Preparation of Hingwadi choorna: An Ayurvedic formulation for bronchial asthma

Shraddha SR, Chethan Kumar VK and Sharashchandra R

Abstract
Choorna kalpana (process of size reduction) is familiar pharmaceutical preparation in Ayurveda. Bhavita choorna has an effective size reduction process and homogenously active substance in its final product. Hingwadi choorna mentioned in Ayurvedic classics contains the ingredients like Ferula asafoetida Linn. (Hingu), Unaqua sodium chloride (Souvarchalalavana), Ziziphus jujuba Mill. (Kola), Rubia cordifolia Linn. (Samanga), Piper longum Linn. (Pippali), Sidacordifolia Linn. (Bala), Citrus medica Linn (Matulunga). In this article, Hingwadi choorna was prepared by using modern pharmaceuticals stuffs. During the method of preparation of Hingwadi choorna according to the Ayurvedic Formulary of India was followed.

Keywords: Hingwadi choorna, Bhavana, pharmaceuticals, particle, size reduction, preparation

Introduction
Tamakaswasa (bronchial asthma) is one of the panchaswasaroga having a clinical features like Peenasa, Ghurghuraka, Swasakrichrata, Kasa, Kanthodhwasam, Ativateevvegamwasam, Vishushkasyata \(^1\) and many more. For its treatment, Charakasamhita, an Ayurvedic treatise mentions Hingwadichoorna \(^2\) formula. The basic idea behind the administration of formulation has to reach a target tissue as per betterment of mankind. To achieve this, many processes were invented in a sense of manufacturing process, these are termed as Kalpanas and Upakalpanas (pharmaceutical preparation). Chooranalpana (process of size reduction) is one of upakalpana of kalka kalpana \(^3\). Bhavana is a wet trituration process and also a size reduction technology, frequently used in Ayurvedic pharmaceutics. It has multi-dimensional pharmaceutical and therapeutic implications by increasing potency, homogeneity in its active compound level \(^4\). Final product named Hingwadichoorna is a active amalgamation for the treatment of Tamakaswasa (bronchial asthma) in children. This article highlights the different steps and stages of preparation of Hingwadichoorna.

Materials and Method
Ingredients of the formulation
1. Ferula asafoetida Linn. (Hingu)
2. Unaqua sodium chloride (Souvarchalalavana)
3. Zizyphus jujuba Mill. (Kola)
4. Rubia cordifolia Linn. (Samanga)
5. Piper longum Linn. (Pippali)
6. Sidacordifolia Linn. (Bala)
7. Citrus medica Linn (Matulunga)

1. Ferula asafoetida Linn belongs to family Apiaceae, well known by name Devil dung. Preliminary studies for photochemical screening suggests the presence of asafoetidin, polysulphides, ferocolin, coladomin, coladin, foliferindiu. HPTLC documentation scan reveals the ferulic acid, ethanol extract of FSF oleogum resin.64%, which contain ferulic acid esters (60%), free ferulic acid (1.3%), coumarin derivatives (e.g. umbelliferone), volatile oils (3%–17%) including sulphur-containing compounds were isolated from plant. E-1-propyl sec-butyl disulfide, as the major component \(^5\). Hingu is one of the important herb of Ayurveda having a properties of swasahara, anulomana, carminative, antispasmodic, digestive, aphrodisiac, emmenagogue, antioxidant, anti-inflammatory, nephroprotective, neuroprotective and anticancer properties are proven pharmacologically and biologically in

Correspondence
Chethan Kumar VK
Associate Professor,
Department of PG Studies in Ayurveda and Hospital,
Udupi, Karnataka, India
animal and humans [6]. The resins have an effect on Asthma as smooth muscle relaxant causing bronchodilation [7].

**Ayurvedic properties**

Rasa: Katu, Tikta
Guna: Laghu, Tikshana
Virya: Ushna
Vipaka: Katu
DoshaKarma: Kapha- Vatahara
RogaKarma: Hrudya, shulahara, chakshushya, bhedaniya, balya, arthavajana

2. *Unqua sodium* chloride (Black salt) [8] primarily consists of sodium chloride (*NaCl*) 97.46%, Magnesium chloride (MgCl2) 0.25%, sodium sulfate (Na2SO4) 0.88%, Calcium sulfate (CaSO4) 0.38%, Iron (Fe+++ 3.00%), Moisture 0.03%.

