Review Article

Extraction Method for Ingredients of Herbal Face Wash

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ABSTRACT

Natural remedies are more acceptable with fewer side effects. Herbal formulations having growing demand in the world market. Acne is antype of infection to the skin, caused by changes in the sebaceous glands. Face wash is cleanser acts without producing any side effects to skin. In order to proclaim the cleansing, anti wrinkle, anticancer, moisturizing property, we propose to formulate herbal face wash. The present work deals with introduction of Pumpkin seed oil, Vertiver root extract, Sweet almond, lavender mustard &Jojoba oil, Babul gum extract, honey, orange peel extract, saffron extract. These plants are having antimicrobial, antioxidant, antiseptic, anti inflammatory, antifungal activity. Multiherbal facewash is find more efficient as compared to the marketed face wash.

Keywords: Acne, Facewash, Pumpkin seed oil, Lavender oil, Jojoba oil, Saffron extract.

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INTRODUCTION

Face wash is a facial care product that is used to remove makeup, dead skin cells, oil, dirt from the skin. [1] There are different types of face washes available in the market like as oily skin face wash, dry skin face wash, normal skin face wash.

Acne Classification

- Comedonal:- Non inflammatory
  a) White heads: - (closed comedo) present as fresh or white colored, raised bumps.
  b) Blackhead: -(opencomedo) present as open pores containing dark coloredskin consisting of melanin, sebum, and follicular cells.
- Papules:-appear as red in colour, solid, elevated lesions often less than 5 mm in diameter.
- Pustules: - skin elevations containing purulent material.
- Cysts:-solid, elevated lesions involving deeper dermal & subcutaneous tissue, <5mm
- Nodules:- solid, elevated lesions involving deeper dermal and subcutaneous tissue, >5 mm

Skin is the largest part of the body, which indicates the health of an individual. It is a consist of amino acids, lipids and carbohydrates etc so that to keep skin clear, glossy and healthy a balanced nutrition is required, it deals with the formulation of cosmetic herbal face wash preparation. In earlier time women are very aware about their beauty and started to dress themselves because they wanted to increase their own beauty. [2] Pumpkin, Lavender oil, Vertiver root, Honey, Saffron, Orange peel extract, Sweet almond oil, Jojoba oil & Babul are having very beneficial effect on acne due to anti-microbial, anti-inflammatory & antioxidant activities. Herbal cosmetics are products which are helps to purify and beautify the skin. The main advantage for using an herbal cosmetic is that it is pure and does not have any side effects on the human body. [3]

Uses of face wash

- For cleansing the skin.
- Antioxidant.
- Bath and renewal to keep skin clean and shiny.
- Stimulates generation of the skin cells and their renewal.
- Help plug the pores clear. [1]

Properties of Face wash:

- The exfoliation increase the blood circulation and promotes skin.
- Regeneration and rejuvenation.
- Face wash should be stable and should have a good appearance.
- It gives soothing effect on application to the skin.
- During application it should not have oily or greasy look.
- A thin emollient film should remain on the skin after its use. [1]

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METHODS

Table 1: List of ingredients

Sr. No	Herbal Extract	Parts Used	Medicinal Importance	Properties	Pictures
1	Pumpkin Scientific Name: *Cucurbitapepo*	Seed	Improves Antioxidant activity. Treats arthritis, insomnia. Reduce inflammation, BP Boosts metabolism.	Antioxidant	
2	Babul Gum Scientific Name: *Acacianilotica*	Bark/ Leaves	Effectively heals wounds. Promote dental health. Enriches skin texture.	Antibacterial Antifungal Anti inflammatory Antiseptic	
3	Sweet Almond Oil Scientific Name: *Prunusamygdalusdulcis*	Seed	Beneficial for blood sugar control. Keep skin hair & scalp soft, hydrated. In the kitchen.	Anti inflammatory Antioxidant Boosts immunity	
4	VertiverRoot Extract Scientific Name:*Chrysopogonzizanioides*	Root	Skin & hair care. As an aromatic. Pest control. Helps in maintain & healing nerves health.	Anti inflammatory Antioxidant Antiseptic	
5	Jojoba Oil Scientific Name:*Simmondsiaceae*	Seed	Treat acne, wound healing Hair, skin care. Chlorine protetant. Deals with sunburns. Makeup remove.	Antioxidant Antifungal Antimicrobial	
6	Orange peel Oil Scientific Name: *Citrus Reticulate*	Peel of Orange	It having antimicrobial activity, pain relief, and anticancer properties. It boosts immunity, cures acne and dermatitis.	Anti-oxidant	

