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"DESIGNING OF POLYHERBAL FORMULATIONS FOR METABOLIC DISORDERS"

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ABSTRACT

The raw materials for the formulations were purchased from the market. All the ingredients were passed through Sieve No.80# and mixed together in equal proportions to get uniformly blended formulations which were then evaluated. The consumption of prepared Triphala & Senna churna showed expected results on the metabolic disorders. The churna showed satisfactory result for the treatment of constipation. We conclude that the prepared polyherbal formulation i.e. churna is effective against constipation. The main objective of the work was to design the polyherbal formulation for metabolic disorder.

KEYWORDS: Triphala & Senna Churna; Herbal; Ayurveda; Churna; Triphala; Senna.

INTRODUCTION

Manufacturing of Herbal and Ayurvedic products is simple and also good market demand for these products. According to the WHO as much as 80% of the world's population relies on traditional medicine. With increased concerns about rising health care costs, some governments are encouraging the use of indigenous form as of medicines rather than expensive drugs. This has been a strong driver for resuscitation of herbal and ayurvedic medicine in the country. Traditional treatment with ayurveda and other herbal medicines etc is well established and widely acknowledged to be safe effective.

The indigenous system of medicine, viz., Ayurveda, Siddha, Unani and Homeopathy are dependent on medicinal plants. Traditional medicines and complementary/Alternative medicine (TM/CAM) particularly in the last decades has come to be widely and increasingly used in both developing and developed countries. Herbal supplements are quickly becoming a growing trend in there US and other parts of the World. The herbal medicine market in the countries of EU was about 6.6 Million dollars with Germany accounting for3 Billion dollars.[1]

Plant introduction

Plant Profile

Triphala is a drug widely used in many disorders due to its various pharmacological activities. Triphala is composed of the three drugs; *Terminalia chebula Retz*(Haritaki), *Terminalia bellerica* Roxb(Bibhitaki) and Emblica *officinalis* Gaertn(Amalaki) and is one of the most commonly used Ayurvedic preparations. The formulation generally consists of equal proportions of pericarps of these drugs.

Triphala has been described in the ancient Ayurvedic text as a Tridoshic Rasayana, a therapeutic agent with balancing and rejuvenating effects on the three humours or constitutional elements in Ayurveda vata, pitta and kapha. Terminalia chebula Retz and Terminalia bellerica Roxb have a warm energy, while Emblica officinalis Gaertn is cool in nature. Triphala, being a combination of all three, is therefore balanced, making it useful as an internal cleansing, detoxifying formula. It is regarded as an important Rasayana and good purgative in Ayurvedic medicine. Recipe for this traditional herbal supplement is described in the traditional Indian texts, the Charaka and Shusrutha Samhita.

The different properties and the characters of the various ingredients of the drug are mentioned below:

Figure no. 1: Triphala Plant.

Haritaki

- **Latin name**: Terminalia chebula Linn.
- **Family**: Combretaceae
- **Classical name:** Haritaki
- **Sanskrit synonyms:** Haritaki, Pathya, Abhaya, Avyatha, Vayastha, Haimavati, Shiva
- **Hindi name:** Harre, Harad
- **English name:** Chebulic Myrobalan
- **Swaroopa (Habit):** A moderate sized / large deciduous tree
- **Habitat:** Found in MP, W. Bengal, Karnataka and Maharashtra in India, Burma and Ceylon

Figure no. 2: Seeds of terminalia chebula linn ayurvedic pharmacodynamics.

- **Rasa:** Pancharasa (Kashaya predominance, Lava rahita)
- **Guna:** Laghu, Ruksha
- **Virya:** Ushna
- **Vipaka:** Madhura
- **Prabhava:** Tridoshahara
- **Dosha karma:** Mainly kapha pitta samaka.
- **Parts used:** Fruits

- **Chemical Composition**: Fruit contains tannin up to 30 %, Chebulic acid and Gallic acid and some purgative constituents of the nature of Anthraquinone.

