



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

International Journal of Current Research
Vol. 10, Issue, 01, pp.63772-63776, January, 2018

INTERNATIONAL JOURNAL
OF CURRENT RESEARCH

RESEARCH ARTICLE

PHARMACEUTICAL STANDARDIZATION OF KAPHA KETU RAS

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ARTICLE INFO

Article History:

Received 12th October, 2017
Received in revised form
17th November, 2017
Accepted 03rd December, 2017
Published online 19th January, 2018

Key words:

Standardization,
Kapha KetuRas,
KharaliyaRasayana,
Pinasa.

ABSTRACT

Standardization is the process of developing and agreeing upon technical standards. A standard is a document that establishes uniform engineering or technical specification, criteria, methods, processes or practices. Many drugs are described in Ayurvedic classical texts for the treatment of various disorders. *Kapha Ketu Rasis* one such *Kharaliya Rasayana* mentioned in *Rasa Yoga Sagara* indicated in *Pinasa*¹. *Shankha* (conch shell), *Tankana* (Borax), *Vatsanabha* (*Aconitum Ferox*), and *Pippali* (*Piper longum*) are the main ingredients. *Shodhana* (Purification) *Bhavana* (Soaking with liquid and triturating till drying) and *Mardana* (Trituration), *Churna nirmana* (Preparation of powder) are the important steps involved in the preparation of *Kapha KetuRas*. *Shodhana of Shankha, Tankana and Vatsanabha* was carried out by classical method to remove the impurities. Churna of all the above ingredients were prepared by subjecting it to grinding in *Khalwa yantra* and filtered through cloth. All ingredients are mixed properly to make homogenous mixture; later on it was triturated with *Ardraka Swarasa* to obtain 125 mg tablet in tablet compression machine. The present study has been planned to standardize the method of preparation of an important Herbo-mineral formulation i.e. *Kapha Ketu Ras*.

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Citation: Dr. N. Jaya Prakash and Dr. G. Ramesh Babu, 2018. "Pharmaceutical standardization of Kapha Ketu Ras", *International Journal of Current Research*, 10, (01), 63772-63776.

INTRODUCTION

The drug manufacturing processes of Ayurveda are included in discipline of *Bhaisajya Kalpana* and *Rasa Sastra*. *Mardana* (Trituration), *Dalana* (Moulding), *Swedana* (Swooning), *Nirjalikarana* (Evaporation of water), *Bharjana* (Frying), *Nirvapana* (Heating and quenching), *Bhavana* (Soak with water and triturating till drying), *Prakshalana* (Washing), *Pruthakkikarana* (Separation), and *Galana* (Filtration) etc. are the important procedures involved in drug manufacturing. All these procedures play a significant and vital role in the pharmaceutical processing of the drug materials. Mineral material as such are claimed to be non-suitable for internal administration by Ayurvedic rasa texts. By adopting specialized pharmaceutical procedures like *shodana* (Purification), *Marana* (incineration), *Jarana* (Digestion), *Murcchana* (Imbibing definite therapeutic properties) etc. they are converted in to nontoxic, safe and potent therapeutic medicine. When processed with metals and minerals they make them not only useful therapeutically but also enhance the disease combating properties in them. Hence in this present study, an effort has been made to standardize the preparation of *Kapha KetuRas*.

MATERIALS AND METHODS

Procurement of Raw material

Shankhawas obtained from local market of Chennai, Tamil Nadu. Vatsanabha, Tankana and Pippaliwere obtained from TTD'S Sri Srinivasa Ayurveda Pharmacy, Tirupati.

Methods

Entire preparation of *Kapha kethuras* was carried out in TTD's Sri Srinivasa Ayurveda Pharmacyand Department of Rasa Shastra and Bhaishajya Kalpana, S.V.Ayurvedic College, Tirupati.

