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PHYTOPHARMACOGNOSTICAL INVESTIGATION OF SAMASARKARA CHURNA

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Keywords:

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ABSTRACT: Introduction: Samasarkara churna is the Ayurvedic medication preferred treatment of dyspepsia, loss of appetite and piles, formulated by mixing powder of cardamoms, long piper, black piper, flowers of *Mesua ferrea*, cinnamon and Sugar. **Method:** With help of reported composition and standard procedure, formulated Samasarkara churna was compared with market formulation. Efforts have been made to developed quality control parameters of Ayurvedic formulation Samasarkara churna by observing of organoleptic features, microscopical characters and physicochemical properties. **Result:** Ash values and volatile oil content of standard and test sample were found to be 4.75, 2.25 and 0.2% w/v and 0.3% w/v respectively. Crude fiber content, pH of 1% w/v solution of churna and loss on drying were found to be (0.11, 0.34), (6.24, 6.29) and (0.7, 0.8) respectively. Calculated extractive values confirms that water soluble contents are more in the Samasarkara churna. **Discussion:** After analysing samples of Samasarkara churna by different parameters such as total ash, water and alcohol soluble extractive values, lipid and volatile oil content, microscopic and phytochemical investigation showed reproducible results between batches. **Conclusion:** Parameters used herewith can be utilize for the evaluation and standardization of various polyherbal formulations.

INTRODUCTION: Indian healthcare consists of medical diversity and Ayurveda still remains prevailing compared to modern medicine, particularly for treatment of a variety of chronic disease conditions ¹. To overcome the disease many Ayurvedic formulations are used like asava, arista, arka, avleha, kvatha, churna, lepa, vatika, gutika, netrabindu, sattva, grita, taila, bhasma *etc.*, but the churna has the unique place in all the formulation. Churna is the fine powder of drug and drugs intended for oral administration.

The World health organization (WHO) in 1999, has given a detail protocol for the standardization of herbal drugs comprising of a single content, but very little literature is available for the standardization of poly-herbal drugs. By considering the increasing demand of Ayurvedic formulations, proper documentation regarding their standardization is more important to assure the quality, purity, safety and efficacy.

Keeping these things in mind, efforts have been made in developing quality control parameters for Ayurvedic formulation 'Samasarkara churna' by means of organoleptic features, microscopical characters and physicochemical properties. It serves quality control and quality assurance aspects of formulation. The standards of in house formulation of Samasarkara churna were determined and compared with market formulation^{2,3}.

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Based up on the composition given in the book of Bhasajyaratnavali, the formula of the Samasarkara churna is composed as in Fig. 1, as follows:

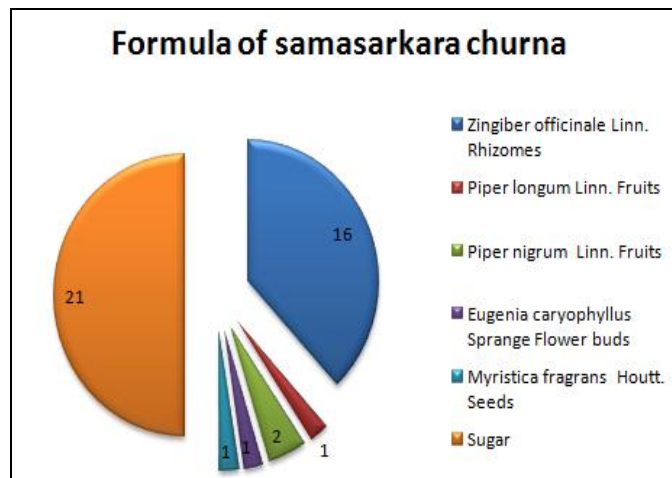


FIG. 1: FORMULA OF SAMASARKARA CHURNA

MATERIAL AND METHODS:

