

Session 02

On the application of mass spectrograph to discriminate fish eggs species

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Abstract

Fish eggs sampling in the ocean is one of the main observation used to understand fish population spatial dynamics; in particular this is a major observation used for small pelagic fish stock assessment methods i.e. Fish egg production method. During the AWA cruise carried out on the fisheries research vessel FRV Thalassa in March 2014, a large number of pelagic fish egg samples were collected off the southern Senegalese coast using the CUFES system (Continuous Underway Fish Egg Sampler). In the lack of local taxonomy expertise, an alternative method, cheaper than genetic tests (DNA barcoding or metagenomic), is considered necessary to identify fish eggs species. In this study we propose a methodology to identify fish egg species using a Matrix-Assisted Laser Desorption/Ionization - Time of Flight (MALDI-TOF) mass spectrometry. Briefly, a single fish egg removed from gonads was triturated in 10 µl of 10% formic acid using a manual homogenizer with disposable inoculation loops, one microliter of the homogenate was spotted in duplicate onto a steel target plate. Additionally, 1 µl of CHCA matrix (alpha-cyano-4-hydroxy-cinnamic acid) was added directly to the spots and air-dried at room temperature. Protein profiles were obtained using a MALDI-TOF Vitek Mass Spectrometry (VITEK® MS RUO, bioMérieux, Marcy l'Etoile, France) at The Principal Hospital of Dakar. Resulting profiles were analyzed using Saramis premium software, version 4.0.0.14. We performed several tests on three different common Senegalese fish species from two family clupeids (*Sardinella aurita*, *Sardinella maderensis*) and sparidae (*Pagellus bellottii*) with eggs collected from fresh mature individuals collected in the main landing place of Dakar. The fish gonad state has been established in laboratory with sizing. The goal in this test was to prove whether the single fish egg could produce a MALDI-TOF spectre, and to test the applicability of the method to eggs fixed in alcohol and buffered formaldehyde solutions. We present preliminary results and discuss the feasibility and locks of this method. As perspective such methodology could also be applied to work on the egg condition factor, level of ecotoxicity as well as probably on the life trait of fish species in the time interval of the fish gonad maturation.

Keywords: CUFES, MALDI-TOF, fish egg, AWA, small pelagic.



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