

Pharmacognostic Studies in ‘Ashtachornam’: An Ayurvedic Formulation

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Abstract

‘Ashtachornam’ (Ashta - eight, chornam - powder) consists polyherbal ayurvedic preparation of seven medicinal plant parts and rock salt, powdered in equal quantity, used in Ayurveda; as anthelmintic, in treatment of indigestion, gas formation anorexia and geriatric care through various vehicles such as ghee, butter milk and honey. Powder analysis is done in three commercial samples of Ashtachornam and a control sample. Distribution of components such as starch grains, oil, parenchyma, pollen grains, trichomes, vessels and oleoresins results in species specific quality standards. Study indicates that traditional home-made preparations could be more effective in assuring quality than opting for commercial preparations.

Keywords: *Ashtachornam, Pharmacognostic, starch grains, parenchyma, pollen grains, trichomes, oleoresins*

1. Introduction

The World Health Organisation (WHO) estimated that 80% of the populations of developing countries rely on traditional medicines, mostly plant drugs, for their primary health care needs. Also modern pharmacopeia still contains at least 25% drugs derived from plants and many others which are synthetic analogues built on proto type compounds isolated from plants. Demand for medicinal plant is increasing in both developing and developed countries due to growing recognition of natural products, being non-narcotic, having no side effects, easily available at affordable prices and sometime the only source of health care available to the poor. Medicinal plant sector has traditionally occupied an important position in the socio cultural, spiritual and medicinal arena of rural and tribal lives of India.

However, maintenance of quality of the drug and its consistency are to be strategically focused.

Among the various types of drugs, choornas (powder drugs) have made significant impacts in health care. Ashtachornam consists of eight ingredients such as *Zingiber officinale* Roscoe, *Carum copticum* L., *Ferula asafoetida* L., *Piper nigrum* L., *Piper longum* L., *Nigella sativa* L., *Cuminum cyminum* L. and rock salt (Sahasra yoga). It is considered to be anthelmintic in Bala chikilsa (paediatrics). It is also a simple and easy treatment for indigestion, gas formation and anorexia. It is also considered to improve geriatric disorders and for improving quality of life (Bharathi & Swamy [1]).

Previous reports have noted the anticestode, nematode activity and anthelmintic activity of *Nigella sativa* and the anthelmintic activity of *Ferula asafoetida*, *Cuminum cyminum*, *Piper longum* and *Piper nigrum* have also been reported (Mahmoud et al [2], Gilani et al [3])

2. Materials and methods

For the pharmacognostic study of ashtachornam several ayurvedic books, research papers and references were required. The three samples of Ashtachornam were collected from various Ayurvedic medical shops. For preparation of control powder the details of the plant materials also collected for identification and maintenance of quality.

2.1 Preparation of control sample Ashtachornam

For the preparation of Ashtachornam, the materials were collected from Ayurveda Medical Shops and were identified with standard reference books (Nadkarni [4]). The materials used are *Carum*

copticum, *Cuminum cymium*, *Ferula asafetida*, *Nigella sativa*, *Piper longum*, *Piper nigrum*, *Zingiber officinale* and rock salt. 50 gms of these materials each were collected. These materials were kept in hot air for powdering it. After proper drying, they are powdered and filtered. Equal mass of each (125 gms) filtered powder were mixed properly. This original Ashtachornam sample and commercially available samples were used for a comparative study. These are termed as sample 1, sample 2, sample 3 and the control sample is termed as sample 4 respectively.

2.1 Powder Analysis

All the four samples were subjected to powder analysis. Each of the ingredients were separately powdered, and were individually analysed to see the nature of each ingredient contributory to the formulation. A small quantity of each powder was taken in a clean glass slide. A small quantity of ethyl alcohol was added and placed a cover slip and examined under microscope. Presence of starch grains, oils, and oleoresin, were identified and recorded. Each sample powder of was prepared and components were identified by the same procedure repeated and recorded. Results were recorded in tables.

3. Observations

The plants enlisted for the preparation of Ashtachornam are described as follows. The results of powder analysis are also included. The observations are followed by tables.

3.1 *Carum copticum*

Family : Apiaceae Benth and Hook F. (Apiaceae)
vernacular Name: San: Yavanika, Hin: Ajowan.

Description

Carum copticum grows as a herb whose roots are fusiform. Stems are 30-90cm long. Leaves are 2-3 pinnate bracts several and linear. The fruit is ovoid in shape and greyish brown in colour.

