

REVIEW ON AYURVEDIC FORMULATION FOR ANTIVIRAL, ANTIOXIDANT AND IMMUNOMODULATORY ACTIVITY SCOPE FOR GLOBAL PANDEMIC (COVID-19)

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ABSTRACT:

The polyherbal churnas is a valuable Ayurvedic preparation, which was used traditionally antiviral, antioxidant, antimalarial, antidiabetic and antipyretic agent etc. It has been given from ancient time Vedas to cure all types of common cold, viral fever etc. Ayurvedic formulation is an important step for the establishment of a consistent chemical profile or simply quality assurance programs for production and manufacturing of ayurvedic drugs. The pharmacological properties are proven on polyherbal churnas are selected by different researcher antioxidant, antiviral and immunomodulatory activity etc. This review helps the researcher to explore depend this formulation for more pharmacological activity and safely use.

KEYWORDS: *churna, Ayurvedic formulation, ingredients and dose*

INTRODUCTION:

The history of *Ayurveda* can be discovered to the period between the pre-vedic periods (4000 B. C.-1500 B. C.). According to *Ayurvedavatarana* (the descent of *Ayurveda*), Lord Brahma, the Hindu God of Creation passed on his “knowledge of life” to Daksha Prajapati and Ashwins, subsequently to Indra. This knowledge is then changed to different rishis (sages), in which these disciples of *Ayurveda* wrote different treatises based on their interpretations. Here, both Bhardwaj and Dhanvantari received the knowledge from Indra. They next developed school of medicine and school of surgery respectively.

The discovery of herbals is further improved with knowledge on the method of isolation, purification, characterization of active ingredients and type of preparation. The term “herbal drug” determines the parts of a plant (leaves, seeds roots, flowers, barks, stems etc.) used for preparing medicines. Various part of the herbs are fully utilized for the different pharmacological action they may produce and made into a range of herbal preparations including Kwatha (Decoction), *Phanta* (Hot infusion), *Hima* (Cold infusion), *Arka* (Liquid Extract),

Churna (Powders), *Guggul* (Resins and balsams), *Taila* (Medicated oil) etc.

Due to the scientific advancement today, more and more pharmacologically active ingredients of the *Ayurvedic* medicines as well as their advantage in drug therapy have been identified. Basically, it is the phytochemical constituent in the herbals which lead to the desired healing effect, such as tannins, alkaloids, alkenyl phenols, flavonoids, terpenoids, saponins, phorbol esters and sesquiterpenes lactones. A single herb may even contain more than one of the identical phytochemical constituents that work synergistically with each other in producing pharmacological action [1].

Churna is a mixture of powdered herbs and on minerals used in *Ayurvedic* medicine. In Sanskrit *Ayurveda* means “The science of life”. *Ayurvedic* knowledge it originated in India more than 5000 years ago and is called the “Mother of all Healing”. In this ancient Vedas culture and was taught for many thousands of years in an oral traditional from accomplished to their apologist . *Ayurvedic* *churna* is the simplest form of *Ayurvedic* medicine which can be easily prepared. *Triphala* is an example of outstanding *Ayurvedic* formula, used for thousands of years that is made from the powders of 3 fruits like *Bibhitaki* (*Terminalia belerica*), *Amalaki* (*Emblica officinalis*) and *Haritaki* (*Terminalia chebula*). *Ayurvedic* *churna* places great significance on prevention and the maintenance of health through close attention to balance in one’s life, right thinking, diet, mental stresses, life style and the use of herbs[2][3].

Synthetic drugs are being prepared by safe the natural drugs as standards but the safety and efficacy of the herbal drugs cannot be imitated and hence 80% of the world population relay on natural drugs for treating their ailments. People trust that natural products are safe compared to synthetic drugs. The improvement in these traditional systems of medicine leads to maintain high quality of the product [4].

Advantages of ayurvedic medicine:

- They are many people of use
- The herbal plants have renewable source of cheaper medicines
- Developments in the quality, safety and efficacy of herbal medicines with the improvement of science and technology
- They are cheap in cost
- They are no harmful
- They are efficient than any synthetic drug



FIGURE:1 Types of churna powders

Method of Ayurvedic formulation [5]

Ayurvedic medicines are available in the form of powder, tablets, pills, liquid and semisolid which are classified into the following different categories:

- Arishta and Asavsa
- Rasa Rasayan
- Lauha
- Bati
- Churna
- Avaleha
- Ghrita
- Parpati
- Taila
- Goggulu

