Research Article

PHARMACEUTICO-ANALYTICAL STUDY OF CHAUSATHPRAHARI PIPPALI CHURNA

Rajendra Barfa¹, Vijay Shreebharti¹, Amit Mishra¹, Dimpal Sharma¹, Amit Kumar Sharma², Sanjay Kumar³

*¹P.G. Scholar, ²PhD Scholar, ³Associate Professor, Department of Rasashastra and Bhaishajya Kalpana, National Institute of Ayurveda, Jaipur, India.

ABSTRACT

Ayurvedic pharmaceuticals is one of the fastest growing sectors in the world market. Globalization expects pharmaceutical standardization. Competition in pharma industry expects good quality products which have documentation regarding safety and efficacy issues. Ancient heritage blended with current updated pharmaceutical technology helps in better appreciation. Chausath Prahari Pippali Churna is a classical Ayurvedic formulation mentioned in Ayurvedsarasamgraha a renowned text of Ayurveda, which is useful in Vata and Kapha diseases. It has potent herbal remedy for both respiratory and digestive disorders. It is prepared by Bhavana with Phanta (hot infusion) of Badippal to Chhotippillalichurna upto 64 Prahar (192hrs) to make it more strong and efficient formulation. The attempt is made in the present article to assess its pharmacological action and analytical aspect while processing the drug – Chausath Prahari Pippali Churna (CPP).

KEYWORDS: Chausath Prahari Pippali Churna, Mardana, Bhavana, Phanta, Prahara.

INTRODUCTION

Chausath Prahari Pippali Churna¹ is one such purely herbal product in Churna form used for the management of various diseases. One such ancient Ayurvedic preparation is very frequently used in the field of Ayurveda is Churna Kalpana which certainly requires upgradation in the terms of pharmaceutical technology. Churna (Powder) Kalpana plays an important role in pharmaceutics of Ayurveda, owing to many advantages like easy manufacturing and economic than other dosage form. Due to availability of various formulation techniques, good patients compliance and huge potential, Churna is popularized in the pharmaceutical market.

Churnakalpana is described by almost all the Acharyas. Elaborate use of Churnakalpana in Charaka Samhita reveals the significance of Churna preparation in that period². Acharya Sushruta has also given prime importance to the Churna Kalpana for the purpose of treatment aspects. In Ashtanga Sangraha, plants like Pippali, Mustaka, Bharangi etc. are indicated to be converted in Churna form which is administered with Guda & Taila³. In Ashtanga Hridaya also a number of Churna preparations have been used like Matulunga, Sunthi, Haritaki etc. in various ailments⁴. In Ashtanga Sangraha & Ashtanga Hridaya, there are abundant uses of Churna Kalpana in almost all the disease conditions. It can be noted that the use of Churna Kalpana became more popular with the advancement of civilization. Acharya Kashyapa took a step further ahead and included Churna in the basic Kashaya Kalpanas⁵.

Piper longum linn. is one of the important medicinal plant of the family piperaceae. Being one among the constituent of Trikatu, Panchakola etc., very widely used in Ayurveda for the treatment of various disorders. The Nirukti of word Pippali signifies its action in maintaining total health and also in Dhatuposhana and Poorana⁶.

In the Ayurvedic Formulary of India, Pippali is being used in 324 formulations. It is used as Prakshepakadravya in many formulations. It is highly valued from time immemorial because of its vast medicinal properties. It is extensively used as Anti-inflammatory, cough suppressor, antibacterial, insecticidal, antimalarial, CNS stimulant, antitubercular, anti-helminthic, hypoglycaemic, antispasmodic, antigiardial, immunomodulatory, hepatoprotective, analeptic, antinarcotic, antiulcerogenic activity.

