Naturkundliche Mitteilungen aus den Landessammlungen Niederösterreich 30: 1-138 St. Pölten, 2020

Atlas of cave bear osteology

Christine Frischauf & Gernot Rabeder

Introduction

Cave bear remains have been recovered in such large numbers in European caves that these bears are considered to be the best documented fossil big mammals. The increasing evidence of several cave bear species together with the fact that sometimes there are brown bear remains in cave bear caves makes the exact determination of teeth and bones more difficult, therefore we are confident that a "bone-atlas" (including the description of the teeth) can be very helpful. Further more an exact determination of bone-elements and fragments is essential for taking samples intended for analyses, like ancient DNA, isotopes and radiometric dating. Those analyses can help clarify questions about the evolution and phylogeny as well as the nutrition and former climatic conditions.

So far there has been no "cave bear bone atlas". There is an excellently designed bone atlas (Pales & Lambert 1971) of extant big mammals that also appeared in Pleistocene and Holocene sites. In the style of this atlas we present the skeleton elements of cave and brown bears. Schematic drawings with the anatomical descriptions are combined with digitally edited photos of fossil and recent bones and teeth.

Material and methods

The uniquely well-preserved cave bear bones and teeth of the Schwabenreith cave near Lunz am See (Lower Austria) are used as basic material for creating this atlas. They belong to one taxon: *Ursus spelaeus eremus* Rabeder et al., 2004. Also remains of the bear cave "Bärenfalle" were depicted because of their particularly good preservation; they also belong to the same taxon.

For comparison with another cave bear species appropriate elements of *Ursus ingressus* Rabeder et al., 2004 from the Gamssulzen cave as well as from the bear cave of Winden, the dragon cave of Mixnitz, the Krizna jama, the Nixloch cave and the Hartelsgraben cave have been utilized.

The most complete remain of each skeleton element has been selected; elements that either could be assigned male or female have been preferred. The chosen elements have been photographed from all anatomical sides. The scaled photos have been transferred into the drawings where the anatomically important areas, such as the articulation areas and the tendon insertions have been highlighted with graphic tools (colors, signatures).

Almost all elements of *Ursus spelaeus eremus* were compared to elements of the Late Pleistocene *Ursus ingressus* and to the extant brown bear *Ursus arctos*.

Sites and taxa of the fossil imaging originals used here

(stored in the collections of Institute of Palaeontology, University Vienna UWPI or PIUW)

Schwabenreith cave near Lunz/See (SW, Lower Austria): *Ursus spelaeus eremus* (s. Döppes & Rabeder 1997)
Bärenfalle Tennengebirge (BF, Pfarrwerfen, Salzburg): *Ursus spelaeus eremus* (s. Frischauf et al. 2015)
Gamssulzen cave Totes Gebirge (GS, Spital am Pyhrn, Upper Austria): *Ursus ingressus* (s. Rabeder 1995)
Bear cave of **Winden** (Wi, Burgenland): *Ursus ingressus* (s. Döppes & Rabeder 1997)
Dragon cave of **Mixnitz** (Mix, Styria): *Ursus ingressus* (s. Frischauf et al. 2014)

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: Naturkundliche Mitteilungen aus den Landessammlungen Niederösterreich

Jahr/Year: 2020

Band/Volume: 30

Autor(en)/Author(s): Frischauf Christine, Rabeder Gernot

Artikel/Article: Atlas of cave bear osteology 1-138