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FORMULATION AND EVALUATION OF ANTIFUNGAL CREAM BY USING MORINGA OLIEFERA AND PONGAMIA PINNATA

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ABSTRACT :

The purpose of this study was to create an antifungal cream with natural extracts from Pongamia pinnate and Moringa oleifera, and to assess the cream's effectiveness against common fungal infections.Using the appropriate solvents, extracts from Pongamia pinnata and Moringa oleifera were made and added to a cream base. Using the agar diffusion and broth dilution procedures, the antifungal activity of the prepared cream was assessed against a range of fungal strains. Physical attributes were evaluated, including texture, pH, color, and odor. Studies on stability were carried out to ascertain the cream's shelf life. Additionally, patch tests on human volunteers were used to assess the possibility of skin irritation. Tested fungal strains such as Candida albicans and Trichophyton mentagrophytes were significantly inhibited by the antifungal cream comprising extracts from Moringa oleifera and Pongamia pinnata. Stable cream compositions with desired sensory qualities were found through physical assessment. Patch testing revealed a low risk of skin irritation.With good stability and tolerability, the antifungal cream that was created using extracts from Pongamia pinnata and Moringa oleifera shown promise activity against fungal infections. To evaluate its clinical effectiveness and safety for human usage, more research is necessary.

Keywords: Antifungal cream, Moringa oleifera, pongamia pinnata.

INTRODUCTION :

In recent years, herbal creams that are made with substances derived from plants have gained a lot of attention as healthier substitutes for skincare products. Herbal creams, which use the healing qualities of medicinal plants to address a range of issues like dryness, irritation, aging, and inflammation, provide a comprehensive approach to skin health.[1]

The process of creating herbal creams is removing these beneficial substances from medicinal plants and combining them with an appropriate foundation, such a cream or lotion. Because each plant extract has a distinct therapeutic value, customized skincare products that address certain skin issues are possible. Herbal creams sometimes contain aloe vera, calendula, chamomile, lavender, green tea, and rosehip as botanical components.[2]

The effectiveness of herbal creams in managing a range of dermatological disorders and boosting skin health is supported by scientific studies. Research has indicated that botanical extracts possess anti-inflammatory properties, the capacity to bolster the skin barrier, and the ability to incite collagen formation and boost skin suppleness. Herbal creams can be used to prevent and cure skin infections since they have been demonstrated to have antibacterial action against a variety of pathogens.[3]

For hundreds of millions of years, fungi have coexisted with humans on Earth, evolving alongside them over time. On Earth, there are over two million distinct kinds of fungus that may be found on human skin, numerous interior surfaces, plants, trees, animals, and mammals.[4,5] Human health and life are consistently at risk from fungal infections.[6]These human fungal infections fall into three categories: (a) fungal protein allergies; (b) fungal toxins-related toxic responses; and (c) fungal infections (mycoses).

A wide range of superficial, cutaneous, subcutaneous, and even systemic infections can cause everything from minor infections of the nails and feet to serious, potentially fatal disseminated diseases (like histoplasmosis) in otherwise healthy people.[7]Opportunistic pathogens, which can be endogenous (Candida infections) or acquired from the environment (Cryptococcus, Aspergillus infections), are responsible for a large number of fungal infections.[6]

In addition to causing skin and mucosal surface infections, fungi can also cause superficial infections. While not life-threatening, these infections are more common than invasive fungal infections (IFI) and significantly lower an individual's quality of life.[8,9]

Two extensively researched plants with a variety of pharmacological qualities, such as antibacterial and antifungal actions, are Moringa oleifera and Pongamia pinnata. The Indian subcontinent is home to Moringa oleifera, sometimes known as the "drumstick tree," which is highly valued in traditional medical systems for its therapeutic benefits. Another significant plant in traditional medicine is Pongamia pinnata, sometimes called the Indian beech or pongam tree. It is native to tropical places such as India.[10,11]

Antifungal creams containing extracts or active ingredients from P. pinnata and M. oleifera have a lot of promise to treat a variety of fungal skin illnesses in a way that is both safe and effective. Comprehensive study is yet required to compare the effectiveness of these creams with currently available antifungal medications, evaluate the stability, safety, and efficacy of the formulation parameters, and optimize the latter.[12]

Mechaniam of Action

It is inefficient against bacteria or yeast and works in a fungistatic way against most other dermatophytes. It is less effective against deep mycoses.[13] The first inhibitory drug that was specific to fungi was called griseofulvin (Fig. 1). Right now, it's unclear how precisely this substance functions.[14] When the serum concentration of griseofulvin is less than 1 pug/ml, it might be helpful for dermatophyte infections. In vitro drug resistance can be produced by cultivating certain dermatophyte strains at increasing drug concentrations.[15] With limited known concerns of liver damage, griseofulvin only shows mild selective toxicity for fungus. It only primarily interacts with dermatophyte fungus. The causes of ringworm and athlete's foot. It is known, meanwhile, that some other types of substances, such as those present in C.neoformans, can interfere with the formation and functionality of microtubules in pathogenic fungus.[17] Because the body flushes away griseofulvin fast, it must be taken for a longer period of time before it becomes effective.[16]