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7	Turmeric Oil Scientific Name: *Curcuma Longa*	Roots	An herbal medicine used for rheumatoid arthritis, Conjunctivitis, Wound Healing, Urinary tract infections. It reduces swelling.	Anti-inflammatory	
8	Lavender Oil Scientific Name:*Levendulaoffic inalis*	Flower	It have Antiseptic Property. Which can help to heal mirror burns and bug bites. Also used to treat anxiety, Insomnia, and depression.	Kills Bacteria	
9	Saffron OilScientific Name: *Crocus Sativus*	Flowers Stigma	It is used as Herbal remedy for ailments like back Pain, Wounds, and abscesses. It can relieve common skin issues, including inflammation and acne.	Reduces Pigment	
10	Liquoric Oil Scientific Name:*Glycerrhizaglabra*	Root	It relieves symptoms of indigestion, such as acid reflux, upset stomach, and heartburn. Used for coughs, antiviral, anti-tussive, laxative	Soothing irritated skin	

Pumpkin Seed Oil

Pumpkin seed oil has vitamin C, E and omega fatty acids that guard against dry itchy skin. It helps in treating acne, reduce skin inflammation. Also increases the production of collagen which improves the tone and elasticity of skin.

Extraction Process

Fruits of Pumpkin are crush to make powder. Desire quantities of powder drugs are weigh and add to the conical flask containing volume of 1:1 water-ethanol mixture. Contents are allow to boil on water bath under reflux condition for about half hour. Contents are filter out and residues is again boil with volume of 1:1 water-ethanol mixture on water bath under reflux condition for about 15 min. Contents are filter out and filtrates are combine. Filtrate are allow to evaporate in evaporating pan until the desire concentration of the extract is obtain.

Babul Gum /KikarGond

Acacia nilotica is an imperative multipurpose plant.[4] Acacia nilotica is pan tropical and subtropical genus with species abundant throughout Asia, Australia, Africa and America.[5] It recognized by following names: Acacia, Acacia Arabica, Babhul, Babla, Babool, babul, Kikar, Sak, Tuma, Baval etc.[6]

Extraction Process

Dried and finely powdered *Acacia nilotica* leaf (2.9 g) was suspended in ethanol (30 mL) and stirred magnetically at room temperature for 1 h and then filtered. Volatiles of the greenish filtrate was removed under reduced pressure to

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provide a sticky solid (0.390 g) that was purified by column chromatography (Si gel, 100 to 200 mesh) using 30% methanol-ethyl acetate as affording a greenish solid (0.3 g).

The column-purified leaf extract(0.005 g) was suspended in distilled water (10 mL) and sonicated in an ultra sonicator bath for 10 min to get as transparent solution (500 mgL−1).[11]

Table 2: Medicinal uses of different parts of *Acacia nilotica.*

Part Used	Uses
Root	The roots are use against cancers, tumors (of ear, eye, or testicles), and liver and spleen.[7]
Leaf	Chemoprventive, anitmutagenic, anti bacterial, anticancer, astringent, anti microbial activity Tender leaves are used to treat diarrhea, Aphrodisiac, dressing of ulcers, anti-inflammatory and Alzheimer's diseases[7]
Gum	Astringent, emollient, liver tonic, reduce fever and antiasthmatic[8]
Stem Bark	Anti bacterial, prevent cell damage, anti-mutagenic, cytotoxic bark is use as astringent, acrid cooling, stop bleeding, emollient, anthelmintic, aphrodisiac, diuretic, expectorant, emetic, nutritive, in hemorrhage, wound ulcers, leprosy, leucoderma, small pox, various skin infections, irritability, burning sensation, toothache, leucoderma, looseness of bowels and seminal weakness. The trunk bark is use for cold, bronchitis, diarrhoea, dysentery, biliousness, bleeding piles and leucoderma.[9]
Seeds	Spasmogenic activity and antiplasmodial activity. [10]

Sweet almond oil

It is a great source of macronutrients and micronutrients and is extracted for food flavouring and the cosmeticherbal industry. Sweet almond oil is rich in minerals and vitamin A & E that promotes cell regeneration.

