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Formulation And Development Of Anti-Acne Cream Containing Ethanolic Vitex Negundo Leaves Extract

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ABSTRACT:

Every person has experienced acne, pimples, sunburns, and pigmentation at some point in their lives. Customers are looking for products, like anti-acne cream, that can treat their skin condition and provide them beautiful, healthy skin. However, the majority of anti-acne creams on the market are loaded with ingredients that could cause a variety of negative side effects for users. The goal of the current study was to develop and assess an anti-acne cream that included extract from Vitex negundo leaves. Using the disc diffusion method, the antibacterial activity of the extract and cream was examined against gram-positive bacteria (Staphylococcus aureus). The cream was made with the antimicrobial extract. In the years to come, clinical and toxicological research will demonstrate the efficacy of this design of creams in treating skin infections, such as acne vulgaris.

Keywords: Vitex negundo Linn, Antibacterial Activity, and Vulgaris Acne, Anti acne cream

INTRODUCTION :

Advanced Herbal Drug Technology First of all, Using the many potentialities of plants for the benefit of humankind is known as herbal technology. For hundreds of across practicing physicians of indigenous medical systems have utilized naturally occurring plant-based substances. These days, a lot of human beings are looking for them because of their effectiveness, safety, and low side effects. Many conventional and nonconventional extraction techniques, such as maceration, infusion, percolation, digestion, decoction, Soxhlet extraction, turbo-extraction, ultrasound-assisted extraction, microwave-assisted extraction, supercritical fluid extraction, solid-phase extraction, and column chromatography, may be utilized to extract plant materials. Ionic liquid extraction, gas-phase chromatography, which chiral phase chromatography, HPLC, and other advanced extraction techniques are samples. The plant extracts that are obtained can be used as medicinal agents in the form of dried powder or fluid extracts. These can be fractionated to identify out individual chemical entities that are then sold as contemporary drugs, or they can be processed further to be added to dosage forms like tablets or capsules. This chapter's goals are to give a general review of the numerous techniques that are used to separate bioactive compounds from medicinal plants as well as a comprehensive overview of the many kinds of phytodrugs.

Nirgundi, or leaves of Vitex negundo First of all, Uncomfortable, especially to teenagers and adolescence, is acne vulgaris. Global statistics show that 85% of people will experience this skin condition between the ages of 12 and 25. Adults between the ages of 23 and 34 will experience it almost 8% of the time, and adults between known as ages of 35 and 44 will experience it 3% of the time. While some skin conditions may be considered self-regulating, they can also have detrimental psychosocial effects on a person, such as low self-esteem, social disengagement from humiliation, and in the worst case, suicide aspirations.

Since Propionibacterium acnes and Staphylococcus aureus were identified in the sample taken from an acne patient, they were the cause of acne. However, there is cause for concern regarding the growing number of bacteria that trigger acne and become resistant to antibiotics. Alternative acne treatments have been researched and used. Administering topical medicinal substances is a more convenient method among alternative medical systems. The majority of people happen increasingly more drawn to using herbal remedies. Four billion people utilize herbal medicine as their primary form of healthcare because they believe it to be safe, according to the WHO. The family Verbenaceae, or gens Vitex, has Eighty genera and roughly eight hundred subspecies.

V. glabrata, V. rotundifolia, V. cymosa, V. negundo, with V. trifolia. Among the most prevalent and significant species of Vitex are V. agnus. The plant known as Vitex negundo Linn. is widely distributed in India and is used extensively in folk and traditional medicine. Various biological activities, such as those related to mosquito repellent, anti-angiogenic, anti-hepatoprotective, analgesic, inflammatory, anti-arthritic, antimicrobial, antihistaminic, CNS depressive, and anti-filarial properties, have been found to have been revealed by the leaf extract of V. negundo. The plant's extensive phytoconstituents, which include terpenoids, alkaloids, flavonoids, polyphenolic chemicals, and iridoids, may be the cause of these effects. This plant is essential to phytomedicine because of many of its compounds.

