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FORMULATION AND EVALUATION OF POLYHERBAL CHURNA IN AGNIMADNYA

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ABSTRACT

Ayurveda is a traditional medicinal system of India, having a unique approach and principle to study and treatment of various disorders. The polyherbal formulation of Churna is prepared as per Ayurvedic Formulary of India. It is used as ailment for various gastro intestinal diseases like acidity, gastric ulcers, Bloating joint disease, ete. Polyherbal Churna is also used as a remedy for Primary dysmenorrhea. The present study was carried out to check quality and purity of formulation using various parameter such as Organoleptic characteristics, Physical Parameters, Physicochemical analysis, was done using active ingredient in the Polyherbal Churna to check adulterants and all the ingredients are present in the formulation. And after completion of quality and purity test on Polyherbal Churna it is found to be more effective.

KEYWORDS: *Polyherbal Churna, Ayurveda, Physicochemical, Physical, Quality, Purity.*

2. INTRODUCTION

The word Ayurveda comes from the Sanskrit terms ayur (life) and veda (knowledge). In countries beyond India, Ayurvedic therapies and practices have been integrated in general wellness applications and in some cases in medical use. [1]

Churna is defined as a fine powder of drug or drugs in Ayurvedic system of medicine. Drugs mentioned are cleaned properly, dried and then sieved. The churna is free flowing and retains its potency for one-two year, if preserved in an airtight containers. Indigestion is a common ailment affecting the general population and in allopathy system antacids are commonly prescribed. Thus the present study examined the favourable influence of four spices formulated into churna said to have digestive property. [2]

Ayurveda places great emphasis on prevention and encourages the maintenance of health through close attention to balance in one's life, right thinking, diet, lifestyle and the use of herbs. [3]

The Polyherbal Churna is one of the classical Ayurvedic dosage form used in Ayurvedic system of medicine. It is official in Ayurvedic Pharmacopoeia of India is combination of nine reputed herbs and one salt. comprised of the fruits like Piper nigrum, Piper longum, Zingiber officinale, Nigella sativa, Cuminum cyminum, Trachyspermum ammi, Ferula foetida, fennel, amla and Rock salt. It is used as Digestive impairment, Colicky pain and Abdominal pain. The formulation was stored in well closed airtight container in dry and cool place. [4]

2.1 Objectives

1. It is used as ailment for various gastro intestinal diseases like acidity, gastric ulcers, Bloating, joint disease, etc
2. Polyherbal Churna is used as a digestive aid and to treat digestive disorders.

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3. Polyherbal Churna is composed of mainly ten ingredients. These ingredients have various therapeutic roles like carminative, stimulant, indigestion, loss of appetite diarrhea.

2.2 Agnimandya

The word 'Agnimandya'in its of itself signifies the state of poor process of digestion on ingested food.
Agni is responsible for varna, bala and sukhayu of an individual. By properly maintaining a balance in agni, one can attain a long and a healthy life. There are 4 types of Agni - Samagni, Mandagni, Teekshnagni and Vishamagni, Samagni involves normal digestive metabolic power. Mandagni is reduced power of digestion and metabolism. Teekshnagni involves intense power of digestion and Vishamagni is irregular and it involves sometimes intense and sometimes reduced power of digestion and metabolism. Agnimandya is considered as the root cause of all diseases". Weakening of the agni results in incomplete production of rasa dhatu which itself helps in the nutrition of the subsequent dhatus. Agnimandya can manifest itself as a symptom or a disease. Changes in lifestyle, diet and any other chronic disease conditions can cause Agnimandya. Aggrevation of kapha is an important cause of Agnimandya. This agnimandya results in the formation of ama which results in srotodushti and vimarga gamana. Therefore, protection of agni is of prime importance in the treatment of Agnimandya"

The symptoms of indigestion include burning sensation in the stomach associated with abdominal pain, bloating, belching, nausea and vomiting". People who consumes too much alcohol, excessive use of pain killers, smoking, obesity, anxiety and depression are at high risk of indigestion. Polyherbal Churna helps in expelling trapped wind, palliating flatulence and checking abdominal distension. It is indicated in Agnimandya, sula, gulma and vataroga. Ingredients consists of Piper nigrum, Piper longum, Zingiber officinale, Nigella sativa, Cuminum cyminum, Trachyspermum ammi, Ferula foetida, fennel, amla and Rock salt. [5]
Symptoms: No hunger, there is no lust for food, food is not digested, stomach cramps cause diarrhea .

