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PREPARATION AND EVALUATION OF ANTI-ACNE SOAP BY USING TULSI AND MINT LEAVES

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ABSTRACT:

Anti-acne soap was prepared by natural tulsi and mint leaves as active ingredients of anti-inflammatory and anti- microbial properties. By cold process the soap was prepared. In this research experiment used to prepare anti- acne soap of natural anti-acne agents were tulsi, mint, tea tree oil, anti-inflammatory agents like coconut oil, castor oil, anti-oxidising agents like olive oil, skin toning agent of carrot and orange peel which removes the excess oil from the pores. When lye solution was mixed with fatty vegetable oils forms a thick mixture, was poured in soap moulds. After 24 hrs demoulded the soaps. Soap sample was evaluated by p^H, moisture content, foam height, foam retention, physical factors. Results were obtained within the acceptance limit. Anti-acne soap was used to treat unplug black heads, white heads, papules, pimples.

KEY WORDS:

Anti-inflammatory, Anti- microbial, Anti-acne.

INTRODUCTION:

Acne is a pimple that develops deep in the skin, causing red, swollen and painful bumps, when hair follicles become plugged with oil and dead skin cells. The follicle wall may bulge and produce a white head or the plug may be open to the surface and darken causing a blackhead. And also symptoms like papules with pus at their tips, large , solid, painful lumps under the skin (nodules), painful pus filled lumps underneath the skin (cystic lesions). Acne starts when the pores in skin get clogged with oil and dead skin cells. Each pore is connected to a sebaceous gland, which produces an oily substance called sebum. It can plug pores, causing increased growth of bacteria known as Propionibacterium acnes. Acne is caused by excess oil production, hair follicles clogged by oil and dead skin cells, bacteria, inflammation, certain medications include drugs containing corticosteroids, testosterone or lithium, fluctuating hormone levels.

Acne problem can be reduced by some ingredients are available in nature. They are a) Tulsi b) Mint c) Tea tree oil d) Orange peel

a) Tulsi :

Figure no.1

Ocium teniflorum, commonly known as holy basil or tulsi is an aromatic perennial plant in the family Lamiaceae. It has vitamin-C, vitamin-A, iron, zinc and calcium and is suggested by some to be an anti-septic and anti-microbial. Tulsi leaves help fight a lot of free radical damage and inflammation, thereby reducing spots and blemishes reduce, resulting in glowing skin. The leaves of tulsi can help to eliminate the acne causing bacteria and also banish acne

scars. Tulsi has anti-inflammatory, anti-bacterial and anti-fungal properties and is super effective when it comes to acne. It kills the acne causing bacteria and disinfects the pores. One of the benefits of tulsi for skin is that it contains camphene which works as a natural toner to remove excess oil in the skin. It prevents the whiteheads, blackheads and other impurities that clog the hair follicles.

b) Mint

Figure no.2

Mint leaves have cooling properties. It controls acne production and stops it recurrence. The strong anti-bacterial property of mint leaves work as an excellent cleanser, toner and moisturizer. Mint leaves are rich in salicylic acid and vitamin-A which controls the secretion of sebum oil in the skin. People with oily skin are more prone to acne out bursts. The anti-bacterial and anti-inflammatory properties of mint leaves prevent inflammation and also cure acne. Mint leaves can act as a mild astringent that helps in toning the skin naturally. It removes the dirt from the pores.

c) Tea tree oil

Figure no.3

Tea tree oil is an essential oil. It is extracted from the leaves of Melaleuca alternifolia. The anti-inflammatory effect of tree tea oil helps to sooth & relieve painful and irritates skin. It may also help to reduce redness and swelling. Tree tea oil is popular choice for treating acne because of its anti-inflammatory and anti-microbial properties. It may even helps to prevent and reduce acne scars, leaving with smooth, clear skin.

d) Orange peel

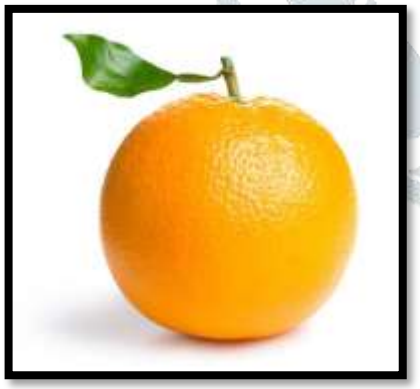

Figure no.4

Figure no.5

Orange peels contain citric acid that helps lighten and brighten the skin orinally. Vitamin-c in the peels is helps cleanse skin deeply and unclogs pores by removing excess oil. The anti-inflammatory properties in the orange peel can heal inflammation caused due to skin infection or other factors.

