17. MORFOMETRIČNA ŠTUDIJA METAPODIJEV JAMSKEGA MEDVEDA IZ DIVJIH BAB I

BORUT TOŠKAN

Izvleček

Morfometrična analiza 1.598 metapodijev jamskega medveda iz mlajšepleistocenskih (OIS 3 in OIS 5) plasti Divjih bab I je pokazala, da metrični podatki omogočajo razlikovanje med spoloma. Ugotovljeno je bilo, da je med gradivom iz OIS 5a–5d delež obeh spolov primerljiv, medtem ko med metapodiji iz OIS 3 s približno dvotretjinsko večino prevladujejo primerki samcev. Povečan delež samcev v OIS 3 je bil razložen z daljšimi, hladnejšimi in bolj vlažnimi zimami v navedenem obdobju napram tistim v OIS 5a–5d. Študije recentnih rjavih in črnih medvedov so namreč izpostavile vzročno-posledično povezavo med nastopom ostrejših klimatskih pogojev na eni strani in povečano konkurenco med spoloma za zasedbo razpoložljivih brlogov na drugi. Skladna s takšno interpretacijo je spolna struktura metapodijev iz edinih dveh razmeroma toplih/suhih faz v OIS 3, ki se s primerljivim deležem zastopanosti obeh spolov ne razlikuje od spolne strukture gradiva iz razmeroma toplega in suhega OIS 5a–5d.

V favni evropskih mlajšepleistocenskih najdišč je jamski medved (*Ursus spelaeus* Rosenmüller, 1794) pogosto najbolje zastopana sesalska vrsta (Miracle 1991; Argant 1996a). Tako je tudi v Divjih babah I (zahodna Slovenija; 450 m nm. v.), kjer njegov delež presega 99 odstotkov vseh živalskih ostankov. Zaradi velikega števila najdb je bilo mogoče nekatere skeletne elemente natančneje biometrično obdelati (npr. Debeljak 2002a; poglavje 16 v tem zborniku). To velja tudi za metapodije, katerih študija je predstavljena v nadaljevanju. Glede na njihovo vlogo v biomehaniki hoje (Opavský 1990) ponuja pričujoči prispevek poglobljen vpogled v obseg in smer mikroevolutivnih sprememb morfologije dlančnic in stopalnic ter v spolno strukturo jamskega medveda iz Divjih bab I, vključno z dejavniki, ki naj bi nanjo vplivali.

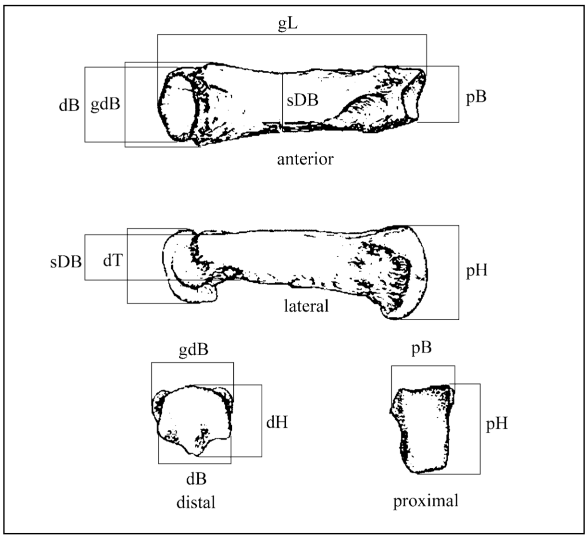
MATERIAL IN METODE

V okviru tukaj predstavljene študije sem biometrično obdelal le 1.598 od skupno nekaj tisoč metapodijev jamskega medveda, ki so bili pridobljeni med večletnimi izkopavanji v Divjih babah I. Z namenom optimizirati primerjave med dlančnicami oz. stopalnicami različne geološke starosti sem namreč obdelal le primerke z izkopnih polj A in B, kjer je Turk (2003a) analiziral vertikalno porazdelitev strukturnih agregatov in več kot 3 mm velikih kostnih fragmentov velikih sesalcev. Na osnovi dobljenih rezultatov je nato na terenu določene geološke plasti zamenjal z novimi temeljnimi stratigrafskimi enotami, t.i. facijami A, B in C, ki jih sestavlja različno število stratigrafskih nivojev. Ker je takšna prerazporeditev omogočila enačenje litostratigrafskih in biostratigrafskih enot, sem prej enoten vzorec 1.598 metapodijev razdelil na tri podvzorce: Db–A (vključuje primerke iz facije A), Db–B (facija B) in Db–C (facija C). Takšna delitev je predstavljala izhodišče za analizo razlik v velikosti oz. morfologiji dlančnic in stopalnic različne geološke starosti.[1]

Podrobne podatke o najdišču in poteku terenskega raziskovanja podaja Turk (poglavje 1 v tem zborniku), zato na tem mestu predstavljam le metodologijo obdelave metapodijev. Na vsakem primerku sem s kljunastim merilom izmeril osem različnih dimenzij (*sl. 17.1*): največja dolžina (gL), medio lateralna širina proksimalne epifize (pB), antero-posteriorna širina proksimalne epifize (pH), najmanjša medio-lateralna širina diafize (sDB), najmanjša dorzo-palmarna oz. dorzo-plantarna širina diafize (sDH), največja medio-lateralna širina distalne epifize (gDB), medio-lateralna širina sklepne površine distalne epifize (dB) in antero-posteriorna širina distalne epifize (dH). Biometrično sem obdelal le v celoti osificirane primerke, pri katerih naj bi bila rast kostnega tkiva torej že končana.[2] Analize rentgenskih posnetkov šap črnega medveda (*Ursus americanus*) so po-

[1] Faciji A in B sta nastali v OIS 3 (tj. interpleniglacial), facija C pa v OIS 5a-5d (tj. zgodnji glacial). OIS 4 (tj. pleniglacial I) v jami ni zastopan, saj je takrat prišlo do zastoja v sedimentaciji (poglavji 6 in 7 v tem zborniku).

[2] Študije skeletov nekaterih vrst kopitarjev so sicer opozorile na možnost občutne rasti kostnega tkiva tudi pri kosteh z že zraščenima epi- in diafizo. Vendar pa se v tem smislu omenjajo predvsem lopatica, distalni del nadlahtnice ali skočnica, ki vse osificirajo zelo zgodaj v ontogenetskem razvoju (npr. Legge, Rowley-Conwy 1988, Payne, Bull 1988; Luff 1993). Kljub temu sem metapodije z vidnimi eksostozami iz analize preventivno izključil.



Sl 17.1: Metapodij jamskega medveda (*Ursus spelaeus*) z označenimi merjenimi dimenzijami. Za opredelitev posamezne dimenzije glej besedilo.
Fig. 17.1: Cave bear (*Ursus spelaeus*) metapodial with measured dimensions marked. See text for definition of individual dimensions.

kazale, da se zraščanje epi- in diafiz pri dlančnicah konča z dopolnitvijo drugega leta življenja, v nadaljnjih nekaj mesecih pa se dokončno oblikuje še greben distalne epifize (Marks, Erickson 1966). Pri jamskem medvedu naj bi se razvoj metapodijev v povprečju končal nekoliko pozneje (tj. šele tik pred dopolnitvijo tretjega leta starosti), saj je bil ontogenetski razvoj skeleta pri omenjeni vrsti domnevno počasnejši (prim. Debeljak 2002b). Poleg tega je tempo zraščanja epi- in diafiz v študiji Marksa in Ericksona najverjetneje nekoliko precenjen, saj njuni sklepi izhajajo iz analize rentgenskih posnetkov (1966; glej tudi Moran, O'Connor 1994).

