
Beached *Velella velella*: from waste to potential source of bioactives compounds

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Résumé

This study investigates the potential use *V. velella* biomass (Fig. 1a), removed from beaches of seaside interest, for sustainable bioactive compounds extraction with a view to a circular economy. The research specifically focused on astaxanthin, bioactive peptides, and chitin. Astaxanthin extraction was carried out with conventional approaches and with natural deep eutectic solvents (NaDES). Results showed comparable yields between NaDES (556 $\mu\text{g/g}$) and traditional methods, with methanol-acetone yielding the highest recovery (1146 $\mu\text{g/g}$) but, interestingly, the NaDES astaxanthin extract demonstrated the highest antioxidant activity (63%). Bioactive peptides, extracted from residual biomass, post-astaxanthin removal, using pepsin, trypsin, or a combination, also gave promising results: cell test using keratinocytes showed that the combined enzymatic peptide extract significantly enhanced wound healing compared to the control. Finally, chitin isolation, using sodium hydroxide and NaDES, yielded approximately 22% in all samples. The preliminary characterization of extracted chitin using the Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy Analysis (ATR-FTIR) evidenced a spectral profile very similar to shrimps alpha chitin commercially available (Fig 1 b). These findings suggest that beached *V. velella* biomass can be a viable resource for extracting valuable compounds, promoting a circular economy approach. The present study also highlights the potential of NaDES as a sustainable solvent and demonstrates the bioactivity of extracted compounds, suggesting future applications in various industries. This research was funded under the National Recovery and Resilience Plan (NRRP), Mission 4 Component 2 Investment 1.4, Project title "National Biodiversity Future Center-NBFC

Mots-Clés: *Velella velella*, chitin, astaxanthin, circular economy, waste reuse

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