

ICE CREAM ENRICHED WITH AQUEOUS EXTRACT OF *THYMUS CITRIODORUS* BY-PRODUCT: PHENOLIC COMPOUNDS AND ANTIOXIDANT ACTIVITY EVALUATION



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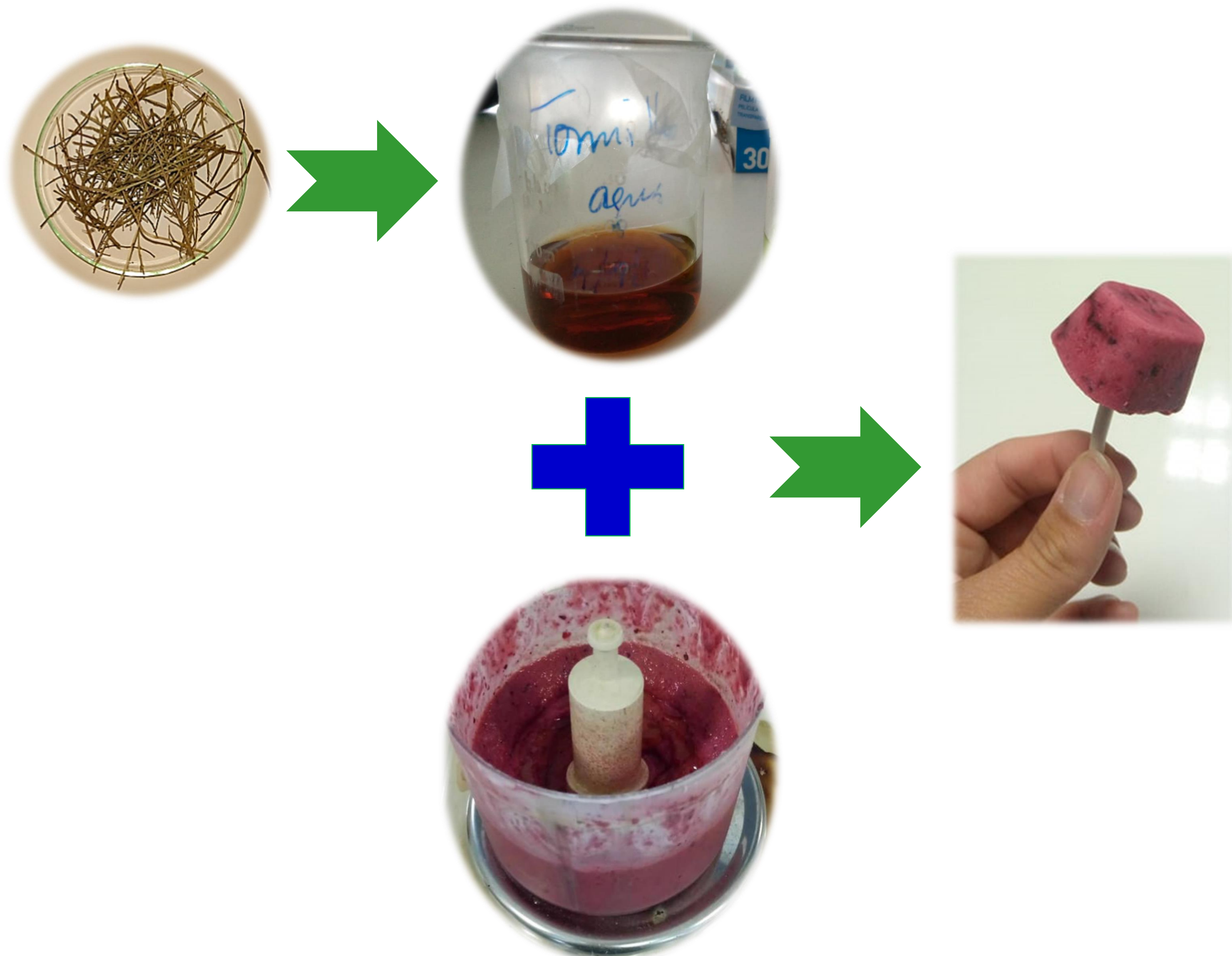
INTRODUCTION

Annually, 1.3 billion edible food produced worldwide are wasted, discarded or lost throughout the food chain [1]. This creates two major problems: the negative economic impact in the value chain and the environmental impact of discarded by-products. To answer these problems food by-products have been used to prepare fertilizers, to produce animal feed, or to recover bioactive compounds that have shown to possess antioxidant, antimicrobial and anti-inflammatory properties, following strategies of circular economy [1-4].

AIM OF THE WORK

The present work was developed within the framework of Waste2Value project and aims, among other aspects, to develop forms of valorization of agricultural and agro-industrial by-products. Lemon thyme (*Thymus citriodorus*) stems are by-products originated by one of our consortium company. Studies in the scientific literature have demonstrated that *Thymus citriodorus* has antimicrobial and antioxidant properties [3]. The aim of the work was to explore the extraction of phenolics from lemon thyme by-products using ecologically viable solvent and its impact on incorporation into a dairy based red berries ice-cream.