Med obdelanimi metapodiji prevladujejo v celoti ohranjeni primerki, pri katerih je bilo mogoče izmeriti vseh osem dimenzij. Z namenom oblikovati kar najobsežnejši (in s tem reprezentativen) vzorec sem analiziral tudi vse tiste delno poškodovane dlančnice in stopalnice, kjer ene od meritev ni bilo mogoče opraviti. Manjkajoče podatke sem pri teh nadomestil z ocenami, ki sem jih pridobil z metodo regresije postopnih korakov (*Forward Stepwise Regression*). Gre za postopek, kjer z analizo nepoškodovanih primerkov oblikujemo linearno kombinacijo tistih dimenzij, katerih meritev je bila mogoča tudi pri delno fragmentiranih metapodijih. Omenjene dimenzije se vključujejo v enačbo postopoma, korak za korakom, dokler vključevanje dodatnih ne prispeva več k bistveno boljši napovedi (StatSoft Inc. 2001). Uspešnost napovedi sem testiral na nepoškodovanih primerkih. Pri tem odsotnost statistično značilnih razlik med izmerjenimi in ocenjenimi vrednostmi (F-test: $p < 0,05$) dokazuje ustreznost uporabljene metode.

Grupiranje metapodijev po spolu temelji na rezultatih analize glavnih komponent (*Principal Components Analysis*; PCA). Omenjena metoda omogoča variacijo *p* osnovnih *x* spremenljivk zadovoljivo pojasniti z (bistveno) manjšim številom glavnih komponent (PC_i), kar zelo olajša interpretacijo znotrajvzorčne variabilnosti (Manly 1994; StatSoft Inc. 2001). Pred izvedbo same analize glavnih komponent sem razpoložljive metrične podatke najprej standardiziral. S tem sem izničil razlike v absolutnih vrednostih posamezne dimenzije med petimi dlančnicami (Mc I do V) oz. stopalnicami (Mt I do V). V nadaljnje analize sem tako prenesel le relativna odstopanja posameznih primerkov od povprečne vrednosti dane dimenzije pri referenčnem vzorcu.[3] Posledično sem lahko vse dlančnice oz. stopalnice združil v enoten statistični vzorec, ki je bil zato bistveno bolj reprezentativen. Metrične podatke sem standardiziral po formuli:

$$\text{standardizirana vrednost} = (x - M) / S$$

kjer x predstavlja posamezno meritev, ki jo želimo standardizirati, M in S pa povprečje in standardno deviacijo za isto dimenzijo pri referenčnem vzorcu.

Z analizo glavnih komponent sem poskušal prepoznati tudi razlike v morfologiji metapodijev različne geološke starosti. Kot izhodišče sem uporabil metrične podatke, iz katerih sem odstranil v tem primeru motečo velikostno komponento (t.i. *Burnaby size-out*). V morfometriji velikost praviloma razloži največji delež variance. Ker v analizi glavnih komponent prva izmed njih (tj. PC 1) praviloma opiše najvišji delež variance osnovne množice podatkov, jo lahko razumemo kot vektor velikosti oz. nosilko velikostne informacije (Lemen 1983). Ostanki regresijske analize (*residuals*) pri pravokotni projekciji matrike osnovnih (tj. velikost vsebujočih) podatkov na PC 1 so tako domnevno velikosti prosti in jih lahko vključimo v nadaljnje multivariatne analize (Burnaby 1966).

Pri statistični obdelavi sem uporabljal programski paket StatSoft 2001, STATISTICA za Windows, verzija 6.0, ter NTSYS-pc, verzija 2.0. Nomenklatura posameznih (delov) skeletnih elementov je povzeta po Riglerju (1985).

Vse obdelane metapodije jamskega medveda iz Divjih bab I hrani Narodni muzej Slovenije v Ljubljani.

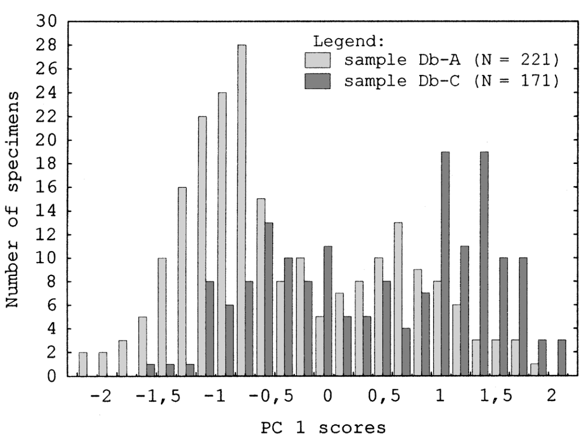
SPOLNA STRUKTURA

Samci jamskega medveda naj bi bili v povprečju za približno tretjino težji od samic (Viranta 1994), kar kaže na zelo izražen spolni dimorfizem (npr. Kurtén 1955; Reisinger, Hohenegger 1998; Grandal D'Anglade 2000). Kljub temu je analiza kar 4.459 dlančnic in stopalnic vrst *U. spelaeus* in *U. deningeri* iz osmih avstrijskih in

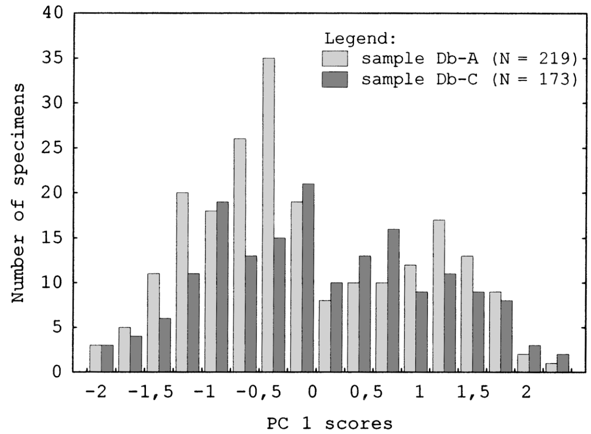
[3] Odstopanja so izražena v standardnih deviacijah.

enega italijanskega najdišča pokazala, da njihovo grupiranje po spolu le na osnovi posameznih linearnih dimenzij ni mogoče (Withalm 2001). Zaradi navedenega sem se ugotavljanja spolne strukture metapodijev jamskega medveda iz Divjih bab I lotil z uporabo analize glavnih komponent (PCA); takšen pristop namreč omogoča hkratno obravnavo več parametrov (v tem primeru osmih). Zaradi predhodnega standardiziranja metričnih podatkov[4] sem lahko variabilnost v velikosti metapodijev primerjal na združenem vzorcu vseh petih dlančnic oz. stopalnic.