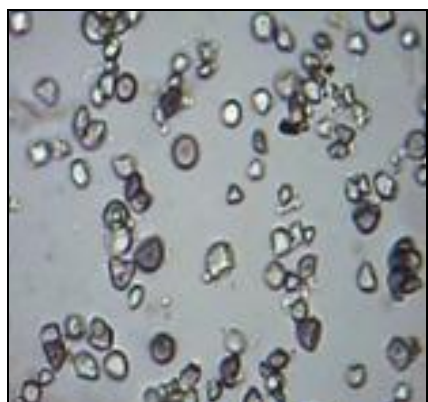
Collection and Identification of Crude Drugs:

All the plant crude drugs required for the preparation of the standard formulation of Samasarkara churna were collected from the local store in the month of November 2015.

Preparation of Churna: All the crude drugs were examined for the presence of the foreign matters and were weighed as prescribed under the formula of the Samasarkara churna in the book Bhasajyaratnavali. All of the drugs were separately grinded. All the powdered drugs were mixed using the homogenizer. One market formulation of Samasarkara churna was purchase from the local

OBSERVATIONS AND RESULTS:

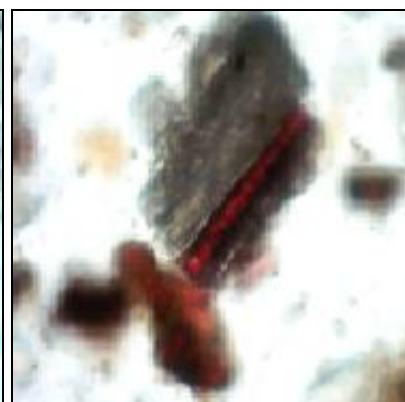
A. Microscopy of Standard Samasarkara Churna:



A: STARCH GRANULES



B: STONE CELLS



C: XYLEM VESSELS

Ayurvedic pharmacy of town, details of market formulation is as follows: (Batch no. D-11 and mfg. Date: Nov. 14): The ingredients and their respective quantity; which is given on label: sunth (95.3 gm), long piper (5.9 gm), black piper (12 gm), lavang (5.9 gm), jayphal (5.9 gm), sugar (125 gm)

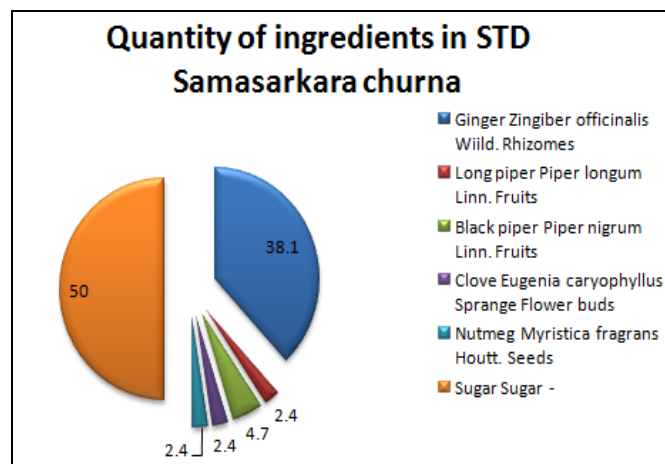
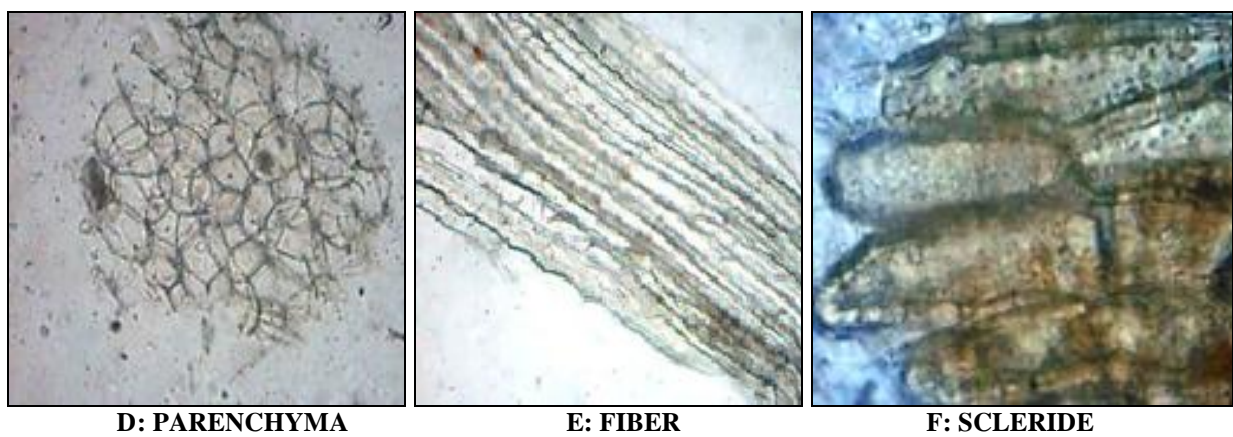