Total pharmaceutical study was carried out in the following stages

Stage – I

- *Sodhana of Sankha.*
- *Sodhana of Vatsanabha.*
- *Sodhana of Tankana*

Stage – II

- *Marana of Sodhita Shanka.*

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Stage – III

- *Churna nirmana of Sodhita Vatsanabha and Pippali.*
- Mixing of fine churnas of *Vatsanabha and Pippali, Tankana* with *Sankhabhasma* in a *Khalwa Yantra* thoroughly until a homogenous mixture is obtained.

Stage – IV

- *Bhavana* of the mixture with *Ardraka Swarasa* for three days.
- Making capsules of *Kapha Ketu Ras*.

Procedure**Shodhana of shankha**

Ashuddha Shankha was made into small pieces, placed in a cloth and made into pottali. The pottali was suspended in vessel containing *Nimbu swarasa* in such a way that it should be freely hanging in the liquid (*Dolayantra*). It was subjected to mandagni for 12 hours. *Nimbu swarasa* was added when ever the liquid level was reduced in the vessel. Then the Shodhitha Shankha was obtained.

Observations

- With in few minutes after starting procedure, froth and air bubbles appeared.
- The *Nimbu swarasa* attained curd like consistency after the shodhana procedure.
- After *shodhana* the hard nature, dirty brown colour and smooth surface of *Shankha* turned to slightly brittle, pure white colour and rough surface.

Marana of Shankha

Marana of Shudha Shankha was carried by taking *Shuddha Shankha* after proper drying and then it was kept in a *sharava* another *sharava* having the same dimensions was placed over it in such a way that the mouth of both sharava come in contact and *sandhibandhana* was done with a cloth smeared with multanimitti. It was allowed for drying. Then it was subjected to *Gaja puta*. *Sharava* was collected after self cooling. *Sandhi bandhana* was removed carefully and the drug was collected. This procedure was repeated for one more time. Drug attained white colour after *first puta* and became more brittle. Drug attained bright white colour after *second puta*.

Observations

- Maximum temperature attained in *Gaja puta* was 1003°C.
- Maximum temperature was attained after 210 minutes.
- Drug attained white colour after *first puta* and became more brittle.
- Drug attained bright white colour after *second puta*.

Shodhana of Vatsanabha

Shodhana of Asuddha Vatsanabha was carried out by taking it and cut into small pieces i.e. *Chaanakamatra* (size of Bengal gram).

The pieces of *Vatsanabha* are taken and placed in a cloth and made in to pottali. The pottali was suspended in a vessel containing *Gokshira* in such a way that it should be freely hanging in the liquid (*Dolayantra*).

It was subjected to mandagni for 6 hours. *Gokshira* was added whenever the liquid level was reduced in the vessel. *Vatsanabha* pieces were taken out and washed properly with hot water and dried. Finally *Shuddha Vatsanabha* was obtained. *Vatsanabha* obtained was made into fine powder.

Observations

- The colour of *Gokshira* changed from white colour to dark brown.
- The pieces of *Vatsanabha* became brittle and pale.

Shodhana of Tankana

Shodhana of Ashodhita Tankana was carried out by taking it in a clean and dry *Khalwa yantra* and pounded well to prepare fine powder. *Ashodhita Tankana* powder was heated in an earthen plate on Gas stove with medium fire. It started disintegrating with crackling sounds, losing moisture.

It was heated further until the crackling sound was stopped. The product thus obtained was taken out and allowed to cool itself, then powdered and preserved in air tight glass container.

Observations

- *Tankana* changed to pale white colour after losing all moisture and becomes puffy.
- It produced sounds like crackling during the process.
- *Tankana* after frying became bloomed and turned in to white opaque substance.

Churna nirmana of Pippali and Vatsanabha

Churna nirmana of Pippali and Vatsanabha were carried out by pounding in *Khalwa yantra* and filtered through a cloth to get fine powder. After that mixing of *Shuddha Shankhabhasma, Shuddha Tankana* and churnas of other herbal drugs were done to form homogenous mixture.

Observations

- Very fine light brown colour *Vatsanabha* powder was obtained.
- Very fine *Pippalichurna* was obtained.