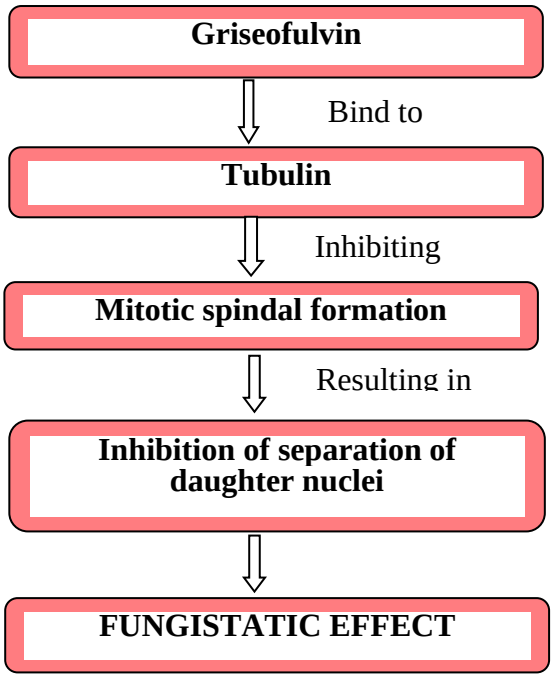


Fig 1: Mechanism of Action [17]

Advantages

- Widespread availability with a reduced chance of negative effects.
- Works well with long-term care.
- Their low cost effectiveness adds to their allure.
- Herbal medication efficiently promotes the body's natural detoxification process.[18]

Disadvatages

- Dosing in bulk.
- Unstable liver metabolism, increased acidic pH, etc.
- Large molecule size restricting passive diffusion absorption.
- Processing the medication requires a large volume of raw materials.
- The medicinal efficacy of a whole herbal extract may be partially or completely lost when specific components are separated and purified.[18]

3. AIM AND OBJECTIVES

Aim :

This research aims to examine in detail the formulation and assessment of an antifungal cream using extracts from Pongamia pinnata and Moringa oleifera. The goal of this study is to close the knowledge gap about the prospective advantages of various plant extracts working in concert to treat fungal skin diseases. By employing an approach that includes formulation development, efficacy testing, mechanism clarification, and safety assessment, this research seeks to offer significant insights into the creation of new herbal antifungal treatments.

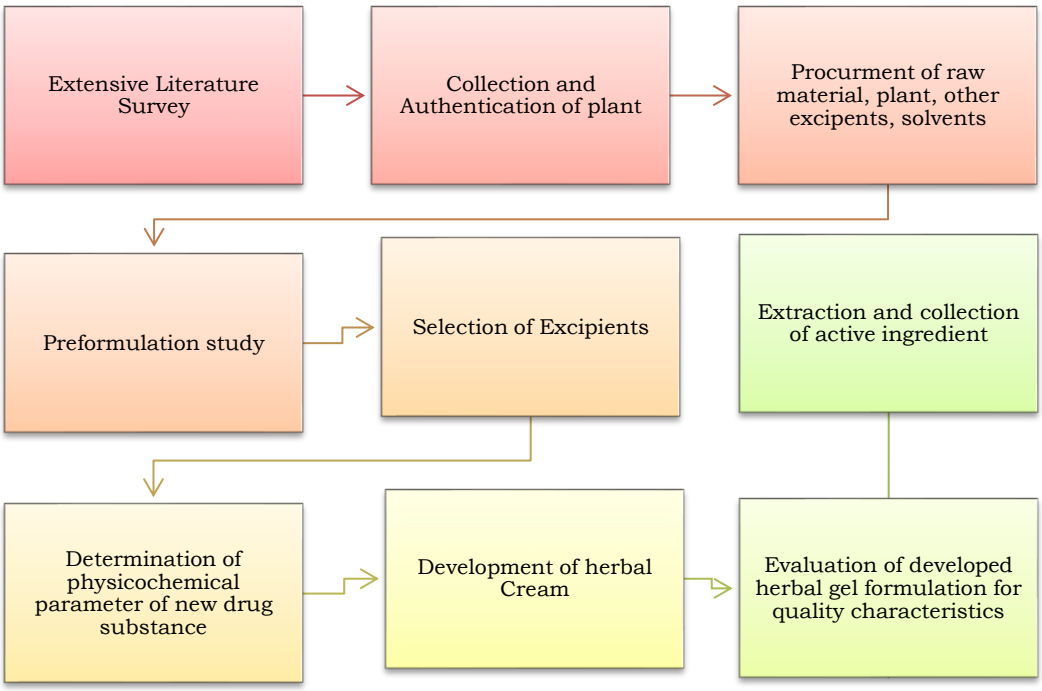
The purpose of this research is to use extracts from Pongamia pinnata and Moringa oleifera to create and assess an antifungal cream. The goal of this study is to find out whether these plant extracts can work in concert to prevent the formation of harmful fungus that are frequently linked to skin illnesses.

