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LATE PLEISTOCENE CAVE BEARS (*URSUS* EX GR. *SPELAEUS*) FROM THE MEDVEDIA CAVE IN THE JÁNSKA VALLEY (THE LOW TATRAS MTS., SLOVAKIA)

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M. Sabol – E. Kozáková – Ľ. Sliva: Late Pleistocene Cave bears (*Ursus* ex gr. *spelaeus*) from the Medvedia Cave in the Jánska Valley (the Low Tatras Mts., Slovakia)

Abstract: The Medvedia Cave in the Jánska Valley represents a new site of cave bears from the *spelaeus*-group within the territory of the Low Tatras Mts. (northern Slovakia). During the field campaign in 2002 – 2004, fossil remains of minimally 8 individuals of the Late Pleistocene cave bears have been found, representing probably a yearling/juvenile-dominated, non-violent assemblage with prevalence of females.

Key words: Cave bears, Last Glacial, Medvedia Cave, Low Tatras Mts., Slovakia

INTRODUCTION

Fossils of cave bears from the *spelaeus*-group are known from many sites, situated from Spain as far as the European part of Russia. Among the areas with the largest occurrence of cave bear fossils belong the Pyrenees, Dordogne in France, Liguria in Italy, the Alps, the Franconian Jura, Sauerland and Harz in Germany, Trieste Karst and Dalmatia in Slovenia and Croatia, Transylvania in Romania, Cracow Karst in Poland, Odessa surroundings and Crimea in Ukraine, the Caucasus, and the Urals (Rabeder et al., 2000) together with Moravia Karst and the Carpathians as well.

Within the Western Carpathians in Slovakia, the territory of the Low Tatras Mts. is well known by occurrence of extensive karst areas with the presence of large spacious caves or cave systems respectively. Besides world-famous caves of the Demänovská Valley, some others have also been discovered in the neighbouring Jánska Valley, representing one of the oldest stages of the local karst evolution.

The larger quantity of cave bear fossils in this mountain territory have been found so far in Late Pleistocene cave deposits of Demänovská Valley (Volko-Starohorský, 1927; Sabol, 2000, 2002; Sabol and Struhár, 2003), whereas fossil remains of bears occurred more or less sporadic in caves of the Jánska Valley up to the discovery of horizontal corridors in the Medvedia Cave. The cave represents today one of the most important cave bear sites in the Low Tatras Mts.

LOCALITY

The Medvedia Cave (or Zimná Cave) is situated on the northern slopes of the Low Tatras Mts. in the abovementioned valley within local area of Liptovský Ján village

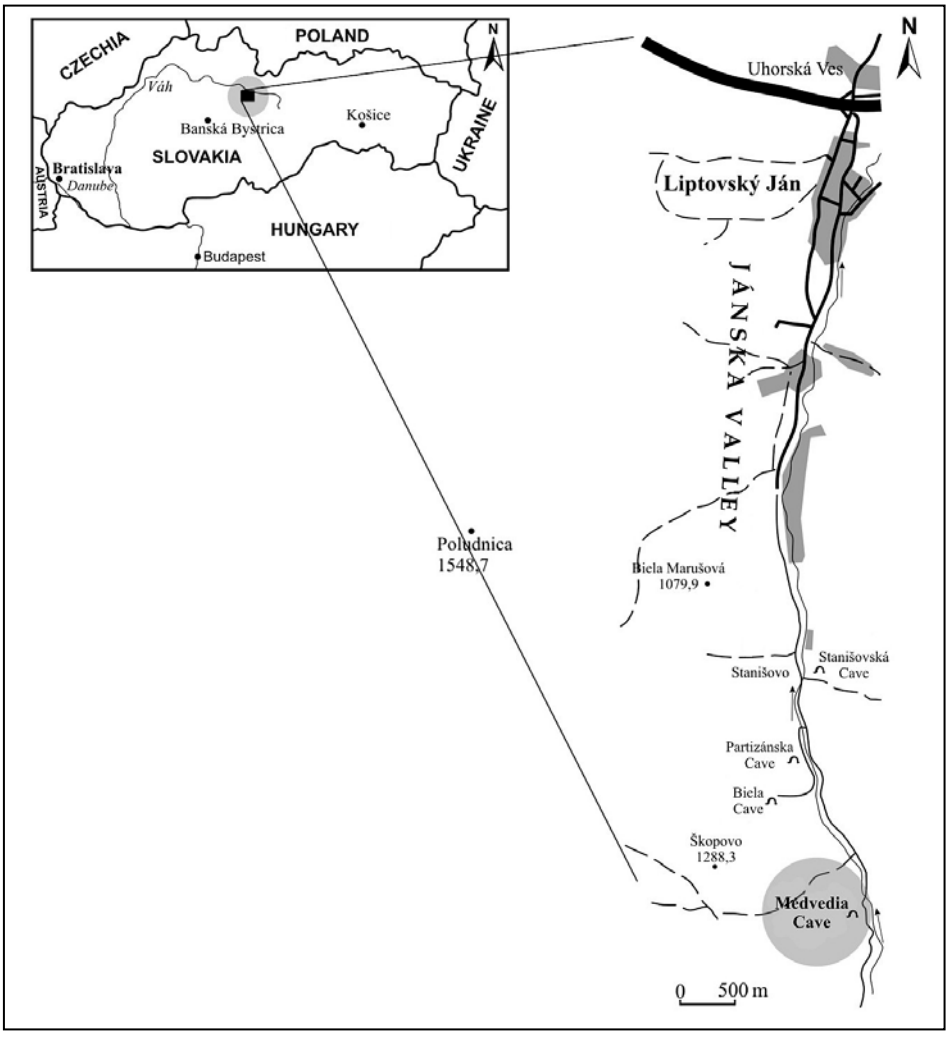

Fig. 1. Location of the Medvedia Cave in the Jánska Valley (the Low Tatras Mts.).
Obr. 1. Lokalizácia Medvedej jaskyne v Jánskej doline (Nízke Tatry).

(Fig. 1). It is inactive, fluviokarst cave of the breakdown type, which entrance is situated 878 m above the sea level. The cave (Fig. 2) is 1,420 m long and 44 m deep (Bella et al., 2007). It represents a fragment of extensive cave system with potential connection to the near Jaskyňa zlomísk Cave, approximately 11 km long (Marušin, 2003).

The cave is developed within the rock massif, consisting mainly of the Middle Triassic Gutenstein limestone. From sedimentary viewpoint, the cave fill consists of both the allochthonous (fluvial granite sand, gravels and loam) and the autochthonous elements (collapse debris and chemogenous cave deposits). The fossiliferous deposits form the Late Pleistocene sedimentary complex (probably from the Last Glacial), consisting of sandy to loamy sediments with fossils of cave bears. They are usually found in the cave part, known as Medvedí cintorín ("Bear Cemetery"). The underlying lower fluvial deposits, known from the profile in the Jazerná chodba ("Lake Passage"), represent probably an older sedimentary event, correlated with palaeomagnetic chron Matuyama (Kadlec et al., 2004).

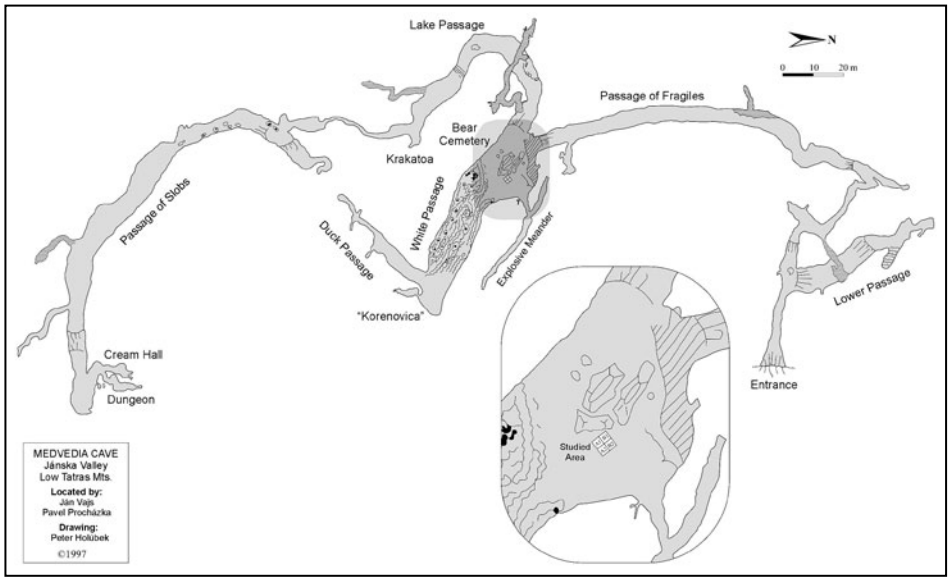

Fig. 2. The Medvedia Cave in the Jánska Valley (the Low Tatras Mts.) with detail view on the area under study – Medvedí cintorín ("Bear Cemetery") (modified according to Holúbek).
Obr. 2. Medvedia jaskyňa v Jánskej doline (Nízke Tatry) s detailom na skúmanú plochu v časti Medvedí cintorín (upravené podľa Holúbeka).

