

## **Collagen extracted from Asian sea bass and diatoms purified silica for the development of scaffold for bone regeneration**

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The sustainable exploitation of aquatic ecosystems resources to obtain valuable compounds is an approach recently adopted by tissue engineering under the Circular Economy concept. This work looked particularly into Asian sea bass scales for collagen extraction, using acetic acid (Acoll) and pepsin (Pcoll) based methodologies, as well as to diatoms produced in aquaculture, which were used to recover silica by thermal purification. The collagen extraction was possible with a yield of 1% and 6.6% for Acoll and Pcoll, respectively, showing features similar to type I collagen. Results from FTIR-ATR and CD analysis suggested that the collagen triple helix was preserved during extraction, with a denaturation temperature around 44 °C. The collagen viscosity were measured through a Digital Viscometer, which showed that the extracts are non-Newtonian fluids, having a similar viscosity of 3 mPa/s. The thermal purification of silica from diatoms was reached at 600 °C, according to TGA results, with FTIR-ATR and SEM/EDS analysis confirming the presence of Si in the SiO<sub>2</sub> form, and that the structure of the frustules has been destroyed. The produced materials have shown interesting results looking into their future use as building blocks for the production of biomaterials for bone regeneration.