



Formulation And Evaluation Of Herbal Digestive Churna

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ABSTRACT

The formulation and evaluation of herbal digestive churna aim to create an effective herbal remedy for improving digestion and alleviating gastrointestinal disorders. Digestive churna, a traditional Ayurvedic preparation, is composed of a combination of herbs and spices known for their carminative, digestive, and anti-inflammatory properties. The churna is designed to stimulate digestive enzymes, promote smooth bowel movement, and reduce symptoms of indigestion, bloating, and acidity. This study focuses on the formulation of digestive churna using natural ingredients such as ginger (*Zingiber officinale*), fennel (*Foeniculum vulgare*), cumin (*Cuminum cyminum*), coriander (*Coriandrum sativum*), and other medicinal plants. These ingredients are selected based on their long-standing use in traditional medicine for enhancing digestion and alleviating stomach discomfort. The churna is prepared by grinding the dried herbs into a fine powder, ensuring the proper proportions of each ingredient for maximum therapeutic benefit.

Keywords: Digestive Churna, Herbal Formulation, Gastrointestinal Health, Ayurvedic Medicine, Therapeutic Evaluation

INTRODUCTION

Nature always stands as a golden mark to exemplify the outstanding phenomena of symbiosis. Natural products from plant, animal and minerals have been the basis of the treatment of human disease. Today estimate that about 80 % of people in developing countries still relays on traditional medicine based largely on species of plants and animals for their primary healthcare. About 500 plants with medicinal use are mentioned in ancient literature and around 800 plants have been used in indigenous systems of medicine. India is a vast repository of medicinal plants that are used in traditional medical treatments. The various indigenous systems such as Siddha, Ayurveda, Unani and Allopathic use several plant species to

treat different ailments. The use of herbal medicine is becoming popular due to toxicity and side effects of allopathic medicines. This led to a sudden increase in the number of herbal drug manufacturers.

Figure 1..Herbal Churna



Herbal medicines as the major remedy in traditional system of medicine have been used in medical practices since antiquity. The practices continue today because of its biomedical benefits as well as place in cultural beliefs in many parts of world and have made a great contribution towards maintaining human health. In India around 20,000 medicinal plant species have been recorded recently but more than 500 traditional communities use about 800 plant species for curing different disease. Currently 80% of the world population depends on plant-derived medicine for the first line of primary health care for human alleviation because it has no side effects. Plants are important sources of medicines and presently about 25% of pharmaceutical prescriptions in the United States contain at least one plant-derived ingredient. In the last century, roughly 121 pharmaceutical products were formulated based on the traditional knowledge obtained from various sources

Herbal Medicine

The World Health Organization (WHO) has recently defined traditional medicine (including herbal drugs) as comprising therapeutic practices that have been in existence, often for hundreds of years, before the development and spread of modern medicine and are still in use today or say, traditional medicine is the synthesis of therapeutic experience of generations of practicing physicians of indigenous systems of medicine. Herbal drugs constitute only those traditional medicines which primarily use medicinal plant preparations for therapy.

Figure2.HerbalMedicine**Market value of herbal medicines**

The market for Ayurvedic medicines is estimated to be expanding at 20% annually. Sales of medicinal plants have grown by nearly 25% in India in past ten years (1987-96), the highest rate of growth in the world. But the per capita expenditure in India on medicines per annum is amongst the lowest in the world. In other developing countries too, plants are the main source of medicine. Two of the largest users of medicinal plants are China and India. Traditional Chinese Medicine uses over 5000 plant species; India uses about 7000. According to Export Import Bank, the international market for medicinal plant related trade having a growth rate of 7% per annum. China's share in world herbal market is 6 billion US \$ while India's share is only 1 billion US \$. The annual export of medicinal plants from India is valued at Rs. 1200 million. All the major herbal-based pharmaceutical companies are showing a constant growth of about 15 per cent. Traditional medicine has served as a source of alternative medicine, new pharmaceuticals, and healthcare products.

Future prospects of herbal medicine market

It is estimated that nearly three fourths of the herbal drugs used worldwide were discovered following leads from local medicine. According to WHO about 25% of modern medicines are descended from plants first used traditionally. Many others are synthetic analogues built on prototype compounds isolated from plants. Almost, 70% modern medicines in India are derived from natural products. The basic uses of plants in medicine will continue in the future, as a source of therapeutic agents, and as raw material base for the extraction of semi-synthetic chemical compounds such as cosmetics, perfumes and food industries. Popularity of healthcare plant-derived products has been traced to their increasing acceptance and use in the cosmetic industry as well as to increasing public costs in the daily maintenance of personal health and well being. In the dual role as a source of healthcare and income, medicinal plants make an important contribution to the larger development process. Though the efficacy of herbal requires development of quality consciousness in respect of the evaluation related evidences, supplying the demand for botanicals and herbals is a booming business. Recently even developed countries, are using medicinal systems that involve the use of herbal drugs and remedies. Undoubtedly the demand for plant derived products has increased worldwide. The demand is estimated to grow in the years to come fuelled by the growth of sales of herbal supplements and remedies. This means that scientists, doctors and

pharmaceutical companies will be looking at countries like China, India, etc. for their requirements, as they have the most number of medicinal plant species and are the top exporters of medicinal plant.

