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FORMULATION AND STANDARDISATION OF POLYHERBAL ANTI ACNE CHURNA

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ABSTRACT

The main aim for the formulation of polyherbal anti-acne churna. Ayurvedic medicines are significant part of healthcare throughout the world. Herbal medicines have been widely used as effective remedies for prevention and multiple health conditions. Ayurvedic herbal preparations based on the medicinal plants are used in modern health care as cosmetic and to prevent common bacterial diseases caused by variouspathogens. There are numerous synthetic drugs available in the market which can cause adverse effects. To avoid the adverse irritation of synthetic formulation, an attempt has been made to formulate a polyherbal anti-acne churna usingEmblica officinalis, Terminalia chebula, Terminalia bellirica, Myristica fragrans, Glycyrrhiza glabra, Azadirachta indica and Curcuma longawith buttermilk which are reported to have very beneficial effect on acne due to anti-microbial, anti-inflammatory and anti-oxidant activities of different chemical constituents. Parameters such organoleptic characters, powder microscopy, physical and physiochemical characters, crude fiber content, p^h, phytochemical tests, limit test and antimicrobial activity. The present study was carried out to formulate polyherbal anti-acne churnawhich is used for the purpose of prevention of bacterial growth and enhancement of complexion. Hence, it can be concluded that the polyherbal anti-acne churna is much better than synthetic formulation due to their ingredients and its effectiveness on our skin.

KEYWORDS: Polyherbal anti-acne churna, anti-acne activity, Emblica officinalis, Terminalia chebula, Terminalia bellirica, Myristica fragrans, Glycyrrhizaglabra, Azadirachtaindica, Curcuma longa.

INTRODUCTION

Ayurvedic formulation: Ayurveda is considered as the "science of life". India has an ancient heritage of traditional herbal medicine focused views of man and his illness. The use of medicines for treating various diseases predates human history forms the origin of much of the modern medicine. It becomes affordable treatment available to poor people in remote communities. It is used in primary health care conventional drug usually provide effective antibiotic therapy for bacterial infections, but there is an increasing problem of antibiotic resistance and a continuing need for new solutions. Hence now herbal drugs are prefer to synthetic antibiotics.[1]

Standardization: Standardization is the code of conduct that ensures the correct substance in correct amount for desired therapeutic effect (safety, quality and efficacy) is known as standardization. It evaluates andgives an account of all operations taken during manufacturing process and qualitycontrol thus leads to reproducible quality of particular product. Itconfirms authentication of drugs and determines its quality and purity.

The word standardization should encompass entire field of study from cultivation of medicinal plant to its clinical application and focus all aspects of medicinal plant research from ethno-pharmacology (traditional medicinal use), utilization (how plant use in specific disease), isolation and identification of active constituents to efficacy evaluation, safety, formulation and clinical evaluation.[2]

Introduction to churna

Churna is a fine powder of drug or combination of drugs. Each ingredient is pulverized separately and mixed together in the specified proportion. The principle of churna is due to the fact that therapeutic value of most of the substances greatly increases when they are reduced to very fine state of subdivision.[3] Churna alone is not administered generally; it is often taken with some Anupana or vehicle such as water, butter milk, honey, milk, ghee, etc. depending upon the formulation and indication.[4]

Churna as face pack: Herbal formulations have growing demand in the world market.[5] A great demand from Ayurveda in the field of cosmetology has been established due to its unique concept about beauty and effective, cheaper and long lasting beauty therapy without any side effect.[6] The advantage of herbal cosmetics is their non-toxic nature, reduce the allergic reactions and time tested usefulness of many ingredients.[7]

Mukhalepa (face pack) in Ayurveda is mentioned under LepaKalpana, One or more drugs are pounded to fine powder form and mixed with any of the specified liquid media to prepare Lepa can be used for treatment of various disease conditions and for beauty of face. It plays a vital role in the field of cosmetology, it is an application of beauty treatment. Mukhalepa helps in Sodhana (purification) of facial skin and is available for all kinds of seasons and Dosha predominance Vata, Pitta, Kapha in classical text.[8]

