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Formulation and evaluation of aloe vera gel shampoo

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Abstract

Aloe Vera is a characteristic item which is presently a days utilized in the field of cosmetology. Our definition is to detail a home grown cleanser utilizing a plant extract which is utilized as hair washing and molding cleanser to treat balding and block twitch scalp and dandruff. is effective than the marketed shampoo as we have used essential oils like coconut oil which is derived from the coconut palm fruit , lavender oil which is derived from the flowers of lavender, rosemary oil derived from the flowering tops of rosemary. eucalyptus oil which is derived from the leaves of eucalyptus plant and some other excepients like antioxidants stabilizers, solubilizing agents, surfactants, cleansing agents, coloring agents and preservatives. All of these are used for the aim to improve the smoothening, shining and growth of the hair. Our study has evaluated all the tests like foaming ability test, pH determination, skin irritancy test, conditioning performance, saturated and in all those test it has shown good results when compared to the marketed shampoo.

Keywords: Aloe Vera, Eucalyptus leaves, Lavender flowers, flowering tops of rosemary coconut oil.

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Introduction

Aloe Vera belongs to the family Liliaceae **,** It's botanical name is "Aloe barbadensis miller". The name Aloe Vera derives from the Arabic word 'Alloeh" meaning "shining bitter substances" while "Vera" in Latin means "true" [1,2,8]. Aloe Vera plant can grow up to 100cm height and most of the specimens are 30 to 60 cm height. It has thick leaves that grow in a rosette shape. The gel inside the long, spiky leaves of this succulent feels cool when used on the skin, The phytochemical constituents present in aloe leaf are alkaloids, flavonoids, glycosides, phenols, saponins, tannins. This helps to soothe inflammation and relieve pain associated with burns. The fleshy leaves with serrated edges that arise from a central base and grow to nearly 30 to 50 cm long have 10 cm width at the base. Health benefits of Aloe Vera include wound healing, treating burns, protect against skin damage from x rays and intestinal problems [3, 6]. It is a natural product that is nowadays frequently

used in the field of cosmetology [1, 2, 8]. It comprises of a few nutrients, minerals, compounds, amino acids, normal sugars and specialists which might be mitigating and hostile to microbial [20, 27]. This plant has potential to cure sun burns, minor cuts and even skin cancer [20]. It is used in cosmetics like shampoos, face washes. Aloe Vera is used as a moisturizer for skin [21]. The benefits expected are conditioning, smoothing of hair surface and good health of the hair, hair free dandruff, dirt, grease and lice [7]. Its function is cleansing the hair and prevent the scalp debris and the residues of the hair grooming preparations [12]. With the assistance of Aloe Vera plant we can decide its properties, system of activity and clinical uses, we can assess the attributes and nature of lab based shampoos figured from the gel of Aloe Vera. In the plan of work our formulation is used to develop and formulate the use of Aloe Vera for its skin soothing and therapeutic properties as a base to make a shampoo. It is used to determine the effectiveness of Aloe Vera peeling in shining and glowing of the hair. It acts as a great conditioner to your

hair which makes hair smooth and shiny. Aloe Vera shampoo is recommended for the treatment of hair loss and also prevents itching of hair scalp. We should use essential oils in the formulation as it shows the best results. In this we study about the differences between our formulation and marketed formulation. Here viscosity value of our formulation should be greater than the marketed shampoo. The pH values should be comparable to those of the marketed shampoo [20]. Formulations with higher solid content, higher surface tension, shorter wetting time, conditioning performance than the marketed shampoo.

Materials and Methods

Materials

Aloe Vera

It is a succulent plant of the genus aloe, it is widely distributed, and is considered an invasive species in many world regions. An evergreen perennial, it originates from the Arabian Peninsula, but grows wild in tropical, semi tropical and arid climates around the world .It can grow up to 30 to 50 cm long and have 10 cm width at the base.

Terms

Aloe Vera is derived from the Arabic word "Alloeh" ,meaning a "shining bitter substance" and Vera came from the Latin word "Vera" meaning "true".

Benefits

- It calms an itchy scalp.
- Deep cleanses the oily hair.
- Strengthens and repairs hair strands.
- May promote hair growth.

Categories

There are 7 categories;

- Stone aloe –Aloe petricola
- Climbing aloes - Aloe ciliaris
- Cape aloe – Aloe ferox
- Coral aloe – Aloe striata
- Lace aloe – Aloe aristata
- Candelabra – Aloe arborescens
- Spider aloe – Aloe humilis

Essential oils

1.Coconut oil : It is a palatable oil gotten from the wick ,meat and milk of the coconut palm natural product. It is a white solid fat ,melts at temperature of 25 C, and in summer it is clear liquid form having the coconut aroma quantity of coconut oil used -1drop.

