Genetic Identification of Commercially Sold Seafood in Fairbanks’ Sushi Restaurants

Zoe Schneider*, Jennifer Tusten+, Julian Pender, Amy Whitney+, Jaden Andrew+, Aksiin Storer+, Franchezca Correa+, and Jessica R. Glass

University of Alaska Fairbanks, Department of Fisheries

*presenting author
+undergraduate

zxschneider@alaska.edu

Background
- Seafood fraud is rampant worldwide.
- From 1987–1998, 37% of fish species sold in the USA were mislabeled.1
- The use of common names that could encompass several species (e.g., tuna) creates confusion.
- Seafood fraud has implications for human health (e.g., mercury content, parasites, forced labor) and consumer trust.
- Seafood mislabeling is also detrimental to the management and conservation of wild fish stocks.
- DNA barcoding is a useful tool for species identification and fraud detection.

Methods
- We sequenced 48 samples of sashimi from seven restaurants in Fairbanks, AK during 2022–2023.
- We used Sanger sequencing to target the mitochondrial DNA cytochrome oxidase I (COI) gene, AKA the “barcoding gene.”
- Sequences were processed and quality checked using Geneious Prime v.11.0.18.
- We used the Basic Local Alignment Search Tool (BLAST) in Geneious to find regions of similarity between our sequences and the NCBI database to determine species identification.
- Species with a match ≥99% are reported.

Results
- Genetic identifications matched 9 out of 11 sushi samples indicated by restaurants.
- Two types of sushi (red snapper and bass) were identified 100% of the time as Nile tilapia (Oreochromis niloticus).

Implications
- Consumer trust is important to restaurant patrons, and most sushi samples were labeled correctly.
- Some species (e.g., red snapper) are either consistently mislabeled, or the common name represents several species (e.g., tuna, flying fish roe).
- Consumers also have a role to play in educating themselves on threatened and endangered fish species.
- White tuna (ono) often refers to albacore tuna or escolar, but is not a legally approved FDA name. Escolar can cause gastrointestinal pain, which highlights the importance of both labeling and consumer awareness.
- This study is a starting point to engage with Fairbanks’ sushi restaurants and to inform consumers.

Download the Monterey Bay Aquarium’s Seafood Watch sushi wallet card to stay informed about sustainable species!


We thank NSF Alaska EPSCoR and Kent Robinson for supporting this research.