Genetic Identification of Commercially Sold Seafood in Fairbanks' Sushi Restaurants

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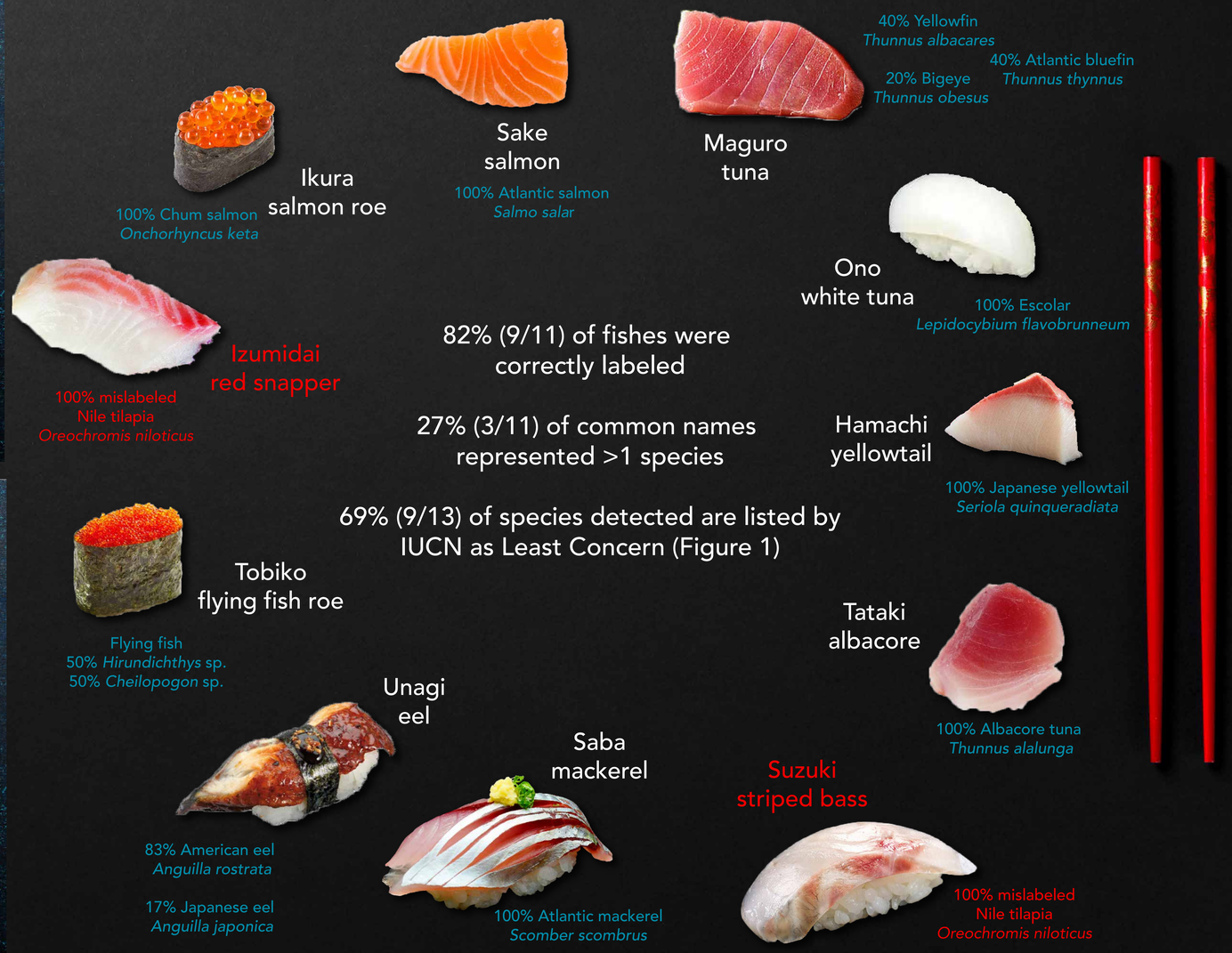
Background

- 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 restuarants 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*).

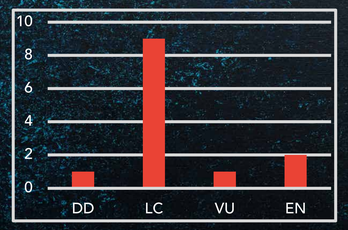


Figure 1. IUCN status of 13 sushi species identified in this study.
DD: data deficient; LC: least concern:
NT: near threatened; VU: vulnerable; EN: endangered

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!

[1]Buck, Eugene H. Seafood Marketing: Combating Fraud and Deception, Congressional Research Service Report,April 11, 2007; Washington D.C..

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