Terms: Cocos Nucifera.

Benefits: It is used for hair growth. It helps your hair healthier, thicker and longer. Used to blend a cup of Aloe Vera gel, to ensure that there are no lumps.

Categories

There are 5 categories;

- Refined coconut oil
- Unrefined coconut oil
- Virgin coconut oil
- Hydrogenated coconut oil
- Organic coconut oil.

2. Cedar wood oil: It is a fundamental oil got from different kinds of conifers, most in the pine or cypress herbal families. It is delivered from the foliage and some of the time the wood, roots and stumps left subsequent to logging of trees of lumber Quantity of cedarwood oil used-8-10 drops.

Terms: It is derived from the Latin word Cedrus.

Benefits: Used to treat hair loss. Used for scalp conditions and treating dandruff. Used for cleansing of dirt in skin.

Categories

There are 6 categories;

- Atlas cedar wood
- Chinese cedar wood
- Himalayan cedar wood
- Port orford cedar wood
- Texas cedar wood
- Virginian cedar wood

3. Lavender oil: It is obtained by distillation process from the flowers of lavender. More than 400 types of lavender species were present with different scents and qualities, quantity of lavender oil used-15 drops.

Terms: Lavender is derived from the Latin word "lavare" meaning "to wash".

Benefits: It helps to promote hair growth. It has anti microbial properties. It also kills head lice.

Categories: Mostly two forms are distinguished;

- Lavender flower oil
- Lavender spike oil

4. Rosemary oil: It is sharp essential oil acquired from the development of elevated points of rosemary and utilized mostly in cleansers, colognes, hair salves and drug orders, quantity of rosemary oil used-25 drops.

Terms: Its Latin origin meaning "dew of the sea".

Benefits: It stimulates hair growth. It is used to prevent premature graying and dandruff. It helps in preventing dry or itchy scalp.

Categories: There are numerous kinds of rosemary plants, in this way delivering various

sorts of rosemary fundamental oils. Here are two unique rosemary fundamentals.

Types: Rosmarinus officinalis var cineole, Rosmarinus officinalis var verbenon

5. Eucalyptus oil: It is aromatic oil extracted from the leaves of the Eucalyptus. It lives an Australian plant most widely used as condiment, fragrance, anti septic uses quantity of eucalyptus oil used-2-4 drops.

Terms: It is an old Greek word "Eu" signifying "great, all things considered, valid, lovely, very" and " Kalypto" signifying "cover, stow away.

Benefits:

- It stimulate hair follicles.
- It further develops hair protection.
- It advances hair development.
- It suppress difficulty scalp.
- It treats head lice.

Categories: There are 750 different species of the genus eucalyptus, of which at least 500 produce essential oils. Here are the three important essential oils ,they are; Blue gum eucalyptus essential oil Broad leaved peppermint eucalyptus essential oil, Eucalyptus Smithii essential oil.

Other excipients:

1. Anti-oxidants: These are man-made or normal substance that may prevent or suspend a few types of cell harm.

Purpose: Aloe Vera gel contains awesome cancer prevention agents having a place with a immense group of substances known as poly phenols. These poly-phenols alongside a few different mixtures in Aloe Vera help with conquer the development of particular microbes that can make pollute people.

Examples:

- Vitamin E or nutrient E
- Beta keratin
- Vitamin C
- Vitamin A
- Phyto chemicals

Nutrient E: It is essential for sound skin and this includes your scalp. It protects the lipid layer by reducing the oxidative stress and gives the hair a strong base.

Terms: It is obtained from vegetable oils such as palm oil, green leafy vegetables, peanut butter and whole grains.

Benefits: It has antioxidant property that can decreases the dandruff and improves hair Growth. It could help support a healthy scalp. It helps to prevent hair loss and increased shine.

Categories: They are of 8 compounds but mostly used are of 2 compounds

- Tocopherols
- Tocotrienols

2. Stabilizers: It is the essential capacity and movement of different components present in therapeutic assign, similar to the ph value to check obstructive caustic or alkalinity item.

Purpose: So as to improve our hair and scalp are returning to a more normal state as most

- Healing and recovering issues have resolved.
- It gives better texture and improves hair color.
- It smoothens and shines the hair.

Examples:

- Guar gum
- Inulin
- Beetle bean gum
- Gum acacia

Guar gum: It hydrates the hair by sealing in the moisture. It acts a conditioner and makes hair smooth and shiny. It prevents breakage. It reduces curl in the hair, protects the hair strands from pollution and prevents static.