Preparation of Kapha kethuras

Homogenous mixture was taken in *Khalwa yantra* and *Ardraka Swarasa* was added until the whole churna was dipped and triturated. Trituration was done until total drying of mixture. Obtained final product i.e. *Bhavita* Homogenous mixture was compressed to 125 mg tablet of *Kapha Ketu Ras*.

Observation:

- Light brown coloured mixture is obtained.



Figure 1. *Ashuddha shankha*; 2- Pottali of Shankha; 3- Swedana in nimbuswarasa; 4- Shoditashankha; 5- Bhavana of shankha with Nimbusarasa; 6- Sealed sharvasamputa; 7-Gaja puta; 8- Shankhabhasma; 9- Ashuddha Tankana; 10- Heating onf Ashuddha tankana churna on mild flame; 11- Shuddha tankana after Nirjalikarana; 12- Shuddha tankana churna; 13- Ashuddha Vatsanabha; 14- Ashuddha vatsanabha shodhana in Gokisheera; 15- Shodhita Vatsanabha; 16- Shoditavatsanabha Churna; 17- Pippali; 18-Pippali Churna; 19- Mixing of all ingredients; 20- Bhavana with ardrakaswarasa; 21- Kaphakethuras 22- Kapha keturas capsules

RESULTS

Table 1. The Results of *Shankha Shodhana*

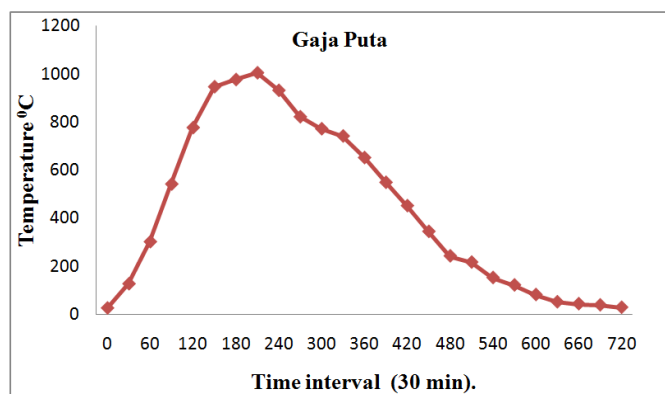
Initial wt.	Final wt.	Loss in wt	Loss percentage
400gm	390gm	10gm	2.5%

Table 2. The Results of *Shankha Marana*

Initial wt.	Final wt.	Loss in wt	Loss percentage
398gm	320gm	78gm	19.60%

Table 3. The Temperature pattern of *Gajaputa*

Time in minutes	Temperature (degree celsius)
0	24
30	125
60	300
90	540
120	775
150	945
180	975
210	1003
240	930
270	820
300	770
330	740
360	650
390	547
420	450
450	343
480	241
510	215
540	151
570	120
600	80
630	50
660	42
690	37
720	27

Graph 1. The Temperature pattern of *Gaja puta* of *Mandura*Table 4. The Results of *Bhavana* of *Shankha Bhasma*

Initial wt	Final wt	Gain in wt
320gm	325gm	25gm

Table 5. The result of *Vatsanabha Shodhana*

Initial Weight	Final Weight	Loss of Vatsanabha	Loss in %
650gm	500gm	150gm	24%

Table 6. The Results of *Shodhana* of *Tankana*

Initial weight	Final weight	Loss of <i>Tankana</i> in weight	Loss of <i>Tankana</i> in percentage.
500gm	320gm	180gm	36%

Table 7. The result of *Vatsanabhachurnanirmanana*

Initial Weight	Final Weight	Loss in Weight	Loss in %
500 g	365g	145 g	22%

Table 8. The result of *Pippalichurnanirmanana*

Initial Weight	Final Weight	Loss in Weight	Loss in %
<i>Pippali</i> - 500g	<i>Pippalichurna</i> – 450 g	50 g	10%

Table 9. The Result of preparation of Homogenous mixture

S.No.	Name of the Drug	Weight of the Drug	Wt. of Homogenous mixture
1.	<i>Shoditha Tankana</i>	250 gm	1000gms
2.	<i>Shoditha Shankha</i>	250gm	
3.	<i>Vatsanabha churna</i>	250gm	
4.	<i>Pippali churna</i>	250gm	

