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## PREPARATION AND EVALUATION OF HERBAL SHAMPOO USING CUSTARD APPLES LEAVES EXTRACT, VITAMIN E, LEMON OIL

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### ABSTRACT

Shampoos made from plant-based materials including flowers, fruits, and herbs are known as herbal shampoos. They are well-liked by those who favor organic and natural personal care products. Herbal shampoos frequently contain chamomile, lavender, rosemary, aloe vera, and tea tree, among other herbs and plants. Herbal shampoos are well-known for their moisturizing and nourishing qualities, which can aid in preventing hair loss, strengthening hair, and promoting hair growth. Additionally, they are soft on the scalp and may be used by those with sensitive skin or scalps. My work is to prepare shampoo containing custard apple leaves, which help to be good for hair problems such as lice infection and regulate the sugar level in the human body because of the presence of fibers and antioxidants. The aim is to study and evaluate herbal shampoo containing all-natural components with an emphasis on efficacy and safety. Leaves of *Annona squamosa* L. were used in the preparation and subjected to physical properties and pH determination, skin irritability, and foam formation.

**Keywords:** Herbal shampoo, *Annona squamosa* L, Formulation, Evaluation

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**INTRODUCTION:**

One of the important parts of our body is hair and we have many hair problems like hair loss, dry hair, split ends, hair loss, hair breakage, frizz, etc. which have been observed in many people. Hair shampoo is generally used among other hair care materials in routine life [1]. Since the classical periods, human kind used herbal products for managing, garnishing, and cleansing hair [2-4]. As time has passed, the use of synthetic agents in the production of hair care products has increased. However, nowadays people are known to this problem which are caused by using new products containing chemicals which has harmful effect on or sensitive body parts like hair, eyes, face.

There are many different kinds of shampoos, including powder, clear liquid, liquid herbal, solid gel, and others. Many herbs are known for their capability to raise hair volume like hibiscus, amla, rosemary, aloe vera, peppermint etc. [5-7]. Herbal shampoos are hair care products made from organic materials including herbs, essential oils, and plant extracts [8]. Unlike conventional shampoos that include harsh chemicals, these shampoos are made to cleanse the hair and scalp without removing natural oils [9].

Herbal shampoos are a terrific option for people who wish to stay away from harsh

chemicals and artificial substances [10-11]. They are also a well-liked choice for people with sensitive scalps or particular hair difficulties, including dandruff or dryness [12-13]. Herbal shampoos also frequently offer further advantages like nourishing the hair and scalp, encouraging strong hair development, and enhancing the general look and texture of the hair [14-17]. Herbal shampoos can be a kinder and more nourishing substitute for conventional shampoos thanks to their all-natural ingredients [18-20].

**MATERIALS AND METHODS:****Collection of plants:**

The leaves of *Annona squamosa* L. were collected from a farm near Padra Town. Ther after, the leaves were boiled in water and dried for 10 or 15 days and then powdered using a mortar and pestle.

**Required chemicals:**

Activated charcoal, Chloroform, Gelatin powder, Guar gum, Petroleum ether, Distilled water, and NaCl are some of the ingredients in glycerin, a vitamin E capsule, rose oil and lemon oil.