Terms: It is gotten from the seed endosperm of guar plant which is for the most part developed in India and Pakistan from ancients necessity.

Benefits: It prevents the product build up on your hair. It makes your hair shiny while adding a smooth texture. It seals the moisture and keeps your hair well hydrated.

3. Solubilizing agents: It is a water dissolvable emulsifier, which ties water and oil together. Polysorbate20 is a delicate, slick, fluid restorative added substance that capacities as a non-ionic surfactant and wetting specialist that upgrades the unfold of fluids.

Purpose: It is the essential capacity is to eliminate soils, like sebum and strong particulates, from the hair. Be that as it may, they likewise are significant for effervesce, building item thickness, suspending actives and the solubility of an aroma.

Examples:

- Sodium lauryl sulfate
- Sodium lauryl ether sulfate
- Ammonium lauryl sulfate
- Ammonium lauryl ether sulfate

Sodium lauryl sulfate: It is otherwise called surfactant. This implies it brings down the surface pressure between fixings which is the reason it is utilized as a purging and frothing specialists. SLS can be for the most part found in magnificence and self consideration items.
Terms: It is gotten from coconut or palm piece oil. It acts as a comprises of a mixture of sodium alkyl sulfates for the most part the lauryl.

Benefits:

- Less likely to cause scalp problems.
- Free from parabens and silicones.

4. Foaming agents: It works with the development of froth like a surfactant. A surfactant, when present in limited quantities, reduce a surface tension of a fluid or assembles its mixture soundness by restrain mixture of vesicles.

Examples:

- Sodium lauryl sulphate
- Sodium bicarbonate

5. Surfactants: It emulsifies slick soil on hair and scalp, and afterward the earth can be manipulate into water and washed off without any problem.

Categories:

Anionic phenol – E.g. SLS
Amphoteric surfactants - E.g. Cocamidopropyl betaine
Non ionic surfactants – E.g. Cocamido MEG

Benefits:

- less likely to cause scalp problems.
- Free fro parabens and silicones.

6. Cleansing agents: It is a authority that varies from cleanser though can also emulsify oils and hold earth in suspension and cleanser. It involves of soaps or cleansers utilized for washing the hair.

Purpose: It is used to remove dirt, grime and sebum from the surface of the skin and the hair.

Categories:

- Detergents
- Degreasers
- Abrasives
- Acid cleaners
- Water
- Organic solvents

Examples:

- Sodium lauryl sulphate
- Humectants
- Silicone
- Proteins

7. Colouring agents: These are the chemicals that are used to enhance the color of the prepared shampoo.

Purpose: The agents are added to the gel in order to improve the color of the prepared shampoo.

Examples:

- Para phenylene diamine
- Resorcinol
- Amino phenol

8. Preservatives: It help with reduction the equating and assurance the strength of our refreshing items. It basically proposed to inhibit the development of small-scale organic systems in the restorative item.

Purpose: It has antimicrobial specialist that minds the item helps with inhibiting the growth of effective micro organisms or kill them. It has a powerful adversary of microbial properties to prevent individual consideration items applicable from destroy and haul out generously the time span of advantage.

Examples:

- Parabens
- Formaldehyde releasers
- Isothiazolinones
- Phenoxy ethanol
- Organic acids

Methods

1. Appearance test

Developed formulation was evaluated for their clarity, color and Odor. All evaluations were reported and discussed.

2. Foaming ability test

Chamber shake technique with slight variation was utilized for determining effervesce ability.50ml of the 1% cleanser arrangement was placed into a 250ml graduated estimating chamber and covered with hand. Estimating chamber was shaken for 1 moment. The all out volume of a froth substance following brief shaking was recorded. The strategy was proceeded for 10 minutes.

3.Establishment of pH

Created plan was weakened utilizing refined water to prepare a straight forward with 10% focus. The pre-arranged example was checked for pH utilizing a digital pH meter at room temperature 27 - 30 C.

4. Skin irritancy

Skin irritancy of a shampoo can be checked by taking small amount of product On skin, after few minute to check whether local irritation or any inflammatory reactions are produce or not.

5. Conditioning performance:

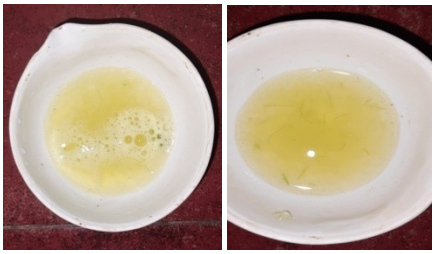
The molding impact of the shampoos can be concentrated by washing a mass of trim hair with the details and mentioning actual objective facts. If the mass of the hair looks smooth and silky then it passes the test.

