

Phycocyanin and Antioxidant Stability in Blue Ice Cream

Alberta Rika Pratiwi, Laksmi Hartayanie
Food Technology, Faculty of Agricultural Technology, Soegijapranata Catholic University

Abstract

Spirulina is a microalga rich in pigment phycocyanin that has antioxidant activity. Blue ice cream is ice cream added pigment phycocyanin of *Spirulina*. The aim of this study was to know the stability of phycocyanin and antioxidant in ice cream during storage. Phycocyanin and antioxidant in blue ice cream were analysed every 3 days for 15 days storage. The phycocyanin content in blue ice cream was relatively stable (18.11 ± 0.21 MG/mg/ml to 15.27 ± 0.11 MG/mg/ml of ice cream contained 1.25% phycocyanin and 17.20 ± 0.24 mg/ml to 13.90 ± 0.16 mg/ml of ice cream contained 1% phycocyanin). The antioxidant activity of blue ice cream were $34.70\pm0.95\%$ to $11.62\pm0.84\%$ (with 1% phycocyanin) and $44.63\pm1.94\%$ to $13.51\pm0.67\%$ with 1.25% phycocyanin).

Keywords: Antioxidant, Microalga, *Spirulina*, Pigment, Phycocyanin

Introduction

Phytonutrients in *Spirulina*

- Beta-Carotene 6.8 mg
- Zeaxanthin 9 mg
- Chlorophyll 30 mg
- Total Carotenoids 15 mg
- C-Phycocyanin 240 mg
- **Total Phycocyanins 519 mg**
- Superoxide Dismutase 1080 units



Figure 1. *Spirulina* in the culture substrate



Figure 2. Dried *Spirulina*

Phycocyanin is a powerful water soluble antioxidant that showed a potent free radical, scavenger and inhibits microsomal lipid peroxidation (Pinero *et al*, 2001). *Spirulina* has many different types of antioxidants, and the unique nature of phycocyanin makes *Spirulina* beyond other food antioxidant food. Phycocyanin could be extracted from *Spirulina*, which has been widely used in commercial applications in the food industry as a natural blue colorant.

Result



Figure 3. Ice Cream with (a) Phycocyanin as a natural blue colorant and (b) control (without Phycocyanin)



Figure 4. Phycocyanin Powder

Results

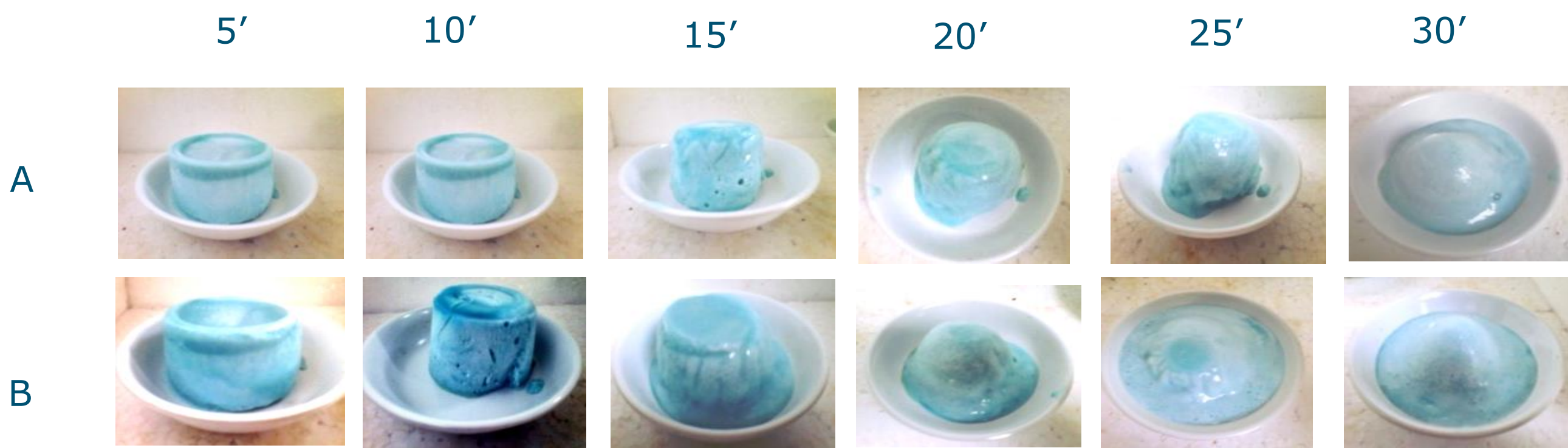


Figure 5. Color change in the blue ice cream during melt at room temperature. (A) added 1% phycocyanin dan (B) added 1.25% Phycocyanin

