

ABSTRACT

Anthocyanins are important phytochemical compounds in nature that are of interest not only for their health benefits such as antioxidant, anti-inflammatory, and anti-carcinogenic properties, but also for their role in imparting attractive and characteristic color to food products. In this study, anthocyanins from hibiscus (*Hibiscus sabdariffa* L.) calyces were microencapsulated by spray-drying technique using maltodextrin as the carrier. The experiment was carried out in the full factorial design with two factors, namely inlet temperature (150, 160, and 170°C) and anthocyanin to maltodextrin mass ratio (1:50, 1:60, 1:70, 1:80, 1:90, and 1:100) with the aim of investigating the effect of spray drying conditions on phenolic content, anthocyanin, antioxidant activity, and color of spray-dried hibiscus powder. The results showed that increasing the carrier ratio significantly reduced the antioxidant content and their activities in the powder. However, the high level of carriers exhibited a protective effect in encapsulating anthocyanin compounds into the maltodextrin matrix, which was demonstrated by high encapsulation efficiency (>85%) observed in the samples prepared at a ratio of 1:100. It should be highlighted that although high temperature (170°C) reduced total anthocyanin concentration, it actually enhanced total phenolic content. In addition, the moisture content of the powder declined with increasing carrier ratio and inlet temperature, and it was found to be in the range of 5.57%– 10.19% in the powder. With solubility greater than 93.71%, the total phenolic and total anthocyanin content of spray-dried hibiscus powder were 31.5–41.9 (mg gallic acid equivalent/g of dry powder) and 6.08–10.47 (mg cyanidin-3-glucoside/g of dry powder), respectively. [6]

INTRODUCTION



Fig 1. Hibiscus calyces.

- Rich in dietary fiber
- polyphenols and antioxidants
- Numerous health Benefits
- Different applications in food and pharmaceuticals

