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Phytochemical and *in-vitro* evaluation of formulated polyherbal hair conditioner

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Abstract
Objective: The present study includes formulate an herbal conditioner for extra smoothening of hair by using garden cress seeds and to evaluate its physicochemical, phytochemical screening properties. Main purpose is to reduce friction between strands of hair to allow easier brushing or combing. It is also evaluated for cleansing action, stability studies, and dirt dispersion test.
Materials and methods: The herbal extract of guava leaves, neem leaves, curry leaves, amla fruit, fenugreek seeds, hibiscus flower and aloevera is used. The extraction is carried out by Soxhlet extraction method by using ethanol and water as a solvent. Mucilage of garden cress seeds is used for smoothening and strengthening of hair. After preparing the formulation, some physicochemical properties such as pH, foam formation, viscosity, conditioning and wettability were evaluated. The pH of formulated conditioner was in the standard range. The results of its rheogram showed good thixotropy property. High foam production and stability were observed, this may be due to the existence of saponin in fenugreek extract. Phytochemical screening was performed. It is also evaluated for eye irritation test, skin sensitization test, dirt dispersion test, On the basis of wettability and conditioning result, it can be concluded that the formulated conditioner has a good quality of introducing it to the market.

Keywords: garden cress seeds mucilage, herbal conditioner, polyherbal extract

Introduction
Herbal products have gained increasing popularity in the last decade, now it is used by 20-30% of the population herbal products are complex mixtures of organic chemicals that may come from any raw processed part of the plant, including leaves, flowers, stems, bark and seeds, etc. Herbal preparations are finished herbal products that contain parts of the plants or other plant material as active ingredient.
In the present scenario, it seems improbable that herbal hair conditioner, although better in performance and safer than the synthetic ones, will be popular with the consumers. A more radical approach in popularizing herbal shampoo would be to change the consumer expectations from a conditioner, with emphasis on safety and efficacy. Formulators must play an active role in educating the consumers about the potential harmful effects of synthetic detergents and other chemical additives present in shampoos. There is a strong need to change the consumer perception of a good conditioner and the onus lies with the formulators
Conditioners which are applied to hair after shampooing are intended to promote the properties such as

- Smooth, easy combing in both wet and dry hair.
- A reduction in the static electricity caused combing and brushing dry hair, resulting in flyaway hair.
- The enhancement of the gloss or as a lustre of hair. [1, 5]

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The polyherbal drugs are as the follows.

Methods and material: Extraction of plant material was carried out by Soxhlet method. Herbs were collected from Sahyadri medicinal plant garden and they were authenticated at Department of Pharmacognosy, Sahyadri. College of Pharmacy, for extraction 80 gm of leaves was accurately weighed in to and used water as a solvent and kept for 48 hours. Collected extract is stored in a well closed container. some plant material was purchased from local market of Sangola. Animals were kept different places, according to group, Swiss albino rats were 6 in number and tested for eye irritation test.

Table 1: The polyherbal drugs are as the follows.

Sr. No.	Plants (ingredient)	Quantity
1.	Guava Leaves	15 gm
2.	Hibiscus Flower	10 gm
3.	Neem Leaves	10 gm
4.	Curry Leaves	5 gm
5.	Amla Fruit	12 gm
6.	Fenugreek Seed	18 gm
7.	Aloevera gel	10 m

Preparation of garden cress mucilage: At First 20 gm of garden cress seeds are weighed and soaked in a water for 24 hours. After the soaking boiled the solution of garden cress seeds and water. Sticky transparent mucilage was collected from the boiling solution.

Extraction process: The polyherbal extract is extracted by Soxhlet process. The solvent was hydro alcoholic extraction. (ethanol and water in the proportion of 70:30 respectively)[3]

- Guava leaves
- Hibiscus flowers
- Neem leaves
- Curry leaves
- Amla fruit
- Fenugreek seeds
- Aloevera seeds

Formulation of conditioner: To formulate an herbal conditioner, by mixing of two phases are prepared such as aqueous phase (A)and Oil phase(B).