Kot vstopni podatek za PCA sem uporabil korelacijsko matriko standardiziranih vrednosti vseh osmih parametrov, in sicer ločeno za dlančnice in stopalnice. Prva glavna komponenta povzema 83,7 odstotka variabilnosti osnovnega nabora podatkov pri dlančnicah in 72,8 odstotka pri stopalnicah. Faktorske uteži (*factor loadings*) vseh osmih parametrov so negativne in nihajo med vrednostmi -0,76 in -0,94. Delež pojasnjene variance posameznih spremenljivk (*communalities*) je visok, preostale soodvisnosti med njimi (*residual correlations*) pa so nizke. Zaradi navedenega sem lahko pretežni del variance osnovnega nabora podatkov zadovoljivo ponazoril že z obema prvima glavnima komponentama.



Sl. 17.2: Porazdelitev vrednosti prve glavne komponente (PC 1), izračunane na osnovi korelacijske matrike standardiziranih podatkov osmih dimenzij dlančnic jamskega medveda (*Ursus spelaeus*) iz Divjih bab I: vzorca Db-A in Db-C. Vrednosti so bile standardizirane po podatkih iz vzorca Db-B. PC 1 pojasnjuje 83,7 odstotka vse v osnovnem naboru podatkov zaobjete variance. Za obrazložitev glej besedilo.
Fig. 17.2: Distribution of first principal component (PC 1) scores, calculated on the correlation matrix of standardised measurements of cave bear (*Ursus spelaeus*) metacarpals from Divje babe I: samples Db-A and Db-C. Measurements were standardised using sample Db-B as reference. PC 1 accounts for 83.7 percent of the total variance in analysed metacarpals. See text for explanation.



Sl. 17.3: Porazdelitev vrednosti prve glavne komponente (PC 1), izračunane na osnovi korelacijske matrike standardiziranih podatkov osmih dimenzij stopalnic jamskega medveda (*Ursus spelaeus*) iz Divjih bab I: vzorca Db-A in Db-C. Vrednosti so bile standardizirane po podatkih iz vzorca Db-B. PC 1 pojasnjuje 72,8 odstotka vse v osnovnem naboru podatkov zaobjete variance. Za obrazložitev glej besedilo.
Fig. 17.3: Distribution of first principal component (PC 1) scores, calculated on the correlation matrix of standardised measurements of cave bear (*Ursus spelaeus*) metatarsals from Divje babe I: samples Db-A and Db-C. Measurements were standardised using sample Db-B as reference. PC 1 accounts for 72.8 percent of the total variance in analysed metatarsals. See text for explanation.

Frekvenčna porazdelitev vrednosti prve glavne komponente (*PC 1 scores*) je izrazito bimodalna tako pri dlančnicah/stopalnicah iz vzorca Db-A, kot tudi pri tistih iz vzorca Db-C (*sl. 17.2* in *sl. 17.3*).[5] Takšno porazdelitev sem interpretiral kot odsev spolnega dimorfizma, kar omogoča vsaj približno oceno razmerja med številom metapodijev samcev in samic. Prekrivanje med vrednostmi obeh spolov je pri stopalnicah nekoliko večje kot pri dlančnicah. Zaradi konstitucije jamskega medveda je takšna ugotovitev povsem pričakovana in je bila dokazana tudi na dolgih kosteh obeh parov okončin (Reisinger, Hohenegger 1998).

Iz frekvenčnih porazdelitev vrednosti PC 1 izhaja, da je v zgodnjeglacialnem vzorcu Db-C (=OIS 5a-5d) število dlančnic in stopalnic obeh spolov v grobem enako. Drugače je pri gradivu interpleniglacialne (=OIS 3) starosti (tj. vzorec Db-A), kjer s približno dvotretjinskim deležem prevladujejo primerki samcev.[6] V tem smislu bistvenih odstopanj ne kaže nobeden od desetih metapodijev (tj. Mc I do V, Mt I do V), v primeru treh od skupno petih dlančnic pa so razlike v spolni strukturi med vzorcema Db-A in Db-C celo visoko statistično

[4] Kot referenčni vzorec sem uporabil metapodije iz facije B, saj se ti po svojih dimenzijah umeščajo med primerke iz facij A in C (glej prilogo 17).

[5] Ker sem metapodije iz vzorca Db-B uporabil kot referenčni vzorec pri standardiziranju, sem jih v tej fazi raziskave iz nje izločil.

[6] Zaradi negativnih faktorskih uteži tvorijo večji (tj. samcem pripisani) metapodiji na *sl. 17.2* in *sl. 17.3* levega od obeh vrhov, manjši (tj. samicam pripisani) primerki pa desnega.

Tab. 17.1: Statistično testiranje razlik v spolni strukturi med vzorcem vseh v Db-A in Db-C zastopanih dlančnic jamskega medveda (*Ursus spelaeus*) na eni strani ter le metacarpus II iz istih dveh vzorcev na drugi.
Tab. 17.1: Statistical testing of differences in the sex structure between samples of all metacarpals of cave bear (*Ursus spelaeus*) represented in Db-A and Db-C, on the one hand, and only metacarpus II from the same two samples on the other.

Sample Db-A	♂	♀	**Total**	**χ^2 test**
Mc II (left)	21	6	27	χ^2 = 1.50
All metacarpals	146 (= 65.7 %)	76 (= 34.3 %)	222	p = 0.220

Sample Db-A	♂	♀	**Total**	**χ^2 test**
Mc II (right)	23	7	30	χ^2 = 1.35
All metacarpals	146 (65.7 %)	76 (= 34.3 %)	222	p = 0.245

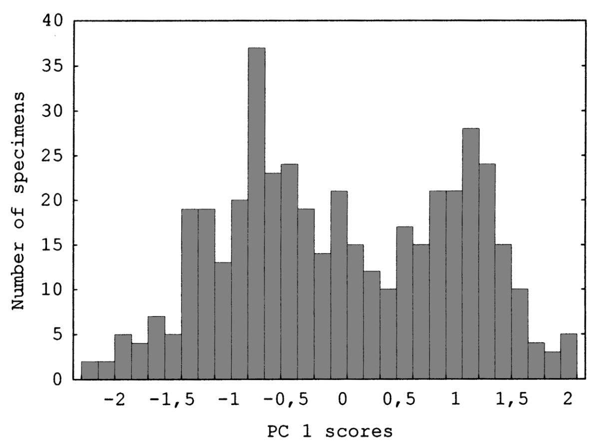
Sample Db-C	♂	♀	**Total**	**χ^2 test**
Mc II (left)	14	12	26	χ^2 = 0.80
All metacarpals	76 (= 44.4 %)	95 (= 55.6 %)	171	p = 0.370

Sample Db-C	♂	♀	**Total**	**χ^2 test**
Mc II (right)	5	8	15	χ^2 = 0.18
All metacarpals	76 (= 44.4 %)	95 (= 55.6 %)	171	p = 0.675

značilne (χ^2 test: $p < 0{,}01$). Pri tem sicer posameznih primerkov praviloma nisem ločeval na leve in desne, saj so bili vzorci za kaj takega preskromni. Edini takšen poskus delitve sem izvedel pri drugih dlančnicah, ki so med vsemi metapodiji najbolje zastopane (Mc II: N = 96). Tudi v tem primeru pa rezultati v celoti potrjujejo zgornje ugotovitve: v vzorcu zgodnjeglacialne (= OIS 5a–5d) starosti je namreč razmerje med spoloma uravnoteženo, medtem ko v interpleniglacialnem vzorcu Db–A (=OIS 3) prevladujejo druge dlančnice samcev (*tab. 17.1*).