- **Therapeutic Uses:** The fruit is the prominent herbal drug, commonly and widely used in Indian system of Medicine and is a frequent addition in a large number of formulations. It is useful in asthma, sore throat, thirst, vomiting, eye disease, heart and bladder diseases, strangury, urinary discharges, ascites, biliousness, inflammation, bleeding piles, typhoid, constipation, anemia, elephantiasis and delirium. The ripe fruit are purgative, tonic, carminative and strengthens the brain, eyes and gums. The unripe fruit is astringent and useful in dysentery and diarrhoea.

Bibhitaki

- **Latin name:** Terminalia bellerica Roxb.
- **Family:** Combretaceae
- **Classical name:** Vibhitaka
- **Sanskrit synonyms:** Aksha, Kaliphala, Bhutavasa, Kalidruma, Karnaphala
- **Hindi name:** Bahera, Baherha
- **English name:** Belleric Myrobalan
- **Swaroopa (Habit):** A large deciduous tree
- **Habitat:** Throughout the deciduous forests of India and Burma.

Figure no. 3: Seeds of terminalia bellerica rox.

Ayurvedic pharmacodynamics

- **Rasa** -Kashaya
- **Guna**-Laghu, Ruksha
- **Virya**-Ushna
- **Vipaka**-Madhura
- **Prabhava**-Tridoshagna
- **Dosha karma** -Kaphahara
- **Parts used** –Fruit

- **Chemical Composition:** Fruit contains 17 % tannin and gallo-tannic acid (coloring matter) and resin. Seeds contain greenish yellow oil.

- **Therapeutic Uses:** The bark is beneficial in asthma and leucoderma. The fruit is digestible, laxative and anti-helminthic and is employed for bronchitis, sore throat, biliousness, inflammation and in diseases of eye, nose, heart and urinary bladder. The oil is a good application for the hair. On the fresh cuts and wounds, the fine powder is dusted to arrest bleeding as an astringent and styptics agent. The fruit of the Beleric myrobalan forms an ingredient of an important group of three myrobalans (viz. embelic, beleric and chebulic myrobalans) popularly known as Triphala**.**

Amalaki

- **Latin name:** Emblica officinalis Gaerth.
- **Family:** Phyllanthaceae
- **Classical name:** Amalaki, Dhatri
- **Hindi name:** Awala, Amla, Aonla
- **Sanskrit name:** Amalaki, Dhatri, Vyastha **English name:** Indian gooseberry **Swaroopa (Habit):** A medium sized tree.
- **Habitat:** Found throughout India; often planted in gardens and cultivated also in small and large scale.

Figure no. 4: Fruits of emblica officinalis gaerth.

Ayurvedic pharmacodynamics

- **Rasa:** Pancharasa (Amla predominance and Lavanarahita)
- **Guna:** Laghu, Ruksha, Sita
- **Virya:** Sita
- **Vipaka:** Madhura
- **Prabhava:** Rasayan
- **Dosha karma:** Tridoshhara, Pittasamaka (mainly)
- **Parts used:** Fruits

- **Chemical Composition:** Fruit is a well-known rich source of Vitamin C. Seeds contains fixed oil, phosphatides and an essential oil. Fruits, barks and leaves are rich in tannins.

- **Therapeutic Uses:** Fruits are the most useful part of the plant and are used medicinally in various diseases adopting different forms. Fruits are used for supplementing Vitamin C and other contents also. It is one of the most popular, common and highly reputed drugs of indigenous system of medicine. It is used in anemia, hyperacidity, peptic ulcer, dyspepsia, anorexia, diarrhoea, dysentery, hemorrhage, eye inflammations, irritability of bladder, leucorrhoea, spermatorrhoea, epitaxis, menorrhagia, jaundice, weak memory condition, nervine debility, oedema and liver condition. The juice of fresh fruit is given as tonic, refrigerant and antiscorbutic, diuretic, laxative and anti-bilious remedy.

Triphala

Types of Triphala

Nighantu has mentioned three types of Triphala:-

- **SwalpaTriphala:** Draksha, kharjura, parushaka; these three fruits together is called SwalpaTriphala.

- **MadhuraTriphala:** Draksha, kharjura, kasmarya; these three fruits together is called swaduTriphala. It is beneficial to vision, appetizer, promotes desire for food, and useful in alleviating irregular fever.

