
PREPARATION AND QUALITY EVALUATION OF POLYHERBAL COMPOUND FORMULATION CHURNA USED FOR STOMACH DISORDER

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ABSTRACT

Across the globe, a sizable section of the population suffers from stomach illnesses, which are widespread health problems. Numerous illnesses, such as indigestion, acidity, gastritis, ulcers, and other problems with the digestive system are included in this group of ailments. Some herbal preparations are thought to improve digestion, lower inflammation, decrease acidity, and lessen symptoms related to stomach disturbances. Therefore, the research work was undertaken and choosing the ingredients for the formulation and manufacturing of a polyherbal compound formulation utilized for digestive disorders. Polyherbal Churna has been specially prepared using some herbs *viz.* Neem, Dalchini, Haldi, Pudeena, Shunthi, Tulsi and Ajaawain, and Saindha salt, can be used to treat stomach issues and promote digestive harmony. This study provides information on formulation composition, preparation, and quality assessment based on macroscopic study, organoleptic characteristics, and physicochemical tests like LOD, extractive value, ash value preliminary phytochemical screening and development of HPTLC fingerprints profile.

Keywords: Stomach disorder, Formulation, Polyherbal churna, Quality evaluation

INTRODUCTION

One of the earliest holistic management systems with well-documented treatments is the Indian system of medicine, which primarily consists of Ayurveda, Siddha, and Unani. Ayurveda, which is a component of India's cultural legacy, is well-known for its originality and widespread acceptance since it provides all natural solutions to treat illness and advance healthcare. Unfortunately, when it comes to the creation of Ayurvedic medications, regulation and quality control are still undefined concepts. The majority of ayurvedic medicines still lack specified quality control measures and an evaluation technique^{1,2,3}.

An estimated 300 million individuals worldwide are thought to be affected by stomach disorders, which are also the third leading cause of hospitalisation. among most nations, especially among youngsters, stomach disorders are becoming more common^{4,5}. In addition to the high cost of medical care, stomach disorders often result in lost productivity and limited involvement in family activities^{6,7}. No of a country's degree of development, stomach disorders are a global public health issue that affect all nations. When it comes to treating gastrointestinal

disorders, both adults (11%) and children (6%) most frequently choose plant-based medications⁸.

Stomach disorder churna is a mixture of herbomineral ingredients used as an Ayurvedic drug. It enhances immunity, improves digestion, and treats microbial diseases, among many other advantages. A wide range of stomach ailments, including diarrhoea, heartburn, constipation, gas, peptic ulcer, and acid-reflux illness, are treated with stomach disorder churna.

Present research work deals with the formulation, preparation and quality evaluation of poly herbal compound formulation used to treat the stomach disorders by using natural herbs like Neem, Dalchini, Haldi, Pudeena, Shunthi, Tulsi and Ajawain, and Saindha salt. Prepared polyherbal formulation was tested by standard parameters such as organoleptic tests, physicochemical tests (LOD, extractive value, ash value) preliminary phytochemical screening and development of HPTLC fingerprints profile.

MATERIALS AND METHODS

Collection of plant materials

For preparation and formulation of Stomach Disorder polyherbal Churna ingredients Neem, Haldi, Pudeena, Sunthi, Tulsi were collected from Arogyadham campus, Chitrakoot while Ajawain, Dalchini and Saindhava salt was purchased from Sitapur market, Chitrakoot. Collected raw materials were washed through soft water and dried in shade and powered for further use.¹¹

Formulation of Stomach Disorder Polyherbal Churna

All grounded ingredients were taken and weighted in specific quantity as mentioned in table 1 separately; mixing the ingredients to prepared the Stomach Disorder Polyherbal Churna for further study¹².

Table-1: Formulation composition of Stomach Disorder Polyherbal Churna

S. no.	Ingredients name	Botanical name & Family	Part used	Quantity
1	Neem	<i>Azadirachta indica</i> -Meliaceae	Leaves	1 gm
2	Haldi	<i>Curcuma longa</i> - Zingiberaceae	Rhizome	1 gm
3	Pudina	<i>Mentha piperita</i> L. -Lamiaceae	Leaves	1 gm
4	Sunthi	<i>Zingiber officinale</i> - Zingiberaceae	Rhizome	1gm
5	Tulsi	<i>Ocimum tenuiflorum</i> - Lamiaceae	Leaves	2 gm
6	Ajawain	<i>Trachyspermum ammi</i> - Apiaceae	Fruits	1gm
7	Dalchini	<i>Myristica fragrans</i> –Myristicaceae	Fruits	2 gm
8	Saindhava	<i>Salt</i>	-	1gm

Organoleptic tests

Organoleptic tests such as colour, odor, taste and texture were evaluated and results are noted.

pH:

At 25°C room temperature, the pH of a 10% stomach disorder polyherbal churna solution in distilled water was measured, with the use of a digital pH metre, the pH was tested¹³.

