



FORMULATION AND EVALUATION OF HERBAL SHAMPOO BY USING JACKFRUIT POWDER FOR ANTIMICROBIAL POTENT

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ABSTRACT :- The aim of the present study was to formulate and evaluate herbal shampoo containing natural ingredients with an emphasis on safety and efficacy. It clears dirt, dandruff, promotes hair growth, luster, strengthens and darkens the hair. The shampoo was prepared by taking the extracts of Jackfruit flour as an active ingredient, A Shikakai, Aloevera, and Reetha in different proportions. Several physicochemical tests were performed for visual assessment, wetting time, pH, assurance of solid contents, surface tension, detergency, dirt dispersion, conditioning performance, foam stability. The formulated herbal shampoo is black in color with demonstrable good froth stability, detergency, good cleansing, low surface tension, optimum pH and conditioning activity. Dirt dispersion of herbal shampoo is light along with 46 ml foam height. All these are the ideal characters for good quality of the herbal shampoo to be used in daily life. However, further scientific investigation is required for validation of its overall quality. In the present study, herbal shampoo was formulated containing suitable ingredients such as Jackfruit flour (*Artocarpus heterophyllus*), Reetha (*Sapindus mukorossi*), Shikakai (*Acacia concinna*), Aloe vera (*Aloe barbadensis*) etc. in different proportions and evaluated for its physicochemical properties. The uniqueness of this herbal shampoo formulation is due to its active ingredient Jackfruit seeds nutrient the hair from the roots, removes the fatty layer above the follicles that hinders hair growth and completely eliminates inflammation and Prevents skin alopecia Its natural UV ray blocking property prevents aging in hair and makes hair shiny and soft.

KEY WORDS :- Herbal Shampoo, Antimicrobial effect, Aqueous extraction.

INTRODUCTION : -

WHAT IS SHAMPOO? A viscous cosmetic preparation with synthetic detergent used for washing hair is called shampoo. Its principle function is to clean the scalp such that it should become free from sebum and foreign substances. Shampoo also makes the hair lustrous and good looking. In olden day's detergent soap were used for washing hairs, but nowadays it has been replaced by shampoo. Today shampoo has become an important hair cosmetic for both men and women. However the detergent and other raw materials selected for shampoo preparation should be non-toxic to tile scalp, eyes etc.

WHAT IS ANTI-MICROBIAL EFFECT! An antimicrobial is an agent that kills microorganisms or stops their growth. Antimicrobial medicines can be grouped according to the microorganisms they act primarily against. For example, antibiotics are used against bacteria, and antifungals are used against fungi. They can also be classified according to their function. Agents that kill microbes are microbicides, while those that merely inhibit their growth are called bacteriostatic agents. The use of antimicrobial medicines to treat infection is known as antimicrobial chemotherapy, while the use of antimicrobial medicines to prevent infection is known as antimicrobial prophylaxis. The term "antibiotic" originally described only those formulations derived from living microorganisms but is now also applied to synthetic agents, such as sulfonamides or fluoroquinolones. Though the term used to be restricted to antibacterial (and is often used as a synonym for them by medical professionals and in medical literature), its context has broadened to include all antimicrobials. Antibacterial agents can be further subdivided into bactericidal agents, which kill bacteria, and bacteriostatic agents, which slow down or stall bacterial growth. In response, further advancements in antimicrobial technologies have resulted in solutions that can go beyond simply inhibiting microbial growth. Instead, certain types of porous media have been developed to kill microbes on contact.

WHY HERBAL SHAMPOO:- Shampooing is the most common form of hair treatment. Shampoos are primarily been products aimed at cleansing the hair and scalp. In the present scenario, it seems improbable that herbal shampoo, 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 consumers' expectations from a shampoo, with emphasis on safety and efficacy.

The hair of the head has historically been associated with beauty and social distinction. The hair has been trimmed, shaped, and even coloured since the most ancient times, relatively little emphasis has been placed on the process of cleaning it. Real technology in the cleaning of hair and scalp has developed only in this century. First came the mass distribution of cake soap and sanitary facilities to make bodily cleanliness and personal hygiene practical. Next came the specialization of branded shampoo products for the hair and scalp, offered in a multiplicity of types and forms. Hair care by itself can induce a state of self confidence and may reflect social status. This may explain significant differences in shampooing regimens, which range from once or twice a week to once a day. Hair is a midway between nature and

culture. Hair care attitudes are different from one society to another regardless of economic differences, and from one person to another within societies.