AIMS & OBJECTIVES OF THE STUDY

1. To prepare Chausath Prahari Pippali Churna as per textual guideline followed by S.O.Ps and S.M.P.
2. To determine Physico-chemical analysis of Chausath Prahari Pippali Churna.
MATERIALS AND METHODS

- Collection of raw Chhoti Pippali (Piper longum) and Badipippali (Piper longum) of about one year old sample was procured from pharmacy, National Institute of Ayurveda, Jaipur was identified and authenticated by the Pharmacognosist, for the preparation of Chausath Prahari Pippalichurna[7].
- Preparation of Chausath Prahari Pippali Churna in the pharmaceutical lab of Rasa shastra & Bhaishajya Kalpana, NIA, Jaipur as per the reference of Ayurved Sara Samghrah.
- Analytical Study was carried out in S.R. Labs 230/20, Sector-23, Pratap Nagar Haldighati Marg, Jaipur, Rajasthan.

Pharmaceutical Methods

All the samples of Chausath Prahari Pippali Churna were prepared inpharmaceutical lab of Department of Rasashastra and Bhaishajya Kalpana, National Institute of Ayurveda, Jaipur. Prior to the pharmaceutical processing, the raw Pippali was washed, cleaned and dried properly to remove the contamination of chemicals, pesticides and heavy metals, if any remains in the raw drug[8]. The whole pharmaceutical study was carried as mentioned below:-

Formulation Details

The preparation of Chausath Prahari Pippali Churna involves the following steps:
1. Preparation of Pippali Churna
2. Preparation of Badipippali Phanta
3. Preparation of Chausath Prahari Pippali Churna
4. Storage of Finished product

Preparation of Pippali Churna

Dried fruits of Pippali were sorted from impurities like small stones, foreign matter etc. As per API norms, raw Pippali was washed under running tap water for three times to remove the external impurities, chemicals, pesticides and heavy metals, if any remains in the raw drug. After properly drying the Pippali was then weighed and transferred into a mixer grinder and rotated for 10 min. The powder was collected and sieved through 85#. The remaining powder was again grinded in a mixer and sieved.

Preparation of Badi Pippali Phanta

Dried fruits of Badi Pippali were sorted from impurities like small stones, foreign matter etc. As per API norms, raw Badi Pippali was washed under running tap water for three times to remove the external impurities, chemicals, pesticides and heavy metals, if any remains in the raw drug. After properly drying the Badi Pippali was then weighed and transferred into a Khalvayantra and grinded for 10 minutes. The Coarse powder was collected and sieved through 44 No. mess size. The Phanta preparation was prepared by adding 4 parts of ‘hot water to the 1 part of ‘coarse powdered drug’. The mixture has to be macerated well for 5 min. Later the liquid was Strain and press out the marc (dense stuff). After that mixture has to be filtered well into the glass container the filtered is called Phanta and this freshly prepared filtered Phanta was further used for Bhavana.

Preparation of Chausath Prahari Pippali Churna

359.4 g. Pippalichurna was taken in a wet-grinder and the same quantity of Phanta was added to it. During first Bhavana 125 ml extra water was added for smooth paste and grinding was carried out for 64 Prahar i.e., 192 hrs. After grinding on first Bhavana when paste became thick and rpm of the wet-grinder decreased to 100 rpm, then again quantity of 150 ml Phanta was added on every 2 Prahar i.e., 6 hrs. So, grinding for 64 Prahar total 32 numbers of Bhavna of Phantadrava has been given to the Pippalichurna, samples were collected at stages of 16, 32, 48 and 64 Prahara for comparative study with the finished product (shown in Table 3.8).

Storage of Finished Product

Dry the final product in shade and Filling in the air tight container.