**Ayurvedic properties**

Rasa: Lavana, Madhura
Guna: Vishada, Laghu, Snigdha and Sukshma
Virya: Ushna
Vipaka: Madhura
Dosha Karma: Vatahara
Roga Karma: Hrudya, gulmahara, vibandhahara, anahahara, udarashulahara and udarakrimihara.

3. *Ziziphus jujuba* Mill. [9] belongs to family Rhamnaceae. Kola commonly named as Indian plum placed in Amradiphala varga. A neutral polysaccharide zizyphus – arabinan composed of L-arabinose, and D-galactose, 2-O-trans-p-coumaroylphtholic acid, asimilobine, betulinic acid, zizyphussaponins I-III, Jujuboside B, triglycerides, vitamin C, carotenes, mallic acid, TLC detected with a compound xylose triterpenoids (betulinic acid, betulin, lupeol), steroidal saponins (oleanolic acid), flavonoids, xylene and others (not identified), are known for antioxidant, haem agglutination, membrane stabilizing property, anti-asthmatic, anti-allergic, immunomodulator, anti-inflammatory and anti-pyretic [10].

**Ayurvedic properties**

Rasa: Madhura, Amla
Guna: Guru, Snigdha
Virya: Sheeta
Vipaka: Madhura
DoshaKarma: Vata- Pittahara
RogaKarma: Jwaraahara, kasahara, hikkahara, shulahara


**Ayurvedic properties**

Rasa: Kashaya, Tikta, Madhura
Guna: Guru, Ruksa
Virya: Ushna
Vipaka: Katu
Dosha karma: Kapha-Pitta hara
Roga Karma: Jwarahara, mutrajanana, lekhaniya, swedajanan, sothahara, varnya, vedanastapana, kushtagha

5. *Piper longum* Linn. [13] belongs to family Piperaceae. The alkaloids piperine, piperlongumine, piperlonguminine, the presence of L-tyrosine, L-cysteine hydrochloride, DL-serine and L-aspaetic acid as free aminoacids has been reported in the fruit. Piperine shows antihypertensive, antioxidant, antitumor, anti-asthmasics, analgesic, anti-inflammatory, anti-diarrheal, antispasmodic, antidepressants, immunomodulatory, anticonvulsant, antibacterial, antifungal, hepato-protective activities [14].

**Ayurvedic properties**

Rasa: Katu
Guna: Tikshana, Laghu, Snigdha
Virya: Anushna
Vipaka: Madhura
DoshaKarma: Kapha-Vatashamaka
RogaKarma: Rasayana, swasakasahara, shoolaprashamana, deepana

6. *Sida cordifolia* Linn [15] belongs to family Malvaceae known by country mallow. Chemical constituents are ephedrine, sitoiodsode X, vasicine, vasicinone, choline, vasicinol, betaine. Presence of ephedrine has highlighted the utility by action of central nervous stimulant used to treat breathing problems. It is also have an anti-inflammatory, analgesic, antibacterial, antifungal [16] action.

**Ayurvedic properties**

Rasa: Madhura
Guna: Snigdha, Guru
Virya: Sheeta
Vipaka: Madhura
DoshaKarma: Vata-Pittahara
Roga Karma: balya, grahi, rasayana, hrudya, ojavardhaka, jwaraghana, prajasthapana,

7. *Citrus medica* Linn [17] known by citron fruit and its decoction have alkaloids, flavonoids, phenols, carbohydrates and mucilage; peels have alkaloids, flavonoids, steroids, phenols and carbohydrates; Abscisic, Abscisin II, limonin, limonene, lomocitrol. It has analgesic, hypoglycaemic, anticancer, antioxidant, anti-helminthic, antimicrobial and antiulcer properties.

