Rasamruta
ISSN 0976-0075 Ayurveda e-Journal Rasamruta
World's First e - journal of Ayurveda
Scientific Revolution in Ayurveda!

PHARMACEUTICO-ANALYTICAL STANDARDIZATION OF RASANJANA-A HERBAL EXTRACT

Sameeksha Gurav* and Gurav Santosh Kishor**

SNKD Trusts's Nalasopara Ayurveda medical College,Maharashtra,India

Abstract

Rasanjana a concentrated extract prepared with roots and stem bark of Daruharidra (B.aristata) proves efficacious on several ailments when prepared using appropriate methods. The preparation is carried out in two steps viz. preparation of Kwatha (decoction) of Daruharidra and preparation of ghana of Rasanjana. It can be administered both internally and externally in curing various ailments. This paper describes the standard method to be adopted for preparation of Rasanjana along with its analytical examination.

Keywords – B. aristata, Rasanjana ,Kwatha preparation, Ghana.

Introduction

The Indian Himalayan region is well known for richness and diversity of valuable and highly sensitive species of medicinal and aromatic plants. Among medicinal plants of his region, genus Berberis has an important place in different system of medicine. There are 55 species of Berberis reported in India out of which 21 are found in Himachal Pradesh. Every part of the species is used in medicinal purpose. Daruharidra, (Berberis aristata) is an important ingredient of Ayurvedic formulations. Berberis species are major source of Berberine and other alkaloids namely berbamine, palmatine, isotetrandrine and jatrorrhizine[1]. The species is used as a remedy for treating eye disorders, ear diseases, jaundice, menorrhagia, diabetes, fever, stomach disorders, malarial fever etc. (Kirtikar and Basu, 1933). Rasanjana (also known as Rasaunt) is the crude concentrated extract prepared from roots and stem bark of Daruharidra (Berberis aristata DC). (Family: Berberidaceae). It proves efficacious on several ailments when prepared using appropriate methods. The preparation is carried out in two steps viz. preparation of Kwatha (decoction) of Daruharidra and preparation of ghana of Rasanjana. It can be administered both internally and externally.

B. aristata is generally used for preparation of Rasanjana[2]. It is an erect shrub with 3-6 m height and obovate and subaccute leaves[3]. Rasanjana is used as folklore medicine for various ailments viz. bleeding piles, conjunctivitis, enlarged spleen and liver etc. If the drug is prepared appropriately by taking required precautions, at each step can lead to its quality control. Standardization of the method of preparation makes it reproducible. The Physico-Chemical tests deal with primary physical and chemical properties of a drug by which we can infer about the internal molecular behavior at different natural conditions. It helps a lot as it can hint about stability of a drug both physically and chemically at complicated body tissue environments. This paper deals with Standardization of preparation of Rasanjana with Daruharidra (B. aristata) and its physio- chemical tests.

Aim – i) Standardization of method of preparation of Rasanjana[4].

ii) Physico-chemical tests of Rasanjana

i) Preparation of Rasanjana was carried out in 2 steps.

Step I – Preparation of Daruharidra Kwatha (decoction)[5].

Step II – Preparation of Rasanjana.

Step I - Preparation of Daruharidra Kwatha-

Materials required – Daruharidra – 100 g

Water- 1600 ml (for Kwatha preparation)

Water - Q.S. (for washing)

Equipments required – utensils, cloth for filtering, heating device.

Procedure:

1. Daruharidra stem bark free from insects was taken and washed properly for soil removal.
2. It was soaked in 16 parts of water i.e. 1600 ml for a period of 12 hours.
3. Soaked Daruharidra was kept on moderate flame for heating. It was subjected to heating till the contents were reduced to ¼ th i.e. 400 ml.
4. Then it was filtered through cloth to get decoction of Daruharidra.

Observation- The colour of water changes to yellow after soaking and after Kwatha preparation its colour changes to dark brown.

Precaution – Heating should be done on moderate flame.

Step II- Preparation of Rasanjana

Materials required – Daruharidra Kwatha - 400 ml

Cow's milk – 400 ml

Equipments required – utensils, stirrer, heating device.

Procedure:

1. Daruharidra Kwatha 400 ml was mixed with equal quantity of cow's milk and subjected to heating on mild flame.
2. Continuous stirring of the contents was done to avoid sticking of contents as the liquid turns thick (syrupy) in consistency.
3. Further heating was carried out by water bath method to avoid charring.
4. After complete evaporation of liquid content it was further dried in the Sun and preserved in air tight containers.

Observation – The contents get thick and towards end turn semisolid in consistency.

Precautions – Heating should be done carefully to avoid charring for which Water bath method is the best.

Result –

Quantity of Daruharidra taken – 100g.
Quantity of water required for Kwatha (decoction) – 1600 ml.
Quantity of Kwatha prepared – 400 ml.
Quantity of cow's milk required – 400 ml.
Quantity of Rasanjana obtained – 75g.

ii) Physico- chemical tests

Following tests were carried out on prepared Rasanjana samples for three times and the values were calculated as average.

