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“GREEN” EXTRACTION OF BIOACTIVE MOLECULES FROM VEGETABLES AND FISH INDUSTRY BY-PRODUCTS

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Abstract

Food companies are increasingly interested in the effective application of sustainable and innovative techniques able of making by-products management less expensive if not even a source of additional incomes. Since several by-products coming from the food processing industry are rich in high-power bioactive molecules, the recovery of such substances is currently the most promising means, either for reusing them as ingredients in functional foods or for applications in many sectors such as the packaging one. Indeed, combining bioactive molecules extracted from vegetables and fishery by-products can contribute to make biofilm with antimicrobial and antioxidant effects. Moreover, from the point of view of sustainability, it is necessary to replace chemical extraction techniques, characterized by heavy environmental side effects. In this paper, the chitin extraction from deep-water shrimp (*Aristeus antennatus*) by-products was performed by using enzymes and organic acids in alternative of harsh chemicals. As for the vegetable products, the ultrasound-assisted extraction (UAE) was applied for a more sustainable extraction of the bioactive molecules from tomato pomace by-products (seeds and peels). Preliminary results showed that the enzymes reduced significantly the protein content in the shrimp by-products, while formic acid was able to remove 100% of the minerals, being as effective as hydrochloric acid. The UAE, performed using water as the “green” solvent, for 20 min at temperature below 40°C, was effective in the complete extraction of polyphenols from tomato pomace by-products. Moreover, an amount of β -carotene of 8.64 mg/100g DW, equal to 50% of what reported in the literature was extracted.

Key words: bioactive molecules, green extraction technologies, shrimp by-products, tomato by-products

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