Quantifying the Frequency of Seafood Mislabeling by Sushi Vendors in the Triangle Area

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Background/Purpose

- **Seafood mislabeling:** lack of **accurate** or **complete** information about the species being sold
  - Hard mislabeling: product sold is a different genus, family, or species than labeled
  - Soft mislabeling: product sold is generically labeled, lacks specificity
- **Why mislabeling matters:** Health risks, local economical strain, inaccurate population data, decreased educated consumerism
- **Study Purpose:** Quantify the frequency of seafood mislabeling among sushi vendors in the Triangle area, with WRAL News

Materials and Methods

Sample Collection
- collaborate with WRAL
- 37 sushi samples
- 7 restaurants

DNA Extraction
- QIAGEN DNeasy Blood & Tissue Kit

PCR & Gel Electrophoresis
- Fish CO1 primer
- Tuna CR primers
- Cephalopod CO1 primers

Sequencing & BLAST identification
- NCBI database
- BLAST ID, query cover, percent identity

Results

30 of 36 samples were successfully sequenced:
- 20% hard mislabeled
- 53% soft mislabeled

Figure 1. Quantity of types of mislabeling by sample

7 Tuna samples
- 28.6% hard mislabeled
- 57.1% soft mislabeled

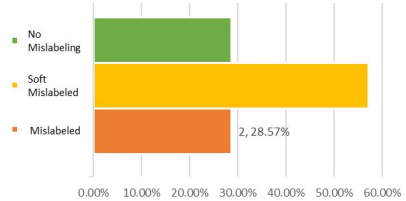

Figure 2. Percentage of tuna mislabeling rates

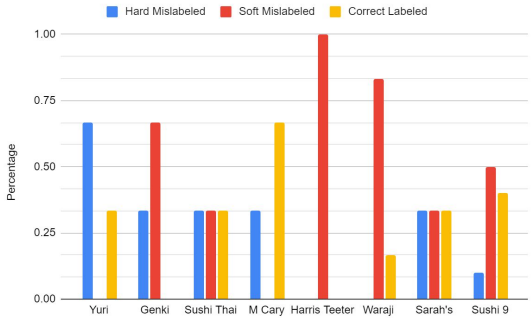

Figure 3. mislabeling rates across sushi vendors

Discussion

Main findings

- Sushi mislabeling is common in the Triangle area.
- Clear and stricter industry guidelines for labeling of seafood used in sushi are needed.
- Future studies should focused on broader areas with more controlled sample collection method.

We also quantified the mislabeling of tuna:

- Scalloped hammerhead shark was sold as white tuna. This is highly problematic due to its critically endangered nature and concentration of mercury in the tissue in this species.

Figure 4. WRAL News Story

References and Acknowledgement

References

- Luque, Gloria, and C. Donlan. "The Characterization of Seafood Mislabeling: A Global Meta-Analysis." *Biological Conservation* 236 (June 1, 2019). https://doi.org/10.1016/j.biocon.2019.04.006.
- Korzik, Morgan L., et al. "Marketplace Shrimp Mislabeling in North Carolina." *PLOS ONE* 15, no. 3 (March 12, 2020): e0229512. https://doi.org/10.1371/journal.pone.0229512.

We would like to acknowledge the entire Fall '23 Seafood Forensics class for their contributions to sequencing, as well as John Bruno and Savannah Ryburn for their direction.