- **SugandhiTriphala:** Jatiphalam, ela, lavangam; these three constitute is called SugandhiTriphala. It is astringent, sweet in vipaka and useful in breaking constipation due to kapha and vatadoshas**.**

Ayurvedic pharmacodynamics

- **Rasa** -Kasaya
- **Guna**-Ruksha, Sara
- **Virya**-Anusna
- **Vipaka**-Madhura
- **Doshaghnata**-Tridoshasamaka
- **Karma** -Chaksusys, Dipana,Vrishya, Prameha, Kustha, Vishamajwarnashaka, Medohara.

Pharmacological Activities: Triphala is classified as an important medicine of the Rasayana group and is believed to promote health, immunity and longevity and frequently used to treat chronic ulcer and it is an antioxidant rich herbal formulation. The aqueous extract of Triphala is reported asantigastric ulcer and anti-peptic activity, good radio-protective agent against gamma radiation and cytotoxic to human breast cancer cell line. The extracts of Triphala reported to exhibited anti mutagenic activity, reduce damage due to oxidative stress, possess sustained anti-diabeticactivity and free radical scavengers, cytotoxic and apoptotic agent against breast cancer cells and prostate cancer and possess antibacterial activity. The powder of Triphala reported as promising anti- inflammatory and anti-arthritic drug and as potent and novel therapeutic agents for scavenging of nitric oxide, as a cardio tonic drug which is also prescribed for symptoms of inflammation, heat, infection, obesity, anaemia, fatigue, Candida, poor digestion, assimilation, tuberculosis, pneumonia and AIDS.

Therapeutic Uses: It is used as laxative in chronic constipation, colon cleansing, digestion problems and poor food assimilation, cardiovascular diseases, high blood pressure, to reduce serum cholesterol, poor liver function, large intestine inflammation, ulcerative colitis. It is good rejuvenator, tonic, hair tonic and good for digestion, purgative, cure all diseases of eyes, heal ulcer, remove diseases of skin, fat, diabetes, blood and fever. Ratio of Triphala (1:2:4) -Several methods are given to prepare Triphala, some use equal proportions (1:1:1) and some authors prepare Triphala by mixing one parts of One Haritaki, two parts of Bibhitaki and four parts of Amalaki.

Chemical Constituents: Triphala has been reported to be a rich source of Vitamin C, ellagic acid, gallic acid, chebulinic acid, bellericanin, β-sitosterol, ascorbic acid and flavonoids. Spectroscopic techniques including mass spectroscopy, nuclear magnetic resonance and Infrared spectroscopy showed gallic acid as the major component. Triphala also contains about 20 % tannins of both condensed and hydrolysable type. Other constituents identified in the fruit include lipids, sitosterol, saponins, cardiac glycoside and various carbohydrates.

Traditional Uses of Triphala: In Ayurvedic practice, Triphala is used for gastric disorders such as digestion problems, poor food assimilation, cleansing of colon, constipation and tonifier of the gastrointestinal tract and colon. It is also recommended tobe used for cardiovascular disorders, high blood pressure, serum cholesterol reduction, ophthalmic problems, liver dysfunction, inflammation and complications of the large intestine. It is also used as a blood purifier, to improve the mental faculties and is reported to possess anti-inflammatory, analgesic, anti-arthritic, hypoglycemic and anti-aging properties.[3,4]

Senna

- **Latin name:Cassia Angustifolia Vahl Family:** Leguminosae
- **Classical name:** Nilavirai
- **Hindi name:** Senna Ki Patti, Senai
- **Sanskrit name:**Swarnapatri
- **English name:** Indian Senna, Alexandrian Senna
- **Swaroopa (Habit):** A medium sized tree.
- **Habitat:** It is a small herb growing to a height of 2-3 feet.It is cultivated in Tamil Nadu, Andhra Pradesh and Karnataka. It is commercially been rising in Gujarat and Jodhpur.

Fig no: 4. Plant of Cassia Angustifolia Vahl.