The first, who states the cave in scientific literature, was Droppa in 1959. He described, however, the cave in more morphological details only in 1972, when he named it as the Zimná Cave. The first speleological description of the cave has been published by Vajs in 1991. He also discussed its history (1994) and a possibility of connection with the Jaskyňa zlomísk Cave (1996). Together with Procházka (1998), they carried out the revisory location of the cave.

The cave served as a den of cave bears for certain time usually during the Last Glacial. Their fossil bones have been accumulated by occasional flow (probably by water from karst chimneys), mainly in the Medvedí cintorín. In this cave part, a palaeontological excavation has been realized since 2002 up to 2004. During the excavation, the L-shaped vertical pit has been dug out as the first one with two profiles: M-5a with depth up to 0.9 m and M-5b with depth only to 0.5 m (Fig. 3). Later,

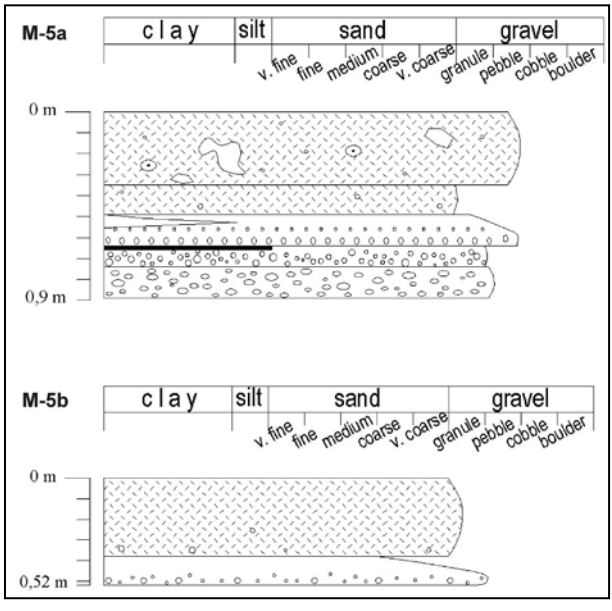

Fig. 3. Sedimentological profiles of M-5a and M-5b.
Obr. 3. Sedimentologické profily sond M-5a a M-5b.

a horizontal pit has been dug out in a place bounded by vertical one. The lower part of the profiles consists of gravels and sand of the riverbed facies of an occasional underground flow. These deposits only represent a filling of the highest riverbed part, where the dynamics of the flow was relatively weak. Based on the analogy with the upper cave floor, it is assumed that basal part of the passage infill consists of boulder-shaped granite gravels. The upper profile part is formed by not assorted loam with an admixture of tiny pebbles and rock fall. This part of the both profiles, containing also fossils of vertebrates, is considerable redeposited.

Based on the cave sedimentary filling in the Jazerná chodba, three different evolution stages of the cave level can be distinguished: 1. A period of active evolution of the cave level – during this period, passages of the cave level have been formed and filled up by deposits of permanent underground stream(-s); 2. A period of predominantly inactive evolution of the cave level – during this period, passages of the cave level have already been situated above the erosive base of underground stream and bones of cave bears have only been transported for a short distance as lightweight material within the fine loamy-sandy sediment, which was accumulated by occasional flows; 3. A period of inactive evolution of the cave level – recent condition of the cave level, situated high above the flow erosive base and also out of reach the floodwater (Sabol et al., 2001). From the viewpoint of the forming of fossiliferous bed, the second period is the most important.

MATERIAL AND METHODS

The research took place at the excavation square area (2 × 2 m) within the Medvedí cintorín cave part. The area has been divided to four quadrants A1, A2, B1 and B2 (Fig. 2) with size one by one metre. The fossils have been exposed up to the depth approximately 50 cm and documented in detail after each 10 cm.

During the whole field campaign, 134 teeth or their fragments, 55 cranium fragments, 17 mandible fragments and 412 elements of the postcranial skeleton or their fragments of cave bears have been found in the fossiliferous deposits of the area under study. The largest quantity of fossils has been situated on the surface or in sediment up to the depth approximately 30 cm.

All material was studied in the Department of Geology and Palaeontology, Comenius University in Bratislava and now it is housed in the Slovak Museum of Natural Protection and Speleology in Liptovský Mikuláš. During the study of found cave bear fossils, the morphometric, morphodynamic, and taphonomic analyses have been used. Within the morphometric analysis, measurements were taken to the nearest 0.1 mm using engineering vernier callipers. The basic morphological terminology and the measure methods of cave bear fossils have been borrowed from Gonzáles (2003) and Withalm (2001; for metapodial bones). For determination of evolutionary level of cave bear teeth, the morphodynamic analysis (Rabeder, 1983, 1999) of premolars has been realized. It was also used for determination of approximate age of fossils since the radiometric dating of a cave bear fossil (left tibia) from the site in the VERA-Laboratory (Vienna) was abortive (see below). The taphonomic analysis has been used for the determination of age structure of studied bear assemblage, for the specification of basic quantitative data (MNI, MNE, NISP), for the identification of various phenomena on the fossils caused by both the mechanical and the chemical factors during the deposition of taphocoenosis, and for the ascertainment of influence of biotic agents, such as diseases or activity of predators (wolves, hyenas, lions).

Within the text, the upper teeth are referred to by capitals, as in “P4”, the lower ones by normal letters, as in “p4”, and the deciduous teeth by D/d, as in “DC” or “dc” (with “s” at the end in the plural, as in “I1s” or “i1s”).

MORPHOMETRIC ANALYSIS OF TEETH

The sample of teeth consists of 5 I1, 7 I2, 6 I3, 6 i1, 3 i2, 7 i3, 3 fragments of incisors, 4 DC/dc, 8 C, 5 c, 13 canine fragments, 7 P4, 5 p4, 10 M1, 9 M2, 15 m1, 12 m2, 7 m3, and 2 fragments of molars. Their mostly unworn and undamaged crowns are coloured to various shades of white, yellow and brown. The measurements of teeth are given in Tab. 1.

The main cusp of five **I1s** is distinct. The mesial cusp is larger than distal one, though it can be shorter and the both cusps are more or less crest-shaped. The root of several these incisors is weakly deformed on its distal side. Also crown of seven **I2s** consists of the distinct main cusp bordered by mesial and distal cusps. The mesial cusp is as large as distal one or it is somewhat larger, and the both accessory cusps are crest-shaped. Whereas the mesial cusp can be serrated, the distal one is divided by shallow depression to two parts. The root of the most these incisors is still open on its base. A dominant crown feature of six **I3s** is relatively sharp main cusp faintly inflexed lingually, with mesial bifurcated crest – its back arm is passing into a basal cingulum on the mesial side with cusp-indication and its distal arm is passing into a weak disto-lingual cingulum. The root of the third upper incisors can be a coarse on the lingual side below the crown. The protoconid of six **i1s** is distinct, separated from the conspicuous distoconid by relatively deep notch. Instead of absent mesioconid, a facet is present. A weak basal cingulum is situated on the lingual side. Only three **i2s** are preserved. Their morphology is similar to that of i1s except for the mesioconid, which can be developed as a blunt hump with weak basal cingulum passing into a lingual one. Also protoconid and distoconid of seven **i3s** are distinct, although the latter cusp is blunt with posterior (folded?) ridge or four small accessory cusps on its posterior margin. The main cusp can be folded on both the labial and the lingual sides. The mesioconid is not conspicuous or it is only developed as a blunt ridge. A weak basal cingulum can be present on the lingual side. Preserved roots of two i3s are distally inflexed. Sample of incisors also contains fragments of one lower and two upper teeth with damaged or worn crown.

The well-preserved crowns of some of seven found **upper canines** show the presence of aboral and antero-mesial crests. An aboral crest is also weakly developed at the aboral crown side of five **lower canines**, preserved mostly in fragments of mandibles. Except measurable canines, the studied sample contains also three to four deciduous ones and 14 fragments of permanent canines, consisting mainly of unworn (hollow in some cases) crown parts.

The morphology of premolars is mirrored in their determination to single morphotypes, constituted by Rabeder (1983). From seven found **P4s**, three teeth represent the morphotype A (basal tricuspid morphotype without accessory cusps or crests between the main cusps), two premolars probably belong to the morphotype C (slightly derived morphotype with metaconule and with accessory cusp situated mesio-lingually from the protocone), and morphology of one P4 indicates probably the morphotype B (slightly derived morphotype with metaconule). The crown of one upper premolar is distinctly worn and so unusable for the determination of morphotype. The morphotype C3 (slightly derived morphotype, consisting of protoconid, paraconid, metaconid, hypoconid and entoconid) dominates among four determinable **p4s** since one found lower premolar is broken off on its lingual side. The morphotypes B2 (basal morphotype with protoconid, paraconid and hypoconid) and B3 (as B2, but with developed entoconid) are represented by one lower premolar only.