Doslej predstavljeni rezultati nasprotujejo mnenju Withalma (2001), po katerem naj metapodiji ne bi bili primerni za ocenjevanje spolne strukture jamskih medvedov. Kljub merjenju povsem istih dimenzij kot navedeni avtor je bilo namreč mogoče z multivariatnim statističnim pristopom spol določiti blizu 90 odstotkom vseh dlančnic in približno 75 odstotkom vseh stopalnic. Kar pri dobljenih rezultatih preseneča, je odstopanje zgoraj predstavljene spolne strukture jamskih medvedov iz Divjih bab I od tiste, ki izhaja iz biometrične analize podočnikov odraslih živali iz istega najdišča (Debeljak 2002b). V primeru vzorca iz OIS 5a–5d se rezultati obeh pristopov sicer ujemajo, saj oba kažeta na približno enakomerno zastopanost vsakega od obeh spolov. Drugače je z gradivom iz OIS 3, kjer študija podočnikov ni dokazala večinskega deleža samcev. V okviru primerjave obeh spolnih struktur sem od vseh analiziranih podočnikov (Debeljak 2002b) upošteval le tiste, ki so pripadali več kot tri leta starim živalim. S tem sem izključil najmlajše starostne kategorije, ki v vzorcu metapodijev niso zastopane.

Ugotovljena razlika med ocenama verjetno ni posledica neustreznosti ene ali druge metode, saj so se metrični podatki v obeh primerih porazdelili izrazito bimodalno. Res je sicer, da vzorec podočnikov obsega vse razpoložljive primerke interpleniglacialne (= OIS 3) starosti, medtem ko so v Db–A zaobjeti le metapodiji iz sklopa plasti 2 do 7 (metrične podatke metapodijev iz vzorca Db–B sem namreč uporabil kot referenco pri standardizaciji). Vendar pa prevlado samcev v OIS 3 dokazuje tudi porazdelitev PC 1 vrednosti standardizi-



Sl. 17.4: Porazdelitev vrednosti prve glavne komponente (PC 1), izračunane na osnovi korelacijske matrike standardiziranih podatkov osmih dimenzij dlančnic jamskega medveda (*Ursus spelaeus*) iz Divjih bab I: vzorec Db–B (N = 434). Vrednosti so bile standardizirane po podatkih celotnega fosilnega vzorca iz Divjih bab I. PC 1 pojasnjuje 77,0 odstotkov v osnovnem naboru podatkov zaobjete variance. Vse faktorske uteži prve glavne komponente so negativne. Za obrazložitev glej besedilo.
Fig. 17.4: Distribution of first principal component (PC 1) scores, calculated on the correlation matrix of standardised measurements of cave bear (*Ursus spelaeus*) metacarpals from Divje babe I: sample Db–B (N = 434). Measurements were standardised using the entire fossil sample from Divje babe I as reference. PC 1 accounts for 77.0 percent of the total variance in analysed metacarpals. All factor loadings of the first principal component are negative. See text for explanation.

Tab. 17.2: Razmerje med številom levih spodnjih podočnikov (C_1) in levih prvih spodnjih meljakov (M_1) nad tri leta starih jamskih medvedov (*Ursus spelaeus*) iz Divjih bab I v vzorcu iz OIS 5a-5d (tj. Db-C) in tistem iz OIS 3 (tj. Db-A + Db-B). Število levih C_1 je bilo ocenjeno na četrtino vseh v obravnavani vzorec zajetih podočnikov. Razlika med obema razmerjema je statistično značilna (χ^2 = 4,47, p = 0,034). Podatke o številu zob podaja Debeljak (2002a).
Tab. 17.2: Ratios between the number of left lower canines (C_1) and left first lower molars (M_1) of cave bears (*Ursus spelaeus*) above three years of age from Divje babe I in the samples from OIS 5a-5d (i.e. Db-C) and from OIS 3 (i.e. Db-A + Db-B). The number of left C_1 was assessed on a quarter of all canines included in the sample. The difference between the two ratios is statistically significant (χ^2 = 4.47, p = 0.034). Data on the number of teeth provided by Debeljak (2002a).

Sample (layers)	M_1 (left specimens)	C_1 & C^1 (all)	C_1 (left specimens)	C_1 (left) / M_1 (left)
Db-A + Db-B (layers 2-10)	123.5	303	76	0.61
Db-C (layers 12-20)	46	193	48	1.05

ranih[7] metričnih podatkov dlančnic iz vzorca Db-B (*sl. 17.4*). Razlika med obema spolnima strukturama tako najverjetneje izhaja iz dejanskega neskladja v deležu vsakega od obeh spolov med interpleniglacialnima vzorcema podočnikov in metapodijev. V tem smislu je zanimiv podatek, daj je količnik med številom levih prvih spodnjih meljakov in levih prvih spodnjih podočnikov nad tri leta starih medvedov v vzorcu zgodnjeglacialne (= OIS 5a-5d) starosti statistično značilno manjši od vrednosti istega količnika pri gradivu iz OIS 3 (*tab. 17.2*), kar kaže na "primanjkljaj" podočnikov v vzorcu interpleniglacialne (= OIS 3) starosti.

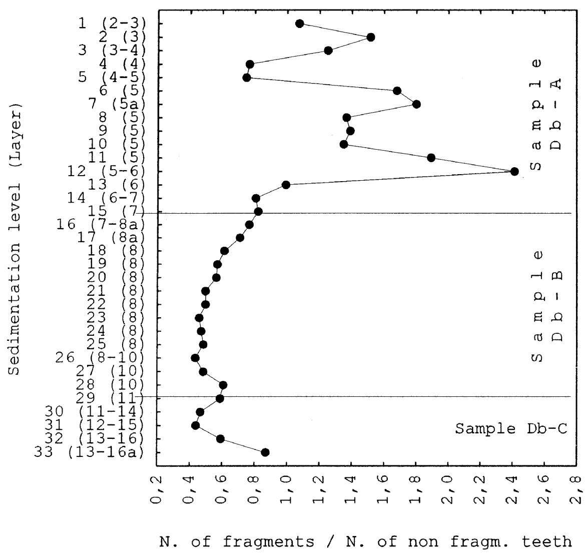
Podobnega primanjkljaja v primeru metapodijev ni mogoče potrditi. Koeficient korelacije med številom vseh biometrično obdelanih dlančnic in stopalnic na eni strani ter številom vseh več kot 3 mm velikih kostnih drobcev jamskega medveda na drugi je namreč zelo visok (Spearman R = 0,89; p = 0,000).[8] Število kostnih drobcev na cel metapodij je sicer v faciji A statistično značilno večje kot v faciji B (Mann Whitney U-test: p = 0,022), vendar pa naj bi se v tem odražala predvsem večja fragmentiranost ostankov v zgornjih stratigrafskih nivojih (*sl. 17.5*; podpoglavje 12.3 v tem zborniku). Omeniti moramo tudi večjo vrednost količnika med številom metapodijev in številom pogačic v vzorcu iz facije A glede na vzorec iz facije B (podpoglavje 12.4 v tem zborniku), saj bi to lahko kazalo na "primanjkljaj" metapodijev v gradivu iz facije B. Tudi če je res tako, pa to še ne pomeni, da je treba tezo o večinskem deležu samcem pripisanih ostankov v gradivu iz OIS 3 ovreči. V to obdobje je namreč datirano tudi gradivo iz facije A, kjer delež samcem pripisanih dlančnic in stopalnic prav tako statistično značilno presega tistega iz zgodnjeglacialnega vzorca Db-C (= OIS 5a-5d).

