A Review On Pharmaceutics Of Brahmya Dighrita

Dr. Santosh Suryakant Pusadkar[1] Dr. Kaustubh Bhoyar[2] Dr. PrashantSarde[3]
Dr. Sunil G. Topre[4], Dr. ShaileshKumar Nagpure[5]

[1]M.D.Rasashastra,AssistantProfessor,DattameghеAyurved college Nagpur
[2]MD Samhita , Assistant Professor,DattameghеAyurved college Nagpur
[3]MD Swasthavritta, Assistant Professor,SiddhakalaAyurvedSamgamner Nagpur
[4]MD Physiology ,GovernmentAyurvedic College Nagpur
5 MD Pharmacology Associate Professor Dept. of Pharmacology Jawaharlal Nehru Medical College, DattaMeghe Institute of Medical Sciences, Sawangi (Meghe), Wardha.

Address for Correspondence
Dr.Santosh Suryakant Pusadkar
M.D.Rasashastra,Assistant Professor,
DattameghеAyurvedcollege Nagpur
pusadkarsantosh@gmail.com

Abstract
According to ayurvedic classical texts, BrahmyadiGhrita is one of the formulation recommended in AshtangaHridyaBalrogadhikar as medhya and Smritivardhak. It contains eight ingredients Brahmi, Kushta, Sariva, Pippali, Vacha, Sidhartaka, Goghritaand Saindhav. These drugs are mainly having Medhyaproperty. In entirety ingredient possess Tikta, Katu Rasa, UshnaVirya, KatuVipaka. Due to these properties it may acts as Kaphavataharandby clearing Srotorodhit makes the way for the action of Medhyadrugs on target cells. Saindhavlavanapossesses'sukshmaguna',it can enter deep into the tissue & can carry the drugs with it. Goghritapossess buddhi, smritivardhak, Agnivardhakproperty. Almost all the drugs possess medhyaactivity, hence synergic effect of these contents makes the formulation potent & useful to treat various CNS disorders. In Ayurvedictext it is recommended as Medha, Buddhi&Smritivardhak.
In present Study it is described about the process of manufacturing and standardization of BrahmyadiGhritain laboratory.

INTRODUCTION:

In *Ayurveda*, it is stated that *Ghrita* promotes memory, intellect, and power of digestion[1]etc. According to *Ayurvedic* classical texts various types of *Ghritas* are recommended for treatment of CNS disorders[2] namely *PanchagavyaGhrita, MahapanchagavyaGhrita*, *KalyanakGhrita* and *MahakalyanakGhrita* etc. So *Ghrita* is the drug of choice prescribed to normalize vitiated entities [*Dosha*] and to nourish, to recover the strength of Brain. These lipophilic medicaments are more helpful to regularize the function of intellect and mind as it crosses the blood brain Barrier.[3]*Ghrita*possess a unique property "*sanskarsyaanuvartanam*" i.e. it enhances the therapeutic efficacy of the drugs which are used along with it in the formulation without losing its own properties.So here we have evaluated the study of *BrahmyadiGhrita*as per thestandard pharmaceutical methods.

CHEMICALS:

Ethanol, potassium hydroxide, phenolphthalein, ethanolic potassium hydroxide, and solution were used for authentication of drugs.

INSTRUMENTS:

Beaker, flask, PH meter, Soxhlet apparatus, crucible, drier, Mortar and pestle, steel vessels, *palikayantra*, iron pans, spoons.

Table no.1: Ingredients of BrahmyadiGhrita[4]

Sr. No.	Drugs	Botanical name	Part Used
1.	*Brahmi*	Bacopamonnieri Linn.	*Panchang*
2.	*Siddharthak*	Brassica campestris Linn.	Seed
3.	*Vacha*	Acoruscalamus Linn.	Rhizome
4.	*Pippali*	Piper longum	Fruit
5.	*Sariva*	Hemidesmusindicus R.Br.	Root
6.	*Kushtha*	SaussurealappaC.B.Clarke	Root
7.	*Saindhavlavan*	Rock salt	-
8.	*Goghrita*	Cow ghee	-
9.	Jal	Water	-

The raw drugs were identified using Ayurvedic Parameters and their analysis were carried out in laboratory and values matched with API parameters.