Face pack is the smooth powder which is one of the well-known effective and oldest methods in which the cosmetic preparations. It is spread over the face and left for some time to cleanse and improve the condition of the skin by forming a film giving tightening, strengthening and cleansing effect to the skin. It is also used to stimulate blood circulation, rejuvenate and help to maintain the elasticity of the skin and remove dirt from skin pores. It is a very good attempt to establish the herbal face pack containing different powders of plants.[9]

Anti-acne activity: Acne vulgaris, a chronic inflammatory disorder in adolescents consists of the pilosebaceous follicles, characterized by comedones, papules, pustules, cysts, nodules and often scars, chiefly on face, neck etc.[10] Patients having acne have an associated increased secretion of sebaceous gland, leading to increase oiliness of the skin.[11] Pathophysiology of acne is attributed to different notable factors such as androgen-mediated stimulation of sebaceous gland activity, follicular hyperkeratinisation, hormonal imbalance, inflammation and external bacterial infection. Propionibacterium acnes and Staphylococcus epidermidis are the major bacteria found on skin which causes acne.[12]

Mode of action: According to Ayurveda science Lepa is applied against the hair follicular direction that is (PratilomaGati). Minute particles penetrate into the Twaka against gravitational pull, weight of drug and Upashoshana property of Vayu (Vyana and Samana) play a major role in penetration. Drug metabolism possible through Bhrajaka Pitta. Drug penentrate according to its (active principle) that is called Virya of Drug and its Prabhava.

In modern it works on the basis of ficks law compound applied topically to the skin surface migrate along concentration gradient according to the law of diffusion penetration pathway intercellular, follicular, intracellular. Face pack applied penetrate through stratum corneum compound is released from reservoir, diffuse into and through variable epidermis into dermis gain access into systematic compartment through vascular system hence diffusion through dermal and hypodermal tissue to reach underline tissue.[8]

AIM AND OBJECTIVE

- The aim and objective of this work is to formulate a polyherbal anti-acne churna as a face pack for cosmetic purpose and perform the standardization of final formulation.
- 7 herbal ingredients Amlaki, Haritaki, BibhitakiYastimadhu, Jathiphala, Nimba and Haridra were used as principle ingredient and were formulated as churna and mixed with buttermilk as face pack.
- To assess efficacy of anti-acne activity and enhancement of complexion.
- To reduce side effect and avoid irritation of synthetic and chemical substances.

MATERIALS AND METHODS

Plant profile

SI. No	Sanskrit Name	Botanical Identity	Part Used	Quantity
1	Amalaki	Emblica officinalis	Fruit pericarp	1 Part
2	Haritaki	Terminalia Chebula	Fruit pericarp	1 Part
3	Bibhitaki	Terminalia bellirica	Fruit pericarp	1 Part
4	Jathiphala	Myristica fragrans	Seed	1 Part
5	Yashtimadhu	Glycyrrhiza glabra	Root	2 Parts
6	Nimba	Azadirachta indica	Leaf	2 Parts
7	Haridra	Curcuma longa	Rhizome	2 Parts

Preparation of Churna: Anti-acne churna consist of 7 main ingredients in powder form. It consist of powder of fruit of Emblica officinalis (1 part), Terminalia chebula (1 part), Terminalia bellirica (1 part), powder seed of Myristica fragrans (1 part), powder of root of Glycyrrhiza glabra (2 parts), powder of leaf of Azadirachta indica (2 parts) and powder of rhizome of Curcuma longa (2 parts).[13] [14] [5] [8]

Collection of materials: The fruit of Amla, Bahera, Myrobalan, and Liquorice were collected from the college laboratory. The leaves of neem and rhizome of turmeric was collected in the month of December from the home garden in Malappuram district. All the ngredients were identified and authentified by the guide Mrs. Rahmabi KP, Associate Professor, Department of Pharmacognosy, Jamia Salafiya Pharmacy College, Pulikkal.

