

A compendious review of *Chitraka Haritaki Avaleha* – A polyherbal *Ayurveda* formulation for bronchial asthma

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Abstract

Introduction: *Avaleha* (confection) is a unique dosage form of Ayurvedic pharmaceuticals, which is frequently prescribed in various disorders and especially in respiratory disorders. *Chitraka Haritaki Avaleha* (CHA) is one such formulation being used extensively by *Ayurveda* physicians for bronchial asthma, despite its classical use in various other disorders too. CHA was first time described by Vrindamadhava in the 9th century and had been amended for many times till today. Because of its demand, many pharmaceutical companies are also manufacturing it, and is freely available in the market. **Aim:** The aim is to screen and compile references pertaining to composition, method of preparation, therapeutic uses, organoleptic, and physico-chemical parameters of CHA from different classics and original research articles. **Materials and methods:** Description of CHA was extensively reviewed from Vrindamadhava, Chakradatta, Vangasena, Gadanigraha, Yogatarangini, Bhaishjya Ratnavali and Yogaratnakara. Synonyms, *Rasapanchaka* (*Ayurveda* principles of drug action), and *Dosha Karma* (therapeutic attributes) of ingredients were compiled from Bhavaprakasha Nighantu. Organoleptic and physicochemical parameters were compiled from original research articles, searched from PubMed, Google Scholar, and Research Gate. **Results:** Variations in formulation name, ingredients, method of preparation, therapeutic indications and *Anupana* (adjuvant) was observed in the classical texts. Value of water-soluble extracts and pH of analytical study was found different than *Ayurveda* Pharmacopeia of India standards. **Conclusion:** Screening through various texts revealed that CHA has been mentioned in seven classical treatises and two gazetted texts with amendments which indicate its high demand and clinical efficacy in bronchial asthma along with other diseases. Disparity found in analytical parameters indicates the need of standardization of pharmaceutical process.

Keywords: Analytical study *Chitraka Haritaki*, confection, organoleptic parameter, pH value, physico-chemical

Introduction

In *Ayurveda*, *Avaleha* (confection) are compound formulations, used in the management of various disease conditions. *Chitraka Haritaki Avaleha* (CHA), *Bharangyadi Avaleha*, *Kantakari Avaleha*, *Vasa Avaleha*, *Chyavanaprasha Avaleha*, and *Kansa Haritaki Avaleha* are frequently prescribed *Avaleha*, especially for ailments of the respiratory tract.^[1-5] CHA is one of the important *Avaleha* formulation used for the management of bronchial asthma.^[6] CHA consists of 23 ingredients, as per the (Ayurvedic Formulary of India [AFI]).^[7] It is also known to pacify symptoms of diseases such as *Agnimandya* (digestive impairment), *Shwasa* (asthma), *Kasa* (cough), *Kshaya* (tuberculosis), *Pinasa* (chronic rhinitis/sinusitis), *Krimi* (worm infestation), *Gulma* (abdominal lump), *Arsha* (hemorrhoids), *Udavarta* (constipation).^[8] As there is

no need of food restriction during the intake of CHA,^[9] it is easy to prescribe and hence widely used among physicians. However, since the 9th century till today, different classics have modified its pharmaceutical processing, ingredients and *Anupana* (adjuvant). As, it is important for the physician to know details of drugs being used by them, critical review of the classical references along with available original published researches on pharmaceutical parameters of CHA was done.

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Aim and objective

To screen and compile references pertaining to composition, method of preparation, *Anupana* and therapeutic indications, along with available research data of organoleptic and physico-chemical parameters of CHA from different classics, published reports, and original research works.

Materials and methods

A review of *Ayurveda* formulations related to Sanskrit based classical texts available in the library of the Institute of Teaching and Research in Ayurveda, Jamnagar was carried out. The texts having formulation named CHA, or formulations with different names but having the same ingredients as mentioned in AFI, were included for the review study. Compiled text or classical texts which did not mention such formulations were excluded from the study. After screening seven classical texts (Vrindamadhava, Chakradatta, Vangasena, Gadanigraha, Sharangdhara Samhita, Bhavaprakasha, Yogaratnakara) and two gazetted books [Ayurveda Pharmacopeia of India (API) and Ayurvedic Formulary of India (AFI)] were reviewed for the study, out of which reference of Bhaishajya Ratnavali was considered as standard comparator (as it is mentioned in AFI) [Table 1].

Along with the review of CHA, synonyms of its ingredients, *Rasapanchaka* (Ayurveda principles of drug action) and *Dosha Karma* (therapeutic attributes) were compiled from Bhavaprakash Nighantu [Tables 2 and 3].

