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BOOK OF ABSTRACTS

Lactic fermentation as a biovalorization strategy for blue crab *(Callinectes sapidus)*: from garum production to antimicrobial extracts.

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● The blue crab (*Callinectes sapidus*), an invasive species in the Mediterranean, poses ecological and economic threats but offers promising potential for valorization due to its nutritional richness and bioactive components. This work investigated the applicability of lactic acid fermentation to enhance the value of both its meat and shell. A crab meat-based garum was developed using lactic acid bacteria (LAB) starters (*Lactiplantibacillus plantarum* and *Lactobacillus helveticus*) and fermented for 90 days. However, indigenous microbes ultimately dominated, resulting in the formation of complex aroma profiles with “cheesy” and “sulfuric” notes, as revealed by HS-SPME/GC-MS. Despite encouraging flavor development, high levels of biogenic amines highlighted food safety concerns. On the other hand, fermentation of hydrated, dried crab shells with six LAB strains showed microbial stability and acidification, buffered by inherent calcium carbonate. Ethanol extracts from fermented shells inhibited Salmonella enterica, with the strongest effect observed in *Lacticaseibacillus rhamnosus* and *Lacticaseibacillus casei* fermented samples. Challenge tests in fish-based products confirmed antimicrobial activity of the extracts, especially under mild thermal abuse. Additionally, fermentation altered the volatile profile of shell extracts, indicating potential for both preservation and flavor enhancement in seafood products. These findings support lactic fermentation as a dual-purpose tool: transforming an ecological threat into a nutritional and functional food ingredient, while promoting sustainable seafood waste utilization. Further studies, including metagenomic and compound-specific analyses, are essential to optimize process control and bioactivity.

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