

RADIOCHEMICAL AGE VERIFICATION
FOR TWO SPECIES OF DEEP-SEA ROCKFISH

(*Sebastolobus altivelis* and *S. alascanus*)

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A Thesis

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By

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ABSTRACT

Radiochemical Age Verification for Two Deep-Sea Rockfishes

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Thornyhead rockfishes (*Sebastolobus altivelis* and *S. alascanus*) have been commercially harvested at an increasing rate off the west coast of the United States. Age estimates suggest that both species are long-lived, making the populations vulnerable to heavy fishing pressure. The purpose of this study was to verify longevity by quantitatively comparing growth patterns found in otoliths with radiochemical age of the CaCO_3 material of which they are made. Growth increment patterns visible in transverse otolith sections from the two were narrow, often irregular, and difficult to interpret, resulting in poor ageing precision. A technique that measures the disequilibria between natural ^{210}Pb and ^{226}Ra in the otoliths was used independently to determine longevity radiochemically. Levels of (^{210}Pb : ^{226}Ra) disequilibria in otolith cores confirmed ages to at least 45 years for *S. altivelis* and 80 years for *S. alascanus*. This technique, however, is very sensitive to small variation or errors in ^{226}Ra measurements when ^{210}Pb levels reach approximately 75% of the equilibrium value. Ages over 80 years, estimated for *S. alascanus*, could not be confirmed due to variation in ^{226}Ra assays.

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