The purpose of this research is to use extracts from Pongamia pinnata and Moringa oleifera to create and assess an antifungal cream. The goal of this study is to find out whether these plant extracts can work in concert to prevent the formation of harmful fungus that are frequently linked to skin illnesses.

Objective :

1.To develop a cream with antifungal qualities
2. An antifungal cream with a pharmaceutical active component derived from herbs.
3. Finding a herb with antifungal qualities.
4. To increase the antifungal creams effectiveness against fungal infections.
5. To minimize the adverse effect.
6. The immune systems reaction to fungus infection.

PLAN OF WORK



5. PLANT PROFILE

5.1 MORINGA OLEIFERA :

Various tropical and subtropical places across the world have experienced the naturalization of Moringa oleifera. This plant is known by various names, including "Mother's best friend," "horseradish tree," "drumstick tree," "ben oil tree," and "miracles tree."[19] The most common name for Moringa oleifera is "Drumstick."[20]

Fig 3: Moringa oleifera seeds.[21,22]

5.1.1 Table No:1 Synonyms[23]

Latin	Moringa oleifera
Sanskrit	Subhanjana
Hindi	Saguna , Sainjna
Gujarati	Suragavo
Punjabi	Sainjna , Soanjna
Unani	Sahajan
Ayurvedic	Akshiva,haritashaaka,raktaka, trishnagandha
Engalish	Drumstick tree, horseradish tree, ben tree

5.1.2 Table No: 2 Toxonomical classification[24]

Kingdom	Plantae
Sub – kingdom	Tracheobionta
Super division	Spermatophyte
Division	Magnoliophyta
Class	Magnoliopsida
Sub class	Dilleniidae
Order	Capparales
Family	Moringaceae
Genus	Moringa
Species	Oleifera

5.1.3 Physical characteristics

The round seeds feature a tannish semi-permeable seed arrangement and three papery wings (Fig 3). The majority of their arrangements are brown to dark brown, while some may be white if they are not very viable. Viable seeds grow in about a week. Three white wings covering the whole body run at 130-second intervals.[25]

5.1.4 Chemical constituents

The round seeds feature a tannish semi-permeable seed arrangement and three papery wings (Fig 3). The majority of their arrangements are brown to dark brown, while some may be white if they are not very viable. Viable seeds grow in about a week. Three white wings covering the whole body run at 130-second intervals.[26]

5.1.4 Geographical Source

Originally from Africa, Arabia, South Asia, South America, the Himalaya area, India, Pakistan, the Pacific, and the Caribbean Islands, Moringa oleifera plant is one of the species of the Moringaceae family.[27]

5.1.5 Traditional uses

The herb has historically been used as a diuretic, expectorant, stimulant, and antispasmodic. The flavor of fresh root is vesicant and bitter, similar to horseradish. It is used as an antilithic, diuretic, and stimulant internally. Gum is mucilaginous and tasteless. Seeds are stimulating and bitter. Bark has emmenogogue, antifungal, antibacterial, and even abortifacient properties. Flowers can help to stimulate the flow of bile since they are cholagogues, stimulants, tonics, and diuretics. The herb also has antibacterial and cardiac circulatory tonic properties.[28] Pods are used to treat diabetes; they are anthelmintic and antipyretic. Root juice is used as an antiepileptic and heart tonic. Used as a diuretic in calculus affection, deep-seated inflammation, enlarged liver and spleen, asthma, and neurological debilityFlowers and stem bark have low glucose levels. Seed infusion is used to treat venereal illnesses and has anti-inflammatory, antispasmodic, and diuretic properties. The Ayurvedic Pharmacopoeia of India listed the use of dried root bark (as well as dried seeds) in goitre, glycosuria, and lipid diseases, and in piles and internal abscesses from leaves, seeds, root bark, and stem bark.[29]

5.2 Pongamia pinnate

India's "Pongam Tree" is regarded as one of the brightest and richest trees. In science, the tree is known as "Pongamia pinnata." The Tamil term "pinnata," which refers to "pinnate leaves," is where the name "Pongamia" originates. The tree belongs to the family Leguminosae. It belongs to the Papilionaceae subfamily. It was called "Karanj," "Papar," or "Kanji" by the people speaking Bengali and Hindi. In English, it is referred to as "Karum Tree" or "Poonga Oil Tree."[30]

Fig 4 : Pongamia pinnata.[31,32]

5.2.1 Synonyms[33]

Derris indica (Lam.)
Bennett Millettia novo-guineensis Kane.
Hat. Pongamia glabra Vent. Pongamia pinnata Merr

5.2.2 Table No: 3 Common Name [34]

Hindi , Bengali , Marathi and Gujarati	Karanj , karanja
Sanskrit	Naktamala
Engalish	Indian beech
Punjabi	Sukhehein , karanj

5.2.3 Table No: 4 Taxonomical Classifications [35]

Kingdom	Plantae
Sub-kingdom	Tracheobionta
Super division	Spermatophyta
Division	Spermatophyta
Class	Magnoliopsida
Subclass	Rosidae
Order	Fabales
Family	Fabaceae
Genus	Millettia Wight & Arn
Species	Millettia pinnata (L.)

