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Early Giraffe with powerful blow

A team of researchers from Beijing has studied a 17 million years old giraffe from northwestern China in collaboration with paleontologists Loïc Costeur and Bastien Mennecart from the Natural History Museum of Basel. They discovered that no other known animal on earth was better adapted to head-butting behaviors involved in reproduction. This discovery allows them to hypothesize that the long neck of the living giraffe probably evolved as a sexual character involved in reproduction to allow for male-male combats rather than merely for feeding higher in trees.

Paleontologists from the Institute for Vertebrate Paleontology and Paleontology and Chinese Academy of Science in Beijing have been digging in the Junggar basin in Northwestern China for about 30 years and patiently gathered material of an early giraffe before analyzing it in precise details. An international team of paleontologists under the direction of Professor Wang ShiQi and in collaboration with Drs. Loïc Costeur and Bastien Mennecart of the Natural History Museum Basel is describing the new giraffe species in details in the renowned journal *Science*.

Particular head structure

The 17 million years old early giraffe was named *Discokeryx xiezhi*. This name reflects the single thick disc-like structure found on its skull, which is an ossicone, the kind of horn giraffes have. The thickness of the disc together with the tube-like thick neck vertebrae show that the animal could hit opponents with fierce blows of the head. *Discokeryx xiezhi* thus shows a very specific adaptation of the head and neck. This new species gives insights into the evolution of the head and neck in giraffes, which probably evolved more in relation to social behavior, specifically between males, and led to a great diversity of forms in giraffes, both extinct and extant with the long neck of the living one.

It is shown that the new species was specialized for head-butting. Males violently hit their heads in intraspecific combat for females. No other animal of the Earth history was better adapted than *Discokeryx* to this behavior.

Combat instead of food

The detailed analysis around the description of *Discokeryx* suggests that the neck of the living giraffe evolved longer in order to increase its ability for necking, the specific combat behavior of the giraffe whereby males hit themselves by slamming their necks and heads against each other. The ability of eating high in trees thanks to the long neck is likely to be a secondary benefit of the reproductive behavior, and not the primary evolutionary force behind this character. The latter hypothesis was previously commonly put forward to explain the extreme morphology of the giraffe.

Diversity of ossicone shapes

Quite many early giraffes are known from 17 to 5 million years. They show an unusually high diversity of cranial appendages, known as ossicones, that seems unparalleled in other groups of mammals. This diversity indicates a wealth of social interactions between males, and between males and females. In addition to the newly described early giraffe *Discokeryx*, all these data suggest that the primary driving

force in the evolution of giraffes head structures and necks is related to reproduction and not to competition for food.

More information

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