For organoleptic and physicochemical parameters of CHA, original research articles of the last 10 years were searched from PubMed, Google Scholar, and Research Gate with keywords “*Chitraka Haritaki Avaleha*,” “organoleptic,” “pharmacognostical” and/or “physico-chemical.” Five articles were found to have these parameters [Table 4].

Results

Out of total of 15 classical texts screened, CHA was not found in eight *Ayurveda* texts (Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, Ashtanga Samgraha, Kashyapa Samhita, Sharangdhara Samhita, Sahastrayoga and Rasa Ratna Sammucchaya) and hence excluded from the review. The rest of the seven texts have mentioned this formulation with the same or different names [Table 1]. Vrindamadhava (9th century) had described this formulation for the first time.^[15] Later on, this formulation appears in Chakradatta (11th century), Vangasena (12th century), Gadanigraha (12th century), Yoga Tarangini (17th century), Bhaishajya Ratnavali (19th century) and in Yogaratnakara (20th century).

Details of name, ingredient, *Anupana*, indications in different texts are mentioned in Table 1.

The formulation composition and ratio of ingredients for the preparation of CHA are mentioned in Table 5.

As mentioned in Table 1, total seven classical texts and two gazetted texts (API and AFI) were reviewed out of which

Acharya Vangasena in Chikitsa Sara Samgraha has mentioned different name, for this formulation, i.e., *Nrupati Rasayana*. In Gadanigraha, Acharya Sodhala has mentioned two formulations with the name of *Chitraka Haritaki*.

Contents of CHA mentioned in Vrindamadhava, Chakradatta, Yogaratnakara, AFI and API are similar to that of *Bhaishajya Ratnavali*, while in *Dvitiya* CHA, *Shunthi* has been replaced with *Nagakeshara* (*Mesua ferrea* Linn.) and in Yoga Tarangini; *Dashamula* has been replaced with *Laghu Panchamula*.

Vrindamadhava and Gadanigraha, have mentioned that *Anupana* of CHA should be as per digestive capacity while AFI has advocated milk. The rest of the classics have not mentioned *Anupana* (vehicle) for this formulation.

According to Gadanigraha, CHA cures *Antra Vriddhi* (intestinal hernia) if taken continuously for 2 months and if taken for 3 days, it cures *Pinasa* along with *Rajayakshma*, *Kushtha*, *Arsha*, *Bhagaadara* and *Shopha*; while *Dvitiya* CHA if taken for 21 days, then the person can digest food efficiently in addition to above effects. The rest of all details are same as available in standard comparator, Bhaishajya Ratnavali.

Synonyms for ingredients of *Chitraka Haritaki Avaleha*

Ingredients with their different names are depicted in Table 2 and the source of the synonyms is *Bhavaprakasha Nighantu*. The synonyms are mentioned to avoid confusion between various synonymous names of the same drugs mentioned by different texts.

Rasapanchaka of ingredients of *Chitraka Haritaki Avaleha*

Ingredients (according to standard reference i.e., *Bhaishajya Ratnavali*) of CHA and their *Rasapanchaka* and *Dosha Karma* are depicted in Table 3. Maximum *Dravya* of this formulation possesses *Ushna Virya* (hot potency) and *Madhura* (sweet) *Vipaka* (post-digestive effect). The source of the *Rasapanchaka* and *Dosha Karma* is *Bhavaprakasha Nighantu*.

Organoleptic and physico-chemical parameters of *Chitraka Haritaki Avaleha*

As shown in Table 4, total of five published articles has mentioned organoleptic and/or physicochemical parameters of CHA, out of which, article serial number 3 (Accelerated stability study of CHA; V K Singh *et al.*) has only organoleptic parameters which are also mentioned in article serial number 2 (Physico-chemical and phytochemical standardization of CHA; V K Singh *et al.*) by the same author of the same sample and hence article serial number 3 was excluded from the review. Article serial number 5 (A randomized controlled clinical study on the efficacy of *Chitrakaharitaki Avaleha* in *Vataja Pratishyaya* w.s.r. to allergic rhinitis in children; T J Yadav *et al.*) has mention organoleptic parameters and hence was included for analytical review only. Hence, results of organoleptic characters of the remaining three original research works are mentioned in Table 6 and physicochemical parameters mentioned in four original research works are mentioned in Table 7 and compared with available standards of API.

