

Isotopic and elemental analysis of fish tissues for provenance determination

Carmela Zannella (1), Paola Adamo (1), Christine Opper (2), Susanne Schwendinger (3), Sara Knezevic (3), Sabrina Van den Oever (2), Anastassiya Tchaikovsky (2), Andreas Zitek (2), and Thomas Prohaska (2)

(1) Department of Agricultural Sciences - University of Naples Federico II, 80055, Via Università 100, Portici, Italy (Carmela Zannella - carmela.zannella@unina.it), (2) Department of Chemistry - VIRIS Laboratory, University of Natural Resources and Life Sciences, Konrad-Lorenz-Straße 24, 3430 Tulln, Austria, (3) HTL Dornbirn, Höchsterstraße 73, 6850 Dornbirn, Austria

The reliable tracing of the productions flows of food products through the entire supply chain is an essential requirement for all types of food commodities qualified by origin, composition and quality. This is a minimum requirement to implement safety for the consumer, enhance consumer confidence and countervail fraudulent practices. One important food commodity is fish and fish products. Reliable methods to trace the origin of fish have become of high importance.

The investigation focused on the identification of adequate geochemical marker in fish meat and the corresponding linkage to the ambient water. The Sr/Ca ratio along with the $^{87}\text{Sr}/^{86}\text{Sr}$ isotope ratio analyzed by (multi collector) inductively coupled plasma mass spectrometry (MC ICP-MS) proved to be the most potential tools in this respect. For the first time, a direct link of fish meat to water could be accomplished. In addition, fish hard parts (otoliths, fin rays, fish bones) were under investigation to reconstruct the habitat changes during the lifespan of a fishes life. Fish hard parts have the potential to serve as “life time recorder”. Thus the spatial investigation of the elemental and isotopic composition can be used to monitor habitat changes with time.

The spatially resolved data of hard tissues was collected by means of Laser Ablation Split Stream ICP-MS/MC ICP-MS.

This work is accomplished within the scope of the project “CSI: TRACE YOUR FOOD”.