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The Islamic Perspective Approach On Plant Pigments As Natural Food Colourants

Nursabrina Munawar[a*], Hajah Makiah Tussaripah bt Hj Jamil[b]

[a]*Fakulti Sains Gunaan (Teknologi Makanan), Universiti Teknologi MARA Cawangan Negeri Sembilan, Malaysia.*
[b]*Pusat Pemikiran dan Kefahaman Islam (CITU), Universiti Teknologi MARA Cawangan Negeri Sembilan, Malaysia*

Abstract

The importance of having halal and *toyyiban* foods has been widely propagated among Muslim all around the world. One of the discussions is the increasing demand for food colourants from natural sources that can serve as substitute to synthetic dyes due to both legislative action and consumer concerns over health issues. Among all pigments, anthocyanin is the target of numerous studies because of its colourant properties and benefits as a potent antioxidants and chemoprotective. This study was conducted to determine the colour changes, anthocyanins stability and antioxidant activity of selected spray dried plant pigment from roselle calyx, and its combination from *senduduk* fruits and purple-flesh sweet potato at the same ratio (50:50). The highest anthocyanin content was obtained in roselle and *senduduk* combination (428.83 ± 5.15 mg/L). It also showed the highest antioxidant activity with FRAP value (52.04 ± 2.67 mg Trolox/g) and DPPH activity (17.94 ± 0.56 %). The phenolic content was 66.97 ± 0.07 mg GAE/g. The colour obtained from the combination of roselle and *senduduk* reported to be the most pinkish with chroma value of 25.43 ± 0.72. It has the greatest potential as a healthy and safe natural colourant to be used as functional ingredient in food products apart from being a natural colouring agent. In short, this concept is in line with maqasid approach of *darruriyat which* signifies five essentials for Muslim community and Islamic legal maxim in promoting the maxim of harm may neither be inflicted nor reciprocated in Islam (*la dharar wa la dhirar*).

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Keywords : Plant Pigment; Natural Food Colourants; Maqasid Shariah; Islamic Legal Maxim

[*] Corresponding author. Tel.: 6064832186; fax: +6064842303
E-mail address: nsabrinam@ns.uitm.edu.my

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1. Introduction

Food colourants have quite a numerous controversial issues throughout the years especially in safety and health issue. Consumers generally associate food colour with safety and quality of fresh foods or of good processing. Some consumers are concerned on the possibility of colourant being used to cover up any misconduct in food preparation by masking deterioration in microbiological, nutritional and flavour of the food. However for food manufacturer, colour is important in terms of marketability and acceptability of food products. It has been shown by studies conducted by many researchers that uses of artificial or synthetic colours in food may increase the risk of getting cancer, allergies and may trigger hyperactivity in children. Due to these, many consumers have shifted their preference towards food products containing natural colourants. Natural pigments from plants sources offer the opportunity to 'colour food with food'. There are various groups of natural colour pigments such as anthocyanins, carotenoid, chlorophyll and betalain. Among these natural pigments, the anthocyanins are the target of numerous studies, due to the colourant properties, as it responsible of the shiny orange, pink, red, violet and blue colours in the flowers and fruits of some plants (Wrolstad, 2000). It is also well known that one of the significant properties of anthocyanins is their antioxidant activity, which plays a vital role in the prevention of neuronal and cardiovascular illnesses, cancer and diabetes (Konczak and Zhang, 2004).

Even though, anthocyanin is among the natural food colourants permitted by food regulations besides curcumin, chlorophyll, β-carotene, lycopene, and beet red but their applications in food products have not been broadly used. The setbacks are caused by their low stability to processing and storage. Their instability in withstanding harsh conditions and complex reactions during processing affects the final product colour quality, lower their health benefits and reduce acceptance by consumer. Many studies have been conducted to find ways to stabilise anthocyanins. From these studies, several intrinsic and extrinsic factors influencing the pigment stability have been investigated such as species, environmental and agronomic conditions; extraction and processing parameters such as pH, storage temperature, concentration, chemical structure, light, oxygen, proteins, ascorbic acid, sugars, sulfites, enzymes and metallic ions (Cavalcanti et al*.,* 2011; Patras et al., 2010; Rein, 2005). Among all the factors, pH and temperature are the major factors significantly influence the pigment colour variations and stability.

1.1. Issues in food colourant

In Malaysia, food colouring is under Food Additive Regulation in The Food Act 1983 and the Food Regulations 1985. Some synthetic dyes are allowed to be used as colouring substances in food and must comply with the permitted level determined by the authority. The usages of synthetic dyes are found mostly in any food application because of the easy application, availability and its stability in food during processing. Synthethic food colourant can be divided into dyes and lakes. Dyes are certified, water soluble synthetic food colourants. They are manufactured as powders, granules or liquids. There are several types of synthetic dyes based on the compound and structure. In the 1936-1960 periods, several studies on the safety of the synthetic colourants were carried out and it was found that some were considered unsafe for consumption. Consumers who are concerned with the safety of synthetic colourant are encouraging food manufacturers to replace the synthetic colourant to natural colouring ingredients. Recently, The European Union (EU) had required all food manufacturers to put a warning label on any products that contained 'southampton six colourant'. These colourant are tartrazine, quinoline yellow, sunset yellow, carmoisine, ponceau red and allura red. There are studies that link the hyperactivity in children with these food colourant. A study reported on the significant increased of ADHD (attention deficit hyperactivity disorder) in children after consumption of drinks with azo dyes and benzoic acid