TABLE: 1 Classification of Ayurvedic medicines

S.no	Ayurvedic medicines	Method of preparation
1.	Aristha and Asava	Asavas and Aristhas are made by soaking the herbs either in powder form or in the form of decoction (kasaya) in a solution of sugar or jaggery, as the case may be, for a specific period of time, during which it undergoes a process of fermentation generation alcohol and facilitates the extraction of the active ingredients contained in the herbs.
2.	Rasa Rasayan	Rasa Rasayan Ayurvedic medicines containing mineral drugs as main ingredients are called Rasa rasayan or Ras-yoga. They are in pill form or in powder form/ forest, minerals such as Anrala, Swarna, Rajata, Tamra etc. and sulphur impurified state are used to convert bhasma form, called kajjali then other drugs are added in small quantities, mixed well and grounded to form fine powder.
3.	Lauha	Lauha kalpas are preparation of Loha Bhasma as main ingredient with other drugs. The other active ingredients are made to fine powder and mixed with Loha Bhasma.
4.	Vati or Gutika	Vati or Gutika Medicines prepared in the form of tablets or pills are known as vati or gutika, these are made of one or more drugs of plant, animal or mineral origin.
5.	Churna	Churna is a fine powder form of drugs. All these plant herbs and other active ingredients are cleaned after dried and powdered together by mechanical means to the fineness of at least 80 mesh.
6.	Avaleha	Avaleha Madak Paak Avaleha or lehya is a semi-solid preparation of drugs. These are prepared by the addition of jaggery sugar or sugar dandy and boiled with prescribed drug juices decoction, Honey, if required, is added when the preparation is cold and mixed well.
7.	Ghrita	Ghrita are preparation in which ghee is boiled with prescribed Kasayas (Decoction) and kalkas of drugs according to formulation as per Ayurvedic formulary.
8.	Parpati	Parpati First Kajjali is prepared with purified Mercury and sulphur. Then other drugs as per Ayurvedic Formula are added and mixed well in grinder. The powder is then heated in iron vessel and melted. This melted material is purified as per Ayurvedic method, cooled and again flakes of medicines are powdered.

9.	Taila	Tailas are prepared by boiling prescribed kasyas (decoction) and kalkas of drugs in oils according to the formula prescribed in Ayurvedic formulary.
10	Goggulu	Goggulu Ayurvedic medicines prepared by the exudates, and obtained from the plant commiphara mukul, are known as Goggulu. There are 5 different varieties of Goggulu in Ayurvedic Shastra but usually two varieties, mahiskasa and kanaka are preferred for medicinal preparation. Exudates in small pieces are taken in a piece of cloth and boiled in gomutara or Dugdha or Triphala kasayua until the exudates pass into the fluid through the cloth to the maximum. The fluid after filtering is boiled till it forms a mass. After drying, the mass is formed into a paste by adding ghee till it becomes waxy.

TABLE: 2 Classification of Herbal churna [6]

Marathi name	English name	Useful for dose preparation	Fineness
Sthul	Coarse	Churna, kashaya, dhum	10 – 44
Pruthu	Moderate coarse	Fant	20 – 60
Pat	Moderate fine	Kalka, lepa, him	44 – 85
Sukshmtam	Finest	Bhasma, bhasma-pishti	120
Sukshmatar	Finer	Anjan, Gutika, vati, pottali, parpati	85

Types of churna:

- I. Sthula churna - coarse powder
- II. Sukshma churna- fine powder
- III. Atyanta sukshma churna- very fine powder

They are two types of churnas as follows

- Simple churna
- Compound churna

Simple churna: It contains only one medicament.

Compound churna: It contains two or more than two medicaments.

Stability period of herbal churnas:

Ayurvedic/ herbal churnas retain their potency for one year

Marketed preparation of churnas:

It is the main source of the churna as follow for example Sudharsan, Drakshadi and Triphala churnas.

Method for preparation of Herbal Churnas:

The drugs are cleaned and dried properly. They are finely powdered and sieved. If more than one drug are present then each one is separately powdered sieved accurately weighed and then all mixed together. The powder is fine to the extent of at least 80 mesh sieves. It should not adhere together or become moist. The finer powder has better therapeutic value.

Preservation:

It should be stored in the air tight containers.

Precautions:

- Thoroughly cleaned and dried drugs should be used for the preparation of churnas
- They should be finely sifted
- Each substance should be powdered separately and then mixed
- Pestle and mortar used for reducing the particle size and mixing the substances should be clean and dry
- They must be stored in a dry container
- They should not be prepared in rainy season
- They should dissolve in the stomach contents

Dose in 2-3 gm, may be increased or decreased according to age, severity of disease [7].