Physico-chemical tests

Physico-chemical parameters such as moisture content (loss on drying at 105⁰C), water soluble extractive value, hexane soluble extractive, alcohol soluble extractive value, total ash value, acid insoluble ash value was calculated¹³.

Preliminary phyto-chemical investigation

Preliminary phyto-chemical tests were carried out on ethanolic and water extract for the presence/absence of phyto-constituents like alkaloids, flavonoids, tannins, resins, carbohydrates, proteins and saponins¹⁴

High Performance Thin Layer Chromatography (HPTLC) fingerprint profile

For High performance thin layer chromatography, the powdered 5 gm of the sample was extracted with 100 ml of ethanol overnight, filtered and concentrated. It was applied by spotting extracted sample on pre-coated silica-gel aluminium plate 60 F₂₅₄ (5x10 cm with 0.2 mm layer thickness Merk Germany) using Camag Linomat -5 sample applicator and a 100 µl Hamilton syringe. The sample, in the form of bands of length 6 mm, were spotted 15 mm from the bottom, 15 mm from left margin the plate and 10 mm part. Plates was developed using mobile phase consisting of toluene: *Toluene: ethyl acetate* (7: 3 v/v). Linear ascending development was carried out in 10x10cm twin through glass chamber equilibrated with mobile phase. The optimized chamber saturation time for mobile phase was 30 min. at room temperature. The length of chromatogram run was 8 cm. 20 ml of the mobile phase. Subsequent to the development, Thin Layer Chromatography plate was dried with the help of Hot Air Oven. The peak area for samples and standard were recorded with Camera photo documentation system Camag Reprostar 3. Visualization of spot was made before and after derivatization (with 5% Methanolic - sulphuric acid reagent) at UV light with Win cat software and R_f values noted¹⁵.

Results & Discussion

Formulation of Stomach Disorder Polyherbal Churna

All grounded ingredients were taken and weighted in specific quantity separately; mixed the ingredients and prepared the stomach disorder polyherbal churna. Formulation composition is given in table 2

Table-2: Formulation composition of Stomach Disorder Polyherbal Churna

S. no.	Ingredients name	Botanical name & Family	Part used	Quantity
1	Neem	<i>Azadirachta indica</i> -Meliaceae	Leaves	1 gm
2	Haldi	<i>Curcuma longa</i> - Zingiberaceae	Rhizome	1 gm
3	Pudina	<i>Mentha piperita</i> L. -Lamiaceae	Leaves	1 gm
4	Sunthi	<i>Zingiber officinale</i> - Zingiberaceae	Rhizome	1gm
5	Tulsi	<i>Ocimum tenuiflorum</i> - Lamiaceae	Leaves	2 gm
6	Ajawain	<i>Trachyspermum ammi</i> - Apiaceae	Fruits	1gm
7	Dalchini	<i>Myristica fragrans</i> –Myristicaceae	Fruits	2 gm
8	Saindhava	<i>Salt</i>	-	1gm

Organoleptic evaluation

Organoleptic tests such as colour, odour, taste and texture were tested through sensory organs and results are given in table 3.

Table-3: Organoleptic tests of Stomach Disorder Polyherbal Churna

S.No.	Tests name	Results
1	Color	Yellowish brownish
2	Odor	Pleasant
3	Taste	Salty bitter
4	Texture	Fine & Smooth

Physicochemical tests

Physicochemical tests were performed such as pH, Moisture Content (Loss on drying at 105⁰C), Water soluble extractive value, Ethanol soluble extractive value, Methanol soluble extractive value, Acetone soluble extractive value, Benzene soluble extractive value and Chloroform soluble extractive value, total ash value and acid insoluble ash value, results are given in table 4

Table-4: Physicochemical tests of Stomach Disorder Polyherbal Churna

S.No.	Tests name	Results
1	<i>pH</i>	5.9
2	Moisture Content (Loss on drying at 105 ⁰ C)	7.4 %
3	Water soluble extractive value	28.62%
4	Ethanol soluble extractive value	11.42%
5	Methanol soluble extractive value	17.1%
6	Acetone soluble extractive value	9.15%
7	Benzene soluble extractive value	4.54%
8	Chloroform soluble extractive value	6.72%
9	Total ash value	8.5%
10	Acid insoluble ash value	0.65%

Preliminary phyto-chemical investigation

Preliminary phytochemical tests were evaluated in water and methanolic extracts. Various types of phytoconstituents such as, resins, proteins, alkaloids, flavonoids, tannins and saponins were present.