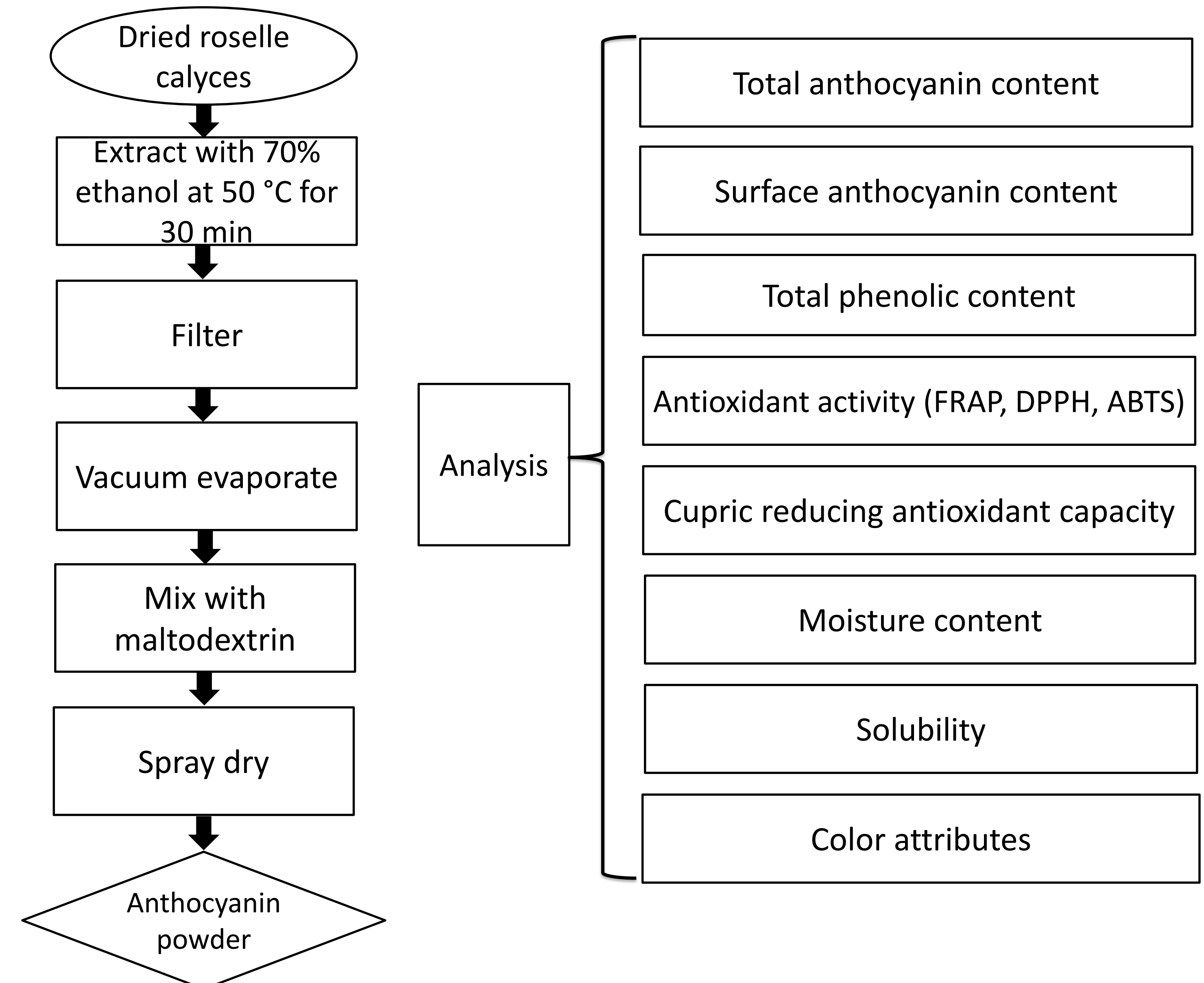
Microencapsulation by spray drying

➤ Cost-effectiveness

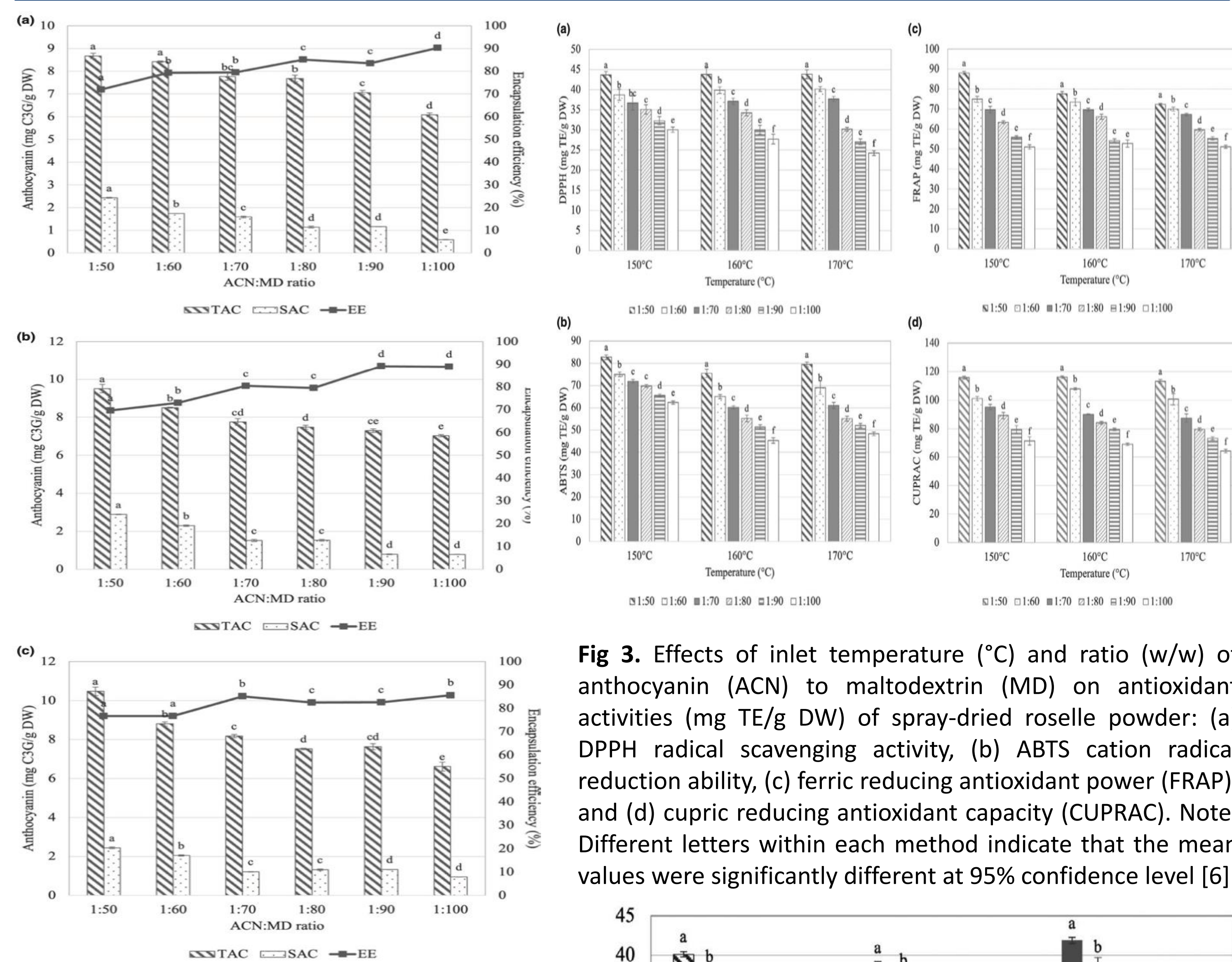
➤ Scalability

➤ Ability to produce stable microcapsules with desirable properties

METHODS AND MATERIALS

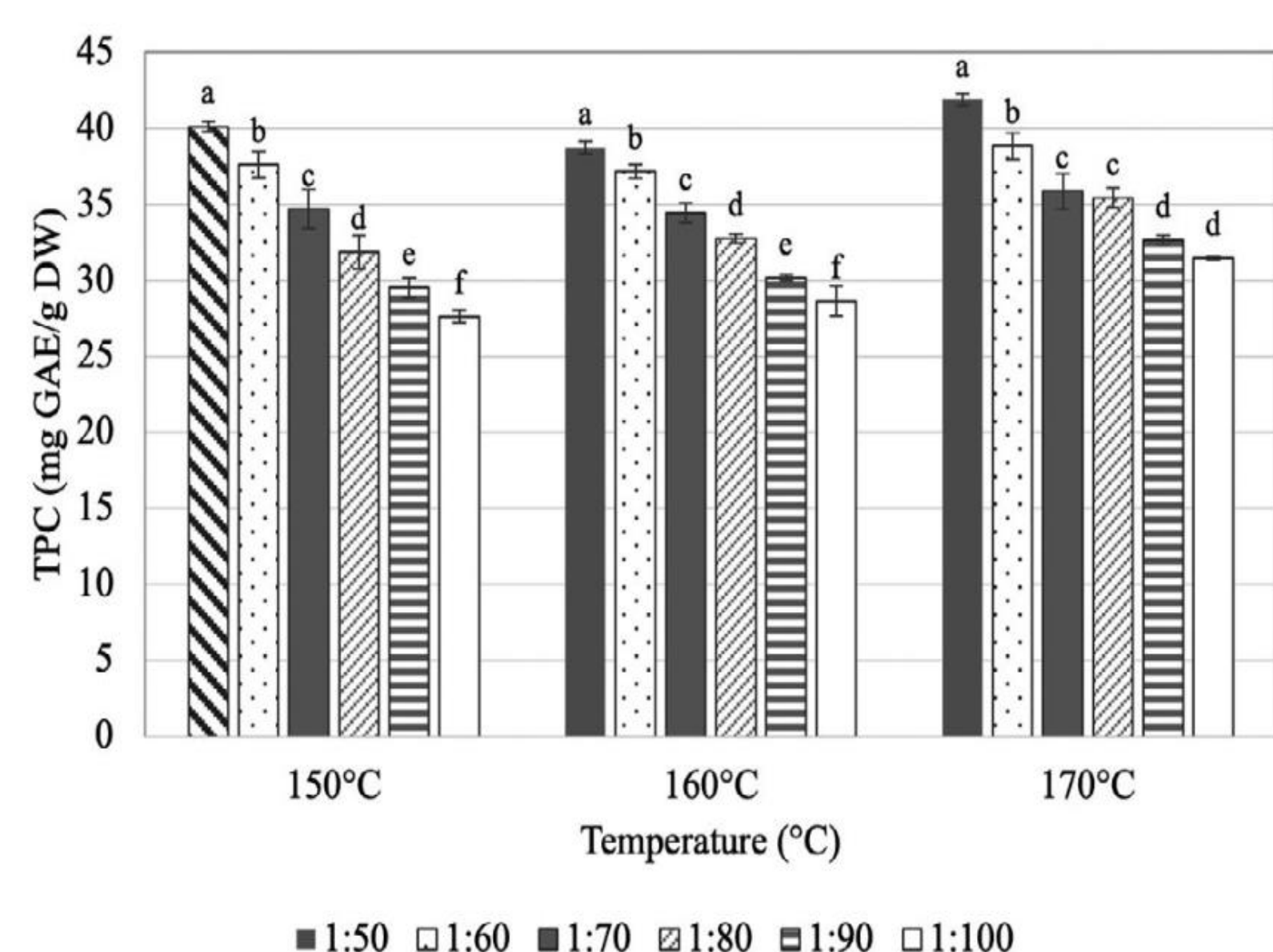


RESULTS AND DISCUSSION



CONCLUSIONS

Hibiscus powder can be obtained using the spray drying process with the assistance of maltodextrin as carrier, in which inlet temperature and carrier ratio are two important parameters affecting the quality of the product. Because maltodextrin only works as a bulking agent or a spray drying aid, increasing the amount of carrier offered greater protection of antioxidants but lowered product quality. Increased temperature in the range of 150–170°C, on the other hand, lowered anthocyanin concentration and antioxidant activities while increasing the phenolic content of the product. The temperature in the investigated range also had an insignificant effect on the color of the product while the high amount of carrier improved the brightness of the product. In addition, high solubility allows the pigment powder to be introduced into other food products, especially beverages, as colorants. [6]



[Microencapsulation Of Roselle \(Hibiscus Sabdariffa L.\) Anthocyanins: Effects Of Drying Conditions On Some Physicochemical Properties And Antioxidant Activities Of Spray-Dried Powder](#) © 2024 by Nguyen Quoc Duy, Dang Thanh Thuy, Nguyen Thi Van Linh, Nguyen Thi Thuy Dung, Nguyen Nhu Ngoc is licensed under [CC BY-NC-ND 4.0](#)

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