Authentication of selected drugs:

All selected samples were tested as per API parameters in departmental laboratory. The parameters were as follows

- Foreign matter
- Total ash content
- Water soluble extractive
- Alcohol soluble extractive
- Total moisture content
- pH
- Volatile oil
- **Foreign matter**

  Each 100gm of Brahmi (Bacopamonnieri Linn.), Siddharthak (Brassica campestris Linn.), Vacha (Acoruscalamus Linn.), Sariva (Hemidesmusindicus R.Br.), Kushtha (SaussurealappaC.B.Clarke),andPippali (Piper longum Linn.) was weighed on a thin layer paper. Foreign matter was inspected with the help of lens (6x). Foreign matter was separated, weighed and its percentage was calculated.
- **Determination of total ash:**

  Accurately weighed 2 gm powder of *Brahmi, Pippali, Siddharthak, Sariva,Kushtha*and *Vacha*was taken separately in crucible and was incinerated at atemperature not exceeding 450°c until free from carbon. The samples were cooled, weighed and the percentage of total ash was calculated with reference to air dried drug.
- **Determination of alcohol soluble extractive:**

5gm coarse powder of *Brahmi, Pippali, Siddharthak, Sariva,Kushtha*and *Vacha*was macerated separately with 100 ml methanol in a closedflask for twenty four hours. The flask was shaken for half an hour and allowed to stand for twenty three and half an hour. The extract was filtered rapidly taking precaution against loss of solvent. 25 ml of the filtrate was evaporated to dryness in a previously weighed, flat-bottomed evaporated dish and dried at 60^0 C to constant weight. From the weight of residue obtained, the percentage of alcohol soluble extractive was calculated with reference to the air dried drug.

- **Determination of water soluble extractive:**

5gm coarse powder of *Brahmi, Pippali, Siddharthak, Sariva,Kushtha*and *Vacha*was macerated separately with 100 ml distilled water in aclosed flask for twenty four hours. The flask was shaken for half an hour and allowed to stand for twenty three and half an hour. The extract was filtered rapidly taking precaution against loss of solvent. 25 ml of the filtrate was evaporated to dryness in a previously weighed, flat-bottomed evaporating dish and dried at 60^0 C to a constant weight.From the weight of residue obtained; the percentage of water soluble extractive was calculated with reference to the air dried drug.

- **Determination of Moisture content:**

Procedure set forth here determination the amount of volatile matter (i.e. water drying off from the drug) in the drug sample.10 gm of coarse powder of Brahmi, Pippali, Siddharthak, Sariva, Kushta, Vacha and Saindhavlavana was taken in tarred evaporating dish and placed in Infrared moisture analyzer. Drying and weighing continued for 1hr. interval until the difference between two successive weighing corresponds to zero. Percentage of Moisture content was calculated according to prescribed formula.

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$$\text{Total moisture content} = \frac{\text{Wt of difference}}{\text{Wt of sample}} \times 100$$

- **Determination of pH :**

The pH value of an aqueous liquid may be defined as the common logarithm of the reciprocal of the hydrogen ion concentration expressed in gm per liter. This definition provides a useful practical means for the quantitative indication of the acidity or alkalinity of a solution. The pH value of raw drugs measuring by the preparation of aqueous solution were determined potentiometrically by means of the glass electrode, a reference electrode and a direct reading type digital pH meter. Digital pH meter was calibrated with buffer solutions having pH 4.0 and pH 9.2.Then the reference electrode was inserted in 10%solution of drug and reading was taken.

- **Determination of Volatile oil :**

The determination of volatile oil in drug is made by distilling the drug with a mixture of water and glycerin, collecting the distillate in a graduated tube in which the aqueous portion of the distilling flask and the volume of the oil was measured. The content of the volatile oil is expressed as a percentage v/w.

Table no.2: Analytical values of raw drugs

Name of the parameter	Brahmi	Siddharthak	Vacha	Sariva	Kushtha	Saindhavlavan	Pippali
Foreign matter	1%	0.5%w/w	0% w/w	0%w/w	0%w/w	0%	01 %w/w
pH	5	6	6.20	7.20	6	6	6

Moisture content	3%	5%	4%	4%	3%	0%	4%
Water soluble extractive	22.4 %w/v	24%w/v	32% w/v	16% w/v	30.4 %w/v	NA	12.8 %w/v
Alcohol soluble extractive	25.6 %w/v	16%w/v	22.4 %w/v	19.2 %w/v	20.8 %w/v	NA	19.2 %w/v
Total ash	3%w/w	4%w/w	7% w/w	3%w/w	4%w/w	NA	6% w/w

Collection and authentication of the animal product:
Cow ghee was purchased from the renowned dairy unit and was tested as per dairy standards and with API parameters viz. pH, specific gravity, refractive index, etc. All tests were performed in triplicate and average value was considered.

