



DINOSARUS : SCIENCE & TECHNOLOGY

NEWS: *Where did dinosaurs first evolve? Scientists have an answer*

WHAT'S IN THE NEWS?

Dinosaurs, a diverse group of reptiles that appeared during the Triassic Period, evolved after a mass extinction event and became dominant due to their unique traits. In India, significant dinosaur fossils, including *Titanosaurus indicus*, were discovered in the Lameta Formation of the Narmada Valley.

1. Introduction: What Are Dinosaurs?

- **Definition:** Dinosaurs are reptiles belonging to the clade *Dinosauria*.
- **Appearance:** Emerged during the Triassic Period, about 243–233 million years ago.
- **Extinction:** Went extinct around 66 million years ago due to a mass extinction event, likely caused by an asteroid impact or volcanic activity.
- **Key Traits:** Upright posture, efficient locomotion, and diverse dietary adaptations.

2. History of Dinosaurs in India

- **Geological Background:**
 - India was part of the southern supercontinent Gondwana, which later split into modern continents.
 - The Indian Plate moved northward, carrying with it fossil records from its Gondwanan past.
- **First Discovery:**
 - Year: 1828.
 - Location: Bara Simla Hill near Jabalpur, Madhya Pradesh.
 - Discoverer: Captain William Henry Sleeman of the East India Company.
 - Fossil: Holotype vertebrae of *Titanosaurus indicus*, later classified as a Late Cretaceous herbivorous dinosaur (145–65 mya).
- **Significant Site: Lameta Formation:**
 - Location: Narmada Valley (Central India).
 - Findings: Dinosaur nests, eggs, and skeletons.
 - Importance: Provides crucial evidence of dinosaur biodiversity in India.

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3. Significant Dinosaur Fossils Discovered in India

- **Barapasaurus:**
 - Type: Sauropod (long-necked herbivore).
 - Significance: Known as "big-legged lizard," one of the earliest sauropods.
- **Isisaurus:**
 - Type: Sauropod.
 - Features: Short neck compared to other sauropods.
- **Indosuchus:**
 - Type: Large theropod (carnivorous).
 - Characteristics: Known for its sharp teeth and predatory nature.
- **Rajasaurus:**
 - Type: Large theropod.
 - Features: A carnivore with a unique crest on its head, considered an apex predator.

4. Global Dinosaur Origins

- **Proposed Origin Areas:**
 - Likely regions: Present-day Sahara Desert and Amazon Rainforest.
 - Time Period: Dinosaurs first appeared on the southern supercontinent Gondwana during the Triassic Period.
- **Oldest Dinosaur Fossils Found:**
 - *Eoraptor* and *Herrerasaurus* (Argentina): Among the earliest known dinosaurs, ~230 million years old.



- *Saturnalia* (Brazil): Early dinosaur ancestor.
- *Mbiresaurus* (Zimbabwe): Evidence of Gondwanan dinosaur distribution.

5. Evolution of Dinosaurs

- **Mass Extinction Event:**
 - Cause: Volcanic activity at the end of the Permian Period (~252 million years ago).
 - Impact: Wiped out 90% of marine species and 70% of terrestrial species, paving the way for dinosaurs to evolve.
- **Early Dinosaurs:**
 - Initially small and less dominant in ecosystems.
 - Larger animals like crocodile relatives and mammal-like creatures were dominant.
- **Rise to Dominance:**
 - Around 201 million years ago, a mass extinction event eliminated their competitors.
 - Dinosaurs diversified and became dominant terrestrial animals.
- **Unique Traits:**
 - Upright stance for efficient movement.
 - Specialized hips and teeth adapted to various diets.
 - Examples:
 - *Herrerasaurus*: A 6-meter-long predator.
 - *Eoraptor*: A small, omnivorous dinosaur.

6. Challenges in Tracing Dinosaur Origins

- **Harsh Triassic Environment:**
 - Climate: Extremely hot and dry conditions, vast deserts, and frequent wildfires.
 - Adaptations: Early dinosaurs and relatives adapted to these extreme environments.
- **Scarcity of Fossils:**
 - Poor preservation conditions due to arid climates and erosion.
 - Fossil exploration hindered by remote and dense regions like the Amazon and Sahara.
 - Fragmentary fossils make it difficult to construct a complete evolutionary timeline.

Source: <https://www.thehindu.com/sci-tech/science/where-did-dinosaurs-first-evolve-scientists-have-an-answer/article69142579.ece#:~:text=%E2%80%9COur%20research%20suggests%20they%20likely,northern%20Africa%2C%E2%80%9D%20Heath%20added.>