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The bacterial biota of fermented fish: The hakarl

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Fermented marine-based products are currently consumed by several cultural groups worldwide. Brilliant examples of traditional fermented fish products are represented by surstroomming and rakfisk, produced in Sweden and Norway, respectively, and hakarl, produced in Iceland. Hakarl is produced by curing of the Greenland shark (Somniosus microcephalus) flesh that, before fermentation, is toxic for the high content of trimethylamine (TMA) or trimethylamine N-oxide (TMAO). Despite its long history of consumption, there is a lack of knowledge on the microbial consortia involved in the fermentation of this fish. In the present study samples of ready-to-eat hakarl were subjected to viable counting of bacteria and eumycetes on different selective growth media. The DNA extracted directly from the hakarl samples was further subjected to Polymerase Chain Reaction-Denaturing Gradient Gel Electrophoresis (PCR-DGGE) and 16S rRNA gene amplicon based sequencing (Illumina sequencing). Viable counting revealed by the presence of total mesophilic aerobes, lactic acid bacteria, and Pseudomonadaceae. The dominance of closest relatives to Tissierella creatinophila was evidenced by PCR-DGGE. Moreover, the main operational taxonomic units (OTUs) shared among the data set were *Tissierella, Pseudomonas, Oceanobacillus, Abyssivirga,* and *Lactococcus*. The detection of *Pseudomonas* by Illumina sequencing supports the hypothesis of a possible role of this microorganism on the detoxification of shark meat from TMAO or TMA during fermentation. Further studies are needed to establish the role and the viability of the detected microbial species during shark fermentation, as well as their interactions and correlation with physical-chemical and rheological traits of hakarl.

Biography

Andrea Osimani is a PhD Associate Professor in Agricultural Microbiolgy, he is author of 71 international scientific papers indexed in Scopus (874 citations; h-index 17) or ISI Web of Knowledge and has been serving as an editorial board member of reputed Journals. He is currently Professor for the Courses of Hygiene, Microbiological Risk Management and Laboratory of Microbiology at the Department of Agricultural, Food and Environmental Sciences- Polytechnic University of Marche, Italy. His research activity is focused in the study of microbial dynamics in conventional and unconventional foods and environmental matrices

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