2.3 Churna

Churna is defined as totally dried raw material which powdered very minutely to make their small size and again filtered through cloth's grid and obtained fine powder is called as "Churna". [2,6]

3. NEED OF WORK

In recent years there has been a tremendous increase in demand herbal drugs due to its safety, efficacy and better therapeutic reason. Due to its economic pricing as compared to synthetic or allopa drugs, which have several therapeutic complications.

As we know that everything in this world change time by time, since thousands of year the era was of Ayurveda or herbal origin drug. But last few decades it was replaced by allopathic system of medicine, which was rapidly accepted worldwide, but latter due to its lots of adverse effect, again men step down on Ayurveda because of its better therapeutic result and safety profile and now the people are more believing in natural origin drug. [6]

Polyherbal Churna, especially those containing ingredients like Asafoetida (Hing) and Rock Salt, represent an innovative approach to churna formulation. Additionally, the inclusion of Ginger, Amla, Nigella sativa, Black pepper and Long pepper provides stomachic, stimulant and aromatic carminative benefits, while Ajwain , Jeera and Fennel enhance flavor and potentially offer further health advantages. Churna is one of the famous Ayurvedic churna formulation which is useful in treatment of anorexia improves digestion, disorder due to vatta aggravation, bloating, joint diseases etc. Balances Vatta and Kapha and increases Pitta.

4. POLYHERBAL CHURNA

Polyherbal churna is well known Ayurvedic formulation used for Vata, Pitta and Kapha doshas. This combination improves appetite, digestion and palatability of herbal formulations, useful in treatment of anorexia, disorder due to vatta aggravation like bloating, joint diseases etc. Balances Vatta and Kapha and increases Pitta.

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Formulation composition:

1. Ginger
2. Black pepper (Meere)
3. Long pepper (Pippali)
4. Ajwain
5. Sendha namak (Rocksalt)
6. Jeera
7. Hing
8. Kale til
9. Saunf
10. Amla

Figure 1: Ingredients of Polyherbal Churna

5. PLANT PROFILE

5.1 Ginger

Figure 2 : Ginger

Synonym: Zingiber officinale
Biological source: Ginger consists of the rhizomes of Zingiber officinale
Family: Zingiberaceae
Chemical Constituents: 1 to 2% volatile oil, Gingerol, Zingiberole Vitamins: B3(niacin), B6(riboflavin), C.Minerals: calcium, Proteins (2 to 3%) Starch (50%)
Uses:

1. Ginger is stomachic, stimulant and aromatic carminative
2. It is used as Flavouring agent

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3. Ginger powder has been reported to be effective in motion sickness. [7,17]

5.2 Black pepper

Figure 3: Black pepper

Synonym: Piper nigrum, Kalimirch, Golmarich
Biological source: It consists of dried unripe fruits of Piper nigrum Linn
Family: Piperaceae
Chemical Constituents: Piperidine group of alkaloids, 1- 2.5% volatile oil, Resin, Starch (30%), Argenine, Ascorbic acid, Carotene, and beta-carotene, lauric-acid, palmitic acid
Uses:

1. Carminative
2. Useful in treatment of gonorrhea and chronic bronchitis [8,18]

5.3 Long pepper

Figure 4: Long pepper

Synonym: Piper longum, Indian long pepper, pipli, Javanese, Piper latifolium Hunter.
Biological source: It consists of dried flowering vine of Piper longum Linn.
Family: Piperaceae

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Volume: 9 | Issue: 6 | June 2024 - Peer Reviewed Journal

Geographical Source: The plant grows in evergreen forests of India and is cultivated in Assam, Tamil Nadu, and Andhra Pradesh.
Chemical constituents: methyl piperine, pergumidiene, brachystamide-B. N-isobutyl deca-dienamide. cinnamoyl-piperidine, and piperlonguminine have been found in the root.
Uses:

1. Anticancer
2. Antioxidant
3. Immunomodulatory.[9, 19]

5.4 Ajwain

Figure 5: Ajwain

Synonym: Trachyspermum ammi
Biological source: consists of dried fruit of Apium leptophyllum.
Family: Apiaceae
Chemical Constituents: Isopimpinellin, bergapten, isorutarin, leptophyllidin, anhydrorutaretin, rutaretin, umbelliferone thymol (87.75%) and carvacrol (11.17%).
Uses:

1. Carminative
2. Flavouring agent.
3. It is a powerful germicide, finds wide application as a disinfectant and antiseptic of rather pleasant odour. [10]

5.5 Rock Salt

Figure 6: Rock Salt

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Volume: 9 | Issue: 6 | June 2024 - Peer Reviewed Journal

Synonym: Sendha namak
Halite commonly known as rock salt is type of salt, the mineral (natural) form of sodium chloride (NaCI), Halite forms isometric crystals. The mineral is typically colourless or white, but may also be light blue, dark blue, purple, pink, red, orange, yellow or gray depending on inclusion of other materials, impurities, and structural or isotopic abnormalities in the crystals.