Table 1: Showing practical details of Pippalichurna

| Quantity of raw Pippali taken | Quantity of Fresh Pippali obtained | Quantity of Rotten/defected Pippali obtained | % Loss |
|------------------------------|-----------------------------------|---------------------------------------------|--------|
| 500 g                        | 419 g                             | 81 g                                       | 16.2%  |

Table 2: Showing practical details of Pippali churna

| Quantity of Fresh Pippali taken | Quantity of Pippalichurna obtained | Residue | Handling loss | % Loss |
|---------------------------------|------------------------------------|--------|--------------|--------|
| 419 g                           | 359.4 g                            | 49.4 g | 10.2 g       | 14.23% |
Table 3: Showing practical details of *Badi Pippali Phanta Churna*

| Quantity of raw *Badi Pippali* taken | Quantity of Fresh *Badi Pippali* obtained | Quantity of Rotten/defected *Badi Pippali* obtained | Loss in % |
|-------------------------------------|------------------------------------------|--------------------------------------------------|-----------|
| 1 kg                                | 907 g                                    | 93 g                                             | 9.3%      |

Table 4: Showing practical details of *Badi Pippali Phanta Churna*

| Quantity of Fresh *Badi Pippali* taken | Quantity of *Badi Pippali* obtained | Residue | Handling loss | Loss in % |
|---------------------------------------|-------------------------------------|---------|--------------|-----------|
| 907 g                                 | 862 g                               | 32 g    | 12.2 g       | 4.87%     |

Table 5: Showing practical details of *Badi Pippali Phantadrava* for Bhavana purpose

| Quantity of Fresh coarse powdered *Badi Pippali* taken | Quantity of hot water added to the *Badi Pippali churna* | Quantity of *Badi Pippali phanta drava* obtained | Loss | Loss in % |
|--------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------|------|-----------|
| 50 g                                                   | 200 ml                                                    | 150 ml                                          | 50 ml| 25 %      |

Table 6: Showing details of ingredient of the *Chausath Prahari Pippali Churna*

| Ingredient required | Botanical Name        | Part used | Quantity |
|---------------------|-----------------------|-----------|----------|
| *Pippali Churna*    | *Piper longum* Linn.  | Fruits    | 359 g    |
| *Badi Pippali Phanta* | *Piper longum* Linn. | Fruits    | 359 ml   |

Table 7: Showing results for preparation of *Chausath Prahari Pippali Churna*

| *Bhavana dravya*      | *Prahar* | Qty of liquid used in ml | Total Qty of Liquid used | Qty of *Pippali Churna* taken | Material obtained | After drying | Gain in % |
|-----------------------|----------|--------------------------|--------------------------|-------------------------------|-------------------|-------------|----------|
| Phanta media          | 16       | 1350                     | 4800 ml                  | 359 g                         | 653 g             | 507 g       | 41.22 %  |
|                       | 32       | 1200                     |                          |                               |                   |             |          |
|                       | 48       | 1200                     |                          |                               |                   |             |          |
|                       | 64       | 1050                     |                          |                               |                   |             |          |

Analytical Methods

- **Organoleptic parameters:** The specific characters which are mentioned in our classics for evaluating the qualities of *Churna* by colour, touch, fineness, taste, odour etc. was noted in the sample. *Rupa* (Appearance & color), *Sparsha* (Touch) - Soft particles that could be detected by touch, *Gandha* (Odour)-Specific odour, *Rasa* (Taste)- Specific taste.

- **Physicochemical parameters:** Physicochemical study of all the samples were carried out by using various physicochemical parameters as mentioned in Ayurvedic Pharmacopoeia of India, Indian Pharmacopoeia. HPLC- qualitative and quantitative analysis of Piperine, Particle Size, Total ash, Acid insoluble ash, pH, Water soluble extractive, Alcohol soluble extractive, Loss on drying at 105°C.

