

Nutritional Evaluation and Development of Anthocyanin-Rich Colouring Formulations From Bioresidues of *Lonicera Caerulea* L. Fruits

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Abstract

The production of waste in different industries such as food or agro-industry can lead to environmental pollution and economic losses. Therefore, the transformation of these biowaste into other raw materials has become an important part of industrial processes, as they can be used for human or animal consumption, which would lead to environmental and economic benefits in the industries (Kowalska et al. 2017). In this perspective, this study aimed to evaluate the nutritional properties and to characterize in terms of anthocyanin and non-anthocyanin compounds the bio-residues of *Lonicera caerulea* L. fruits (haskap) (fallen, maggoty and/or bird-bitten fruits, not appropriated for consumption). Moreover, four anthocyanin-based colouring formulations (two liquid and two solid) were developed by means of thermal gelation (with adragant gum and pectin) and spray-drying (with Arabic gum and maltodextrin) methodologies. Preliminary pasteurization studies were carried out to determine the best preservation conditions. The extracts were pasteurized prior to the preparation of the colorants, thus guaranteeing their microbiological safety. The colorants stability was evaluated over three months (stored at 3 °C and room temperature) by monitoring colour variation, anthocyanin concentration, and cytotoxicity. The fruit biowaste presented a balanced nutritional value, showing carbohydrates as the main macronutrients, as well as proving to be excellent sources of anthocyanins, mainly cyanidin derivatives. On the other hand, the solid formulations revealed a higher stability, with lower variations in colour and anthocyanin concentration, especially the formulations containing stabilising agents. None of the colorant formulations (solid or liquid solutions) revealed cytotoxic properties for a non-tumour primary culture of porcine liver cells, thus validating their feasibility for application in the food industry without associated toxicity issues. Thus, the present study allowed obtaining stable anthocyanin-based colouring formulations using *Lonicera caerulea* L. biowaste, with high potential to be used in several sectors such as food, pharmaceutical, and cosmetics.

Keywords: Haskap; bioresidues, nutritional value; anthocyanins; colouring formulations.

References

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