

The updated record of cave bear and other members of the genus *Ursus* on the territory of Czech Republic

Registro actualizado de Oso de las Cavernas y otras especies del género *Ursus* en la República Checa

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ABSTRACT

During the 2nd half of 20th century, a succession of new Pleistocene localities was discovered and some classical paleontological sites were revised. From many of those places also bear remains were recorded. Nine localities provided large material of bear remains in good stratified layers. Bear record from Moravian localities were studied in details by Prof. R. MUSIL from Brno. This paper presents a review of updated knowledge on this localities - especially about their stratigrafical position (based on micro-mammalian evidence) and basic information on bear remains studied.

Key words: Pleistocene, *Ursus*, cave bear, brown bear, Czech Republic, Bohemian karst, Moravian Karst

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INTRODUCTION

Palaeontological investigation of fossil cenozoic mammals has a tradition in the territory of the Czech Republic. Already from the beginning of this investigations remains of bears were among the most frequent finds. The first phase research started in area of Moravian karst in the 1st half of the 19th century (e. g. WANKEL made in 1850 first skeleton of cave bear in the Austria-Ungarn from bones founded in Vupustek cave). From the 2nd half of 19th century lot of data about bear finds from Moravia (WANKEL, 1867; MASKA, 1884, 1886; KNIES, 1891, 1893 etc.) and from Bohemia (KREJCI, 1865; LAUBE, 1874; WOLDRICH, 1890, 1893, etc.) has been recorded. At the end of 19th and during the 1st half of 20th century first lists of vertebrates fossils finds (incl. bears) were given from the area of Bohemia (WOLDRICH, 1897; KAFKA, 1901; BAYER, 1905) and Moravia (KNIES, 1929; STEHLIK, 1929; SKUTIL & STEHLIK, 1932). The old authors determined their finds mostly as *U. spelaeus* or *Ursus arctos/priscus*. Some of these finds are but lost, the most of remaining is not revised and without stratigraphical level or correct localization. Till in 2nd half of 20st century began modern palaeontological research. New and revised old localities are discovered, with emphasis to stratigraphical signification. The most important researchers of this period are FEJFAR in Bohemia (FEJFAR, 1956, 1961, 1993, etc.) and MUSIL (MUSIL, 1959, 1962, 1965, 1968, etc.) in Moravia. The papers of the last author brought detailed studies of cave and brown bear.

The most important informations are given by new discovered sites with both large and small mammals together, which allows morphometric studies of bears combined with their exact stratification. The most important are as follows:

1) Holstejn (Moravian karst)

Stratigraphy: zona B of Early Biharian 1 (FEJFAR & HORACEK, 1990)

Stratigraphically significant taxa from this locality: *Microtus (Allophaimys) pliocaenicus* KORMOS, *Mimomys pusilus* (MÉHELY), *Pliomys episcopalis* MÉHELY, *P. lenki* (HELLER), *Hypolaqus beremendensis* (PETENYI) (according MUSIL, 1966).

The others species of carnivores from this locality: *Panthera cf. gobaszoegensis* (KRETZOI), *Putorius cf. stromeri* KORMOS, *Meles meles* (LINNAEUS) (according MUSIL, 1966).

Locality was discovered in 1965 during limestone-mining. It was a chimney cave infilled with terra rossa deposits. Fauna was published by MUSIL (1966).

The locality provided about 30 items of bears, all identified as *Ursus* sp. by MUSIL who compared them to the bears of Biharian age (*U. deningeri*, *U. mediterraneus*, *U. e. ? d. gobaszoegensis*) but did not coidentified the Holstejn bears with anyone of them. The form was very near to *U. e. ? d. gobaszoegensis* but exhibited some more primitive features.

The following items were published: fragment of mandible with M₂ and M₃, free C, fragment of mandible with C, and a lot of fragments of long bones, hand and food bones and ribs.

2) Stranska Skala (Brno)

Stratigraphy: Late Biharian 2 (FEJFAR & HORACEK, 1990)

Stratigraphically significant taxa from this locality: *Allocricetus bursae* SCHAUB, *Pliomys episcopalis* MEHELY, *Mimomys savini* HINTON, *Pitymys hintoni* KRETZOI, *Pitymys gregaloides* HINTON (according LOZEK & FEJFAR, 1957 and MUSIL & VALOCH, 1968)

The others species of carnivores from this locality: *Canis mosbachensis* SOERGEL, ?*Cuon* sp., *Vulpes angustidens* THENIUS, *Vulpes praeglacialis*, ?*Vulpes* sp., *Xenocyon lycaonoides* KREETZOI, *Crocota crocuta* ssp., *Hyaena brevirostris* AYMARD, *Gula schlosseri* KORMOS, *Homotherium moravicum* (WOLDRICH), *Lynx* sp., *Meles atavus* KORMOS, *Panthera gombaszoegensis* KRETZOI, *Panthera pardus* (LINNAEUS) (according (MUSIL & VALOCH, 1968 and WOLSAN, 1993)

This is a classical palaeontologic site repeatedly investigated since the beginning of 20th Century. The history of investigation was described in details by MUSIL (1965). Besides of the main section (site 4 by MUSIL), a number of different fissures and caves nearby it was also investigated.