**Preparation of solvent extract:****Extraction of *Annona squamosa* L.:**

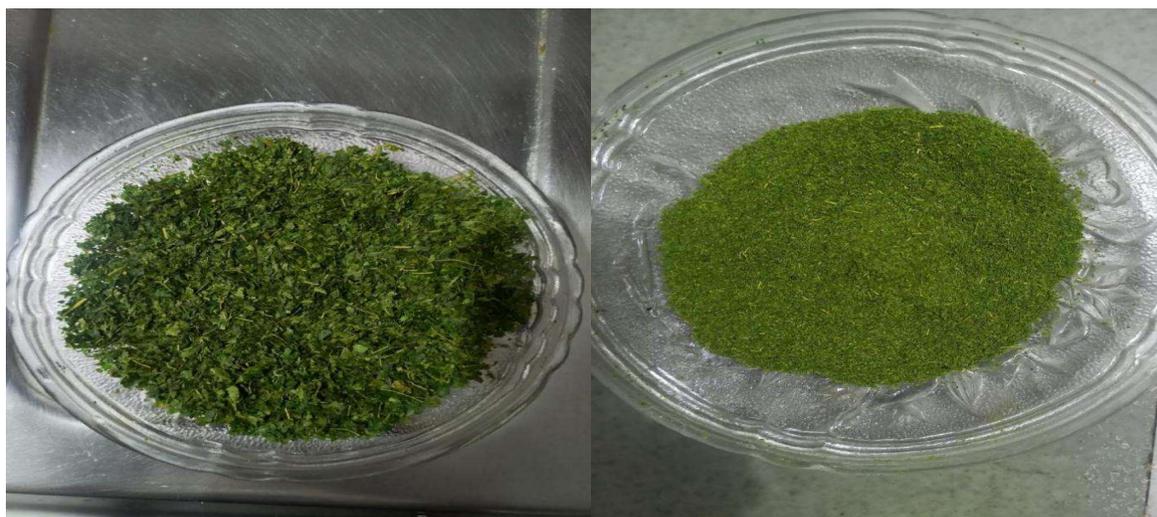
During 10 to 15 days, fresh custard apple leaves are gathered and shed-dried. The dried leaves are then crushed to a powder using a

mortar and pestle. After being sieved and weighed at 25.56 g, the powdered custard apple leaves are soaked with 250 ml of distilled water while being continuously stirred in a beaker. The created mixture is then kept for three days in a container that is foil-sealed and sealed to allow for soaking while

being stirred daily. The mixture was then separated using filter paper. The solvent can evaporate by being dried in a hot water bath. In the freezer, the dry extract was cooled after being collected. It is prepared and then measured.



**Figure 1: Fresh leaves of custard apple**



**Figure 2: Prepared powder of custard apple leaves**

**Formulation of Herbal shampoo:****Procedure:**

Take a beaker and add sodium chloride in an amount of 4 ml of 0.1M. Next fill the beaker with 1.5 gms of guar gum. Measure 0.5 ml of glycerin and add it to the beaker. Add 4.5 gm gelatin powder and two capsules of Vitamin E. After that add activated charcoal powder to the beaker and stir the mixture. Now, add the prepared custard apple leaf extract powder now, and thoroughly combine. To produce a smooth and consistent paste, add water as needed. 2-4 drops of rose oil should now be added to the mixture. As a preservative, add a couple of drops of lemon oil. To prevent any lumps from forming, mix it for a while more. Then, let it cool and analyze.

**Evaluation of herbal shampoo:**

The evaluation of shampoo comprises quality control tests including visual assessment and measuring physio-chemical controls such as determination of pH, foam volume, wetting ability, determining the percent of solid components, and skin sensitization test was performed.

**1. Physical appearance:** The prepared shampoo was evaluated for its color, odour, clarity, and foam-producing ability.

**2. Determination of pH:** The pH of herbal shampoo was measured by using a calibrated pH meter. In this test, shampoo solution was

formed into distilled water and then the pH of the solution was measured.

**3. Determine the percent of solid components:** Firstly, we take one clean and dry evaporating disc and weighed the disc. 5gm of shampoo was added to the disc and evaporating disc with shampoo was fixed on the hot plate until the liquid portion was evaporated. After drying, the weighted of the solid component present in the shampoo was calculated.

**4. Wetting time:** Wetting time was calculated by noting how long it took the material paper to completely sink. A circle measuring 1 inch in diameter was cut from a material paper weighing 0.42gm. The material paper plate was placed over the surface of the cleaner, and the timer was used to predict how long it would take the paper to sink.