MATERIALS AND METHODS

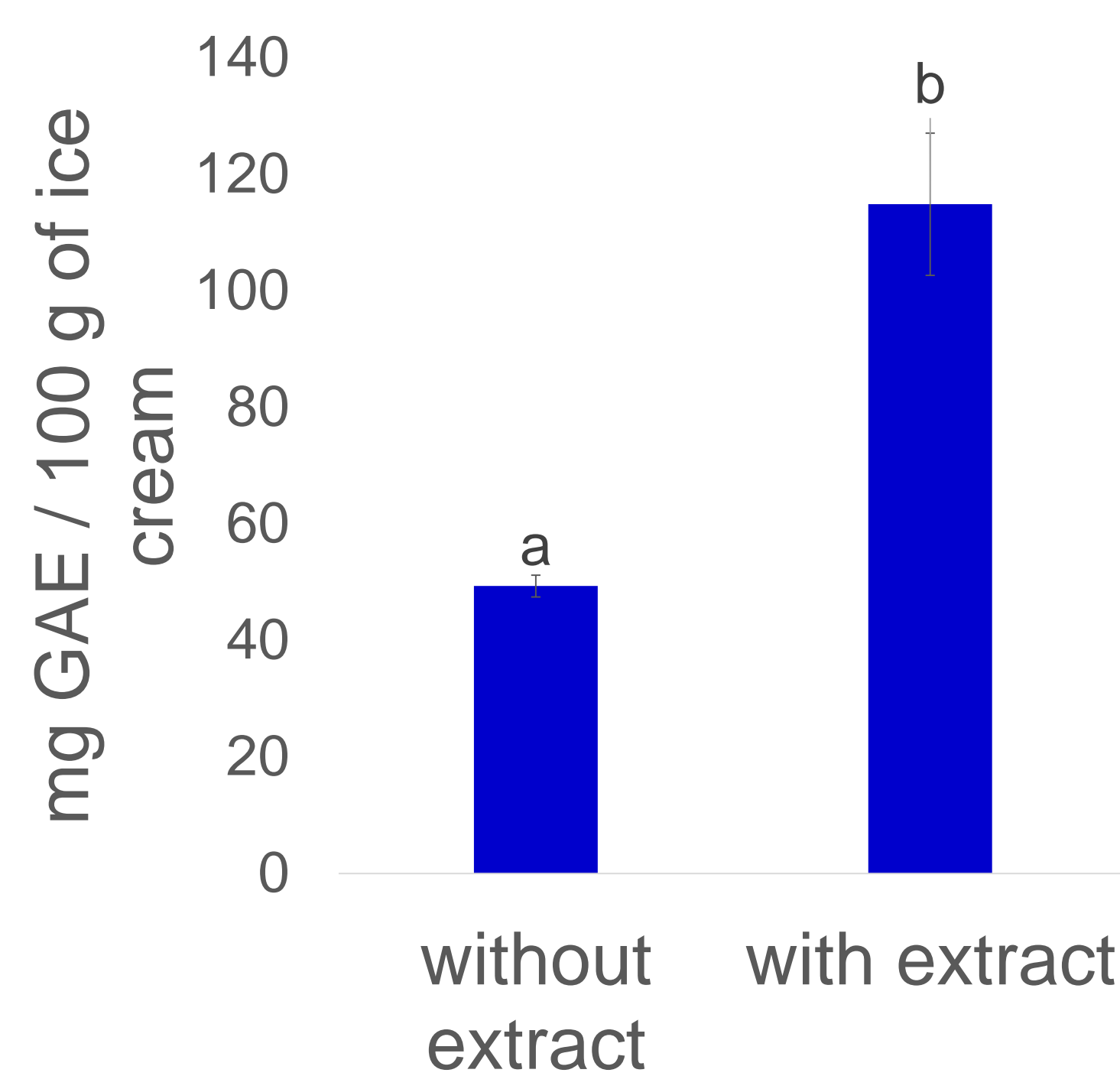


The lemon thyme by-products were dried and extracted for 1 hour using water at 50 °C. After that the extract was filtrated and stored at -4°C.

The formulation of the ice cream was tested and adjusted to the following: 75 g of frozen red berries; 12 g of honey; 0,75 g of guar gum and 62,25 g of natural Greek style yogurt. Two types of ice cream were tested: one without the lemon thyme water extract and other with lemon thyme water extract (≈ 7 mL per 100 g of ice cream).

A total phenolic compound (TPC) determination by the Folin-Ciocalteu method and assessment of the antioxidant activity by the reduction of the DPPH• radical method were performed on both ice creams.

RESULTS



The results showed a significant increase ($p < 0,05$) to almost the double in the mean value of the total phenolic compounds for the ice cream with lemon thyme extract (114,86 mg GAE/100g) compared to the one without incorporation of extract (49,33 mg GAE/100g).