Various plant components can be decocted to treat a variety of conditions, including leucoderma, sinusitis, the disease known as bronchitis, ulcers, and toothaches.Iridoids, which are cyclopentane monoterpenoids, are produced by plants as secondary metabolites and offer a wide range of medicinal uses. Numerous iridoids, including agnuside, negundoside, nishindaside, and aucubin, are present in Vitex species along with other chemical elements and are responsible for a variety of pharmacological effects. Agnuside is a significant chemotaxonomic marker among these iridoids that can be utilized to establish a standard Vitex extract.

Figure No.1 Vitex negundo leaves and flower

formulas that include it. Agnuside, which can be found in the Vitex and Rhinanthus species, is also known as Buddhlejoside. It is an ester of p-hydroxy benzoic acid and aucubin. It discloses pharmacological effects in premenstrual syndrome, anti-inflammatory, and anti-arthritic conditions, among others. This study looks at the effectiveness of using different extraction techniques, including as maceration, reflux, microwave, and ultrasonication, to extract the iridoid avocado from the plant. Additionally, a few adjustments to the published approach were made to an HPLC method, which was then verified for the quantitative measurement of agnuside from plant extract and its formulation.

Plantae is the kingdom; Lamiales is the decree; Verbenaceae is the family; Vitex is the genus; Negundo is the species; Vitex negundo is the botanical name; Nirgundi, Sephal is the Sanskrit name; and the English name is Five-Leaved Chaste Tree. Nirgundi's Physicochemical Analysis:Green in color Odor: Specific characteristics Taste: Astringent and bitter combined Chemical Components: It is known what substances make up the essential oil derived from V. negundo. It has been discovered the fact that its important components are helpful for healing ulcers and sores. Fresh leaves, flowers, and dried fruits have been employed to extract the essential chemical contents, which were then analyzed by GC/MS and Regulatory Issues: Concerns over consistency and quality arise since herbal creams could not be subject to the same stringent testing and regulations as pharmaceutical goods in some areas. be the cause of the plant's outer diverse therapeutic qualities.

Studies combining chemicals on Vitex negundo Linn. showed the presence of flavonoids, flavones, glycosides, indoid glycosides, lignan, triterpenes, diterpenes, sesquiterpenes, and stilbene derivative. The list of particular chemical substances found in every part of the plant is provided below.

The components found in leaves were: p-cymene, cis-ocimene, citronellal, B-curcumene, B caryophyllene, aguaiene, guaia-3,7-diene, 8 guaiene, valencene, caryophyllene epoxide, ethyl 9-hexadecenoate, palmitic acid, €-nerolidol, humulene a chemical 1, globulol, humulene epoxideA-cadinol, a-muurolol, a-cadinol, and bisabolol acetate made for roughly 85.5% of the essential oil of leaf composition.A-cadinol, a-muurolol, a-cadinol, and bisabolol acetate made for roughly 85.5% of the essential oil of leaf composition.

Formic acid, n-heptane, p cymene, ß-caryophyllene, trans-a-bergamotene, valencene, a-selinene, ß-selinene, germacren-4-ol, caryophyllene epoxide, €-nerolidol, and P-(1,1 dimethylethyl) were the twelve components found in floral essential oil. According to Khokra et al. (2008), the oil derived from the flowers of V. negundo contained predominantly ß-caryophyllene, globulol, linalool, terpinen-4-ol, a-guaiene, and toluene, which accounted for approximately 65% of the oil's total composition. Other major constituents included sesquiterpenes, monoterpenes, terpenoids, and sterols.

Dried fruit oil was found to contain thirteen unique constituents, including a copaene, ß-caryophyllene, a-cedrene, a-guaiene, guaia-3, 7diene, a-humulene, aristolene, germacrene D, B-selinene, caryophyllene oxide, n hexadecanoic acid, palmitolic acid, and traces of acetyl lactyl glycerate.