Synonyms

Marathi	fanas
Hindi	kathal
English	jackfruit
Tamil	palappalam
Kannada	halasu
Telgu	kadagi

Manipur	Bhashmukh parbat
German	jackfrucht

Different vernacular names of Jackfruit

Biological source: *Artocarpus heterophyllus* Lam., which is commonly known as jackfruit is a tropical climacteric fruit, belonging to Moraceae family, is native to Western Ghats of India and common in Asia, Africa, and some regions in South America.

Verbenaceae Taxonomy :

Kingdom	plantae
Sub kingdom	Tracheobionta
Division	Magnolophyta
Class	Magnoliosida
order	Rsales
family	moraceae
genus	Artocarpus
species	A.heterophyllus

Taxonomy of Jackfruit

geographical source of jackfruit : The jackfruit (*Artocarpus heterophyllus* Lam.) is native to South and Southeast Asia and is believed to have originated in the rainforests of the Western Ghats of India (Chandler, 1958, Rowe-Dutton, 1985) and is cultivated throughout the lowlands in South and Southeast Asia (Samaddar, 1985, Soepadmo, 1991, Acedo, 1992).

Plant Discription of jackfruit

The jackfruit tree is 15 to 20 metres (50 to 70 feet) tall at maturity and has large stiff glossy green leaves about 15 to 20 cm (6 to 8 inches) long. The small unisexual flowers are borne on dense inflorescences that emerge directly from the trunk and branches.

Leaves of jackfruit: The leaves are alternate and spirally arranged. They are gummy and thick and are divided into a petiole and a leaf blade. The petiole is 2.5 to 7.5 cm (1 to 3 inches) long. The leathery leaf blade is 20 to 40 cm (7 to 15 inches) long and 7.5 to 18 cm (3 to 7 inches) wide, and is oblong to ovate in shape.



Flowers: Flowering ontogeny of jackfruit The jackfruit flower is monoecious, with the separated male and female inflorescences in the same individual tree. Jackfruit has a cauliflory type, in which inflorescences emerge from the main stem or older branches rather than the axillary or terminal parts.



Fruit: the jackfruit is the fruit of jack tree *Artocarpus heterophyllus*, a species of tree in the fig, mulberry, and breadfruit family (Moraceae). The jackfruit is the largest tree fruit, reaching as much as 55 kg (120 pounds) in weight, 90 cm (35 inches) in length, and 50 cm (20 inches) in diameter.



Ecology: Jackfruit grows well in humid lowland tropical areas, at an elevation below 1,000 metres, with a mean annual temperature of 24 – 28°C. A mature jack tree produces about 200 fruits per year, with older trees bearing up to 500 fruits in a year.

Traditional uses: Different maturity stages of jackfruit flesh are consumed fresh or as canned slices, fruit juice, and dried chips. Fully ripen stage produce fruit juice of good eating quality with suitable aroma, texture, sweetness, and taste. In some countries, pureed jackfruit has been processed into baby food, juice, jam, jelly, base for cordials, candies, fruit-rolls, marmalades, jackfruit leather, and ice cream. The unripe stage is also used to prepare pickles, when the fruit is tender. The seeds are also consumed after boiling and roasting or added to flour for baking and cooked in dishes. Jacktree is used for its durable timber, which acquire reddish orange colour when aging. The timber also has antitermite properties and used for the preparation of furniture. The chips are used to extract an orange-red dye, which is used to colour the robes of Buddhist monks. The leaves and fruit wastes of the jacktree are used produce fodder for cattle, pigs, and goats. Many parts of the plant,

including the bark, roots, leaves, and fruits, are known for their medicinal properties in traditional and folk medicine.

Phytochemical constituents: Recent studies have also shown that the key carotenoids present in jackfruit are all-trans-lutein (24–44%), all-trans- β -carotene (24–30%), all-trans-neoxanthin (4–19%), 9-cis-neoxanthin (4–9%) and 9-cis-violaxanthin (4–10%).

Pharmacological activities:

- Antioxidant
- anti-inflammatory
- antibacterial
- anticariogenic
- antifungal
- antineoplastic
- hypoglycemic
- wound healing effects and causes a transient decrease in the sexual activity.

Experimental:

PREPARATION OF EXTRACT:

Ingredients	quantity
Jackfruit powder	10 mg
Reetha powder	20 mg
Shikakai powder	10 mg

Method of preparation of herbal extract :

- 10gm of reetha powder, 20gm of shikakai powder, 10gm of jackfruit powder was taken into bowl
- 100ml of distilled water added into
- Kept for boiling until the water was reduced to one quarter
- Then filtered and clear extract was obtained used as an herbal extract

Formulation of herbal shampoo :

- Take Herbal extract was 30ml
- To increase the thickness of formulation gelatin solution was prepared 10gm of gelatin into 100ml water and boil them.
- 20ml of gelatin solution with 20 ml of 0.1 M NaCl solution mixed by shaking gently.
- The final volume was made to 100 ml water by adding 20ml distilled water 5ml glycerine
- To improve aroma add essentials oil like lavender oil quantity sufficient.
- Vitamin E capsule added into it then activate charcoal for colour and lemon juice as preservative.