The crown of most **M1s** consists of the conspicuous smooth-walled paracone with anteriorly situated parastyle, the lower metacone with crest-shaped or smooth inner side and with metastyle at the back, the undivided protocone, the small mesocone, the distinct hypocone with a posterior accessory cusp in two cases, the cusp-shaped middle area and the

distinct basal cingulum, developed only more or less on the lingual side. An accessory cusp (mesostyle) is also developed between the paracone and the metacone at the crown of one M1 and tooth decay (?) was found in the place of hypocone of another molar.

Only two of nine **M2s** have not developed a small parastyle in front of the robust paracone, mostly with crest(-s) on its inner side, passing into its undulated base. In one molar, the posterior and medial accessory cusps are present near the paracone. The lower, lesser, and more cone-shaped metacone (mostly with small anterior cusp and without inner crests) is separated from metastyle by one or two blunt accessory cusps. The protocone is mostly divided by a notch to larger anterior part and smaller posterior part; only in two molars it consists of three cusps. The conspicuous hypocone with a posterior accessory cusp is larger than posteriorly situated posthypocone, sporadically with one-two accessory cusps behind it. The talon is rounded (except one molar, where it forms an angle), with three to eight accessory cusps at posterior crown margin. Small cuspids form also the central crown area, mainly in its posterior part. The distinct basal cingulum is developed only on the antero-lingual side of molars.

The distinct paraconid of the most of **m1s** with the sporadically developed paralophid is separated from both the protoconid and the metaconid by a notch or by a narrow valley. The cone-shaped protoconid is robust with the distinguishable mesoconid behind it. The mesoconid is developed either as a crest-shaped cusp or it consists of three small cuspids. One-two mesial metastylids and one distal metastylid surround the massive metaconid with curious development of posterior crest in one molar, turning at right angle into the central part of the crown and then extending almost to the entoconid. At the inner side of the distinct hypoconid, the conspicuous enthypoconid is present, mostly divided to two parts (morphotype C according to Rabeder et al., 2004). The entoconid consists of two cusps, anterior of which is frequently smaller than posterior one. The mesostylid between the metaconid and the entoconid is almost always developed. The cusp-shaped hypoconulid is situated on the posterior crown margin, frequently separated from the entoconid by one-two small accessory cusps. The basal cingulum, commonly present on buccal side, is also developed on lingual side below the paraconid at one molar.

Whereas the paraconid of the most **m2s** is indistinguishable from accessory cusps on the anterior margin of crowns, the metaconid is distinct with variable number of metastylids. Generally, there are developed one to four mesial metastylids, one to two distal ones and rarely one small parietal metastylid, representing seven basic morphotypes. The dominant of them, however, consists of one mesial metastylid as large as distal one and/or one small parietal metastylid. The crest-shaped entmetaconid is divided from the opposite entprotoconid by a notch. The protoconid with

Tab. 1. Crown length (L) and crown width (W) of cave bear teeth (longitudinal and transverse diameter of crown in the case of incisors and canines) from the Medvedia Cave in the Jánska Valley.
Tab. 1. Dĺžka korunky (L) a šírka korunky (W) zubov jaskynných medveďov (pozdĺžny a priečny priemer korunky v prípade rezákov a špiciakov) z Medvedej jaskyne v Jánskej doline.

tooth	N	L			W		
		min.	**max.**	**Ø**	**min.**	**max.**	**Ø**
I1	4	8.0	10.1	9.2	7.4	7.7	7.5
I2	6	8.6	12.6	11.0	7.9	11.8	9.5
I3	5	12.5	18.6	15.1	12.8	17.8	15.1
i1	5	7.5	9.5	8.3	3.8	5.9	4.9
i2	2	10.2	11.6	10.9	5.6	8.9	7.3
i3	6	10.7	11.8	11.3	5.5	10.2	7.4
C	8	19.7	25.1	21.4	15.2	21.5	17.2
c	3	19.1	25.1	21.7	14.3	20.0	17.1
P4	7	17.6	20.6	18.3	12.6	14.9	13.4
p4	4	12.3	15.0	13.8	7.9	9.0	8.6
M1	10	25.3	31.8	27.0	16.6	22.1	18.4
M2	8	36.2	50.8	43.9	19.4	23.3	21.5
m1	10	25.3	33.2	28.1	11.0	17.6	13.6
m2	10	26.0	31.4	28,2	15.5	20.0	17.3
m3	7	21.8	30.0	24.4	17.0	22.0	19.2

distinct posterior crest-shaped mesolophid is not so large as the metaconid. On the inner side of the low hypoconid, the cusp-shaped (rarely crest-shaped), mostly undivided enthypoconid (morphotype B according to Rabeder et al., 2004) is present. Anteriorly situated hypostylid of seven molars is mostly crest-shaped, although it is developed as a bicuspid cusp in one case as well. Only one m2 contains the non-divided entoconid, whereas at other molars it consists of two cusps, rarely with small accessory cusp in between. In the most cases, the anterior entoconid cusp is approximately as large as the posterior one, or somewhat smaller, divided from the metaconid complex mostly by tiny mesostylid. The hypoconid forms together with some posterior accessory cusps the posterior crown margin of m2s, the central area of which was initially cusp-shaped. The cingulum is mainly distinguishable on the base of buccal side only.

Also crown morphology of seven **m3s** is well conspicuous, consisting mostly of the non-divided metaconid with anterior and posterior accessory cusp(-s), the varying entoconid, the blunt protoconid with distinct mesolophid and rare crest- to bump-shaped entprotoconid, and the distinct hypoconid with anterior accessory cusp(-s) and posterior crest-shaped lophid(-s). The central area of molars is cusp-shaped and the cingulum is only indicated on the base of antero-buccal side of some m3s.

MORPHOMETRIC ANALYSIS OF CRANIAL SKELETON

Cranial skeleton (Pl. 1 and 2) is very fragmentary preserved, consisting of 54 fragments of skull bones, 14 fragments of lower jaws, and only 3 more or less entirely preserved mandibles.

The most of **skull bones** is represented by fragments of neurocranium (mainly of temporal bones), belonging mostly to juveniles (minimally seven individuals, Pl. 1.3). Among the best preserved cranial elements, a fragment of viscerocranium of prime adult male can be assigned, consisting mainly of left lacrimal bone, left maxilla, palatinal bones and praemaxilla with I1-2 dext. et sin., I3 sin., C sin., P4 sin., M1 sin., and M2 sin. (Pl. 1.2a-b). Some other fragments of praemaxillas, jugals and basicranial bones form the rest of found cranial fossils.

Fragments of **mandibles** (Tab. 2) belong mainly to juveniles, only two fragments pertain to adult individuals and one-two fragments can be asigned to neonates (Pl. 2.1a-b). The most of mandibular fragments consists of molar part of the jaw body, the posterior part is preserved only in four specimens.

All three more or less entirely found branches of lower jaws belong to adults (two prime adults and one senile one, Pl. 2.2-3). Their coronoid processes are partly broken off, condylar processes are relatively long, and angular processes are distinct developed (if preserved) together with subangular ones (except one specimen) with obvious tuberosity on their inner sides. The

Tab. 2. Measurements of cave bear mandibles from the Medvedia Cave in the Jánska Valley.
Tab. 2. Rozmery sánok medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

mandibles (juveniles)	**N**	**min.**	**max.**	**Ø**
mandible height	1	–	–	85.20
length of condylar p. – angular p.	1	–	–	38.70
mandible height in the place of m1	2	27.60	31.80	29.70
mandibles (adults)	**N**	**min.**	**max.**	**Ø**
mandible length	2	307.50	367.55	337.53
mandible height	1	–	–	144.00
length of condylar p. – angular p.	2	60.50	60.80	60.65
mandible height in the place of m1	3	52.45	65.50	59.75
height of canine crowns	1	–	–	28.50
p4 – m3 length	2	93.90	109.30	101.60
c – m3 length	2	160.05	185.50	172.78

number of mental foramina ranges from two to four, the mandibular foramen is relatively large, and external temporal fossa is relatively shallow with distinct narrow basal horizontal shelf. In one specimen, linear tuberosity is present on outer side between subangular process and lower border of external temporal fossa, forming a two-rowed blunt ridge. In another one, narrow shallow grooves of unknown origin are situated there.