**5. Cleansing action:** Applying the shampoo on hair that hasn't been washed in a week will reveal this activity. 4-5 hours prior to washing, the shampoo was used to cleanse the hair that had oil in it. The shampoo's effectiveness was assessed based on its capacity to clean the scalp of greasy particles.

**6. Foaming capability and stability:** The ability to produce foam was assessed using the shaking technique of measurement. A 10 ml measuring flask was filled with 50 ml of the 1% herbal shampoo, which was then covered

with the thumb and shook for 7-8 minutes. After 1 minute of shaking, the total amount of the foam content was measured. The volume of the foam was measured immediately after shaking it for 5-7 minutes at intervals of 1 minute. The foam volume stays the same over the course of around 5 minutes, indicating that the shampoo-generated foam has high stability.

**7. Stability study:** Stability of formulated shampoo can study by kept it at room temperature for period of 3 weeks,

**8. Skin irritation test:** It can be used for determine if a shampoo will cause irritation in the skin or not. Formulated herbal shampoo put on skin for 5-7 minutes to check the irritation test, after that washed out that part of skin and test it.

## RESULT AND DISCUSSION:

**Physical appearance look-over:** The herbal shampoo has a mildly sweet smell and is green in color.

Sr. No.	Parameter	Evaluation
1.	Color	Green
2.	Odor	Pleasant

**pH:** The best pH value for herbal shampoo is between 5 to 7.5pH of determinate shampoo was 5.5 which is near to the skin pH. This formulated shampoo was acidic-balanced shampoo. pH levels in shampoo can affect the

health of your scalp, leading to cuticles damage and fiber breakage. If shampoo is too thick then dilute it with distilled water to get a pH reading.

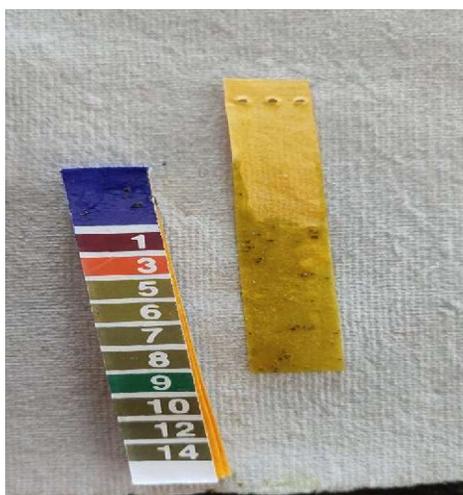


Figure 3: pH of the herbal shampoo

**Percentage of solid components:** The result of solid content is 0.15% which is normal. If the shampoo has more solid content than its

difficult to work, difficult for wash out the hair. The amount of solid content of the herbal shampoo shown in **Figure 4**.



Figure 4: Amount of solid content

**Cleaning ability:** Hair that had been oiled and hadn't been washed for a week was used for the cleansing test. The primary goal of this practice is to clean the scalp and hair of oil and grime. The findings of this study demonstrated shampoo's capacity to clean hair by removing oil and impurities.

**Foaming capability and stability:** To check the foaming ability of shampoo, take 10 ml measuring flask, which was covered by thumb, add shampoo and little bit of distilled water and shaken five to ten time. After one minute of shaking, record the total volume of the foam. The foam's height was evaluated.

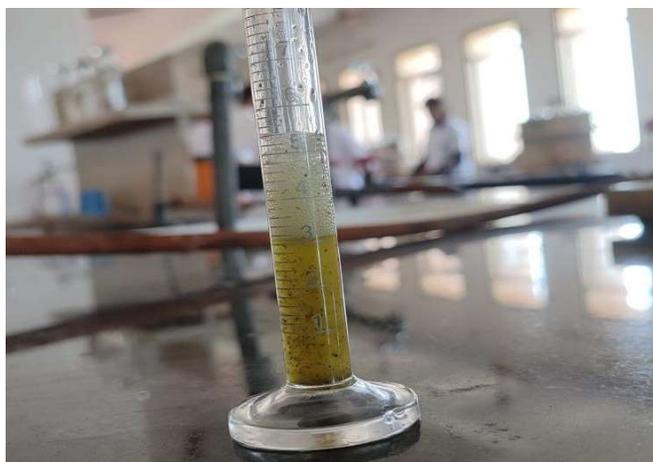


Figure 5: Height of foam

**Skin sensitivity test:** Because there are no chemical components in the shampoo formulation, it has no irritating effects on the skin. Typically, produced chemicals cause

skin irritation and swelling, but we utilized natural ingredients in this preparation, so it has no negative effects.

