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Radiocarbon dates on cave bear (Ursus spelaeus) and brown bear (Ursus arctos) from Late Pleistocene of Poland

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Although cave bear (Ursus spelaeus) is far more abundant in last glacial in Europe than brown bear (Ursus arctos), the co-occurrence of both species during Oxygen Isotope Stage 3 (OIS 3) is not questioned. The cave bear (Ursus spelaeus) has been an important part of the European large mammal fauna of last glaciation. Most of the remains come from karst areas where larger caves were used as hibernation sites. In Poland caves occur in the Sudetes Mts, Kraków-Częstochowa Upland, Świętokrzyskie Mts and in the Carpathians (especially in Tatra and Pieniny Mts). The AMS 14C dates were obtained for 14 sites (23 dates) distributed in all karst areas of Poland. All samples dated in Poznań Radiocarbon Laboratory (Poz) were subject of pre-treatment procedures (ultrafiltration and removal of consolidants). Dates are given as an uncalibrated radiocarbon dates (BP) and as calendar dates (cal. BP). The Eastern Sudetes sites are represented by two cave bear remains from Niedźwiedzia Cave, Kletno. Most of samples come from several localities located in different parts of Kraków-Częstochowa Upland (Nietoperzowa, Mamutowa, Ciemna, Wylotne and Zawalona caves – all near Kraków; Komarowa, Deszczowa, Stajnia and Niedźwiedzia near Olsztyn caves – all from the middle part of the Upland). Raj Cave is located in Świętokrzyskie Mts. The Carpathians samples come from two caves in Tatra Mts: Magurska and Poszukiwaczy Skarbów. Results obtained suggest that in the early part of OIS 3, ca. 50-33 ka (ca. 54-37,5 cal. ka), when the climate was relatively stable and warm, cave bears occurred probably more or less continuously from Sudetes Mts to Kraków-Częstochowa Upland and in the Carpathians. The available 18 dates range from >52,000 BP (Poz-24205) to 33,000±400 BP (Poz-23655) (cal. 38,571±1,449 BP). Around 33 ka BP (cal. 38,5 ka BP) cave bears probably disappeared, or at least reduced their number, in the area north from Sudetes and the Carpathians for next ca. 4-5 millennia. However, this evidence requires further investigation. The dates younger than 29 ka BP (cal. 33 ka BP) include 4 dates ranging from 28,500±500 BP (GdA-94) (this conventional 14C date is doubtful due to pre-treatment methods used) to 26,010±150 BP (OxA-14406) (cal. 30,971±344 BP). The youngest available so far AMS date from Poland is a fragment presumably of cave bear skull (we cannot exclude the brown bear) from Komarowa Cave (layer C), 24,550±220 BP (Poz-339) (cal. 29,361±508 BP). However, this date must be regarded with considerable caution because the improved pre-treatment methods were not used. Although the data are still limited at present, there are strong indications that the cave bear (Ursus spelaeus) did not survived to the Last Glacial Maximum (LGM), and become extinct ca. 26 ka BP (ca. cal. 31 ka BP) at areas north from the Sudetes and the Carpathians ranges, thus earlier than in the Alps (ca. 24 ka BP, ca. cal. 28 ka BP). The direct dating of brown bear remains are still scarce. The AMS 14C dates were obtained for 10 remains of Ursus arctos previously dated for late Pleistocene on the basis of stratigraphic position of remains and archaeological chronology. The Eastern Sudetes sites are represented by a single date of brown bear skull described previously by Zotz (1939) from a cave (most probably Kammerberghöhle) near Wschodnia Cave (Połom Mt.). Most of samples come from few archaeological sites located in different parts of Kraków-Częstochowa Upland (Mamutowa, Komarowa, Deszczowa and Dziadowa Skała caves). A single date obtained for Kraków Spadzista Street (from a trench near site B) is surprising, because of extreme rarity of brown bears in archaeological open-air sites in Poland. In six cases the late Pleistocene age of Ursus arctos remains was confirmed, however only one obtained date agree with the opinion of possible co-occurrence of the brown bear and cave bear during OIS 3 in Poland (Kadzielnia in Kielce, ca. 37,7 ka BP). The oldest available date (ca. 24,4 ka BP) of brown bear found in Kraków Spadzista Street, is younger from all the youngest dates so far available for Ursus spelaeus in Poland. Another unusual date, ca. 19,7 ka BP from Mamutowa cave, confirms the presence of Ursus arctos in area north of the Carpathians even during the full glacial of the LGM. All other Pleistocene dates fall in an important late glacial warming dated to ca. 11 –12 ka BP (Bølling-Allerød).