Table 8: Organo-Leptic Evaluation of *Chausath Prahari Pippali Churna* at Different Stages

| *Bhavana dravya*      | *Prahar* | Appearance          | Colour     | Smell         | Taste       |
|-----------------------|----------|---------------------|------------|---------------|-------------|
| Phanta media          | 0        | Fine Powder         | Green      | Strong Pungent| Pungent+++  |
|                       | 16       | Fine Powder         | Light Brown| Strong Pungent| Pungent+++  |
|                       | 32       | Fine Powder         | Brown      | Mild Pungent  | Pungent++   |
|                       | 48       | Fine Powder         | Dark Brown | Mild Pungent  | Pungent++   |
|                       | 64       | Fine Powder         | Dark Chocolate Brown | Mild Pungent | Pungent+   |
Table 9: Physico-Chemical Analysis of *Chausath Prahari Pippali Churna* and *Pippali Churna*

| S.No. | Name of Test                              | Batch  | 0 Prahara | 16 Prahara | 32 Prahara | 48 Prahara | 64 Prahara |
|-------|-------------------------------------------|--------|-----------|------------|------------|------------|------------|
| 1.    | Loss on drying (w/w %)                    | PC     | 15.84     | -          | -          | -          | -          |
|       |                                            | CPP    | -         | 10.86      | 10.35      | 12.41      | 16.07      |
| 2.    | Total Ash Value (w/w %)                    | PC     | 7.76      | -          | -          | -          | -          |
|       |                                            | CPP    | -         | 9.17       | 10.08      | 10.48      | 11.57      |
| 3.    | Acid Insoluble Ash (w/w %)                 | PC     | 0.199     | -          | -          | -          | -          |
|       |                                            | CPP    | -         | 0.199      | 0.299      | 0.195      | 0.199      |
| 4.    | pH Value                                   | PC     | 4.0       | -          | -          | -          | -          |
|       |                                            | CPP    | -         | 4.5        | 4.5        | 5.1        | 5.0        |
| 5.    | Water soluble extract (w/w %)              | PC     | 32.6      | -          | -          | -          | -          |
|       |                                            | CPP    | -         | 47.70      | 60.00      | 58.42      | 57.30      |
| 6.    | Alcohol soluble extract (w/w %)            | PC     | 26.6      | -          | -          | -          | -          |
|       |                                            | CPP    | -         | 31.2       | 32.1       | 32.3       | 20.0       |

PC = *Pippali Churna*, CPP = *Chausath Prahari Pippali Churna*

Table 10: Particle Consistency of *Chausath Prahari Pippali Churna* and *Pippali Churna*

| S.No. | Name of Test                        | Batch  | 0 Prahara | 16 Prahara | 32 Prahara | 48 Prahara | 64 Prahara |
|-------|-------------------------------------|--------|-----------|------------|------------|------------|------------|
| 1.    | % of Moderately Coarse Powder       | PC     | 90.48     | -          | -          | -          | -          |
|       |                                     | CPP    | -         | 8.69       | 0.40       | 0.45       | 0.76       |
| 2.    | % of Moderately Fine Powder         | PC     | 8.54      | -          | -          | -          | -          |
|       |                                     | CPP    | -         | 57.65      | 60.35      | 60.50      | 64.81      |
| 3.    | % of Fine Powder                    | PC     | 0.0       | -          | -          | -          | -          |
|       |                                     | CPP    | -         | 29.11      | 29.25      | 28.42      | 26.42      |
| 4.    | % of Very Fine Powder               | PC     | 0.0       | -          | -          | -          | -          |
|       |                                     | CPP    | -         | 6.53       | 6.85       | 6.90       | 7.01       |

PC = *Pippali Churna*, CPP = *Chausath Prahari Pippali Churna*,

Table 11: Showing Area of Piperine Content in HPLC (AT 345 nm)

| S.NO. | Con. (mg/kg) | Area    | Retention Time | Peak |
|-------|--------------|---------|----------------|------|
| 1.    | 0.5          | 39477   | 2.456          | 1    |
| 2.    | 1            | 65171   | 2.468          | 1    |
| 3.    | 2.5          | 153069  | 2.469          | 1    |
| 4.    | 5            | 301709  | 2.429          | 1    |
| 5.    | 10           | 613064  | 2.416          | 1    |
| 6.    | 30           | 1879214 | 2.453          | 1    |
| 7.    | 50           | 3167357 | 2.445          | 1    |
Rajendra Barfa et al Pharmaceutico- Analytical Study of Chausathprahari Pippali Churna