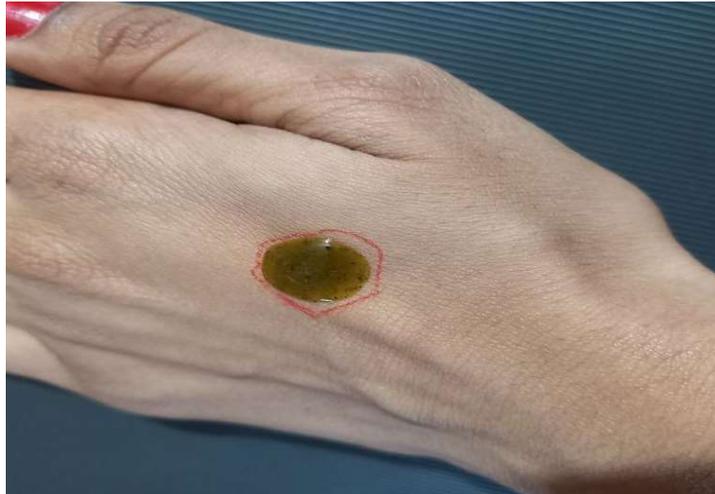


Figure 6: Skin irritation test

**Stability analysis:** Analysis of the formulated shampoo's stability during storage reveals that it is both chemically and physically stable. The herbal shampoo is stable between 30°C-

32°C. The outcome of the two-week stability assessment demonstrates that it has respectable stability.



Figure 7: Stability test

**Wetting time:** A surfactant's concentration affects how well it wets things, and this property is frequently used to gauge a substance's effectiveness. This test makes use of the canvas disc approach. This test is quick, accurate, and effective for assessing a shampoo's wetting power. 3 seconds was shown to be a good soaking time for herbal shampoo. Anti-Microbial Activity of Herbal Shampoo

**Disc diffusion method:**

The *E.coli* bacteria was spread on a Mueller Hinton plate and was kept for 10 minutes. The

paper disc which was used for testing the sample, which was cut from whatman filter paper by using punching machine. The disc was dipped in the shampoo solution, which was prepared by dissolving the 0.2ml herbal shampoo in 1ml water. Place the dipped disc in Mueller Hinton Agar plate. Incubate the plate for 24 hours.

The zone of inhibition obtained against E-Coli bacteria is 10mm. Thus it is resistive against bacterial growth.



Figure 8: Anti- Microbial Activity

**CONCLUSION:**

Herbal shampoo using custard apple leaves is prepared and evaluation were carried out for these following parameters: Physical appearance, pH determination, determination

of solid content, wetting time, stability study, skin irritation test. In addition to being safer than chemical conditioning agents, especially designed shampoos also significantly lessen hair loss over time and support hair growth.

To maintain the scalp's naturally acidic mantle, the pH of the shampoos was set to 5.5. The present study was point out with the object of preparing the herbal shampoo that reduces hair loss promote growth and strength of hair.

