Extraction of Marine Collagen Derivatives from *Hoplostethus mediterraneus* Cuvier, 1829 Using a Pressurized Water - CO2 System

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INTRODUCTION

1. Marine ecosystems are valuable biological resources rich in natural products.

2. Discarding catch species negatively impacts the marine ecosystem and fisheries economy.

3. *Hoplostethus mediterraneus* (Mediterranean slime head) is a common discarded catch species in the deep zone of the Mediterranean Sea.

Hoplostethus mediterraneus

Iglésias S.P. - 2009 - Actinopterygians from the North-eastern Atlantic and the Mediterranean
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Utilization of Discarded Species

1. Many discarded species cannot be consumed directly but can be used as raw materials for marine bioactive compounds.

2. *Hoplostethus mediterraneus* can serve as a valuable source for marine collagen derivatives.

Objective

1. The main objective of this study is to couple a green extraction process with discarded marine origin raw material to obtain marine collagen derivatives.

2. Marine collagen has unique physicochemical properties, but its availability is limited due to inefficient extraction methodologies.
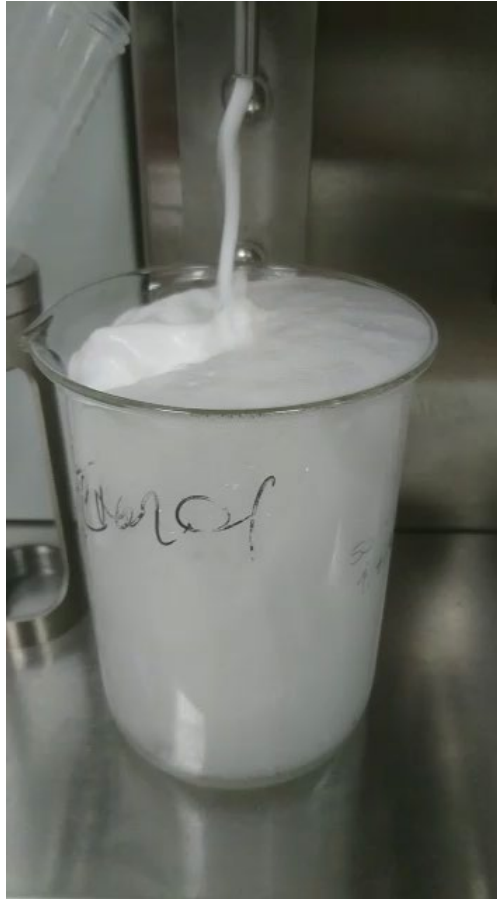
Challenges with Conventional Extraction Techniques

- Conventional extraction techniques for marine collagen are time-consuming and involve multiple steps and large amounts of solvents.

- Inefficient methodologies restrict the availability of marine collagen for various applications.

Proposed Extraction Approach

- The study proposes a new extraction perspective using a pressurized liquid solvent with CO2 and ultrasound-assisted pretreatment.

- High pressurized conditions (320 bar for 2 hours) with acidified water (CO2) promote collagen extraction from *H. mediterraneus*.
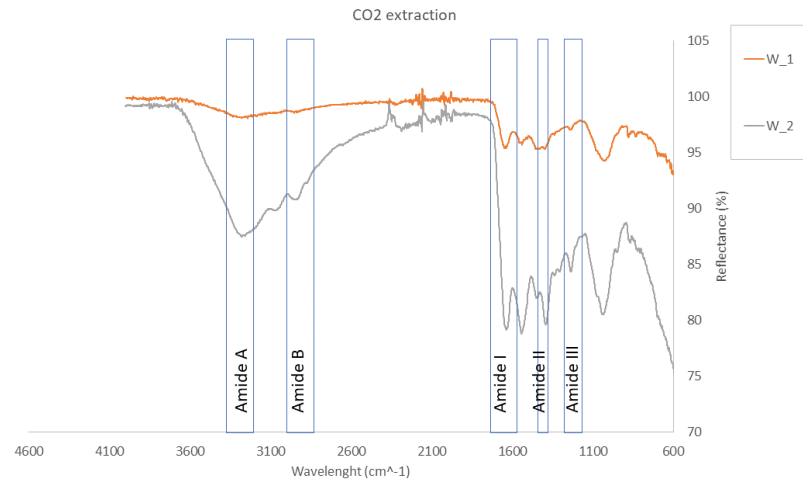
Methodology

- Isolation and characterization of collagen derivatives from the whole body and head of *H. mediterraneus* in the western Mediterranean Sea.

