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## Abstracts Book



## Renewables, biofuels and bioenergy

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#### VALORIZATION OF CANNED SARDINE AND MACKEREL RESIDUES THROUGH EXTRACTION OF BIOACTIVE COMPOUNDS

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Healthful and valuable compounds can be recovered from the fish canning residues and employed in high-priority fields such as medicine and food, or in other areas such as agrochemical and animal feedings. Proteins, lipids, biopolymers, amino acids and enzymes can be recovered either from wastewaters or from solid residues (head, viscera, skin, tails and flesh) generated along the canning process of sardine and mackerel, throughout the salting, cooking and filleting stages.

Sardine and mackerel scales were processed for the recovery of collagen and its hydrolysed derivatives, either enzymatically, such as collagen peptides, or thermally, such as gelatine. The hydroxyapatite and calcium phosphate-based materials were extracted from bones throughout calcination, while anti-hypertensive peptides were recovered from flesh or cooking wastewater through enzymatic hydrolysis of muscle proteins. Peptides obtained from hydrolysis showed bioactivity namely high anti-hypertensive property.

Collagen and collagen peptides could be employed in cosmetics and biomedicine, while gelatine could be used in low-fat food formulations, due to its fat-like melting properties which can contribute to a smooth and creamy mouth-feel.

Hydroxyapatite and calcium phosphate could be used for the development of biocompatible bone cement for craniofacial, oral-maxillofacial and orthopaedic defect repair, and coating for femoral components; the ion-exchange properties of hydroxyapatite could make it also suitable for wastewater treatment (heavy metals removal). Finally, anti-hypertensive peptides from flesh residues, as well as collagen peptides (<3000 Da) could be employed in the development of functional foods and drinks formulations.

This research shows the opportunities for the valorisation of bioactive compounds from sardine and mackerel canning residues. These are amongst the most consumed fish in the Mediterranean area; moreover, canning is one of the most important and applied methods of preservation. The large quantities of by-products generated have great potentials of valorisation and the extraction of bioactive compounds will also contribute to reduce their impact on the environment.