Propagation : By seeds

Parts used: Fruits leaves, seeds, oil and essence

3.2 *Cuminum cyminum*

Family: Apiaceae

Vernacular names:- San: Jiraka, Jira; Eng: Cumin;
Hin: Safed zeera; Reng; Beng: Jira; Tam: Siragam;
Tel: Jilakara, Jiraka; Kan: Jeerige & Mal: Jorekam

Habitat: Cultivated all over India

Propagation: By seeds

Parts used: Fruits

Description

Cumin is the dried seed of the herb *Cuminum cyminum*, a member of the parsley family. The cumin plant grows to 30-50cm (0.98- 1.6ft) tall and is harvested by hand.

It is an herbaceous annual plant, with a slender branched stem 20-30cm tall. The leaves are 5-10cm long, pinnate or bipinnate, thread-like leaflets. The flowers are small, white or pink, and borne in umbels. The fruit is a lateral fusiform or ovoid achene 4-5mm long, containing a single seed. Cumin seeds are similar to fennel and anise seeds in appearance, but are smaller and darker in colour.

Cumin seeds resemble caraway seeds, being oblong in shape, longitudinally ridged, and yellow- brown in colour, like other members of the Umbellifearae family such as caraway, parsley and dill.

3.3 *Ferula asafoetida*

Family : Apiaceae

Vernacular name: San: Hingu, Eng: Asafoetida (Asafetida) Hin: Hing Kan: Hingu, Mal: K-yam, Kariik-yam, perunk-yam, Tam: perunk-yam, K-Yam, Tel: Inguva

Description

A herbaceous perennial with fleshy, massive carrot-shaped root with one or more forks, stem 1.8-3m high, solid, clothes with membranous leaf shaths; leaves radical, 45cm long, shiny coriaceous with pinnatifid segments & channelled petiole; flowers 10-20 in the main and 5-6 in the partial umbels; fruits flat; thin, reddish brown.

Habitat: Wild in the Punjab and Iran, Kashmir, Afghanistan

Propagation : By seeds and vegetative method

Parts used: Resinous exudates of the root.

3.4 *Nigella sativa*

Family : Ranunculaceae

Vernacular Name: San Upakuncika, Karavi, Krsnajiraka; Eng: Small fennel, Black cumin; Hin: Kalajira, Kalomji; Kan: Kanjirigae; Mal: Karincirakam; Tam; Karumciragam; Tel: Nallajilakarra

Description

Nigella sativa is an annual flowering plant, native to southwest Asia. It grows to 20-30cm (7.9-12 in) tall, with finely divided, linear leaves. The flowers are delicate, and usually coloured pale blue and white, with 5-10 petals. The fruit is a large and inflated capsule composed of 3-7 united follicles, each containing numerous seeds. The seed is used as a spice.

Propagation: By seeds & vegetative method

Parts used: Seeds

3.5 *Piper longum* L

Family : piperaceae

Vernacular Name:- Eng: Idnian Long Papper; Hin: Pipli; Kan: Hippali; Mal; Thippali; Mar: Pimpli; San: Pippali, Kana; Tam:, Thippili; Tel: Pippallu

Description

A slender sub-scandent herb, branchlets erect, straggling or sometimes climbing, hairless, with swollen nodes and those or creeping branches with roots at lower nodes, Leaves alternate, variable in shape, usually egg- shaped- heart- shaped, 7-15 ×4-6cm, base heart-shaped and unequal, apex acute to acuminate, margin entire, hairless, lower leaves with long stalks and upper ones without stalk lateral nerves 5-7 arising from the base. Male spikes erect, 2-7 cm long, greenish yellow, fleshy, cylindrically oblong about 4×1cm. Berries globose, about 2mm across partly sunken in the rachis, compactly arranged, red turning black when ripe.

Habitat: Moist deciduous to evergreen forests

Propagation: By seeds and vegetative methods

Parts used: Fruits and roots.

3.6 Piper nigrum L.

Family: Piperaceae

Vernacular Name: San Maricha, ushana, hapusha; Eng; Black pepper, common pepper, white pepper; Hin: Kalimirch, Kalamorich, golmorich; Beng: Kalimirch, kalamorich, golmorich; Tel: Miriyala tige; Tam: Milagu; Kan: Kare menasu and Mal: Kurumulaku, nallamulaku.

Description

Climbing perennial plant, stems glabrous, rooting at the nodes. Leaves alternate, coriaceous, rounded at the base; apex pointed; recurved nerves prominent beneath. Inflorescence in drooping spike of dioecious flowers, opposite to and shorter than the leaf. Berry globular, red when ripe, turning black after drying, 3-4mm. In diameter, strongly scented and bitter to the taste.

Flowering period : May - August

Habitat: Extensively cultivated in hotter and moist parts of India.

Propagation: By seeds and vegetative method.

Part Used: The fruit, picked when fully ripe, is dried in the sun or in ovens. After drying the pericarp may be removed.