AYURVEDIC PHARMACODYNAMICS:

- **Rasa:** Katu, Tikta(Bitter), Madhura
- **Guna:** Laghu, Rooksha
- **Virya:** Ushna(Hot)
- **Vipaka:** Katu
- **Prabhava:** Sukha Virechaka
- **Dosha karma:** Pitta shodhaka, Vata anulomaka
- **Parts used:** Dried leaves, pod and root of the plant

- **Chemical Composition:** The basic constituents of senna are glycosides which include:

➢ Anthraquinone Glycosides: It contains two active crystalline glycosides viz Sennoside A&B. Sennidin A is dextrorotatory & B has no rotation being the mesoform,

➢ formed by the intra molecular compensation. It also contains Sennosides C&D, which are hetero-dianthrones with respective aglycones rhein & aloe emodin.

➢ Napthalene Glycosides: It contains a naphthalene glycoside known as tinnevellin glycoside (0.3%).

➢ Miscellanous: In fraction of flavonoid family senna contains yellow flavonol coloring matters keampferol (3,4,5,7-trihydroxyflavone), isohamnetin, β-sitosterol, calcium oxalate, mucilage, resin, saponins and polysaccharide hydrocolloids are also present.

Therapeutic Uses: The basic uses of Senna as follows:-

➢ The dried leaf of Senna is used as an purgative.

➢ Ayurveda has advised Virechana in conditions of Hepatomegaly, Splenomegaly and Jaundice to relive excessive Pitta from body using dried leaf or pod of Senna plant.

➢ It is used for irritable bowel syndrome, heamorhoids and weight loss.

➢ Senna leaves in dried form stimulates the liver for production of Pitta.

➢ The leaf of Senna is a blood purifier

The anthraquinones of this herb can inhibit a variety of bacteria and dermatomyces etc.[5]

MATERIALS AND METHODS

Collection of Drugs: Triphala & Senna Churna consist of four main ingredients in powder form, it consist of powder fruits of Terminalia Chebula Linn, fruits of Terminalia Bellerica Roxb ,fruits of Emblica Officinalis Gartn and leaves of Cassia Angustfolia Vahl. All the ingredients were procured from the local market of Gondia. Ingredients were identified on the basis of their morphological characters.

Collection of Powdered Drugs

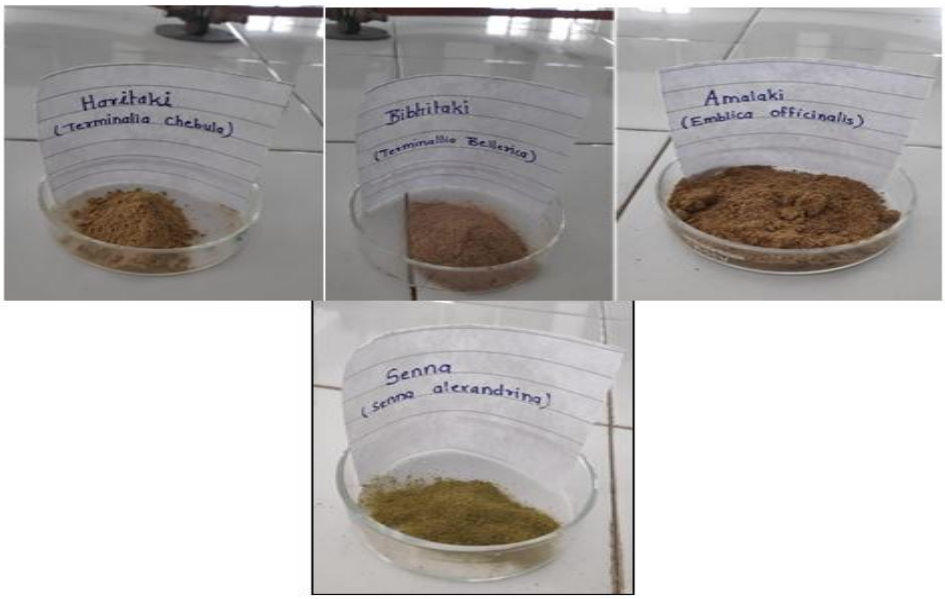


Figure 1: Crude Powdered Drugs of Triphala & Senna

Method of Preparation of Triphala & Senna Churna

The raw material used for this formulation were purchased from the market and authenticated in the Botanical Department of D.B.Science College, Gondia. The authentication is carried out based on the microscopic characteristics of powdered drugs.