**DISCUSSION**

- **Pippali** is one such established drug which has multiple pharmacological actions. But to get the optimum effect in small dose is the aim of Bhaishajya Kalpana. For this reason, Chausath Prahari Pippali Churna may be the choice. It just by doing Mardana for 64 Prahara attains a potent effect against the diseases. How just simple rubbing brings such tremendous change in a drug always fascinated the researchers all over the globe. Keeping this view in mind the preparation of Chausath Prahari Pippali Churna was carried out by Mardana and Bhavana processes and to affirm the role of Mardana and Bhavana processes in such pharmaceutical preparations.

- The mobile phase consisted of solvent A: B [80:20]. Solvent A is Methanol and solvent B is water.

- Initially the raw material was found easy to powder, which gradually became difficult to powder at the end. Because after certain extent when mixer-grinder became hot and the residual powder in it became hard like granules, it was impossible to further powder it. Hence, rest of the coarse powder was discarded. The average size of Fresh Pippali taken for making Churna was 419 gm. An average of 14.23% of loss was obtained.

- The average size of Badi Pippali was 25.43mm in length and average wt. of Badi Pippali—0.431 gm was taken for making Churna. Prior to making the Churna, physical impurities from the raw drug were removed and was thoroughly washed under running water for three times so as to remove the external impurities, chemicals, pesticides and heavy metals, if any remains in the raw drug. After properly drying the Pippali was then weighed and transferred into a mixer grinder and rotated for 10 minutes to make powder. Then the powder was collected and sieved through # 85 mesh.

- **HPLC:**

HPLC for Methanolic Extract of Pippali Churna and Chausath Prahari Pippali Churna with comparison to standard Piperine. The mobile phase consisted of solvent A: B [80:20]. Solvent A is Methanol and solvent B is water.

---

**Fig. No.- 1 A linear Graph showing Piperine Content**

![Graph showing Piperine Content](image)

- **Sample- Pippali**
- **Area- 2830104**
- **Observed concentration from calculated curve - 44.836**
- **Dilution (mg/100ml)**
- **Sample weight - 500.45 mg**
- **Applied concentration In mg/kg**
- **Calculation**

Piperine Content = \[ \frac{\text{Observed concentration from calculated curve} \times \text{Purity of standard}}{\text{Applied concentration}} \]

Piperine %= 0.89

---

**DISCUSSION**

- **Pippali** is one such established drug which has multiple pharmacological actions. But to get the optimum effect in small dose is the aim of Bhaishajya Kalpana. For this reason may be Chausath Prahari Pippali Churna came into vogue, where Pippali just by doing Mardana for 64 Prahara attains a potent effect against the diseases. How just simple rubbing brings such tremendous change in a drug always fascinated the researchers all over the globe. Keeping this view in mind the preparation of Chausath Prahari Pippali Churna was carried out by Mardana and Bhavana processes and to affirm the role of Mardana and Bhavana processes in such pharmaceutical preparations. The average size of Pippali was 17.93mm and average weight of Pippali—0.243 gm was taken for making Churna. Prior to making the Churna, physical impurities from the raw drug were removed and was thoroughly washed under running water for three times so as to remove the external impurities, chemicals, pesticides and heavy metals, if any remains in the raw drug. After properly drying the Pippali was then weighed and transferred into a mixer grinder and rotated for 10 minutes to make powder. Then the powder was collected and sieved through # 85 mesh.

- Initially the raw material was found easy to powder, which gradually became difficult to powder at the end. Because after certain extent when mixer-grinder became hot and the residual powder in it became hard like granules, it was impossible to further powder it. Hence, rest of the coarse powder was discarded. Quantity of Fresh Pippali taken for making Churna was 419 gm. An average of 14.23% of loss was obtained.