Kot kaže, je razliko v deležu obeh spolov med vzorcema fosilnih metapodijev in podočnikov dejansko mogoče povezati s "primanjkljajem" slednjih. Manj jasno je, zakaj je do "primanjkljaja" sploh prišlo. Starostna struktura jamskih medvedov iz Divjih bab I kaže, da je množično pojavljanje njihovih ostankov domnevno posledica naravne smrtnosti med hibernacijo oz. tik po njej (Debeljak 2002a). Če je to res, lahko ugotovljeni "primanjkljaj" podočnikov kaže le na delovanje biotskih (zveri, človek) in/ali abiotskih (nihanje temperature in vlage, vodni transport) poodložitvenih dejavnikov. Da so bile tafonomske izgube v Divjih babah I dejansko velike, sta pokazala že Turk in Dirjec (1991). Njuna analiza množičnih živalskih ostankov je namreč v marsičem potrdila obstoj močne zverske (domnevno predvsem medvedje) destrukcije dolgih cevasti kosti. Ker pa naj bi bila vloga zveri pri drobljenju zob bistveno manjša, gre vzroke za "primanjkljaj" podočnikov v facijah A in B iskati drugje. Dokaj obrobna se zdi tudi vloga različne intenzivnosti razpadanja zob. Že preliminarna študija množičnosti kostnih drobcev različnih velikostnih razredov za spodnji del plasti 8 in zgornji del sklopa plasti 10 do 14 je namreč pokazala, da se relativno večji "primanjkljaj" podočnikov stratigrafsko ne ujema z večjim deležem bolj razdrobljenih fragmentov (Turk *et al.* 1988-1989). Enako pa kaže tudi razmerje med številom zobnih odlomkov in številom vseh celih zob na posamezno plast (*sl. 17.5*). Statistično značilne razlike so bile namreč ugotovljene le med obema interpleniglacialnima (= OIS 3) vzorcema Db-A in Db-B (Mann-Whitney U-test: p = 0,000), ne pa tudi med Db-B in zgodnjeglacialnim (= OIS 5a-5d) vzorcem Db-C (Mann-Whitney U-test: p = 0,882). Naj pri tem spomnim, da med vzorcema Db-A in Db-B bistvenih razlik v razmerju med številom levih C_1 in levih M_1 nad tri leta starih medvedov ni (χ^2 test: p = 0,818),[9] oba vzorca pa sta si zelo podobna tudi po deležu metapodijev vsakega od obeh spolov. Da stratigrafski nivoji z največjim "primanjkljajem" podočnikov ne izstopajo tudi po velikem številu zobnih drobcev, je potrdila tudi analiza gradiva iz profilov (Toškan 2004); volumen pregledanega sedimenta je bil sicer v tem primeru bistveno manjši (Turk 2003a), so pa bili zato zaradi natančne kontrole iz njega zagotovo pobrani prav vsi celi in zdrobljeni zobje.

7 Vrednosti so bile standardizirane po podatkih celotnega fosilnega vzorca iz Divjih bab I (tj. Db-A + Db-B + Db-C).

8 Korelacije med številom podočnikov in številom več kot 3 mm velikih kostnih drobcev jamskega medveda ni mogoče oceniti, saj se podatki o številu kostnih fragmentov (tako kot to velja tudi za število metapodijev) nanašajo le na izkopni polji A in B, medtem ko so bili podočniki pobrani s celotnega izkopnega polja.

9 Podatke o številu zob podaja Debeljak (2002a).

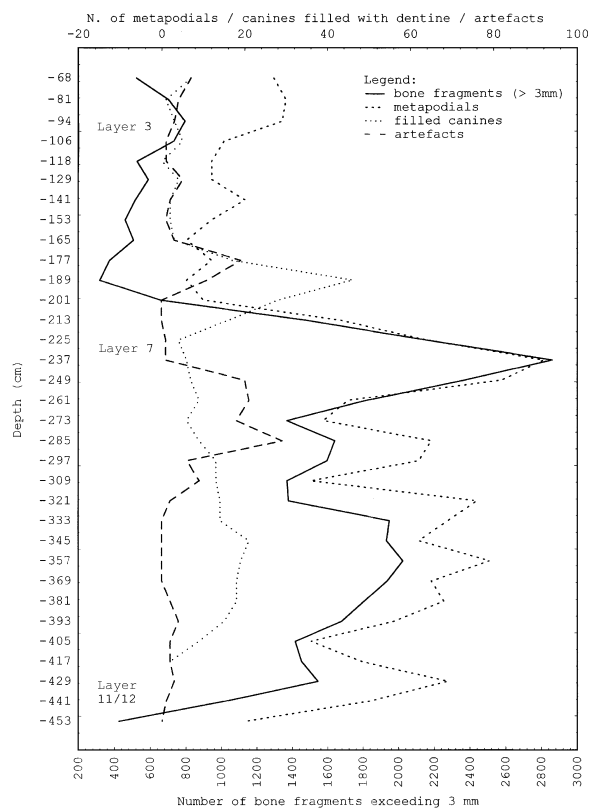


Sl. 17.5: Nihanje deleža med številom odlomkov in številom vseh celih zob jamskega medveda (*Ursus spelaeus*) iz Divjih bab I po plasteh. Podatki se nanašajo izključno na izkopni polji A in B in jih podaja Turk *et al.* (2002a).

Fig. 17.5: The quotient between the number of fragments and the number of all complete teeth of cave bear (*Ursus spelaeus*) from Divje babe I by layers. Data refer exclusively to excavation areas A and B and are taken from Turk *et al.* (2002a).

Med dejavnike, ki bi lahko prispevali k nastalemu "primanjkljaju" podočnikov več kot 3 leta starih medvedov, sodi tudi človek. Znane so razprave o pomenu in obsegu t.i. kulta jamskega medveda (npr. Kurtén 1972; Chase 1987). Med drugim se omenja tudi možnost, da so medvedji podočniki nekoč (kot to navsezadnje velja še tudi danes) veljali za trofejo, zato naj bi jih človek veliko odtujil (Turk *et al.* 1988–1989; Turk 2003b). Iz mlajšega paleolitika je znanih več prevrtanih podočnikov jamskega medveda (npr. Schreve, Currant 2003; Tejero *et al.* 2005; Vercoutère *et al.* 2006), še starejši pa so podobni primerki lisičjih zob (Vercoutère 2002; Valde-Nowak, Charles 2003). Tu so še preluknjane prstnice severnega jelena, za katere je morda prav tako odgovoren srednjepaleolitski človek (Chase 2001). Arheologi poročajo celo o dobro dokumentiranih primerih namernih pokopov neandertalcev ter o določenih okrasnih ali drugače nenavadnih predmetih, ki naj bi dokazovali obstoj simbolizma, religije in umetnosti (npr. Chase 1987; Germonpré 2001; Horusitzky 2003; Turk *et al.* 2003a; Valde-Nowak, Charles 2003; Maureille 2004).

