



Bringing Back Extinct Species Poses Greater Challenges than Scientific Breakthroughs: IPN Researchers

- *The "de-extinction" of the dire wolf species by Colossal Biosciences is a significant milestone and could be applied to other fields, such as genetic diseases*
- **Researchers highlight unresolved issues, such as whether these animals will be released into the wild, potentially violating wildlife introduction laws, and how long they will live**

Following the biotechnology-driven revival of three dire wolf pups (*Aenocyon dirus*), researchers from the Instituto Politécnico Nacional (IPN) have raised critical ethical and ecological questions about the purpose of bringing this Pleistocene-era species back to life.

Dr. Miguel Ángel Reyes López, head of the Conservation Medicine Laboratory at the IPN's Centro de Biotecnología Genómica (CBG), noted that there is uncertainty about whether an appropriate habitat for these animals still exists, as they historically preyed on large species that are now extinct.

He also questioned whether the wolves would live their entire lives in captivity or if they might eventually be released, which could violate national and international regulations on the reintroduction of wild species. Such a move would force them to compete with existing native predators.

"What is being referred to as de-extinction is a highly complex scientific process involving molecular genetic engineering techniques such as CRISPR-Cas9 and cloning," he explained. "However, the long-term survival of these specimens remains uncertain, as the techniques have not yet proven successful in ensuring extended lifespans."

Dr. Reyes López emphasized that while these biotechnological tools—combined with in vitro fertilization—represent a major scientific achievement, their greatest potential might lie in addressing genetic diseases in humans and other living species.



According to Dra. Cynthia Elizalde Arellano of the IPN's Escuela Nacional de Ciencias Biológicas (ENCB), a truly extinct species cannot be brought back to life. In the case of the so-called dire wolves, she explained, the resulting organisms are hybrids: genetic fragments extracted from fossilized dire wolf remains were merged with DNA from gray wolves.

A specialist in mastozoology—the study of mammals—Dra. Elizalde acknowledged the experiment as a major genetic advance. However, she stressed that observation is needed as the animals grow, especially since a species' identity is closely tied to behavior, which wolves in particular acquire while maturing within a pack.

From dire wolves to modern wolves, these animals are social by nature. "They learn social behaviors and hunting techniques from their parents and other pack members," she said.

"Wolf pups spend at least two or three years with their mothers to hone their hunting skills. If they don't learn to hunt, they cannot truly be called dire wolves."

Dra. Elizalde suggested that the most likely future for these revived animals is life in captivity, as their natural place in the ecosystem no longer exists. "This experiment disregards the rules of natural selection, which determine whether a species can survive in current environmental conditions," she noted. "When a species goes extinct, it's gone forever. Extinction is permanent."

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