Biological source: Halite commonly known as rock salt is a type of salt, the mineral (natural) form of sodium chloride.

Chemical Constituents: Its primary constituents are sodium, chloride, calcium, magnesium, potassium, and sulfate, Iron, Zinc, Strontium. Rock salt generally contains between 90 to 98% sodium chloride.
Uses:
Salt is used extensively in cooking as a flavour enhancer, It is frequently used in food preservation methods across various cultures. [11,20]

5.6 Jeera

Figure 7:Jeera

Synonym: Cuminum cyminum, Cumin
Biological source: It consists of the dried seed of the herb Cuminum cyminum.
Family: Apiaceae
Chemical Constituents: Chemical flavonoids, iso-flavonoids, glycosides, monoterpenoids such as carvone and its derivatives, glucosides, alkaloids. lignins, b-pinene, p-cymene, g-terpinene, and cuminaldehyde
Uses:
Cumin has been used as anti- inflammatory, diuretic, carminative, and also used to treat diarrhoea, flatulence, and indigestion. [12,21]

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Volume: 9 | Issue: 6 | June 2024 - Peer Reviewed Journal

5.7 Asafoetida

Figure 8: Asafoetida

Synonym: Ferula foetida, devil's dung
Biological source: It is the oleo-gum-resin extractedfrom the living rhizomes and roots of Ferula foetida (F. Foetida Regal)
Family: Umbelliferae
Chemical Constituents: It contains 4-15% volatile oil, 45- 65%resin and 20% gum and about 10% ash.
Uses:

1. As a carminative (relieve excessive collection of gas in the stomach)
2. As a laxative (which induces active movement of bowels). [13]

5.8 Kale til

Figure 9: Kale til

Synonym: Nigella sativa, black cumin, nigella, kalonji, black seed
Biological source: Nigella sativa is an annual flowering plant.
Family: Ranunculaceae
Chemical constituents:

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Volume: 9 | Issue: 6 | June 2024 - Peer Reviewed Journal

Thymoquinone, thymohydroquinone, dithymoquinone, thymol, nigellone and many other phytochemicals, linoleic acid (50.3–49.2%), followed by oleic acid (25.0–23.7%), while the main saturated fatty acid was palmitic acid (17.2–18.4%).

Uses:

1. indigestion
2. loss of appetite
3. amenorrhoea and dysmenorrhoea [14]

5.9 Saunf

Figure 10: Sanuf

Synonym: Fennel, Foeniculum vulgare

Biological source: Fennel consists of the dried ripe fruits of Foeniculum vulgare Miller belonging to **family** Umbelliferae.

Chemical constituents: Fennel contains volatile oil (1-4%), fixed oil (9-12%) and proteins (20%). volatile phenolic ether anethole (50-60%) and ketone fenchone (18-20%), methyl chavicol, etc.

Uses:

1. Flavouring agent
2. Carminative
3. abdominal cramps. [15]

5.10 Amla

Figure 11: Amla

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Volume: 9 | Issue: 6 | June 2024 - Peer Reviewed Journal

Synonym: Emblica officinalis, Cicca emblica, Emblica officinalis Gaertn.,
Biological source : this consists of dried as well as fresh fruits of the plant Emblica officinalis, belonging to the **family** Euphorbiaceae.
Chemical constituents: Tannins; phyllembelin-gallic acid; ellagic acid and glucose; pectins and vitamin C.
Uses: as a purgative, treatment of jaundice, dyspepsia and cough; cooling, diuretic, used in gastritis syndrome. [16]

6. PLANT MATERIAL AND METHOD

The crude drugs used in preparation of Polyherbal churna were collected from local Market of Jalna in April 2024. All plant parts were then dried and make powder and then passed through sieve no.60 and lastly packed in a well closed container to protect them from moisture. Each ingredients 6gm weight separately, mixed together to obtain a homogeneous blend which shown in figure.

