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Abstract

The present work was carried out to produce a dry powder of red color from natural sources available in Egypt i. e. roselle calyces, and red beet roots for coloring some food products.

Four different extracting solvents were evaluated for the extraction of roselle, and red beet pigments and the results indicated that ethanol acidified with 1.5N HCl (85:15) had the greatest influence in recovering high amount of anthocyanins from roselle calyces while, distilled water was the most effective in extracting the highest level of betalains from red beet roots.

The effects of pH values and heat treatments on the extracted pigments were studied and the results showed that roselle anthocyanin was more stable at the low pH values, while, beet betalains was more stable at the higher pH values (5-7). The results also proved that anthocyanin was more stable to heat treatments than betalain.

Degradation Kinetic studies of encapsulated pigments showed that degradation of roselle and red beet pigments followed the first order reaction kinetics. The effect of three different encapsulating agents i.e. Maltodextrin D.E. 10, Maltodextrin D.E. 20, and gum arabic on pigments stability was investigated . The three types of matrices largely increased the half-life of the pigments during storage at different levels of water activity. Maltodextrin D.E. 20 was found to be the most effective carrier in stabilizing the pigments under all conditions examined.

Water activity was found to be an important factor affecting the degradation of the encapsulated pigments. Degradation rates of the encapsulated pigments were found to increase with increasing water activity levels.

The encapsulated anthocyanins and betalains were used for coloring some food products and the results proved that roselle anthocyanins could be used for color fortification of strawberry jam, and hard candy. While beet betalain was found to be suitable for coloring the products which have short shelf-life i.e. Ice cream.

Key words:

Roselle (*Hibiscus subdariffa* L), Red beet (*Beta vulgaris* L.), Anthocyanins, Betalains, Encapsulation, Maltodextrin, Gum arabic, Water activity, Degradation kinetic, Hard candy, Jam, Ice cream, shelf-life.