- ❖ Moisture value
- ❖ Total ash value
- ❖ Acid insoluble ash
- ❖ Water soluble ash
- ❖ Water soluble extractive value
- ❖ Alcohol soluble extractive value.

A. Moisture Value:

Procedure: 5 gm sample is weighed and kept in a porcelain crucible. Hot air oven thermostat is adjusted to 105°C and left for certain time to get stabilised at that temperature. Porcelain crucible with sample is kept on oven tray with equidistant from four walls of oven. Sample is dried for one hour. Porcelain crucible is taken out and kept in desiccator to prevent any moisture absorption. After self-cooling porcelain crucible with sample is weighed to calculate the loss of weight on drying. The percentage content of moisture value is calculated in percentage (%w/w).

$$\frac{\text{Weight of sample obtained}}{\text{Weight of sample taken}} \quad \textbf{\textit{X 100= \% value of moisture content}}$$

B. Total Ash Value:

Procedure: 5 gm Sample is weighed and kept in a silicon crucible. This crucible is kept on wire gauze and heated on a gas stove. It starts emitting fumes and heating is continued until fumes subside. Then this crucible is kept in muffle furnace equidistant from four walls and temperature is gradually raised up to 450°C for 6 hours. After complete incineration and after self-cooling, crucible is taken out and kept in a desiccator. The weight of ash with silica crucible is noted. Then the total ash is calculated in terms of percentage (%w/w). Similar procedure is repeated for three times

$$\frac{\text{Weight of ash obtained}}{\text{Weight of sample taken}} \quad \textbf{\textit{X 100 = \% value of total ash content}}$$

C. Acid insoluble Ash Value:

Procedure: Above prepared ash is washed into a 100 ml beaker using 25 ml. of dilute hydrochloric acid. Beaker is boiled for 5 minutes. Contents are filtered through an ash less filter paper, residue is washed twice with hot water. Filter paper is placed in a silica crucible and incinerated by gradually increasing the heat in a muffle furnace at 450º C for some hours. After complete incineration and after self-cooling, crucible is taken out and kept in a desiccator. The weight of ash with silica crucible is noted. Then the acid insoluble ash is calculated in terms of percentage (%w/w). Similar procedure is repeated for three times.

$$\frac{\text{Weight of ash remained in Crucible}}{\text{Weight of sample taken}} \quad \textbf{\textit{X 100= \% value of acid insoluble ash}}$$

D. Water soluble Ash Value:

Procedure: The method up to preparation of ash is same as above, instead of 25 ml HCl 25 ml of distilled water must be used. The weight of ash with silica crucible is noted. Then the loss of ash in water is calculated and water soluble ash value is quantified in terms of percentage (% w/w). Similar procedure is repeated for three times.

$$\frac{\text{Weight of ash dissolved in water}}{\text{Weight of sample taken}} \quad \textbf{\textit{X 100= \% value of water soluble ash}}$$

E. Alcohol Soluble Extractive Value:

Procedure: Sample is weighed and transferred to a 100ml conical flask. 100 ml of the 90 % alcohol is added to it and closed with the cork. Kept aside for 24 hours with shaking frequently. Filtered, 25 ml of the filtrate is collected and transferred to a weighed, thin Porcelain dish. Evaporated to dryness on a water bath and dried completely in an oven at 100º C. Kept in a desiccator to cool, then percentage w/w of extractive with reference to air dried drug is calculated. Similar procedure is repeated for three times.

$$\frac{\text{Weight of dry extract obtained}}{\text{Weight of sample taken (air dried)}} \quad \textbf{\textit{X 100 =}} \quad \textbf{\textit{\% value of alcohol soluble Extractive value}}$$

F. Water Soluble Extractive Value:

Procedure: Sample is weighed and transferred to a 100ml conical flask. 100 ml of the 50 % chloroform water is added to it and closed with the cork. Flask is kept aside for 24 hours with frequent shaking. Filtered, 25 ml of the filtrate is collected and transferred to a weighed, thin Porcelain dish. Evaporated to dryness on a water bath and dried completely in an oven at 100º C. Kept in a desiccator to cool, then

percentage w/w of extractive with reference to air dried drug is calculated. Similar procedure is repeated for three times.

$$\frac{\text{Weight of dry extract obtained}}{\text{Weight of sample taken (air dried)}} \quad X\ 100 = \quad \textit{\% value of alcohol soluble Extractive value}$$

Results

S. No	Test name	Values in % w/w			Arithmetic Mean of three attempts
		1st time	2nd time	3rd time	
1.	Moisture value	8	7.98	8	**7.99% w/w**
2.	Total Ash Value	7.5	7.46	7.51	**7.49% w/w**
3.	Acid insoluble ash value	55.55	55.57	55.58	**55.56% w/w**
4.	Water soluble ash value	66.67	66.65	66.69	**66.67% w/w**
5.	Alcohol soluble extractive value	14.8	15	14.72	**14.84% w/w**
6.	Water soluble extractive value	16.8	16.53	16.88	**16.7366 % w/w**

Organoleptic characters of Rasanjana:

Colour- Yellowish brown. Smell – Milky.