3.7 Zingiber officinale Rosc

Family: Zingibeaceae

Vernacular Name: Eng: Ginger; Hin: Adarak; Kan: Haisunti, Ardraka; Mal: Inci, Erukkilannu; San: Ardrakam; Tam: Inci; Tel: Allamu, Ardrakamu.

Description

A slender, perennial rhizomatous herb; leaves linear, sessile, glabrous; flowers yellowish green in oblong,

cylindric spikes, ensheathed in a few scarious, glabrous bracts; fruits oblong capsules. The rhizomes are white to yellowish brown in colour, irregularly branched, somewhat annulated and laterally flattened. The growing tips are covered over by a few scales. The surface of the rhizome is smooth and if broken a few fibrous elements of the vascular bundles project out from the cut ends.

Habitat: Cultivated throughout India, run wild in some place in the Western Ghats.

Propagation: By rhizomes.

Parts used: rhizomes (raw as well as dry)

4. Results and Discussion

4.1 Results of powder analysis

1. *Carum copticum*

In the powder analysis of *Carum copticum* trichomes and starch grains are identified. Starch grains are in many forms. Here Eccentric starch grains (with a beak) are identified. Oils and vessels are also identified.

2. *Cuminum cyminum*

In *Cuminum cyminum* oleoresin containing cell and oval starch grains are present. Vessel with spiral thickening can be observed.

3. *Ferula asafoetida*

In *Ferula asafetida* oils parenchyma cells, starch grains (oval) vessels and Oleoresin containing cells are present.

4. *Nigella sativa*

Oval starch grains present. Some black coloured unknown substance are present. Trichomes and oils are also present.

5. *Piper longum*

Eccentric starch grains with and without beak are many. Many oleoresin, oils, pollen grains, parenchyma cells are also present.

6. *Piper nigrum*

Many Eccentric starch grains with beak are present. Most of the starch grains are oval in shape. Oils parenchyma cells pollen grains also present.

7. *Zingiber officinale*

Eccentric starch grains without beak many. Oval shaped starch grains are more than eccentric. Oils, parenchyma cells and concentric starch grains are present.

Table 1. Compilation of the results of powder analysis of SAMPLE – 1

Constituents	Quantity	Plant materials
1. Starch Grains	Many	<i>Cuminum cyminum</i> , <i>Ferula asafetida</i> , <i>Nigella sativa</i> , <i>Piper nigrum</i>
Oval		
Eccentric beaked	Many	<i>Carum coptycum</i> , <i>Piper longum</i> , <i>Piper nigrum</i>
Eccentric without beak	Average	<i>Piper longum</i> , <i>Zingiber officinale</i>
Concentric	Few	<i>Zingiber officinale</i>
2.Oil	More	<i>Carum coptycum</i> , <i>Ferula asafetida</i> , <i>Nigella sativa</i> , <i>Piper longum</i> , <i>Piper nigrum</i> , <i>Zingiber officinale</i>
3. Parenchyma cell	Average	<i>Ferula asafetida</i> , <i>Piper longum</i> , <i>Piper nigrum</i> , <i>Zingiber officinale</i>
4. Pollen grains	Few	<i>Piper longum</i> , <i>Piper nigrum</i>
5.Trichome	Very Few	<i>Carum coptycum</i> , <i>Nigella sativa</i>
6.Vessel	Very small amount	<i>Ferula asafetida</i>
7.Oleoresin	Average	<i>Piper longum</i> , <i>Ferula asafetida</i>

Table 2. Compilation of the results of powder analysis of SAMPLE – 2

Constituents	Quantity	Plant materials
1. Starch Grains	Many	<i>Cuminum cyminum</i> , <i>Ferula asafetida</i> , <i>Nigella sativa</i> , <i>Piper nigrum</i>
Oval		
Eccentric beaked	Many	<i>Carum coptycum</i> , <i>Piper longum</i> , <i>Piper nigrum</i>
Eccentric without beak	Average	<i>Piper longum</i> , <i>Zingiber officinale</i>
Concentric	Absent	
2.Oil	Average	<i>Carum coptycum</i> , <i>Ferula asafetida</i> , <i>Nigella sativa</i> , <i>Piper longum</i> , <i>Piper nigrum</i> , <i>Zingiber officinale</i>
3. Parenchyma cell	Very small quantity	<i>Ferula asafetida</i> , <i>Piper longum</i> , <i>Piper nigrum</i> , <i>Zingiber officinale</i>
4. Pollen grains	Very few number	<i>Piper longum</i> , <i>Piper nigrum</i>
5.Trichome	Few number	<i>Carum coptycum</i> , <i>Nigella sativa</i>
6.Vessel	Absent	
7.Oleoresin	Average	<i>Piper longum</i> , <i>Ferula asafetida</i>