Soaps:

Soaps are essential to cleanse dirt and oil on skin surface to maintain the hygiene and good health. Soaps are widely used in bathing, cleaning, washing. The process of making sap is called saponification. Soaps are potassium or sodium salts of long chain fatty acids. During saponification ester reacts with an inorganic base to produce alocohol and soap. When trigycerides are reacts with potassium or sodium hydroxide (lye) to produce glycerol and fatty acid salts called soap. Triglcerides are generally animal fats and vegetable oils. When they are reacted with sodium hydroxide, a hard form of soap is formed. Based on the base used soaps can either be hard soaps or soft soaps. Potassium soaps are soft and sodium soaps are hard.

Along with natural ingredients some vegetable oils also play a role in acne. They are a) coconut oil b) olive oil c) castor oil

a) Coconut oil

Figure no.6

Coconut oil is highly saturated oil. Coconut oil is rich in medium chain fatty acids. The medium chain fatty acids in coconut oil have anti-microbial properties that can help protect against harmful microorganisms. Coconut oil has been shows to have anti-inflammatory properties. It may also aid in the treatment of acne. Furthermore, the anti-bacterial properties of the medium chain fatty acids in coconut oil could also help reduce acne.

b) Olive oil

Figure no.7

Olive oil is rich in vitamins and anti-oxidants. Removing the excess oil is important because it helps to prevent the oil from clogging pores. Clogged pores lead to breakouts. Using a soap made with olive oil may help decrease acne by killing off the bacteria that causes the acne. Olive oil is also known to moisturize and hydrates the skin.

c) Castor oil

Figure no.8

Ricinoleic acid, the main fatty acid found in castor oil, has anti-inflammatory and pain reducing properties. It may help reduce skin inflammation.

Carrot

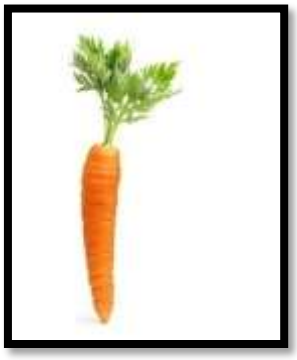

Figure no.9

Carrot is known to treat skin ailments like acne, pimples, and rashes. Besides their anti-oxidant content, they are also loaded with beta carotene that works on healing scars and blemishes on the skin. Carrot can protect skin from the sun rays. It helps repair skin tissue which also protecting skin from harmful radiation.

Sodium hydroxide

Figure no.10

Sodium hydroxide (NaOH) is a chemical compound that holds or maintains the p^H of skin care products, also known as lye. In soap, it's combined with animal fat or vegetable oil in a process is called saponification.

Sodium lauryl sulfate

Sodium lauryi sulfate is a chemical surfactant,that lowers the surface tension between two materials. The main reason that it is used is for cleaning products. Sodium lauryl sulfate is a harsh synthetic detergent and foaming agent that corrodes in order to clean.

MATERIALS AND METHOD:

Sodium hydroxide, sodium lauryl sulfate was used which was purchased from Yarrow chem. Products, Mumbai by St.Ann's College of Pharmacy, Vizianagaram . Coconut oil, olive oil, tea tree oil, tulsi, mint, carrot, orange were purchased from local market of Vizianagaram.

FORMULATION:

Table no.1

Ingredients	Quantity (gram)	Purpose
Sodium hydroxide	23	Surfactant
Coconut oil	78.97	Vegetable oil
Olive oil	44.18	Vegetable oil
Castor oil	26.85	Vegetable oil
Tea tree oil	1.6	Anti-inflammatory agent
Tulsi leaves powder	1.5	Anti-bacterial agent
Mint leaves powder	1.5	Anti-fungal agent
Carrot powder	1	Skin toning agent
Orange powder	1	Remove excess oil
Sodium lauryl sulfate (1%)	4.97	Foaming agent

METHOD OF PREPARATION:

Fresh leaves

(Tulsi, mint, carrot, orange)

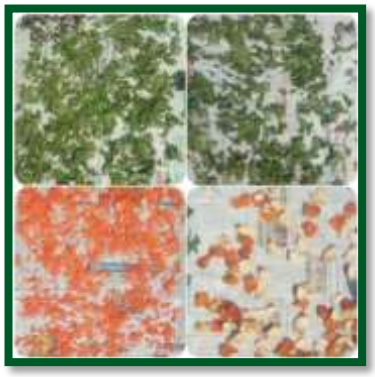

Figure no.11

Dried leaves

(After drying)

Figure no.12

Dry leaves powder

Figure no.13

Preparation of Tulsi & mint dry leaves powder:

Leaves of tulsi were collected and it was washed with water. Pick the leaves of tulsi and mint from the stems, sun dried for 3days. The dried leaves were powdered, sieved through 44 mesh number sieve to get a fine powder.