Table 2: Part A (aqueous phase)

Sr. No.	Ingredient	Quantity	Role
1.	Plant Extract	4 ml	Medicinal Agent
2.	Mucilage of Garden Cress Seeds	4 ml	Smoothing Agent
3.	Aloevera Gel	1 gm	Conditioning Agent
4.	Glycerine	3 ml	Humectant
5.	Citric Acid	0.6 gm	pH Maintainance
6.	Xanthum Gum	0.3 gm	Stabilizer
7.	Methyl Paraben	Q.S.	Preservative
8.	Rose Water	Q.S.	Perfume

Table 3: Part B (oil phase)

Sr. No.	Ingredient	Quantity	Role
1.	Polysorbate 80	3 gm	Emulsifier & Surfactant
2.	Coconut oil	3 ml	Softening agent
3.	Almond oil	3 ml	Strengthning agent
4.	Castor oil	3 ml	Enrichment of scalp
5.	Vitamin E oil	1 ml	Antioxidant & moisturizer

Both the aqueous phase and oil phase was mixed into each other with continuous stirring by using the mechanical stirrer, both the phases are mixed properly and pouredinto the suitable labelled container.

Evaluation test of conditioner: Dirt dispersion: Two drops of shampoo were added in a large test tube contain 10 ml of distilled water. 1 drop of India ink was added; the test tube was stoppered and shakes it ten times. The amount of ink in the foam was estimated as None, Light, Moderate, or Heavy.

Cleaning action: 5 grams of wool yarn were placed in grease, after that it was placed in 200 ml. of water containing 1 gram of shampoo in a flask. Temperature of water was maintained at 350C. The flask was shaked for 4 minutes at the rate of 50 times a minute. The solution was removed and sample was taken out, dried and weighed. The amount of grease removed was calculated by using the following equation [4].

Eye irritation test: Animals (albino rats) were collected from animal house. About 1% conditioner solutions was dripped into the eyes of six albino rabbits with their eyes held open with clips at the lid. The progressive damage to the rabbit's eyes was recorded at specific intervals over an average period of 4 seconds. Reactions to the irritants can include swelling of the eyelid, inflammation of the iris, ulceration, haemorrhaging (bleeding) and blindness. Conditioning products are well served by objective methods to establish their various properties.[4] The measurement was performed in triplicate and mean values are taken. The experiment was performed at room temperature some of the evaluation test are as following [8].

Moisturising time determination: One gram of hair ball with approximate of 20 cm^3 size was placed on the surface of 60 ml of different dilution of conditioner and the complete sinking time of the ball hair in the conditioner was measured.5-15 minutes were required to sink for silky, smooth hairs.

