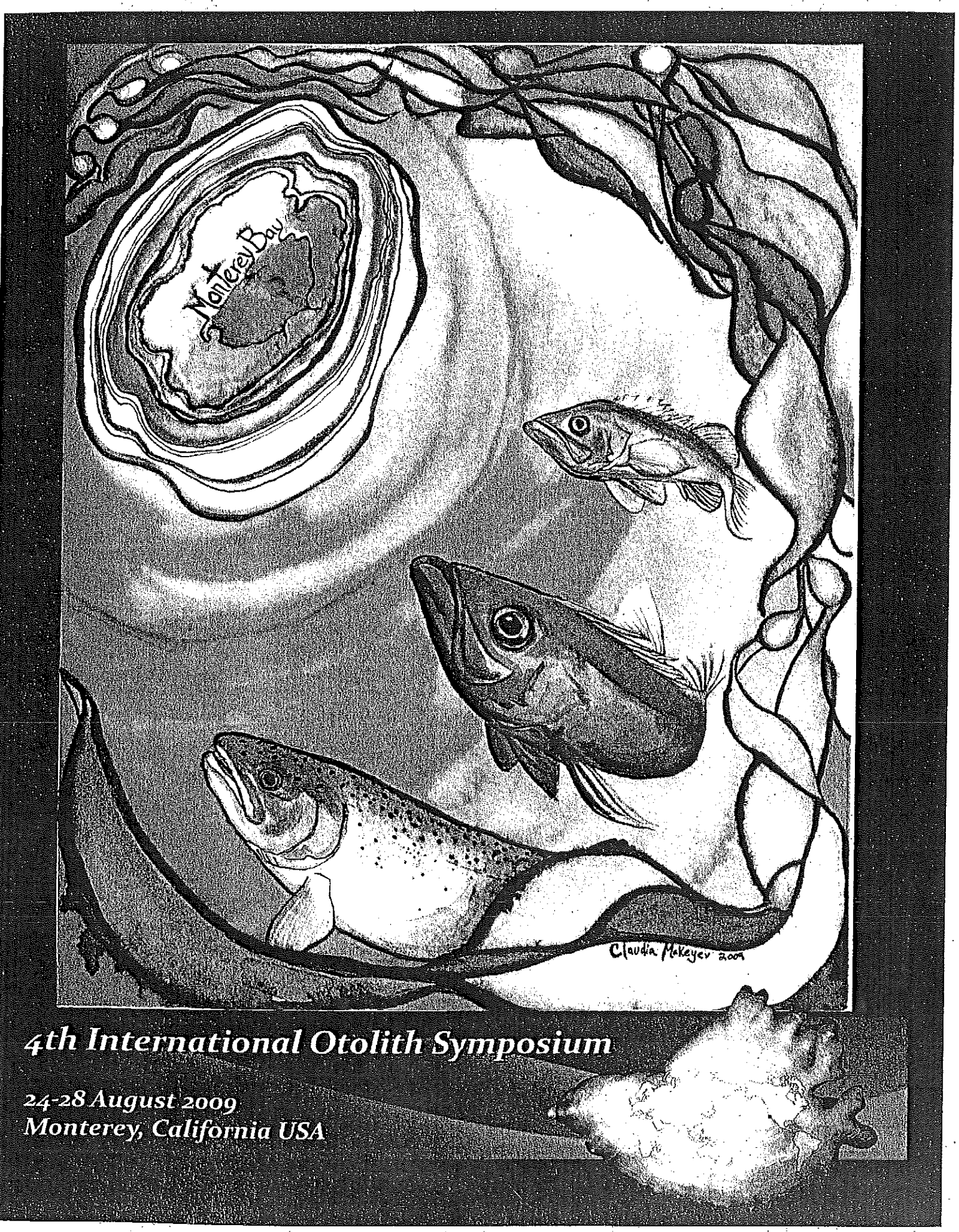

4th International Otolith Symposium

24-28 August 2009
Monterey, California USA

Lombardi, Linda

Theme: Chemistry

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Validation of Growth Zone Deposition in the Golden Tilefish *Lopholatilus chamaeleonticeps* Using Lead (210Pb) and Radium (226Ra) Dating

There is a growing concern over the lack of life history information for many deepwater fisheries, including golden tilefish, *Lopholatitus chamaeleonticeps*. Not knowing fundamental characteristics, like age and growth, precludes accurate stock assessments. A previous effort to validate age estimates using bomb radiocarbon dating for this species was inconclusive and led to an application of lead-radium dating, a method that uses radioactive 210Pb:226Ra disequilibria in otoliths as an independent estimate of age. Golden tilefish were intercepted from commercial bottom longline vessels in 2007 on the east coast of Florida. Both sagittal otoliths and gonad tissue were collected. One otolith from each pair sampled was thin sectioned and the other was cored to the first few increments of growth by grinding the whole otolith. Core samples were pooled based on estimated age and sex (male, female, unknown) into groups that could be analyzed using lead-radium dating. Age was estimated using counts of growth increments in thin otolith sections and aged independently with lead-radium dating. Radiometric ages closely agreed with age estimates from counts of growth zones for females and unknown sex fish, which confirmed an annual increment formation. However, radiometric ages did not agree with age estimates from counts of growth zones for males. This difference may be attributed to differing growth rates by sex. Radiometric results indicated the golden tilefish can live at least 25 years.

Megalofonou, Persefoni

Theme: Physiology and Morphology

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Comparison of Bluefin Tuna Age Estimations Based on External and Internal Features in Otoliths

Age estimates from bluefin tuna otolith sections have been validated and thus confirmed that Atlantic bluefin tuna otoliths are a valid indicator of the age of fish. However, the preparation and reading of thin otolith sections is time-consuming and an expensive procedure. In the present study, we tested whether the external growth features that can be observed on bluefin tuna otoliths can be used in ageing and yield as reliable an estimate as the internal growth zones with less effort. The null hypothesis is that there is no difference in age estimates obtained from analyzing the whole otoliths or transverse sections of otoliths. Otoliths were extracted from specimens sampled from the Mediterranean Sea and were aged using two methods. The first was to infer age from external examination of otoliths. All intact otoliths (N=177) were observed in reflected light and a black background under a binocular stereoscope equipped with an image analysis system. Growth increments were counted beginning from the primordium and along the axis of the rostrum to the boundary. These increments were assumed to be annual in formation, but this assumption has not been validated for bluefin. The second method was to estimate age from examination of transverse thin otolith sections under transmitted light. Ages were estimated by counting growth bands on the long arm of otolith sections. For each otolith and method, two independent counts were performed. The precision or the reproducibility of repeated measurements was estimated using the coefficient of variation. The results from the whole otoliths and the sectioned otoliths gave clearly different age frequency distributions. The percent agreement between the two methods was high in fish up to 8 yrs of age but lower in older fish. Specifically, in fish older than 8 yrs old age was underestimated in the whole otolith method compared to the sectioned otolith method. However, the whole otolith method is fast. It is now possible to do direct determination to estimate year class composition of large numbers of fish of less than 8 yrs, which is prohibitively expensive with sections and is confounded using length and weight estimates.