ADVANTAGES OF HERBAL CHURNA:

- I. In the majority of the drugs are available in powder form and it become more convenient for the physician to prescribed specific amount of medicament according to the need of the patient.
- II. The smaller particle size of powder produces most rapid absorption than other solid dosage form i.e capsule, tablet and pills etc.
- III. Preparation of powder is efficient as compare to other dosage form.
- IV. The patients who cannot swallow the pill, tablets, capsule etc can easily take powder with water or any liquid (Anupana).

DISADVANTAGES OF HERBAL CHURNA:

Powders have some disadvantages as a dosage form as described below:

- I. Drugs which decline on exposure to atmospheric condition are inappropriate for dispensing in powder forms.
- II. Volatile drugs are inappropriate for dispensing in powder form.
- III. To take bitter or unpleasant tasting drugs by oral administration. Many herbal drugs have extremely bitter tastes. To overcome the unpleasant taste of the extracts, it was often told that "bitter medicine is better medicament."

IV. It is very difficult to protect powders containing hygroscopic, deliquescent, or aromatic materials from decomposition.

V. Uniform, separately wrapped doses of powders (sachets) are required and this may increase the manufacturing expenditure. It is possible to include a spoon in a packet of powder drug. This may result in inaccurate amount of drug delivered.

VI. Powder must be a homogeneous of the entire constituent and be of the most advantages particle size. The particle size of a drug influences the rate of dissoluble in water. It may also influence the biological activity of a drug.

Antioxidant, Antiviral and immunomodulatory:

The presence of phenolic compounds in the extract of these herbal churna often demonstrates the potent antioxidant, antiviral and immunomodulatory properties. Therefore Ayurvedic churnas are often preferred due to their less toxic and side effect free nature compared to synthetic medicines. Based on the high ability of these herbal plants, they can be beneficial for healing all types of diseases. The health benefits of herbal plants for humans [8].

These are related in Ayurvedic churnas based on the antiviral, antioxidant and immunomodulatory properties of herbal plants in this shows table 1.

Table 3: Pharmacological activity or Benefits of the different polyherbal churnas

S.no	Name of the churna	Ingredients	Dose	Pharmacological activity or Benefits	References
1.	Pharmacological potential of polyherbal formulation, Sudarshan Churna	Chirata,patolpatra, prshnparni,haridra,davd aru,kaliyak, vacha, motha, harr,kakrasinghi,kantkari,sonth, triman, pittapapra, neem chal, pipra mool, netrabala, amla, giloy, kutki, satwari,kush, dalchini, shalparni, atis, kurchi, mulethi.	The dose of Sudarshan churna is 2-4 gm Anupana: usnodaka	Sudarshan churna is very potent Ayurvedic medicine having antiviral, antioxidant activity.	[9]
2.	Standardization of Narasimha churna: A poly herbal formulation	Shatavari, varahi, guduchi, bhallataka, chitraka, tila, maricha, pippali,vidari kanta, gokshura.	Matra:1-5 gm Anupana: milk	Narasimha churna is an Ayurvedic polyherbal formulation having antiviral, antioxidant activity.	[10]
3.	In-vitro antioxidant activity of extracts of avipattikar churn a	Zingiber, pepper, chebula, bellerica, amla, cardamom, cinnamon, syzgium aromaticum, operculina	Matra: 3-6 gm Anupana: jala	Avipattikar churna is the present study is very potent antioxidant ingredients / activity of avipattikar churn a	[11]

		terpethum and saccharum officinarum.			
4.	Total phenolic and flavanoid content, antioxidant effects and antidiarrheal activity of balacaturbhadrika churna- an Ayurvedic preparation	Cyperus rotundus, pistacia integerrima, piper longum and aconitum heterophyllum	Matra: ½-1 gm Anupana: madhu	The amounts of flavanoids and phenolics in churna. It is antioxidant and immune boosting activity.	[12]
5.	Immunity against COVID-19: potential role of Ayush kwath	Tulsi, dalchini, sunthi, marich	Matra: 2 gm Anupana: tea or hot drink	Ayush kwath due to its antiviral, immunomodulatory, antioxidant, anti-inflammatory, anti-platelet, hepatoprotective properties; to be effective in regulating immunity for the prevention and reduction of viral diseases.	[13]
6.	Immunomodulatory activity of the Ayurvedic formulation Ashwagandha churn a	Ashwagandha [withania somnifera L. Dunal (solanaceae)]	Matra: 3-6 gm Anupana: Dugdha	Ashwagandha churna has the potential to stimulate cell-mediated immunity and it may be a potential therapeutic candidate in several immunosuppressed clinical conditions.	[14]
7.	Preparation of karpooradi churna by using the ingredients taken from local market and comparative standardization	Karpooora, chocha, takkola, jatiphala, lavanga, maricha, Krishna, shunti, sita	Matra: 1-3 gm Anupana: jala	It is used in the treatment of chronic respiratory, cough, difficulty in breathing problems is also used good for heart.	[15]

