Pristine reptile fossil holds new information about aquatic adaptations

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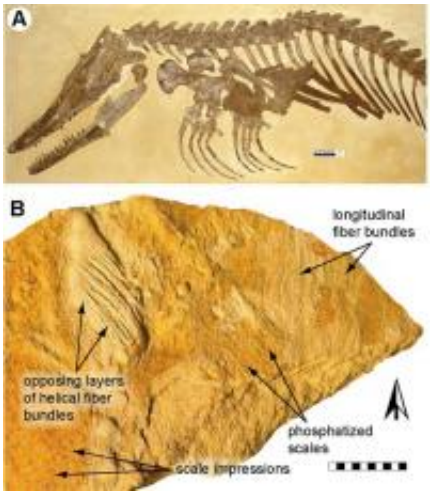

Ectenosaurus clidastoides FHSM VP-401. (A) Skull, partial axial and appendicular skeleton, and calcified sternal cartilage in oblique ventro-lateral view. (B) Slab FHSM VP-401-05 showing phosphatized integumentary structures in medial view. Black and white arrow indicates anterior. Scale bars, (A) 10 cm and (B) 10 mm. Image: PLoS ONE 6(11): e27343

Extinct animals hide their secrets well, but an exceptionally well-preserved fossil of an aquatic reptile, with traces of soft tissue present, is providing scientists a new window into the behavior of these ancient swimmers.

According to the study published in PLoS ONE's November 16th issue, the fossil, characterized by a team led by Johan Lindgren of Lund

University in Sweden, is from the mosasaur family, a group of reptiles that lived between 65 and 98 million years ago. The fossil was found in Western Kansas, and was submerged under a shallow sea at the time of the mosasaur's existence.

Previous analysis of mosasaur locomotion had been limited by a lack of soft tissue fossils, which was crucial for the scientists to truly understand the degree of aquatic adaptation that the creature had achieved. The new findings, which include scales and skin impressions, suggest that the mosasaur was able to minimize its frictional drag in the water. Additional features suggest that it held the front of its body somewhat rigid during swimming, leading it to depend on the rear of its body and tail for propulsion.

According to Dr. Lindgren, this study provides "unique insights into the biology of an extinct group of marine lizards that became adapted to aquatic environments in a fashion similar to that of the preceding ichthyosaurs ('fish-lizards') and succeeding whales." Thus, these results may have implications for understanding how this group ultimately transformed from land-dwellers to pelagic cruisers in a relatively short period of geological time.

More information: Lindgren J, Everhart MJ, Caldwell MW (2011) Three-Dimensionally Preserved Integument Reveals Hydrodynamic Adaptations in the Extinct Marine Lizard Ectenosaurus (Reptilia, Mosasauridae). PLoS ONE 6(11): e27343. doi:10.1371/journal.pone.0027343

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