

USE OF NATURAL FOOD ADDITIVES FROM HYDROCERUS UNDATUS (DRAGON FRUIT) IN FOOD INDUSTRY- A GREEN STEP IN GREEN CHEMISTRY.

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ABSTRACT

Natural food colour in any dye obtained from any vegetable, animal or mineral which is capable of colouring food, drugs, cosmetics or any part of human body. These natural colour or additives come from variety of sources such as seeds, fruits and vegetables, leaves algae and insects. Sometimes due to lack of knowledge the applications of these additives are not widely used. Dragon fruit or pitahya is one of the tropical fruit which has low calories and filled with various nutritive elements, vitamins and antioxidants. Dragon fruit is cultivated in India by farmers. In Maharashtra, area like karjat, solapur and Pune and even in certain places of Hyderabad. Dragon fruits is also called as strawberry pear. Dragon fruit colouring powder named (DFCP) as a natural food additive using dragon fruit albedo which is nothing but thin layer of dragon fruit peel. The albedo of dragon fruit is dried and use to colour various food stuffs. In this study, a conventional method was used to access the albedo powder and as a additive in a similar process to saffron as a food colouring. To prepare powder from albedo the dragon fruit was dried on a stove after outer layer was peeled. Heating at low temperature is one of the conventional method for drying dragon fruit albedo. Using DFPC as natural food colourant is healthy for humans and also ecofriendly to society.

Keywords: Albedo, dragon fruit, peel, conventional.

INTRODUCTION

Dragon fruit is one of the tropical fruit which has low calories and filled with various nutritious elements, vitamins and antioxidants. Though the dragon fruit is popular in several American and South Asian countries but due to its delicious taste and health benefits it is becoming popular in India too.

In India the crop is cultivated by formers in areas like, Karjat, Solapur, and Pune in Maharashtra and even in certain places of Hyderabad.

Since this plant is from cactus family it requires less water.

Traditionally people use natural colour which obtained from nature. We use turmeric, saffron, various flower petals, paprika and beet extracts as yellow, orange, red etc. colours into various food stuffs which plays vital role for human health. (Arnell, Need, M. 2011).

In the beginning of 20th Century, numerous synthetic food additives had been produced, however only few synthetic colours approved to be used since the banned items have been identified as being potential cancer – causing chemicals. According to FDA, since 1955, the trend of synthetic food consumption has been stronger. The

excessive increase is due to higher consumer on processed food, such as soft drinks, breakfast cereals, candies, Snacks, food, baked food, frozen desert, pickles, salad dressing. Where synthetic colours being used on large scale. However, it is challenge how we replace synthetic food colouring with natural one.

To overcome such problem using dragon fruit albedo namely Dragon fruit colouring powder (DFCP). It is tremendously healthy and attractive especially for consumers. Developing DFPC as the natural food colorants is not healthy for human body but also eco-friendly to society. It is estimated to cost effective as it is sourced from the only disposable part (peel) of the fruit. The DFPC has several properties compared to the extracted flesh from fruit, which is feasible to carry, packing and less space for storing.

“Red pitaya” or dragon fruit has rich sources of vitamins eg. B1, B2, B3 and C, minerals eg. Potassium sodium, calcium, iron and phosphorous and nutrients eg. fat, protein carbohydrate, flavonoids, crude fiber, thiamin, phytoalbumin, niacin, pyridoxine, glucose, betacyanins, phenolics, carotene and polyphenol (Le Bellec *et al.*, 2006). It has relatively high antioxidant activity in comparison with other subtropical fruits (Davis

et al., 2007). Betalins, for the first time extracted from red beet (*Beta vulgaris*) and is used largely for food colouring additives and the extract includes red and yellow pigments namely beta cyanins and betaxanthins respectively.

Due to unfavourable earthy favour of geosmin and pyrazine derivatives as well as possibilities of carcinogenic nitrosamines in red beet, there is a high demand to replace this source (Esquivel, Patrica *et al.*, 2007).

Since Betacyanin is the main component (95%) of the red pigment extract, in addition dragon fruit peel includes betacyanin can make contribution to produce beauty and health products (Arrifin AA, Bakar J., *et al.*, 2008). Since dragon peel contains betalins and lacks disadvantages of beet root, it can be replaced as a new red dye. The flesh of dragon fruit according to a study of Luders and McMahon, (2006), can be mixed with milk, soft drink, ice used jellies.

MATERIALS AND METHOD

Dragon fruit peel has a high potential to be used as natural dye Harivaindaran *et al.*, (2008). The inner layer of dragon fruit peel i.e. Albedo can have high potential as a colour powder and a natural food additive.

In this study, a conventional method was used to assess the albedo powder as a food additive in a similar process to Saffron as a food colouring.

To prepare powder from albedo, the thick dragon fruit was dried on stove after the outer layers were peeled. Heating method as one of the conventional method for food drying was used to dry dragon fruit albedo. Both the sides of the Albedo were evenly dried for approximately one hour with low temperature. The dried layer was then ground in a

mortar and pestle to make a fine powder, which was filtered through a strainer and dissolved in boiling water.

The prepared solution of dragon fruit albedo was then added to milk, yogurt, pastry, juice and rice in order to test dragon fruit albedo has ability to change colour.

RESULTS AND DISCUSSION

DFCP is a natural food additive by using dragon fruit albedo. In the previous study researchers have found that the red peel of dragon fruit contains varieties of vitamins, minerals and nutrients with remarkable amount to antioxidant compounds compared to other subtropical fruits. It has a source of functional ingredients that provide nutrients to prevent nutrition related diseases and improvement and physical well-being of the consumers.

Through a conventional method in this study, different parts of dragon fruit eg. outer layer inner layer (albedo) and flesh were used. However only the albedo part was successful in the preparation of powder.

Concern study revealed that consumer prefer chemical free products especially when it is related to food consumption. The process to prepare dragon fruit powder is also believed to be less time consuming. In the economics of scale of the production, it is also expected that they can produce with less time.

In conclusion, the albedo powder of dragon fruit can be used for food colouring. In order to mass production of DFPC, where would be a need for future research in wider perspective to introduce this new product.

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