5.2.4 Physical characteristics

The Pongamia pinatta tree, a glabrous shrub, is a normal-sized deciduous or evergreen plant that ranges in height from 15 to 25 meters. Its trunk is 50 to 80 cm crooked, with drooping branches and a large spreading crown. This plant has smooth, grey-brown, vertically fissured bark, and its branchlets are fairly hairy and have scars from stipules. When the leaves reach maturity, they have a conspicuous vein arrangement and a pinkish red to dark green, hairless leaf stem. The leaves are imparipinnate. At the end of a short stalk with an oblong or ovate elliptical form, five to nine paired leaflets may be seen. They have a rounded base, an obtuse apex, and somewhat thickened toothed margins. Numerous pairs of fragrant blooms are borne on an axile that is between 6 and 27 centimeters long, resembling a raceme. The campanulate calyx is truncate, measuring 4 to 5 millimeters in length, and delicately pubescent. A cluster of blooms with a length of 15 centimeters is located at the shorter base, drooping and thin. Usually, a pea-shaped stem with two or four blooms together ranges in length from around 15 to 18 millimeters. The corolla of this flower has oblong wings, silky hairs, and basal auricles. Its color ranges from pink to purple on the inside to brown on the exterior.[36]

5.2.5 Chemical Constituents

The oil extracted from karanja (Pongamia pinnata) seeds includes karanjin, a bioactive compound with significant biological properties.[37]

Eight fatty acids—three saturated and five unsaturated—as well as six compounds—two sterols, three sterol derivatives, and one disaccharide—have been extracted from Pongamia pinnata seeds. Both spectroscopic and physicochemical approaches were used to clarify their structures. This plant is the source of the first reports of the metabolites beta-sitosteryl acetate and galactoside, stigma sterol, its galactoside, and sucrose. There were precisely equal amounts of saturated and unsaturated fatty acids—two monoenoic, one dienoic, and two trienoic. The most common acids were oleic acid (44.24%), followed by stearic acid (29.64%) and palmitic acid (18.58%). Trace levels (0.88%) of octadecatrienoic and hiragonic acids were found. It

has been possible to isolate and describe karangin, pongamol, pongagalabrone, and pongapin, pinnatin, and kanjone from seeds. 'Pongol' is a flavone derivative found in immature seeds. 'Glybanchalcone, isopongachromene' is the other flavonoid that was extracted from the seeds. Numerous flavone and chalcone derivatives, including pongagallone A and B, galbone, pongone, and ponggalabol, are found in the plant's leaves and stem.[38]

5.2.6 Geographical Source

It is commonly found across tropical Asia, the Seychelles Islands, South Eastern Asia, Australia, and India. It is also locally dispersed along riverbanks in the Indian state of Maharashtra; it is particularly prevalent close to the shore in tidal and beach woods in the Konkan region and along Deccan rivers.[39]

