'Anaconda' meets 'Jurassic Park': Study shows ancient snakes ate dinosaur babies (w/ Video)

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This is a life-sized reconstruction of the moment just before preservation. The scales and patterning of Sanajeh's skin is based on modern relatives of the fossil snake. The hatchling dinosaur is reconstructed from known skeletal materials, but its color is conjectural. The eggs are based directly on the fossils. Credit: Sculpture by Tyler Keillor and original photography by Ximena Erickson; image modified by Bonnie Miljour

(PhysOrg.com) -- The remains of an extraordinary fossil unearthed in 67-million-year-old sediments from Gujarat, western India provide a rare glimpse at an unusual feeding behavior in ancient snakes.

An international paleontological team led by the University of Michigan's Jeff Wilson and the Geological Survey of India's Dhananjay Mohabey will publish their discovery online March 2 in the open-access

journal *PLoS Biology*.

The remains of a nearly complete snake were found preserved in the nest of a sauropod dinosaur, adults of which are the largest animals known to have walked the earth. The snake was coiled around a recently hatched egg adjacent to a hatchling sauropod. Remains of other snake individuals associated with egg clutches at the same site indicate that the newly described snake made its living feeding on young dinosaurs.

"It was such a thrill to discover such a portentous moment frozen in time," said Mohabey, who made the initial discovery in the early 1980s.

Working with the sediment-covered and inscrutable specimen in 1987, Mohabey recognized dinosaur eggshell and limb bones but was unable to fully interpret the specimen. In 2001, Wilson visited Mohabey at his office at the Geological Survey of India and was astonished when he examined the specimen.

"I saw the characteristic vertebral locking mechanism of snakes alongside dinosaur eggshell and larger bones, and I knew it was an extraordinary specimen---but I also knew we needed to develop it further," Wilson said.

From that point began a decade-long odyssey that led to a formal agreement with the Government of India Ministry of Mines in 2004 that allowed preparation and study of the fossil at the U-M Museum of Paleontology, weeks of museum study in India, and field reconnaissance at the original locality in Gujarat by a team that included Wilson, Mohabey, snake expert Jason Head of the University of Toronto-Mississaugua, and geologist Shanan Peters of the University of Wisconsin. The field research was funded by the National Geographic Society.

Preparation of the fossil at the U-M revealed the snake was coiled around a crushed dinosaur egg next to a freshly hatched sauropod dinosaur.

"We think that the hatchling had just exited its egg, and that activity attracted the snake," said Mohabey. "The eggs were lain in the loose sands near a small drainage and covered by a thin layer of sediment."

The arrangement of the bones and delicate structures, such as eggshells and the snake's skull, point to quick entombment.

"Sedimentation was unusually rapid and deep for this formation---a pulse of sand, probably mobilized during a storm, resulted in the preservation of this spectacular association," said Peters, who interpreted the paleoenvironment of the site.

The new snake, which was named Sanajeh indicus or "ancient-gaped one from the Indian subcontinent," because of its lizard-like gape, adds critical information that helps resolve the early diversification of snakes. Modern large-mouthed snakes are able to eat large prey because they have mobile skulls and wide gapes. Sanajeh bears only some of the traits of modern large-mouthed snakes and provides insight into how they evolved.

"Sanajeh was capable of ingesting the half meter-long sauropod hatchling because it was quite large itself, almost 3.5 meters long," Head said. "This points to an interesting evolutionary strategy for primitive snakes to eat large prey by increasing their body size."

Although the sauropod dinosaurs that Sanajeh preyed upon include the largest animals capable of walking on land, they began their life as small hatchlings that were about one-seventh the length of Sanajeh. Sauropods appear to have achieved their enormous size by virtue of a fast-growth

phase, which would have kept them out of danger from Sanajeh-sized predators by the end of their first year of life.

This discovery of Sanajeh adds to a growing body of evidence suggesting that the Indian subcontinent retained ties to southern landmasses for longer than once hypothesized. Sanajeh's closest relatives are from Australia and speak to its strong ties to southern continents, collectively known as Gondwana.

A life-sized flesh reconstruction of the scene immediately before burial was designed and executed by University of Chicago paleoartist Tyler Keillor. The team will donate the first cast to the Geological Survey of India at a formal function to be held in Mumbai, India, on March 12, 2010.

More information: Wilson JA, Mohabey DM, Peters SE, Head JJ (2010) Predation upon Hatchling Dinosaurs by a New Snake from the Late Cretaceous of India. PLoS Biol 8(3): e1000322. doi:10.1371/journal.pbio.1000322

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