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A Comparative Study of API Gallery and MALDI-TOF MS in Identifying Hydrogen Sulfide-positive Bacteria in the Digestive Tracts of Fish from the Atlantic Region of Macaronesia

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Introduction

The identification and classification of bacteria, particularly those that produce hydrogen sulfide (H2S), is an essential task in food safety and microbiological studies. Among the various approaches available for bacterial identification, two technologies that have gained widespread use are the API Gallery system and MALDI-TOF MS (Matrix-Assisted Laser Desorption/Ionization-Time of Flight Mass Spectrometry). These techniques offer distinct advantages for the rapid identification of bacterial strains, including those found in fish, a vital food source for many populations around the world.

In particular, the study of the digestive content of fish from the Atlantic area of Macaronesia—comprising the Canary Islands, Azores, Madeira, and Cape Verde—is of significant interest. This region is not only rich in marine biodiversity but also plays a crucial role in global fisheries. Understanding the microbiome of fish, especially hydrogen sulfide-producing bacteria, is key to ensuring food safety, quality, and public health. This article aims to explore the comparative effectiveness of the API Gallery and MALDI-TOF MS for identifying hydrogen sulfide-producing bacteria in the digestive content of fish and examines the role of these bacteria as potential carriers in the digestive systems of fish from the Macaronesia region [1-3].

Description

Hydrogen sulfide is a toxic gas that can be produced by bacteria during the breakdown of sulfur-containing amino acids in an anaerobic environment. In the context of fish, these bacteria can be part of the normal microbiota of the digestive system. However, the presence of hydrogen sulfide-producing bacteria may also indicate an imbalance in the microbial population, often linked to factors such as spoilage, contamination, or improper handling of the fish. Hydrogen sulfide production by bacteria, such as Proteus spp., Enterobacter spp., and Salmonella spp., can impact the safety and quality of fish, leading to undesirable odors, flavors, and even potential health risks if consumed. Identifying these bacteria efficiently is crucial for ensuring the safety of seafood products and monitoring the microbial quality of fish in the supply chain [4,5].

Conclusion

Both the API Gallery and MALDI-TOF MS offer valuable tools for the identification of hydrogen sulfide-producing bacteria in fish from the Atlantic area of Macaronesia. While MALDI-TOF MS is faster, more accurate, and highly effective for complex microbiomes, the API Gallery system remains a cost-effective and reliable option for routine bacterial identification. Ultimately, the choice of method will depend on factors such as available resources, required speed of results, and the specific needs of the research or food safety application. Combining both techniques may offer a complementary approach, leveraging the strengths of each to enhance the identification and monitoring of hydrogen sulfide-producing bacteria in fish.

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Conflict of Interest

None.

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