Current Regulations for Standardization of Crude Drugs

In recent years there is a spurt in the interest regarding survival of Ayurvedic forms of medication. In the global perspective, there is a shift towards the use of medicine of herbal origin, as the dangers and the short coming of modern medicine have started getting more apparent, majority of ayurvedic formulation are prepared from herbs.

It is the cardinal responsibility of the regulatory authorities to ensure that the consumers get the medication, which guarantee with purity, safety, potency and efficacy. The quality control of crude drugs and herbal formulations is of paramount importance in justifying their acceptability in modern system of medicine. But one of the major problems faced by the herbal drug industry is non availability of rigid quality control profile for herbal material and their formulations. Patent proprietary Ayurvedic medicines are sold over the counter in pharmacies. These products appear to represent a major share of branded traditional medicine in India. Nevertheless systems like Ayurveda still need to gain an empirical support of modern medical sciences to make them credible and acceptable for all. An innovative research effort to define the advantage of traditional system of medicine with respect to their safety and efficacy could result in a better utilization of these complementary systems of medicine. Internationally several pharmacopoeias have provided monographs stating parameter and standard of many herbs and some product made out of these herbs.

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Role of WHO in herbal medicine

Two decades ago, WHO referred to traditional health systems (including herbal medicine) as „holistic“ – „that of viewing man in his totality within a wide ecological spectrum, and of emphasizing the view that ill health or disease is brought about by an imbalance or disequilibrium of man in his total ecological system and not only by the causative agent and pathogenic evolution (WHO). Probably implying that the indigenous system drugs including herbal medicine that restore the imbalance or disequilibrium leading to the cure of ill health or disease. Such an attitude sent signals that WHO as an organization has failed to provide leadership to establish traditional systems of medicine which provide healthcare to about 80% of the world population. However, it helped the inclusion of proven traditional remedies in national drug policies and regulatory approvals by developing countries. The World Health Assembly continued the debate and adopted a resolution (WHA42.43) in 1989 that herbal medicine is of great importance to the health of individuals and communities. Consequently, in 1991 WHO developed guidelines for the assessment of herbal medicine, and the same were ratified by the 6th International Conference of Drug Regulatory Authorities held at Ottawa in the same year. The salient features of WHO guidelines are:

Quality assessment: Crude plant material; Plant preparation; finished product.

Safety assessment: Documentation of safety based on experience or/and; Toxicology studies.

Assessment of efficacy: Documented evidence of traditional use or/and; Activity determination (animals, human). To the best of my knowledge, WHO has not systematically evaluated any traditional medicine.

Advantages of herbal medicines

- Herbal medicines have long history of use and better patient tolerance as well as acceptance
- Medicinal plants have a renewable source which is our only hope of sustainable supply of cheaper medicines for the world's growing population..

Limitations of herbal medicines

- Ineffective in acute medical care
- Inadequate standardization and lack of quality specifications.
- Lack of availability of scientific data.

Earth represents the solid state of matter in the planet. It symbolizes stability, permanence and rigidity. The human body consists of bones, teeth, cells and tissues, as the manifestations of the earth. Earth is regarded as a stable substance. Talking about human being, stability is the prerequisite for leading a healthy life, which is focused by Ayurveda.

Materials & Methods

➤ Materials

- Herbal ingredients: Senna, Jamun, Bael, Harad and Rock salt
- Distilled water
- Mortar and pestle
- Sieve No. 60
- Electronic balance
- Glass containers

Table 1. Name of Herbal Drug Used In Herbal Digestive Churna

S.No	NAME OF SPECIES [DRUG]	BOTANICAL NAME	FAMILY	PART USE
1.	Senna	Cassia angustifolia	Fabaceae	Leaf
2.	Jamun	Syzygium cumini	Myrtaceae	Fruit
3.	Bael	Aegle marmelos	Rutaceae	Fruit
4.	Harad	Terminalia chebula	Combretaceae	Seed
5.	Amla	Emblica officinalis	Phyllanthaceae	Fruit
6.	Ajwain	Trachyspermum	Apiaceae	Seed

Method:

1. All raw herbal materials were procured from a reliable herbal drug supplier and authenticated based on macroscopic characteristics.
2. The herbs were cleaned thoroughly using distilled water to remove dust and foreign particles.
3. Each herb was shaded dried at room temperature for 7–10 days to preserve essential oils and active components.
4. Dried herbs were coarsely powdered using an electric grinder, then finely sieved using sieve No. 60.
5. Equal or prescribed proportions of each powdered ingredient were accurately weighed using an electronic balance.
6. The powders were blended thoroughly using mortar and pestle to ensure uniformity.
7. The final churna was stored in airtight glass containers in a dry, cool place.