Triphala & Senna Churna was prepared in laboratory using method described in Ayurvedic Formulary. The entire ingredient passed through 80# sieve and then mixed together in equal proportion to get uniform blended Churna by using spatula. The Lab preparation was named as LP (Lab Prepared).

Table No. 01: Ingredients of Triphala & Senna Churna.

SN	Ingredients	Formulations with their quantities				
		F1	F2	F3	F4	F5
1	Terminalia Chebula(Fruits)	15g	15g	15g	15g	12g
2	Terminalia Bellerica(Fruits)	15g	15g	15g	15g	15g
3	Emblica Officinalis(Fruits)	15g	15g	15g	15g	18g
4	Cassia Angustfolia Vahl(Leaves)	1g	2g	3g	4g	2g
5	Saindhav	2g	1.5g	1g	0.5g	1.5g
6	Sanchal	2g	1.5g	1g	0.5g	1.5g

Figure 2: Laboratory Prepared Triphala & Senna Churna.

Evaluation of Triphala & Senna Churna

Organoleptic evaluation: Organoleptic evaluation refers to evaluation of formulation by appearance, colour, odour, taste, etc. The Organoleptic characters of the preparations were carried out. However, these characteristic are judged subjectively and substitutes or adulterants may closely resemble the genuine material, it is often necessary to substantiate the findings by microscopy and physicochemical analysis.[6]

Table No. 02. Organoleptic characteristics of Triphala Churna LP.

Formulations	Organoleptic Characteristics		
	Color	**Odor**	**Taste**
F1	Dark green	Characteristic	Astringent
F2	Dark green	Characteristic	Astringent
F3	Light green	Characteristic	Bitter
F4	Dark green	Characteristic	Astringent
F5	Dark green	Characteristic	Bitter
Standard formulation	Dark yellow/slightly greenish	Characteristic	Bitter

Microscopic characteristic: Lignified tissues are to be confirmed by staining with different staining reagents. All the powders were boiled with chloral hydrate/glycerin and mounted on slide to observe under compound microscope (10x & 40x). First all powders were stained with few drops of mixture of 1:1 Phloroglucinol + Conc. HCl, after 3 to 4 minutes, lignified cells Parenchyma cell, fibre, Cork cell, Stone cell and Oleo resins etc. were observed . Further slides were stained with iodine to observe starch grains.[7]

Figure 3: Staining With Phloroglucinol+HCL and with Iodine solution.

Phytochemical Screening[8]

SN	Phytoconstit uents	Name of test	Observation									
			Aqueous					Alcohol				
			F1	F2	F3	F4	F5	F1	F2	F3	F4	F5
1	Alkaloids	Hager's Wagner's Mayer's	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
2	Glycosides	Killer-killiani test	-	-	-	-	-	-	-	-	-	-
3	Carbohydrates	Molish test	+	+	+	+	+	+	+	+	+	+
4	Proteins	Biuret test Milan's test	- -	- 	- -	- -	- -	- -	- -	- -	- -	- -
5	Amino acids	Ninhydrin	-	-	-	-	-	-	-	-	-	-
6	Steroids	Salkowski	+	+	+	+	+	+	+	+	+	+
7	Flavonoids	Alkali reagent Leadacetate	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +
8	Terpenoids	Copperacetate	-	-	-	-	-	-	-	-	-	-
9	Tannins	FeCl3	+	+	+	+	+	+	+	+	+	+
10	Sapiens	Foam test	+	+	+	+	+	-	-	-	-	-
11	Phenol	FeCl3 Lead acetate	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +	+ +

Physico-Chemical Investigation Ash Value

The ash remaining after the 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-soluble ash is the difference in weight between the total ash and the residue after treatment of the total ash with water.