Method of preparation: Drugs according to the composition of the churna are collected, dried, powdered individually and passed through sieve number 80 to prepare a fine powder. They are mixed in the specified proportion to get uniform blended churna and stored in well closed container in cool and dry place. It should not adhere together or become moist. The fine the powder, the better its therapeutic value.[15]

Application of face pack: Take prepared churna in a bowl as per the requirement (half teaspoon) and add buttermilk (one teaspoon) to get a smooth paste. Mix well and apply over the facial skin. Cover the acne and blemishes spots too. Kept as it is for complete drying for 20 to 25 min and then wash with cold water.

Figure 3: Poly herbal anti-acne churna.

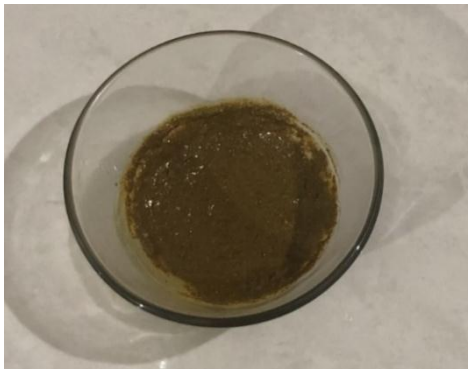


Figure 4: Face pack.

RESULTS AND DISCUSSION

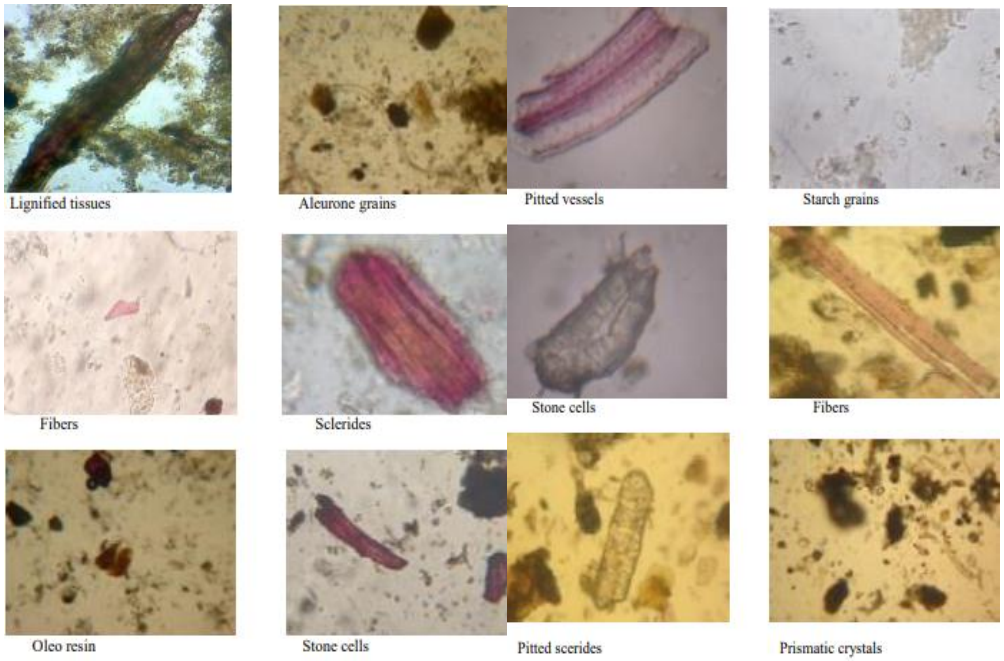
1. Organoleptic Characters

Table 1: Organoleptic Characters.