The finds of bears before 1945 was revised by MUSIL (1972) and new materials was discribed by the same author (MUSIL & VALOCH, 1968; MUSIL, 1995). All Biharian bears were designated as *U. deningeri*.

3) **C 718 (Bohemian karst)**

Stratigraphy: Late Biharian 2 (FEJFAR & HORACEK, 1990); this is one glacial cycle probably at the end of biharian.

Stratigraphically significant taxa from this locality: *Allocricetus bursae* SCHAUB, *Pliomys episcopalis* MEHELY, *Mimomys savi - ni* HINTON, *Pitymys hintoni* KRETZOI,

Pitymys gregaloides HINTON, *Pitymys schmidtgeni* KRETZOI (according FEJFAR, 1961).

The others species of carnivores from this locality: *Canis mosbachensis* SOERGEL, *Vulpes angustidens* THENIUS, *Mustela palerminea* (PETENYI), *Meles atavus* KORMOS, *Xenocyon lycaonoides* KRETZOI, *Hyaena brevirostris* AYMARD, *Panthera fossilis* (VON REICHENAU), *Panthera gombaszoegensis* KRETZOI, *Felis* sp., *Lynx issiodorensis* (CROIZET & JOBERT), *Homotherium moravicum* (WOLDRICH) (according FEJFAR, 1961, WOLSAN, 1993 and MAZUCH, 1997)

This is a karst filling - relict of an extent cave entrance. It was studied by FEJFAR (1956, 1961 etc.). From this filling exist detailed description of layers and their micromammalian remains, therefore all record of bears collected by Fejfar is stratigraphically fixed.

From this locality two bear species were described: *U. deningeri* and a smaller form, which is usually reported as *U. mediterraneus* (of course, it could be a member of *Ursus* gr. *arctos* sensu MAZZA & RUSTIONY, 1994, in fact). The material is rich. It is partly deposited in Charles University (FEJFAR collection), partly in National Museum (PETRBOK collection) and a few pieces (about 14) in Museum of Bohemian karst in Beroun (LYSENKO collection).

4) **Stranska Skala cave (Brno)**

Stratigraphy: earlier part of Toringian (FEJFAR & HORACEK, 1990) (based on the micromammalian from cave clay)

Stratigraphically significant taxa from this locality: *Microtus gregalis* type "*gregaloides*", *Microtus arvalis* type "*arvaloides*",

Dicrostonyx simplicior, *Pliomys episcopolis* (according FEJFAR & HORACEK, 1990)

It is a spacious cave where a large number of bear remains was found just at the surface of deposits. These bears was determinated as *U. deningeri* (MUSIL, SEITEL in litt. ex FEJFAR & HORACEK, 1990). By MUSIL's opinion (MUSIL in litt.) the bears remains are of the Cromerian age (i.e. the late Biharian), the microfauna obtained from the deposits by HORACEK (in litt.) was apparently of the post-Biharian age.

5) Chlupacova sluj (Bohemian karst)

Stratigraphy: toringian (FEJFAR & HORACEK, 1990); in this cave are the interglacial and glacial deposits of Eemian and Weichselian

Interglacial micromammalian: *Microtus arvalis*, *Apodemus* sp., *Glis* sp. (FEJFAR in litt.)

The others species of integracially carnivores from this locality: *Vulpes* sp., *Panthera spelaea* (GOLDFUSS), *Crocota spelaea* (GOLDFUSS) (according MOSTECKY, 1969).

This is a remain of vertical karst cavity. It was discovered during limestone mining at the end of 19th or beginning of 20th century.

The R/W (= Eemian) interglacial bears were studied by MOSTECKY (1963) and determinated as *Ursus arctos taubachensis*. Besides the isolated tooth (e. g. 4x P⁴, 5x M¹, 7x M², 3x M₁, 2x M₂ and 2x M₃) and postcranial elements (published by MOSTECKY) a nearly complete skull is available from the interglacial layers of the site (HORACEK in litt.). The most of the items were collected in the sixties by J. Peterbok and latter by MOSTECKY.

