medical Journal {online} 2020 {cited August, 2020} Available from: http://www.iamj.in/posts/images/upload/4116_4124.pdf