Extraction Process

The lipid elements of the sweet almond seeds (1000 g) were later on extracted with n-hexane by using a Soxhlet apparatus at 45-50 °C for 6-8 hours until the extraction was done. The solvent was separated from the oil using rotary vacuum evaporator at 65 ºC under reduced pressure. Oil content calculated from the weight difference of the dried seeds sample before and after extraction. After the extraction process, the oil obtained was kept in a cool and dry place. The acid value of sweet almond seed oil was measured by the American Oil Chemists Society (AOCS Official Method Cd 3d-63). The oil content and acid value determinations carried out in triplicate, and the data reported as mean ± standard deviation.

Vertiver root extract

A plant that is extensively used in cosmetic, perfumery and food industries and has potential application in the pharmaceutical industry.[12] The plant originating from India, it is tall, perennial, scented grass with straight stem, long leaves.[13]

Extraction Process

Soxhlet extraction

About 20 g of dried roots were loaded into a Soxhlet apparatus which was connected to a round flask containing 300 ml of hexane. The extraction was carried out at the boiling temperature of hexane for 5 h. After extraction, hexane was removed by evaporation at the boiling point. The evaporation was stopped once about 5mlremained in the system this was then divided in halves: one was subjected to chemical analysis, whilst the other was evaporated to completely remove hexane for determination of extract weight.

Hydro-distillation

Driedvetiver roots (approximately 20 g) were hydro-distilled using a Clevenger-type extraction apparatus. The extraction was carried out over 12h. After extraction, the extract was dehydrated by anhydrous sodium sulphate, and then weighed. The extraction was repeated three times.

Jojoba oil

Jojoba plant has seeds of nut shaped form. It is around 1-2 cm long, colour is red- dark brown.[14] It is grown in countries at the middle east was adapted to water stress. It contain high percentage of oil ranged from 50% to 60%.[15] The following formula represents an ester which is found in Jojoba oil:

$CH_3(CH_2)_7CH{=}CH\ (CH_2)_7CO\text{-}O\ (CH_2)_{11}CH = CH(CH_2)_7CH_3$[16]

Extraction Process

All seeds of jojoba were collected, washed to remove impurities, dried in 110ºC for 24 hours to get rid of water prior any further treating then a 10 grams of seed were crushed to have either coarse particles (1.5 mm) or fine particles (0.45mm). The extraction process using Soxhlet extractor shown in Figure 1 was done using two aqueous solvents: n-hexane(95% ALDRICH) and ethanol. The organic solvents have dissimilar polarities varying from highly non-polar solvent (hexane) to moderate polar solvent (ethanol), their specification as shown in table 1. Dissimilar concentrations of solvent water solutions were used. These were: 75%, 50%, and 25% (Vol. %), in addition to the pure solvents. The weighed crushed seeds were blended with 100 ml of the solvent. The extraction process was carried out at the boiling point of the solvent for four hours. Then, the oil was recovered using rotary evaporator (RE3022C STUART) as shown in Figure 2 to separate the oil-solvent mixture so that almost complete removal of solvent was conducted. The extracted oil was estimated by using FTIR analysis (Genesys 10UV) and by weight.[14-16]

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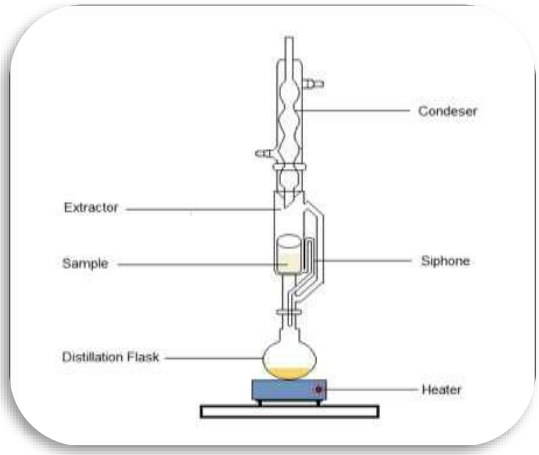