Taste – Katu (Pungent), Tikta (Bitter). Consistency – Semisolid.

Discussion:

Among 55 species of Berberis found all over India B. aristata is considered to have high medicinal value. Therefore Rasanjana prepared with it is highly efficacious. Preparation of Rasanjana is mentioned in two Ayurvedic texts. Bhava Mishra the author of Bhava Prakasha puts forward the use of cow's milk for preparation of Rasanjana whereas Rasa Madhava the author of Ayurveda Prakasha advocates the use of goat's milk[6], the basic procedure being the same. Properties possessed by cow's milk according to Ayurvedic Samhitas (classical texts) viz. Sheeta Virya (cold potency) and Madhura rasa (sweet taste)[7] makes Rasanjana prepared with it suitable for Pitta dosha (humour) disorders like Pittaj Atisaar (diarrhea) etc. Goat's

milk has Kashaya (astringent), Katu (pungent) and Tikta (bitter) Rasa which renders Rasanjana prepared with it efficacious on bleeding conditions and disease with excessive secretions like Rakta Arsha (Bleeding Piles), Rakta Pradara (Menorrhagia), Raktapitta (Epistaxis) etc.[8]

In Kwatha (decoction) heat stable and water soluble principles of herbal drugs are extracted. The dose of Kwatha is 96 ml[9]. Ghana is concentrated extract of herbs prepared by evaporation of moisture content of Kwatha. It can be given to patients in powder form or as tablets in low dosage as compared to Kwatha. Rasanjana is Ghana of Daruharidra (B. aristata) and can be easily administered to patients.

Moisture value determines the quantity of moisture a sample contains. Stability, shelf life and microbiological safety depend on this value. Rasanjana is organic in nature therefore the value was found to be 7.99 %. Total ash value determines the percentage of non-volatile Inorganic content of the sample and it has not more than 7.49 % of inorganic content as. Ash contains inorganic radicals like phosphates, carbonates and silicates of sodium, potassium, magnesium, calcium etc. sometimes, inorganic variables like calcium oxalate, silica, carbonate content of the crude drug affects 'total ash'. Such variables are then removed by treating with acid and this value determines the percentage of Inorganic content of the sample. Rasanjana sample was found to contain 55.56% of acid insoluble ash. This procedure determines quantity of water soluble content contributing to the weight of ash. Rasanjana was found to contain 66.67% of water soluble content. Alcohol soluble extractive value determines the nature of the chemical constituents present in the drug, which is useful for estimating character of chemical constituents, soluble in that particular solvent used for extraction. Rasanjana was found to contain 14.48% of alcohol soluble extractive value. Water soluble extractive value determines the Nature of the chemical constituents present in the drug, which is useful for estimating character of chemical constituents, soluble in water. Rasanjana was found to contain 16.73% water soluble extractive value. Hence, we can say that it has more solubility in water than alcohol.

*BAMS, M.D. (Rasa Sastra) Assistant Professor, Dept. of Agad Tantra, SNKD Trusts's Nalasopara Ayurveda medical College

**BAMS, M.D. (Ayurved Siddhant) Assistant Professor, Dept. of Basic Principles, SNKD Trusts's Nalasopara Ayurveda medical College

References:

1. Rashmi, Jagdish Pant and A. Rajasekaran*1* HPTLC Fingerprinting Profile of Marker Compound (Berberine) in Roots of *Berberis aristata* DC, Pharmacognosy Journal, Vol 3, issue 19, pg-41.
2. A Rajasekaran & Nilay Kumar, *Rasont*- A traditional crude drug prepared from Berberis sp and its uses, Vol. 8(4), Oct.2009, pg 562-563.
3. Dr. Bulusu Sitaram, Bhavaprakasha of Bhavmishra, 2006, Varanasi, Chaukhamba Orientalia, 177-178.
4. Bhavaprakasha
5. Prof. PHC Murthy, Sharangdhar Samhita, 2010, Varanasi, Chaukhamba Sanskrit Series office, pg-111.
6. Shri. Gulraj Sharma Mishra, Ayurved Prakash, 2007, Varanasi, Chaukhamba Bharati Academy, Chapter -2, pg- 316.
7. Prof. KRS Murthy, Ashtang Hridaya, 2006, Varanasi, Chaukhamba Krishnadas Academy, Sutra Sthana, Vol.-I, Chapter-5, pg-58.
8. Dr. R.K. Sharma & Vd. Bhagwan Dash, Charaka Samhita, 2009, Varanasi, Chaukhamba Sanskrit Series office, Vol. XCIV, Sutra Sthana, Vol.-I, Chapter-27, pg-533.
9. Dr. P.V.N.R. Prasad, Bhaishajya Kalpana Vijnana, 2008, Varanasi, Chaukhamba Krishnadas Academy, pg-146.