Da je "primanjkljaj" podočnikov med gradivom iz OIS 3 morda res utemeljeno povezovati (tudi) s človekom, kaže *sl. 17.6*. Kot vidimo, se vertikalna porazdelitev metapodijev v celoti ujema s porazdelitvijo vseh koščenih fragmentov, večjih od 3 mm. V številu dlančnic in stopalnic na stratigrafski nivo se torej kaže predvsem naravna smrtnost medvedov v jami v posameznih obdobjih (vsaj metapodiji iz vzorcev Db-A in Db-C ne izkazujejo "primanjkljajev", kakršne sem ugotovil pri podočnikih). Zanimivejša je zato primerjava vertikalnih porazdelitev metapodijev oz. z dentinom že zapolnjenih podočnikov z vertikalno porazdelitvijo kamenih artefaktov. Presežki v številu metapodijev se s presežki v številu podočnikov namreč ujemajo le v plasteh, kjer je število pobranih lusk, odbitkov, orodij, jeder in razbitin zanemarljivo (npr. sediment od −309 do −417 cm globine). Drugače je s sedimentacijskimi nivoji, kjer veliko število pobranih kamenih artefaktov nakazuje povečano frekvenco oz. trajanje človekovih obiskov jame (npr. sediment od −237 do −297 cm globine). V teh ostaja namreč število z dentinom zapolnjenih kaninov majhno kljub sicer mnogim najdbam metapodijev in koščenih fragmentov. Pri tem se je seveda treba zavedati, da večje število pobranih lusk, odbitkov, orodij, jeder in razbitin ni zanesljiv kazalec daljšega človekovega zadrževanja v jami. Prav tako drži, da stratigrafski nivoji z izrazitim "primanjkljajem" podočnikov ne izstopajo vedno tudi



Sl. 17.6: Primerjava vertikalnih porazdelitev metapodijev, z dentinom že zapolnjenih podočnikov, kamenih artefaktov ter več kot 3 mm velikih kostnih fragmentov za izkopno polje B. Podatki o številu artefaktov, zob in kostnih fragmentov so povzeti po Turk (2003a) in Turk *et al.* (2002b).

Fig. 17.6: Comparison of vertical distributions of metapodials, root-filled canines, stone artefacts and more than 3 mm bone fragments from excavated area B. Data on the number of artefacts, teeth and bone fragments are taken from Turk (2003a) and Turk *et al.* (2002b).

po relativno velikem številu kamenih artefaktov. Je pa mogoče "primanjkljaj" podočnikov kljub vsemu bolje razložiti z domnevno večjo frekvenco človekovih obiskov jame kot pa s klimatskimi nihanji v obravnavanem obdobju. Podobnost med vertikalnima porazdelitvama z dentinom zapolnjenih C_1 in deležem v sedimentu zastopanih kongelifraktov (kazalec temperaturnih nihanj) oz. med vertikalnima porazdelitvama z dentinom zapolnjenih C_1 in deležem v sedimentu zastopanih agregatov (kazalec nihanj vlažnosti) je namreč praktično nična (Toškan 2004).

V kolikor je človek v OIS 3 iz Divjih bab I dejansko odnašal podočnike jamskega medveda, pričakujem, da je prednostno zbiral večje, odraslim samcem pripadajoče primerke. Preferenca do večjih, trofejnih podočnikov je bila nenazadnje večkrat jasno izražena celo ob modernih izkopavanjih arheoloških in paleontoloških najdišč (npr. Kurtén 1972; Weinstock 2000). Takšno selektivno odtujevanje primerkov bi (je?) seveda porušilo izhodiščno razmerje med spoloma in s tem prispevalo k podcenjenemu deležu podočnikov samcev v analizi Debeljakove (2002b). Z domnevo o človekovi preferenci do večjih, trofejnih zob se ujema tudi ugotovitev, da je mogoče "primanjkljaj" podočnikov statistično dokazati le na vzorcu zob odraslih živali (χ^2 test: p = 0,032), ne pa tudi pri gradivu s primerki vseh več kot 2 leti starih medvedov (χ^2 test: p = 0,118). V vzorcu podočnikov vseh več kot 2 leti starih medvedov namreč močno prevladujejo primerki mladih (<3 leta) živali (Debeljak 2002a), ki so še votli in razmeroma majhni (Debeljak 1996). Kot taki so bili za potencialnega "zbiratelja" najverjetneje nezanimivi, zato naj bi bilo njihovo odtujevanje iz jame zanemarljivo.

ANALIZA VELIKOSTI

Metrični podatki dolgih kosti omogočajo zanesljivejšo oceno velikosti (mase) fosilnih medvedov, kot to velja za metapodije (npr. Jackson 1989; Damuth, MacFadden 1990; Christiansen 1999). V okviru analize velikosti tako nisem ugotavljal absolutnih razlik v masi medvedov različne geološke starosti, ampak le relativne. Dobljeni rezultati so kljub temu pomembni, saj je število v celoti ohranjenih metapodijev v fosilnem gradivu iz Divjih bab I bistveno večje od števila nepoškodovanih dolgih kosti ($N_{metapodiji}$ = 1.598; $N_{dolge\ kosti}$ = 272).

Relativne razlike v velikosti metapodijev različne geološke starosti so prikazane na *sliki 17.7*. Zaradi večje obremenitve prednjih okončin je razlika v vrednostih prve glavne komponente pri dlančnicah[10] bistveno večja kot pri stopalnicah, pri katerih sploh ne presega meje statistične značilnosti (samci: F = 0,20 p = 0,650; samice: F = 0,46 p = 0,495). V nasprotju s tem so razlike pri dlančnicah celo visoko statistično značilne (*tab. 17.3*).[11]

Predstavljeni rezultati kažejo na to, da so Divje babe I v OIS 3 obiskovali večji jamski medvedi kot v OIS 5a-5d. Brez primerjalnih podatkov iz vsaj še nekaj drugih jam v regiji seveda navedene ugotovitve ni mogoče *a priori* posplošiti na celotno populacijo, saj le eno najdišče ne more v zadovoljivi meri povzeti heterogenosti nekdanjih biotopov.[12] Žal pa je večina objavljenih metričnih podatkov metapodijev jamskega medveda iz bližnje (npr. Rakovec 1967; Pohar 1981; Krklec 1997; Withalm 2001) in nekoliko bolj oddaljene (npr. Torres 1988; Argant 1991) okolice v tem smislu neuporabna. Njihovo primerjalno vrednost namreč bistve-