Figure 12: Polyherbal Churna

Table 1.Composition of Formulation

Sr.no.	Ingredients	Latin name	Part used	Quantity
1	Ginger	Zingiber Officinale	Rhizome	6 gm
2	Black pepper	Piper nigrum	Fruit	6 gm
3	Long pepper	Piper longum	Fruit	6 gm
4	Ajwain	Trachyspermum ammi	Fruit	6 gm
5	Sendha namak	Rock salt	Crystals	6 gm
6	Jeera	Cuminum cyminum	Seed	6 gm
7	Hing	Ferula foetida	Rhizome	6 gm
8	Kale til	Nigella sativa	Fruit	6 gm
9	Saunf	Fennel	Fruit	6 gm
10	Amla	Emblica officinalis	Fruit	6 gm

6.1 Preparation of Polyherbal Churna:

Drying: All the powder are in dry form and grinded.
Size reduction: The crude ingredients were collected and these ingredients were size reduced using driven mixer individually.
Sieving: Then this fine powder was passed through sieve no:60, 80 to get the sufficient quantity of fine powder.
Weighing: All the required herbal powders weigh .
Mixing: All these fine ingredients were mixed throughly by mixer to form a homogeneous fine powder.

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EPRA International Journal of Research and Development (IJRD)
Volume: 9 | Issue: 6 | June 2024 - Peer Reviewed Journal

Packing and Labeling: Then it was packed and labeled suitably.

6.2 Procedure

- The churna was formulated according to the procedures given in Ayurvedic Formulary of India.
- Piper nigrum, Piper longum, Zingiber officinale, Nigella sativa, Cuminum cyminum and Trachyspermum ammi , fennel, amla were taken in equal amounts that were 6 grams each as mentioned in Table no 1.
- Then the coarsely powdered form and were fried in equal quantities it become more stable, moisture free and more potent.
- They were then coarsely grinded separately
- Then passed through 60 or 80 # sieve
- Then mixed together in an equal proportions along with Ferula foetida and rock salt
- Then you get uniform and homogenous churna

7. EVALUATION OF POLYHERBAL CHURNA

7.1 Organoleptic Evaluation of Polyherbal Churna:

The color, odour and taste of Churna were evaluated manually using sensory organs of our body and results are summarized in Table no 2.

Table no.2: Organoleptic description of Polyherbal Churna

Sr.No.	Parameters	Observation
1	Colour	Light Brown
2	Odour	Characteristic
3	Taste	Acrid and Pungent
4	Appearance	Fine

7.2 Physical Parameters [22-25]

Bulk density, Tapped density, Angle of repose was determined for evaluating of physical characteristics of the Churna. The results are compiled in Table no 3.

a) Bulk density:

It is the ratio of given mass of powder and its bulk volume. It is determined by transferring an accurately weighed amount of powder sample to the graduated cylinder with the aid of a funnel. The initial volume was noted. The ratio of weight of the volume it occupied was calculated.

Bulk density = w/v0 g/ml Where, W = mass of the powder and VO = untapped volume

b) Tapped density:

It is measured by transferring a known quantity (30g) of powder into a graduated cylinder and tapping it for a specific number of times. The initial volume was noted. The graduated cylinder was tapped continuously for a period of 10-15 min. The density can be determined as the ratio of mass of the powder to the tapped volume.

Tap density= w/vf (g/ml) Where, W = mass of the powder and vf = tapped volume

c) Angle of repose:

The internal angle between the surface of the pile of powder and the horizontal surface is known as the angle of repose. The powder is passed through funnel fixed to a burette stand height of 4 cm. A graph paper is placed below the funnel on the table. The height and the radius of the pile were measured.

Angle of repose= tan-1(h/r)

Where, h=height of the pile and r = radius of the pile

d) Determination of particle size:

25 g of sample was placed in a sieve of suitable nominal mesh aperture (sieve 80). Sieve was shaken for not less than 30 minutes in horizontal direction and vertically by tapping on a hard surface. Weights of amount remaining on sieve were taken and determine the particle size.