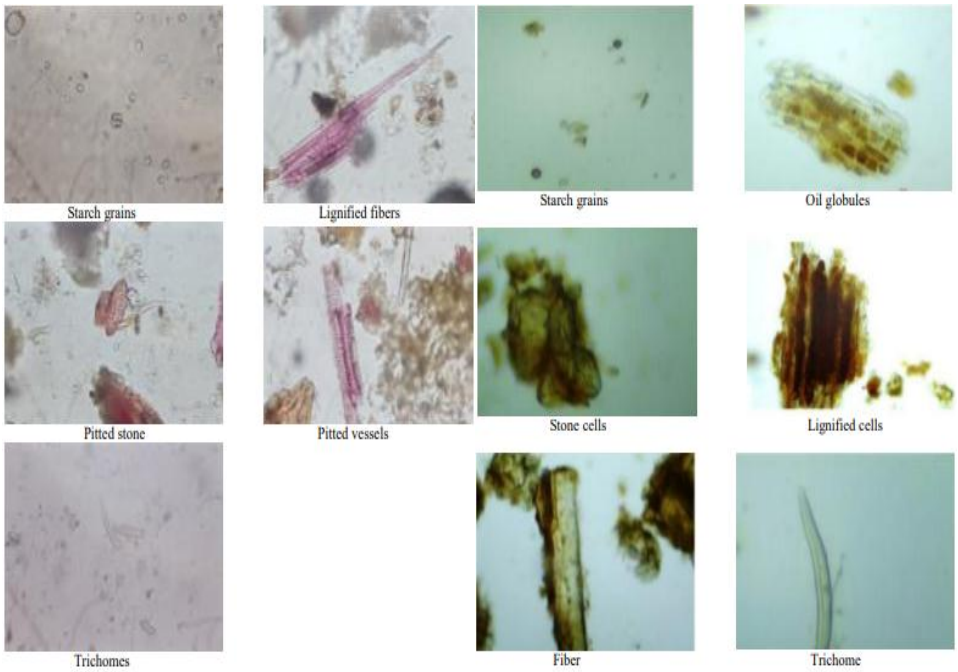
SI No	Organoleptic Character	Result
1	Appearance	Powder
2	Colour	Greenish yellow
3	Taste	Bitter
4	Odour	Characteristic

2. Powder Microscopy

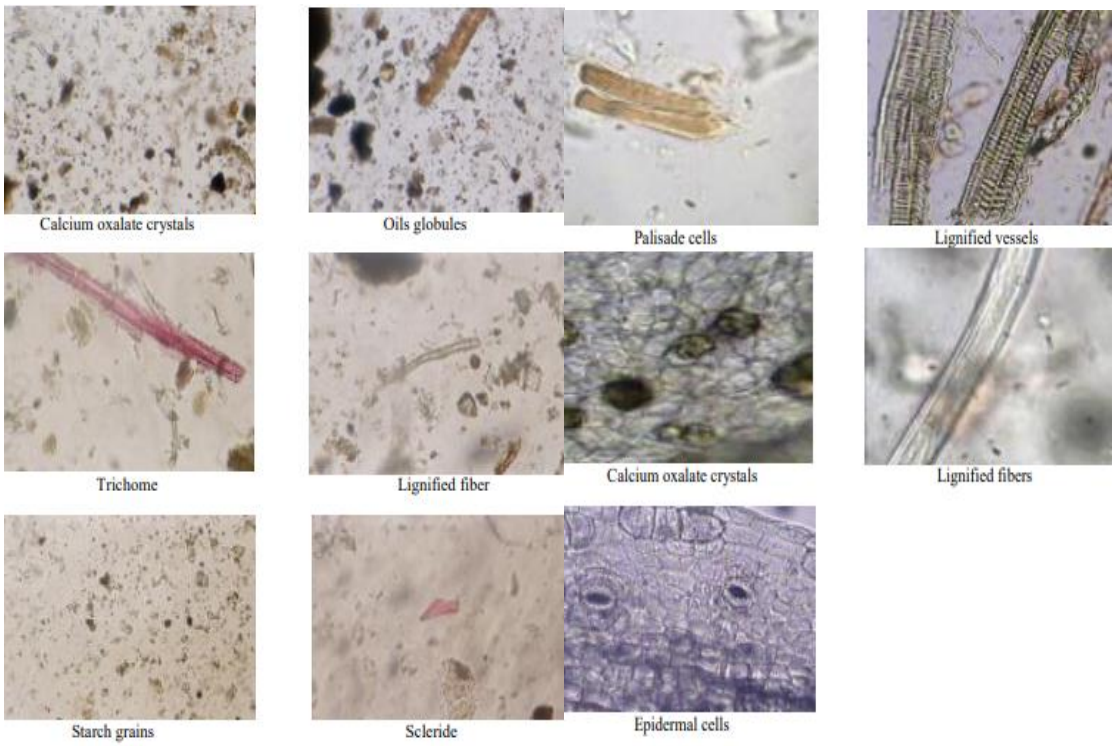
Table 2: Microscopic characters.