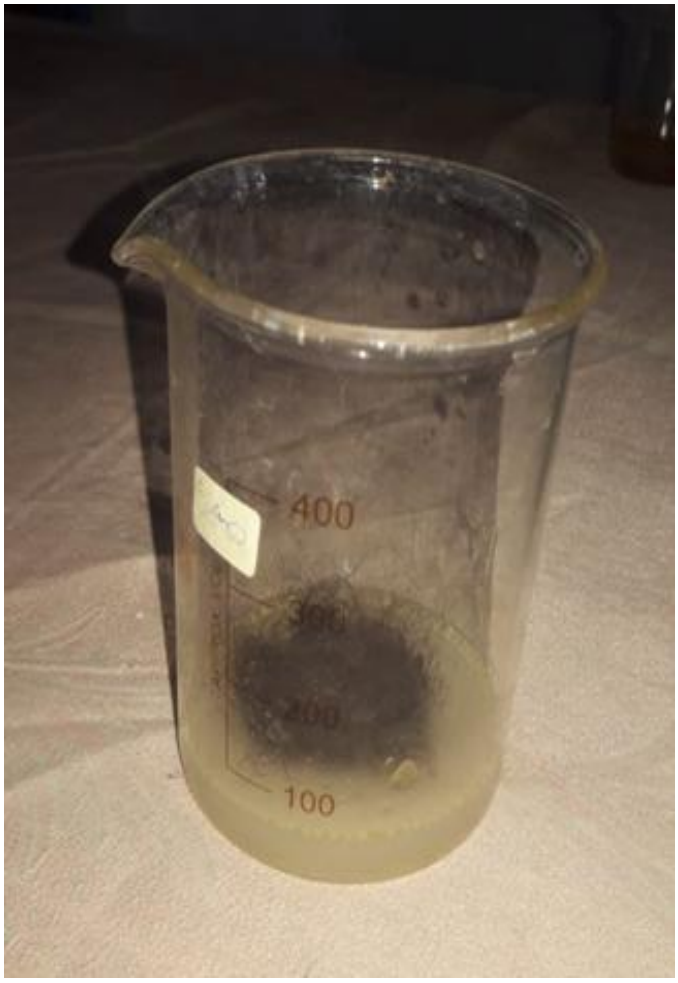

Fig 1: Moisturising time determination

Fig 2: pH determination

Naturally, human hair and sebum have a pH level between 4.5 to 5.5. This slightly acidity actually helps prevent the growth of fungi and bacteria on hair and scalp, keeping the cuticle sealed and healthy. Standard pH of conditioner is to be 7 to 8.

Stability studies: The thermal stability of formulations was studied by placing in glass tubes and they were placed in a humidity chamber at 45°C and 75% relative humidity. Their appearance and physical stability were inspected for a period of 3 months at interval of one month. pH of prepared conditioner 7.6.

- Rheology experiment: Rotational spindle Brookfied viscometer (Model DV-I plus, LV, USA) instrument was used for rheology experiment.
- Conditioning effect experiment: In order to test the conditioning effect of the conditioner, we had to see how it is easy to comb the hairs, and to do so, we had to use a comb connected to a spring and a scaled page. The scaled page was able to display the rate of hair resistance against combing. In this method, the incoming force on ergometer caused by moving of the comb between hairs before and after using of conditioner was measured.

Results

The polyherbal conditioner by using the mucilage of garden cress seeds was prepared and evaluated. The moisturising results are as shown in fig 1, which shows that as the concentration of conditioner increases the rate of moisturisation increases.

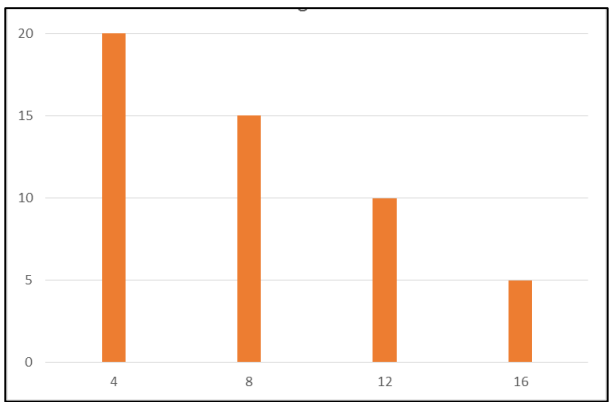

Fig 3: Moisturising results

The pH result is as shown in the table no.4

Table 4: pH Results.

Sr. No.	Product	pH
1.	Basic Conditioner	6 to 8
2.	Conditioner Containing herbal extract & mucilage of garden cress seeds	7.6