5.3 Pharmacological Activity

Fig 5: Pharmacological activites of Moringa oleifera

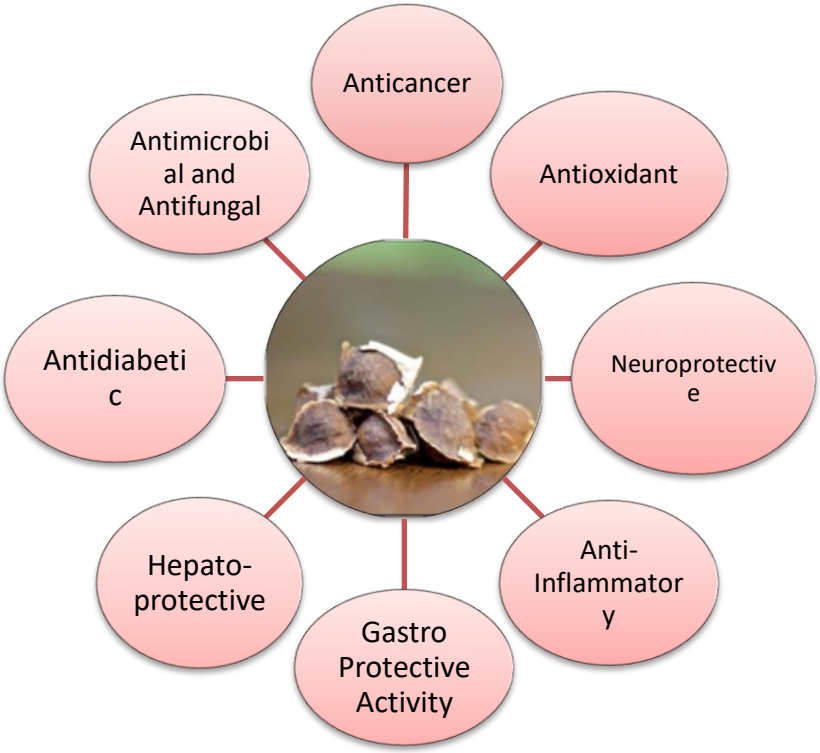
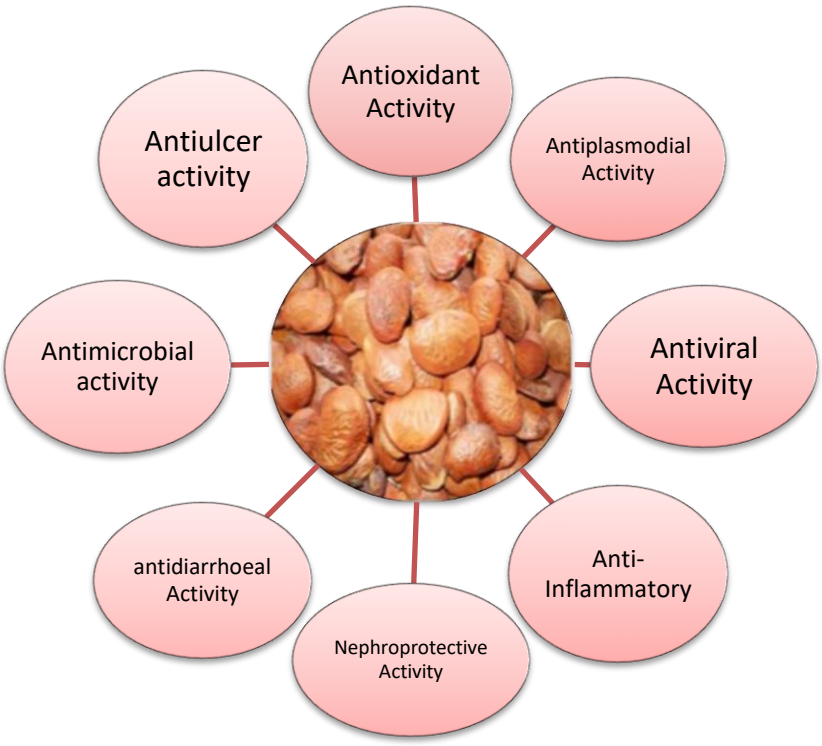


Fig 6: Pharmacological Activity of Pongamia Pinnate



6. MATERIAL AND EQUIPMENTS

Table No:5 List of instruments used for work

Sr. No.	Name of Instrument
1	Soxhlet apparatus
2	Autoclave
3	Electronic weighing balance
4	PH meter
5	Brookfield viscometer
6	Heating mantal

Table No:6 List of material

Sr. No.	Name of Ingredient
1	Glycerin
2	Stearic acid
3	Titanium dioxide
4	Cetyl alcohol
5	Methyl paraben
6	Propyl paraben
7	Glyceryl monosterate
8	Petroleum jelly

7. EXPERIMENTAL METHODS

PHARMACOGNOSTIC INVESTIGATION

Moringa Oleifera :

A.Collection and Authentication

Seeds of Moringa oleifera were collected from different areas. Collected material made to coarse powder, packed in polythene bags and stored for further analysis.

B. Organoleptic Characterization

Colour, odour, shape, test and size of the seed and texture, fracture were observed.

C.Physicochemical Characters

The antifungal action of Moringa oleifera seeds is attributed to their physicochemical properties, which also include their pH, solubility, particle size, density, and chemical composition. For example, fungal growth can be inhibited by the presence of bioactive chemicals including glucosinolates, alkaloids, flavonoids, and phenolic compounds. Furthermore, the antifungal capabilities of the seeds can be influenced by their lipid and protein makeup. Additionally, the way the seeds interact with fungal cells and the effectiveness of their antifungal activity can be influenced by their physical characteristics, such as their porosity and surface area.

Pongamia pinnate :

A.Collection and Authentication

Seeds of pongamia pinate werw collected from different areas. Collected material made to coarse powder, packed in polythene bags and stored for further analysis.

B. Organoleptic Characterization

Colour, odour, shape, test and size of the seed and texture, fracture were observed.

C. Physicochemical Characters

Pongamia pinnata seeds have several physicochemical properties, including as solubility, pH, particle size, physical form, stability, viscosity, and surface tension, which all contribute to their antifungal efficacy. For example, bioactive substances such flavonoids, alkaloids, phenolic compounds, and saponins are present and contribute to its antifungal characteristics.

