A non-lethal approach identifies variability in δ¹⁵N values in fin rays of the Atlantic Goliath Grouper, *Epinephelus itajara*



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Fin Ray Comparisons



Gag

- Largest Epinephild in the Atlantic: Up to 400 kg and 3m
- Primarily an invertivore, although feeds opportunistically
- Feeds at a relatively low trophic level, may enhance fish biodiversity and abundances
- "Critically endangered", but recovering in Florida state waters
- Objective: Use δ¹⁵N values from cross sections of fin rays to test isotopic shifts over time

Non-Lethal Sampling

Goliath Grouper

Red Grouper

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<u>Average δ¹⁵N Values Over Time</u>





- Each fish measured for total length, and tagged both externally and internally
- Dorsal fin rays 6 & 7 collected and processed
- Stomach contents collected manually

Fin Ray Analysis



- $\delta^{15}N$ values change over time as the animal ages
- Error bars represent 95% confidence intervals

δ¹⁵N Values at Time of Capture



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Age at Time of Capture (Years)

- Coastal differences in both magnitude and pattern
- Linear relationship significant for east coast but not west coast fish

Conclusions

- $\delta^{15}N$ values vary over time within individual fish
- These variations may be due to ontogenetic shifts in diet or movements
- δ¹⁵N chronologies differ in both magnitude and pattern between west and east coast samples

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