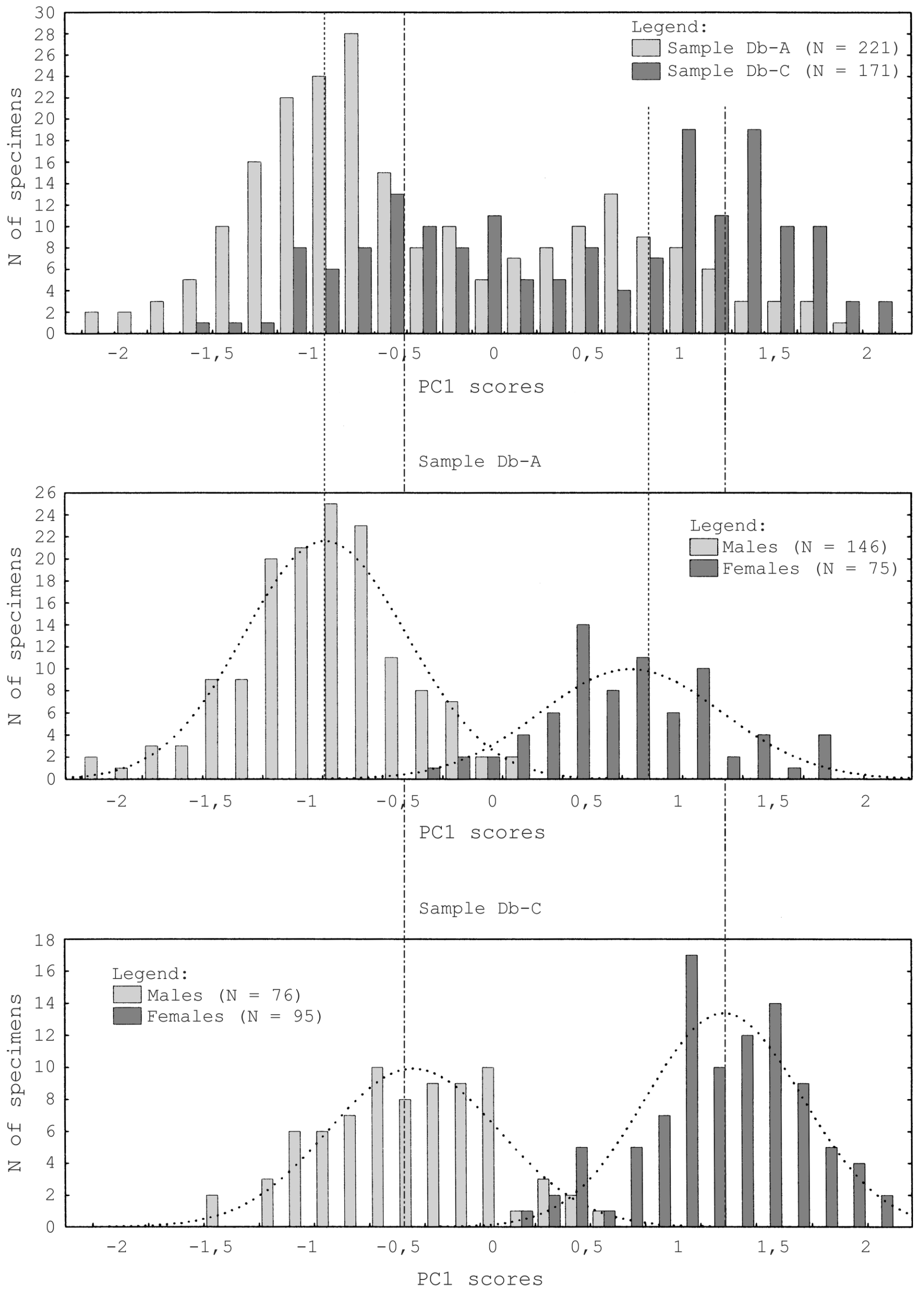
10 PC 1 povzema nad 70 odstotkov variance v osnovnem naboru metričnih podatkov.

11 Razlika je visoko statistično značilna ne glede na to, kako med oba spola porazdelim po dimenzijah "vmesne" dlančnice (N = 47), ki jih sicer ni mogoče z zanesljivostjo pripisati nobenemu od obeh spolov (Toškan 2004).

12 Reprezentativnost razpoložljivih ostankov je do neke mere vprašljiva že zato, ker v jami najdeni ostanki prvenstveno kažejo na lastnosti med "zimskim spanjem" poginulih (ne pa vseh nekdaj živečih) živali (Fenster *et al.* 1992).

Tab. 17.3: Testiranje statistične značilnosti razlik med spoloma v vrednostih prve glavne komponente (PC 1), izračunane na osnovi korelacijske matrike standardiziranih podatkov osmih dimenzij po spolu ločenih dlančnic jamskega medveda (*Ursus spelaeus*) iz Divjih bab I: vzorca Db-A in Db-C. Vrednosti so bile standardizirane po podatkih iz vzorca Db-B. PC 1 pojasnjuje 83,7 odstotka vse v osnovnem naboru podatkov zaobjete variance. Vse faktorske uteži prve glavne komponente so negativne. Obrazložitev simbolov: M – povprečna vrednost. Za obrazložitev glej besedilo.
Tab. 17.3: Testing the statistical significance of differences between sexes in the first principal component (PC 1) scores, calculated on the correlation matrix of standardised measurements of cave bear (*Ursus spelaeus*) metacarpals separated by sex, from Divje babe I: samples Db-A and Db-C. Measurements were standardised using sample Db-B as reference. PC 1 accounts for 83.7 percent of the total variance in analysed metacarpals. All PC 1 factor loadings are negative. Explanation of symbols: M – average value. See text for explanation.

Sex	PC 1_{Db-A} scores	PC 1_{Db-C} scores	F-test	Mann-Whitney U test
♂	M = -0.91 min = -2.21 max = 0.19	M = -0.44 min = -1.56 max = 0.55	F = 28.38 p = 0.000	Z = -6.63 p = 0.000
♀	M = -0.71 min = -0.35 max = 1.81	M = -1.21 min = 0.14 max = 2.14	F = 25.46 p = 0.000	Z = -6.28 p = 0.000



Sl. 17.7: Porazdelitev vrednosti prve glavne komponente (PC 1), izračunane na osnovi korelacijske matrike standardiziranih podatkov osmih dimenzij dlančnic jamskega medveda (*Ursus spelaeus*) iz Divjih bab I. Prikazani so rezultati za skupen vzorec Db-A + Db-C (zgoraj), vzorec Db-A (= OIS 3; sredina) in vzorec Db-C (= OIS 5; spodaj). Vrednosti so bile standardizirane po podatkih iz vzorca Db-B. PC 1 pojasnjuje 83,7 odstotka vse v osnovnem naboru podatkov zaobjete variance. Pikčasta črta (····) označuje povprečje vrednosti prve glavne komponente za dlančnic samcev in samic iz vzorca Db-A, prekinjena črta (– · · –) pa za tiste iz vzorca Db-C. Za obrazložitev glej besedilo.

Fig. 17.7: Distribution of first principal component (PC 1) scores, calculated on the correlation matrix of standardised measurements of cave bear (*Ursus spelaeus*) metacarpals from Divje babe I. Shown are the results for the pooled sample Db-A + Db-C (top), sample Db-A (= OIS 3; middle) and sample Db-C (= OIS 5; bottom). Measurements were standardised using sample Db-B as reference. PC 1 accounts for 83.7 percent of the total variance in analysed metacarpals. Dot line (····) represents the average value of PC1 scores for male and female metacarpals from sample Db-A, while dash-and-dot line (– · · –) represents the average value of PC1 scores for male and female metacarpals from sample Db-C. See text for explanation.

no zmanjšujejo premajhna časovna ločljivost vzorcev, neznano razmerje med spoloma in/ali neprimeren način predstavitve rezultatov brez podajanja vsaj osnovne opisne statistike.

