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To prepare and evaluate herbal antiseptic cream

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Abstract
Neem, Tulsi, and Aloe Vera have been utilised to cure numerous skin disorders since ancient times. It is a preventive, curative and healing Ayurvedic cream for dry skin, cuts, scratches, minor burns, wounds, cold sores and chapped skin. In this study, several components were combined with Neem leaves (*Azrachta indica*), Tulsi leaves (*Ocimum sanctum*), and Aloe Vera (Curacao aloes) to make a poly herbal cream. The coarse powder was kept for further research. The extract was evaporated in a rotary evaporator, and the ethanol extracts were kept in a desiccator for further research. The extracts were combined with a variety of substances and excipients to create a poly herbal cream. The cream was tested for pH, viscosity, spread ability, centrifugation, accelerated stability studies, and microbial stability, among other criteria. The accelerated stability tests were carried out in a stability chamber for 20 days at room and higher temperatures. After centrifugation and stability testing, the cream was confirmed to be stable. There was no phase separation. For bacterial growth (*E. coli*) and yeast, the microbiological stability was tested. The results demonstrated that the cream's microbiological stability did not include any microbial growth.

Keywords: Neem, Tulsi, Aloe-vera, Cream, Anti-septic

Introduction
Cream is a topical preparation usually for application to skin. They are also applied to the mucous membranes such as those of the rectum, vagina. Cream may be considered pharmaceutical products as even cosmetic creams are based on techniques developed by pharmacy. There are two types of cream, Oil in water (o/w) type creams which are composed of small droplets of oil dispersed in a continuous watery phase. Water in oil (w/o) type creams are composed of small droplets of water dispersed in a continuous oily phase. Here our aim is to formulate herbal cream for Antiseptic with the ingredients obtained from our locality.

- **Basic components of cream:** A cream consist of two basic components being an oil and aqueous phase. The oil soluble and water soluble ingredients are added in to either of these two phases respectively according to their nature [2].
- **Neem**

Synonym: Margosa
Biological Source: It consists of all aerial parts of plant knows as *Azadirachta indica*.
Family: Meliaceae

- **Geographical Source:** It is found in India, Pakistan, Bangladesh, Shri Lanka, Thailand, Malaysia, South Africa and East Africa [3].
- **Preparation of Neem powder:** The fresh matured leaves of neem were collected and washed with water to remove impurities. Then it dried under the shade, after drying it is grinded well and passed through the sieve no: 150 and properly stored [2].
- **Uses:** Recently, it has been studied scientifically and reported that it contains different chemicals which have insect repellent, insecticide, nematicide, and antimicrobial properties [3].

Macroscopical Characters
Leaves: They are imparipinnate, alternate, exstipulate, 3-6 cm long on long slender petioles; leaflets 7-17, alternate or opposite, very shortly stalked, 1-1.5 cm long.
Apex: Ovate-lanceolate, attenuate
Base: Unequal.
Colour: Smooth and dark green.
Odour: Typical.
Taste: Bitter [4].

Chemical constitution
Good number of isolated from the plant belong to the classes diterpenes (suggiol), nimiol (bark), triterpenes: B - Sitosterol, stigmasterol (leaf),

Limonoids: Maliantriol (seed oil), nimbidinine (seed oil), Nimbendiol (seed oil) and azzadiractin (seed).

Sulphurous compounds: Nuuumber of cyclic tri and tetrasulphides (leaves), flavonol glycosides: Nimaton, quercetin, myrecetin, kaempferol. Neem leaves contain not less than 1.0% w/w of Rutin.

Leaves: Azadirachtin Insect repellent.
Meliantriol: Anti-feedant.
Salanin: Anti-feedant.
Seed: Nimbin- Antiviral action.
Nimbidin- Antiviral action.
Azadirachtin Insect repellent.
Flowers: Nimbosterol, Myricitin, Kaempferol-Insecticidal.
Fruits: Deacetyl azadirachtinol-Paralyzes insects swallowing mechanisms.
Bark: Nimbin, nimbinin, nimbidin-Antiviral.
Margolone, margolonone: Antibacterial.

