

are two intramontane basins in southern and central Austria (Fig. 26/1-6, Table 1). Six Austrian vertebrate faunas have been recorded from lignite mines, river sediments and delta deposits, which yielded fossil primate remains. There is some evidence that only one species is present in each site. The lignite deposits from Trimmelkam, Göriach and St. Stefan represent swampy forest areas, in which pliopithecids or hominids lived. The sands of Klein Hadersdorf are interpreted as delta sediments. They contained hominid limb bones. The faunas of Götzendorf and Mariathal yielded pliopithecids and hominid remains, respectively. These were imbedded in sands, which characterize a marginal fluvial environment. Special mention must be given to two famous primate localities of Devínska Nova Ves (Neudorf a. d. March) from Slovakia, which are situated close to the easternmost border of Austria (Fig. 26/7). The type locality of *Pliopithecus vindobonensis* stems from this area. It is the well-known fissure "Neudorf Spalte". A few teeth of *Pliopithecus antiquus* and *Griphopithecus darwini* were located in the marine sands of "Neudorf-Sandberg", which is a second site of the Devínska Nova Ves area (ANDREWS et al. 1996).

In Austria some primate species are represented by isolated teeth only: *Anapithecus hernyaki* from Götzendorf and *Dryopithecus carinthiacus* from Mariathal. *Dryopithecus carinthiacus* from St. Stefan and *Plesiopliopithecus lockeri* from Trimmelkam have been identified by jaws, while *Pliopithecus platyodon* from Göriach, *Plesiopliopithecus lockeri* from Trimmelkam and *Griphopithecus darwini* from Klein Hadersdorf. Although postcranial hominid remains are generally rare, *Griphopithecus darwini* from Klein Hadersdorf is documented by a humerus and an ulna only.

According to the European record, the extinct primates – the pliopithecids, the crouzelliids and the dryopithecids – ranged in Austria from the Middle to the Late Miocene. Their first records were in the Badenian, i. e., *Pliopithecus platyodon* from Göriach, *Plesiopliopithecus lockeri* from Trimmelkam and *Griphopithecus darwini* from Klein Hadersdorf. *Dryopithecus carinthiacus* from St. Stefan is of Sarmatian age. *Anapithecus hernyaki* from Götzendorf and *Dryopithecus carinthiacus* from Mariathal were recorded for the last time in the Pannonian.

The Cave bear: Gentle Giant of the Alps

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Large quantities of fossil teeth and bones have been found in caves throughout Europe, from the Pyrenees to the Urals and from the Abruzzes to the Harz mountains. They belong to a type of bear, which differs from the living brown bear in many aspects and was classified in 1794 as a separate species – *Ursus spelaeus* – the cave bear.

The cave bear is mainly a European speciality. More than 30 cave bear sites are known in Austria alone (DÖPPES & RABEDER 1997; Fig. 27) and some of these caves are situated at an altitude of 2,000 m or more (Salzofen, Ramesch-Knochenhöhle, Brettstein, Brieglersberg, Schreiberwand-Höhle, etc.).

The abundance of cave bear remains and the possibility of radiocarbon dating, as well as uranium-series dating, allow us to deal with this extinct animal both zoologically and palaeontologically. Questions like biostratigraphy, pal-

aeobiogeography, palaeoclimatology, mode and speed of evolution, way of living (hibernation, food preference), sexual dimorphism, size variation and interaction with humans can now be answered. A short summary is given here.

The evolutionary line from *Ursavus* to *U. etruscus* to *U. deningeri* leading to *U. spelaeus* is well documented in Austrian caves and sites (Fig. 27). The cave bear weighed up to 900 kg and thus was larger than any living bear today (Fig. 28). The increase of cusps per tooth and the enlargement of occlusal surfaces – suited to grinding functions – is an adaptation to a herbivorous way of life. The rapid evolution from an omnivorous ancestor to a herbivorous cave bear, documented in various sites and profiles, took less than 150,000 years: Radiocarbon and uranium-series dates constrain these palaeontological results. This evolutionary speed is unrivalled among mammals.