Table 1: Description of Chitraka Haritaki Avaleha in various texts

| Reviewed text (Chapter name, number/verse number) | Name of formulation | Total number of ingredients | Name of ingredients | Anupana | Therapeutic indication |
|--|--|--------------------------------|---|---|--|
| <i>Vrindamadhava</i> (<i>Nasarogadhikara</i> , 60/29-31) | <i>Chitraka Haritaki</i> | 23 | <i>Chitraka, Amalaki</i> <i>Swarasa</i> (juice), <i>Guduchi</i> juice, <i>Dashamula</i> ^a , <i>Haritaki</i> , <i>Guda</i> , <i>Madhu</i> , <i>Trikatu</i> ^b , <i>Trijata</i> ^c , <i>Yavakshara</i> | <i>Yathagni</i> (As per digestive capacity) | <i>Mandagni</i> (subdued digestive power), <i>Kshaya</i> , <i>Kasa</i> , <i>Pinasa</i> , <i>Krimi</i> , <i>Gulma</i> , <i>Udavarta</i> , <i>Arsha</i> , <i>Shwasa</i> , <i>Rasayana</i> (rejuvenating drugs) |
| <i>Chakradatta</i> (<i>Nasa Roga Chikitsa</i> , 56/28-30) | <i>Chitraka Haritaki</i> | 23 | <i>Chitraka, Amalaka, Guduchi</i> , <i>Dashamula, Haritaki</i> <i>Churna, Trikatu, Trijata</i> , <i>Yavakshara, Madhu, Guda</i> | - | <i>Mandagni, Kshaya, Kasa</i> , <i>Pinasa, Krimi, Gulma</i> , <i>Udavarta, Arsha, Shwasa</i> , <i>Rasayana</i> |
| <i>Vangasena</i> , (<i>Nasaroga</i> , 70/35-39) | <i>Nrupati Rasayana</i> | 23 | <i>Chitraka, Amalaki Swarasa</i> , <i>Guduchi Swarasa</i> , <i>Dashamula, Haritaki, Guda</i> , <i>Madhu, Trikatu, Trijata</i> , <i>Yavakshara</i> | - | <i>Mandagni, Pinasa</i> |
| <i>Gadanigraha, Prathama Bhaga</i> (<i>Lehadhikara</i> , 5/118-113) | <i>Chitraka Haritaki</i> | 23 | <i>Chitraka, Amalaka, Guduchi</i> , <i>Dashamula, Haritaki</i> <i>Churna, Trikatu, Trijata</i> , <i>Yavakshara, Madhu, Guda</i> | As per digestive capacity | <i>Arsha, Shwasa</i> , <i>Bhagandara</i> (anal fistula), <i>Kasa, Krimi</i> , <i>Shopha</i> (swelling), <i>Kushtha</i> (skin disease), <i>Gulma, Aantravridhi</i> , <i>Pinasa, Rajyakshma</i> |
| <i>Gadanigraha, Prathama Bhaga</i> (<i>Lehadhikara</i> , 5/112-114) | <i>Dvitiya Chitraka Haritaki</i> | 23 | <i>Chitraka, Amalaka, Guduchi</i> , <i>Dashamula, Haritaki</i> <i>Churna, Maricha, Pippali</i> , <i>Nagakeshara, Trijata</i> , <i>Yavakshara, Madhu, Guda</i> | As per digestive capacity | <i>Kasa, Shwasa, Bhagandara</i> , 18 <i>Kushtha</i> , 8 <i>Udara Roga</i> (diseases related to abdominal organs), <i>Kshatakshaya</i> (lung parenchymal diseases), <i>Rajyakshma</i> |
| <i>Yoga Tarangini</i> (<i>Taranga</i> 72) | <i>Chitraka Haritaki</i> | 18 | <i>Chitraka, Laghu</i> <i>Panchamula</i> ^d , <i>Guduchi</i> , <i>Amalaki, Guda, Madhu</i> , <i>Trijata, Trikatu, Yavakshara</i> | - | <i>Shosha, Shwasa</i> , <i>Pralapa</i> (insanity), <i>Kasa</i> , <i>Vamathu</i> (vomiting), <i>Kaphaja Pratishyaya</i> (a type of cold), <i>Urahkshata</i> (lung parenchymal diseases), <i>Hikka</i> (hiccup), <i>Kaphaja Shiroyoga</i> (a type of headache), <i>Mandagni</i> |
| <i>Bhaishajya Ratnavali</i> (<i>Nasa Roga Chikitsa</i> , 63/25-28) | <i>Chitraka Haritaki</i> | 23 | <i>Chitraka, Amalaka, Guduchi</i> , <i>Dashamula, Haritaki</i> , <i>Trikatu, Trijata, Yavakshara</i> , <i>Madhu, Guda</i> | - | <i>Mandagni, Kshaya, Kasa</i> , <i>Pinasa, Krimi, Gulma</i> , <i>Udavarta, Arsha, Shwasa</i> |
| <i>Yoga Ratnakara</i> , <i>Uttarardha</i> (<i>Nasa Roga Chikitsa</i>) | <i>Chitraka Haritaki</i> | 23 | <i>Chitraka, Amalaka, Guduchi</i> , <i>Dashamula, Haritaki</i> , <i>Trikatu, Trijata, Yavakshara</i> , <i>Madhu, Guda</i> | - | <i>Shosha, Shwasa</i> , <i>Malavarodha</i> (constipation), <i>Vamana, Kaphaja Pratishyaya, Kshina</i> , <i>Urahkshata, Hikka, Kapha Roga, Shiro Roga</i> |
| AFI Part 1, volume 1 (<i>Avaleha</i> , 3/10) | <i>Chitraka Haritaki</i> | 23 | <i>Chitraka, Amalaka, Guduchi</i> , <i>Dashamula, Haritaki</i> , <i>Trikatu, Trijata, Yavakshara</i> , <i>Madhu, Guda</i> | Milk | <i>Mandagni, Kshaya, Kasa</i> , <i>Pinasa, Krimi, Gulma</i> , <i>Udavarta, Arsha, Shwasa</i> |
| API Part 2, volume 1 (<i>Avaleha</i> , 1/4) | <i>Chitraka Haritaki</i> | | 23- <i>Chitraka, Amalaka</i> , <i>Guduchi, Dashamula</i> , <i>Haritaki, Trikatu, Trijata</i> , <i>Yavakshara, Madhu, Guda</i> | - | <i>Mandagni, Kshaya, Kasa</i> , <i>Pinasa, Krimi, Gulma</i> , <i>Udavarta, Arsha, Shwasa</i> |

