Prehistoric Reptiles From Russia Possessed The First Modern Ears – Radiocápsula RCP/CPR. [1]

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Calificación:

ScienceDaily - The discovery of the first anatomically modern ear in a group of 260 million-year-old fossil reptiles significantly pushes back the date of the origin of an advanced sense of hearing, and suggests the first known adaptations to living in the dark. In a new study published in PLoS One, Johannes Müller and Linda Tsuji, paleobiologists at the Natural History Museum of the Humboldt University in Berlin, Germany report that fossils of the small reptile Bashkyroleter mesensis, found in deposits of Permian age near the Mezen River in central Russia, possessed all the anatomical features typical of a vertebrate with a surprisingly modern ear. When vertebrates had conquered land and the ancestors of modern day mammals, reptiles, and birds first began to diversify, hearing was not of high importance. The first fully terrestrial land vertebrates were, in fact, largely deaf, and lacked any of the anatomical features that would indicate the possession of what is termed impedance-matching hearing - the mechanism by which modern land vertebrates are able to transmit airborne sounds into the inner ear by means of small bony connections. The ability of modern animals to hear a wide range of frequencies, highly important for prey capture, escape, and communication, was long assumed to have only evolved shortly before the origin of dinosaurs, not much longer than 200 million years ago, and therefore comparatively late in vertebrate history. But these fossils demonstrate that this advanced ear was

in existence much earlier than previously suggested. In these small reptiles the outside of the cheek was covered with a large eardrum, and a bone comparable to our own hearing ossicles connected this structure with the inner ear and the brain. Müller and Tsuji also examined the functional performance of this unique and unexpected auditory arrangement, and discovered that these little reptiles were able to hear at least as well as a modern lizard. But why would these animals have possessed such an ear" "Of course this question cannot be answered with certainty", explains Müller, "but when we compared these fossils with modern land vertebrates, we recognized that animals with an excellent sense of hearing such as cats, owls, or geckos, are all active at night or under low-light conditions. And maybe this is what these Permian reptiles did too." Because the fossils from the Mezen River also possess comparatively large eyes, another typical feature of vertebrates living in the dark, these reptiles indeed might have been among the first land vertebrates to pursue a specifically nocturnal lifestyle. An adaptation of this kind would have been a significant step at this early stage of terrestrial evolution, as endothermic (cold-blooded) animals require the heat of the sun to maintain their body temperature. The discovery of an ear comparable to modern-day standards in such ancient land vertebrates provides an entirely new piece of information about the earliest terrestrial ecosystems, which no longer seem to be as primitive as once assumed. Already by this time, there must have been intense pressure to exploit new ecological niches and to evolve new structures to gain an advantage over other species in an increasingly crowded world. At last, it was those pressures and evolutionary inventions that paved the way for our modern day environments. Citation: Müller J, Tsuji LA (2007) Impedance-Matching Hearing in Paleozoic Reptiles: Evidence of Advanced Sensory Perception at an Early Stage of Amniote Evolution. PLoS ONE 2(9): e889. doi:10.1371/journal.pone.0000889

Links

[1] https://www.cienciapr.org/en/external-news/prehistoric-reptiles-russia-possessed-first-modern-ears-radiocapsula-rcpcpr