7.2 Soxhlet extraction method

1.Plant material was extracted in ethanol using soxhlet extraction method.[47]
40 g of moringa oleifera powder was placed into the thimble and placed in the soxhlet chamber.
2.100 ml of selected solvents were placed in a round bottom flask and assembled for soxhlet extractor then the distillation process was begun. Solvent is heated to reflux.
The solvent vapour travels up a distillation arm and floods into the chamber housing the thimble of solid.
3.Solid material in chamber slowly fills warm solvent.Desired compound dissolves in the warm solvent.
4.When the Soxhlet chamber is almost full the chamber is emptied by the siphon. The solvent running back down to the distillation flask.
5.This cycle may be allowed to repeat many times, over hours or day.
6.During each cycle, a portion of the compound dissolve in the soivent.
After many cycles [72 hours] the desired compound is concentrated in the distillation flask.
7.After extraction the solvent is removed, typically by means of a rotary evaporator, yielding the extracted compound. After completed the extraction process, the solvent and extractor were placed on water bath to evaporate the solvent.[48]
8. Allow to evaporate and collected in small labelled vials.[49]

Fig No: 7 Soxhlet Extraction Moringa oleifera Extract

Preliminary phytochemical investigation :
To qualitatively identify different chemicals such as alkaloids, flavonoids, steroids, volatile oil, glycoside, reducing sugar, tannins, and saponins, the extracts were subjected to phytochemical analysis.[43]

Sr.No	Test	Procedure	Obervation	Inferance
1	Alkaloid Wagner's test	By mixing Wagner's reagent, a diluted iodine solution, with the therapeutic solution.	Reddish brown coloured precipitate	Present
	Dragendroff's Test	In Dragendroff's test, the therapeutic solution is combined with the potassium bismuth iodide reagent.	Oranange coloured precipitate	Present
	Hager test :	To resolve picric acid, combine the medication solution with a tiny amount of saturated aqueous Hager's reagent.	Yellow precipitate	Present

	Mayer's Test:	By mixing Mayer's reagent, K2HgI4, in tiny amounts into the medication solution	Cream coloured precipitate	Present
2.	Saponins : Frothing test:	The first sign of saponins was observed in a test tube when 0.1 g of extract and 5 ml of distilled water were shaken together. This produced a continuous honeycomb foam that lasted for five minutes.		Present
3.	Flavonoids : Lead sub-acetate test:	Five milliliters of distilled water were mixed with 0.5 gram of extract, boiled for five minutes, and then filtered. When two to three drops of lead sub-acetate solution were added to the filtrate after it had cooled for five minutes, a yellow precipitate formed, signifying the presence of flavonoids.		Present
	Ferric chloride test:	The presence of flavonoids was demonstrated by mixing 1 ml of ethanol with around 0.1 g of extract, adding 1 ml of 10% ferric chloride, and then seeing the creation of a brown solution and a murky green precipitate.		Present
4.	Tannins :	0.5 g of plant extract was mixed with 1 milliliter of distilled water, the combination was filtered, and the filtrate was then mixed with a few drops of ferric chloride. Tannins were demonstrated by the presence of a green, blue-black, or blue green precipitate.		Present
5.	Steroids :	One milliliter of each extract was combined with five drops of concentrated H2SO4 in a different test tube.		Present
6.	Glycosides:	Five milliliters of the extract, twenty-five milliliters of diluted sulfuric acid, and fifteen minutes of boiling were added to a test tube. After cooling, 5 milliliters of Fehling solution were added after neutralization with 10% NaOH.		Present
7.	Reducing Sugars	Heating 0.5 ml of plant extracts, 1 ml of water, and 5-8 drops of Fehling's solution was made easier by applying a water bath.		Present
8.	Volatile oil :	Two milliliters of the extract were shaken with 0.1 milliliters of diluted NaOH and a tiny amount of diluted HCl.		Present

Table No: 7 Pongamia Pinnata [44]

Sr.No	Test	Procedure	Observation	Inferance
1	Alkaloids Wagner's reagent	by mixing Wagner's reagent, a diluted iodine solution, with the medication solution.	Reddish brown coloured precipitate	Present
	Dragendorff's reagents	Adding potassium bismuth iodide reagent to the medication solution is Dragendroff's test method.	Orange coloured precipitate	Present
	Hager Test	To resolve picric acid, combine the medication solution with a tiny amount of saturated aqueous Hager's reagent.	Yellow precipitate	Present
	Mayer's Test	By incorporating Mayer's reagent, K2HgI4, in tiny amounts into the medication solution	Cream coloured precipitate	Present
2.	Test for flavonoids: Lead acetate test	A few drops of lead acetate were added to a test tube containing the raw extract. The production of a yellow-colored precipitate was one sign that flavonoids were present.		Present
3.	Test for tannins: Braymer's test	Two milliliters of the unrefined extract, two milliliters of distilled water, and a little quantity of 10% FeCl3 were mixed together in a test tube. It was thought that the presence of tannins was indicated by the production of a green-black precipitate.		Present