^a*Dashamula*: Equal mixture of ten drugs namely *Agnimantha* (*Premna mucronata* Roxb.), *Bilva* (*Aegle marmelos* Corr.), *Brihati* (*Solanum indicum* Linn.), *Gokshura* (*Tribulus terrestris* Linn.), *Kantakari* (*Solanum surattense* Burm.), *Gambhari* (*Gmelina arborea* Linn.), *Patala* (*Stereospermum suaveolens* DC.), *Prishnaparni* (*Uraria picta* Desv.), *Shalaparni* (*Desmodium gangeticum* DC.) and *Shyonaka* (*Oroxylum indicum* Vent.), ^b*Trikatu*: Equal mixture of three drugs namely *Shunthi* (*Zingiber officinale* Rosc.), *Maricha* (*Piper nigrum* Linn.) and *Pippali* (*Piper longum* Linn.), ^c*Trijata*: Equal mixture of three drugs namely *Tvaka* (*Cinnamomum zeylanicum* Breyn.), *Ela* (*Elettaria cardamomum* Maton.) and *Patra* (*Cinnamomum tamala* Nees and Eberm.), ^d*Laghu Panchamula*: Equal mixture of five drugs namely *Brihati*, *Kantakari*, *Shalaparni*, *Prishnaparni* and *Gokshura*