Fig 1. – Total phenolic compounds content of ice cream with and without addition of lemon thyme water extract express as mg GAE / 100 g of ice cream.

For the antioxidant activity evaluation through the reduction of the radical DPPH• method the same trend observed for TPC were obtained, being the ice cream with extract the one that showed the highest antioxidant activity towards the DPPH• radical (11,41 mg AAE / 100 g) when compared with the ice cream without extract (6,07 mg AAE / 100 g).

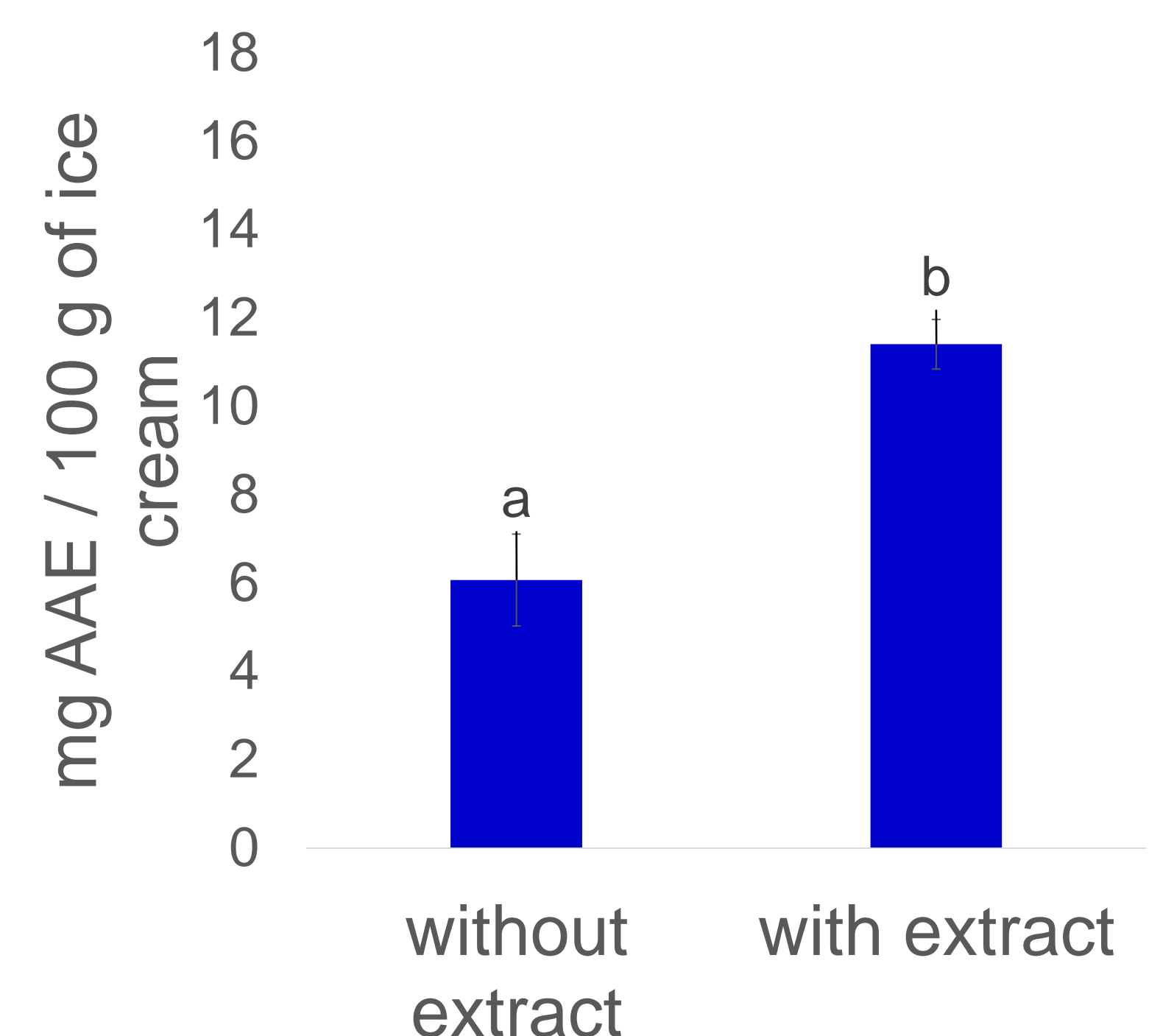


Fig 2. – Antioxidant activity by the reduction of the radical DPPH• method of ice cream with and without addition of lemon thyme water extract express as mg ascorbic acid equivalents (AAE) / 100 g of ice cream.

CONCLUSION

The evaluation carried out with the ice cream at the level of total phenolic compounds and antioxidant activity allowed to conclude that the ice cream took advantage of the incorporation of the lemon thyme by-product aqueous extract, increasing its potential beneficial effect on health.

ACKNOWLEDGEMENTS

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