

## **Fourier-Transform Near Infrared Spectroscopy application to age determination of *Engraulis encrasicolus* (Linnaeus, 1758) in the central Mediterranean Sea.**

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### **ABSTRACT**

This study represents the first application of Fourier-Transform Near Infrared Spectroscopy (FT-NIRS) to European anchovy (*Engraulis encrasicolus*), which is an essential species in the marine ecosystem due to its low-trophic position in the food chain as a plankton feeder and prey for predatory fish and seabirds. For this reason, the age of anchovies is routinely determined by stereomicroscope otolith reading in order to check stock levels. Otoliths preparation (extraction, embedding in resin, thin sectioning, polishing, etc.) and age determination protocol are actually a big issue for time spent by the experienced technicians. Despite the considerable time-consuming, the results are biased by subjectivity and experience of readers, that are generally 2 or 3 for requirement of stock assessment data. FT-NIRS has recently been used to reduce the processing time for estimates of annual age in several fish species. Absorption spectra of the whole otoliths were acquired by FT-NIRS across a multiyear dataset, obtained during acoustic surveys carried out in different regions of the central Mediterranean Sea. The acquired spectra were processed to optimize calibration models to predict age.