Table 2: Synonyms of Ingredients of *Chitraka Haritaki Avaleha*

| Ingredients | Synonyms |
|---------------------|--|
| <i>Chitraka</i> | <i>Agni, Anala, Dahana, Pathi, Vanhisam, Vyala, Ushna</i> |
| <i>Amalaki</i> | <i>Vayasya, Vrishya, Dhatriphala, Amalaka, Amritaphala, Tishyaphala</i> |
| <i>Guduchi</i> | <i>Amrita, Madhuparni, Chhinnaruha, Vatsadani</i> |
| <i>Haritaki</i> | <i>Abhaya, Pathya, Kayastha, Putana, Amrita, Haimavati, Avyatha, Chetaki, Shreyasi, Shiva, Vayastha, Vijaya, Jivanti, Rohini</i> |
| <i>Brihati</i> | <i>Simhi, Kshudrabhantaki</i> |
| <i>Kantakari</i> | <i>Kantakari, Duhsparsa, Vyaghr, Kshudra, Nidigdika, Kantakarika, Dhavani, Kanthalika</i> |
| <i>Shalaparni</i> | <i>Vidarigandha, Anshumati</i> |
| <i>Prishnaparni</i> | <i>Prithaparni, Kalashi, Dhavani, Shrigalvina</i> |
| <i>Gokshura</i> | <i>Shwadamsotra, Trikantaka, Chanadruma, Ikshugandhika</i> |
| <i>Patala</i> | <i>Madhuduti, Krishnavrinta, Tamrapushpi, Kuberakshi, Amogha</i> |
| <i>Shyonaka</i> | <i>Tuntuka, Kutannata, Prithushimba</i> |
| <i>Agnimantha</i> | <i>Jaya, Shriparna, Vatgni</i> |
| <i>Bilva</i> | <i>Shriphala, Sadaphala, Mallora, Shailoosha, Mahakapittha, Gandhag, Granthila</i> |
| <i>Gambhari</i> | <i>Madhuparnika, Shriparni, Kashmiri</i> |
| <i>Shunthi</i> | <i>Vishva, Vishvam, Nagaram, Vishvabheshajam, Ushna, Katubhadram, Shringaveram, Mahaushadham</i> |
| <i>Maricha</i> | <i>Vellaja, Krishna, Ushna, Dharmapattanam</i> |
| <i>Pippali</i> | <i>Magadhi, Krishna, Vaidehi, Chapala, Kana, Upakulya, Ushna, Saundhi, Kola, Tikshnatandula</i> |
| <i>Tvaka</i> | <i>Swadutvak, Tanutvaka, Darusita</i> |
| <i>Ela</i> | <i>Shuksma-Ela, Upakunchika, Tuttha, Korangi, Dravidi, Truti</i> |
| <i>Patra</i> | <i>Tamalpatra, Patranamaka, Tejapatra</i> |
| <i>Yavakshara</i> | - |
| <i>Guda</i> | <i>Ikshu, Dirghachchda, Madhutrina, Gudamoola</i> |
| <i>Madhu</i> | <i>Makshika</i> |

As per Table 6, according to standards of API, CHA has blackish brown color, semisolid touch, pleasant odor and bitter astringent taste. Out of these, taste mentioned for CHA articles of Achyuta Atara *et al.* and Poonam Gaur *et al.* is astringent, pungent and sweetish sour with astringent respectively, which is devoid of bitterness and hence different than API standards, and the justification for this change is not found in the article.

The physico-chemical parameter of any drug provides information about its purity.^[17] As mentioned in Table 7, loss on drying, total ash, acid insoluble ash and alcohol soluble extractive of three researches are fulfilling the standards of API, but values of water-soluble extractive and pH are not matching with API standards. Total ash and alcohol soluble extractive mentioned in the research work of Yadav *et al.* are also different than that mentioned in API.

Discussion

The basic method of the preparation of CHA includes three major components; *Drava Dravya* (containing decoction of *Chitraka*, *Amalaki*, *Guduchi* and *Dashamula*), *Madhura Dravya* (jaggery and honey) and *Prakshepa Dravya* (*Trikatu Trijata*, and *Yavakshara*). *Drava Dravya* helps in the extraction of water-soluble active principles; *Madhura Dravya* is responsible for palatability and also acts as preservatives; *Prakshepa Dravya* enhances the taste as well as increases the bioavailability of the drugs.^[18]

This standard pharmaceutical procedure of CHA was amended by Chakradatta and Gadanigraha by using fresh

juice of *Guduchi* and *Amalaki* in place of decoction, while Yogaratnakara, had specified the quantity of water (3 *Drona* = 36.6 liters) for preparation of decoction from *Kwathya Dravya* (400 *Pala* = 19.2 kg). Major variation was observed in stages of the process during which *Haritaki* is to be added. Chakradatta, Acharya Vangasena, Gadanigraha, Yoga Tarangini and API opined to add *Haritaki* at the timing of boiling of decoction during *Gudapaka*, while Yogaratnakara opines to add *Haritaki* after *Gudapaka*. It is important to note that, as boiling of the tea leaves leads to more yield of tannin,^[19] boiling of *Haritaki* during *Gudapaka* leads to more tannin release which makes *Avaleha* more astringent. Hence to reduce astringent taste of CHA, Yogaratnakara might have changed the sequence of *Haritaki* addition. The same could be the reason of the change in taste of CHA in the research work of Poonam Gaur *et al.* In the same work; sour taste might be because of the proportionate increase in *Amalaki* content when *Haritaki* proportion is reduced.

Acharya Vangasena has mentioned another name “*Nrupati Rasayana*” of this formulation and claimed that it can digest food which is as hard as stone, cures *Pinasa* in three days if taken continuously and there is no need to follow food restrictions while taking this formulation. This name is given as no food restriction is needed during intake of it.