4.	Test for saponins	Fill a test tube with 2 milliliters of the raw extract, top it off with 4 milliliters of distilled water, stir well, and shake hard. It was thought that the production of a long-lasting foam indicated the presence of saponins.	Present
5.	Test for terpenoids: Salkowski test:	Put two milliliters of the raw extract, a little amount of chloroform, and one milliliter of sulfuric acid concentration in a test tube. The presence of terpenoids was assumed to be indicated by the formation of a reddish-brown complex.	
6.	Test for steroids:	In a test tube, combine 0.5 ml of the unrefined extract with 2 ml of concentrated sulfuric acid and 2 ml of acetic anhydride. Steroids were thought to be present when the hue changed from violet to green or blue.	Present
7.	Test for Proteins	One milliliter of the extract in a 70% NaOH solution should be mixed with two to three drops of 1% CuSO4 solution. Proteins are indicated by the presence of a purple color. When doing an amino acid test, add one milliliter of the sample to the Ninhydrin reagent. After a short time in a water bath, the presence of amino acids may be determined by the violet hue that results.	Present
8.	Test for Reducing Sugar	One milliliter of the extract should be mixed with a few drops of Molisch's reagent, and it should be well shaken. To create a reddish-violet ring, add one milliliter of concentrated sulfuric acid to the test tube's sidewalls. The point where the two layers converge indicates the presence of carbs.	Present

7.4 Preformulation study

To guarantee the creation of a stable, safe, and effective dosage form, preformulation studies are required. During this phase of development, the pharmacist describes the physicochemical characteristics of the medicinal ingredients and how they interact with different formulation elements. The objectives of a preformulation study are to

- Establish the incompatibility of a novel drug substance with formulation excipients
- Establish the physicochemical parameter of the drug substance that is required.

Experimental Design

Formulation of herbal antifungal cream.

Preparation of herbal antifungal cream.

7.5 Selection of excipients

The raw materials and chemicals were taken from Ashokrao mane institute of pharmacy, ambap, kolhapur.
All ingredients and excipients used are given in the Table

7.6 Method of preparation

I. Preparation of oil phase
All of the components, including glyceryl monosterate, methyl paraben, propyl paraben, and stearic acid, were melted in a container. Pongamia pinnata oil and petroleum jelly were added to this combination and allowed to melt. After then, the temperature was maintained at 65 to 70°C.
II. Preparation of Aqueous phase
It was 65 to 70°C in the water. All of the reagents, including titanium dioxide, glycerin, propyl paraben, and methyl paraben, as well as moringa oleifera extract, were preweighed and put to this aqueous medium. The aqueous phase's temperature was then kept between 65 and 70°C.
III. Development of Cream formulation
At 65 to 70°C, the whole oil phase was then gradually poured into the aqueous phase and stirred for ten to fifteen minutes. The aqueous phase was gradually added to the oil phase with gentle agitation after the temperatures of the two media were equal. The mixture was then agitated until the temperature decreased to 40°C. After cooling to room temperature, the o/w emulsion was transformed into a thick cream foundation.
In the instance of formulation, rose water was added at the very end, transferred right away into a container, and sealed firmly.[45]

Table No: 8

Oil phase [gm]		Water phase [gm]	
Steric acid	6.00	Glycerin	6.00
Cetyl alcohol	4.00	Titanium dioxide	4.00
Methyl paraben	0.30	Methyl paraben	0.30
Propyl paraben	0.30	Propyl paraben	0.30
Glyceryl mono sterate	4.00	Water	q.s
Petroleum jelly	3.00	Perfume	q.s
Pongamia pinnata oil	1.00	Moringa oleifera extract	1.00

8. Evaluation of Cream[46]

Table No: 9

Sr.No	Test	Procedure	Obeservation
1.	pH	The pH of the cream can be measured by using pH paper.	5
2.	Physical appearance	The physical appearance of the cream can be observed by its colour, roughness and graded.	Coloure-Light Ivory Oder-Pleasant nutty aroma
3.	Spreadability:	Adequate amount of sample is taken between two glass slides and a weight of 100gm is applied on the slides for 5 minutes. Spreadability can be expressed as, S= m*l/t Where, m = weight applied to upper slide. l = length moved on the glass slide. t = time taken.	20*5/60=2
4.	Viscosity	Viscosity of formulated creams can be determined by using Brookfield Viscometer	Moderately thik
5.	Homogeneity	The formulation was tested for the homogeneity by visual appearance and by touch.	Smooth
6.	Removal	The ease of removal of the creams applied was examined by washing the applied part with tap water	Easily removal