DISCUSSION

The pharmaceutical procedures adopted in this study are *Shodhana*, *Marana*, *Bhavana* and *churna nirmana*. *Shodhanais* done for *Shankha*, *Tankana* and *Vatsanabha*. It was done to convert materials into suitable form for further procedures, to remove visible & invisible impurities, to reduce the toxicity and to enhance the therapeutic properties. *Marana* was done for *Shankha*. It makes *Shankha* adaptable, absorbable and assimilable.

Shankashodhana

By doing *Shodhana* of *Shankha* with *Nimbuswarasa* in *dolayantra*² the impurities are removed from *Shankha* and get settled at the bottom of the vessel and also due to the effect of *Nimbu* the *Shankhas* become brittle and the outer surface becomes rough, so that in further *Marana* procedure *Shankha* can be converted into *Bhasma* form easily.

Shanka Marana

In *puta* system of heating there is gradual rise and fall of temperature which helps in making the material more agnithayi (heatstable)³. It cannot regain its form back after complete procedure. *Gajaputa* system of heating was suitable for preparation of *Shankhabhasma*⁴. The maximum temperature recorded during *puta* was 1003°C and it was maintained for a period of 4-5 minutes. After that, gradual fall in temperature was noted. After first *Putaksharata* of *Shankhabhasma* remained a little and after second *Puta* it was normal. The material turned to soft powder after complete process, which indicates that the temperature was sufficient for the formation of the desired compound.

Vatsanabhashodhana

Vatsanabhashodhana was done by *Swedana* in *dolayantra* with *gokshira*⁵. After *swedana* in *gokshira* *Vatsanabha* became soft and colour of *Gokshira* changed to dark brown. It may be due to release of some toxic substances. It is believed that the toxicity of *Vatsanabha* decreased by treating it with *Gokshira* brought about a partial change of toxins aconitine and pseudoaconitine into the less poisonous substance called Benzelaconine and Vertoroyl aconite due to its vishahara property. During pounding of *Vatsanabhaugragandha* was produced may be due to *Vyavayi*, *Vikasi*, *Teekshnagunas* of it.

Tankana Shodhana

- Necessity of *Shodhana*: The *Ashodhita Tankana* may cause complications like *Chardi* [vomiting] and *Bhranti* [delusions].
- In *Rasa Tarangini* 13/78 the author mentioned that *Nirjalikaranais* to be done to purify *Tankana*⁶
- *Tankana Shodhana* was done by frying the fine powder in an earthen pot. During frying it produced crackling sounds. After continuous frying it became bloomed and turned into lighter white opaque substance.

Churna preparation

- *Vatsanabhachurna* and *Pippali churna* were prepared according to *Sarangadhara Samhita Madhyama Khanda* eference⁷.

Homogenous Mixture

- Homogenous mixture was prepared by properly mixing of *churna* of all the ingredients. Then *Bhavana* of homogenous mixture with *Ardrakaswarasa* was given. The resultant homogenous mixture was made in to capsules.

Preparation of Kapha Ketu Ras Capsule

As the dose of *Kapha Ketu Ras* is 125 mg a large quantity of binding agents to be added to prepare tablet form which may lead to loss of efficacy of the drug. so the capsule form is preferred to maintain the efficacy of drug

Conclusion

Pharmaceutical standardization of medicines is an essential requirement to establish the safety and efficacy, as well as to ensure the quality and the yield of final product.

Shodhana helps in removing the toxic impurities by undergoing physical, chemical and biological changes. *Bhavana* procedure plays a vital role in reducing the particle size and exposing maximum surface area, thus facilitating better absorption of the drug in the body. *Marana* makes the drug more adaptable, absorbable and assimilable in the body without producing any toxic effects. Hence all these procedures can be considered ideal in the standardization of the preparation of *Kapha Ketu Ras*.

Conflict of Interest: No conflict of interest.

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