Figure 1: Extraction setup (Soxhlet extractor)

Figure 2: Rotary evaporator

Orange peel extract

Orange is a citrus fruit which contains different nutritional sources such as vitamin C, calcium, Potassium and Magnesium. It helps the skin from free radicle damage, skin hydration and oxidative stress. Also it is having instantaneous glow property, helps to prevent acne, blemishes, wrinkles & aging. [17] Oranges are some of the most commonly utilized fruits in the world due to its pleasant smell. [18] The peels carry innumerable oil bearing glands that enclose significant amount of citrus oil.[19] The oil extracted from orange peels can also be used as green insecticide. [20]

Extraction Process

Essential oil extraction from orange peels was done with the help of Soxhlet extraction method. The orange peels were grind using a blender. A round bottom flask washed properly, oven dried, and chilled in a desiccators. To perform this process, the ground peels were sieved with the help of a standard 0.6 mm particle size sieve. A dried mass of 10g of the orange peel powder was weighed, & the weight is note down. The weighed sample was dropped in the soxhlet extract apparatus as shown in figure. The extraction was performed by using normal hexane, methanol, and petroleum as the extraction solvent. In the soxhlet apparatus, the solvent in the round bottom flask was heated from the heating mantle to got evaporated and got condensed down through the sample where it was able to extract the oil along, thereby, giving a mixture of oil and solvent, which was later separated by using separating funnel. [21]

Turmeric

Turmeric is mainly used to rejuvenate the skin. It retards the symptoms of aging like wrinkles and also possesses other properties like antibacterial, antiseptic and anti-inflammatory. It is best source of blood purifier. It is effectual in cure of acne due to its antiseptic and antibacterial properties that fight pimples and breakouts to provide a youthful glow to your skin. [22-23] It has antifungal activity against dermatophytes.[24]

Extraction of oil

Method 1: In order to extract turmeric oil, researchers have used steam distillation, hydro distillation, and extraction using hexane. Hexane was fused with the oils succeeding curcumin extraction and heated to 60 C thrice for 60 min. The solvent was removed, which result in successful turmeric oil extraction. [25]

Method 2: Steam distillation procedure was used to acquire the essential oil from turmeric rhizomes. Modified steam distillation is a modification of the Clevenger apparatus which is used to procure essential oil from herbs and plant genesis. The sliced turmeric rhizome pieces are fed into the stuffed bed with wire gauze at the bottom to give bottom support to feed. Condensed water is fed to the flask A in which distilled water is boiled continuously with the help of heating mantle.The experimental setup comprised of equipment made up of glass. Components of the experimental setup includes: flask 1 (Round bottom flask), flask 2 (Round bottom flask), Condenser 3, Oil collector 4 and feed 5. The upper diagram shows the experimental setup. Distilled water is taken in round bottom flask A and it continuously heated to 100 C using heating mantle. The column of the flask is attached with bottom line of stuffed bed which is farther attached with a round bottom flask 2 for collection of condensate mixture. Stuffed bedcontains packing of sliced turmeric rhizomes. The proper insulation was furnished to the entire setup to prevent heat losses. The steam developed in the flask a pass through the turmeric bed. The slices of turmeric rhizome absorbs the heat from the steam and steam got condensed. The condensate alone with yellow colour of turmeric collected in vessel 2. The cell of the turmeric rhizome cracked and the volatile components of essential oil evaporated. The evaporated volatile components sweep off by the trailing steam and pass through the top mounted condenser 4. All oil and vapour mixture is got condensed and collected in collector 5. The essential oil slightly lighter than the water, hence turmeric oil gathers as top layer in collector 5. The concentration of the water soluble component increase through the process. After 5-6 hours operation, the turmeric oil is collected from the collector from the collector 5 as top layer.