- The average size of Badi Pippali was 25.43mm in length and average wt. of Badi Pippali—0.431 gm was taken for making Churna. Prior to making the Churna, physical impurities from the raw drug were removed and was thoroughly washed under running water for three times so as to remove the external impurities, chemicals, pesticides and heavy metals, if any remains in the raw drug.
After properly drying the Badi Pippali was then weighed and transferred into Khalvayantra and grinded for 10 minutes to make coarse powder. Then the coarse powder was collected and sieved through # 44 mesh. Remaining Badi paippali was again grinded in a Khalvayantra and sieved. Quantity of Fresh Badi Pippali taken for making coarse powder was 907 gm.

359gm of Pippali churna was taken for preparing Chausath Prahara Pippali Churna.

To assess the effect of Mardana and Bhavana processes, the samples were collected at 16, 32, 48 and 64 Prahara and were analyzed.

The Phanta media was used to make Chausath Prahara Pippali Churna.

Instrument used: Wet Grinder of Butterfly Matchless Table Top wet grinder, with 2 cylindrical Roller Stone having weight: 4.3Kg, with Stainless Steel Jar having capacity of 2 l, with Dimensions of 7.2 inch deep & Diameter of 10.2 inch. Rpm of Wet grinder was 297/ min.

359.4gm Pippali churna was taken in a Wet-grinder and 359.4ml quantity of Badi Pippalli phanta was added to it. Grinding was carried out for 64 Prahara i.e., 192 hours. When paste became thick and rpm of the wet-grinder decreased to 100 rpm, required quantity of Phanta was added to the material.

During Mardana for 64 Prahara, in between samples were collected at stages of 16, 32, 48 and 64 Prahara, for comparative study with the finished product.

Colour of Pippali churna slowly turned to darker colour with increasing Mardana period.

After grinding all the samples were taken out and dried under shade.

The final product was difficult to powder after drying because it was very sticky.

To prepare 359.4 g of drug 359 ml of Phanta was added but given quantity of Phanta according to reference was unable to make a proper paste for smooth grinding, so 125ml of extra water was added.

- For first 16 Prahara mardana it required 1350ml of Phanta,
- For 16-32 Prahara mardana required 1200ml of phanta,
- For 32-48 Prahara mardana it required 1200ml of Phanta,
- For 48-64 Prahara mardana it required 1050ml of Phanta,

So it can be seen that it required more Phanta for first 16 Prahara because initially the Churna required more liquid to become moist and to turn into paste. Later on for 32 Prahara, 48 Prahara and 64 Prahara it required comparatively less quantity of Phanta for Mardana.

A gain of 41.22% was observed. This gain was due to the addition of water soluble extract of Badi Pippalli phanta to the material which has increased the weight of final quantity.

0 Prahara Pippali i.e., Pippali churna was common as an initial drug for the preparation of Chausath Prahara Pippali Churna. It was sieved through #85 mesh, so was fine in touch. Freshly powdered Pippalichurna was light green in colour, had strong pungent smell and very strong pungent taste (as shown in Table XIII). In different stages, after 16, 32, 48 and 64 Prahara of Mardana the collected samples were completely dried under shade and rotated in mixer-grinder for 10 minutes to get these in Churna form and sieved through #85 mesh to get uniform Churna. That is why all the samples appeared in fine powder form. In different stages of sample smell of Pippali was strong pungent which got diminished gradually after 32, 48 and 64 Prahara mardana. This may be due to breakdown of its chemical components and by Mardana its volatile part may have evaporated with increasing Mardana period the strong smell gradually became mild. 0 Prahara Pippali (Pippali Churna) had strong pungent with instant burning tingling taste, which was found gradually decreasing in 16, 32, 48 and 64 Prahara Pippali churna. The tingling sensation is observed delayed but strong in all the samples of finished product as compared to Pippali churna which may be due to the exposed cellular content caused by the prolonged Mardana of Pippali. Regarding colour, Pippali churna which was light green colour turned slowly to dark brown, and dark chocolate brown at different stages of Mardana. This change in colour is may be due to prolong triturition of Pippali. As it is known that during Mardana (trituration), a mild heat is generated due to friction which darkens the grinding matter and the breakage of cellular content of the drug may be causing the change in colour.

