

EMBARGOED NEWS UNTIL THURSDAY, OCT 24 at 2 P.M. EDT.



CONTACT

Denver Museum of Nature & Science

Maura O’Neal

303.370.6407

maura.oneal@dmns.org

Joe DePlasco

212.981.5125

Joe_deplasco@dkcnews.com

**RECOVERY OF LIFE ON EARTH AFTER ASTEROID IMPACT
DOCUMENTED IN UNPRECEDENTED NEW FOSSIL TROVE**

One-Million Year Fossil-Rich Timeline Revealed by Denver Museum of Nature & Science Researchers

Research Documented in New Paper Published in Science Magazine and Told in NOVA Documentary, “Rise of the Mammals,” Streaming on PBS (with national broadcast premiere on Oct. 30)

DENVER – (Oct. 24, 2019 2 p.m. EDT) – The discovery in Colorado Springs, Colo., of an extraordinary collection of fossils by scientists from the Denver Museum of Nature & Science reveals in striking detail how the world and life recovered after the catastrophic asteroid impact that wiped out the dinosaurs 66 million years ago. Described in a peer-reviewed scientific paper in this week’s issue of Science magazine, the unprecedented find – thousands of exceptionally preserved animal and plant fossils from the critical first million years after the catastrophe – shines a revelatory light on how life emerged from Earth’s darkest hour.

The new and exceptional record from the first million years after the asteroid impact combines plants, animals and precise dates – a paleontological trifecta – painting a portrait of the emergence of the modern world.

Dr. Tyler Lyson, the Museum’s curator of vertebrate paleontology and lead author of the Science magazine paper, and Dr. Ian Miller, the Museum’s curator of paleobotany and director of earth and space sciences, led the team that announced the discovery.

In addition to the paper published in Science magazine, the story of the discovery is told in a new documentary, “Rise of the Mammals,” a NOVA production by HHMI Tangled Bank Studios for WGBH Boston, that will stream online beginning today at (<https://www.pbs.org/nova/video/rise-of-the-mammals/>) across PBS platforms and mobile apps and will broadcast nationally on PBS Oct. 30 at 9 p.m. EDT/8 p.m. CDT (check local listings).

“Thanks to the expertise, vision and grit of the scientific team, we are gaining a clearer understanding of how our modern world of mammals arose from the ashes of the dinosaurs,” said George Sparks, the

Museum's President and CEO. "We hope that this story inspires people – especially future generations – to follow their curiosity and contemplate the big questions our world presents to us."

"The course of life on Earth changed radically on a single day 66 million years ago," said Lyson. "Blasting our planet, an asteroid triggered the extinction of three of every four kinds of living organisms. While it was a really bad time for life on Earth, some things survived, including some of our earliest, earliest ancestors."

"These fossils tell us about our journey as a species – how we got to be here," said Dr. Neil Shubin, a paleontologist at the University of Chicago who was not involved in the discovery.

As explained in the documentary and an accompanying exhibit at the Museum, a moment of serendipity pointed the way to the exquisite fossils, which had been hiding in plain sight. Dr. Lyson grew up in fossil-rich North Dakota and by his teens had become a dinosaur-hunter phenom. But fossil remains of vertebrates after the asteroid impact had largely eluded him – until 2016. That summer, inspired by a fossil that had been sitting in a Museum drawer and fossil hunting techniques used by some of his South African colleagues, he stopped looking for glinting bits of bone in the Denver Basin and instead zeroed in on egg-shaped rocks called concretions.

"It was absolutely a light bulb moment. That was the game changer," he said.

Cracking open the concretions, Lyson and Miller found wonders. Inside were skulls of mammals from the early generations of survivors of the mass extinction. Finding even a single skull from this era is a coup. In fact, most of what is understood from this era is based on tiny fragments of fossils, such as pieces of mammal teeth. "You could go your entire career and not find a skull from this period. That's how rare they are," said Miller.

Yet he and Lyson found four in a single day and over a dozen in a week once the fossil-searching code was cracked. "It was crazy the way it happened," he noted. So far, they've found fossils from at least 16 different species of mammal.

The Denver Basin site also adds powerful evidence to the idea that the recovery and evolution of plants and animals were intricately linked after the asteroid impact. Combining a remarkable fossil plant record with the discovery of the fossil mammals has allowed the team to link millennia-long warming spells to global events, including massive amounts of volcanism on the Indian subcontinent. These events may have shaped the ecosystems half a world away.

"It was only after the meteor impact wiped out the dinosaurs that mammals explode into the breathtaking diversity of forms we see today," says Professor Anjali Goswami, a paleobiologist at the Natural History Museum, London, who was not involved in the discovery.

"Our understanding of the asteroid's aftermath has been spotty," Lyson explained. "These fossils tell us for the first time how exactly our planet recovered from this global cataclysm."

Additional collaborators include:

- David Krause, James Hagadorn, Antoine Bercovici, Farley Fleming, Ken Weissenburger, Denver Museum of Nature & Science
- Stephen Chester, Brooklyn College, City University of New York (CUNY)
- William Clyde and Anthony Fuentes, University of New Hampshire
- Greg Wilson, University of Washington

- Kirk Johnson and Rich Barclay, National Museum of Natural History, Smithsonian Institution
- Matthew Butrim, Wesleyan University
- Gussie Maccracken, University of Maryland
- Ben Lloyd, Colorado College

The museum worked with the United States Geological Survey's National Unmanned Aircraft Systems Project to gather high-resolution images.

For more information about NOVA "Rise of the Mammals" airing Oct. 30 at 9 p.m. EDT/8 p.m. CDT on PBS (check your local listings for exact times), please visit pbs.org/nova. Clips and photos are also available from the film. Please contact: Jennifer Welsh at NOVA/WGBH, 617.300.4382, jennifer_welsh@wgbh.org.

An exhibition about the findings, "After the Asteroid: Earth's Comeback Story," will open at the Museum on October 24, 2019.

About Denver Museum of Nature & Science

The Denver Museum of Nature & Science is the Rocky Mountain Region's leading resource for informal science education. Our mission is to be a catalyst and ignite the community's passion for nature and science. The Museum offers a wide variety of engaging exhibitions, programs, activities and scientific research to inspire public appreciation and understanding of the wonders of Colorado, Earth and the universe. The Museum is located at 2001 Colorado Blvd., Denver, CO, 80205. Information: dmns.org or 303.370.6000. Many of the Museum's educational programs and exhibits are made possible in part by the citizens of the seven-county metro area through the Scientific & Cultural Facilities District. The Museum is accredited by the American Alliance of Museums. Connect with the Museum on Facebook, Twitter and Instagram.

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