- Pressurized liquid solvent with CO2 and ultrasound-assisted pretreatment employed. Analytical techniques: Fourier-transformed infrared spectroscopy (FTIR) and differential scanning calorimetry (DSC).

Results

- Fourier-transformed infrared spectroscopy (FTIR) and differential scanning calorimetry (DSC) confirm the purity of marine collagen derivatives.
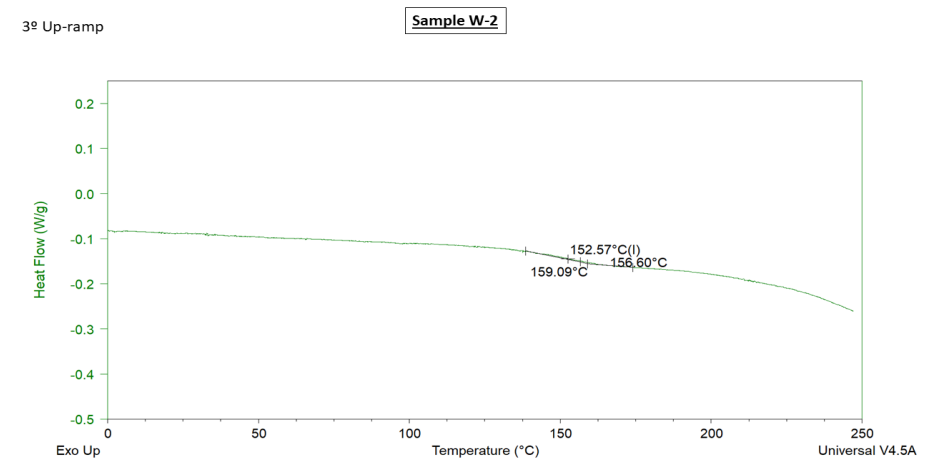