FIG. 2: QUANTITY OF INGREDIENTS IN STD SAMASARKARA CHURNA

All powdered crude drug ingredients; standard and market formulations of Samasarkara churna were examined for their morphological and microscopical characters and quantitative microscopical studies. That gives detail idea about Pharmacognostical evaluation

Phytochemical Evaluation: Organoleptic characters, loss on drying, ash value, water soluble extract, alcohol soluble extract and pH in 5% aqueous suspension were assessed.

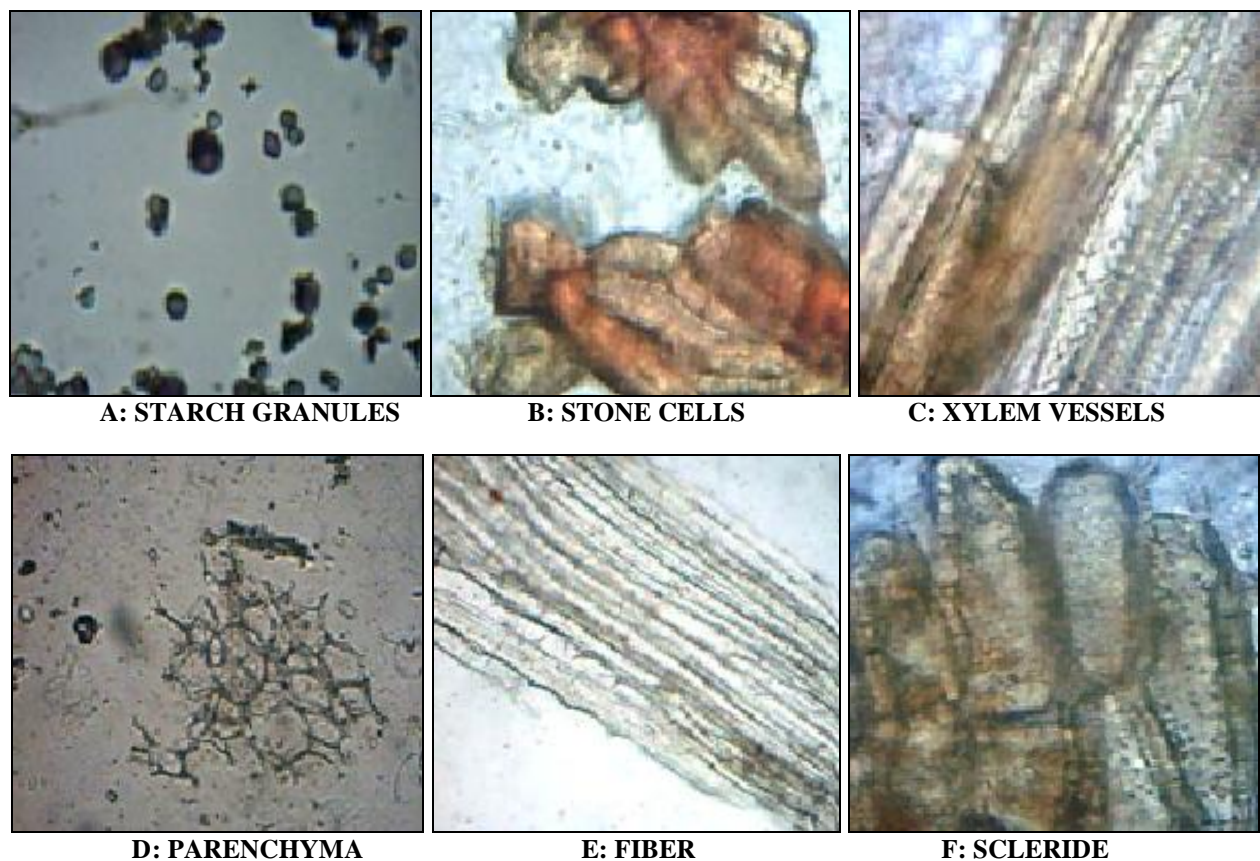


D: PARENCHYMA

E: FIBER

F: SCLERIDE

B. Microscopy of Test Samasarkara Churna:



A: STARCH GRANULES

B: STONE CELLS

C: XYLEM VESSELS

D: PARENCHYMA

E: FIBER

F: SCLERIDE

TABLE 1: MORPHOLOGICAL CHARACTERS OF STANDARD AND MARKET FORMULATIONS OF SAMASARKARA CHURNA

Parameters	Formulations	
	Std.	Test
State	Fine	Very fine
Color	Creamish brown	Brown
Odor	Aromatic and pungent	Aromatic and pungent
Taste	Aromatic and sweet	Aromatic and sweet

TABLE 2: SCREENING OF PHYTOCONSTITUENTS IN STANDARD AND MARKET FORMULATIONS OF SAMASARKARA CHURNA

Phytoconstituents	Formulations	
	Std.	Test
Alkaloids	+	+
Antraquinone Glycosides	-	-

Phenolics	+	+
Carbohydrates	+	+
Flavonoids	+	+
Tannins	+	+
Saponins	-	-
Coumarin s	-	-