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Lavender oil

Lavender oil is popular as a useful medicine in its own right and as an additive to many over the counter complementary medicine and cosmetic products. [26-28]Essential oil from Lavandula,Is also recognized in aromatherapy as a holistic relaxant, antioxidant, and antimicrobial agent.[29-31] It is used to disinfect skin and scalp to treat burns, insect bites and many more. [32]

Extraction Process

This Essential Oil is extracted from the steam distillation of the fresh or half dried leaves. This method brings out a extreme amount of oil compared to other techniques due to reduction of polar compound loss.

Collection of lavender blooms is generally around June month. Lavender flowers are compacted into a still. minor air pockets in the still effect in better oil yield. Then the vessel used to steam the bottom of the lavender flower filled still at low pressure. The lavender flower pockets containing oil are fragmented from this heating operation and a pipe of cold water is run through the Centre of the still. The hot lavender oil vapour condenses on the cold pipe with cold water and then collected into a holding tank where it is permitted to resolve. Due to the polarity and the densities of the oil and water, those two will divide in the holding tank where upon the water is piped out, leaving just lavender essential oil. [33]

Saffron extract

Saffron has different parts with different activities like saffron stigma contains superior antioxidant activity.[34]Saffron petal extract also shows antioxidant activity.[34] similarly the extract of stigma and petal of saffron shows anti-inflammatory activity.[35] Extract of crocus sativus against bacterial strains have confirmed an improved activity against bacteria and fungi used as test organisms.[36] Saffron is known to reduce the pigment called melanin. The formulation .containing C. sativus extract caused significant depigmentation and antirhytmic effect on human skin. [37]

Extraction Process

A steam distillation method is connected with a supercritical extraction method, the saffron crocus oil yield can be successfully improved, and correlated with a traditional steam distillation method, the method has the advantage that the oil yield is improved by about 20 percent. [38]

Steam distillation process

This is the most popular technique working for essential oil extraction. Steam is used for vaporizing the volatile compounds of the plant which is then liquidized and compiled as a liquid once it is cooled. The temperature at which this extraction method takes place gives it an important advantage over other procedure. It is easy, quick, and cost-effective. Here's the process involved:

1. Plant material are taken in a stainless steel container called "still" and covered with a lid, thus creating a closed environment.
2. Steam is injected into the still through an inlet. This causes the plant to release the volatile essential oil in the form of vapour.
3. The vaporized oil travels through a condensation flak (also known as the condenser) and exit the container.
4. The condenser has two separate pipes. One is for the hot water to exit the still, and the second for the cold water to enter condenser.
5. The hot vapour cools down when it comes in contact with cold water. It is then gathered inside a receptacle, also called a separator.
6. Since oil and water do not mix, oil is separated from the water and you get essential oil as the final product. [39]

Liquorice extract

It is used for the removal of skin pigmentation.[40] *Glycerrhiza glabra* or liquorice root extract, may be effective against bacteria that can infect the skin.[41,42] Historically it has been used as a sweetener, and medicinally as antibacterial, anti-viral, fungicidal, anti-inflammatory antioxidant and for adrenal insufficiency and stomach and intestine problems.

Extraction process

Wash the liquorice root by rubbing it under running water to remove any soil or plant debris. You can also use a soft brush to get into the crevices. If you bought the root dried, it has apparently already been well washed and there is no need to was hit further. You should detach a large mass of roots into small pieces so that you can clean it properly. Soak the dried root overnight in water to plump it up. Fresh roots will keep their moisture content for many days and should not need an additional soaking. put the root into a food processor or blender with equal parts of water and pulse it up to the chopped pieces are the size of sawdust. Collect the mixture of water and roots into a pot and put over low heat. Cover the pot and allow it to simmer for about an 60 min to release essential oils. Detach the pot from the heat and allow to cool without removing the pot cover. Once it has achieve room temperature, strain the liquid and pour into a light proof container. [43-45]

CONCLUSION

The herbal face wash was prepared by using various herbs like Lavender, Pumpkin seed oil, Saffron, Turmeric, Orange, Almond, Jojoba oil, Vertiver root, and Acacia. The herbal face wash is more efficient and safe as compared to the marketed face wash. At this formulation contains all herbal ingredients it neither produces any harmful action on skin and are reliable. Preferably they are used for all skin types. Herbal face wash not only moisturised but also they are used as a cleanser.

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