MORPHOMETRIC ANALYSIS OF POSTCRANIAL SKELETON

Similarly to cranial skeleton, the postcranial fossil finds are also very fragmentary represented. Only a few bones have been excavated unbroken. Overall, 44 vertebrae or their fragments, 16 longer fragments of ribs, 11 fragments of shoulder blades, 37 humera or their fragments (2 fragments of proximal epiphyses, 19 fragments of distal epihyses and 10 diaphyseal fragments), 16 fragments of ulnae (minimally 10 fragments of proximal bone part), 14 fragment of radii (6 fragments of proximal epiphyses, 3 fragments of distal epihyses and 5 diaphyseal fragments), 8 carpal bones, 23 metacarpals, 9 fragments of pelvis, 20 thighbone fragments (9 fragments of proximal epiphyses, 5 fragments of distal epihyses and 6 diaphyseal fragments), 18 fragments of shinbones (7 fragments of proximal epiphyses, 9 fragments of distal epihyses and 2 diaphyseal fragments), 6 fragments of fibulae (1 fragments of proximal epiphyses, 2 fragments of distal epihyses and 3 diaphyseal fragments), 6 heel bones, 3 anklebones, 25 tarsal

Tab. 3. Number of cave bear postcranial elements from the Medvedia Cave in the Jánska Valley.
Tab. 3. Počet postkraniálnych elementov medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

Bones	NISP	MNE	MNI	neonates	juveniles	subadults	adults
atlas	4	4	4	–	–	–	4
axis	1	1	1	–	1	–	–
v. thoracicae	11	11	?	–	–	–	11
v. lumbales	14	14	?	–	2	1	10
v. caudales	14	14	?	1	–	4	9
costae (fr.)	16	15	?	1	1	–	14
scapula	11	11	2	–	2	–	8
humerus	37	35	19	2	9	8	17
ulna	16	15	9	–	4	2	10
radius	14	13	6	–	1	–	13
carpals	8	8	4	–	–	–	8
Mc	23	23	12	–	–	5	18
pelvis	9	9	2	–	–	–	8
femur	20	17	8	1	6	9	4
tibia	18	17	7	–	8	4	6
fibula	6	6	2	–	–	–	6
calcaneus	6	6	3	–	–	1	5
talus	3	3	2	–	–	–	3
tarsals	25	25	?	–	1	–	24
Mt	22	22	13	–	–	4	18
phalanges	72	72	?	1	2	10	59
os penis	5	5	5?	–	–	–	5
fragments	57	56	?	3	7	4	31

bones, 22 metatarsals, 72 phalanges, 5 pieces of *os penis*, and 57 bone fragments have been studied (Tabs. 3-13). All postcranial bones or their fragments are coloured from white-grey to dark-brown. From morphological point of view, the small bones, such as caudal vertebrae, carpal bones or phalanges, are the best preserved because of their smaller measurements. To the contrary, the long bones (including ribs) and bones with distinct protuberances, such as thoracic and lumbar vertebrae or shoulder blade, are very frequently preserved in fragments of their diaphyseal or epiphyseal parts. In spite of that, all found postcranial fossils show no differences in comparison with postcranial elements of cave bears from other European sites.

Tab. 4. Measurements of cave bear vertebrae from the Medvedia Cave in the Jánska Valley.
Tab. 4. Rozmery stavcov medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

vertebrae	atlas				vertebrae caudales			
	N	min.	max.	Ø	N	min.	max.	Ø
maximum anteroposterior length	1	–	–	53.60	1	–	–	37.50
maximum width of body	–	–	–	–	4	11.25	25.15	18.69
minimum width of body	–	–	–	–	6	9.85	23.15	15.06
length of the dorsal arch	1	–	–	23.50	–	–	–	–
max. transversal diameter of the posterior articular surfaces	2	43.80	68.70	56.25	–	–	–	–
dorsal-ventral diameter of body	2	39.25	42.95	41.10	–	–	–	–
vertebrae	**vertebrae thoracicae**				**vertebrae lumbales**			
	N	**min.**	**max.**	**Ø**	**N**	**min.**	**max.**	**Ø**
maximum height of vertebra	1	–	–	72.75	2	125.00	145.50	135.25
prezygapophysis – postzygapophysis length	1	–	–	72.85	–	–	–	–
maximum width of body	5	38.00	69.25	55.65	13	26.3	66.10	54.49
minimum width of body	2	37.00	37.95	37.48	6	32.25	63.85	53.48
maximum height of body	2	34.30	43.65	38.98	7	21.40	62.55	48.46
minimum height of body	2	34.65	42.15	38.40	9	20.55	56.35	43.95

Tab. 5. Measurements of cave bear humera from the Medvedia Cave in the Jánska Valley.
Tab. 5. Rozmery ramenných kostí medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

humerus	neonates – juveniles				adults			
	N	min.	max.	Ø	N	min.	max.	Ø
maximum length	–	–	–	–	2	380.00	417.35	398.68
maximum anteroposterior diameter of the head	–	–	–	–	2	77.30	92.95	85.13
maximum transversal diameter of the head	–	–	–	–	2	65.00	94.45	79.73
max. transversal diameter of the proximal epiphysis	1	–	–	12.45	2	74.50	85.25	79.88
transversal diameter of the diaphysis (proximal)	6	6.95	22.65	14.97	6	29.80	49.50	38.12
transversal diameter of the diaphysis (distal)	9	7.05	21.30	15.17	9	25.6	39.40	32.52
maximum transversal diameter of the distal epiphysis	1	–	–	14.25	4	107.80	125.10	118.66
maximum height of the trochlea	–	–	–	–	7	25.35	41.80	32.27
upper transversal diameter of the trochlea	–	–	–	–	6	59.85	76.95	68.43
lower transversal diameter of the trochlea	–	–	–	–	5	69.35	99.30	85.24

Tab. 6. Measurements of cave bear ulnae from the Medvedia Cave in the Jánska Valley.
Tab. 6. Rozmery lakťových kostí medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

ulna	neonates – juveniles				adults			
	N	min.	max.	Ø	N	min.	max.	Ø
height of the sigmoid cavity	–	–	–	–	5	38.95	48.15	42.85
min. anteroposterior diameter at height of sigmoid cavity	1	–	–	21.35	4	33.05	46.85	38.04
min. transversal diameter at height of sigmoid cavity	–	–	–	–	5	23.50	38.60	33.42
maximum width of the sigmoid cavity	–	–	–	–	1	–	–	44.20
maximum anteroposterior diameter of the olecranon	–	–	–	–	1	–	–	77.95
maximum transversal diameter of the olecranon	–	–	–	–	2	73.10	79.65	76.38
height of the anterior apophysis of the olecranon	–	–	–	–	4	30.50	37.10	33.98
anteroposterior diameter of the diaphysis	2	14.35	18.15	16.25	3	34.55	45.05	40.97

Tab. 7. Measurements of cave bear radii from the Medvedia Cave in the Jánska Valley.
Tab. 7. Rozmery vretenných kostí medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

radius	adults			
	N	min.	max.	Ø
maximum length	1	–	–	319.00
max. anteroposterior diameter of the head	4	40.85	49.50	44.51
max. transversal diameter of the head	4	30.00	35.05	32.40
anteroposterior diameter of the neck	5	28.85	33.45	29.72
anteroposterior diameter of the proximal articular surface	4	37.95	43.60	40.08
anteroposterior diameter of the distal articular surface	3	37.25	52.55	43.28
transversal diameter of the distal articular surface	1	–	–	38.75
anteroposterior diameter of the diaphysis	6	25.75	33.45	27.84
max. anteroposterior diameter of the distal epiphysis	1	–	–	58.60
max. transversal diameter of the distal epiphysis	1	–	–	38.75

Tab. 8. Measurements of cave bear carpal bones from the Medvedia Cave in the Jánska Valley.
Tab. 8. Rozmery karpálnych kostí medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

carpal bones	scapholunatum			
	N	min.	max.	Ø
maximum anteroposterior diameter	2	55.25	59.80	57.53
maximum transversal diameter	2	50.35	50.70	50.53
maximum vertical diameter	1	–	–	29.80
carpal bones	**pisiform**			
	N	**min.**	**max.**	**Ø**
maximum anteroposterior diameter	1	–	–	46.55
maximum transversal diameter	1	–	–	33.30
maximum vertical diameter	–	–	–	–
carpal bones	**capitatum**			
	N	**min.**	**max.**	**Ø**
maximum anteroposterior diameter	2	30.00	33.85	31.93
maximum transversal diameter	2	18.65	18.75	18.70
maximum vertical diameter	2	28.05	28.15	28.10