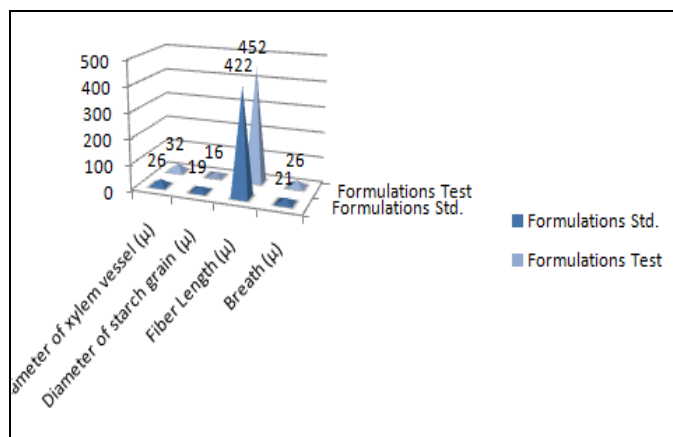


FIG. 3: QUANTITATIVE MICROSCOPICAL MEASUREMENTS OF STANDARD AND MARKET FORMULATIONS OF SAMASARKARA CHURNA

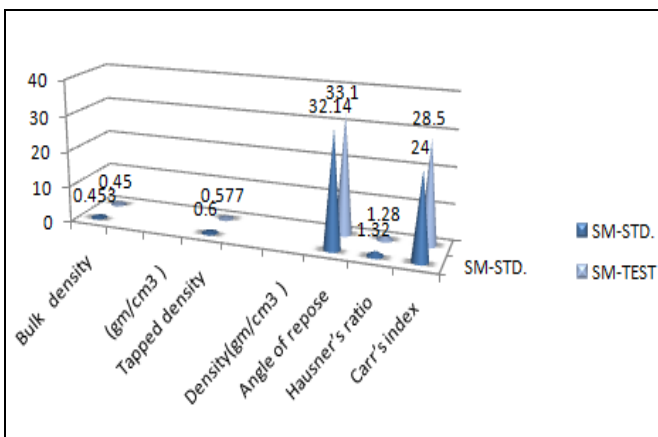


FIG. 4: PHYSICAL CHARACTERISTICS OF SAMASARKARA CHURNA

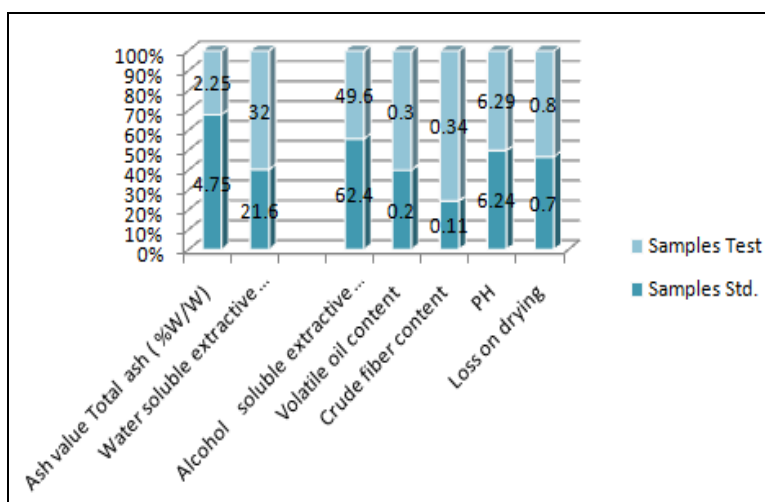


FIG. 5: PHYSICOCHEMICAL PARAMETERS OF STANDARD AND MARKET FORMULATIONS OF SAMASARKARA CHURNA

TABLE 3: ESTIMATION OF PHYTOCONSTITUENTS IN STANDARD AND MARKET FORMULATIONS OF SAMASARKARA CHURNA

Phytoconstituents	Formulations	
	Std.	Test
Total tannin content (% w/w)	1.6	1.7
Total flavonoid content (% w/w)	0.236	0.254
Na ⁺ ion salts (% w/w)	0.9	1.1
K ⁺ ion salts (% w/w)	1.2	1.4

TABLE 4: FLUORESCENCE ANALYSIS OF STD AND MKT FORMULATIONS OF SAMASARKARA CHURNA

Treatment of Powder	Std. Formulation		Test Formulation	
	Day light	UV light	Day light	UV light
1N HCl	PY	FLG	YBR	FG
1N H ₂ SO ₄	PY	FLG	YBR	FLG
1N HNO ₃	PY	FLG	YBR	FG

1 N NaOH (aq.)	RBR	FG	BR	FDG
1N NaOH (alcoholic)	YBR	FDG	BR	FDG
I ₂	GBR	FDG	GBR	FDG
KOH	YBR	FG	RBR	FG
NH ₃	YBR	FG	RBR	FDG

PY-pale yellow, YBR- yellowish brown, GBR- greenish brown, RBR-reddish brown, BR- brown, FLG- fluorescence light green, FG- fluorescence green, FDG- fluorescence dark green

