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Source: BioScience, 59(6) : 536

Published By: American Institute of Biological Sciences

URL: <https://doi.org/10.1525/bio.2009.59.6.17>

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Surprising Fossil Finds

A new Cambrian predator has been discovered, in a way. *Hurdia victoria*, originally described in 1912, has been pieced together from parts previously attributed to other taxa, thanks to a large number of specimens collected from the Burgess Shale, in British Columbia. The story of this early arthropod progenitor, which swam the oceans 500 million years ago, began to be revised in the 1980s and culminates with a study published in *Science* (20 March), written by Allison Daley, a graduate student at Uppsala University in Sweden, and her colleagues in Europe and Canada.

Even in its newly described form, *Hurdia* retains a good deal of its mystery. Its large frontal carapace, which would appear to be protective, is mostly empty and its role is unclear; the animal's back half is a series of segments containing gills. At its midsection, where the front and back halves join, a pair of stalked eyes protrudes beyond the lateral edges of the carapace, and on the underside are frontal appendages that may have been used for feeding and a round mouth with rows of teeth.

Hurdia and its fellow anomalocaridids ("strange shrimp") were the world's largest predators in their day, but their relationship to other arthropods is somewhat uncertain. This clarification of *Hurdia*'s morphology has helped to position them in the stem group for arthropods.

Soft tissues are so rarely preserved in fossils that it is utterly remarkable that complete fossils of entirely soft-bodied creatures have been found in Lebanon. Paleontologists Dirk Fuchs, of Free University of Berlin, Germany, and his colleagues have described three new species of octopus from these 95-million-year-old fossils. Their work appears in the January issue of *Palaeontology*.

The imprints the five specimens left behind are clearly recognizable as octopods, with eight long arms, some with rows of suckers visible, and a head and mantle with ink sac remnants. The feature that figures most prominently in distinguishing the separate species is the gladius vestige, a pair of chitinous blades located at the outer edge of the mantle, to which fins might have been attached. The gladius vestiges of two of the new species, *Keuppia levante* and *Keuppia hyperbolaris*, show clear ridges, or growth lines, but no fins are visible.

The third new species, *Styletoctopus annae*, exhibits a thin pair of stylets, a reduction of the gladius vestige typical of more recent octopods lacking fins. This finding places the origin of the modern Octopodidae, the family to which this new species belongs, significantly earlier than previously supposed. And with two new genera, we now have more limbs on the octopod tree.

A tragic event from the distant past, captured in stone, has been excavated from the Gobi Desert, in Inner Mongolia. A herd of young ornithomimids, or "ostrich dinosaurs," was trapped by drying mud at the edge of a lake and perished; the skeletal remains were in close proximity, oriented in their travelling formation.

Chinese and American paleontologists studying the fossils found no adults among the 25 *Sinornithomimus dongi* individuals that died together some 90 million years ago. Most of the youngsters were 1 to 2 years old, with a few 3- to 7-year-olds, as determined by the size of long bones, maturity of vertebral sutures, and annual growth lines of sectioned bones. The work was published in the December 2008 issue of *Acta Palaeontologica Polonica*.

The deeply mired legs and tails are the best preserved portions of the skeletons; the parts that remained uppermost show signs of trampling and possibly scavenging. Other fossil evidence suggests the lake may have been in a cycle of drought. This assemblage of mired juvenile theropods tells quite a lot about the sociality of these nonavian dinosaurs, indicating a life history that included extended parental care of hatchlings (by the absence of both adults and hatchlings) and prolonged adolescence.

The "discovery" of a museum specimen collected from Dinosaur Park Formation, in Alberta, Canada, and overlooked for 25 years has filled in some rather remarkable gaps. Until now, the Cretaceous dinosaur assemblages of North America were curiously lacking in small carnivores. Canadian biologists Nicholas Longrich and Philip Currie describe the new species, *Hesperonychus elizabethae*, in the 16 March online edition of *Proceedings of the National Academy of Sciences*.

The newly described dromaeosaurid ("running lizard") was a small, birdlike predator that, at 1.9 kilograms, was four orders of magnitude smaller than the behemoths typically associated with the Cretaceous (145 million to 65 million years ago). Its closest known relatives, *Sinornithosaurus* and *Microraptor*, hail from northeastern China, and at 75 million years of age, *Hesperonychus* is the youngest member of the Microraptorinae by a whopping 45 million years.

Not only is this a first for North America, it may signal the start of many more discoveries to come, if the abundance of small carnivores on other continents is any indication.

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doi:10.1525/bio.2009.59.6.17