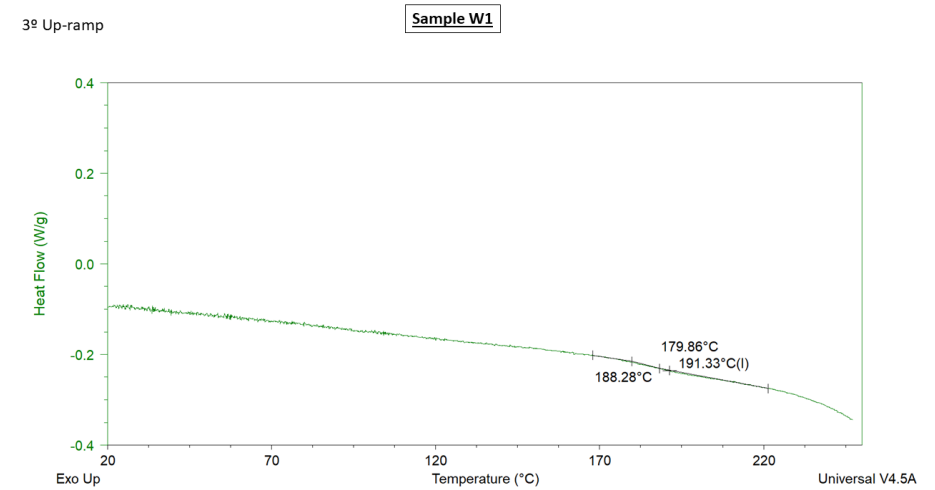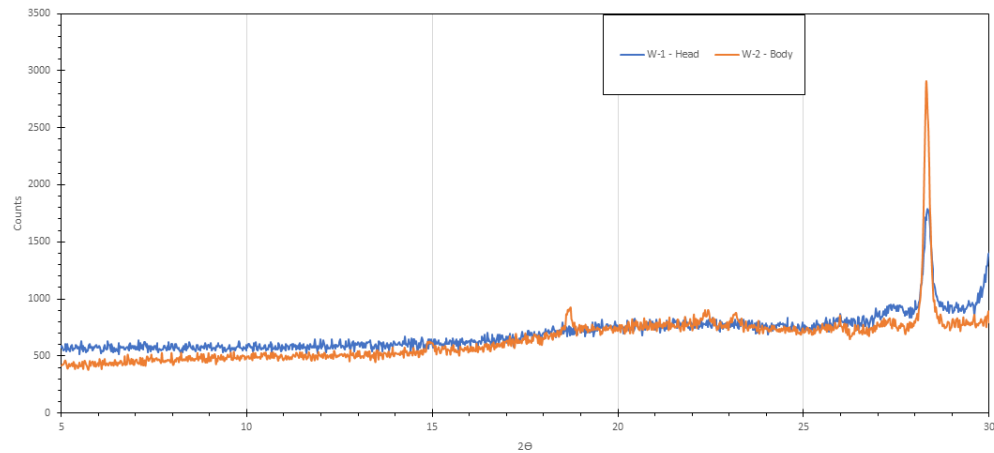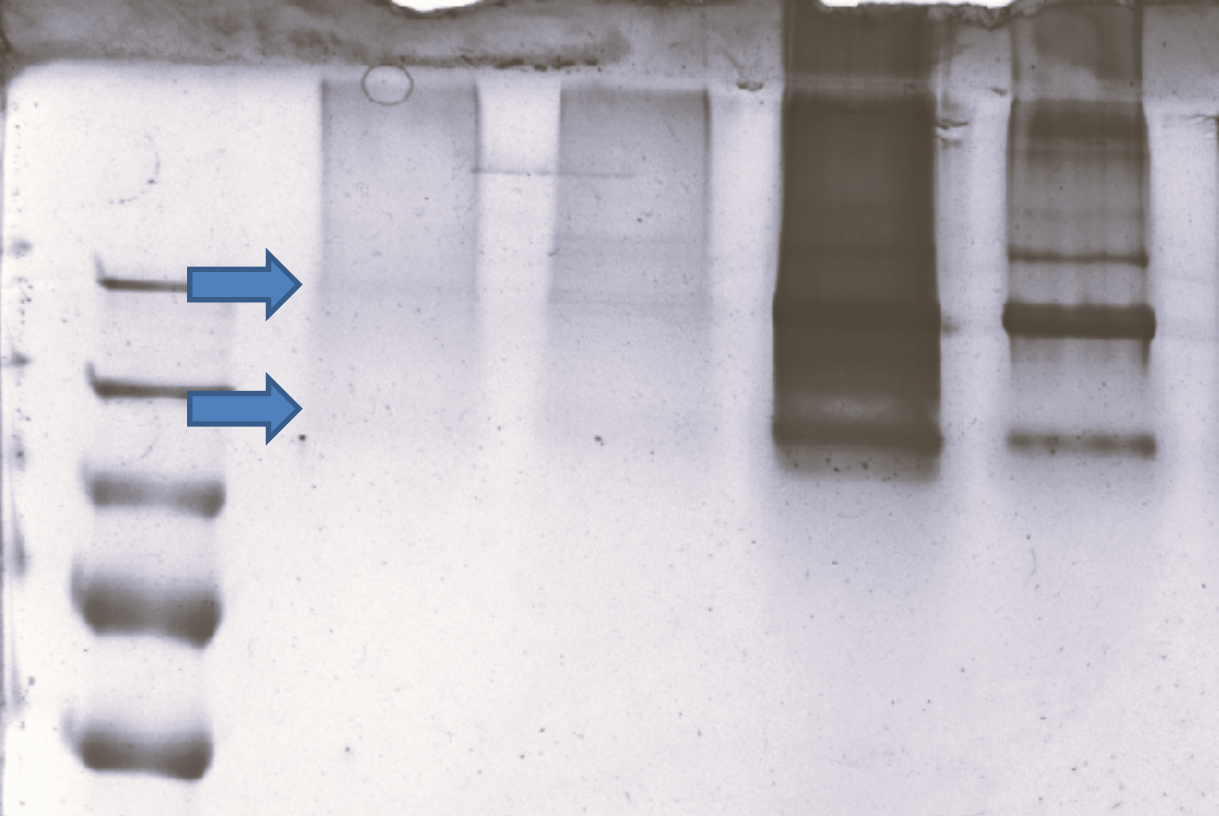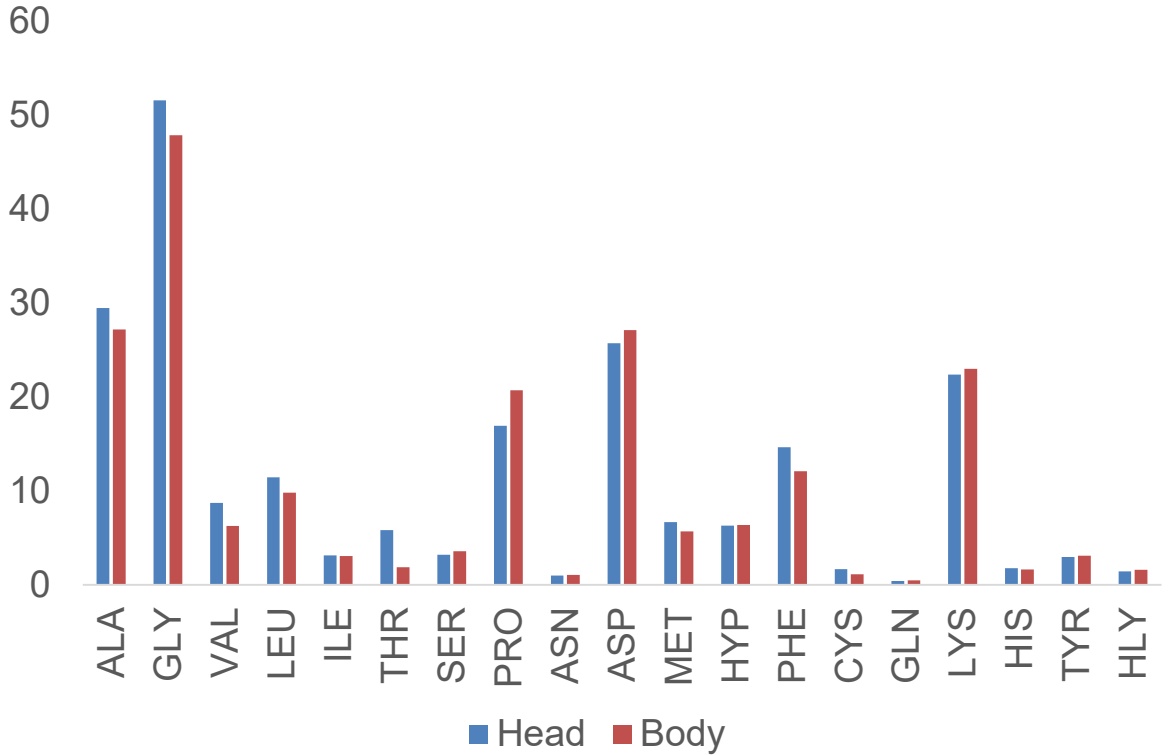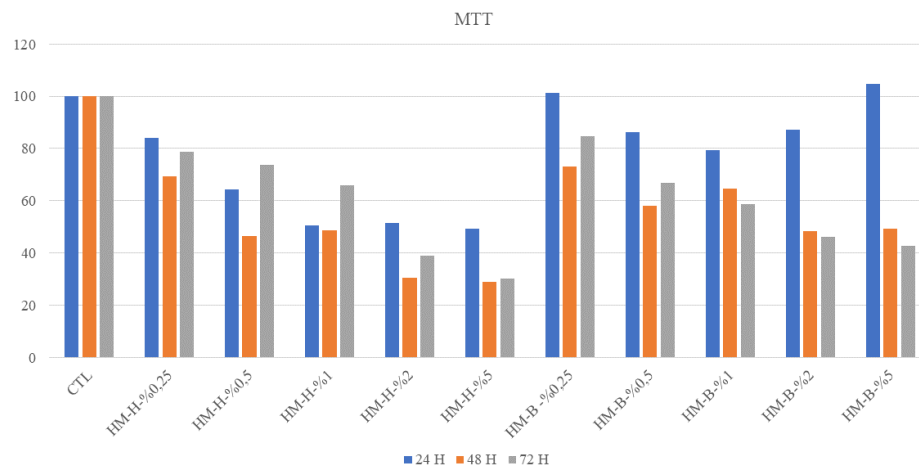
SDS-PAGE