TABLE 5: CONTENT AND DETAILS OF CHURNA

Botanica I name	Family	Taxonomy	Vernacular name	Distribution	Chemical Constituents	Medicinal Properties and Uses		
Ginger <i>Zingiber Officinal e</i> Wiild	Zingibera- ceae	Kingdom	Plant	Sans.	Ardraka, Sunthi	West Indies, India, Nigeria and West Africa.	Gingerol, fats and waxes, volatile oil Contains: zingiberene, β- sesquiphell- andrene, and arcurcumene	Thermogenic, carm- inative, laxative, digestive, emollient, appetizer, stoma- chic, expecto- rant, anthelmintc, anti- ulcer, antifungal useful in asthma, cough, diarrhea, cholera, nausea, vomiting
		Division	Phanerogams	Eng.	Ginger	Madras Cochin,		
		Sub division	Angiosperm	Hin.	Adrak, Sunth	Travancore, somewhat less extent in Bengal and Punjab		
		Class	Monocoty- ledons	Guj.	Sunth, Adu			
		Order	Scitamineae	Ben.	Adu			
Species	Officinale	Tam.	Allamu, Sunti					
Black Piper	Piperaceae	Kingdom	Plant	Sans.	Milagu	South Africa, Indonesia, Brazil, Malasia,and Sri Lanka, In india	Piperine, volatile oil contains l- phellandrene, caryoph-yllene, limonene, sabinene, β/ α- pinene, myrcene, p-cymeme	Aromatic, stimulant, stomachic and carminative, oil can be used to help in the treatment of pain relief, rheumatism, chills, flu, colds, increase circulation, exhaustion, muscular aches
		Division	Phanerogams	Eng.	Black pepper	Karnataka and Maharashtra		
		Sub division	Angiosperm	Guj.	Golmirch	India and the Philippines. piperlongum is available in Tamil Nadu, Andhra Pradesh and Kerala states		
		Class	Dicot	Tam	Maricha			
		Subclass	Archichl amydeae	Beng.	Golmorich			
Long Piper	Piperaceae	Kingdom	Plant	Eng.	Long pepper	Indonesia, India and the Philippines. piperlongum is available in Tamil Nadu, Andhra Pradesh and Kerala states	Volatile oil piperine, piperattine resin, piperidine and starch, volatile oil contains l-phellandrene and caryophyllene	Immuno modulating, antiallergic, anti asthmatic, fruits are used as aromatic, stimulant, stomachic and carminative
		Division	Phanero- gams	Hin.	Pippal			
		Sub division	Angio-sperm	Sans.	Pippali			
		Class	Dicot	Guj.	Pippal			
		Subclass	Archichla- mydeae					
Clove	Myrtaceae	Kingdom	Plant	Sans.	Lavangaha	Zanzibar, Pemba, Madagascar, Carribbean islands, Sri Lanka. In India, cloves are grown jn Nilgiri, Tenkasi hills and Tamil Nadu	Volatile oil, tannins, various triterpene acids and esters, and glycosides, eugenol, iso- eugenol, farnesol, nerolidol, sitosterol, and campesterol	Potentialanticarcino- genic, used as dental analgesic, flavouring agent, antiseptic and carminative. The oil is used in perfumery and in the preparation of vanillin
		Division	Phanero- gams	Eng.	Clove			
		Subdivision	Angio-sperm	Hin.	Laung			
		Class	Dicot	Guj.	Laving			
		Subclass	Archichia- mydeae	Ben.	Lavang			
Nutmeg	Myristica- ceae	Kingdom	Plant	Sans.	Jatiphalam	Indonesia, Malasia and Carribbean islands, In India it is cultivated in Kerala, Tamil Nadu	Volatile oil, fat, phytosterin, starch, amyloextrin, colouring matter and saponin	Used as aromatic, stimulant and carminative, used in soap industries, the treatment of infantile diarrhoea
		Division	Phanero- gams	Mar.	Jayphal			
		Subdivision	Angio-sperm	Hin.	Jayphal			
		Class	Dicot	Guj.	Jayphal			
		Subclass	Archichia- mydeae	Ben.	Jayphal			
		Order	Myrtiflorae	Tam.	Lavangapatti			
		Genus	<i>Eugenia</i>					
		Species	<i>Cary- ophyllus</i>					
		Kingdom	Plant	Sans.	Jatiphalam	Indonesia, Malasia and Carribbean islands, In India it is cultivated in Kerala, Tamil Nadu	Volatile oil, fat, phytosterin, starch, amyloextrin, colouring matter and saponin	Used as aromatic, stimulant and carminative, used in soap industries, the treatment of infantile diarrhoea
		Division	Phanero- gams	Mar.	Jayphal			
		Subdivision	Angio-sperm	Hin.	Jayphal			
		Class	Dicot	Guj.	Jayphal			
		Subclass	Archichia- mydeae	Ben.	Jayphal			
		Order	Magnoli-ales	Tam.	Jajikaya			
		Genus	<i>Myristica</i>					
		Species	<i>fragrans</i>					