In Gadanigraha, Acharya Sodhala has done amendment in *Dvitiya* CHA and used *Nagakeshara* (*Mesua ferrea* Linn.) in place of *Shunthi* and has mentioned to use fresh (*Navina*) *Chitraka* root and doubled the quantity of honey and

Table 3: Rasapanchaka and Dosha Karma of Ingredients of Chitraka Haritaki Avaleha as per Bhavaprakasha Nighantu

| Drug | Rasa (taste) | Guna (property) | Virya (potency) | Vipaka (postdigestive effect) | Dosha Karma (type of action on specific Dosha) |
|--------------|--|--|-----------------|-------------------------------|--|
| Chitraka | Katu (pungent) | Laghu (light), Ruksha (dry), Tikshna (sharp) | Ushna (hot) | Katu (pungent) | Kapha Vatahara (pacifies Kapha and Vata Dosha) |
| Amalaki | Pancha Rasa-Alavana (all 5 tastes except salty) | Guru, Ruksha, Shita (cold) | Shita | Madhura (sweet) | Tridosha Shamaka (pacifies all three Dosha) |
| Guduchi | Tikta (bitter), Kashaya (astringent) | Guru (heavy), Snigdha (oily) | Ushna | Madhura | Tridosha Shamaka |
| Haritaki | Madhura (sweet), Amla (sour), Katu, Tikta, Kashaya | Laghu, Ruksha | Ushna | Madhura | Tridosahara (pacifies all three Dosha) |
| Brihati | Katu, Tikta | Laghu, Ruksha, Tikshna | Ushna | Katu | Kapha Vata Shamaka (pacifies Kapha and Vata Dosha) |
| Kantakari | Katu, Tikta | Laghu, Ruksha, Tikshna | Ushna | Katu | Kapha Vatahara |
| Shalaparni | Madhura, Tikta | Guru, Snigdha | Ushna | Madhura | Tridosahara |
| Prishnaparni | Madhura | Laghu, Snigdha | Ushna | Madhura | Tridosha Shamaka |
| Gokshura | Madhura | Guru, Snigdha | Shita | Madhura | Vata Pitta Shamaka (pacifies Vata and Pitta) |
| Patala | Tikta, Kashaya | Laghu, Ruksha | Ushna | Katu | Tridosha Shamaka |
| Shyonaka | Madhura, Tikta, Kashaya | Guru | Ushna | Katu | Kapha Pitta Shamaka (pacifies Kapha and Pitta) |
| Agnimantha | Katu, Tikta, Kashaya, Madhura | Laghu, Ruksha | Ushna | Katu | Kapha Vatahara (pacifies Kapha and Vata) |
| Bilwa | Kashaya, Tikta | Laghu, Ruksha | Ushna | Katu | Kapha Vata Shamaka |
| Gambhari | Tikta, Kashaya, Madhura | Guru | Ushna | Katu | Tridosha Shamaka |
| Yavakshara | Kashaya, Madhura | Guru, Ruksha, Sukshma (subtle) | Shita | Katu | Kapha Pitta Shamaka |
| Guda | Madhura | Laghu, Snigdha | Shita | Madhura | Vata Pitta Shamaka |
| Madhu | Madura, Kashaya | Guru, Ruksha, Sukshma | Shita | Katu | Kapha Vata Shamaka |
| Shunthi | Katu | Laghu, Snigdha | Ushna | Madhura | Vatahara (pacifies Vata) |
| Maricha | Katu | Laghu, Tikshna | Ushna | Katu | Kapha Vata Shamaka |
| Pippali | Katu | Laghu, Snigdha, Tikshna | Anushna-shita | Madhura | Kapha Vata Shamaka |
| Tvaka | Madhura, Katu, Tikta | Ruksha, Laghu, Tikshna | Ushna | Katu | Kapha Vatahara, Pitta Vardhaka (increases Pitta) |
| Ela | Madhura, Katu | Laghu, Ruksha | Shita | Shita | Tridosahara |
| Patra | Madhura, Tikta, Katu | Ruksha, Laghu, Tikshna | Ushna | Katu | Kapha Vatahara |