Roots: Excellent for reforestation Compounds with antibacterial and antifunal properties.
The neem oil contains 2% of bitters, which are sulphur containing compounds nimbin, simbidin, nimbinin and nimbidol.
Azadirachtin-k, new tetraterpenoid has been isolated from seed emels of neem along with other compounds such as nimbolide, olichinolide B, nimbin, 6- deacetyl sinbin, salanin and azadiradione.
Important Commercial Neem Products Margosan O U.S.A.; Vepaside India Neem oil Neem cake Spermicidal agent. Anti-nematodes [5].

Fig 1: Neem Leave

Fig 2: Neem Leave Powder

Tulsi
Synonym: Sacred basil, Holy basil.
Biological Source: Tulsi consists of fresh and dried leaves of *Ocimum sanctum* Linn.
Family: Labiatae
Geographical Source: It is an herbaceous, much branched annual plant found throughout India. It is considered as sacred by Hindus.
The plant is commonly cultivated in garden and also grown near temples. It is propagated by seed. Tulsi, now-a-day, is cultivated commercially for its volatile oil [3].

Preparation of Tulsi powder: The fresh matured leaves of Tulsi were collected and washed with water to remove impurities. Then it dried under the shade, after drying it is grinded well and passed through the Sieve No: 150 and properly stored [2].

Uses: The fresh leaves, its juice and volatile oil are used for various purposes. The oil is antibacterial and insecticidal.
The leaves are used as stimulant, aromatic, anticatarrhal, spasmolytic, and diaphoretic.
The juice is used as an antiperiodic and as a constituent of several preparations for skin diseases and also to cure ear-ache.

Infusion of the leaves is used as a stomachic. The drug is a good immune- modulatory agent [3].

Macroscopical character
Leaves: Exstipulate, opposite, petiolate. Petiole 2.6 to 3.1 cm long, slender, thin, pubescent with narrow adaxial groove; lamina elliptical to ovoid, oblong 5-6 cm long and 2.6 to 3.2 cm broad, pubescent.
Margin: Entire, irregularly undulated or bluntly secret.
Apex: Acute or obtuse.
Adaxial surface: Bright
Abaxial surface: pale green with prominent veins.
Venation: Pinnately reticulate with 5-6, alternate pairs of lateral veins.
Odour: aromatic.
Taste: Pungent [6].

Chemical Constituents
Tulsi leaves contain bright, yellow coloured and pleasant volatile oil (0.1-0.9 per cent).
The oil content of the drug varies depending upon the type, the place of cultivation and season of its collection.
The oil is collected by steam distillation method from the leaves and flowering tops.
It contains approximately 70 per cent eugenol, carvacrol (3 per cent) and eugenol-methyl-ether (20 per cent).
It also contains, Methyl eugenol caryophyllin. Seeds contain fixed oil with good drying properties.
The plant is also reported to contain alkaloids, glycosides, saponin, tannins, an appreciable amount of vitamin C, and traces of maleic, citric and tartaric acid [3].

Fig 3: Tulsi leave

Fig 4: Tulsi Leave Powder

Aloe Vera

Synonyms: Aloe, Musabbar, Kumari.

Biological Source: Aloes is the dried juice of the leaves of Aloe barbadensis Miller, known as Curacao aloes.

Family: Liliaceae

Geographical Source: Aloe is indigenous to eastern and southern Africa and grown in Cape colony, Zanzibar and islands of Socotra. It is also cultivated in Caribbean islands, Europe and many parts of India, including North West Himalayan region.

Uses: Alones is used as a purgative. Its effect is mainly on colon. It has a stronger purgative action in the series of all crude drugs with anthracene glycosidal content. To counter effect the pripping action, it is given with carminatives.

It is also used in the treatment of pains and itching and also to slow down ulceration and keratosis, Aloe gel is used in skin cosmetics as a protective due to its antiwrinkle properties. Aloe is also used externally for painful inflammation [3].

Chemical Constituents

All the varieties of aloe are the major sources of anthraquinone glycosides.

The principal active composition of aloe is aloin, which is a mixture of glucosides, among which barbaloin is the chief constituent.