The viscosity result is as shown in the table 4

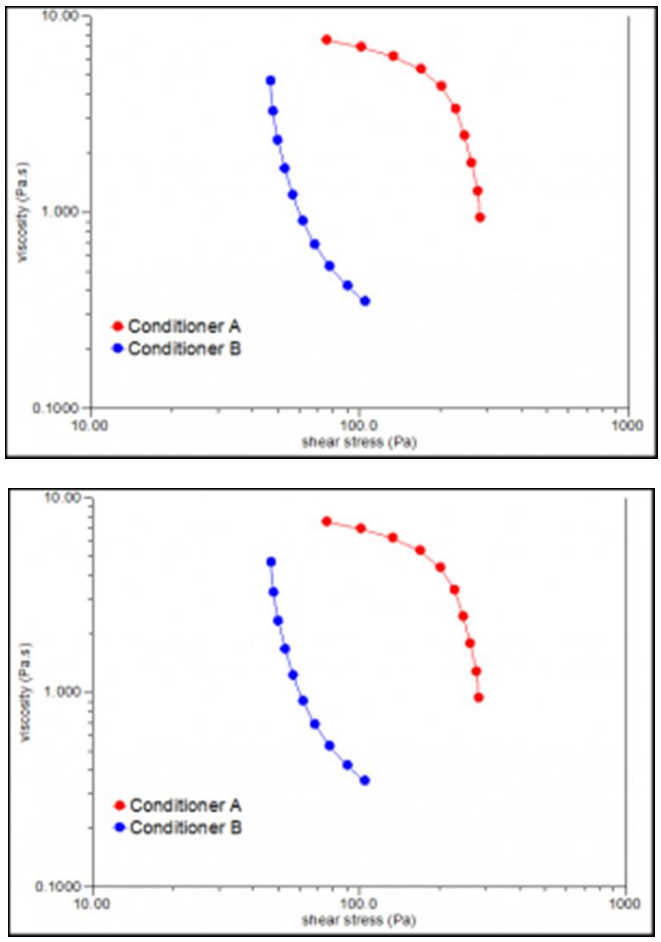

Fig 4: Viscosity Conditioner A (Prepared conditioner) Conditioner B (Marketed conditioner)

The Wetting result are displayed in fig 5

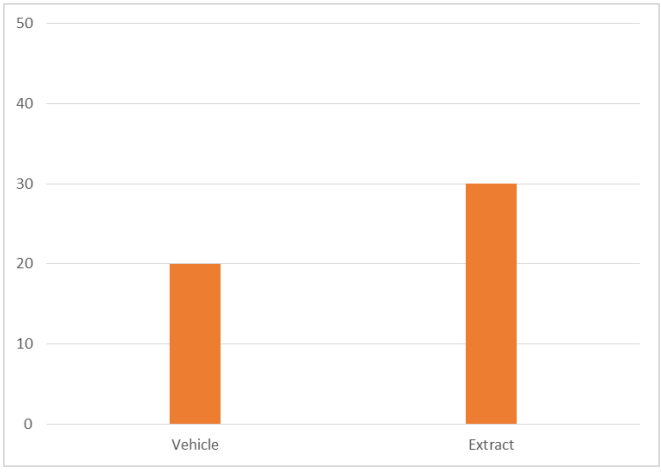

Fig 5: Wetting results.

Table 5: Phytochemical screening of formulated product

Sr. no.	Tests	Remark
1	Test for alkaloid	+
2	Test for Flavanoid	++
3	Test for tannin	++
4	Test for mucilage	++
5	Test for resin	-
6	Test for sterol	+
7	Test for glycoside	+
8	Test for carbohydrate (-reducing sugar)-Fehlings test	+
9	Test for protein (biurette test)	+

Table 6: Stability studies of herbal formulation

Sr. no	parameters	1 month	2 months	3 months
1	Visual appearance	clear	clear	clear
2	pH	7.6	7.6	7.6
3	Solid content	24.51±0.2	25.11±0.2	26.31±0.2
4	Surface tension	33.22±0.02	32.52±0.02	35.20±0.02
5	Detergency ability	52.12±0.1	57.10±0.1	54.11±0.1

Table 7: Evaluation of formulation for cleansing and surface tension

Sr. no.	formulation	Cleansing percentage	Surface tension(dyne/cm)
1	F1	26.21±0.3	33.15±0.2
2	F2	33.17±0.08	34.21±0.13
3	F3	19.40±0.11	31.17±0.4

Fig 6: Polyherbal hair conditioner.