Vitex negundo is the primary plant found in irgundi cream, which helps to relieve a variety of skin conditions. To improve the therapeutic qualities of Nirgundi cream and oil, a tiny amount of other herbs including Manjistha, Kalihari, and Haridra are also added. It heals leprosy, inflammation of the skin, skin lesions, and helps wounds heal more quickly.

Principal Therapeutic Benefits:

The plant helps treat skin infections and wounds due to its antifungal, antibacterial, and anti-inflammatory qualities. • Joint and muscular aches are relieved by the five-leaved chaste tree. Vaginal discharge can be effectively treated with the herb. Additionally, it improves the male lidibo.

FORMULATION

Vitex negundo Cream

By implementing an ethanolic extract from Vitex negundo's leaves, this anti-acne cream especially capitalizes on the plant's medicinal qualities. Vitex negundo, well-known for its antibacterial and anti-inflammatory properties, provides a natural acne treatment option. The cream's recipe is designed to target skin prone to acne, minimising outbreaks and encouraging a more radiant complexion.

Benefits: Reduces Inflammation: Assists in reducing the redness and swelling brought on by acne, resulting in a more serene aspect of the skin. Effectively targets and diminishes germs that cause acne, helping to prevent fresh breakouts. This is known as antimicrobial action. Natural Formulation: Suitable for individuals looking for natural skincare substitutes, it makes use of plant-based substances. Topical Efficacy: By applying topically to the afflicted areas, a targeted therapy with negligible adverse effects on the system is provided.

Advantages:

1. Antimicrobial Properties: It may have antimicrobial properties due to compounds present in Vitex negundo, which could help in treating certain skin infections.
2. Anti-inflammatory Effects: The cream might help reduce inflammation, making it potentially useful for conditions like acne or eczema.
3. Antioxidant Benefits: Vitex negundo contains antioxidants that could help protect the skin from damage caused by free radicals.
4. Traditional Medicine: It's a part of traditional medicine systems in various cultures, suggesting potential efficacy based on historical use..

Disadvantage

1. Skin irritation: The cream's ingredients may cause skin irritation or allergic reactions in certain people.
2. Limited Scientific Evidence: Despite its usage in traditional medicine, there may not be many research that support its safety and efficacy when applied topically.
3. Possible Adverse Effects: Similar to any herbal medicine, there may be unidentified adverse effects or drug interactions.
4. Regulatory Issues: Concerns over consistency and quality arise since herbal creams could not be subject to the same stringent testing and regulations as pharmaceutical goods in some areas.

PLANT PROFILE

Vitex negundo

Synonyms: Chaste Tree, Man Ching, Negundo. Lenggundi source: It is obtained from the leaves of the plant Vitex Negundo,

Biological Family. Verbenaceae

Plant part use: leaves Uses: Anti acne Anti bacterial, treatment in cough cure diabetes

Chemical constituents:

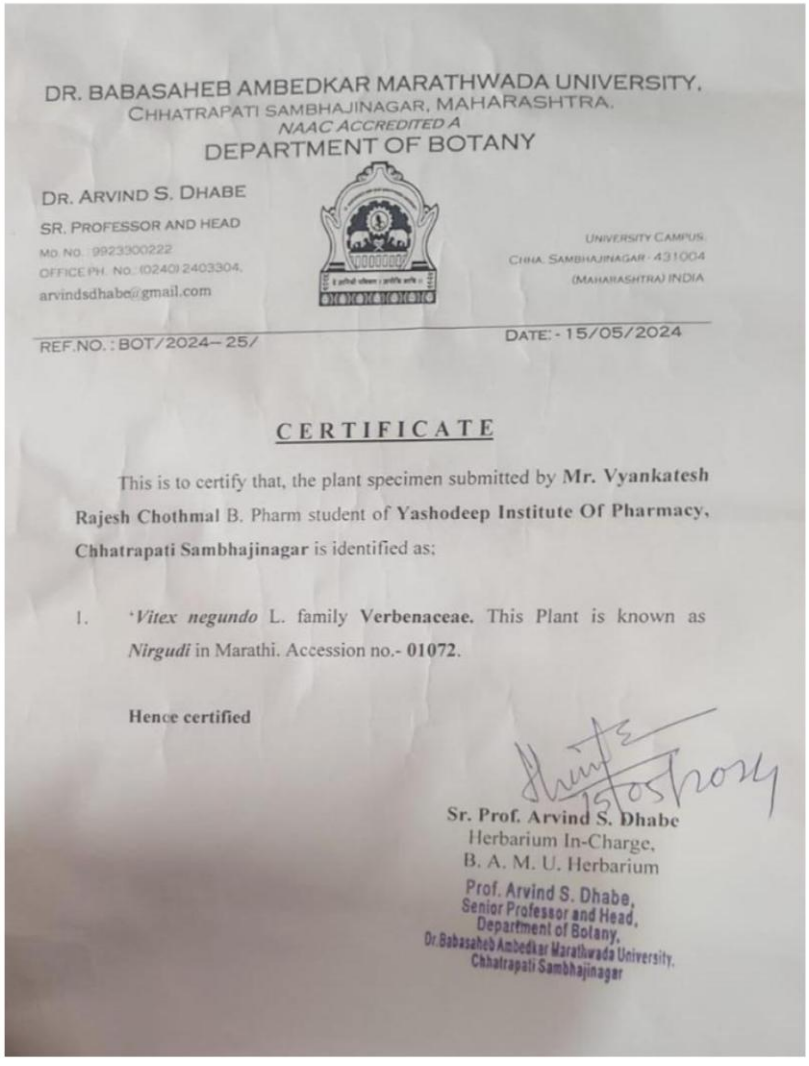
viridiflorol (26.52%), p-caryophy/lene (13.20%), 4-terpineol (4.46%), linalool

(2.04%), globulol (1.82%), elemol (1,48%), 17-farnesene (1.38%) and

aromadendrene (1.04%

Figure No.2 Vitex negundo plant

AUTHENTICATIONCERTIFICATE



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REF.NO. : BOT/2024– 25/

DATE: - 15/05/2024

CERTIFICATE

This is to certify that, the plant specimen submitted by **Mr. Vyankatesh Rajesh Chothmal** B. Pharm student of **Yashodeep Institute Of Pharmacy, Chhatrapati Sambhajinagar** is identified as;

1. '*Vitex negundo* L. family **Verbenaceae.** This Plant is known as *Nirgudi* in Marathi. Accession no.- **01072**.

Hence certified

15/05/2024

Sr. Prof. Arvind S. Dhabe
Herbarium In-Charge,
B. A. M. U. Herbarium

Prof. Arvind S. Dhabe,
Senior Professor and Head,
Department of Botany,
Dr.Babasaheb Ambedkar Marathwada University,
Chhatrapati Sambhajinagar

Figure No.3 Authentication Certificate

PHYTOCHEMICALS SCREENING

Initial Extract Tests: Phytochemical analysis was performed on the plant extracts of ethanol to see if active components were present.The substances were examined using qualitative biochemical assays to determine whether phenol, coumarin, reducing sugar, saponin, and steroids were present.
Reducing Sugar The extract (1 ml) was first mixed with 1 ml of water in a test tube along with 20 drops of Fehling's reagent that had been brought to a boil. Reducing sugars are present in the tube when a precipitate red-brick forms at the bottom.

Saponins test In a test tube, a small amount of distilled water was added to 1 milliliter of extract. After giving the mixture a good shake, the mixture was watched for a stable, long-lasting foam for 20 minutes.

Test for Phenols Two milliliters of distilled water and a few drops of a 10% aqueous ferric chloride solution were added to one milliliter of the sample extract. Phenols were present when a blue or green color formed.

Test for Coumarin Put 5 milliliters of extract and 2 milliliters of 10% NaOH in a test tube. After five minutes of boiling, the presence of coumarin is shown by the yellow color.