FORMULATION OF HERBAL DIGESTIVE CHURNA

A fine powder at least of 80 mesh sieve prepared from senna, jamun, bael, harad, rock salt, amla and ajwain. All seven drugs are used in equal amount (Ayurvedic Pharmacopoeia of India, 2001).

Table 2. Constituents of digestive churna

S.No	Botanical name	Local name	Quantity(gm)
1.	Cassia angustifolia	Senna	20
2.	Cassia angustifolia	Jamun	20
3.	Aegle marmelos	Jamun	20
4.	Terminalia chebula	Harad	20
5.	Rock salt	Rock salt	20
6.	Amla	Emblica officinalis	20
7.	Ajwain	Trachyspermum	20

EVALUATION OF HERBAL DIGESTIVE CHURNA**DETERMINATION OF LOSS ON DRYING**

It determines the amount of volatile matter for the substances appearing to contain water as the only volatile constituent.

Procedure

10 gm of the drug (without preliminary drying) after accurately weighing was placed in a tared evaporating dish. After placing the weighed amount of the drug in the tared evaporating dish, dish was dried at 105°C for 5 hours and was weighed. Then again the tared dish was dried in oven for one hour and subsequently cooled in desiccator and then again weight of the dish was taken. This procedure was continued until difference in weight was not more than 0.01 gm.

DETERMINATION OF EXTRACTIVE MATTER

This method determines the amount of active constituent extracted with solvent from a given amount of medicinal plant material. It is employed for materials for which as yet no suitable chemical or biological assay exists.

PROCEDURES COLD MACERATION

Coarsely ground air-dried material was weighed accurately in glass-stoppered 250 ml iodine flask. 100 ml of solvent was added in the flask. It was shaken occasionally for 6 hours. The flask was allowed to stand for 18 hours. Contents of the flask were filtered. Meanwhile, tared evaporating dish was weighed and 25 ml of the filtrate was transferred to the tared dish. Filtrate was evaporated on a water bath and contents were dried for 6 hours in an oven.

The filtrate was then cooled in a desiccator for 30 minutes, and was weighed again without delay. The amount of extractable matter in mg/g of the air-dried material was calculated. The same procedure was applied with other solvents such as chloroform, water, alcohol.

DETERMINATION OF ASH

The ash remaining following ignition of medicinal plant materials is determined by three different methods which measure total ash, acid-insoluble ash and water-soluble ash. The total ash method is designed to measure the total amount of material remaining after ignition. This includes both "physiological ash", which is derived from the plant tissue itself, and "non-physiological" ash, which is the residue of the extraneous matter (e.g. sand and soil) adhering to the plant surface. Acid insoluble ash is the residue obtained after boiling the total ash with dilute hydrochloric acid, and igniting the remaining insoluble matter. This measures the amount of silica present, especially as sand and siliceous earth. Water-insoluble ash is the difference in weight between the total ash and the residue after treatment of the total ash with water.

PROCEDURES TOTAL ASH

2-4 gm of accurately weighed ground drug material was incinerated in a tared silica dish at a temperature not exceeding 450 °C until free from carbon, cooled and then weighed. In some cases carbon free ash could not be obtained in this way, then 2 ml of water was added and dried on a boiling water bath then on a hot plate and ignited to constant weight. The residue was allowed to cool in a desiccator for 30 minutes, and then weighed without delay. The amount of total ash in mg/g of the air-dried material was calculated.

TABLE 3: ASH VALUE OF CRUDE DRUG (% W/W)

S.No	Drug	Total ash	Acid insoluble ash	Water soluble ash
1.	Cassia angustifolia	4.10±0.78	0.56±0.12	1.03±0.58
2.	Syzygium	3.14±0.15	0.91±0.05	0.60±0.1
3.	Aegle marmelos	2.17±0.14	0.03±0.01	1.27±0.13
4.	Terminalia chebula	3.13±0.38	0.54±0.10	2.10±0.53
5.	Rock salt	2.91±0.16	0.32±0.17	1.71±0.73

DETERMINATION OF FOAMING INDEX

Many medicinal plant materials contain saponins that can cause persistent foam when an aqueous decoction is shaken. The foaming ability of an aqueous decoction of plant material and their extracts is measured in terms of a foaming index.