Tab. 9. Measurements of cave bear thighbones from the Medvedia Cave in the Jánska Valley.
Tab. 9. Rozmery stehnových kostí medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

femur	neonates – juveniles				adults			
	N	min.	max.	Ø	N	min.	max.	Ø
intertrochanter distance	–	–	–	–	2	74.20	96.00	85.10
length of the neck	1	–	–	22.44	2	70,40	81.85	76.13
transversal diameter of the head	–	–	–	–	4	47.05	56.25	51.14
max. transversal diameter of the proximal epiphysis	–	–	–	–	3	117.40	122.05	120.45
min. transversal diameter of the diaphysis	7	4.95	23.00	16.24	4	26.85	45.75	39.83
max. anteroposterior diameter of the distal epiphysis	–	–	–	–	1	–	–	67.90
lower diameter of the distal articular surface	–	–	–	–	2	41.50	43.15	42.33
transversal diameter of the epicondyles	–	–	–	–	1	–	–	92,75
distance between epicondyles	–	–	–	–	1	–	–	16,85

Tab. 10. Measurements of cave bear shinbones from the Medvedia Cave in the Jánska Valley.
Tab. 10. Rozmery holenných kostí medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

tibia	neonates – juveniles				adults			
	N	min.	max.	Ø	N	min.	max.	Ø
maximum length	–	–	–	–	1	–	–	46,95
length of the crest of tibia	1	–	–	21.95	2	42.40	44.45	43.43
distance between tubercles of the intercondylear spine	–	–	–	–	2	15.75	17.65	16.70
max. anteroposterior diameter of the proximal epiphysis	–	–	–	–	2	65.35	71.05	68.20
max. transversal diameter of the proximal epiphysis	2	5.95	19.55	12.75	2	83.50	86.35	84.93
breadth of the poplitea cavity	–	–	–	–	1	–	–	10,85
maximum transversal diameter of the diaphysis	5	11.35	20.90	16.23	4	27.30	35.45	30.05
max. anteroposterior diameter of the distal epiphysis	–	–	–	–	2	46.00	57.35	51.68
max. transversal diameter of the distal epiphysis	–	–	–	–	2	37.65	64.20	50.93
anteroposterior diameter of the distal articular surface	–	–	–	–	2	36.95	43.65	40.30
transversal diameter of the distal articular surface	–	–	–	–	2	24.45	31.95	28.20

Tab. 11. Measurements of cave bear fibulae from the Medvedia Cave in the Jánska Valley.
Tab. 11. Rozmery lýtkových kostí medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

fibula	adults			
	N	min.	max.	Ø
transversal diameter of the external malleolus	2	28.75	32.85	30.80
transversal diameter of the diaphysis	2	11.45	28.05	19.75

Tab. 12. Measurements of cave bear tarsal bones from the Medvedia Cave in the Jánska Valley.
Tab. 12. Rozmery tarzálnych kostí medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

tarsal bones	calcaneus				astragalus			
	N	min.	max.	Ø	N	min.	max.	Ø
maximum height	4	85.55	104.85	93.80	–	–	–	–
height of the tuberosity	4	42.65	64.45	52.75	–	–	–	–
anteroposterior diameter of the tuberosity	5	33.75	40.65	38.92	–	–	–	–
transversal diameter of the tuberosity	5	33.65	38.35	35.70	–	–	–	–
maximum anteroposterior diameter	3	47.00	48.50	47.85	2	60.60	62.20	61.40
maximum transversal diameter	2	58.20	63.40	60.80	1	–	–	68.10
tarsal bones	**escaphoid**				**cuneiform I**			
	N	**min.**	**max.**	**Ø**	**N**	**min.**	**max.**	**Ø**
maximum anteroposterior diameter	3	36.05	40.85	39.18	3	25.35	28.95	27.68
maximum transversal diameter	4	41.00	45.75	43.80	3	14.15	15.85	15.18
maximum vertical diameter	–	–	–	–	3	11.75	17.55	15.42
tarsal bones	**cuneiform II**				**cuneiform III**			
	N	**min.**	**max.**	**Ø**	**N**	**min.**	**max.**	**Ø**
maximum anteroposterior diameter	12	13.00	27.85	20.73	1	–	–	28.85
maximum transversal diameter	12	9.05	16.75	11.15	3	14.95	21.55	19.08
maximum vertical diameter	12	9.00	14.25	10.60	3	11.55	14.95	13.72

Tab. 13. Measurements of cave bear metapodial bones from the Medvedia Cave in the Jánska Valley.
Tab. 13. Rozmery metapódií medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

metapodial bones	Mc I				Mc II			
	N	min.	max.	Ø	N	min.	max.	Ø
maximum length	2	61.55	64.95	63.25	4	77.85	85.20	81.41
maximum depth of the proximal epiphysis	2	17.00	22.15	19.58	4	26.50	31.00	28.55
maximum width of the proximal epiphysis	2	24.00	27.05	25.53	4	18.05	20.40	19.50
minimum depth of the diaphysis	2	10.75	11.45	11.10	4	12.55	14.05	13.61
minimum width of the diaphysis	2	11.45	12.25	11.85	4	15.75	17.80	16.71
maximum depth of the distal epiphysis	2	14.00	17.20	15.60	4	18.25	21.55	19.53
maximum width of the distal epiphysis	2	18.85	19.75	19.30	4	23.35	27.00	25.03
metapodial bones	**Mc III**				**Mc IV**			
maximum length	1	–	–	66.75	4	71.55	83.25	78.71
maximum depth of the proximal epiphysis	–	–	–	–	4	27.15	42.00	32.55
maximum width of the proximal epiphysis	1	–	–	16.00	4	18.75	25.15	22.00
minimum depth of the diaphysis	1	–	–	11.15	8	10.35	18.35	13.88
minimum width of the diaphysis	1	–	–	14.45	8	12.95	18.15	14.12
maximum depth of the distal epiphysis	1	–	–	15.50	5	15.65	20,80	19.40
maximum width of the distal epiphysis	1	–	–	21.75	5	17.00	28.45	25.11
metapodial bones	**Mc V**							
maximum length	2	74.20	77.25	75.73				
maximum depth of the proximal epiphysis	–	–	–	–				
maximum width of the proximal epiphysis	–	–	–	–				
minimum depth of the diaphysis	4	12.05	16.20	14.04				
minimum width of the diaphysis	3	14.35	16.90	15.93				
maximum depth of the distal epiphysis	2	17.65	18.20	17.93				
maximum width of the distal epiphysis	1	–	–	24.10				

metapodial bones	Mt I				Mt II			
	N	min.	max.	Ø	N	min.	max.	Ø
maximum length	5	54.00	64.55	57.03	4	65.55	88.50	79.54
maximum depth of the proximal epiphysis	5	22.00	26.95	24.34	2	30.65	34.25	32.34
maximum width of the proximal epiphysis	5	21.90	26.25	23.68	3	16.85	21.00	18.23
minimum depth of the diaphysis	5	11.25	12.55	11.77	4	10.95	15.90	13.90
minimum width of the diaphysis	5	10.65	12.85	12.13	4	14.25	17.00	15.56
maximum depth of the distal epiphysis	5	13.85	16.35	14.77	4	17.05	20.45	18.65
maximum width of the distal epiphysis	5	16.55	18.85	17.24	4	20.75	25.20	22.94
metapodial bones	**Mt III**				**Mt IV**			
maximum length	4	72.55	77.00	75.58	3	84.35	89.75	86.37
maximum depth of the proximal epiphysis	3	27.50	30.75	29.30	4	31.05	35.45	33.18
maximum width of the proximal epiphysis	4	13.85	20.05	16.94	5	19.05	31.75	24.23
minimum depth of the diaphysis	4	11.65	13.00	12.49	6	13.15	16.55	14.43
minimum width of the diaphysis	4	14.70	15.00	14.91	6	12.55	17.00	15.12
maximum depth of the distal epiphysis	4	16.85	18.95	17.64	1	–	–	25.30
maximum width of the distal epiphysis	4	12.00	22.95	19.00	3	22.45	27.05	24.58

FOSSIL POPULATION STRUCTURE AND BASIC TAPHONOMIC ANALYSIS

The first lower molars have been used for the analysis of age structure of cave bear population from the Medvedia Cave in the Jánska Valley since this type of tooth is the most frequently represented within the sample under study (n = 14). The analysis showed a dominance of young animals (wear stages I-III, according to Stiner 1998), including yearlings (33.3 % – 37.5 %), juveniles (25 % – 33.3 %) and subadults (12.5 % – 16.7 %). The rest of m1 (16.7 % – 25 %) belongs to prime adults only (wear stages IV-VII), whereas old animals (wear stages VIII and IX) are not present within the sample under study (Fig. 4). These data, however, are only informatory because of scarcity of the fossil record (only 8 m1 dext. and 6 m1 sin. have been analysed). A similar situation is also regarded in incisors, premolars and other lower molars,