TABLE No. 3: Organoleptic test of Cow ghee.

Organoleptic test	***Cow ghee***
Sound	No Sound
Touch	Oily
Colour	Oily and yellowish
Taste	Sweet
Smell	Pleasant

TABLE No. 4: Analytical Parameters of Cow ghee.

Parameter	***Reading***
Free Fatty acid	0.68
Moisture	0.26%
Burtorefrctometer reading	41.1
pH	5
Specific Gravity	0.918615
Wt/ml	0.9gm

PREPARATION OF *BRAHMYADI GHRITA (ASH. HR. UT.*1/42*)*:
*BrahmyadiGhrita*was prepared as per standard guideline stated in *Shrangdharsamhita*to manufacture medicated ghee was followed [1:4:16][9]. All herbal fine powdered drugs were mixed with each other and then paste of this mixture was made by adding little water. Cow ghee was heated initially and cooled to room temperature. Paste and water was added to it. The whole mixture was then heated on low flame to achieve *Ayurvedic* testing parameters.[10]

Instruments: Instruments used in manufacturing process are as below

1. Grinder
2. Sieves of mesh size 80
3. Weighing machine
4. Measuring cylinder
5. Mortar and pestle
6. Gas burner
7. Vessels
8. Spatula

Manufacturing Process:

 Removal of physical impurities:

Authenticated raw drugs namely *Brahmi* (Bacopamonnieri Linn.), *Siddharthaka*(Brassica campestris Linn.),*Vacha*(Acoruscalamus Linn.),*Sariva*(Hemidesmusindicus R.Br.),*Kushtha*(SaussurealappaC.B.Clarke)and *Pippali* (Piper longum Linn.) and Saindhavlavan were taken and physical impurities were separated.

Preparation of paste[7,8]:

The drugs (*Kalka dravya*) other than *brahmi* were subjected to grinding separately so as to convert them into powder form. The powders were passed through sieves with mesh size 80 to get fine powder. Freshly collected *BrahmiPanchanga* was taken double to the quantity of dry drugs as per standard guideline mentioned, washed and pounded to get its *Kalka*(fine paste). Fine paste (*kalka*) of all the remaining dry drugs was made by triturating them with water using mortar and pestle as per standard operating procedure (SOP). Finally *Brahmikalka&kalka*of remaining drugs was pounded & mixed to get a homogenous paste.

 Heating process (*Pachana*):

Cow ghee was heated on low flame. Heating was discontinued as fumes appeared. The triturated bolus was added to the cow ghee and mixed well. Then the mentioned amount of water was added and mixture was subjected to heat on low flame until the testing criteria occurred. As the fulfillment of testing criteria achieved the prepared *BrahmyadiGhrita*was filtered through a clean cotton cloth.

 Storing of *BG*:

After cooling it (BG) was then filtered and stored in the air tight Container. In the similar way 2

more batches were prepared and tested for organoleptic characters and physio-chemical characters were carried out and matched with each other.

FINAL PRODUCT: Prepared*BG*was tested with organoleptic test.

TABLE no 5: ORGANOLEPTIC PARAMETER OF BG

Organoleptic parameter	**O Observation**
Sound	No sound
Touch	Unctuousness
Colour	Light Greenish
Taste	Brittle ++
Odor	Ghee Odor

Procedures for analysis of all Cow products and BG:

1. pH determination

Digital pH meter is calibrated with buffer solutions having pH 4.0 and pH 9.2. It was used to measure pH of cow ghee and BG.

2. Determination of specific gravity

Specific gravity of cow ghee and BG was measured by using Pycnometer. Weight of empty pycnometer; with distilled water and with sample was taken. Then specific gravity was calculated according to prescribed formula.

$$\textbf{Specific gravity} = \frac{\text{weight of pycnometer with sample}}{\text{Weight of pycnometer with distilled water}}$$

3. Determination of Acid value:

Acid value is the number which expresses in milligrams the amount of potassium hydroxide necessary to neutralize free acids present in 1 gm of substance. Acidity of cow ghee and BG was determined by 10gm of sample in 50 ml of a mixture of equal volumes of ethanol (95%) and ether previously neutralized with 0.1 M potassium hydroxide to phenolphthalein solution titrated with 0.1M potassium hydroxide until the solution remains faint pink.