Table 3. Compilation of the results of powder analysis of SAMPLE – 3

Constituents	Quantity	Plant materials
1. Starch Grains	Few	<i>Cuminum cyminum,</i> <i>Ferula asafetida,</i> <i>Nigella sativa,</i> <i>Piper nigrum</i>
Oval		
Eccentric beaked	More	<i>Carum copticum,</i> <i>Piper longum,</i> <i>Piper nigrum</i>
Eccentric without beak	Few	<i>Piper longum,</i> <i>Zingiber officinale</i>
Concentric	Absent	
2.Oil	More	<i>Carum copticum,</i> <i>Ferula asafetida,</i> <i>Nigella sativa,</i> <i>Piper longum,</i> <i>Piper nigrum,</i> <i>Zingiber officinale</i>
3. Parenchyma cell	Small number	<i>Ferula asafetida,</i> <i>Piper longum,</i> <i>Piper nigrum,</i> <i>Zingiber officinale</i>
4.Pollen grains	Few	<i>Piper longum,</i> <i>Piper nigrum</i>
5.Trichome	Very small	<i>Carum copticum,</i> <i>Nigella sativa</i>
6.Vessel	Absent	
7.Oleoresin	Small quantity	<i>Piper longum,</i> <i>Ferula asafetida</i>

Table 4. Compilation of the results of powder analysis of SAMPLE – 4

Constituents	Quantity	Plant materials
1. Starch Grains	Many	<i>Cuminum cyminum,</i> <i>Ferula asafetida,</i> <i>Nigella sativa,</i> <i>Piper nigrum</i>
Oval		
Eccentric beak	Many	<i>Carum copticum,</i> <i>Piper longum,</i> <i>Piper nigrum</i>
Eccentric without beak	Average	<i>Piper longum,</i> <i>Zingiber officinale</i>
Concentric	Average	<i>Zingiber officinale</i>
2.Oil	More	<i>Carum copticum,</i> <i>Ferula asafetida,</i> <i>Nigella sativa,</i> <i>Piper longum,</i> <i>Piper nigrum,</i> <i>Zingiber officinale</i>
3. Parenchyma cell	Average	<i>Ferula asafetida,</i> <i>Piper longum,</i> <i>Piper nigrum,</i> <i>Zingiber officinale</i>
4.Pollen grains	Average	<i>Piper longum,</i> <i>Piper nigrum</i>
5.Trichome	Moderately present	<i>Carum copticum,</i> <i>Nigella sativa</i>
6.Vessel with spiral thickening	Present	<i>Ferula asafoetida</i>
7.Oleoresin	Average	<i>Piper longum,</i> <i>Ferula asafetida</i>

The present study is an attempt to understand the amount of plant materials in four samples of ashtachooram powder. According to the presence of different constituents, the quality of each ashtachooram sample can be assessed. In the absence or presence of different constituents, the amount of plant materials and extent of adulteration can be assessed.

From the table of **sample I** all constituents such as starch grains, oil, parenchyma cells, pollen grains, trichomes are present. That means in sample I all plant materials are almost in right proportion. From the powder analysis of this sample, the amount of constituents results the procedure of preparation is correct including drying and powdering.

In the powder analysis of **sample II** the presence of starch grains not too small when compared to sample I and IV. Concentric starch grains and vessels are absent in this sample. It may be due to low quantity of *Zingiber officinale* and *Ferula asafoetida* or drying. The powdering of these materials has not been done properly. *Ferula asafoetida* and *Zingiber officinale* are always used in food. May be the high cost of the plant material or non-availability of these materials could be the causes of adulteration.

In sample III starch grains are too small. Here concentric starch grains and vessels are absent. It is due to low quantity of material, or procedural error.

Sample IV is prepared one used as control. Here starch grains, oils, parenchyma cells, pollen grains, trichome, vessel with spiral thickening, oleoresin are present. It is found to be similar to sample I. Here all plant materials are present in the correct proportion.

The forgoing account shows that even in a simple formulation of Ashtachooram with 8 constituents, the proportion of different components vary.

Sahasrayoga [5] reports that Ashtachooram is carminative, digestant, astringent, antacid and is used to improve appetite. The powder has diverse 'Anupanas' or vehicles such as ghee, honey, hot water and butter milk. The dosage is 1-5 gms as directed by the physicians (Pharmacopeia 2010). However, the quality assurance of drugs is an important aspect of ayurvedic formulations, and an integrated attempt of chemists, botanist and ayurvedic physicians can certainly ensure the same. From the comparison with control sample it is also evident that traditional home-made preparations could be more effective in assuring quality than opting for commercial preparations.

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