6. Wetting ability:

The most recommended shampoos are those that have the more limited wetting time. To check the moisten ability we should compare our formulation with the commercial Aloe Vera shampoo, if our formulation have the shorter wetting time than that of the commercial one, then it passes the test.

7.Viscosity:

The regularity upsides of the shampoos went from 22.19(4 ml gel) to 26.86(10 ml gel), So the clarity with higher range of the gel shows higher density.To make the shampoos with improved consistency we must prepare shampoos with higher viscosities.



8. Dirt Dispersion

Dirt dispersion is another analytical limit in estimating the purifying activity of shampoos, while top notch shampoos reduce the dirt in the water, low quality ones reduce the dirt in their foams. Any dirt or stains that accumulate in the foam is hard to wash away and can be remain on the hair.

9. Solid content

Lower solid content makes the shampoos watery and clear of hair quickly, if solid content is between 20 to 30% then the test will be passed.

10. Surface tension

One of the measures in the detergency property is the bringing down of surface tension, and this will give the indication for an acceptable detergency results of the shampoo which should be possible by lessening the surface tension of water from 71.6 dynes/cm to the surface tension of water 31-38 dynes/cm.

Results and Discussion

Table 01: Physicochemical study of the Aloe Vera gel shampoo

Evaluation Test	
Color	Mint green
Transparency	Clear
Odor	Good
Ph	5.7
Solid contents	22 to 27%
Foam ability	Stable
Wetting ability	Wetting ability - 90sec
Surface tension	30 to 37 dynes/cm
Viscosity	96.71 to 96.82%
HLB Value	20

Table 02: Conditioning effectiveness of F S (Formulated shampoo)

Client	FS	Standard
1	1	15
2	3	3
3	11	1
4	2	1
Mean	3	1.1

The mean score dependent on the assessment given by the volunteers from understudy populace (n=24) on the molding impact of the shampoos on the chose plait. Client1- poor, Client2- fair, Client3- good, Client4- excellent.

Table 03: Conditioning effectiveness of F S

Client	FS	Standard
1	2	13
2	1	2
3	12	2
4	1	3
Mean	1	4

The mean score dependent on the assessment given by the volunteers from understudy populace (n=24) on the molding impact of the shampoos on the chose plait. Client 1-good, Client 2-excellent, Client 3-fair ,Client 4-poor.

Table 04: Conditioning effectiveness of F S

Client	FS	Standard
1	3	11
2	2	3
3	13	4
4	1	2
Mean	4	3

The mean score dependent on the assessment given by the volunteers from understudy populace (n=24) on the molding impact of the shampoos on the chose plait. Client 1-fair, client 2 – poor, client 3-excellent, client 4 – good.

Table 05: conditioning effectiveness of FS

Client	**FS**	**Standard**
1	1	12
2	3	1
3	10	3
4	2	4
Mean	4	2

The mean score dependent on the assessment given by the volunteers from understudy populace (n=24) on the molding impact of the shampoos on the chose plait. Client 1-good , Client 2 – fair , client 3 – poor, client 4-excellent.

Table 06: Conditioning effectiveness of F S

Client	FS	Standard
1	13	3
2	5	12
3	3	1
4	2	4
Mean	4	3

The mean score dependent on the assessment given by the volunteers from understudy populace (n=24) on the molding impact of the shampoos on the chose plait. Client 1- excellent, Client 2: fair, Client 3: poor, Client 4:good.

Table 07: Conditioning effectiveness of F S

Client	FS	Standard
1	13	11
2	3	5
3	2	3
4	4	2
Mean	2	4

The mean score dependent on the assessment given by the volunteers from understudy populace (n=24) on the molding impact of the shampoos on the chose plait. Client 1-fair , Client 2-good , Client 3-excellent ,Client 4-poor.

Conclusion

The point of the investigation was to define a totally home grown cleanser which is at far with the manufactured cleanser accessible in the market. We assess a natural cleanser by utilizing plant extract which are regularly utilized generally for their hair removing activities. Every one of the fixings are utilized to define a cleanser are more secure than manufactured molding specialists and can incredibly lessen the hair or protein misfortune during brushing. A few tests were performed to assess and look at the physico synthetic properties of both arranged and promoted shampoos. We have performed the tests with the clients by applying our FS, it has shown best results when compared with retail shampoo, in any case further innovative work is needed to work on its general quality.

Author Contribution

All authors are Contributed Equally

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