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#### **REFERENCES:**

- [1] Ishita, K., Ishita, S., Ishita, S., Sayak, D. and Rajat, D., Formulation and Evaluation of Herbal Shampoo using neem, amla, and reetha extract, *Journal of Pharmacognosy and Phytochemistry*, 11(4), 2022, 179-184
- [2] Prachi, S., Sonal, D., Preparation of Herbello- an herbal anti-dandruff shampoo. *Research article biological science*, 5(2), 2015, 220-228
- [3] Vaidya, S., Characterization and comparison Herbello-an herbal antidandruff shampoo with commercial shampoos. *Jigyasa*, 8, 2012, 113-119
- [4] Desai, N., Isolation And Identification Of Dandruff Causing Organism And Their Sensitivity Against Some Herbs, *Jigyasa*, 8, 2012, 176-182
- [5] Jennifer, G., Vito, R., Paola, F., Pinalysa, C., Hair care cosmetics: Traditional Shampoo to Solid Clay and Herbal Shampoo, A Review. *Cosmetics*. 6(1), 2019, 2-3.
- [6] Arora, P., Arun, N., Karan, M., Shampoos based on synthetic ingredients vis-à-vis shampoos based on herbal ingredients: A review. *Int. J. Pharm. Sci. Rev. Res.* 7(1), 2011, 41–46.
- [7] Bellare, J., Iyer, R., Mainkar, A.R., Jolly, C.I., A study on the conditioning effects of natural shampoos using the scanning electron microscope. *Int. J. Cosmet. Sci.* 23(3), 2001, 139–145.
- [8] Adwan, G., Mhanna, M., Synergistic Effects of Plant Extracts and Antibiotics on Staphylococcus aureus Strains Isolated from Clinical Specimens, *Asian Pacific Journal of Tropical Medicine* 2(3), 2009, 46-51
- [9] Neelam, J., Kalpana, P., Rakesh, S., Vandana, M., Preparation and Evaluation of herbal hair growth promoting shampoo formulation containing Piper betle and Psidium guajava leaves extract. *International Journal of green Pharmacy*, 12(4), 2018, S835.

- [10] Utane, R., Deo, S., Itankar, P., Preparation of herbal shampoo (HS) by green method and their characterization, International Journal of researches in social sciences and information studies, 5, 2017, 254-258.
- [11] Rimjhim, Arora., Rathore, K.S., Bharakatiya, M., Formulation and Evaluation of Herbal Shampoo by Extract of Some Plants, The Pharmaceutical and Chemical Journal, 6(4), 2019, 74-80
- [12] Pundkar, A.S., and Sujata, P., Ingale, Formulation and evaluation of herbal liquid shampoo, World Journal of Pharmaceutical Research, 9(5), 2020, 901-911
- [13] Mainkar, A.R., Jolly, C.I., Formulation of Natural Shampoo, International journal of cosmetic science, 23(1), 2001, 59-62
- [14] Sharma, R.M., Shah, K., Patel, J., Evaluation of prepared herbal shampoo formulations and to compare formulated shampoo with marketed shampoos. International journal of pharmacy and pharmaceutical sciences, 3(4), 2011, 402-405.
- [15] Chandran, S., Vipin, K.V., Augusthy, A.R., Lindumol, K.V., Shirwaikar, A., Development and evaluation of antidandruff shampoo based on natural sources. J Pharm Phototherapeutics, 1(4), 2013, 10-14
- [16] Shinde, P.R., Tatiya, A.U., Surana, S.J., Formulation Development and Evaluation of Herbal Antidandruff Shampoo. International Jnl of research in Cosmetic Science, 3, 2013, 25-33
- [17] Snehal, W., Nitin, K., Vaibhav, B., Original research paper on Preparation and Evaluation of Antidandruff polyherbal powder Shampoo. Pharmacophore an international research Jnl, 5(1), 2014, 77-84.
- [18] Potluri, A., Harish, G.B., Kumar, P., Durraivel, A review article on Formulation and evaluation of Herbal Anti-Dandruff Shampoo. Indian jnl of Research in Pharmacy and Biotechnology, 1(6), 2013, 835-839.
- [19] Syed, R., Kumar, A., Setting up a business venture for herbal shampoo, Jigyasa, 8, 2012, 119- 127

- [20] Griffin, J.J., Corcoran, R.F., Akana, K.K., The pH of hair shampoo. J. Chem. Education, 54, 1977, 553-554