The material is deposited in The National Museum Prague.

The Würmian (= Weichselian) finds are fairly poor. They were identified as *Ursus arctos* ssp. by MOSTECKY (1969). Between these two bear-containing stratas is a considerable time gap from which no bear remains are available (W 1-2) (MOSTECKY, 1969).

6) Cave "Barova" (Moravian karst)

Stratigraphy: Upper Toringian (sensu FEJFAR & HORACEK, 1990); Würm glacial (MUSIL, 1959)

This is a typical bear-cave. It was discovered in 1947. The section of the cave bearing a large concentration of cave bear bones was discovered in 1958 during the speleological investigation. The material was collected by R. MUSIL.

The most bear remains were in red-brownish (ferruginous) soil (W1-2). Anyhow, the bones were found also in the overlying layers but in much smaller concentration. Excavated were only the W1-2 remains. Tooth (e. g. 6x P⁴, 17x M¹, 22x M², 9x P₄, 12x M₁, 28x M₂ and 18x M₃) from this layer were studied by MUSIL (1959). The bears were determinated as *Ursus spelaeus*.

7) Cave "Sveduv stul" (Moravian karst)

Stratigraphy: Upper Toringian (sensu FEJFAR & HORACEK, 1990); Würm glacial (MUSIL, 1962)

The others species of carnivores from this locality: *Panthera pardus* (LINNAEUS), *Crocota spelaea* (GOLDFUSS), *Canis lupus* LINNAEUS, *Vulpes vulpes* (LINNAEUS), *Alopex lagopus* seu *corsac*, *Meles meles* (LINNAEUS) (according MUSIL, 1962).

This is a one of the typical palaeontological localities in Moravian karst. The investigation has begun here at the end of 19th century. This is a typical hyaena-cave. The results of the recent investigation (1953-1955) was published by MUSIL (1962).

The locality provided more than 700 tooth and some bones (not so many). All were dated to the Würmian, covering either W1-2 (+? R/W), W2, W2-3 and W3. The bear remains were found in all the stratas. The largest number of remains come from W1-2 (320 tooth) and W2 (343 tooth). Both *Ursus spelaeus* and *Ursus arctos* were determinated but most of remains belong to cave bear.

Worth of particular interest are some tooth from W1-2 and W2, called "tooth with simple morphology". They are assigned to cave bear, but have only main cusps, simple inner field and are mostly without cingulum. These characters states are even here quite a rare, of course.

8) Cave "Pod hradem" (Moravian Karst)

Stratigraphy: Upper Toringian (sensu FEJFAR & HORACEK, 1990); Würm glacial (MUSIL, 1965)

Stratigraphically significant taxa from this locality: *Citellus citellus* LINNAEUS, *Microtus gregalis* (PALLAS), *Microtus oeconomus* (PALLAS), *Microtus nivalis* (MARTIS) (according MUSIL, 1965)

The others species of carnivores from this locality: *Panthera spelaea* (GOLDFUSS), *Crocota spelaea* (GOLDFUSS), *Canis lupus* LINNAEUS, *Vulpes vulpes* (LINNAEUS), *Alopex lagopus* (LINNAEUS), *Martes* sp., *Mustela erminea* LINNAEUS, *Mustela nivalis* LINNAEUS,

Mustela cf. *minuta* (POMEL), *Putorius* cf. *putorius* (LINNAEUS) (according MUSIL, 1965)

The site known since the end of 19th century was newly studied during 1956-1958 by MUSIL (1965).

