

STUDIES ON BETALAINES IN BETA VULGARIS
AND
CAROTENOIDS AND CARBOHYDRATES IN
CHRYSOPHYLLUM ROXBURGHII FRUIT

by

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"Thesis submitted in partial fulfilment of the requirements for the degree of DOCTOR OF PHILOSOPHY of the UNIVERSITY OF COLOMBO, SRI LANKA"

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2020

440613

November, 1991



ABSTRACT

The thesis consist of three parts. Part one, describes a study of betalaines in Beta vulgaris (Chenopodiaceae). The different methods of extraction of betalaines were carried out to evaluate the most economical and an efficient method suited for local industry. Pilot plant trials of the method identified and also fermentation studies of the product were carried out to obtain a betalaine concentrate of high pigment content. Finally the suitability of the betalaine colour concentrate and powder for use as a possible substitute for the banned FD&C Red No : 2 (Amaranth). in some selected food products was evaluated.

Part two of the thesis describes a study of the carotenoid compounds present in Chrysophyllum roxburghii (Sapotaceae) fruit commonly called "Lawalu". Although this fruit is available in plenty it is not relished by many. Literature survey revealed that no attempt has been made so far to use this fruit as a natural colouring agent or to identify the pigments in this species or any other species of Chrysophyllum fruit. A chemical evaluation of the nutritional status of this fruit was also carried out. The carotenoids present were determined qualitatively and quantitatively. The carotenoid content was found to be very high compared to other fruits and it was observed that a carotenoid concentrate suitable for use in beverages and confectionery products could

be obtained from it. This concentrate could be used as a possible substitute for the widely used yellow shade tartrazine which though a permitted food colour is reported to cause several allergies etc. Several vitamin A active carotenoids were identified and thus the fruit can be considered as a good source of vitamin A.

Part 3 of this thesis deals with the study of the carbohydrates found in the pulp of the Chrysophyllum roxburghii fruit. The water soluble sugars were identified and quantified by g.c. and h.p.l.c. analysis. The water soluble polysaccharides were isolated and fractionated. Sugar analysis, methylation analysis, g.c., g.c. - m.s, ¹H n.m.r. and ¹³C n.m.r. spectroscopy were used to study the composition and structure of the polysaccharide.

The polysaccharide was composed mainly of arabinose, galactose and glucose. The arabinose was present as terminal furanosyl and pyranosyl residues. Results obtained suggest a branched structure for the polysaccharide in which the hexopyranosyl residues form the backbone of the polymer.