Discussion and conclusion

Recent study shows that hair shine can have profound physiological effects and affect people confidence. There are a remarkable number of non-approved products for treating hair problems available in the market without any scientific evidence indicating that they are effective products. This research showed that our product has contained herbal formulation and because of that no any side effects are observed as compared to similar product in the market. The conditioner has sufficient ability for hair conditioning, viscosity and rheological properties as playing important role for conditioner. It can influence many of the product attributes, such as shelf life, its beauty, its transparency, easy removal from its packaging, its expansion and its consistency. The rheological properties of this formulation showed that this formulation has a proper trait. In another word, it has a proper viscosity and if it is exposed to certain cutting speed, shear stress viscosity of the system will be reduced over time consequently. It causes increase in flowing ability and decrease in their viscosity however our rheogram formulation seems more appropriate in comparison with the samples taken from the market. As we did not used any viscous substance for making our conditioner, the amount of viscous substance in conditioner is up to 10%. As fenugreek seeds are used in the extract contains viscous component. The use of garden cress seeds mucilage is more effective in the formulation for its smooth and glossy effect on the hairs. This study shows that our formulation has suitable moisturising effect therefore, based on the results of strength and moisturising time our formulation gives more effectiveness [6]. The hair shining and its glittering are two values for consumer showing the suitability after using a shampoo. The citric acid used in the formulation for the pH adjustment according to the pH of scalp (i.e. acidic). Since fenugreek seeds have carbohydrates and proteins compounds, it is expected that a conditioner containing fenugreek extract makes hair combing very easy [4].

Garden cress seed contains the protein and amino acids and this is important for hair strength and its softness. Hydrolysed proteins are important components in the formulation of conditioner. Guava leaves is an effective herb to reduce hair loss. Hibiscus is very nutritious and as a result they are effective in reducing hair loss, baldness and thin hair. Fenugreek seeds contain progressive hormones that increase hair growth. There are natural emulsions for hair moisturising that contains high concentration of proteins and are similar to fenugreek seeds, they have the ability to eliminate hair loss and hair damage, Trigonelline which is present in the fenugreek seeds gives the more conditioning effect for hair. Flavonoids are important for increasing blood cells and they also help the blood to circulate to all parts of the body including scalp. In this study, it was determined that the conditioner is more comfort for hair combing, smooth and shiny hair and lack of static electricity in hair. Based on this and other studies, it appeared that the use of herbal conditioner are safer and healthier for smooth and shiny hair.

Acknowledgement

I take this pleasant and unique opportunity to express my deep sense of gratitude and offer my most sincere humble thanks to our beloved president Dr. Dilipkumar M. Ingawale sir for their moral support to make this work possible.

References

1. Nema RK, Rathod KS, Dube BK. Text book of cosmetics 1st edition 2009, 111.
2. Sharma PP. Cosmetic Formulation Manufacturing and Quality Control, 3ed ed., Vandana Publication, Delhi, 644-647
3. Mainkar AR, Jolly CI. International Journal of Cosmetic Science, 2000; 22(5):385-391
4. Ireland S, Carlino K *et al*. Formulation and evaluation of herbal shampoo, 2018, 11.
5. Dr. Singh Dheeraj *et al*. Extraction, Isolation and Characterisation of a Phytochemicals. 2015; 4(5):2730-2717.
6. Gholamreza DN, Fariba S *et al*. Formulation of herbal conditioner shampoo by using extracts of fenugreek seeds and evaluation its physiochemical parameter. African journal of pharmacy and pharmacology. 2011; 5(22); 2420-2427.
7. Nandu R, Nandu S, Khar RK. Cosmetics technology Birla publication Pvt. Ltd. 400.

8. Ashok Kumar, Rakesh Roshan Mali2. Evaluation of prepared shampoo formulations and to compare formulated shampoo with marketed shampoos, International Journal of Pharmaceutical Sciences Review and Research, 2010; 1(3):Article 025.