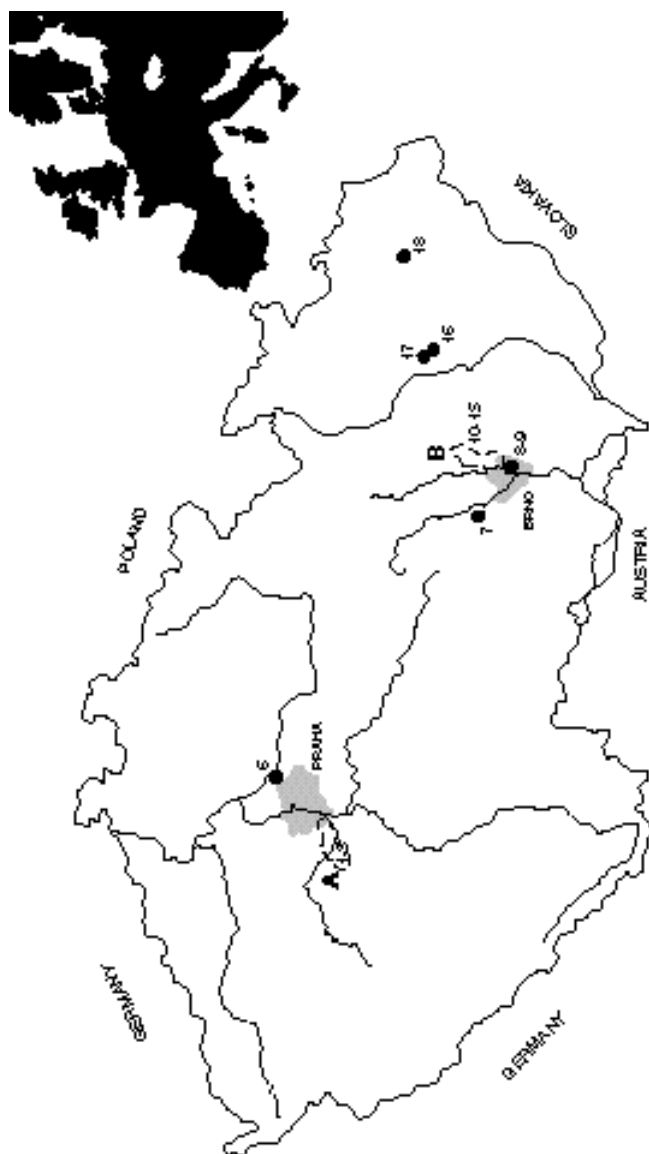
The Pleistocene layers were subdivided into 5 sections (W1, W1-2, W2, W2-3, W3). All these stratas were fossiliferous, and, in general, quite a large collection of bears was obtained from this locality. The most of remains belong to *Ursus spelaeus*, a few finds (remains of three mandibles) from W₁₋₂ were designated as *Ursus arctos priscus*. Teeth and bones were described in details by MUSIL (1965) who compared them with those of the cave bears from "Barova" cave and "Sveduv stul" and demonstrated morphometric changes during Pleistocene in morphometric patterns of cave bear populations and morphometric differences between separate populations of this species over such a small area as that of the Moravian karst. The morphogenetic analysis of cave bears from cave "Pod hradem" was further undertaken by G. RABEDER (1989).

9) Predmosti near Prerov

Stratigraphy: Upper Toringian (sensu FEJFAR & HORACEK, 1990); würm (MUSIL, 1965)

This locality ranks among the classical palaeontological and archaeological locality. The records come from an extensive loess deposit very rich in fossil remains (the station of the Mammoth hunters). The bear material was revised by MUSIL (1964).

The former descriptions coincided the bear material with *Ursus spelaeus*. During revision by MUSIL also a larger



A - BOHEMIAN KARST, B - MORAVIAN KARST

Figure 2. Map of some interesting localities in the Czech Republic:

1 - C 718 (FEJFAR, 1961, +); 2 - Koneprusy caves (FEJFAR in litt., +); 3 - Chlupacova sluj (MOSTECKÝ, 1963, *); 4 - Chlum IV (FEJFAR, 1961, +); 5 - cave Nad Kacákem (PETRBOK, 1956, *); 6 - Prezletice (FEJFAR, 1993, +); 7 - Lazanky near Tisnov (MUSIL, 1974, +); 8 - Stránská Skála (MUSIL & VALOCH, 1968, +); 9 - Stránská Skála cave (FEJFAR & HORACEK, 1990, *); 10 - cave Svedchv stul (MUSIL, 1962, *); 11 - Vypustek cave (KRIZ, 1893, *); 12 - cave Barova (MUSIL, 1959, *); 13 - Holštejn (MUSIL, 1966, +); 14 - cave Pod hradem (MUSIL, 1966, *); 15 - Sloupské caves (SEITEL, 1998, *); 16 - Tucín (FEJFAR in litt., *); 17 - Předmostí near Přerov (MUSIL, 1964, *); 18 - cave Šipka (MUSIL, 1965, *). + - localities of the Biharian age; * - localities of the Toringian age.
Ursus sp. L.: 13; *Ursus deningeri*: 1, 2Q; 4, 7, 8, 9; *Ursus "mediterraneus"*: 1, 4, 6; *Ursus* sp. II: 16; *Ursus arctos*: 3 (*taxibachensis*), 5, 14, 17 (*pris-cus*), 10, 18; *Ursus spelaeus*: 5, 10, 11, 12, 14, 15, 17, 18.

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