Preparation of orange peel powder:

Peeled the layer of orange into small pieces, and dried under sun light up to 3 days. After 3 days, the dried pieces were powdered and it was sieved through 44 mesh sieve to get a fine powder.

Preparation of carrot powder:

Fresh carrots were washed with water, grated and dried under sunlight for 3days. Dried carrot pieces were grinded to get powder and for fine powder sieved through 44 mesh sieve.

Procedure for preparation of Anti-acne soap:

Required quantity of sodium hydroxide was dissolved in ice water. Take another beaker add coconut oil, olive oil, castor oil, tea tree oil mixed well. Add tulsi, mint, orange, carrot powders to the vegetable oils. Lye solution was slowly added to the oil mixture with continuous stirring until it forms a desired consistency. The soap mixture was poured in soap moulds and rests it for 24 hrs to harden soap. Once soaps were hardened, removed from moulds and packed.

Before drying soap moulds

Figure no.14

Demoulded soaps

Figure.no.15

EVALUATION TESTS:

Physical appearance:

The physical appearance of soap is checked visually.

Colour :

The colour of soap is checked visually.

Odour :

The odour of soap is observed manually.

Greasiness:

The greasiness is observed by applying onto skin and it is washed with water then observed manually.

Washability :

Observe the wash ability property of soap after rinse with water on applying on to skin.

Skin irritability test:

Soap is applied on to skin by using water and let it for few minutes then observe for irritability symptoms.

Moisture content:

Analysis of water content was done using hot air oven method. Approximately 5grms of sample was taken into dried petridish and added some water to the soap sample and mixed thoroughly to make it in liquid form, and accurately weighed by using weighing balance. And kept the petridish in hot air oven for 30 min at 80ºc and repeated until constant weight was reached.

Determination of p^H:

Soap sample weighing 1.5 gr was mixed in 15 ml of distilled water without producing much lather. It was kept undisturbed for 24 hr for maximum dissolution of soap. Then the p^H of soap sample was measured.

Determination of total fatty matter in the soap:

5grms of soap sample was dissolved in 100ml hot water. About 40ml of 0.5N HNO3 is added to make it acidic. The mixture is heated until fatty acids are floating as a layer above the solution. It is cooled in ice water to solidify the fatty acids. The fatty acids were separated and the aqueous solution was treated with 50ml chloroform to remove the remaining fatty acids. The separated fatty matter was mixed together, solvent was evaporated and yield is noted. The total fatty matter can be calculated using the following formula

% of fatty matter = (y-x) X 100/weight of soap sample

Where, x = weight of dish

Y = weight of dish + soap after drying

Determination of Foam height of soap:

1gr of soap sample taken in a beaker add 100ml of distilled water. From that take 25ml solution make up with 50ml of distilled water.

Determination of Foam retention:

1gr of soap sample mixed with 100ml of distilled water, shake it for 10 times and observe the height of leather.

RESULTS & DISCUSSION:

Organoleptic characters of Anti-acne soap

Physical appearance, colour, odour, greasiness, washability, skin irritability test for soap sample was observed following table.no.2

Table no.2

Test	Observation
Appearance	Good, Smooth surface and hard
Colour	Dark green
Odour	Tulsi fragrance
Greasiness	NO
Washability	Easily washable with water
Skin irritabillity	Found no skin inflammation, edema, swelling & irritation

% Moisture content

% Moisture content of Anti-acne soap was observed until a constant weight was reached then calculating moisture content by using formula. And value was listed below table.no.3

P^H of Anti-acne soap

P^H of anti-acne soap was checked using P^H meter and the value was listed below table.no.3

Total fatty matter

After drying total fatty matter was present in soap was found and mentioned in below table.no.3

Foam height

After volume is make up with water then observe the height of soap foam was shown in below table.no.3

Figure no.16

Foam retention:

After 10 times shaking the foam retention was observed and value was shown below table.no.3

Table no.3

Test	Observation value
% Moisture content	3.37%
P^H	9.9
Total fatty matter	98%
Foam height	3.5cm
Foam retention	11min

CONCLUSION:

Anti – acne soap was prepared under cold process using tulsi and mint natural anti-acne agents. Dark green colour appearance, mint & tulsi smell, and smooth texture of soap shows better organoleptic characteristics. Evaluation tests were conducted and results obtained which shows the basic p^H (9.9), no irritation observed on to skin, foam height, foam retention, fatty matter, and moisture content all of the results were within acceptance limit. Soap was evaluated by different tests and observed the values. Finally each and every evaluated test was passed. So, wash the face daily with this anti-acne soap properly to help prevent pimples and to remove excess oil, dirt.

