E24   The Rapid Online Wildlife Identification Network (ROWIN): A Bioinformatic Analysis Pipeline Developed for Wildlife DNA Forensics

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After attending this presentation, attendees will have a detailed understanding of the issues associated with wildlife forensics and the efforts being made to combat wildlife crimes.

This presentation will impact the forensic science community by revealing greater focus on the importance of wildlife forensics.

The black market trading of illegally poached wildlife is estimated to generate $20 billion in annual revenues. The travesty associated with the illegal trade of wildlife is two-fold. First, the dramatic decline of biological diversity has resulted in irreparable damage to the ecology of affected environments. Second, the black market trade of illegal wildlife products has been directly linked to funding terrorism. For more than 15 years, the field of wildlife DNA forensics has utilized the principles and tools of conservation genetics and forensic genetics to investigate wildlife crimes. Currently, the state-of-the-art technology in forensic wildlife DNA analysis utilizes Sanger sequencing to determine the genetic sequence of "marker genes." These "marker genes" are often located on the mitochondrial genome and are sequenced and analyzed one at a time.

While current techniques are effective, advances in high-throughput DNA sequencing offers the wildlife DNA forensic community an opportunity to dramatically improve the process of forensic species identification. This improvement requires the development of two key components: (1) a single method for the extraction, sequencing, and analysis of an entire mitochondrial genome; and, (2) a database consisting of forensic vouchered reference DNA samples. The wildlife DNA forensics community is therefore offered ROWIN, the first bioinformatic pipeline developed for wildlife forensics. ROWIN utilizes DNA sequencing data obtained from mitochondrial DNA (mtDNA) -specific extraction methods. ROWIN was been developed with the wildlife forensic scientist in mind and for the specific goal of eukaryotic species determination. Forensic species identification by ROWIN is independent of Polymerase Chain Reaction (PCR) and is completely controlled by the forensic scientist submitting the data. Prior knowledge of computer programming is not required and results are courtroom-ready. Implementation of ROWIN provides the wildlife forensics community with a powerful analytic tool that will result in a reduction of time and cost.

Wildlife Forensics, Bioinformatic, Next Generation Sequencing

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