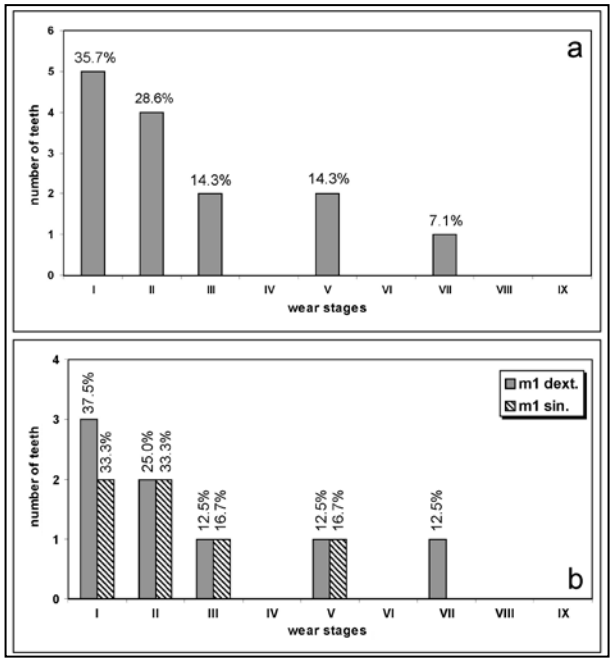

Fig. 4. Frequencies and percentages of m1 (a) and m1 dext. et sin. (b) from the Medvedia Cave in the Jánska Valley in different classes based on the crown wear stage (according to Stinner, 1998).
Obr. 4. Percentuálne zastúpenie m1 (a) a m1 dext. et sin. (b) z Medvedej jaskyne v Jánskej doline v jednotlivých skupinách založených na stupni abrázie zubných koruniek (podľa Stinnerovej, 1998).

whereas upper molars indicate a dominance of prime adults. Adult animals are also more frequently represented among the finds of postcranial skeleton (Tab. 3, Fig. 5), what can be explained by better physical resistance of bones of adults than bones of cubs. On the other hand, surprisingly, fragments of skulls and mandibles of young animals outnumber those of adults. Probably, the first discoverers of fossils at the site took the skulls and mandibles of adult bears, preserved more or less completely. Based on the available data, the fossil population of cave bears from the Medvedia Cave in the Jánska Valley can generally be marked as yearling/juvenile-dominated.

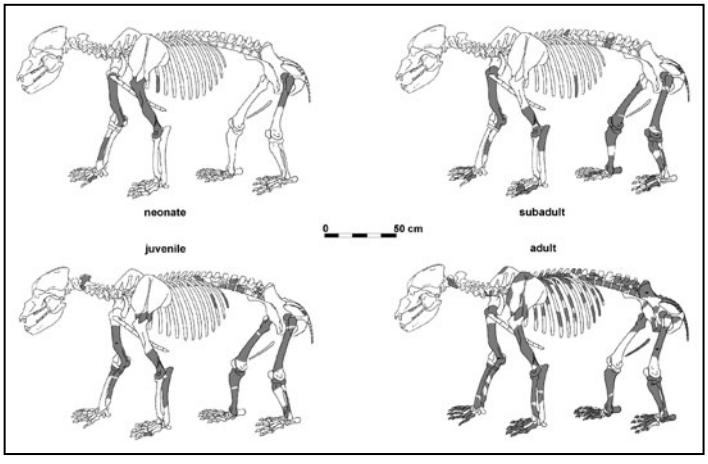

Fig. 5. Schematic drawing of postcranial record within the individual age group of cave bears from the Medvedia Cave in the Jánska Valley.
Obr. 5. Nákres zachovaných postkraniálnych elementov jednotlivých vekových skupín medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

The sexual dimorphism is clearly pronounced in the dimension of canines, such as crown width (Fig. 6). The canines with crown width smaller than 18.5 mm belong to females (7 specimens) and the canines with crown width larger than 19.5 mm belong to males (3 specimens). On the other hand, five specimens of *os penis* have also been found (Tab. 3), indicating a possibility of more significant number of males within the cave bear population from the site. In spite of that, females still outnumber males in the fossil sample under study. And although this sample is not statistically demonstrable, it yields partial information on the sexual structure of found assemblage.

The found bear fossils represent a sample of cave bear palaeopopulation, consisting minimally of 8 individuals. The minimal number of individuals (MNI) was calculated from the number of found m1 dext., although postcranial record can indicate the occurrence of larger quantity of specimens at the site (Tab. 3). The minimal number of individuals ba-

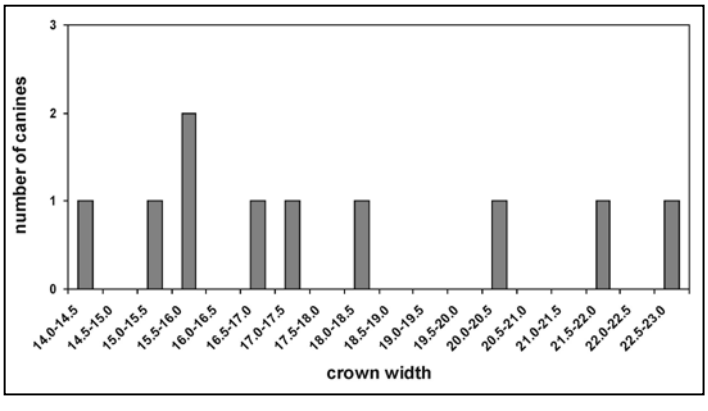

Fig. 6. Histogram for crown width (in mm) of upper and lower canines (n = 10) of cave bears from the Medvedia Cave in the Jánska Valley.
Obr. 6. Histogram šírky koruniek (v mm) vrchných a spodných špiciakov (n = 10) medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

sed on the finds of postcranial elements is, however, questionable since the bones have been found more or less in very fragmentary conditions.

Based on the analysis of bone fractures, the saw-toothed, irregular perpendicular and spiral types dominate (Fig. 7). Their occurrence within the sample under study (mainly saw-toothed and irregular perpendicular fractures) can indicate a possible activity of large predators (lions) or scavengers (probably rather wolves than hyenas because of higher altitude of the site), supported by a record of post-mortem gnawing marks on the surface of some, mainly adult bones (rodent-gnawing marks have been found in some specimens too). On the other hand, the lesser number of polished bones with rounded margins demonstrates a short water transport. It was probably occasional and chaotic (as indicated by orientation of fossils in layers), flowing maybe partly from the Lake Passage towards the Explosive Meander, where many bear long bones are accumulated at its bottom in the NW-SE direction.

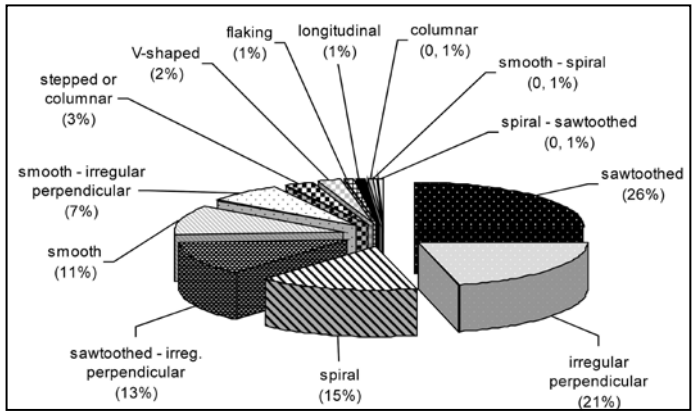

Fig. 7. The percentages of fracture types found in analysed bone sample of cave bears from the Medvedia Cave in the Jánska Valley.
Obr. 7. Percentuálne zastúpenie typov fraktúr kostí medveďov jaskynných z Medvedej jaskyne v Jánskej doline.

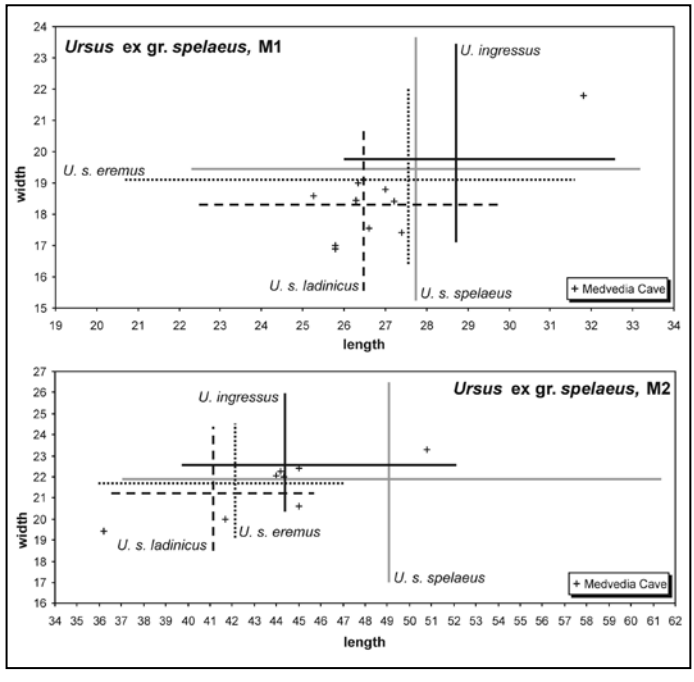

Fig. 8. Scatter diagrams of cave bear upper molars (modified according to Erdbrink, 1953; Rabeder et al., 2004; Baryshnikov, 2007).
Obr. 8. Diagramy pre vrchné stoličky medveďov jaskynných (upravené podľa Erdbrinka, 1953; Rabedera et al., 2004; Baryshnikova 2007).