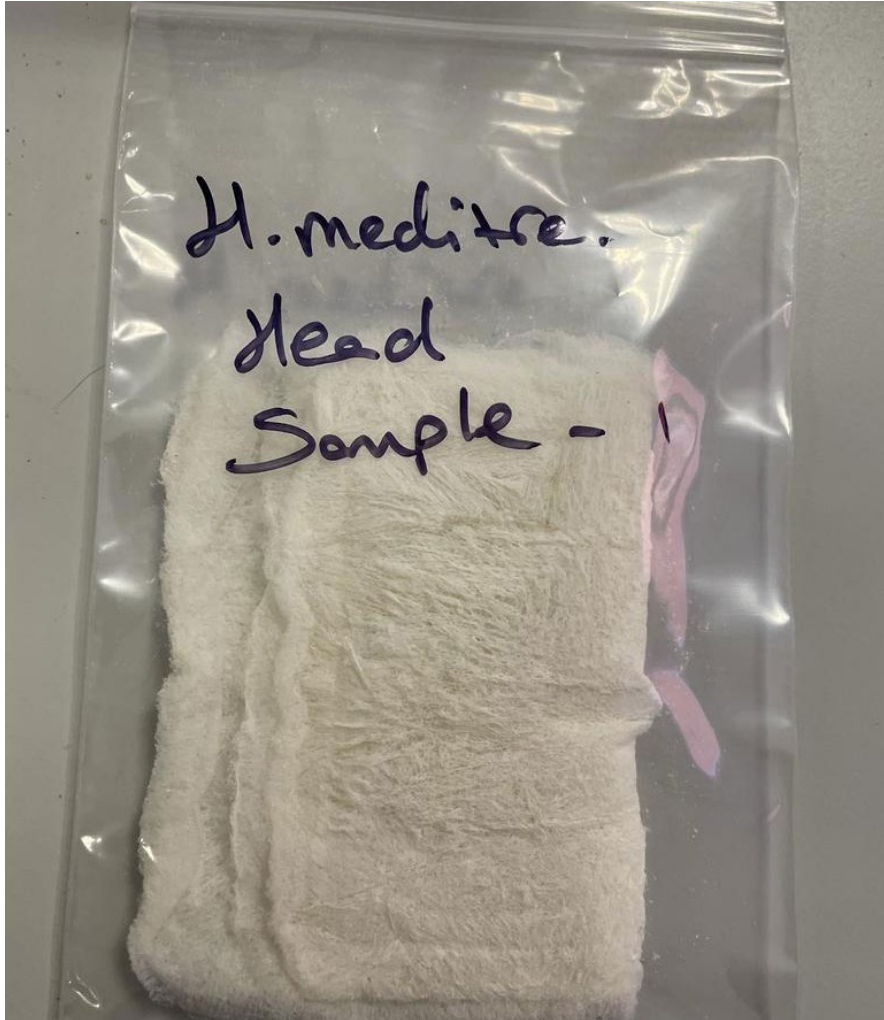Aminoacid Profile (mg/100g)

Standard   Head 1   Head 2   Body 1   Body2

Proliferation Assays

- The effect of collagen on the wound closure was concentration dependent; that is, the percentage of wound closure for the cell treated with collagen peptides not increased as the concentration increased between 0.25 % and 5 %

Applications of Marine Collagen Derivatives

- Marine collagen derivatives can be used as nutritional and functional biomaterials.

- Potential applications include dietary supplements, functional foods, beverages, cosmetics, pharmaceuticals, and biomedical engineering.

Environmental and Sustainable Impact

- Utilizing discarded catch species for marine collagen derivatives promotes efficient resource use and reduces waste.

- The study contributes to environmentally responsible and sustainable practices in the marine industry.

Conclusion

- The study presents a new approach for obtaining marine collagen derivatives from discarded catch species.

- Green extraction techniques using CO2 and ultrasound -assisted pretreatment offer a more efficient extraction process.

- Marine collagen derivatives have diverse applications and contribute to environmentally responsible and sustainable resource utilization.

Questions and Discussion

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