Results

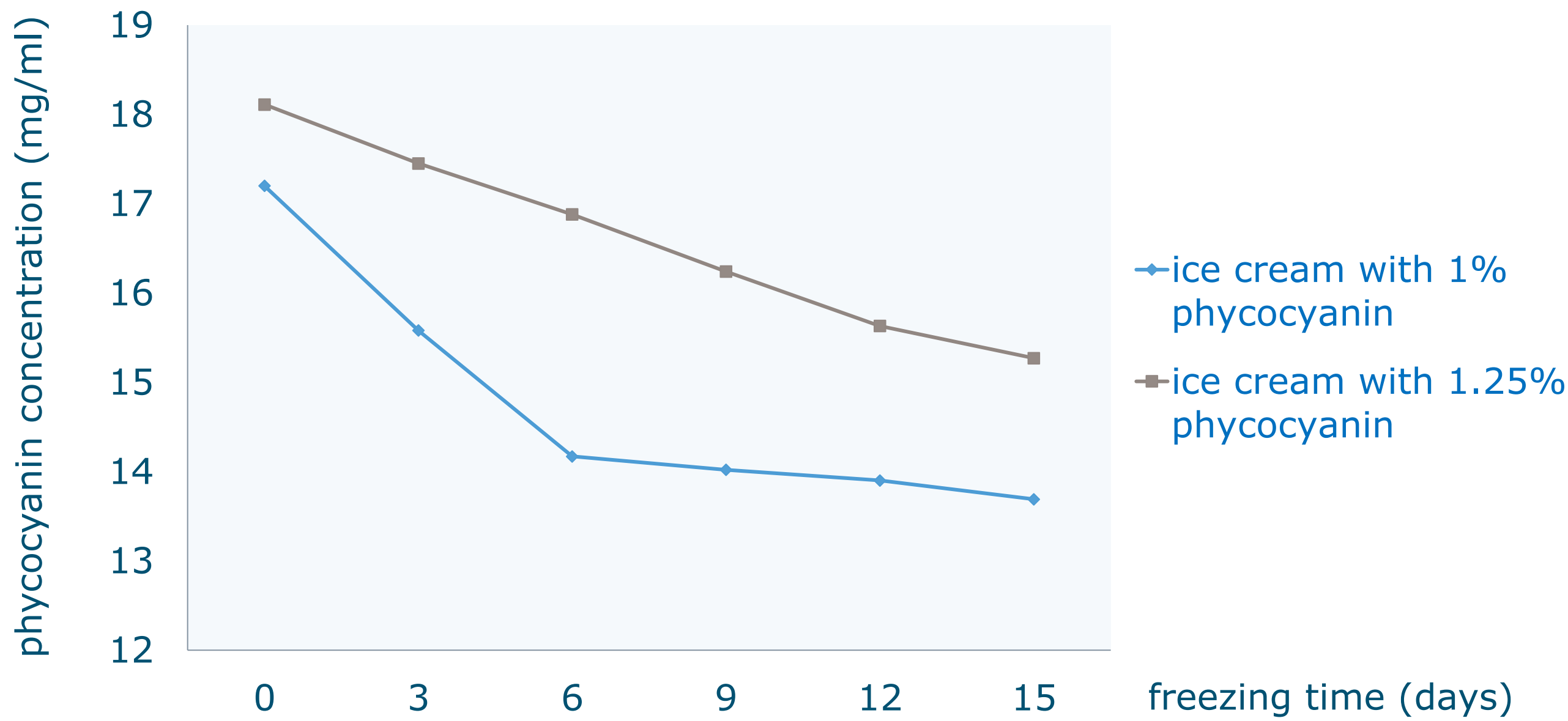


Figure 6. Phycocyanin stability in blue ice cream during 15 days freezing

Table 2. Changing of antioxidant activity in blue ice cream after 15 days freezing

Concentration of phycocyanin (%)	Antioxidant activity (%) after 1 day freezing	Antioxidant activity (%) after 15 days freezing
Without Phycocyanin	3,90±1,21 ^a	2,79±0,61 ^a
1%	34,70±0,95 ^b	11,62±0,84 ^b
1.25%	44,63±1,94 ^c	13,51±0,67 ^c

Conclusions

- Phycocyanin content in blue ice cream was decreased during frozen storage
- Antioxidant activity in blue ice cream was unstable during frozen storage

Acknowledgements

This research was supported in part by Hibah Bersaing-DIKTI-2012/2013.
NO: 011/006.2/PP/SP/2012