Apart from various marks of activity of predators and scavengers in fossil record, different diseases, such as exostosis (mainly in long bones) or bone deformations (mainly in phalanges) also represent the biotic agents.

AGE AND TAXONOMIC POSITION OF THE CAVE BEAR FOSSILS

A left tibia of adult individual has been submitted to VERA-Laboratory (Vienna Environmental Research Accelerator Lab.) in Vienna for AMS dating. The sample, however, did not yield an adequate volume of collagen for the determination of the exact age of fossil record from the site, based on the radiometric data.

Anyway, the exact taxonomic position of found fossils is also open. Although the basic morphology of excavated teeth is typical for bears from the *spelaeus*-group (with occurrence of some weak plesiomorphic characters, such as narrower anterior part of some M1s or smaller anterior entoconid cusp in the most of m1s), the more exact classification is not possible because of abovementioned scarcity of found dentition and statistical indemonstrability of teeth sample under study. In spite of that, some morphological characters (such as development of enthypoconid complex in m1 or m2) can point out a close relationship of cave bears from the Medvedia Cave in the Jánska Valley with those ones from the Gamssulzen Cave in the Austrian Alps. On the other hand, the measurements of some teeth (mainly M1, m1 and m2) are more close to the dimension range of cave bear teeth from High Alpine sites (Conturines Cave and Ramesch Cave) (Figs. 8 and 9). Measurements of metapodial bones, however, indicate once again more close affinity to measurements of metapodial bones of Gamssulzen bears than to metapodial measurements of those ones from both the

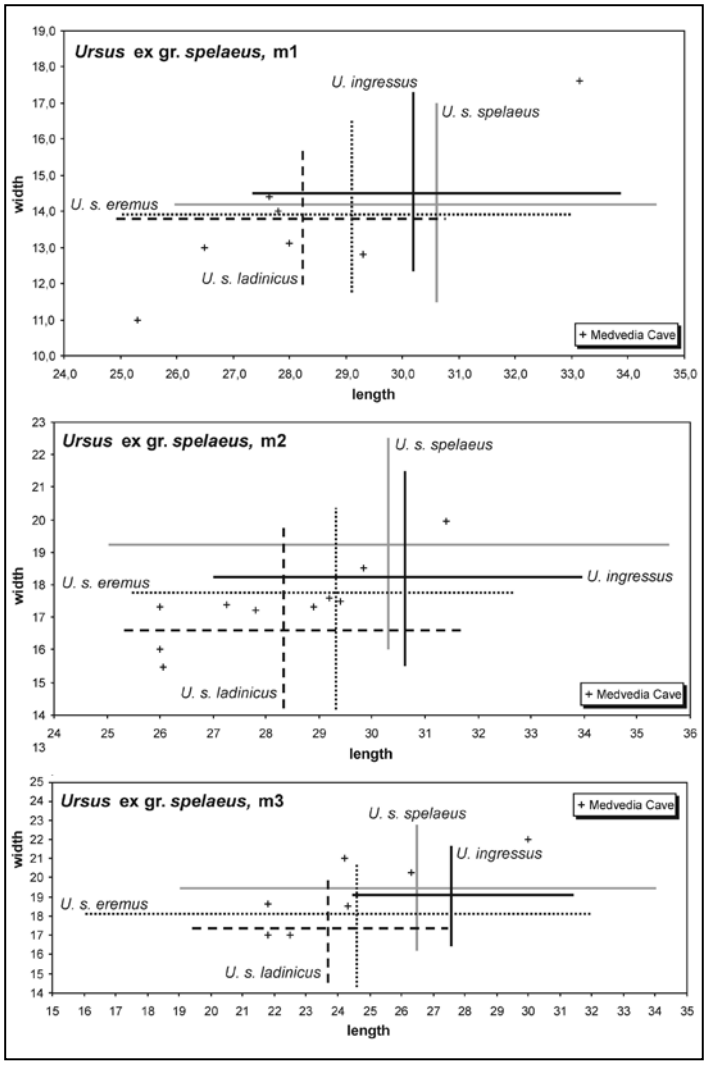

Fig. 9. Scatter diagrams of cave bear lower molars (modified according to Erdbrink, 1953; Rabeder, et al. 2004; Baryshnikov, 2007).

Obr. 9. Diagramy pre spodné stoličky medveďov jaskynných (upravené podľa Erdbrinka, 1953; Rabedera et al., 2004; Baryshnikova 2007).

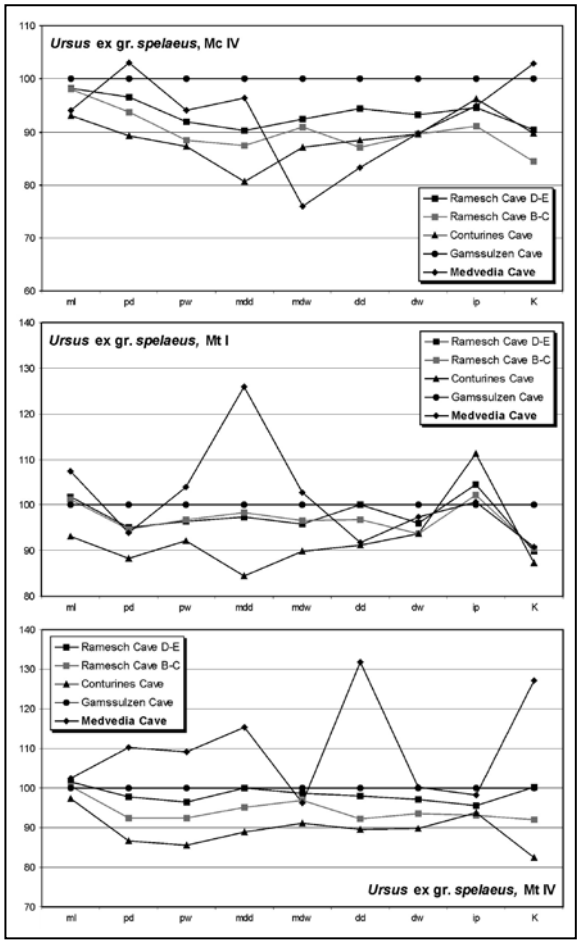

Fig. 10. Comparison of the mean standardized measurements and indices of Mc IV, Mt I and Mt IV from the Alpine sites (Ramesch Cave and Conturines Cave) and the cave under study in relation to mean values of the Gamsulzen Cave (modified according to Withalm, 2001, 2004). ml – maximum length, pd – proximal depth, pw – proximal width, mdd – minimum diaphyseal depth, mdw – minimum diaphyseal width, dd – distal depth, dw – distal width, ip – index of plumpness, K – K-index.

Obr. 10. Porovnanie priemerných štandardizovaných rozmerov a indexov Mc IV, Mt I a Mt IV z alpských nálezísk (Ramešská jaskyňa a jaskyňa Conturines) a skúmanej jaskyne vzhľadom na priemerné hodnoty z Gamsulzenskej jaskyne (upravené podľa Withalma, 2001, 2004). ml – maximálna dĺžka, pd – proximálna hrúbka, pw – proximálna šírka, mdd – minimálna hrúbka diafýzy, mdw – minimálna šírka diafýzy, dd – distálna hrúbka, dw – distálna šírka, ip – index zaoblenosti, K – K-index.

Conturines Cave in Italy and the Ramesch Cave in Austria (Fig. 10).

The morphodynamic analysis of fourth premolars for the determination of evolutionary level of fossil record from the site was impracticable because of statistically irrelevant number of P4s (only 6 suitable premolars) and p4s (only 4 suitable ones). Thus, it could not be used for the calculation of P4/4 index, which is important for the age specification of the cave bear assemblage.

Based on the abovementioned data, the cave bears from the Medvedia Cave in the Jánska Valley are so far classified as *Ursus* ex gr. *spelaeus* only, representing a Late Pleistocene palaeopopulation probably from the period of the Last Glacial.

