

Effect of Supplementing with *Nelumbo Nucifera* Petals Products on Promoting Hair Growth in Adolescent Girls

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KEYWORDS

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Abstract

Hair loss among adolescent girls is an emerging nutritional and health concern influenced by dietary deficiencies, stress, hormonal imbalance, and lifestyle factors. The present study aimed to develop value-added products using *Nelumbo nucifera* petals and evaluate their effectiveness in promoting hair growth among adolescent girls. Three products namely *Nelumbo* Blossom Chai (T1), *Nelumbo* Blossom Gulkand (T2), and *Nelumbo* Blossom Mix Powder (T3) were prepared and standardized. Organoleptic evaluation, shelf-life study, nutrient analysis, phytochemical analysis, and microbial assessment were carried out. A supplementation study was conducted among adolescent girls in and around Thoothukudi district, Tamil Nadu. Results revealed that T3 exhibited higher overall acceptability (61%) compared to T1 and T2. Supplementation with *Nelumbo* Blossom Mix Powder showed improvement in hair growth and reduction in hair fall among the respondents. The study concludes that *Nelumbo nucifera* petals can be effectively utilized as a functional dietary supplement for promoting hair health among adolescent girls.

1. INTRODUCTION

Hair loss is a common concern among adolescents and young adults, particularly among females, due to nutritional deficiencies, stress, hormonal imbalance, poor dietary habits, and environmental factors. Adequate nutrition

plays a crucial role in maintaining healthy hair growth and preventing alopecia.

Nelumbo nucifera (Sacred Lotus) is an aquatic perennial plant widely distributed in Asian countries and valued for its nutritional, medicinal, and

therapeutic properties. Various parts of the lotus plant have been traditionally used in Ayurveda and Chinese medicine for treating several ailments. Lotus petals are rich in flavonoids, phenolic compounds, antioxidants, vitamins, and minerals that contribute to overall health and wellness. All parts of the lotus plant are used: rhizome is used as food, seeds are used as medicine, thalamus as fruit, leaves for plate or thali, stalks are used for making pickle, and petals of lotus flower are utilized for extraction of colour. (Mehta, 2013). Lotus contains a number of important bioactive compounds such as alkaloids, flavonoids, steroids, triterpenoids, glycosides and polyphenols (Mukherjee *et al.*, 2009).

Flowers are wide, 10-25 cm in diameter, white, pink or pinkish white in colour and are formed by the nodes of the rhizomes. Plentiful small, scattered stings, sepals, petals and stamens are found (Gupta *et al.*, 1979). In recent years, interest in functional foods and nutraceuticals has increased due to their health-promoting properties. The incorporation of lotus petals into dietary products may provide nutritional support for improving hair

health. Therefore, the present study was undertaken to develop lotus petal-based products and evaluate their role in promoting hair growth among adolescent girls.

2. OBJECTIVES

- To study the health and economic status of adolescent girls.
- To develop products using *Nelumbo nucifera* petals.
- To study the shelf life of the developed products.
- To evaluate the organoleptic acceptability of the products.
- To assess the effect of dietary supplementation on hair growth among adolescent girls.

3. MATERIALS AND METHODS

3.1. Study Area and Respondents

The study was conducted in and around Thoothukudi district, Tamil Nadu, India. Adolescent girls aged between 13 and 20 years experiencing hair loss were selected randomly for the study.

3.2. Product Development

Three different products were prepared using *Nelumbo nucifera* petals:

- **T1:** *Nelumbo* Blossom Chai

- **T2:** *Nelumbo* Blossom Gulkand
- **T3:** *Nelumbo* Blossom Health Mix Powder

3.2.1. Ingredients Used

T1 – *Nelumbo* Blossom Chai

- Fresh lotus petals
- Ginger
- Cardamom
- Honey/Brown sugar



T2 – *Nelumbo* Blossom Gulkand

- Fresh lotus petals
- Jaggery
- Honey



T3 – *Nelumbo* Blossom Health Mix Powder

- Dried lotus petals
- Flax seeds
- Watermelon seeds
- Pumpkin seeds
- Sunflower seeds



3.2.2. Organoleptic Evaluation

The developed products were evaluated by panel members using a 9-point hedonic scale based on appearance, colour, taste, flavour, odour, texture, mouthfeel, and overall acceptability.

Plate. 2. Sensory Evaluation of the Panel members



3.2.3. Shelf-Life Study

Shelf-life studies of the products were conducted under appropriate storage conditions.

two months, and changes in hair growth and hair fall were assessed.

3.2.4. Supplementation Study

Participants were divided into control and experimental groups. Experimental groups received the developed products for

4. RESULTS

4.1.Organoleptic Acceptability

Among the developed products, T3 (*Nelumbo* Blossom Health Mix Powder) showed the highest overall acceptability score (61%), followed by T1 and T2 (59%).

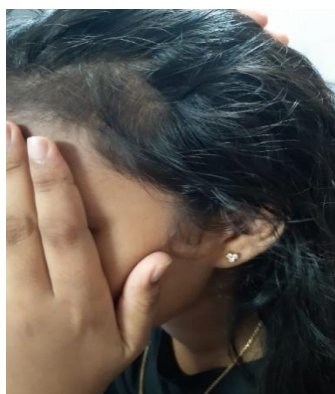
Product	Overall Acceptability
T1 (<i>Nelumbo</i> Blossom Chai)	59%
T2 (<i>Nelumbo</i> Blossom Gulkand)	59%
T3 (<i>Nelumbo</i> Blossom Health Mix Powder)	61%

4.2.Shelf-Life Study

T1 remained stable for 7 days, while T2 showed stability for 2 months under refrigerated conditions. T3 remained acceptable for one month in airtight storage conditions.

The supplementation study revealed noticeable improvement in hair growth and reduction in hair fall among respondents consuming the lotus petal products, particularly T3. Participants also reported better hair texture and reduced hair thinning.

4.3.Effect of Supplementation



5. DISCUSSION

According to Yi, *et al.*, (2016) has explained that lotus has been widely cultivated for food production, ornamental horticulture and traditional Asian medicine in China, Korea, Japan and India. Its root, which contains abundant dietary fibers, starches, sugars, proteins, amino acids, 7 minerals, vitamins and phenolics is popularly consumed as both a delicious and nutritional vegetable and a therapeutic herb. Lotus root beverage is commonly made from raw lotus root (RLR). However, RLR production is strictly limited, because it is prone to decomposition and browning after its short harvest season (Liu, *et al.*, 2010). Sun-dried powdered flowers of *N.nucifera* developed hypoglycaemia in fasting healthy albino rabbit. The sun-dried flower extracts reduced hyperglycaemia by injection of adrenaline hydrochloride 0.5 mg / kg at a dose of 1000 mg / kg. In vitro studies with rat hemi diaphragms have shown that the test drug (sun-dried flowers

powdered) appreciably boosted the effect of insulin (Huralikuppi *et al.*, 1991).

6. CONCLUSION

The present study demonstrated that *Nelumbo nucifera* petals can be effectively utilized in the preparation of value-added functional food products. Among the products developed, *Nelumbo* Blossom Mix Powder (T3) showed higher acceptability and better supplementation outcomes. The nutritional and phytochemical composition of lotus petals supports their therapeutic potential in promoting hair growth and improving overall hair health among adolescent girls. The study highlights the importance of incorporating natural plant-based functional foods into the diet for managing nutritional deficiencies associated with hair loss.

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