



## Hic sunt leones et hyaenae

Ewa Barycka 2008. *Middle and Late Pleistocene Felidae and Hyaenidae of Poland. Fauna Poloniae, New Series, volume 2, 228 pp. Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw. ISBN 978-83-918040-5-6; Price 48 Euro.*

Only a few months after Ewa Barycka had passed away (for an obituary, see Wolsan 2008), an English translation of her Ph.D. thesis on the fossil record of Middle to Late Pleistocene felids and hyenids from Poland appeared as a book publication. The book consists of five

main chapters: Introduction, Material and Methods, Localities, Results and Discussion, and Summary. The record of four taxa of Pleistocene carnivores is comprehensively described from more than dozen sites, including the European steppe lion (*Panthera spelaea fossilis*), European cave lion (*P. spelaea spelaea*), wild cat (*Felis silvestris*), and cave hyena (*Crocota crocuta spelaea*), supplemented by information on fossil finds of the Eurasian lynx (*Lynx lynx*). Descriptions and discussions of finds of lions and cave hyenas represent the greater part of the book, including the first record of the European steppe lion from Poland.

Although fossil remains of lions and cave hyenas are known from the Pleistocene since the 18<sup>th</sup> Century, a question of their exact taxonomic position is one of the most controversial issues relating to Quaternary mammals. The analyses of the cave hyena's DNA suggest a subspecific (*Crocota crocuta spelaea*) or specific (*C. spelaea*) status of these large Pleistocene scavengers (Rohland et al. 2005). Similarly, the lions of the European Quaternary are often believed to be either a form (or forms) of the modern lion (*Panthera leo*) or separate species (Baryshnikov and Boeskorov 2001), and sporadically they are associated with tiger (*Panthera tigris*). Phylogenetic analyses (Burger et al. 2004) show that DNA sequences of cave lions represent a lineage separated from the modern lions in Africa and Asia, suggesting a sister-group relationship between the cave and modern lions. The latest, more detailed morphological analyses of fossil lion skulls (Sotnikova and Nikolskiy 2006) support the late Pleistocene cave lion as a separate species. The taxonomic affinity of middle Pleistocene European lions (*Panthera fossilis* or *P. leo fossilis*) remains open because of the scarcity of the fossil record. From this viewpoint, each new publication dealing with fossils of lions or hyenas is important for our knowledge of these extinct animals. Based on analyses from Deszczowa Cave and Wierzchowska Górna Cave, Ewa Barycka attributes the middle Pleistocene European lions to a branch of the *Panthera spelaea*-group, referring to as *P. spelaea fossilis*.

Certain circumstantial evidence on different ecological requirements of middle and late Pleistocene lions of Europe can also indicate a possible separation of both forms (*P. spelaea* and *P. fossilis*) in distinct species. It is outlined within the book in the section on ecology, supplemented by some remarks on mass and sexual dimorphism, teeth abnormalities, pathology, phylogeny and geographical range of these largest representatives of the Felidae. Remarks on morphological evolution, phylogeny and palaeoecology are also included in the chapter on records of cave hyenas.

A minor part of the book consists of descriptions of fossil finds of the Eurasian lynx and wild cat. These include brief characteristics of their occurrence in Poland, including morphological evolution, origin and dispersal of the genus *Lynx*. A morphometric analysis of wildcat fossils from upper Pleniglacial layers of the Deszczowa Cave and their comparison to

modern European wild cat subspecies reveals an intermediate position between *Felis silvestris silvestris* and *F. silvestris tatressia*.

Notwithstanding a few errors (e.g., the type site for *Crocota crocuta spelaea* is Zoolithen Cave, not Mosbach, p. 149; Gombasek site is situated in Slovakia, not Gombaszög in Romania, p. 201), the book yields important information on felids and hyenids from Poland. Apart from the exact stratigraphic determination of fossil remains, Ewa Barycka reached many significant results, important minimally within the Central European area. The full detailed morphometric analysis of fossils of *Panthera* demonstrated the growth of hypercarnivory specialization towards the species *P. spelaea*, associated with both the elongation of main cusps and the reduction of anterior accessory cusps in premolars as well as with the elongation of the cutting edge in narrowed m1s. The finding of differences in postcranial skeletons (mainly in hind limbs) between forms of *P. leo*, *P. fossilis*, and *P. spelaea*, and rejecting the hypothesis about hybridisation of late Pleistocene cave lions with assumed invasion of African lions are the main assets of Ewa Barycka's work. Comparisons of evolutionary trends in lower incisors of Polish cave lions, which resulted in both the loss of i3 and the translocation of the remaining incisors one under another in relation with size increase of upper canines, is also novel and important. The confirmation of the cave hyena's variability in dependence on climatic oscillations and migration events is significant together with the rebutting of former data on cave hyena populations, specified on the basis of m1 width from British sites for constituent phases of the late Pleistocene. The comparisons of evolutionary changes, leading to an increase of shearing function of carnassials, showed also the uniformity of the Polish cave hyena record with the European one.

Generally, this book will be a standard reference for Pleistocene carnivores from Europe, representing a valuable publication for everybody who is seriously interested in faunal history and evolution during the Quaternary. With respect to that, Poland lost in Ewa Barycka a promising young paleontologist, whose further research could have yielded new significant data on large Pleistocene predators of Europe and elsewhere.

## References

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Martin Sabol [sabol@nic.fns.uniba.sk], Katedra geológie a paleontológie, Prírodovedecká fakulta, Univerzita Komenského, Mlynská dolina, pavilón B, SK 842 15 Bratislava, Slovakia.