It is chemically aloe-emodin anthrone C 10 glucoside and it is water soluble.

Barbaloin is a C-glycoside and it is not hydrolysed by heating with dilute acids or alkalis.

Ferric chloride decomposes barbaloin by oxidative hydrolysis into aloe-emodin- anthrone, little aloe emodin and glucose.

Along with barbaloin, aloes also contains isobarbaloin, B-barbaloin, aloe-emodin and resins.

The drug also contains aloetic acid, homonataloin, aloesone, chrysophanic acid, chrysamminic acid, galactouronic acid, choline, choline salicylate, saponins, mucopolysaccharides, glucosamines, hexuronic acid, coniferyl alcohol, etc.

The amount of barbaloin in different commercial varieties varies to a large extent.

Curacao aloes contains about 22 per cent of barbaloin. Indian variety, generally Aloe vera, contains very less quantity (3.5 4 per cent).

Curacao aloes contains two and half times quantity of aloe-emodin, as compared to Cape-aloe-emodin.

The resin of aloe principally contains aloesin. It is a type of a C-glucosyl chromome. aloesin is also responsible for purgative action of aloes [5].

Fig 5: Aloe Vera

Fig 6: Aloe Vera Oil

Extraction

Extraction is the method of removing active constituents from a solid or liquid by means of liquid solvent.

Method of Extraction

1. Infusion
2. Decoction
3. Digestion
4. Maceration
5. Percolation
6. Continues hot extraction (Soxhlet method)
7. Supercritical fluid extraction
8. Counter current extraction
9. Microwave assisted extraction
10. Ultrasonication assisted extraction [7]

Ingredients of herbal cream
Active constituent involved in the herbal cream are following.

Active ingredients: Neem Tulsi, Aloevera Oil.

Excipients: Excipients are an inactive substance used as a carrier for the ingredient of medication.
In general the active ingredients may not be easily administered and absorbed by the body they need to be put in some appropriate form.
The following excipients are used in this cream.
In our cream stearic acid is used as cream forming base.
It is an 18carbon fatty acid and are white waxy solid crystalline and are widely used because stearic acid helps water andoil mix, stearic acid helps in preventing the formulas from separating into liquid and oily layers.
As a result, products that contain stearic acid require less shaking prior to use and remain more potent when stored for extended periods of time.

Preservatives: Methylparaben are the main class of chemical used as preservative in the cosmetics because of their bactericidal and fungicidal properties in our cream about 0.1 – 0.2% paraben is used as preservative.

Emulsifying agent: Emulsifying agent reduce the interfacial tension between the two phases.
- It is used in cream to maintain the stability. It also known as emulsifier or emulgent.
- In our cream cetyl alcohol is the emulsifying agent.

Humectant: Humectant is a substance used in cosmetic preparations which helps in retaining moisture. Glycerin is frequently added in moisturizing lotion and creams for the purpose moisturizing and smoothing skin.[2]

Experimental work
Neem powder extraction
1. Weight about 10gm of neem powder in weighing balance and transfer it to a dry 250mlconical flask.
2. Add 50ml alcohol to conical flask.
3. Cork the flask and heat on the water bath for 15min with shaking frequently.
4. Filter into 50ml measuring cylinder to collect the filtrate
5. Weight empty porcelain dish.
6. Evaporate to dryness on a heating mental machine and complete drying in it an oven.
7. After cooling the residue, weighing it.
8. Calculate the %W/W of extractive.

Tulsi powder extraction
1. Weight about 10gm of Tulsi powder in weighing balance and transfer it to a dry 250ml conical flask.
2. Add 50ml alcohol to conical flask.
3. Corck the flask and heat on the water bath for 15min with shaking frequently.
4. Filter into 50ml measuring cylinder to collect the filtrate
5. Weight empty porcelain dish.
6. Evaporate to dryness on a heating mental machine and complete drying in it an oven.
7. After cooling the residue, weighing it.
8. Calculate the gram of extractive

Preparation of oil phase and water phase
Part (A) Oil phase: In the oil phase prepare a water bath and maintain the 75°C Temperature.
Take one empty porcelain dish and add stearic acid & cetyl alcohol.
Put Porcelain dish into the water bath and maintain temperature until oil phase is ready.
Add aloe vera oil with continue string.