CONCLUSION

The Medvedia Cave in the Jánska Valley (the Low Tatras Mts.) represents a new site of the Late Pleistocene cave bear assemblage in the Slovak territory of the Western Carpathians. The fossil record under study consists of 618 dental and osteological remains, belonging minimally to 8 individuals of cave bears from the *spelaeus*-group. The found assemblage can be determined as yearling/juvenile-dominated with outnumbering of females.

The basic taphonomic analysis demonstrated the presence of post-mortem processes, such as short transport of fossils in the water environment or gnawing of bones by larger predators (lions and wolves?) and rodents. From pathological viewpoint, the marks of some diseases (e. g. exostosis or bone deformation) have been found within sample of adult bones under study.

Overall, found fossil record from the Medvedia Cave in the Jánska Valley represents probably a non-violent taphocoenosis of cave bears, which death is related to their hibernation.

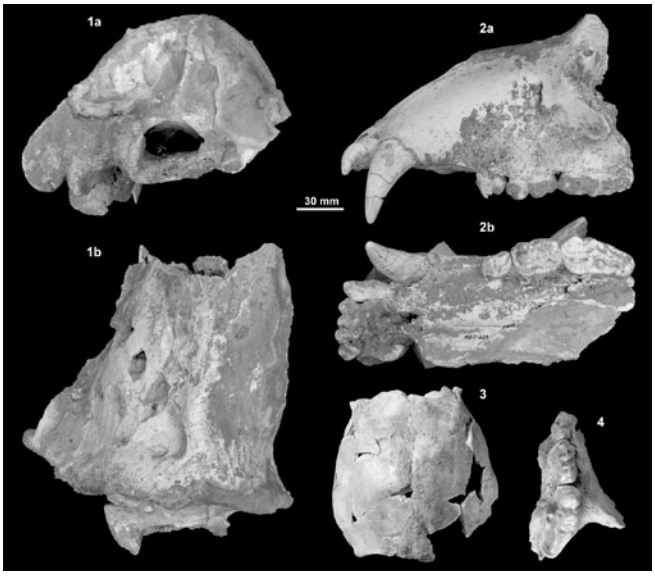

Plate 1. Cranial fragments of cave bears from the Medvedia Cave in the Jánska Valley. 1 – caudal (a) and dorsal (b) view on the neurocranium of adult male; 2 – lateral (a) and palatinal (b) view on the viscerocranium of the same adult male; 3 – dorsal view on the neurocranium of juvenile (neonate?); 4 – occlusal view on left cheek teeth (P4-M2) of adult animal.
Fototabuľa 1. Kraniálne fragmenty medveďov jaskynných z Medvedej jaskyne v Jánskej doline. 1 – kaudálny (a) a dorzálny (b) pohľad na neurokránium dospelého samca; 2 – bočný (a) a podnebný (b) pohľad na viscerokránium toho istého jedinca; 3 – dorzálny pohľad na neurokránium juvenila (neonát?); 4 – oklúzny pohľad na ľavé lícne zuby (P4-M2) dospelého jedinca.

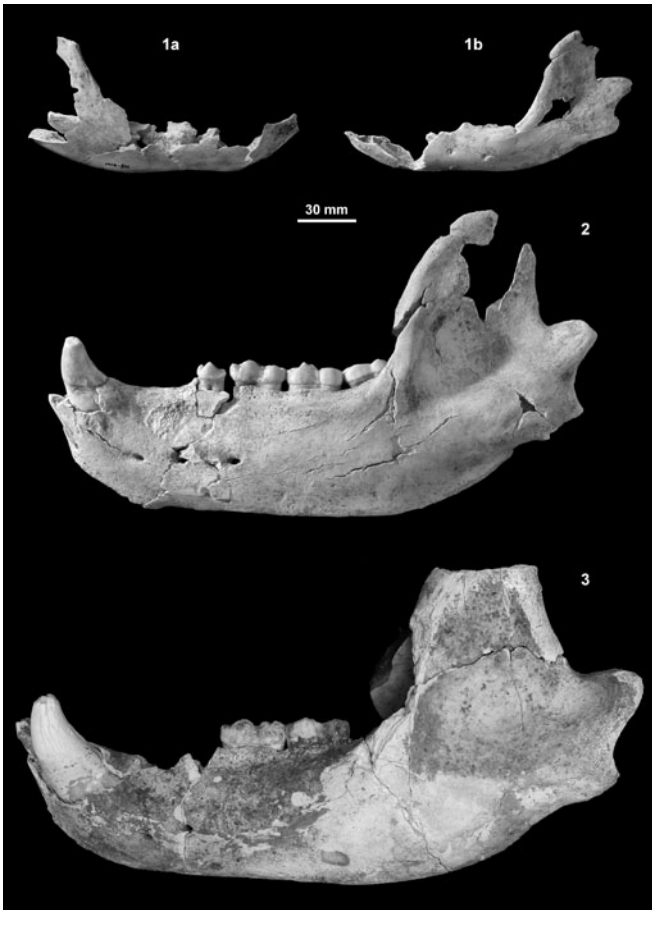

Plate 2. Mandibles of cave bears from the Medvedia Cave in the Jánska Valley. 1 – right (a) and left (b) mandible branches of neonate; 2 – left mandible with dentition of adult animal; 3 – mandible with dentition of adult male, consisting of left branch and fragment of right one (the mandible probably belongs to the same individual as cranial fragments in Pl. 1/figs. 1 – 2).
Fototabuľa 2. Sánky medveďov jaskynných z Medvedej jaskyne v Jánskej doline. 1 – pravá (a) a ľavá (b) vetva sánky neonáta; 2 – ľavá vetva sánky s dentíciou dospelého jedinca; 3 – sánka s dentíciou dospelého samca, pozostávajúca z ľavej vetvy a fragmentu pravej (sánka pravdepodobne patrí tomu istému jedincovi ako fragment lebky na Fototab. 1/obr. 1 – 2).

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VRCHNOPLEISTOCÉNNE MEDVEDE JASKYNNÉ (*URSUS* EX GR. *SPELAEUS*) Z MEDVEDEJ JASKYNE V JÁNSKEJ DOLINE (NÍZKE TATRY, SLOVENSKO)

Zhrnutie

Medvedia jaskyňa sa nachádza na severných svahoch Nízkych Tatier v Jánskej doline (obr. 1). Jej sedimentárna výplň pozostáva z alochtónnej (fluviálne granitové piesky, štrky a hlina) a z autochtónnej zložky (opad a chemogénne jaskynné sedimenty). Zatiaľ čo podložné fluviálne sedimenty v Jazernej chodbe sa usadili pravdepodobne v období medzi 780 000 až 990 000 rokmi (Kadlec et al., 2004), nadložné piesčité a hlinité sedimenty sú vrchnopleistocénneho veku (pravdepodobne z obdobia posledného zaľadnenia). Tieto mladšie sedimenty obsahujú fosílne zvyšky medveďov jaskynných, nachádzajúce sa predovšetkým v jaskynnej časti Medvedí cintorín. Počas paleontologických vykopávok v rokoch 2002 až 2004 sa v tejto časti jaskyne vykopali dve sondy: M-5a do hĺbky 0,9 m a M-5b s hĺbkou 0,5 m (obr. 3). Na ich mieste sa neskôr uskutočnili vykopávky na ploche 2 × 2 m, odkiaľ boli odoberané vzorky po každých 10 cm vykopanej hĺbky. Celkovo sa našlo 134 zubov alebo ich fragmentov, 55 fragmentov lebiek, 17 fragmentov sánok a 412 častí postkraniálnej kostry medveďov jaskynných. Najväčšie množstvo fosílií sa koncentrovalo v sedimente do hĺbky 30 cm od povrchu. Štúdium zubov preukázalo dominanciu mladých zvierat (približne 75 %), zvyšok patril dospelým jedincom (obr. 4). Analýza postkraniálneho skeletu odhalila oproti tomu častejšie zastúpenie dospelých zvierat v skúmanej vzorke medveďov jaskynných (obr. 5), čo je možné vysvetliť lepšou odolnosťou kostí dospelých jedincov ako kostí mláďat. Z hľadiska sexuálneho dimorfizmu prevládali na lokalite samice nad samcami, pričom sa zistili fosílne zvyšky minimálne 8 jedincov. Štúdium fraktúr kostí poukázalo na možnú aktivitu predátorov (levov) alebo zdochlinožravcov (vlkov), potvrdenú aj zistením prítomnosti stôp po ohrýzaní na kostiach medveďov. Z chorôb, ktoré trápili medvede, boli na kostiach zistené najmä exostózy a rôzne deformácie. Z taxonomického hľadiska sú medvede jaskynné z Medvedej jaskyne v Jánskej doline radené len do taxónu *Ursus* ex gr. *spelaeus* (pre nepreukázateľnosť znakov na presnejšiu determináciu), reprezentujúc vzorku vrchnopleistocénnej paleopopulácie, pravdepodobne z obdobia posledného zaľadnenia.