DISCUSSION AND CONCLUSION: Samasarkara Churna; an Ayurvedic formulation has been standardized by intervention of contemporary scientific quality control actions in the traditional research described in conventional texts. Pharmacognostic appeals established for the raw materials could be employed as Q.C. standards for evaluating its identity and can be used for repetitive analysis. Purity and potency of the materials and formulations; following the procedure given could be performed in QC/QA laboratory of pharmaceutical firm. In the present study, two different polyherbal formulations of Samasarkara churna was taken and they were evaluated as per Indian Pharmacopoeia and WHO guidelines for their different properties like - organoleptic, extractive values (alcohol and water), Ash values (Total ash), physical characteristics (tapped and bulk density, Hausner's ratio and Carr's index), phytochemical evaluation, fluorescence analysis. Organoleptic studies revealed that altogether batches (Standard and Test) of Samasarkara Churna were brown in colour with pungent odour and sweet taste. More than 90% of these samples (Standard and Test) passed through 60- mesh sieve.

The extractive values (% w/v) of Samasarkara Churna (std. and test) in water and alcohol were found to be (62.4%, 49.6%); (21.6%, 32%); respectively, **Fig. 5** it confirms that water soluble contents are more in the Samasarkara churna. Ash values (% w/w) of Samasarkara churna (std. and test) were found to be 4.75 and 2.25 respectively and volatile oil content of std. and test for mutations were found to be 0.2% w/v and 0.3% w/v respectively. And as per **Table 2** crude fiber content, pH of 1% w/v solution of churna and loss on drying were found to be (0.11, 0.34), (6.24, 6.29) and (0.7, 0.8) respectively.

The data of **Table 5** shows that; physical characteristics of Samasarkara Churna like-Bulk density (g/ml), tapped density (g/ml), angle of repose, Hausner's ratio and Carr's index is found to be (0.453,0.45); (0.6,0.577); (32.14, 33.10); (1.32, 1.28); (24, 28.5) respectively. Low values of angle of repose show the poor flow ability for all samples. As per **Table 5**; UV light and fluorescence was observed in both of the std. and test formulation.

It is clear from **Table 3** that active constituents like glycosides, carbohydrates, steroids, tannins and saponins are present and the total tannin content in Samasarkara churna (std. and test) were found to be 1.6 and 1.7 %w/w respectively. Total flavonoid content estimated for both std. and Test Samasarkara churna which were found to be 0.236 and 0.254% w/w respectively. Na⁺ ion salts and K⁺ ion salts were quantified which were found to be (0.9, 1.1% w/w) and (1.2, 1.4% w/w) respectively.

After analysis of sample of Samasarkara churna by different parameters such as total ash, acid insoluble ash, water soluble extractive, alcohol soluble extractive, lipid content, volatile oil content, and microscopic analysis, phytochemical analysis showed reproducible results between batches. So it can be concluded that these parameters can be used for the evaluation of Samasarkara churna. The same protocol may be applied for as a regular quality control and standardization for various polyherbal formulations

SUMMARY: Two consignments of different polyherbal formulation Samasarkara churna which purchased from the local market were evaluated as per Indian Pharmacopoeia and WHO guidelines. Different parameters like - organoleptic characteristics, extractive value, ash value, physical characteristics, phytochemical evaluation, fluorescence analysis, pH value *etc.* were evaluated and compared. The result of Samasarkara Churna was found in close proximity. This study on Samasarkara churna was precise, reproducible and may be considered as a protocol for its evaluation. Present methods can be draw a parallel for evaluation for other Ayurvedic formulations. The same protocol may be applied for as a regular quality control and standardization for polyherbal formulations like churna.

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CONFLICTS OF INTEREST: Nil

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