Part (B) Water phase: Take one empty porcelain dish and add glycerine, methyl paraben.
Porcelain dish put into the water bath and staring continuous and add into the Tulsi and neem extract.
After heating, add the aqueous phase in small portions to the oil phase with continuous trituration and add small amount of triethanolamine and 2-3 drops Tulsi oil in mortar pistol until a smooth cream is formed.

Table 1: Ingredient list with its quantity

Ingredient	Quantity (6 gm)
Neem Extract	0.26gm
Tulsi Extract	0.20gm
Aloevera Oil	0.92ml
Stearic Acid	2.3gm
Cetyl Alcohol	1.38gm
Glycerine	0.92ml
Methyl Paraben	0.0092gm
Triethanolamine	Q.S.
Tulsi Oil	Q.S.

Evaluation Parameter of cream
Physical Evaluation: In this test, the cream was observed for color, odor, texture, state.

Irritancy: Mark the area (1 cm2 Wash ability) on the left-hand dorsal surface. Then the cream was applied to that area and the time was noted. Then it is checked for irritancy, erythema, and edema if any for an interval up to 24 h and reported.

Wash ability: A small amount of cream was applied on the hand and it is then washed with tap water.

Viscosity: Viscosity of cream was done by using Brooke field viscometer at a temperature of 25℃ using spindle No. 63 at 2.5 RPM.

Phase separation: Prepared cream was kept in a closed container at a temperature of 25-100 ℃ away from light.
Then phase separation was checked for 24 h for 30 d. Any change in the phase separation was observed/checked.

Spread ability: The spread ability was expressed in terms of time in seconds taken by two slides to slip off from the cream, placed in between the slides, under certain load.
Lesser the time taken for separation of the two slides better the spread ability.
Two sets of glass slides of standard dimension were taken.
Then one slide of suitable dimension was taken and the cream formulation was placed on that slide.
Then other slide was placed on the top of the formulation.

Then a weight or certain load was placed on the upper slide so that the cream between the two slides was pressed uniformly to form a thin layer.
Then the weight was removed and excess of formulation adhering to the slides was scrapped off.
The upper slide was allowed to slip off freely by the force of weight tied to it.
The time taken by the upper slide to slip off was noted.
Spread ability= m × l/t
Where, M=Standard weight which is tied to or placed over the upper slide.
L=Length of a glass slide.
T=Time taken in seconds.

Greasiness: Here the cream was applied on the skin surface in the form of smear and checked if the smear was oily or grease-like [2].

Results

Table 2: Evaluation parameter result

Sr. No.	Parameter	Result
1.	Color	Faint green
2.	Odour	Pleasant
3.	Texture	Smooth
4.	State	Semisolid
5.	Ph	7.5
6.	Irritant Effect	Nil
7.	Washability	Easy washable
8.	Phase Separation	No Phase separation
9.	Spreadability time	15 min
10.	Greasiness	Non-greasy

Use of cream: It helps in natural healing small cuts, burns and wounds without leaving any marks. Apply on burns, cuts or wounds or use as directed by physician.

Fig 7: Tulsi Oil

Fig 8: Aloe Vera Oil

Fig 9: Neem Leaves Powder

Fig 10: Tulsi Leaves Powder

Fig 11: Final Product

Discussion

Ayurvedic herbal antiseptic cream is a multipurpose antiseptic cream that treats all skin types. The natural antiseptic cream was found to act as an effective and potential antimicrobial agent. It is a preventive, curative and healing Ayurvedic cream for dry skin, cuts, scratches, minor burns, wounds, cold sores and chapped skin. By using Aloe Vera oil, Neem and Tulsi the cream showed a multipurpose effect and all these herbal ingredients showed significant different activities. Here in this formulation Neem act as Disinfectant, Tulsi as antiseptic, and Aloe vera as moisturizer. The study suggests that the composition and the base of the cream are more stable and safe for use.

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