Physico-Chemical Parameters

Loss on Drying (LOD)

The loss on drying of any sample is directly related to its moisture content. If the moisture content is very high in any drug it may affect its preservation. Hence, the loss on drying of the sample was determined and as data shown in Table-IX. It was found that Pippali churna (PC) had 15.84% loss on drying. In CPP Churna which had increase in loss
of drying by 16.07%. This may be due to the presence of sticky alkaloid present in Pippali Phanta which may be hindering the complete drying of the final product and increases the moisture content.

**Ash Value**

Data pertaining to Ash value of raw Pippali churna and finished product, i.e., CPP Churna has been tabulated in Table 11. Which shows Ash value of PC as 7.76% w/w which significantly increased to 11.57% w/w in CPP Churna. This may be probably due to the presence of some inorganic contents incorporated due to the prolong trituration of Pippali churna in the stone roller mortars. The total ash usually consist mainly of carbonates, phosphates, silicates and silica. The total ash figure is of importance and indicates to some extent the amount of care taken in the preparation of the drug.

**pH**

As per the data shown in Table-9, pH value of PC was found to be 4.0. Acidic pH slightly reduced within the range of 4.5 to 5.0 subsequently in all the stages of CPP Pippali churna. Thereby it indicates that the Tikshata of Pippali is reduced due to prolonged Mardana. Solubility, stability, activity and absorption of a drug depend upon its pH. The pH of CPP Churna indicated that it is slightly acidic. The degree of ionization and lipid solubility of a drug are two important factors that determine the rate of absorption of drugs from GI tract, and indeed their passage through cellular membranes easily.

**Acid Insoluble Ash**

If the total ash is treated with dilute hydrochloric acid, the percentage of acid-insoluble ash may be determined. As shown in Table-9. Acid insoluble ash was found to be 0.199% w/w in PC. It remained constant in CPP Churna. Acid insoluble ash usually consists mainly of silica. A high acid-insoluble ash in drugs indicates contamination with earthy material and may be fine particles from grinding stones possibly got mixed with the drug during prolonged Mardana.

**Water Soluble extract**

Extractive values for water soluble were shown in the Table-9. It was found that water soluble extract in PC was 32.6% w/w which gradually increased in the CPP Churna to 57.3%. Increase in water soluble extract in CPP Churna may be due its processing method where with liquid media was used.

**Alcohol Soluble Extract**

Data pertaining to Alcohol soluble extract of the all stages have been tabulated in Table no-9 which revealed that in PC it was 26.6% w/w which got reduced in different stages 16, 32, 48, and 64 Prahar, by 31.2%, 32.1%, 32.3% and 20.0% respectively. This may be due to some change in their chemical nature attained by the virtue of Mardana process.

**Particle Consistency**

Estimation of particle consistency of raw drug Pippali churna and the prepared drugs of different stages of CPP Pippali churna was also carried out which is tabulated in Table no-10. In PC maximum part i.e., 90.48% was in moderate coarse powder form. Whereas in CPP at 64 Prahara, the particle size remarkably reduced to fine or very fine particle size viz. 26.42% and 7.01% respectively. This suggests that due to the prolonged Mardana process the particle size definitely reduces in the final product.

**HPLC**

The HPLC finger prints of the CPP Churna have been presented in fig.no.9. The mean of total area of Piperine content in HPLC samples at 345 nm wavelengths have been tabulated in Table no.11.

In Table 11 it is evident that the mean of total area of piperine in CPP Churna was 2830104. The data of HPLC of the CPP Churna and Pippali churna prepared samples were run parallel with standard marker Piperine and all the corresponding spots were recorded at 345nm wavelengths at 0.05, 1, 2.5, 5, 10, 30, 50 ppm.

