Elucidating the biology of extinct cave bears

August 24 2017, by Kristoff Veitschegger

One of the largest known species of bear, the cave bear (*Ursus spelaeus*), ranged widely through Eurasia all the way to the Mediterranean in the south and to the Caucasus Mountains and northern Iran in the east during Late Pleistocene times. Its name is based on the fact that it spent more of its life in caves than its closest present-day relative, the brown bear (*Ursus arctos*).

First appearing in the fossil record some 300,000 years ago, the cave bear vanished between 20,000 and 25,000 years ago during the Last Glacial Maximum. Countless fossils, especially from the European Alps and including many skeletons representing all ages, have allowed paleontologists to reconstruct the life and times of the cave bear in great detail. New research by Kristof Veitschegger of the University of Zürich (Switzerland) will be presented at the annual Society of Vertebrate Paleontology meeting in Alberta, Canada, sheds additional light on the biology of this extinct giant.

Male cave bears had estimated average weights between 400 and 500 kilograms whereas female cave bears were smaller, with average weights ranging from 225 to 250 kilograms. The massive grinding molars and nitrogen-isotope data from its bones indicate that the cave bear was primarily herbivorous, with foliage its main dietary staple. Cave bears and people likely encountered one another occasionally. Most researchers think that the bears fell victim to the profound environmental changes following the glaciers' withdrawal from Europe rather than human hunting.

Collecting data on relative brain size for present-day and extinct bears, Veitschegger discovered that the cave bear had an unusually small brain relative to its body size. Zoologists use a measure known as the encephalization quotient (EQ) to express this ratio. The brown bear has an EQ of 0.83 and the (small-bodied) Malayan sun bear has an EQ of 1.31. By contrast, the cave bear scored a mere 0.60. Veitschegger interprets this as evidence that the increase in body size during the evolution of the cave bear did not correlate with change in brain size. However, the proportionately small brain may also reflect a less energy-rich diet (as other bears consume more animal protein) and a highly seasonal environment that probably required longer periods of hibernation.

Veitschegger considers it likely that cave bears gave birth to numerous cubs after long gestation periods. His examination of the microscopic structure of their leg bones indicates that these extinct bears grew more rapidly but attained sexual maturity later in life than other bear species.

Provided by Society of Vertebrate Paleontology

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