Extraction of Marine Collagen Derivatives from *Hoplostethus mediterraneus* Cuvier, 1829 Using a Pressurized Water - CO_2 System

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The marine ecosystems are extremely rich in natural products and are considered a promising biological resource. Discarding has a negative impact on the marine ecosystem and the economy of fisheries [1]. These species dominate the marine environment instead of commercial species. Indeed, most of them cannot be available for human consumption. *Hoplostethus mediterraneus* Cuvier 1829– Mediterranean slime head – is the common discard catch species from the deep zone in the Mediterranean Sea [2]. Although these kinds of species cannot be consumed directly, they could be utilized as raw material for marine bioactive compounds. The main objective of this study is to couple a green extraction process with a discarded marine origin raw material to obtain marine collagen derivatives from discarded catch species for different applications. Marine collagen has unique physicochemical properties, but its application is limited by the lack of availability due to inefficient methodologies. Conventional extraction techniques are time-consuming because of including several operating steps and large amounts of solvents [3]. In the present study, the isolation and characterization of collagen derivatives from the whole body and head of *H. mediterraneus* in the western Mediterranean Sea were carried out by using a pressurized liquid solvent with CO_2, combined with an ultra-sound assisted pretreatment method. We propose a new extraction perspective performing high pressurized conditions at 320 bar for 2 hours in which water is acidified with carbon dioxide (CO_2) to promote the extraction of collagen from *H. mediterraneus*. The results of Fourier-transformed infrared spectroscopy (FTIR), and differential scanning calorimetry (DSC) spectra defined marine collagen derivatives with purity, and the analysis of the amino acid composition was performed.

The study indicated a new approach for producing nutritional and functional biomaterial from a relatively unutilized marine source while contributing to environmentally responsible and sustainable practices of efficient resource use.

Figure 1. *H. mediterranean* from the western Mediterranean Sea

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