

Development of a color calendar for food colors using natural colors

By

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Declaration

"The work describe in this thesis was carried out by me as a project in The Department of Food Science and Technology,University of Jayewardenepura under the supervision of Dr.S.B. Navarathne and A report on this thesis has not been submitted in whole or in part to any University or any other institution for another degree."

A.P.G.W. Chandramali
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We Dr.S.B.Navarathne certify that the statement in the proceeding page made by the candidate is true and that this thesis is suitable for submission for the University for the purpose of evaluation.



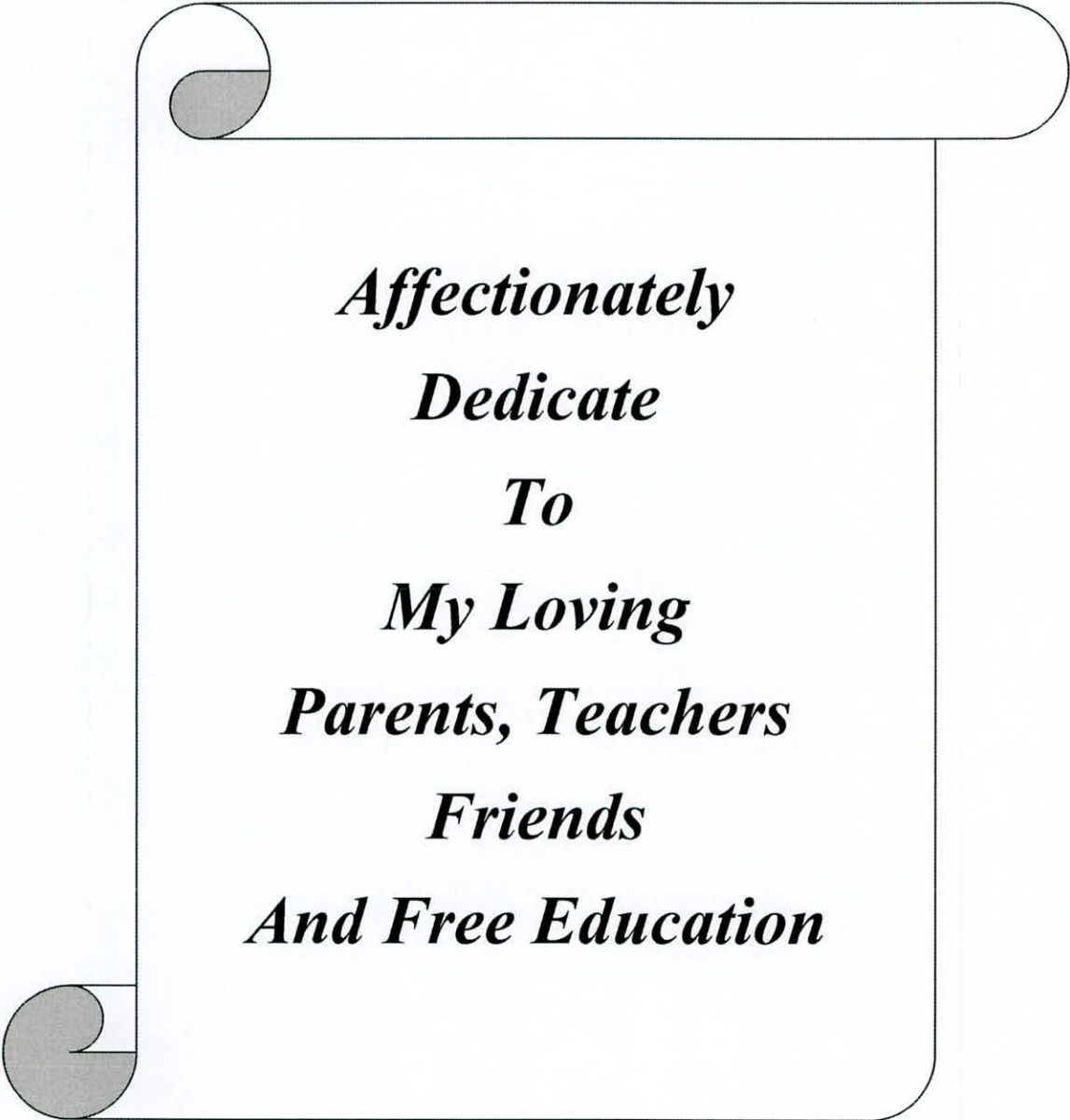
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*Affectionately
Dedicate
To
My Loving
Parents, Teachers
Friends
And Free Education*

ABSTRACT

Colorants are characterized by their ability to absorb visible part of the electromagnetic spectrum (380 – 780 nm) For good colouring property it has to have enough absorption coefficient (10000 to 40000 $\text{lmol}^{-1} \text{cm}^{-1}$) Also it must have properties enabling it to keep with colored material and stability. As a rule colorants nowadays have to be harmless. Many dyes have been extracted traditionally from roots, berries, flowers, barks and leaves. Common natural colorings include annatto, saffron, paprika, grapes skin, caramel, beetroot, cochineal and turmeric. The objectives of the study are Identification of edible grade different plant based pigment sources, classification of pigment sources according to chemical composition and morphology, development of extraction methods, monitoring stability of the pigments under different food processing condition, monitoring stability of the color with respect to shelf life, selection of best compatible color for appropriate food product.

In this research as a lower based material used hibiscus, clitoria, ranawara, rathmal, buthsarana, bell fruit flower. Also as a plant based material used mango, jackfruit, pomengranate, passionfruit. According to the chemical composition ranawara and mango include carotenoides, hibiscus include flavanoides and clitoria include betalines.

Due to water solubility of hibiscus and clitoria for extraction purpose used water extraction method. Due to fat solubility of ranawara for extraction purpose used ethanol extraction method.

By using hibiscus 3g could extract 30% percentage of colour (0.906g) By using 5g of hibiscus could extract 18% percentage of colour (0.05g) By using 3g of clitoria could extract 8% percentage of colour (0.24g). By using 5g of clitoria could extract 22% percentage of colour (1.14g). By using 3g of ranawara could extract 38% percentage of colour (1.16g). By using 5g of ranawara could extract 5% percentage of colour (0.25g).

With increasing pH from 1-10 color intensity of hibiscus varies from dark red to colorless. It means hibiscus shows dark red color in acidic medium. For clitoria with increasing pH from 1-10 color intensity varies from light blue to dark blue. It means clitoria shows dark blue color in base medium. Those shows the properties/characters of the indicators.

Extracted color in liquid form stored in refrigerator at 4 °c could kept for 6 weeks. This shelf life was lengthened up to 8 weeks after applied citric acid to the liquid form. Also powdery form could kept for 10 weeks after sealed it.

Jam and RTS drink were made by using natural brown color extracted by bell fruit flowers. It was get nice brown color appearance very close to company made RTS product and jam. After application of blue, yellow and pink colors to the icing sugar it takes beautiful color appearance of it.

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