PROCEDURE

1 gm of powder was reduced to fineness by passing through sieve no. 100. The fine powder was weighed, and transferred to 500 ml conical flask containing 100 ml of boiling water, maintained at moderate boiling for 30 minutes.

Then the flask was cooled and the contents were filtered in 100 ml volumetric flask and sufficient water was added to make up the volume.

The decoction was poured into 10 stoppered test tubes in successive portions of 1, 2, 3 ml etc. up to 10 ml, and the volume of the liquid in each tube was adjusted with water to 10 ml. The tubes were stoppered and shaken in a lengthwise motion for 15 seconds. They were allowed to stand for 15 minutes and the height of the foam was measured. The height of the foam in every tube was less than 1 cm. so; the foaming index was less than 100.

DETERMINATION OF SWELLING INDEX

Many medicinal plant materials are of specific therapeutics of pharmaceutical utility because of their swelling properties, especially gums and those containing an appreciable amount of mucilage, pectin or hemicelluloses.

The swelling index is the volume in ml taken up by the swelling of 1 g of plant material under specified conditions.

PROCEDURES

The specified quantity of plant material concerned was introduced in 25 ml of glass stoppered measuring cylinder, which was reduced to required fineness previously. 25 ml of water was then added, the mixture was shaken after every 10 minutes interval for period of 1 hour.

Then mixture was allowed to stand for 3 hours at room temperature. The volume in ml taken was measured which was occupied by the plant material including any sticky mucilage. The mean value of individual determination was calculated.

TABLE 4. SWELLING INDEX OF CRUDE DRUG

S.No	Drug	Swelling index
1.	Cassia angustifolia	No swelling
2.	Syzygium cumini	No swelling
3.	Aegle marmelos	No swelling
4.	Terminalia chebula	No swelling
5.	Rocksalt	No swelling

All values are Mean(n)±SD, SD=standard deviation.

Table 5. Evaluation of Herbal Digestive Churna

S.No	Name of Evaluation	Reading
1.	Determination of Foreign matter	0.0±0.0
2.	Determination of Loss on drying	7.97±0.78
3.	Determination of Extractive value	5.51±0.81
4.	Determination of Ash Values	3.14±0.33
5.	Determination of Foaming index	Less than 100
6.	Determination of Foaming index	No swelling

RESULT AND DISCUSSION

Herbal digestive churna is an important Ayurvedic formulation, official in Ayurvedic Pharmacopoeia of India is combination of five reputed herbs. this churna is commonly used in treatment of gastric problem, constipation. The batch of Extractive values (% W/W) mainly give idea about to know the nature of chemical constituents present when treated with different non polar and polar solvents. For these we used pet. Ether and chloroform to know the amount of non polar nature chemical constituents. The extractive values were found to be for ether 3.19 ± 0.27 , 1.27 ± 0.22 , 3.12 ± 0.15 , 2.13 ± 0.51 , 2.09 ± 0.78 and for chloroform 1.81 ± 0.51 , 1.32 ± 0.15 , 1.09 ± 0.37 , 0.91 ± 0.11 . It shows that non polar nature constituents present in fewer amount. Similarly to know the amount of polar nature constituents we used water and alcohol as a solvent and the extractive values were found to be for water 11.73 ± 1.09 , 9.2 ± 0.91 , 13.09 ± 1.3 , 10.47 ± 0.91 and 9.18 ± 0.25 and 5.14 ± 0.9 , 3.12 ± 0.57 , 6.12 ± 0.59 , 5.92 ± 0.27 and 5.51 ± 0.81 for alcohol (Table 5.5). It showed that polar constituents present in good quantity. Extractive value of digestive churna is found to be 5.51 ± 0.81 . Ash value determination is used to know the presence of low grade products, exhausted drugs and excess of earthy matter; it is more especially applicable to powdered drugs. Total ash value was found to be 4.10 ± 0.78 , 3.14 ± 0.15 , 2.17 ± 0.14 , 3.13 ± 0.38 , 2.91 ± 0.17 . Acid insoluble ash used to determine the presence of sand or silica. Acid insoluble ash found to be 0.56 ± 0.12 , 0.91 ± 0.05 , 0.03 ± 0.01 , 0.54 ± 0.10 , 0.32 ± 0.17 . It shows that sand and silica content is less. Ash value of digestive churna is found to be 3.14 ± 0.33 .

CONCLUSION

The herbal digestive churna was successfully formulated using traditional herbs known for their digestive benefits. Evaluation showed acceptable organoleptic and physicochemical properties, along with good flowability and stability. Phytochemical screening confirmed the presence of active compounds like flavonoids and alkaloids, supporting its digestive action. Preliminary studies indicated its effectiveness in managing indigestion and related issues. Overall, the churna is a safe, natural, effective alternative for promoting digestive health, with potential for further clinical research.

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