The residue remaining after incineration is the ash content of the drug which simply represents inorganic salts, naturally in drug or adhering to it or deliberately added to it as a form of adulteration. Physiological ash is the total ash of the drug is inclusive of physiological as well as non-physiological ash. Physiological ash is derived from the plant tissues, while non-physiological ash consist of residue of the extraneous matter (such as soil, sand etc.) adhering to the herb itself. Ash value is a criterion to judge the identity or purity of crude drugs. Total ash usually consists of carbonate, oxides, phosphate, silicates and silica. Acid insoluble ash, which is a part of total ash insoluble in dilute HCL, is also recommended for certain drugs.

Determination of Total Ash

Total Ash determination consists of detecting the physiological ash (ash derived from plant tissue) and the non-physiological ash (ash from extrageneous matter, especially sand and soil adhering to the surface of the drug).2g of powdered material of each formulation and the individual ingredients of the powders were placed separately in a suitable tarred crucible of silica previously ignited and weighed. The powdered drugs were spread evenly and weighed accurately. The materials were incinerated by gradually increasing the heat, not exceeding 450°C until free from carbon, cooled in a desiccator, weighed and percentage ash was calculated by taking in account the difference of empty weight of crucible & crucible with Total Ash.[9]

Acid Insoluble Ash

Total Ash obtained was boiled for 5min with 25ml of dilute hydrochloric acid. The insoluble matter was collected on an ash less filter paper, washed with hot water and ignited to constant weight. The percentage of acid-insoluble ash with reference to the air-dried drug was calculated.

Water Soluble Ash

The Total Ash obtained was boiled with 25 ml water for five minutes and then filter through an ash less filter paper. The filter paper was ignited in the silica crucible to constant weight.[9] The water soluble ash was calculated.

Table No. 03. Determination of Ash value of LP.

S N	Formulations	Total ash %(w/w)	Acid insoluble ash (w/w)	Water soluble ash %(w/w)
1	F1	11	2.1	2.5
2	F2	10	2.7	2.3
3	F3	7.6	2.2	2
4	F4	8.2	3.4	4.2
5	F5	6.6	4	5.3
6	Std formulation	NMT 8%	NMT 3%	NMT 9.6%

Extractive Value

The extracts obtained by exhausting crude drugs are indicative of approximate measures of their chemical constituents. The solvent used for extraction is in a position to dissolve appreciable quantities of substances desired.

They are also useful for the evaluation of a crude drug and at the same time give an idea about the nature of the chemical constituents present, which is helpful for the estimation of specific constituents, soluble in that particular solvent used for extraction. For this purpose we have to determine alcohol-soluble and water soluble extractives. Water soluble extractive value gives idea about presence of tannins, sugars, plant acids, mucilage and other water soluble phytochemicals. It also indicates about drug quality, adulteration and or incorrect processing. The alcohol soluble extractives are also indicatives of the same purpose and at the same time are best to determine the resin content of a drug

Determination of Water Soluble Extractives

5gms of each Triphala & Senna Churna was accurately weighed and placed inside a glass stoppered conical flask. It is then macerated with 100ml of chloroform water for 18 hours. It was then filtered and about 25ml of filtrate was transferred into a china dish and was evaporated to dryness on a water bath. It was then dried to 105°C for 6 hours, cooled and finally weighed and water soluble extractive value was calculated.

Determination of Alcohol Soluble Extractive

5gms of each Triphala & Senna Churna was accurately weighed and placed inside a glass stoppered conical

flask. It was then macerated with 100ml of ethanol 18 hours. It was then filtered and about 25ml of filtrate was transferred into a china dish and was evaporated to dryness on a water bath. It was then dried to 105°C for 6 hours, cooled and finally weighed and calculated.[10]

Extractive Value

Table No. 04. Determination of Extractive value of LP.

S N	Formulations	Water soluble extractive	Alcohol soluble extractive
1	F1	48.7% w/w	9.72% w/w
2	F2	51.2% w/w	10.02% w/w
3	F3	46.8% w/w	9.1% w/w
4	F4	50.2% w/w	11.06% w/w
5	F5	47.3% w/w	9.8% w/w
6	Std. formulation	46.2% w/w	8.6% w/w

Table No. 05. Determination of LOD of LP.

