PURPLE SWEET POTATO ANTHOCYANINS AS ANTIOXIDANTS AND COLORANT OF PORK PATTIES

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I. INTRODUCTION

In the dynamic landscape of the food industry, green labels have emerged as a beacon of sustainability and health consciousness. In recent years, purple sweet potato (*Ipomoea batata L*) has attracted increasing attention from the food industry. Its popularity has increased, especially in the production of sweet potato chips, in response to the growth in demand and consumption of vegetarian snacks. In addition, the scientific community is exploring various applications of purple sweet potato, such as breakfast cereals, yoghurts, pasta, and cookies, among others [1–3]. The production of these foods generates peel, which, with an economic treatment, could be a source of anthocyanins and a way to valorize food industry co-products. The current work aimed to evaluate the antioxidant and colorant ability of Purple Sweet potato anthocyanins in pork patties after 9 days of cold storage.

II. MATERIALS AND METHODS

Anthocyanins were extracted for dehydrated purple sweet potato peel (*Ipomea batata*) (PSPP). For extraction Ultrasonicator UP400St accoupled with S24d22D probe a 180 W and 24 kHz were used. The following conditions were used for extraction: 5 minutes; extractant: EtOH (60%, pH 3.0), solid to solvent ratio 1:30; amplitude 100%. Then, the rich anthocyanin extract was atomized through a spray-dryer (Mini Spray Dryer B-290; Büchi), using maltodextrin as carried agent (13.5 g/100 g extract). Four patties batches of 2 kg each, whose common ingredients were pork, water, and salt, were made: negative control [N-CON.] (without additives), positive control [P-CON.] (with addition of sodium erythorbate at 0.5 g/kg), and two formulations with addition of 2.5 and 5.0 g/kg of encapsulated anthocyanins from PSPP [A-2.5] and [A-5.0], respectively. The chemical composition and the oxidations in raw pork patties stored at 4ºC were evaluated. Chemical composition was achieved following the corresponding AOAC method. Color was measured in CIELAB space with Minolta spectrophotometer. The lipid oxidation was evaluated with the thiobarbituric acid reactive substances (TBARS) assay. Significant differences were determined by means of one-way ANOVA and two-way ANOVA (day and treatment).

III. RESULTS AND DISCUSSION

The chemical composition of the four-patties treatment was equal, and no significant differences among treatments were observed (Table 1). Anthocyanin extract from PSPP protected lipid oxidation during refrigeration storage, as can be appreciated in Figure 1A. The antioxidant activity against lipid oxidation was better than erythorbate, whose values were higher even than the control (p <0.05). This fact could be due to erythorbate protecting more protein oxidation than lipid oxidation. In addition, the antioxidant ability of anthocyanin extract from PSPP was not concentration-dependent (p <0.05). Therefore, the lowest concentration of anthocyanins extract from PSPP (2.5 g/kg) could be sufficient

to slow down lipid oxidation in pork patties. Concerning color attributes, the action was concentration-dependent and showed only the biggest concentration studied potential as a colorant in pork patties, as can be observed in Figure 1A (p <0.05).

Table 1- Chemical composition of four batches of pork patties.

	Moisture	Fat	Protein	Ash
N-CON	74.14 ± 0.44	5.13 ± 0.53	18.08 ± 0.24	1.83 ± 0.02
P-CON	74.31 ± 0.70	5.35 ± 0.42	17.91 ± 0.22	1.84 ± 0.04
A-2.5	74.75 ± 0.30	4.89 ± 0.18	17.98 ± 0.05	1.83 ± 0.01
A-5.0	73.83 ± 0.33	5.79 ± 0.41	17.86 ± 0.09	1.86 ± 0.01

Different letters in the same row indicate significant differences among formula. Statistically significant differences were considered when p <0.05 after Tukey`s post hot test.

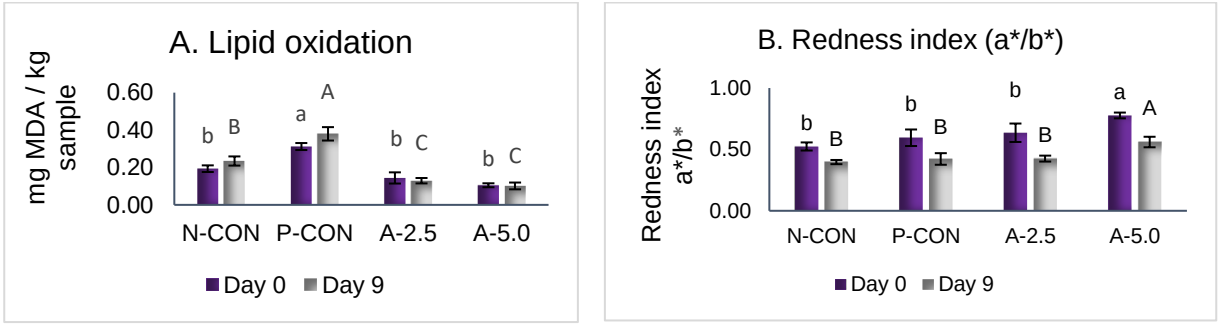

Figure 1. A. Lipid oxidation and B. Redness index values of four studied baches of pork patties on days 0 and 9 of cold storage. Statistically significant differences were considered when p <0.05 after Tukey`s post hot test.

IV. CONCLUSION

Anthocyanin extract from purple sweet potato peel effectively acted as an antioxidant against lipid oxidation in pork patties. Furthermore, at 5 g/kg, the anthocyanin extract presented colorant activity. In conclusion, anthocyanins extract from purple sweet potato peel could be used as a natural additive in the patties elaboration.

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