Formula: $Acid\ value = 5.61n/w$Where n= the number of ml of 0.1M potassium hydroxide required$W$= the weight in gm of sample

4. Determination of Saponification value:

The Saponification value is a number of milligrams of the amount of potassium hydroxide necessary to neutralize free acids and to saponify the esters present in 1 gm of substance. Saponification value of cow ghee and BG was determined by taking mixture of 2 gm of cow ghee and 25 ml of 0.5 M ethanolic potassium hydroxide and was boiled under reflux on a water

bath for 30minutes. Then phenolphthalein solution was added to this mixture and immediately triturated with 0.5 M hydrolic acid until the solution turned from pink to colorless and remained so even after 30 sec. Saponification value was calculated according to prescribed formula.

Formula: *Saponification value= 28.05 (b-a)/w* Where,

b= Quantity of hydrolic acid required to triturate the solution without sample

a= Quantity of hydrolic acid required to triturate the solution with sample

w= weight, in gm, of the sample

Following two tests were performed according to the procedure given in book of Biochemical Methods.

5. Determination of Iodine value:

The iodine value is a measure of the degree of unsaturation in a ghee or oil. 0.25 gm of cow ghee was dissolved in 10ml of chloroform in an iodine flask. In the mixture; using a pipette 25 ml of Hansus iodine solution was added. After mixing, it was allowed to stand in dark for exactly 30min with occasional shaking.10ml of 15% KI was added and shake thoroughly then 100ml of freshly boiled and cooled water. Titration against 0.1 N sodium thiosulphate was done until yellow solution turned into almost colorless. 2-3 drops of starch as an indicator was added to colorless solution and then it was again titrated until blue color completely disappeared. The method was repeated without sample.

Formula:

Iodine number= (B-S) N *12.69/ Weight of sample

Where,

B= ml thiosulphate for blank

S= ml thiosulphate for sample

N= normality of thiosulphate solution

6. Determination of Peroxide value:

Peroxide value is a measure of the peroxides contained in the ghee. 1 gm of cow ghee was added to 1gm of powdered potassium iodide and 20ml of solvent mixture (2 volumes of glacial acetic acid + 1 volume of chloroform) in a clean dry boiling tube. This tube was placed in boiling water for 30 seconds. This content was quickly transferred to a conical flask containing 20 ml of 5% potassium iodide solution. The tube was washed twice with 25ml water each time and collected into the conical flask. Titration against N/500 sodium thiosulphate solution was done until yellow color completely disappeared. Then 0.5 ml of starch, an indicator was added to the colorlesssolution and shaken vigorously. This solution was titrated carefully till the blue color just disappeared. The method was repeated without sample. This procedure was followed for BG also.

Formula:

Peroxide value= S* N * 100 / Weight of sample

Where,

S= ml sodium thiosulphate (test- blank)

N= normality of sodium thiosulphate

7. Determination of weight per ml:

One ml sample of cow ghee and BG was measured in measuring cylinder. Then it was weighed on digital weighing machine. The weight of one ml sample of both the product was noted.

CONCLUSION:

Collection of all raw drugs from authentic source was helpful for a good therapeutic effect of the final formulation. Analytical values as per API

- Parameters for all ingredients were within normal limits indicate ideal selection of all raw drugs.
- . As per guidelines mentioned in *Sharangdharsamhita*. For this study whole wet Brahmi was taken in double quantity of other dry drugs present in BG. Thus modification in preparation of

BG was done. It is observed that due to this modification i.e. reduction of kalka drug quantity and heating on mild flame, the final yield of the formulation was increased to 86-90 % without changing in organoleptic tests.

- Hence it was concluded that after evaluating the pharmaceutics of *Brahmyadighrita*, the cumulative properties of *Brahmyadighrita* as a ghrita can be understood with effect in*vata*and*kapha*dominant prakruti. The base drug i.e. Goghrita possesses smritivardhaka (memory enhancing) and buddhivardhaka (intellect promoting)property[6.] . The Ghrita is lipophilic in nature and it has property to cross blood brain barrier and so can be used as an effective drug for further scope of study as aayrvedic medicine.

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