S.N.	Formulations	Loss on Drying (LOD)
1	F1	7%
2	F2	15%
3	F3	11%
4	F4	20%
5	F5	13%
6	Standard formulation	NMT 12%

Determination of pH:

1% w/v 0r 10%w/v solution of samples were prepared in distilled water and pH was determined using Digital pH Meter Model EQ- 610.[11]

Table No. 06. Determination of PH.

S.N.	Formulations	PH
1	F1	7.1
2	F2	7.2
3	F3	6.4
4	F4	4.5
5	F5	7
6	Standard formulation	6.2

Table No.07. Evaluations of physical properties of churna for LP.

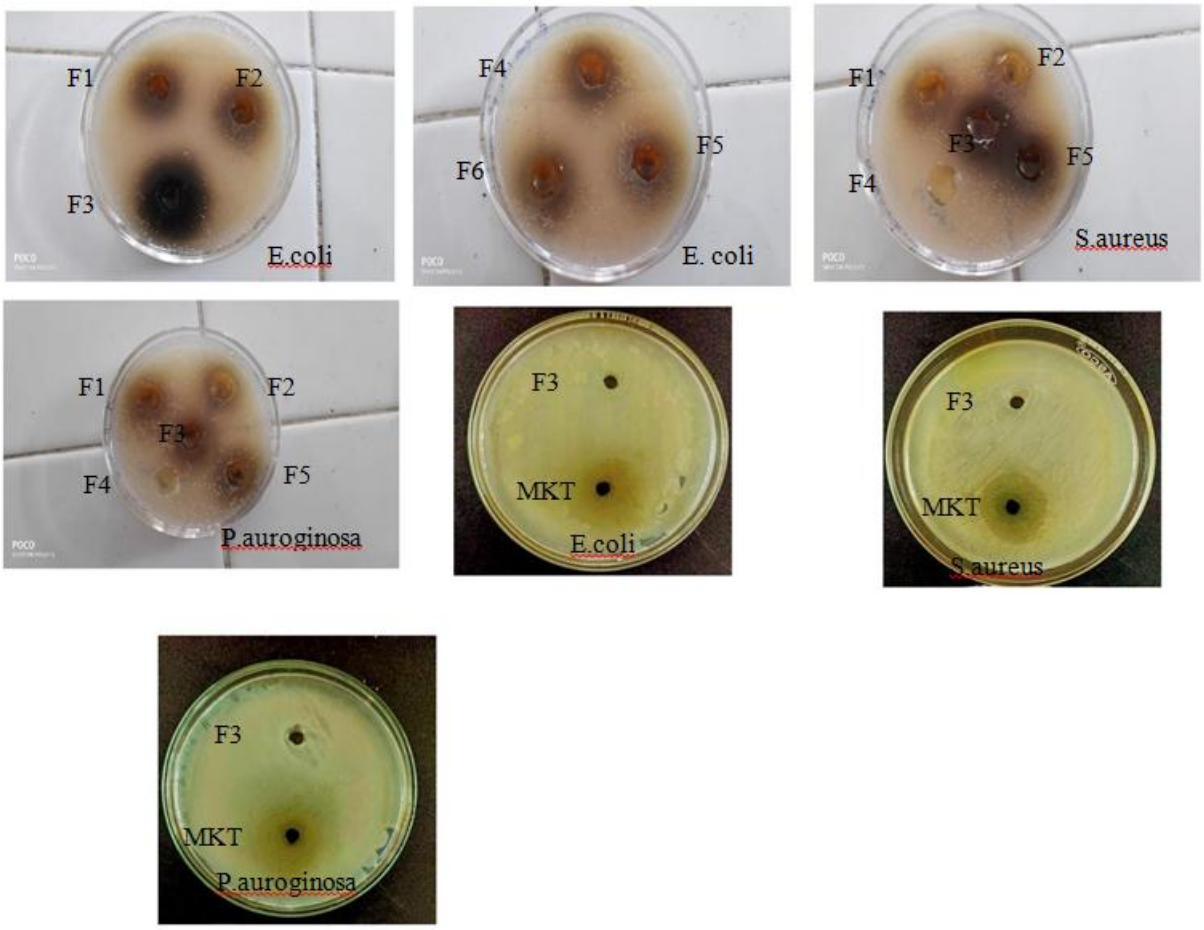
S.N.	Physical properties	Formulations					
		F1	F2	F3	F4	F5	Standard formulation
1	Bulk density	0.5379 gm/ml	0.5279 gm/ml	0.4902 gm/ml	0.5333gm /ml	0.5102gm /ml	0.4879gm/ml
2	Tapped density	0.7209 gm/ml	0.7019 gm/ml	0.6476 gm/ml	0.6888gm /ml	0.6976gm /ml	0.6455gm/ml
3	Angle of repose	25.2	26.3	22.9	24.5	23.23	22.3
4	Hauser's ratio	1.5230	1.4320	1.3420	1.4222	1.4576	1.3230
5	Carr's index	25.456	24.918	24.618	25.220	24.877	24.415