Plant profile:

name : Jackfruit

Synonyms : Artocarpus heterophyllus

Family : Moraceae

Parts to be used : leaves, bark , seeds etc .

Medicinal uses :

The compound shows antimicrobial, anti carcinogenic, anti fungal, hypoglycemic and anti bacterial activity.

Wound healing properties.

Chemical constituents :

Amino acids, arginine, cystine, histidine, leucine, lysine, methionine, threonine, tryptophan etc.

Sr no	ingredient	Quantity
1	Jackfruit powder	10 gm
2	Reetha powder	10 gm
3	Shikakai powder	20 gm
4	Gelatin solution	20 ml
5	Lavender oil	2 ml
6	Glycerine	5 ml
7	Distilled water	20 ml
8	NaCl solution	20 ml
9	Activated charcoal	QS
10	Lemon juice	3 ml

Evolution test:

- Physical appearance/visual inspection:** The formulation prepared was evaluated for the clarity, color, odor and foam producing ability and fluidity.
- Determination of pH :** A 10% v/v shampoo solution was constituted in distilled water and the pH of the solution was measured by using a calibrated pH meter.
- Determination of solid content percentage:** A clean dry evaporating dish was weighed and 4 grams of shampoo was added to the evaporating dish. The evaporating dish with shampoo was placed on the hot plate until the liquid portion was evaporated. The weight of the solid contents present in the shampoo was calculated after drying.
- Wetting time:** Wetting time was calculated by noting the time required by the canvas paper to sink completely. A canvas paper weighing 0.44 g was cut into a disc of diameter measuring 1-inch. Over the shampoo (1% v / v) surface, the canvas paper disc was kept and the time taken for the paper to sink was measured using the stopwatch.
- Rheological evaluation:** The viscosity of herbal shampoo was determined by using Ostwald's viscometer. The viscosity of the herbal shampoo was measured by counting drops of herbal shampoo from the mark to bottom.
- Dirt dispersion:** Two drops of herbal shampoo were added in a wide mouthed falcon tube containing 10ml of distilled water. 1 drop of India ink was added, the falcon tube was covered and shaken for ten times. The amount of ink in the foam was estimated as None, Light, Moderate, or Heavy.
- Skin Irritation Test:** Prepared herbal shampoo was applied on skin for 5 minutes after that was washed and tested for irritation or inflammation to the skin.
- Stability Study:** The stability of the formulation was studied for a period of four to five days by keeping at temperature of 25 - 30 deg * C
- Conditioning attributes:** The conditioning effect of the shampoo on the hair was evaluated after the hair had been washed with it. Conditioning properties include all desirable benefits imparted to the hair such as increased mass to the hair, improved lusture, softness and silkiness.
- Examination :** 100 microlitre of shampoo was mixed with melted Mueller Hinton agar and poured to sterile petri dishes under aseptic conditions. The plates were rotated to mix thoroughly and then allowed to set. The plates were incubated at 37 deg ^ * C for 24 hours and observed for microbial growth.

Result And Discussion

Parameter	observation
pH determination	6.14
% of solid content	4.3%
viscosity	118.6-1098 cp
Foaming determination	50 ml (good)

Physical examination

Sr no	Physical properties and test	description
1	Physical state	Liquid
2	Colour	Dark brown
3	Odour	Aromatic
4	Dirt dispersion	Light
5	Nature of hairs after washes	Soft, shiny, smooth etc.

Conclusion -

In this study, The Herbal Shampoo was evaluated in terms of their pH levels, foam formation, foam stability, viscosity, wetting time, surface tension, and antimicrobial activity to assess the quality of these shampoos. The formulated shampoo were not only safer than the chemical conditioning agents, but also greatly reduce the hair loss during combing as well as strengthens the hair growth. The pH of the shampoo was adjusted to 5, to retain the acidic mantle of scalp. The physicochemical approach used for preservation of the formulations to avoid the risk posed by chemical preservatives. In times when keeping oneself safe from infections is crucial, our fast acting, dual benefit formula makes it a necessary daily driver to nourish and protect your hair and scalp from microorganisms.

Mainly, the above Research Article indicates Herbal shampoo having Antimicrobial Potential to help relieve and heal symptoms due to skin infections caused by bacteria, Fungi, and yeast.

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