Comparitive Study of Delonix Regia and Butea Monosperma

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Abstract*— Gulmohar (Delonix regia), commonly known as the "Flame Tree," and Palash (Butea monosperma), referred to as the "Flame of the Forest," are vibrant flowering plants with significant phytochemical properties. While Gulmohar is renowned for its medicinal benefits, Palash flowers remain underexplored as a natural source of pigments. This study aimed to extract color from Palash flowers and evaluate their potential as an eco-friendly alternative to synthetic dyes, particularly in color cosmetics [1]. Shade-dried flowers produced a bright orange pigment, which was standardized and assessed for sensory attributes. Results indicated no significant differences in quality attributes when compared to synthetic dyes. These findings highlight Palash flower extract as a sustainable, natural pigment for cosmetic and industrial applications, promoting eco-friendly and chemical-free practices [5].

Index Terms- Palash (Butea Monosperma, Natural pigments, Synthetic Dyes, Eco-friendly alternatives, Color Cosmetics, Bright orange pigment, Sustainable practices.

I. INTRODUCTION

GULMOHAR:

Gulmohar (Delonixregia), also known as the flame tree, royal poinciana, or peacock flower tree, is a large deciduous tree belonging to the Fabaceae family [6]. It is widely planted as an ornamental street tree, valued for its beauty and shade. The tree's medicinal properties have been well documented, with its leaves and flowers offering various therapeutic benefits, including anti-rheumatic and spasmogenic properties. Additionally, the flowers have been used as a natural colorant and as an acid-base indicator [8].

PALASH:

Palash flowers (Butea monosperma), commonly found in tropical regions like Vidarbha, are known for their bright orange-red color, earning them the nickname "Flame of the Forest" [1]. These flowers have been traditionally used to produce natural orange-red food color, offering a healthier alternative to synthetic dyes. The focus of this study is to explore the potential of Palash flowers as a natural food coloring agent in traditional recipes, specifically Coconut Burfi, Jalebi, and Sweet Rice [9].

HISTORY:

The Gulmohar tree was originally discovered in Madagascar and later introduced to various parts of the world, including tropical India. It was named by the French botanist WenselBojer in the 19th century. Although the tree has been cultivated widely for ornamental purposes, it is also used in traditional medicine for its medicinal properties [15].

Palash flowers have long been used in Indian culture for various purposes, including as a natural dye for textiles and foods. The use of these flowers for coloring has recently gained interest as a natural alternative to synthetic colorants [12].

GEOGRAPHICAL DISTRIBUTION:

- Delonixregia (Gulmohar): Originally native to Madagascar, this tree is now widely distributed across tropical and subtropical regions, including India, Southeast Asia, and parts of Africa [14].
- Butea monosperma (Palash): Found across tropical areas of India, Bangladesh, Nepal, and other Southeast Asian countries [18].

BOTANICAL CLASSIFICATION:

Delonixregia (Gulmohar) [18]:

- Domain: Eukaryota
- Kingdom: Plantae
- Family: Leguminosae
- Genus: Delonix
- Species: Delonixregia (Hook.) Raf.

Butea monosperma (Palash) [14]:

- Kingdom: Plantae
- Family: Fabaceae
- Genus: Butea
- Species: Butea monosperma (Lam.) Taub.

PARAMETER:

Sr.no.	Parameter	Delonix regia	Butea Monosperma
1	Family	Fabaceae	Fabaceae
2	Flower Colour	Bright Red to Orange	Flame-Orange to Reddish
3	Fruit Type	Long,Flat,Pods	Long,Thin,Pods
4	Uses	Ornamental value Shade Tree	Dye Productio Traditionl Remedies
5	Chemical Constituent	Flavonids, Carotenoids, Saponins	Flavonids, Sterols, Polysaccharides

COLOR IN FOOD:

Color plays a critical role in food aesthetics, influencing taste perception and overall acceptance. Natural food colorants, such as carotenoids (which produce red, orange, and yellow hues), are derived from plants and are increasingly being used as alternatives to synthetic food dyes, which have been linked to various health risks [4].

Carotenoids, found in fruits, vegetables, and flowers, are the primary compounds responsible for the vibrant colors of many foods. These compounds have also been used historically as natural food colorants. The carotenoids in Palash flowers could potentially replace synthetic dyes in food products, offering both a safe and sustainable option [19].

BOTANICAL DESCRIPTION:

- Gulmohar: A large, deciduous tree that can grow up to 18 meters tall, with broad, umbrella-shaped crowns. It produces stunning orange-red flowers [12].
- Palash: A small to medium-sized deciduous tree, typically growing up to 15 meters tall, with bright orange-red flowers that are often used for their coloring properties [8].

PHARMACOLOGICAL USES:

Delonixregia (Gulmohar) [19]:

- Anti-diabetic: Methanol extracts of leaves show significant hypoglycemic effects.
- Anti-bacterial: Effective against bacteria like *Staphylococcus subtilis* and *S. epidermis*.
- Anti-inflammatory: Exhibits significant anti-inflammatory properties through various experimental models.
- Anti-microbial: Inhibits the growth of various microbes, including *S. aureus* and *C. albicans*.

Butea monosperma (Palash) [16]:

- Anti-diabetic: Demonstrates beneficial effects on blood sugar regulation.
- Anti-inflammatory: Reduces inflammation in various animal models.
- Anti-cancer: Shows potential anti-tumor activity.
- Hepatoprotective: Exhibits liver-protective properties.

CONCLUSION

This study highlights the potential of Palash flowers as a natural alternative to synthetic colorants. The color extracted from Palash flowers was successfully

incorporated into traditional recipes such as Coconut Burfi, Jalebi, and Sweet Rice [20]. Sensory evaluations revealed that food prepared with Palash flower extract was equally accepted compared to the control recipes with synthetic colors. The findings suggest that Palash flowers could play a significant role in the color manufacturing industry, providing an eco-friendly and sustainable option [14]

Gulmohar (Delonix regia), a vibrant flowering tree, holds potential as a natural colorant due to its rich pigments found in its flowers. The anthocyanins and carotenoids present in the petals provide shades of red, orange, and yellow, making it a viable alternative to synthetic dyes in various applications [11].The use of Gulmohar as a natural colorant is environmentally friendly, biodegradable, and safer compared to synthetic dyes, which are often toxic and harmful [21]. However, further research and standardization of extraction methods, stability, and colorfastness are necessary for its widespread commercial use [13]. With the growing trend of eco-conscious and sustainable products, Gulmohar presents a promising option in the field of natural dyes for textiles, cosmetics, and even food industries [17].

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