8.	Physic-chemical standardization of sitopaladi churna	Sitopala, vamsalochan, pippali, ela, twak	Matra: 1-3 gm Anupana: madhu	Sitopaladi churna, a polyherbal Ayurvedic formulation prescribed for cold, cough, supportive agent for allergy, viral respiratory infection and chest congestion.	[16]
9.	A clinical study on the role of shringyadi churna in the management of the disease tamaka shwasa	Shati, pippali, shunthi, maricha, karkatshringi, vasa	Matra: 1/3-1 gm Anupana: madhu	shringyadi churna is Ayurvedic formulation anti-allergic, anti-inflammatory, antiviral, immunomodulatory, antioxidant activity.	[17]
10.	A review of comprehensive study on medicinal plants of polyherbal formulations-churna	Cumin, mimosa, pomegranate, amla, sesame	-	It is anantii -inflammatory, antioxidant, antibacterial, antiviral, anti-tumor, antiulcer, anti diabetic etc.	[18]
11.	Role of Rasayan churna in outbreak of COVID-19 as preventive and curative aspect	Amalaki, guduchi, gokshura	Matra: equal quantity of powder Anupana: ghee and honey	Rasayan churna can be used it as a best therapy, as it has a property like immunomodulatory, antidepressant, antidiabetes, antihypertensive, antimicrobial and antioxidant effect. So it should be taken in day to day life during COVID-19 outbreak for the protection of the health.	[19]
12.	Development of quality parameter of Hingwashatak churna	Sunthi, pippali, ajamoda, marica, sveta jirika, krisna jirika, hingusuddha, saindhav	Matra: 1-2 gm Anupana: Goghruta	Anti inflammatory, antibacterial and antiviral properties of the churna	[20]

13.	Evaluation of antioxidant activity of panchachurnam: Ayurvedic polyherbomineral formulation	Cassia angustifolia vahl. Leaf, fruit terminalia chebula retz. Fruit, zingiber officinale rocs. Rhizome, foeniculum vulgare mill. Fruit and saindhava lavana	Matra: 1-3 gm Anupana: Usnodaka	It is use of this churnam to cure various stomach related problems. The high antioxidant property exhibited by the aqueous extract of this churnam.	[21]
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TABLE 4: Ayurvedic formulations.

S.no	Name of formulation	Benefits	Dose	References
1.	Badaradya Churn a	Hrudroga, Jwara, Vamana, Rajayakma, Raktapitta, Kasa.etc.	Matra:3-6gm Anupana: Jala	[22]
2.	Talisadya Churna	Kasa, Swasa, Aruchi, Chhardi , Grahani etc.	Matra:3gm Anupana: Madhu	[23]
3.	Krusnadi Churn a	Jwara, swasa, Balatisara, Balakasa, Vamana	Matra:1-3gm Anupana: Madhu	[23]
4.	Gandhaka rasayana	Viryaksaya, Kandu, Kustha, Grahani, jeernajwara, etc.	Matra:1-3gm Anupana: Jala	[24]
5.	Katphaladi Churn a	Jwara, swasa, aruchi, Chhardi, kasa,	Matra:5-10gm Anupana:Madhu	[24]
6.	Chandanadi Churn a	prameha, Kasa, Swasa, Jeerna jwara, Kamala.	Matra:1/2-1 gm Anupana: Madhu	[25]
7.	srungyadi Churn a	Kasa, jwara Swasa, Kapharoga	Matra:1/4-1 gm Anupana: Madhu	[25]
8.	Utpaladya Churn a	Jwaratisara, Ravahika.	Matra:2-4 gm Anupana: Tandulodaka	[25]
9.	Amrutadi Churn a	Swasa jwara, Daha, Pittavikara, Jarajanya vyadhi	Matra:3-6gm Anupana:Madhu/ Ghruta	[26]
10.	Methikadya Churn a	Jwara, Raktabata, Mudhagarbha, Pittavikara etc.	Matra:10-20gm Anupana: Jala	[26]

Conclusion:

In Ayurvedic field of practice several types of kalpanas (medicines) are being used presently, Churna (Powder) kalpana plays a major role in pharmaceuticals of Ayurveda. In this paper antioxidant, antiviral and immunomodulatory properties of polyherbal churnas and combination of these herbs is also widespread in traditional medicines. Therefore, future research can focus on the characterisation of the active components and the effect of herb-herb combination for further therapeutic advancements and pharmacokinetic product development. These materials shows high antiviral activity, therefore these biomaterials are suggested for used against the current global pandemic COVID-19 virus. These antiviral, antioxidant and immunomodulatory properties are selected articles by polyherbal churnas.

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