Exotic Meats & What's Inside Them

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Abstract

As New York City houses cultures from across the world, the city contains a variety of diverse food options. This diversity could result in people trying unfamiliar foods, which could be problematic if the food had ingredients unknown to the consumer that pose an offense to their cultural views. Our goal was to address this problem by testing the authenticity of exotic meats sold in New York City, either verifying or exposing falsities in their description. We purchased antelope, camel, and alligator meat, and then took a sample from each and conducted the Rapid DNA Isolation procedure. Subsequently, the DNA was put through PCR and then sent for sequencing. Unfortunately, the sequencing yielded no helpful data, so the results are inconclusive. In the future, it may improve the results if the sample is extracted from a different part of the meat or if a larger sample is taken.

Introduction

- Eating a food with mislabeled ingredients could offend a person's cultural views
- As exotic meats are more rarely consumed, a person eating some might not know if it's 100% authentic to labeling or supplemented with another meat
- DNA barcoding has been shown to verify or expose falsities in descriptions of foods
- We wanted to apply DNA barcoding to exotic meats to verify their authenticity or display that consumers should be careful when purchasing them
- We purchased an alligator fillet, ground camel and ground antelope to extract DNA from and compare their barcodes to other meats

Materials & Methods

- We used Rapid DNA Isolation to retrieve our DNA because it is relatively fast and works with animal tissue.
- We first cut 3 rice grain sized samples from each specimen, then put the samples in tubes with 50 µL of lysis.
- We next used a pestle to finely grind the tissue in the lysis solution.
- Added one 3-mm diameter disc of Whatman No. 1 Chromatography paper to the labeled tubes, making sure it is submerged before letting it sit for 1 minute.
- Added 200 µL of wash buffer to remove the contaminants that could prevent PCR to a separate sterile tube.
- Then removed the disc and placed it in the tube with the wash buffer for another minute.
- Dragged the paper to the top of the tube and let it air dry for 2 minutes to evaporate any ethanol that could impact PCR.
- Put 30 µL of TE in a clean 1.5-mL tube that we added the disc to once it is dry.
- Then we let that sit to remove, the purified DNA.
- We then stored the mixture at 4° C until we were ready to perform PCR.

Results

Our samples yielded no sequence data, so our results were inconclusive. There was likely not enough DNA for the PCR to amplify, and thus not enough DNA for the sequencing to yield helpful results.

Figure 1: The meats we tested

Discussion

We ended up choosing one filet, alligator, and two ground meats, camel and antelope. We initially intended to test kangaroo but we noticed that the kangaroo was advertised as mixed with beef, inspiring us to look at other ground meat to see if it was supplemented with other more common meat. Antelope was chosen to see if we could identify a more specific species that was used.

Although our results were inconclusive, we have identified a few changes that could be made if we repeated the experiment that may help yield data:

1. Sampling not from the surface of the meat but from the center, similar to archaic DNA sampling.
2. Increasing the amount of DNA yielded for PCR; the procedure suggests that a "small grain" of the sample be added to the vial, yet it is possible that this was not enough. Instead, a larger sample could be used, which may yield more mitochondrial DNA. If so, the PCR would amplify more DNA, and sequencing could yield helpful results.

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