Percent of sample passing through each sieve = (Wt. of sample taken wt. of sample remaining on the sieve)/wt. of sample taken] × 100

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Volume: 9 | Issue: 6 | June 2024 - Peer Reviewed Journal


Table No.3 : Physical Characters of Polyherbal Churna

Sr.No.	Parameters	Observation
1	Bulk Density (g/ml)	0.605
2	Tapped Density	0.76
3	Angle of Repose	R= 2.6 , H= 2.8
4	particle size (80 sieve)	65% Mode Fine

7.3 Physiochemical Description of Polyherbal Churna: [26-27]

Total ash value, Acid insoluble ash value, Water soluble ash value, Water soluble extractive value, Alcohol soluble extractive value, LOD, PH. The results are compiled in Table No 4.

Determination of Ash value: Used to determine quality and purity of a crude drug.

a) Determination of Total ash:

About 2 g of sample was accurately weighed in a tarred silica dish and kept in a muffle-furnace at a temperature not exceeding 600 C until it was free from carbon. Then it was cooled and weighed.

Total Ash value % = [Wt. of total ash / air dried drug] ×100

b) Determination of Acid insoluble ash:

The total ash obtained was boiled for 5 minutes. with 25 ml of dilute hydrochloric acid, the insoluble matter obtained was collected on an ash less filter paper, washed with hot water until the filtrate is neutral and ignited to constant weight.

Acid insoluble ash value % [Wt. of acid insoluble ash / air dried drug] ×100

c) Water-soluble Ash:

The ash obtained in the determination of total ash was boiled for 5 minutes with 25 ml of water. The insoluble matter was collected on an ash less filter paper and washed with hot water. The insoluble ash was transferred into a tarred silica crucible and ignited for 15 minutes at temperature not exceeding 600 C. The weight of the insoluble matter was subtracted from the weight of the total ash.

Water soluble ash value % [Wt. of water soluble ash / air dried drug) ×100

Determination of extractive value:

Used for estimation of specific constituents, soluble in that particular solvent used for extraction.

a) Determination of Water-soluble extractive:

5 g of test sample was weighed and macerated with 100 ml of water in a closed flask for twenty-four hours, shaking frequently during six hours and allowing standing for eighteen hours. It was filtered rapidly, taking precautions against the loss of solvent.25 ml of the filtrate was taken and evaporated to dryness in a tarred flat bottomed shallow dish at 1050 C, to constant weight and weighed.

Water soluble extractive value% [water soluble residue /air dried drug] ×100

b) Determination of Alcohol-soluble extractive:

5 g of test sample was weighed and macerated with 100 ml of alcohol of specified strength in a closed flask for twenty-four hours, shaking frequently during six hours and allowing standing for eighteen hours. It was filtered rapidly, taking precautions against the loss of solvent.25 ml of the filtrate was taken and evaporated to dryness in a tarred flat bottomed shallow dish at 1050°C, to constant weight and weighed.

Alcohol soluble extractive value= [alcohol soluble residue /air dried drug] ×100

c) Determination of loss on drying:

2.5 g of the sample (without preliminary drying) was weighed and placed in a tarred evaporating successive weighing corresponded to not more than 0.25%.

Loss on drying % = [Initial wt.-final wt. / initial wt.] ×100

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EPRA International Journal of Research and Development (IJRD)
Volume: 9 | Issue: 6 | June 2024 - Peer Reviewed Journal

d) Determination of pH:

The powder sample of Polyherbal Churna was weighed to about 5g and immersed in 100 ml of water in a beaker. The beaker was closed with aluminium foil and left behind for 24 hours in room temperature. Later the supernatant solution was decanted into another beaker and the pH of the formulation was determined using a calibrated pH meter.

SJIF Impact Factor (2024): 8.675| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 9 | Issue: 6 | June 2024 - Peer Reviewed Journal

Table no.4 : Physiochemical Description of Polyherbal Churna

Sr.no.	Parameters	Observation
1	Total ash value (%w/w)	7.45
2	Acid insoluble ash(%w/w)	3.10
3	Water soluble ash (%w/w)	4.31
4	Water soluble extractive (%w/w)	9.20
5	Alcohol soluble extractive value (%w/w)	6.52
6	Loss on drying LOD %	1.80
7	PH (%w/w)	5.7

8. CONCLUSION

The churna was evaluated counting on various evaluation parameters and from the results obtained it had been found to be within the standards. These preliminary tests are often prescribed as standards to repair the standard control test the churna and may be utilized in routine analysis of an equivalent. And perform internal control and quality assurance within the laboratory. And this Polyherbal Churna has 10 ingredients. The mode of action of each ingredient suggests that Polyherbal churna has a significant effect in treating digestion on ingested food. It can be taken as the first choice of medication or can be used as an adjuvant along with a primary medicament.

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