**Ayurvedic properties**

Rasa: Amla, Madhura
Guna: Laghu, Snigdha
Virya: Ushna
Vipaka: Amla
Dosha Karma: Vata-kaphahara
Roga karma: swasahara, deepana, hrudya

**Collection and authentication of raw drugs**

The above mentioned drugs were collected from Sri Dharmasthala Manjunatheshwara Pharmacy, Kuthpady, Udupi, Karnataka, India. The drug analysis and standardization was done at SDM centre for Research in Ayurveda and Allied Sciences, Kuthpady, Udupi, Karnataka, India.
Apparatus used for Preparation of Hingwadi choorna\textsuperscript{[18]}
Impact Pulveriser- It is used for size reduction of the drugs.
Muslin cloth- used for the filtration of Matulungaswarasa.
End runner – utilised for Bhavana procedure.
Tray dryer- is used to dry the bhavitha choorna.

Method of preparation
Hingwadi choorna were prepared by using different parts of medicinally important herbal drugs such as Sauvarchala lavana (Crystal) (Fig 1), Kola fruit (Fig 2), Samanga (Root) (Fig 3), Pippali (Fig 4), Bala (Root) (Fig 5), choorna of above drugs were taken separately in equal quantity and shodhita Hingu (Latex) (Fig 6) taken half of the total quantity of above drugs and were made into fine powder and mixed homogeneously in a pulveriser. The homogeneous choorna is filtered by sieve number 85. Mixture was subjected for Bhavana with juice of Matulunga fruit (Fig 7) for 7 times \textsuperscript{[19]}.
After samyak siddhi lakshana of Bhavana, chakrikas (pellets) were prepared and dried in tray dryer. After complete drying pellets were made into powdered form and packed in a sachet. This method of preparation of choorna is followed according to The Ayurvedic Formulary of India.

Fig 1: Sauvarchala lavana

Fig 2: Fruits of Kola

Fig 3: Roots of Samanga

Fig 4: Fruits of Pippali

Fig 5: Roots of Bala

Fig 6: Shodhita Hingu

Fig 7: Fruit and juice of Matulunga

Fig 8: Pellets
Precautions to be taken
1. All ingredients should be powered separately.
2. Powders having sugars and salts as ingredients should not be formulated during rainy season as they catch moisture and may get spoiled due to their hygroscopic nature.
3. Powders should be immediately packed air tight after powdering, as it may catch moisture.
4. The fineness of powders should be preferably 85 mesh per square inch or still finer.
5. The powders which are not packed airtight lose their potency in 2 months while well packed and preserved powders may be kept active for 1 year.

Duration of preparation- 8 days
Test of choorna
Choorna is a size reduction process by using any herbal or mineral drugs. Colour according to the nature of the drugs used and smell of the predominant drug.

Organoleptic parameters of finished product
• Color: Brown
• Odour: Specific odour
• Taste: Tikta amla
• Touch : Smooth

Table showing results of standardization [20] parameters of Hingwadi choorna

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Results n = 3 % w/w</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss on drying</td>
<td>10.98</td>
</tr>
<tr>
<td>Total Ash</td>
<td>15.32</td>
</tr>
<tr>
<td>Acid Insoluble Ash</td>
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</tr>
<tr>
<td>Water soluble Ash</td>
<td>12.8</td>
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<tr>
<td>Alcohol soluble extractive value</td>
<td>16.64</td>
</tr>
<tr>
<td>Water soluble extractive value</td>
<td>43.90</td>
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</table>

Discussion
Bronchial asthma is a major public health problem affecting a large number of individuals of all ages. Globally, 100 to 150 million people suffer from asthma [21]. The signs and symptoms of Tamakawasa explained in Ayurvedic classics resemble Bronchial Asthma. Choorna Kalpana (particle size reduction) is most predominately used form of Ayurvedic preparation among 5 basic preparations and rate of drug absorption is fast. Bhavana is one among such sanskara which is defined in different literature of Rasashastra. Bhavana with organic juices improves the bioavailability of the drug there by enhance their rate of absorption. Hingwadi choorna is one of the best formulations for the treatment of bronchial asthma. The raw drugs were authenticated by the experts and final product was standardized and its value was compared as per Ayurvedic Formulary of India.

Conclusion
Different pharmaceutical techniques are scientifically designed by ancient Ayurvedic scholars. Choorna kalpana is most predominately used form in Ayurvedic preparation. Samskara is a process in which the quality of raw drug is converted according to the requirement of the formulation. Bhavita Hingwadi choorna is a convenient form to prescribe in required amount particularly in children. Ayurveda is principle among the traditional health practice in the world hence traditional inspired practical approach should be made in preparing prime quality preparations.

References