Quantitative assessment of piperine content in CPP Churna was found to be 0.89% w/w.

**CONCLUSION**

The following conclusions were drawn from the present article:

1. In preparation of Chausath Prahari Pippali Churna the quantity of liquid i.e., Badi Pippali Phanta was used 4800ml for 359gm of Pippali Churna. Total 41.22% wt. was gained in final product.

2. In Organoleptic study at different stages of sample the smell of Chausath Prahari Pippali Churna was found pungent which got diminished gradually after 32, 48 and 64 Prahara mardana. This may be due to breakdown of its chemical constituents and its volatile part may have evaporated with increasing trituration period.

3. In Physico-chemical analysis it showed decrease in average loss on drying in Chausath prahari Pippali churna at different stages. Ash value, Acid insoluble ash, Water soluble extractives and Alcohol soluble extractives increased gradually in all samples as compared to Pippali churna. The pH value of Pippali churna was found 4.0 which is acidic in nature further in successive stages of Chausath Prahari Pippali Churna preparation pH increases in the range of 4.4 to 5 which indicates...
the Tikshnata of Pippali was reduced due to prolonged trituration.

4. In HPLC analysis, Piperine content was found 0.89% w/w in final product.

5. The analytical parameters were within the parameters mentioned in the API and were suggestive of the genuinity of the raw material used and the quality of the end product obtained.

REFERENCES
1. Pathak, Vaidya Ramraksha, Ayurved Sara Sangrath, Shree Baidyanath Ayurved Bhawan Ltd. Nagpur, Edition 2012 Pg No.309.

2. Chaturvedi, Gorakhnath, Charaka Samhita of Agnivesha revised by Pt. Kashinath Shastri & Choukhambha publications, New Delhi 8th edition. Charak sutra 3/11.

3. Shatri Pandit Lal chandra Ashtanga Sangrarah A. S. Chi.3/15, Shri Baidyanath Ayurved Bhavan Ltd. Nagpur. 4th edition 1996.

4. Gupta Kavirajatrideva Ashtangahridaya Choukhamba publications, New Delhi 14th edition. A. H. Chi. 10/161.

5. Sharma Hemraja Pandit Kashyapa Samhita choukhamba publications, New Delhi. 9th edition 2004. Ka. Khi. 3/35.

6. Chunekar K.C, Bhavamishra, Bhavaprakasa Nighantu, commentary and edited by. Pandey G.S, Varanasi: Chaukambha Sanskrit Sansthan Reprint 2004, T pg: 984, pg- 15.

7. Sharma Vinay et al., Pharmacognostical and Phytochemical study of Piper longum L. and Piper retrofractum Vahl., Journal of Pharmaceutical and Scientific Innovation: JPSI 1(1) Jan- Feb. 2012, p.62-67.

8. Anonyms, Ayurveda Pharmacopeia of India, Part-I, Vol.3, 1st Edition, The Controller of Publications, Govt. of India, Ministry of Health & Family Welfare, Dept. of ISM & H, Civil lines, Delhi, 2001, p.11

Cite this article as:
Rajendra Barfa, Vijay Shreebharti, Amit Mishra, Dimpal Sharma, Amit Kumar Sharma, Sanjay Kumar. Pharmaceutico-Analytical Study of Chausathprahari Pippali Churna. International Journal of Ayurveda and Pharma Research. 2021;9(1):25-32.

Source of support: Nil, Conflict of interest: None Declared

*Address for correspondence
Dr Rajendra Barfa
P.G. Scholar,
P.G. Department of Rasashastra and Bhaishajya Kalpana, NIA, Jaipur.
Email: rajendrabarfa@gmail.com

Disclaimer: IJAPR is solely owned by Mahadev Publications - dedicated to publish quality research, while every effort has been taken to verify the accuracy of the content published in our Journal. IJAPR cannot accept any responsibility or liability for the articles content which are published. The views expressed in articles by our contributing authors are not necessarily those of IJAPR editor or editorial board members.