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Standardization of bio saponins, formulation and evaluation of herbal shampoo

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Abstract
Saponins are naturally occurring high-molecular-weight glycosides with distinct foaming characteristics. They are found in many plants, but get their name from the soapwort plant (*Saponaria*), of which the root was historically used as soap. The name saponin is derived from the Latin word Sapo, which means soap. Saponins are high-foaming agents and therefore excellent to use when natural surface active compounds are required. Saponins are excellent when used in soaps, shampoos, creams, lotions, shaving products, body washes, etc.
Bio saponins were extracted from individual plant and formulation was prepared with aqueous juice of hibiscus petals as base. The proportion of individual saponin extract is selected upon its foaming index. Finally olive oil and citriodora oil was added as conditioner and antidandruff respectively, formulated shampoo were also subjected for same test performed for individual plants as mentioned in formulation, it possess all evaluatory parameter which should satisfy by ideal shampoo. In future research newer herbs should carry out with new herbal base.

Keywords: bio saponins, herbal plants, shampoo, foaming index

1. Introduction
Herbal shampoo are always better than synthetic shampoo because it doesn't cause irritation to eye, drying of hair, loss of hair hence we have to use herbal shampoo. Shampoos are simply detergents. They are a different type of cleaning media than ordinary laundry or hand detergents because of their application to different types of hair. Shampoos are used to remove excess oil, dirt and skin debris from the hair known as sebum. A good shampoo will perform this function while leaving the hair manageable. These products should possess rich foaming action and rinse out easily. Various forms of shampoos are available, from clear liquids to opaque pastes.
To select detergent for using in shampoos, the following factors should be considered.

1. Safety or non-toxicity
2. Ease of distribution and lathering power
3. Luster imparted to hair
4. Ease of combing wet hair
5. Speed of drying
6. Ease of setting dry hair

Herbal shampoos and conditioners provide an all-natural organic experience. They are gentle and made with organic and herbal extracts. Herbal shampoos and conditioners tend to be pH balanced and are great for all hair types. They are especially beneficial for restoring dry, damaged or chemically treated hair. Using herbal cleansers, nourish the scalp shafts helping prevent dandruff. Using natural or herbal shampoos and conditioners cleanse and moisturize hair without harsh chemicals that strip your hair of its natural oils. Your hair receives nourishment from the herbal botanicals and is left clean, shiny and healthy [1-4].

2. Object of the Invention
The present invention relates to standardize Amla, Reetha, and Shikakai for its detergent property, formulation and evaluation of herbal shampoo with these plant extract by using herbal base. Number of plants are available in traditional medicinal system for the hair care. In present study the four traditional herbs were selected. Amla, Reetha, and Shikakai were being conventionally using for hair rinsing with hibiscus petal juice as natural base, so aimed to standardise them for its detergent property, formulation and evaluation of herbal shampoo with herbal base.

3. Material and Methods
3.1 Extraction of bio saponins and determination of foaming index of plants
3.1.1 Extraction of bio saponins
All the plant material were produced from local market, authenticated, washed, cleaned and powdered and subjected for extraction. Individual plant materials were extracted with distilled water, as saponines are soluble in water. The aqueous extracts were evaporated under reduced pressure. It was used for further study [5].

3.1.2 Determination of foaming index: (1% solution)
The foaming index of individual plant was determined for 5, 15, 30 and 45 min. All the plant produced stable foam up to 45 min. The observation was shown in Table No. 1.

Table 1: Foaming index of 1% extract of individual plants

Plant name	Reetha	Shikakai	Amla
Foaming index	250	166.66	142.85

3.2 Formulation of Shampoo
For shampoo various natural herbs were evaluated as base, the best consistency and stability was found with Hibiscus petal juice was used as base. The quantity of aqueous extract of individual plant material was taken on its foaming index.

Contents of shampoo
Reetha
Shikakai
Amla
Olive oil
Citriodora oil
Hibiscus Petal Juice
The olive oil was acting as conditioner while oil of Citriodora acting as antidandruff [6, 7, 8, 9, 10].
The different evaluator test were performed, results were shown in table 2 and 3.

3.3 Evaluation of individual plants and formulated shampoo for detergent property

The 1% aqueous extract of individual plants and formulated shampoo were evaluated for detergent activity on hairs. The 10 gm. of natural hairs were used for it. The different test such as effect of spreading, leathering power, effect of rinsing, effect of combing on wet hair, speed of drying, luster of hair, and efficiency of combing and setting hairs, dirt dispersion ink test was performed[6.] The results were mentioned as bad, satisfactory, good and excellent. The observation were mentioned in Table No. 2.

3.3.1 Shake Test

The 50 ml of 1% extract and formulated shampoo was taken in 100 ml of graduated measuring cylinder, shaken for 1 min and foam retention were observed for 4 min each after 1 min [11-13]. The observation were mentioned in Table No. 3.

Table 2: Evaluation of detergent property of 1% of individual plant extract & formulated shampoo

Sr. No	Test	Observation (1% saponin extract)	Observation (Formulated shampoo)
1.	Effect of spreading	Time required for observe on hair was 2 min.	2 min.
2.	Leathering power		
	Volume of 1% extract consumed by 1gm of hair With adding grease.	Reetha - 6ml Shikakai-10ml Amla- Unable to produce foam	-
	Volume of 1%extract consumed by 1gm of hair without adding grease.	Reetha - 2.5 ml Shikakai - 4.5 ml Amla - Unable to produce foam	-
3.	Effect of rinsing	Rinsing property of Reetha & shikakai were good &satisfactory with amla	Good
4.	Effect of combing on wet hair	The combing property of Reetha, amala was good easy with shikakai.	Good
5.	Speed of drying	Reetha & shikakai- within 30min for amala- within 20min	20 min
6.	Luster of hair	For amala &s hikakai was good,shikakai-satisfactory	Excellent
7.	Efficiency of combing & setting of hair	Good with all plant extract	Good
8.	pH of 1% extract	Reetha & Shikakai- 6-7 Amla – 5	6-7
9.	Dirt dispersion India ink test	Good	Excellent

Table 3: Foam quality and foam stability of 1% plant extracts and formulated shampoo

Sr. No.	Time (min)	Volume of foam (ml)			
		Reetha	Shikakai	Amla	Formulated Shampoo
1.	0	90	75	65	70
2.	1	85	70	63	68
3.	2	85	69	61	65
4.	3	85	69	61	65
5.	4	85	69	61	62

4. Result

We claim that

- Foaming index of 1% aqueous extract of individual plant material found to be good, and stable up to 45 min.
- The maximum foaming index was shown by Reetha i.e. 250 while minimum was 142.5 by Amla.
- The lustering effect of formulated shampoo was found to be excellent.

5. Conclusion and summary

All the plant material shown good detergent property. This was revel by the different evaluatory test. As foaming index 1% Aqueous extract of individual plant material found to be good, and stable up to 45 min. the maximum foaming index was shown by Reetha i.e. 250 while minimum was 142.5 by Amla. Both the formulated shampoo and individual plant (1%) extract shown spreading ability on natural hair within 2 min. Effect of combing on wet hair, effect of combing and setting of dry hairs and dirt dispersion ability was found to be good. All the plant material shown good lustering effect and leathering power. The lustering effect of formulated shampoo was found to be excellent.
The foam stability and foam retention was comparable within the individual plant material and shampoo. While amla shows the least foaming index and foam stability and foam retention ability as more or less because of conditioner effect of amla.
The individual plant material was found to be excellent detergent property. While formulated shampoo possess all The characteristic of ideal shampoo, which was evaluated with natural hairs in vitro.

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