

De-Extinction

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De-Extinction Latest News

A US-based bioscience company, Colossal Biosciences, has recently made headlines by announcing the birth of three genetically modified grey wolf pups.

What is De-Extinction?

- **De-extinction** refers to the **scientific process of reviving extinct species** by using their **genetic material**, often through **gene editing and cloning techniques**.
- It involves **reconstructing the genome** of an extinct species and **modifying the DNA** of a closely related living organism to resemble the extinct one.

About The Dire Wolf

- The **dire wolf (Aenocyon dirus)** was a **large prehistoric canine** that once roamed across **southern Canada and the United States**. It became extinct around **13,000 years ago**.

- Although they **resembled modern grey wolves (Canis lupus)**, dire wolves were **larger**, with **thicker white coats**, and hunted **large prey** like **bison, horses**, and even **mammoths**.
- Their extinction is believed to be linked to the **disappearance of their prey species**, possibly accelerated by **human hunting activities**.

Scientific Process: How Was It Done?

The **de-extinction process** followed by Colossal involved the following steps:

- **DNA extraction:** Scientists obtained DNA from two ancient dire wolf specimens: a 13,000-year-old **tooth** and a **72,000-year-old skull**. The **petrous bone** from the skull, known for its **preserved DNA**, was crucial in this process.
- **Genome reconstruction:** The DNA was sequenced to recreate the **complete genome** of the dire wolf. This was then compared with genomes from **closely related canids** like **coyotes, jackals, dholes**, and particularly, **grey wolves**, which were found to share **99.5% of their DNA** with dire wolves.
- **Gene editing:** Using **gene editing tools**, scientists made **20 unique changes to 14 genes** in the grey wolf genome. These edits aimed to reproduce features such as:
 - Light-colored coat
 - Increased hair length
 - Distinct coat patterns
 - Larger body size
 - Enhanced musculature
- **Surrogacy and Birth:** The **genetically modified embryos** were implanted into **surrogate dog mothers**, leading to the birth of the pups.

De-Extinction FAQs

Q1. What is de-extinction?

Ans. The process of reviving extinct species using biotechnology like CRISPR gene editing, cloning, or back-breeding (e.g., attempts to resurrect the Woolly Mammoth).

Q2. How could de-extinction aid India's ecology?

Ans. Potential restoration of keystone species like the Asiatic Cheetah (reintroduced in 2022) to rebalance ecosystems and boost biodiversity.

Q3. What ethical concerns surround de-extinction?

Ans. Risks include ecosystem disruption, animal welfare issues, and resource diversion from conserving extant endangered species.

Q4. Name a global de-extinction initiative involving India.

Ans. The *Lazarus Project* collaborates with Indian researchers on reviving the extinct Himalayan Quail using DNA from museum specimens.

Q5. How does de-extinction align with international frameworks?

Ans. The CBD (Convention on Biological Diversity) urges caution, prioritizing habitat protection over “resurrection biology.”

Source: DTE

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