Antimicrobial Activity[13]

Presence of microorganism also effects the stability of the drug. Sample of 10g was wighed and 100ml of sterile distilled water in a sterilized conical flask are prepared for serial dilution. The flasks are kept in a mechanical shaker for five minutes to obtain uniform suspension of microorganism. The dilution is 1-10. From this 1 ml of dilution from 10-1 sample is taken and transferred in to 9ml, this is 10-2 dilution. The procedure is repeated up to 2-4 tmes. Antimicrobial efficacy of various extracts was assessed by disc diffusion method against Gram positive bacteria-Staphylococcus Aureus, Gram negative-Escherichia coli, Pseudomonas aeruginosa. Transfer this serial dilution to sterilized petri dishes for enumerating

pathogens which are:-
Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa[14,15,16]

Antimicrobial Assay



RESULT AND DISCUSSION

Table No. 08 Antimicrobial Assay.

Sr. No.	Type of Bacteria	Colony Forming Unit (CFU)				
		F1	F2	F3	F4	F5
1	S.aureus	60	66	82	62	54
2	E.coli	62	68	79	60	59
3	P.auroginosa	50	54	56	49	47

Table No. 09 Comparative Antimicrobial Assay.

S N	Type of Bacteria	Colony Forming Unit (CFU)	
		F3	MKT
1	S.aureus	70	80
2	E.coli	65	75
3	P.auroginosa	48	52

The antimicrobial activity of the Triphala and senna churna was quantitatively assessed by the presence or absence of the inhibition zone and by measuring the diameter of the inhibition zone around the wells or disks.The antimicrobial activity was done by using different organisms namely S.aureus, E.coli, P.auroginosa. The results of antimicrobial activity is shown in table no. 08. The above result help us to choose the more effective formulation (here F3). The total ash value is an indicative of total amount of inorganic material after complete incineration and the acid insoluble ash value is an indicative of silicate impurities, which might have arisen due to improper washing of drug. The loss on drying value obtained is an indicative of amount of moisture content present in the drug. The extractive values names water soluble indicates the amount of active constituent in given amount of plant material when extracted with respective solvent, values

obtained supports the fact that drug is unexhausted which is contrary to lower extractive value.

CONCLUSION

Constipation is the infrequent bowel movements in common language its hardening of stools. Triphala churna is found useful in treating constipation. Hence the main motive behind this project work is to DESIGN POLYHERBALFORMULATION FOR METABOLIC DISORDER (here constipation).The activity of the formulation was examined using Antimicrobial assay. Triphala and Senna have significant antibacterial activity. From the designed formulation the mosteffective formulation was chosen and comparatively studied with the marketed formulation. . The comparison between the marketed sample and lab made churna have been done on the basis of which it shows satisfactory results. From the present investigation of various standardization parameters such as physicochemical standards like total ash, acid insoluble ash, water soluble extractive values, loss on drying, flow properties and safety evaluation were carried out, it can be concluded that the formulated Triphala & Senna churna contains all good characters comparitive with marketed Triphala churna and it was found to be harmless, more effective, and economic.

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