



CONVERSION OF TUBER SHELLS WASTE INTO NATURAL FOOD COLORANTS USING NATURAL DEEP EUTECTIC SOLVENTS (NADES)

Matheus, Julia Rabelo Vaz ¹

Maragoni-Santos, Carollyne ²

Hackbart, Emily Farias Costa ³

Freitas, Thalita Ferreira de ⁴

Andrade, Cristiano José de ⁵

Luchese, Cláudia Leites ⁶

Fai, Ana Elizabeth Cavalcante ⁷

Betalains, extracted from beets, are usually used as a reddish colorant in vegetable plant-based meat. The potential utilization of anthocyanins for comparable objectives is worth investigating. In this study, the peel flour of purple carrots (PC) and purple sweet potatoes (PSP) were analyzed as an alternative source of food colorant using a green extraction method. Flour produced from red beets was used for data comparison. The flours (4 mg/mL) were diluted into different solvents such as distilled water (DW), an aqueous solution with citric acid 1% (v/v) (CA), and an aqueous solution with NADES 1% (v/v) composed of choline chloride: citric acid (1:1M) and kept at room temperature for 30 min with constant stirring. Subsequently, filtered extracts were analyzed for UV-Vis spectroscopy (400 to 700 nm) and colorimetric profile at pH 2 to 12 was registered. The results showed that both solvent and pH affected the colorimetric profile. The extraction using the CA solution increased a^* values for BEET (4.4 to 5.9), PSP (3.5 to 10.7), and PC (6.3 to 7). However, there was a decrease in a^* values of BEET (2.8) and PC (2.7) using the NADES solution, except for PSP (3.6) which remained similar to DW. The PSP showed a higher ΔE^* values using DW (9.5) and CA (12.9) compared to the PC (5.6 and 9.3 to DW and CA, respectively). A different result was observed using NADES as a solvent (3.0 and 2.6 for PSP and PC, respectively). The PSP extracted with NADES showed the

¹ – Master, Federal University of Rio de Janeiro State (UNIRIO), Rio de Janeiro, Brazil, juuh.rabelo@hotmail.com

² – Master, Federal University of Rio de Janeiro State (UNIRIO), Rio de Janeiro, Brazil, carolmaragoni@hotmail.com

³ – Graduate student, Rio de Janeiro State University (UERJ), Rio de Janeiro, Brazil, emilyhackbart@gmail.com

⁴ – Nutritionist, Rio de Janeiro State University (UERJ), Rio de Janeiro, Brazil, thalitaffreitas1@gmail.com

⁵ – PhD, Federal University of Santa Catarina (USFC), Santa Catarina, Brazil, eng.crisja@gmail.com

⁶ – PhD, Federal University of Latin American Integration (UNILA), Paraná, Brazil, claudialuchese@yahoo.com.br

⁷ – PhD, Rio de Janeiro State University (UERJ), Rio de Janeiro, Brazil, bethfai@icloud.com

greatest color variation in response to pH visible to the human eye, confirmed by the UV spectra and color measurements. The purple pigment has the potential to be used as a functional ingredient (natural colorant) and applied to alternative materials for the development of smart and pH-sensitive food packaging. Further studies are underway.

¹ – Master, Federal University of Rio de Janeiro State (UNIRIO), Rio de Janeiro, Brazil, juuh.rabelo@hotmail.com

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³ – Graduate student, Rio de Janeiro State University (UERJ), Rio de Janeiro, Brazil, emilyhackbart@gmail.com

⁴ – Nutritionist, Rio de Janeiro State University (UERJ), Rio de Janeiro, Brazil, thalitafr Freitas1@gmail.com

⁵ – PhD, Federal University of Santa Catarina (USFC), Santa Catarina, Brazil, eng.crisja@gmail.com

⁶ – PhD, Federal University of Latin American Integration (UNILA), Paraná, Brazil, claudialuchese@yahoo.com.br

⁷ – PhD, Rio de Janeiro State University (UERJ), Rio de Janeiro, Brazil, bethfai@icloud.com