Table 4: Results for organoleptic and physico-chemical parameters of Chitraka Haritaki Avaleha

| Author/s | Title | Journal | Volume (issue), Year |
|-----------------------------------|--|---|----------------------|
| Achyuta et al. ^[10] | Pharmacognostical and physicochemical evaluation of Chitraka Haritaki: A compound Ayurvedic formulation | Int. J. Res. Ayurveda pharm. | 5 (3), 2014 |
| V K Singh et al. ^[11] | Physico-chemical and phytochemical standardization of Chitraka Haritaki Avaleha | International journal of pharmaceutical & biological archives | 6 (3), 2015 |
| VK Singh, et al. ^[12] | Accelerated stability study of Chitraka Haritaki Avaleha | International journal of pharmacy and pharmaceutical sciences | 8 (2), 2016 |
| Poonam et al. ^[13] | Pharmaceutical and pharmacognostical evaluation of Chitraka Haritaki-An Ayurvedic compound | World journal of pharmaceutical research | 6 (5), 2017 |
| Yadav and Tukaram ^[14] | A randomized controlled clinical study on the efficacy of Chitrakaharitaki Avaleha in Vataja Pratishyaya w.s.r. to allergic rhinitis in children | International Journal of Ayurvedic Research (PIJAR) | 1 (3), 2017 |

Table 5: Formulation composition of *Chitraka Haritaki Avaleha* as per Bhaishajya Ratnavali

| Name of ingredients | Scientific name/English name | Part used | Ratio |
|---------------------|---|----------------------------|----------|
| <i>Chitraka</i> | <i>Plumbago zeylanica</i> Linn. | Root | 25 part |
| <i>Amalaki</i> | <i>Embllica officinalis</i> Gaertn. | Fruit | 25 part |
| <i>Guduchi</i> | <i>Tinospora cordifolia</i> Mier ex Hook | Stem | 25 part |
| <i>Haritaki</i> | <i>Terminalia chebula</i> Retz. | Fruit pericarp | 32 part |
| <i>Brihati</i> | <i>Solanum indicum</i> Linn. | Root | 2.5 part |
| <i>Kantakari</i> | <i>Solanum surattense</i> Burm. | Root | 2.5 part |
| <i>Shalaparni</i> | <i>Desmodium gangeticum</i> DC. | Whole plant | 2.5 part |
| <i>Prishnaparni</i> | <i>Uraria picta</i> Desv. | Root | 2.5 part |
| <i>Gokshura</i> | <i>Tribulus terrestris</i> Linn. | Root | 2.5 part |
| <i>Gambhari</i> | <i>Gmelina arborea</i> Linn. | Root | 2.5 part |
| <i>Patala</i> | <i>Stereospermum suaveolens</i> DC. | Root | 2.5 part |
| <i>Shyonaka</i> | <i>Oroxylum indicum</i> Vent. | Root | 2.5 part |
| <i>Agnimantha</i> | <i>Premna mucronata</i> Roxb. | Root | 2.5 part |
| <i>Bilva</i> | <i>Aegle marmelos</i> Corr. | Root | 2.5 part |
| <i>Yavakshara</i> | Alkaline substance of <i>Hordeum vulgare</i> L. | Water soluble ash of plant | ¼ part |
| <i>Guda</i> | Jaggery | - | 50 part |
| <i>Madhu</i> | Honey | - | 4 part |
| <i>Shunthi</i> | <i>Zingiber officinale</i> Rosc. | Rhizome | 1 part |
| <i>Maricha</i> | <i>Piper nigrum</i> Linn. | Fruit | 1 part |
| <i>Pippali</i> | <i>Piper longum</i> Linn | Fruit | 1 part |
| <i>Tvaka</i> | <i>Cinnamomum zeylanicum</i> Breyn | Bark | 1 part |
| <i>Ela</i> | <i>Elettaria cardamomum</i> Maton. | Seeds | 1 part |
| <i>Patra</i> | <i>Cinnamomum tamala</i> Nees and Eberm | Leaves | 1 part |

Table 6: Organoleptic characters of *Chitraka Haritaki Avaleha* as per various published articles

| Parameters | Achyuta Atara et al. | Poonam Gaur et al. | V.K. Singh et al. | API ^[16] |
|------------|----------------------|-------------------------------|-----------------------|---------------------|
| Color | Dark brown | Dark brown | Blackish brown | Blackish Brown |
| Touch | Soft | Semisolid | Soft and viscous | Semisolid paste |
| Odour | Pleasant | Sweetish aromatic | Spicy pleasant | Pleasant |
| Taste | Astringent, pungent | Sweetish sour with astringent | Bitter astringent | Bitter Astringent |
| Appearance | - | - | Thick semi solid mass | - |