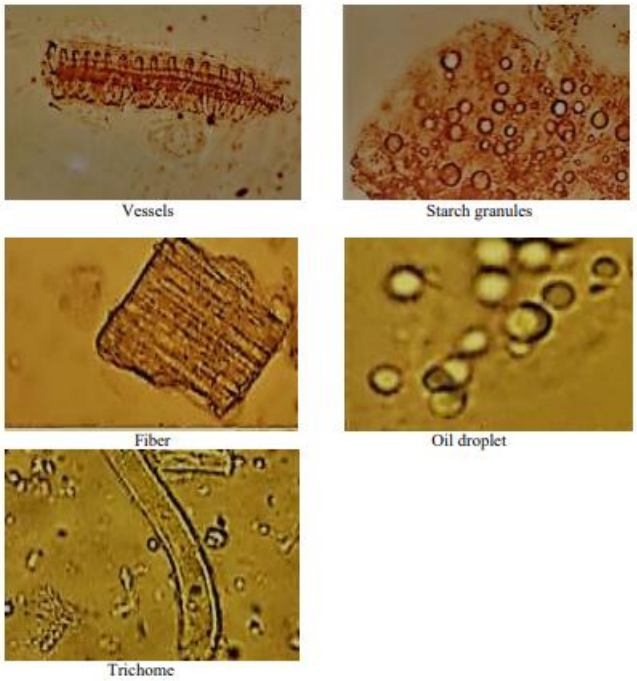
Emblica officinalis Terminalia chebula



Terminalia bellirica Myristica fragrans



Glycyrrhiza glabra Azadirachta indica



Curcuma longa

3. Physical characters

The flowability of the formulation was found to be very poor, further confirmed by hausner and carr's index.

Table 3: Physical characters.

SI No	Parameters	Result
1.	Bulk Density	0.33 g/cm^3
2.	Tapped Density	0.50 g/cm^3
3.	Angle of Repose	41.63^0
4.	Hausner Ratio	1.51
5.	Carr's Index	34.00

4. Physio Chemical Analysis

Table 4: Physio Chemical Analysis.

SI. No	Physio Chemical Analysis.	Result (%w/w)
1	Total ash	5.65
2	Acid insoluble ash	2.67
3	Water soluble ash	2.51
4	Alcohol soluble extractive value	3.24
5	Water soluble extractive value	1.20
6	Loss on drying	0.320

5. Crude fiber content

Table 5: Crude fiber content.

SI. NO	Formulation	Crude fiber content
1	Anti-acne churna	0.45

6. Determination of p^H

Table 6: P^H of Churna.

SI. NO	Formulation	P^H
1	Anti-acne churna	5.5 (acidic)

- The physico-chemical characteristic, crude fiber content and p^H of the formulation were found to be within standard ranges.

7. Limit test for heavy metals

The result obtained from limit test reveals absence of heavy metals (cadmium, bismuth, lead). There by confirming the non-toxic nature of preparation.

Table 8: Limit test for heavy metals.

Test for Cadmium.

Test	Observation	Result
NH4OH added in the sample solution	White ppt. is absent	Absence of cadmium
Potassium ferrocyanide is added in the sample solution	White ppt. is absent	Absence of cadmium

Test for Bismuth.

Test	Observation	Result
H2S gas added in the sample solution	Dark brown ppt. is absent	Absence of bismuth
NH4OH is added in the sample solution	White ppt. is absent	Absence of bismuth

Test for Lead.

Test	Observation	Result
DilHCl added in the sample solution	White ppt. of CaCl2 is absent	Absence of lead
KI is added in the sample solution	Yellow ppt. is absent	Absence of lead

6. Pytochemical Tests

The result obtained from phyto chemical screening reveals that phytoconstituents like Alkaloids, Carbohydrates, saponins, Flavanoids, Phenol, Terpinoids, glycosidees, Volatile oils were present in sample.

Table 9: Pytochemical Tests.