Test for steroid use One milliliter of the extract was placed in a test tube with the least amount of chloroform possible. Drops of acetic anhydride were then added, and finally, one drop of concentrated sulfuric acid. Blue green replaced the violet hue, signifying the presence of steroids.

Figure No4 Phytochemical screening result

Material

Table no.1 Ingredients

Sr.no	Ingredients	Quantity
1	Ethanolic Vitex negundo leaves extract	10ml
2	Steric acid	10gm
3	Cetyl alcohol	10ml
4	Liquid paraffin	10ml
5	Glycerine	10ml
6	Methyl paraffin	0.5ml
7	Thioethanolamine	0.5gm
8	Rose water	1ml
9	Distilled water	Qs

PROCEDURE

Extraction of herb

Maceration process use
The collected leaves of Nirgundi were washed thoroughly in distilled water to remove the contaminants. The leaves were chopped into small pieces and dried under shade for 1 week; the dried materials were coarsely powdered using mechanical blender. The powdered leaves of Nirgundi with total weight of 20 gm were extracted by maceration method shaking. The ethanolic extract of Nirgundi leaves was filtered and concentrated to dryness under reduced pressure and controlled temperature using rotary evaporator. The extract was stored in air-tight containers in a refrigerator at 4°C until further use

Formulation Procedure

Phase of Oil Preparation Stearic acid makes up the oil phase, which also contains dissolved liquid paraffin and other oil-soluble components like cetyl alcohol. The beaker containing the oil phase was submerged in the water bath. During the heating process, the water bath's temperature was adjusted to 75°C. Setting Up The Aqueous Phase Glycerine, methyl paraben, and triethanolamine—the water-soluble ingredients and preservatives—were dissolved in the aqueous phase and heated to 75° in the same water bath.
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Aqueous Phase Addition to Oil Phase Following heating, the aqueous phase was gradually added to the oil phase while being constantly stirred until the emulsifier cooled. The base was combined with a different percentage of 10% Vitex negundo leaf extract, and the scent (0.5%) was added last, right before the final product was put into an appropriate container.

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FORMULATION

Formulation and evelopment of anti acne cream containing ethanolic Vitex negundo leaves extract 100 gm It is use for anti **acne**

Figure No.5. Ethanolic Vitex Negundo Cream

Evaluation test

1) Determination of Organoleptic Properties: The cream prepared was found to be of a brown colour and had pleasant odour
2) Determination of Homogeneity: It was found that the cream was homogeneous and smooth andconsistent in nature.
3) Determination Of pH: The prepared sample was checked for pH using pH paper. The pH is neutral
4) After Feel: After observation, it was found that cream not left residue on skin surface after application.
5) Determination of type of Smear: It was found that the cream produced non-greasy film on the skinsurface.
6) Removal: After observation, it was found that it is easy to removal by washing with tap water.

8) Antibacterial activity : by disc diffusion method show maximum zone inhibition at 15 mm

RESULT

An extensive analysis of the Vitex negundo leaf extract-containing anti-acne cream The formulation's apparent antibacterial action could be attributed to active ingredients found in the ethanolic Vitex negundo Leaves extract. When it was transformed into a cream formulation, the antibacterial action was effectively preserved, enhancing the general health and appearance of the skin.

Evaluation Test

Table no 2 Evaluation result

Sr. No	Evaluation Parameters	Result
1)	Colour	Brown
2)	Odour	Pleasunt
3)	Apperance	No change in colour
4)	Homogeneity	Good
5)	After feel	Emolient and slipperiness
6)	Type of smear	None greasy
7)	Removal	Easy
8)	Antibacterial activity	Show maximum inhibition zone at 15 mm

Phytochemical Analysis

Table no.3 Phytochemical result

Sr no.	Test	Observation	Result
1	Reducing sugar	Red brick precipitate in botto	Positive
2	Soponins	Stable persistent for 20 minute	Positive
3	phenol	Blue colour	Positive
4	Coumerin	Yellow colour	Positive
5	Steroid	Colour change from voilet to blue	Positive

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