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REFERENCES:

1. Swarnali Roy, Sankhadip Bose, Dhrubajyoti sarkar, Sanjjit Mandal, Sipra Sarkar, Sudip kumar mandal. Formulation and Evaluation of Anti-acne gel containing Murraya Koeinigi extract, International Journal of current pharmaceutical Research, ISSN- 0975-7066, vol.12, Issue 4, 2020.
2. K. Kameswara rao, T. Karun kumar, K. Malleswari, V. Ramya Krishna, P.N.S.S. Sathyanarayanamma, M. Sandhyanjali. Formulation and Evaluation of Herbal Anti-Acne Face wash. International Research Journal of Pharmaceutical & Bioscience, 2019.
3. Mahammad Haneefa K. P, Shilpa NM, Junise V, Ajith chandran. Journal of Pharmaceutical sciences & Research, ISSN : 0975-1439, vol.11(8), 2019.
4. Jyothi Joshi, Devi P. Bhandari, Rajeswar Ranjitkar, Laxman, Bhandari & Paras M. Yadav. Journal of Plaant Resouraces, vol. 17, no.1, pp 112-117, 2019.
5. Nitin Mautri, Hanna A. Yamini, Edwin C. Pang and Margaret A. Deighton. Antimicrobial Activity of Tulsi (Ocimum tenuiflorum) Essential oil and their major constituents against three species of Bacteria. Front. Microbiol., 17 May 2016. Sec,

Antimicrobials, Resistance and chemotherapy, volume-7-2016. https://doi.org/10.3389/fmicb.2016.0068.

6. Lopamudra sethi and Preetha Bhadra. A Review paper on Tulsi plant (Ocimum sanctum L.) Indian journal of Natural Sciences, vol.10/Issue 60/June/2020. ISSN: 0976-0997.
7. Mkaddem M, Bouajila J, Ennajar M, Lebrihi A, Mathien F, Romdhane M. Chemical composition and anti- microbial & anti- oxidant activities of Mentha (Longifolia L. & Viridis). Essential oils. J. Food Sci. 2009; 74: M 358-63.
8. Arweiler, N.B., N. Donos, L. Netuschil, E. Reich and A.Sculean 2000. Clinical and anti-bacterial effect of tea tree oil- a pilot study. Clin. Oral Investig. 4:70-73.
9. Acne symptoms and causes –Mayo clinic-1998-2022 May, Foundation for Medical Education & Research. https://www.mayoclinic.org
10. American academy of Dermatology Association (AAD). Copyright 2022. Acne: Tips for managing.
11. Beauty benefits of tulsi, from india.com. copyright 2022 Zee Entertainment Enterprises updated Date June 22,2017,7:28 pm IST, https://www.india.com
12. The health site.com. 7 ways to use tulsi to banish acne & acne scars, written by Debjani Arora, published : September, 17, 2018, 6:28pm IST. https://www.thehealth.com
13. This Indian herb Tulsi helped reduced my acne-iDiva. Updated on June 30, 2020, 18:50 IST. http://www.idiva.com
14. Ayurvedic skin care: Tulsi is the powerhouse herb you need for gorgeous skin, benefits of tulsi for skin- Basil leaves for healthy skin. http://www.myglamm.com>2020
15. Ocimun tenuiflorum en.m.wikipedia.org, http://en.m.wikipedia.org
16. Unknown benefits of Mint in skin care. Last updated on August 2, 2021, 16:20 IST. http://m.timesofindia.com>beauty
17. The truth about lye: what you need to know about NaOH, May 21, 2020. Herbneeden.com. http://www.herbneden.com>blogs
18. Is coconut oil good for your skin? Written by Rachael link, MS, RD on April 9, 2017. https://www.healthline.com
19. Olive oil benefits for skin, on your skin has benefits & risks, by Carrie Madormo, RN, MPH, updated on April 27, 2021, medically reviewed by Leah Ansell, MD. https://www.verywellhealth.com

20. Olive oil benefits for your face. Medically reviewed by Debra Rose Wilson, ph.D, MSN, R.N, IBLC, AHN-BC, CHT written by Chaunie Brusie – updated on September 18, 2018. https://www.healthline.com
21. Four benefits and uses of castor oil written by Jillian Kubala, MS, RD- Medically reviewed by Adrienne Seitz, MS, RD, CDN, Nutrition- updated on January 28, 2022.
22. How does tea tree oil help the skin? Medically reviewed by Cynthia cob, DNP, APRN, WHNP-BC, FAANP- written by Emily Cronkleton- updated on March 7, 2019. https://healthline.com
23. Nine health & beauty of carrots for skin- written by Sumona Bose, May 26, 2020. https://www.healthline.com
24. William Mwangi Gichunki, Kisii University. Saponification Reaction: Preparation of soaps. September 2022, DOI: 10.13140/RG.2.2.10865.35684. https://www.researchgate.net/publication/363861477.