

Comparative Analysis of Identification by API Gallery and MALDI-TOF MS and Other Hydrogen Sulfide-positive Bacteria Carriers in the Digestive Content of Fish from the Atlantic Area of Macaronesia

Esther Gallo*

Department of Clinical Sciences, University of Las Palmas de Gran Canaria, 35016 Las Palmas, Spain

Introduction

In the context of seafood safety, the identification of H₂S-positive bacteria is not only critical for detecting specific pathogens like, but it also serves as an important quality control tool for assessing the microbial contamination of fish products. The accurate and rapid identification of these bacteria is essential for preventing outbreaks and ensuring that seafood products are safe for consumption. The API Gallery system, developed by bioMérieux, is a widely used biochemical test panel that relies on the metabolic characteristics of bacteria for identification. The system consists of a series of miniaturized test wells containing various biochemical substrates that, when inoculated with a bacterial sample, allow for the determination of the bacterium's metabolic profile. Although the API Gallery system is relatively easy to use and provides species-level identification, it is time-consuming, typically requiring 18-48 hours for a full identification. Additionally, some strains may exhibit atypical biochemical profiles, leading to potential misidentification or slower identification times [1-3].

Description

Several factors impact the effectiveness of edible coatings in preserving fish. These include the storage temperature, the specific requirements of the fish product, antioxidant properties, and the formulation of the coating itself. Storage temperature plays a pivotal role in the preservation of coated fish products. The shelf life of fish is highly temperature-dependent, with lower temperatures generally slowing down the rate of spoilage. Refrigeration and freezing are common methods used to store fish, but they present different challenges when combined with edible coatings. When fish is stored at refrigeration temperatures, the rate of microbial growth is reduced, and biochemical reactions such as lipid oxidation are slowed down. However, even at these temperatures, the shelf life of fish can be limited to just a few days. Coatings formulated with hydrophilic and hydrophobic components, such as cellulose derivatives combined with lipids, have demonstrated success in preventing ice damage and maintaining the texture of fish during frozen storage. However, thawing and refreezing can lead to the degradation of the coating's protective properties, reducing its effectiveness. The fish species being preserved, its fat content, moisture levels, and the desired texture and flavor all influence the type of edible coating used. Fish species such as salmon, mackerel, and tuna, which have higher fat content, are more susceptible to oxidation, while lean fish like cod and haddock may require coatings that protect against dehydration and texture changes [4,5].

***Address for Correspondence:** Esther Gallo, Department of Clinical Sciences, University of Las Palmas de Gran Canaria, 35016 Las Palmas, Spain; E-mail: galloe@gmail.com

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Conclusion

API Gallery, on the other hand, remains a reliable and cost-effective option for traditional biochemical identification, particularly in resource-limited settings. Given the importance of timely and accurate identification of pathogens in seafood, particularly in the Atlantic area of Macaronesia where marine bacterial species may vary, MALDI-TOF MS represents the future of microbial diagnostics, while API Gallery remains a valuable tool for routine and confirmatory testing. For optimal bacterial identification, a combined approach using both methods may offer the best of both worlds, ensuring accurate and timely results for public health and food safety management.

Acknowledgement

None.

Conflict of Interest

None.

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