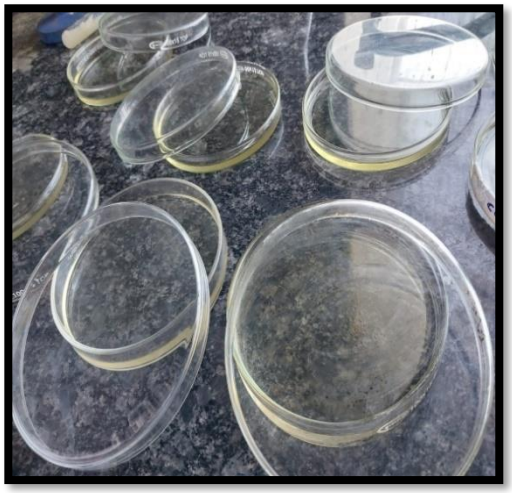
pH Test And Spreadability

9. Determination of Antifungal Activity

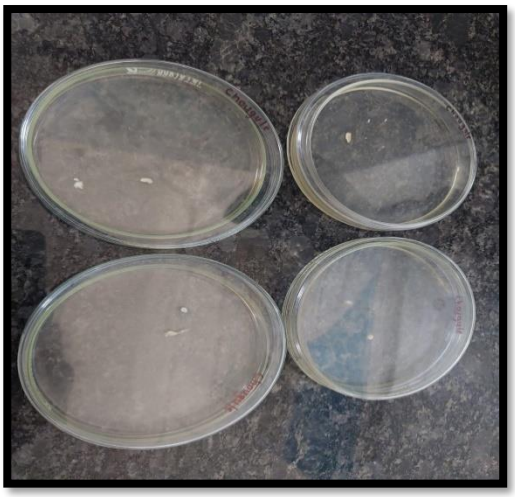
The in vitro antifungal activity of the plants crude extract was evaluate. To create the sample of nutrient agar media. Sterilization of petri plate and nutrient agar media by using autoclave. Then this mixture was added to previously sterilized petri dishes.Preparation of agar plates. Streaking of Aspergillus Niger fungi on prepared agar plates by using laminar airflow. Put the plates in incubator for the growth of Fungi for 72 hrs. Application of standard anti-fungal cream on growth of fungal plate and apply prepared sample herbal anti-fungal cream on growth of Fungal plate. After 24 hrs, action of inhibition of fungi is determined by the comparison of standard and test sample and check. The prepared herbal anti fungal cream shows anti-Fungal activity.

Table No: 10 Determination of antifungal activity

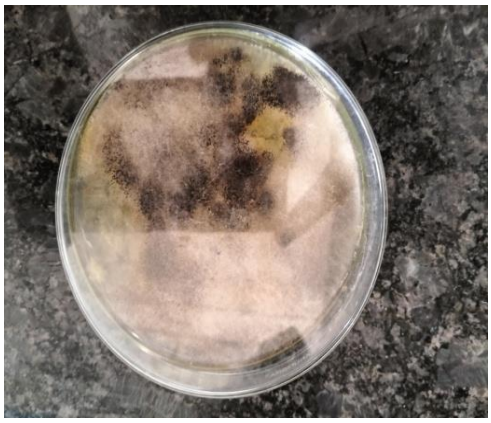
Standard cream [Dia. In mm]	**Moringa Oleifera Extract [Dia. In mm]**	**Pongamia Pinnate [Dia. In mm]**	**Prepared Herbal Anti-fungal cream [Dia. In mm]**
38.20	**35.20**	**34.10**	**28.00**
39.40	**34.40**	**32.60**	**27.80**
38.80	**35.00**	**32.30**	**28.40**



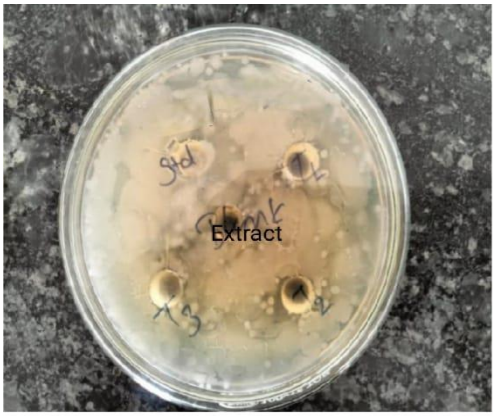
Prepared Agar Plate



Streaking of Aspergillus Niger fungi On prepared agar plates



Growth of Fungi



Zone of Inhibition

Standard Antifungal cream **Prepared antifungal cream**

10. RESULT AND DISCUSSION :

Effectively formulate and evaluate an antifungal cream using Moringa oleifera and Pongamia pinnata extracts, providing valuable insights into their potential as natural antifungal agents.

Standard cream [Dia. In mm]	**Moringa Oleifera Extract [Dia. In mm]**	**Pongamia Pinnate [Dia. In mm]**	**Prepared Herbal Anti-fungal cream [Dia. In mm]**
38.20	**35.20**	**34.10**	**28.00**
39.40	**34.40**	**32.60**	**27.80**
38.80	**35.00**	**32.30**	**28.40**

11. CONCLUSION :

The formulated Antifungal cream, enriched with Moringa Oleifera and Pongamia Pinnate presents a promising natural alternative for Antifungal management. It's development could lead to a safer , more effective topical treatment option, reducing reliance on synthetic drugs and there associated side effects. Future studies will focus on clinical trials to validate these results and explore the formulation potential in broader therapeutic applications.

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