SI. No	Phytochemicals	Test	Result
1.	Alkaloids	Mayers Test	+
		Wagners Test	+
		Dragondroffs Test	+
2.	Carbohydrates	Molisch	+
		Fehlings Test	+
3.	Flavanoids	Shinoda Test	+
4.	Saponins	Froth Test	+
5.	Steroids	Libermann&Burchard Test	-
6.	Phenol	Ferric chloride test	+
7.	Tannins	Lead Acetate	+
8.	Terpinoids	Salkowskis Test	+
9.	Glycoside	Keller Killani Test	+
10.	Amino acids	Ninhydrin reagent	-
11.	Volatile oils	Sudan red III	+
12.	Fats and oils	Spot Test	_

7. Antibacterial activity

Microorganism: E coli (gram-ve), Standard antibacterial agent: Gentamicin (10mg/disc). Agar well diffusion method was used for churna.

The formulation possess good antibacterial activity. Various concentrations of formulation showed activity against gram negative E.coli and were compared with that of gentamycin as standard.

SI. No	Treatment	Concentration	Zone of inhibition (mm)
1.	Gentamycin	10 mcg	22 mm
2.	C1	100 mg/ml	11 mm
	C2	150 mg/ml	14 mm
	C3	200 mg/ml	18mm
	C4	250 mg/ml	19 mm