In some cases up to 92% of the pollens found in caves are from Asteraceae. We assume that these are remains of the cave bear diet, which passed the digestive system (e.g., *Armeria*, *Artemisia*, *Centaurea*, *Geranium*, *Knautia*, *Scabiosa* and *Trifolium*).

The only herbivorous bear today is the Great Panda but it inhabits areas with a temperate climate. The cave bear had to face long winters. There are only two solutions to this problem: migration or hibernation; the cave bear chose the latter, which saved him about 95% of the needed energy. The abundance of cave bear bones in caves are mostly the remains of individuals, which did not survive the winter. This frequent occurrence and their statistical relevance make the cave bear the most important animal in mammalian palaeontological evolutionary research.

Cave bears had an obvious accentuated sexual dimorphism, in which females were about 15% smaller than males. Measurements of the canines prove not only this difference in size but also the male/female distribution in the fossil sites: it is nearly equal, with slightly more females. This corresponds with the results of studies concerning recent brown bear populations.

The coincidence of cave bears with Palaeolithic stone artefacts left by humans only proves a mutual interest in caves as a shelter and it is unlikely that the caves were inhabited simultaneously. The excavations of over 20 caves in Austria, with thousands of fossil teeth and bones revealed no evidence so far to substantiate the "cave bear cult" (BÄCHLER 1923, 1940, PACHER 1997).

Figs. 27 + 28 see next page

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Fig.1: Fossil sites of the cave bear and its ancestors.

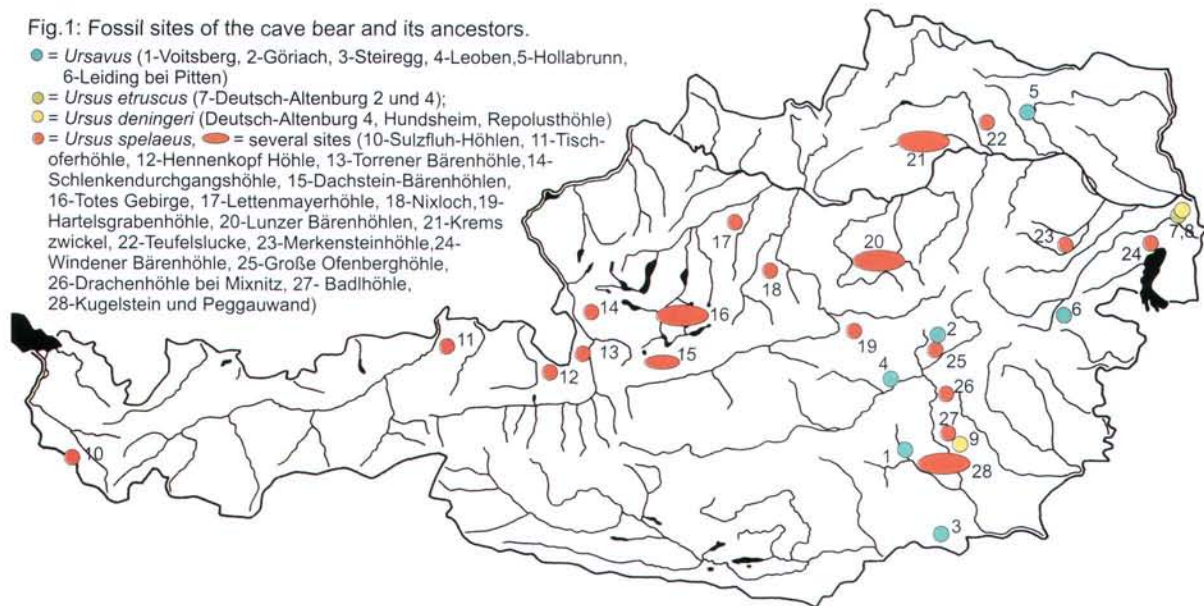


Fig. 27

Fossil sites of the cave bear and its ancestors in Austria.



Fig. 28

Reconstruction of a cave bear. Original in the Bündner Naturmuseum, Chur, Switzerland (Copyright Bündner Naturmuseum, Chur).