

In the fossil commonly encountered and often represented by a large number of remains are bears. Being additionally quite large animals are among the most commonly analysed fossil forms. However, the vast majority of these analyses relate to the cave bear, while the brown bear was treated mostly as an additional species, which single individuals were analysed in the examination of *Ursus spelaeus sensu lato*. Recent years have seen a revival of research (none, dating, isotopes) of *Ursus arctos*. However, they have focused almost exclusively on the material coming from sites located in Western and Southern Europe, but overlooked the localities from Central and Eastern Europe. Those not included in these analyses the regions which were for the Pleistocene fauna along key migration routes, forming a corridor between Europe and Asia. This means that without testing the positions of these areas you cannot get a full view on the evolution, migration and genetic variation of brown bear.

Detail morphometric analysis, based on a sufficiently numerous samples allowed to determine statistically significant features, describing the form. The previous descriptions of the various forms/subspecies of the brown bear (and created their more than 150) were devoid of statistical verification element and concerned individuals often of uncertain stratigraphic position. The aim of this project is to change this situation, through a large specimens series were dated of that species of Poland and neighbouring countries (Czech Republic, Slovakia, Russia, Ukraine) of Central Europe and correlating the results with biometric and stratigraphic data. Simultaneously dated specimens will be subject to isotopic analysis, aimed to determine the composition of their diet, as well as ancient DNA research. Molecular studies will identify the genetic diversity of origin, migration trends and phylogenetic divergence time of individual haplogroups and lineages of the brown bear. The results of the analyses will be correlated with climatic and environmental changes taking place in the Pleistocene, as well as the reconstruction of the composition of fauna of the period. Gather all of these data would provide a complete view of the evolution of the brown bear on a global scale.

All these issues are of such importance that morphometric analysis also revealed the existence of two distinct forms: big, primitive *U. a. priscus* and smaller, evolutionarily advanced *U. a. arctos*, which appears in the fossil record at the end of the last glaciation. Pleistocene bear differed not only a significant increase in size from the modern and more stouter build, but also a different composition of the diet. This played also an important role in its large dimensions. It is not entirely clear whether they were connected only with the influence of temperature and climate, where according to the rule of Bergman larger individuals live in regions of hardened climate regime. Larger individuals/forms are also known interglacial/interstadial periods. It seems that the large size were also associated with high-protein diet, sourced by these great bears in two ways: by hunting prey and taken carcasses from another predators. They could roam the vast open areas in search of victims and food, also taking advantage of the seasonal abundance (fish, berries). Their size was great advantage in confrontation with other predators. Abundance of large herds of hoofed mammals provide the necessary amount of food to survive for such large predator.

After the retreat of the glacier was rebuilt fauna, in place of open grasslands there were thick forests, inhabited by many small and medium-sized species living in dispersed. The world around great, predatory brown bear has changed, and it turned out that the environment offers much more favourable conditions for smaller, more versatile and environmentally plastic forms. This also applied to the brown bear, where large, carnivorous *U. a. priscus*, needing large amounts of food, it was replaced by a smaller, more omnivorous *U. a. arctos*, which has survived to this day. Preliminary results of isotopic (Krajcarz et al. 2014) also confirm a higher proportion of meat in the diet Pleistocene forms. Isotopic studies carried out in the framework of this project are to determine whether indeed there is a change of diet in the period after the withdrawal of the glacier.

The brown bear is still little known, Pleistocene predator whose research may also have a positive influence on his contemporary protection. Knowing the mechanisms that led to the extinction of the particular lineages in the past, and the survival of others, you can try to apply them in today, so dynamically changing world. To continue on our forests and mountains wandered "lord of the forest".