Identification of Mitochondrial Gene Polymorphisms between Alaskan Salmonid Species

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Procedures and Methods:
1. Extraction of DNA from Muscle Tissue
   - Pink, sockeye, silver, and king
   - Lysing of the tissue samples
2. DNA Purification
   - Genomic DNA within the supernatant (liquid given off of the lysed tissue samples) was bound over the surface of silica spin columns
3. DNA Amplification through PCR
   - Polymerase chain reaction
   - Isolates and copies one desired section of DNA out of the entire genome
4. DNA Quantitation
5. RFLP Analysis
   - Restriction Fragment Length Polymorphism
   - Verify identities of salmonid species
6. Sequencing of Amplified mtDNA
   - Identify Hpa1 enzyme recognition sites
   - Infer evolutionary relationships based on polymorphisms

Error Analysis:
- Initial inconsistencies with the grocery store-bought salmon tissue samples
- The pink salmon tissue had been canned
- Canning was detrimental to DNA
- A faulty pipet was used to add proteinase K. to pink and sockeye salmon tissue samples.
- During RFLP analysis, the well-bearing end of the agarose gel was mistakenly aligned with the positive electrode.

Results and Conclusions:
- Present king and silver
- Absent pink and sockeye

DNA Quantitation:
- The DNA concentration of the silver salmon amplicon sample was 717.2165 µg per ml.
- The DNA concentration of the king salmon amplicon sample was 1,054.3236 µg per ml.

Restriction Digestion of PCR products:
- Only one band appeared for each digested sample of king and silver.

PCR Product Quantification
- Conclusion: Hpa1 enzyme did not digest the PCR products.

RFLP Analysis
- Result: One band appeared for each digested sample.
- Conclusion: Pink DNA was not present due to its canning beforehand.

DNA Purification
- Result: One band appeared for each amplified sample of king and silver.
- This indicates PCR product was present in two fish samples: king and silver.

DNA Extraction
- Result: Agarose gel did not illuminate a band for the pink DNA.

PCR
- Conclusion: Pink DNA was not present due to its canning beforehand.

Figure 1: Procedure

Figure 2: Results and Conclusions

Figure 3: PCR Agarose Gel

Figure 4: Calculation of volumes of PCR products to be used in the restriction digests

Table:
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<tr>
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Bibliography:
- Zimmerman, C.E., 2003, The importance of hormone genes in Coho salmon is sex-linked,