Zone of inhibition

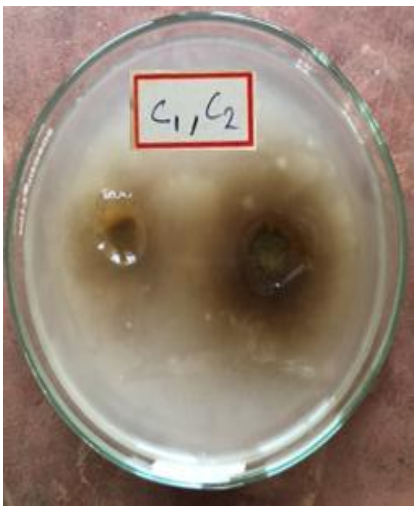
Gentamycin

Before incubation

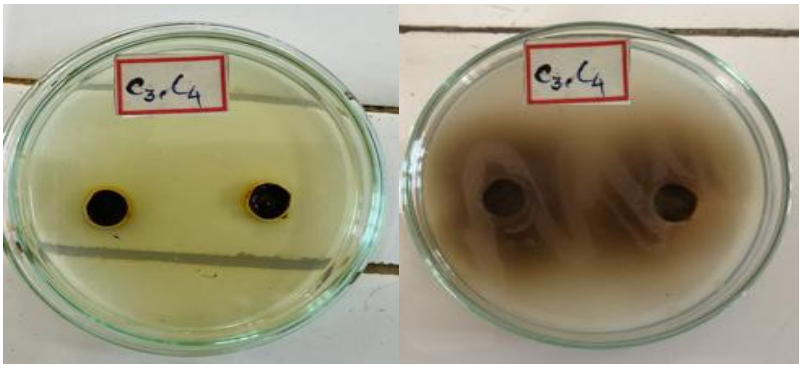
After incubation

Formulation

Before incubation



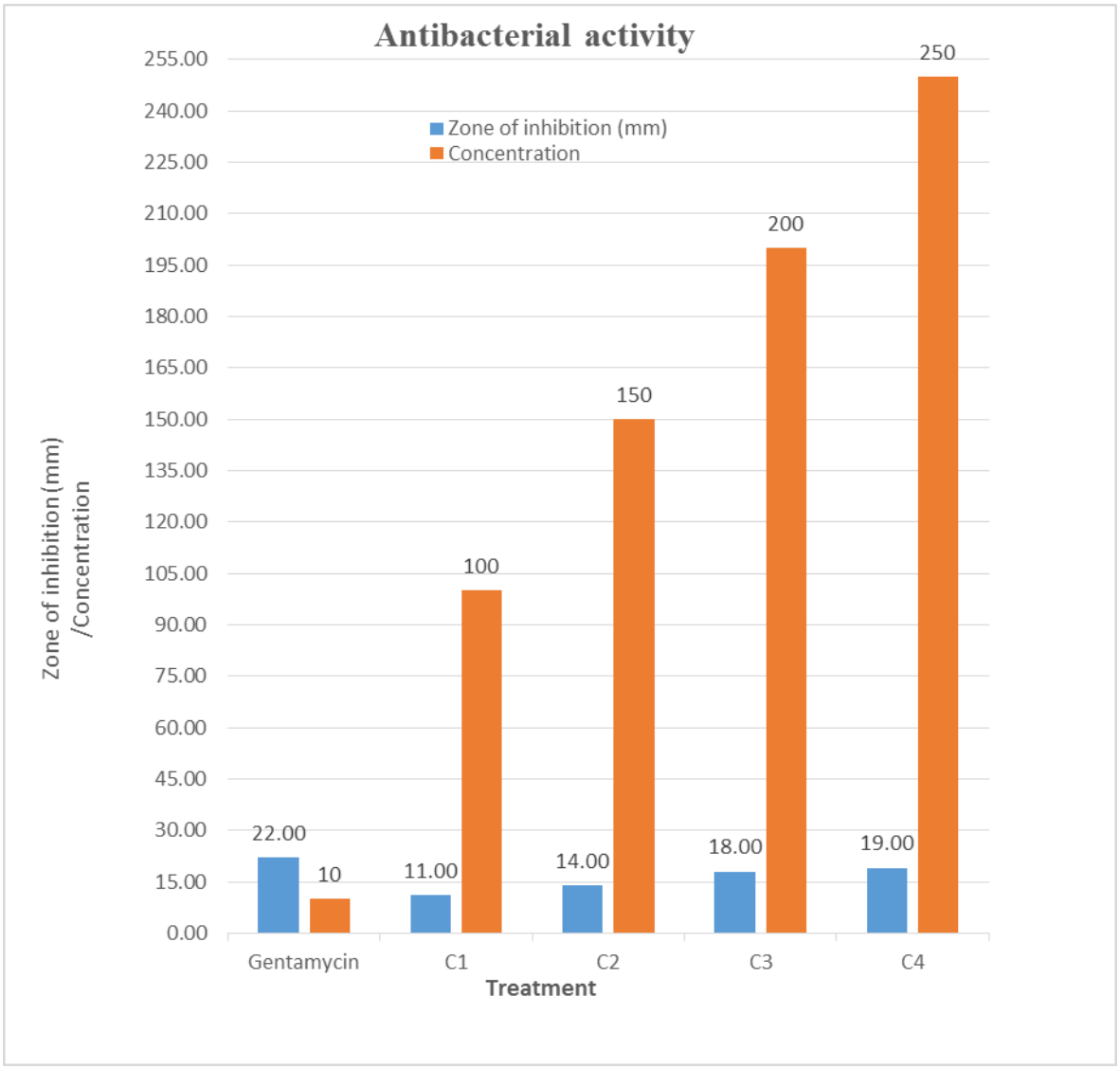
After incubation



Before incubation **After incubation**

Figure 20: Antibacterial activity of churna.

Graphical representation



Treatment v/s Zone of inhibition/Concentration

CONCLUSION

This evaluation study was intended to determine quality and phytochemical characteristics of anti-acne churna. The development of churna was based on outcome of organoleptic, physical characters physicochemical and phytochemical analysis and limit test for heavy metals. The result were found to be highly accurate and reliable. The Study suggested that, polyherbal formulation contain vitamin c in amla, tannins, gallic acid, ellagic acid, chebulic acid in myrobalan and bahera, phenylpropenes like myristicin, volatile oils, terpenoids, and lignins in nutmeg, triterpenoidsaponin glycoside glycyrrhizin in licorice, azadirachtin, Nimbin, nimbidin in neem, curcuminoids in turmeric, and polyphenols in almost all of these ingredients have great potential as anti-inflammatory, antimicrobial, antioxidant and in stimulation and regeneration of skin. This may be used medically to treat dermatologic diseases. This study supports the use of these herbal preparation to prevent or control acne. The present study can serve as the reference for future work on polyherbal anti-acne churna.

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