HPTLC fingerprints profile of face pack powder

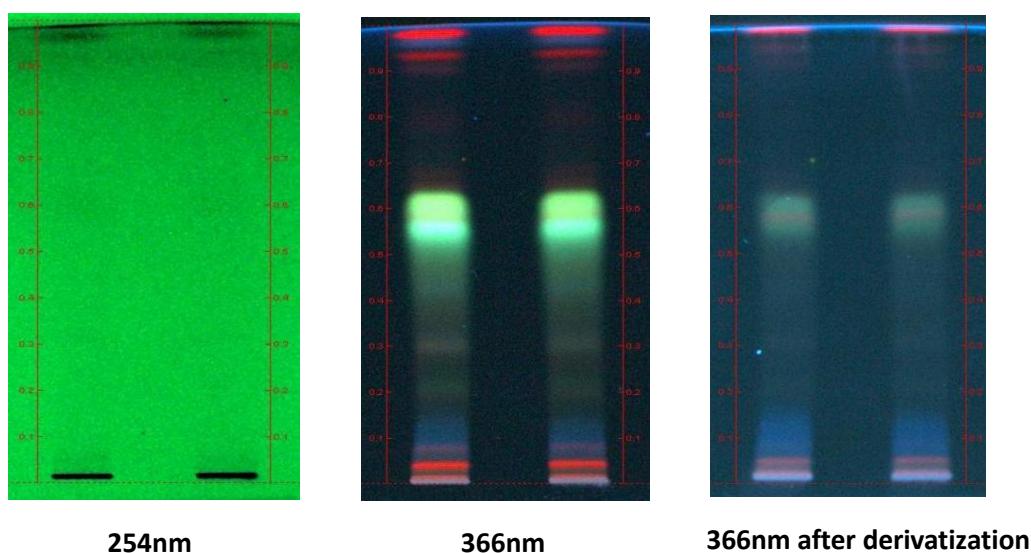
HPTLC fingerprinting was developed by using a Camag Linomat -5 sample applicator and a 100 l Hamilton syringe, it was applied by dotting the extracted sample onto a pre-coated silica-gel aluminium plate 60 F254 (5x10 cm with 0.2 mm layer thickness, Merk Germany). The sample, which was in the shape of 6 mm long bands, was placed 15 mm from the plate's left margin, 10 mm from the bottom, and 15 mm from the plate's edge. *Toluene: Ethyl acetate (7:3*

v/v) mobile phase was used. After development of the plate, a hot air oven was used to dry the thin layer chromatography plate. Utilizing the Camag Reprostar 3 camera photo documentation system, the peak area for samples and standards was captured. Win Cat software was used to visualize the spot before and after derivatization (using 5% Methanolic-sulphuric acid reagent) under UV light, and R_f values were recorded and given in table 5 and captured fingerprints image were given in Fig.1.

Table-5: R_f values of HPTLC fingerprints profile of stomach disorder churna

R_f Values	Before derivatization		After derivatization
	254nm	366nm	366nm
R_f1	0.97 (dark red)	0.05(orange)	0.05(light orange)
R_f2	-	0.18(light brown)	0.57(peach)
R_f3	-	0.62(light green)	0.94(light pink)
R_f4	-	0.93(red)	0.97(red)
R_f5	-	0.98(red)	-

Fig.1: HPTLC fingerprints profile of stomach disorder churna



Physico-chemical tests were performed and set up the certain standards for formulation separately in order to avoid the batch-to batch variation and also to check their adulteration and quality. The study was also giving an idea regarding the nature of phyto-constituents present, for quality, safety and efficacy of poly herbal stomach disorder churna. The ash value is useful to determine the quality and purity of the drug. Ash contains inorganic radicals like phosphate, carbonates and silicates of sodium, potassium, magnesium, calcium, etc.

CONCLUSION

Across the globe, a sizable section of the population suffers from stomach illnesses, which are widespread health problems. Numerous illnesses, such as indigestion, acidity, gastritis, ulcers, and other problems with the digestive system are included in this group of ailments.

Formulated polyherbal compound formulation to used for digestive disorders Churna has been specially prepared using some herbs viz. Neem, Dalchini, Haldi, Pudeena, Shunthi, Tulsi and Ajaawain, and Saindha salt, can be used to treat stomach issues and promote digestive harmony.

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