API: Ayurveda Pharmacopeia of India

Table 7: Physico-chemical parameters of *Chitraka Haritaki Avaleha* as per various published articles

| Parameter | Achyuta Atara et al. | Poonam Gaur et al. | V. K. Singh et al. | T. J. Yadav et al | API |
|-------------------------------------|----------------------|--------------------|--------------------|-------------------|--------------------|
| Loss on drying (%w/w) | 23.5 | 14.25 | 23.78 | 15.86 | Not more than 36.0 |
| Total ash (%w/w) | 2.5 | 0.787 | 4.045 | 10.56 | Not more than 4.7 |
| Acid insoluble ash (%) | - | - | 0.306 | - | Not more than 1.0 |
| Alcoholic-soluble extractive (%w/w) | 69 | 89.2 | 48.64 | 17 | Not less than 21.0 |
| Water soluble extractive (%w/w) | 61% | 79.85 | 65.29 | 24 | Not less than 67.0 |
| pH (1% aqueous solution) | 5.80 | 4.5 | 5.19 | 5.72 | 6.4 to 6.6 |

API: Ayurveda Pharmacopeia of India

Yavakshara (1 *Pala* = 48 grams). Here, it is interesting to notice that by amending the content and procedure, Acharya has changed the indication by focusing on improvement in digestion. This might be because *Shunthi*, due to its pungent taste; oily property; and sweet post digestion effect, enhances its effect on the respiratory system. While *Nagakeshara* due to its bitter, pungent, astringent taste; light, dry property; and pungent post-digestive effect^[20] and increased dose of *Yavakshara* enhances digestion power.

In Yoga Tarangini and Yogaratnakara, the quantity of *Prakshepa Dravya* (*Trikatu* and *Trijata*) is reduced to half in comparison to the standard comparator. This may be to make CHA more palatable by reducing its spicy and bitter taste. The impact of this change, on the phytochemical constitution and clinical efficacy is a matter of further study.

According to AFI, the therapeutic dose of *Chitraka Haritaki Avaleha* is mentioned as 6–12 g and has been indicated for *Gulma* (abdominal lump), *Udavarta* (constipation),

Pinasa (chronic rhinitis/sinusitis), *Kasa* (cough), *Shwasa* (dyspnoea/asthma), *Arsha* (hemorrhoids), *Agnimandya* (digestive impairment), *Kshaya* (tuberculosis) and *Krimi* (worm infestation). According to API, part to be used of *Dashamula Dravya* is stem bark; which might be to conserve the biodiversity of herbal plants.^[21]

It is always important to observe organoleptic and physicochemical parameters of the finished product, especially in which stringent and multiple complex procedures are involved. All the reviewed articles had mentioned that CHA was prepared as per the reference of *Bhaishajya Ratnavali*, which is also mentioned in AFI and API. Despite having same method of preparation, disparity in the organoleptic and analytical parameters is apparent [Tables 6 and 7]. Water-soluble extractive and pH of all these samples are not matching with API standards. This disparity might be due to variation in the quality of raw drugs, seasonal variation, differences in pharmaceutical instruments used in CHA preparation or may be due to difference in the assessment method of organoleptic and physicochemical parameters. Hence, this may be matter for further research to find out that, how to overcome above-mentioned confounders to achieve unanimity in these parameters.

Scope and limitations of this study

Review article provides bird eye view of the subject that is an important and probably required step in the scientific validation or discovery process.^[22] This review article provides the historical background of amendments along with data of organoleptic and analytical parameters of recent (last 10 years) original research works which provide platform for researchers to develop research questions for fundamental as well as applied research. Along with these outcomes, this review study also has certain limitations. In this review work, classical texts, which are not available in the Institute of Teaching & Research in Ayurveda library, were not screened. Unpublished raw data of original research carried out on organoleptic and analytical parameters of CHA was also not included in this study.

Conclusion

Chitraka Haritaki Avaleha was introduced by Vrindamadhava in Ayurveda pharmaceuticals and is mentioned thereafter in various texts, which indicates its clinical acceptance and efficacy. By keeping *Bhaishajya Ratnavali* as standard comparator, variations in formulation name, ingredients, method of preparation, indication and *Anupana* is observed. Most of the ingredients in *Chitraka Haritaki Avaleha* have *Vatakapha* and *Tridosha* pacifying properties, which makes it effective in the treatment of bronchial asthma. Organoleptic and physicochemical parameters mentioned in the published research works when compared with available standards of API reveals that the values of water-soluble extracts and pH differs and this can be a matter for further extensive research. This review might help the clinician and researcher to get the compendious idea of *Chitraka Haritaki Avaleha*.

Conflicts of interest

There are no conflicts of interest.

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