ANALIZA OBLIKE

Za razliko od ekofenotipsko plastične velikosti velja oblika za bolj konzervativno komponento morfološke variabilnosti, kar ji daje bistveno večjo "filetsko težo". Morebitne razlike v obliki metapodijev jamskega medveda različnih geoloških starosti bi bilo zato mogoče povezovati z (mikro)evolutivnimi spremembami. Morfometrične in morfogenetske študije dlančnic in stopalnic iz sklopa plasti K do M iz jame Vindija pri Donji Voći (Krklec 1997; Gužvica, Radanović-Gužvica 2000) ter iz Jame pod Herkovimi pečmi na Kozjaku (Pohar 1981) kažejo prav to. Na osnovi pridobljenih rezultatov je bilo namreč za obdobje prehoda iz riško-würmskega interglaciala v würm mogoče potrditi sočasno prisotnost "klasičnih" jamskih medvedov in pa manjših "zamudnikov" kroga deningeri.

Analizirani metapodiji iz Divjih bab I so geološko bistveno mlajši od tistih iz Vindije (sklop plasti K do M) in iz Jame pod Herkovimi pečmi,[13] zato neposredna primerjava med navedenimi najdišči ni mogoča. V tem pogledu so uporabnejši metrični podatki dlančnic in stopalnic jamskega medveda iz več avstrijskih in ene italijanske jame, ki jih je objavil Withalm (2001). Žal njihovo primerjalno vrednost zmanjšuje preohlapen in včasih vprašljiv časovni okvir posameznih vzorcev (prim. Turk *et al.* 2003b). Še bolj problematično je nepoznavanje razmerja med spoloma, kar onemogoča razlikovanje med spolno in filogenetsko pogojenimi razlikami v morfologiji dlančnic in stopalnic. Po Withalmu (2001; 2004) naj bi tako naraščajoče vrednosti indeksa zavaljenosti[14] metapodijev srednjeevropskih jamskih medvedov v würmu kazale na pojav vse naprednejših oblik te vrste. Kot kažejo tukaj predstavljeni rezultati, pa ni nujno tako. Podoben trend je bil sicer sprva res ugotovljen tudi pri gradivu iz Divjih bab I, a le na vzorcu, ki je združeval primerke obeh spolov! Ko sem namreč med seboj primerjal po spolu ločene dlančnice in stopalnice, razlike v vrednosti indeksa zavaljenosti niso bile več statistično značilne (*tab. 17.4*). Po vrednostih I_z se sicer samicam pripisane dlančnice iz Divjih bab I v grobem ujemajo s primerki iz avstrijskih najdišč Windener Bärenhöhle (pribl. 35.000 p.s.), Gamssulzenhöhle (pribl. 40.000–25.000 p.s.) in Ramesch-Knochenhöhle (pribl. 30.000–60.000 p.s.). V nasprotju s tem so dlančnice samcev v povprečju nekoliko bolj zavaljene in kot take bližje tistim iz Potočke zijalke (pribl. 35.000–26.000 p.s.; Withalm 2001; 2004).

Še spornejša od računanja indeksa zavaljenosti pri vzorcih metapodijev brez znanega razmerja med spoloma je uporaba t.i. indeksa K[15] (npr. Gužvica, Radanović-Gužvica 2000; Withalm 2001; 2004). Ker je namreč v imenovalcu izražena linearna meritev (tj. gL), v števcu pa zmnožek dveh linearnih meritev (tj. pB*pH), je naraščanje vrednosti v imenovalcu bistveno počasnejše od naraščanja tiste v števcu tudi v (hipotetičnih) primerih, ko se vrednosti vseh treh dimenzij (tj. pB, pH in gL) sicer povečujejo enakomerno. Uporaba K-indeksa v morfometričnih študijah je torej neustrezna tudi ob poznavanju razmerja med spoloma (prim. Atchley, Anderson 1978).

Pomembna pomanjkljivost "klasičnih" pristopov k morfometričnim analizam oblike skeletnih elementov je tudi, da praviloma ne omogočajo zanesljivega

[13] Domnevno namreč niti najstarejši primerki iz Divjih bab I (tj. tisti iz plasti 16a) ne presegajo geološke starosti 80.000 let p.s.

[14] Indeks zavaljenosti (I_Z) je opredeljen kot v odstotkih izražen količnik med največjo medio lateralno širino distalne epifize (gdB) in največjo dolžino metapodija (gL).

[15] K-indeks je opredeljen kot (pB*pH)/gL, kjer gL predstavlja največjo dolžino metapodijev, pB in pH pa največjo širino oz. največjo višino proksimalne epifize.

Tab. 17.4: Vrednosti indeksa zavaljenosti za po spolu ločene dlančnice jamskega medveda (*Ursus spelaeus*) iz vzorcev Db–A in Db–C. Obstoj statistično značilnih razlik med gradivom različne geološke starosti je bil testiran z uporabo Mann-Whitneyjevega U testa. Za opredelitev indeksa zavaljenosti glej besedilo. Opredelitev simbolov: Me – mediana.

Tab. 17.4: Values of the index of plumpness for metacarpals of cave bear (*Ursus spelaeus*) from samples Db–A and Db–C divided by sex. The existence of statistically significant differences between materials of different geological age was tested using the Mann-Whitney U test. See text for definition of the index of plumpness. Explanation of symbols: Me – mediana.

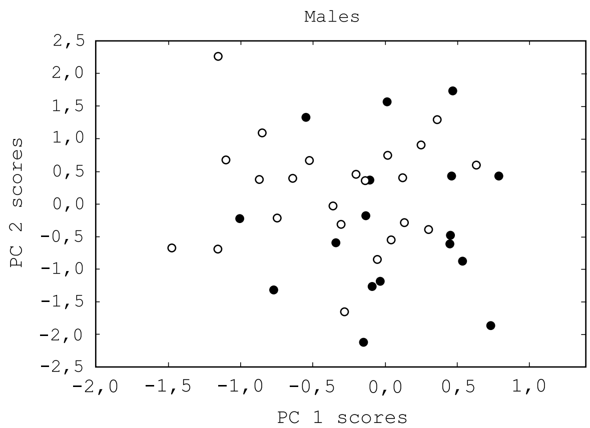
Metacarpal	Sex	Db-A		Db-C		Mann-Whitney U test	
		Me	25% - 75%	Me	25% - 75%		
Mc I	♂	31.2	30.0 - 32.1	31.2	30.6 - 31.8	Z = -0.35	p = 0.728
	♀	28.9	27.7 - 30.0	29.1	28.6 - 30.4	Z = -0.74	p = 0.456
Mc II	♂	34.6	33.6 - 35.7	34.9	33.7 - 35.9	Z = -0.54	p = 0.590
	♀	32.7	32.3 - 34.3	32.7	32.4 - 33.3	Z = 0.07	p = 0.941
Mc III	♂	32.9	32.0 - 34.3	32.5	31.1 - 34.4	Z = 0.63	p = 0.527
	♀	31.8	30.6 - 32.7	30.4	29.7 - 31.1	Z = 1.95	p = 0.051
Mc IV	♂	33.3	32.2 - 34.1	32.9	31.8 - 34.2	Z = 0.85	p = 0.395
	♀	30.5	29.7 - 32.1	30.8	30.1 - 31.6	Z = -0.67	p = 0.499
Mc V	♂	35.2	33.8 - 36.6	35.4	34.9 - 36.5	Z = -0.33	p = 0.742
	♀	33.2	32.3 - 34.8	32.7	32.3 - 33.6	Z = 0.90	p = 0.369

razlikovanja med obliko in velikostjo (za izjemi glej npr. Grandal d'Anglade (1993b) in Grandal d'Anglade, López-Gonzáles (2005)). Problem sem skušal odpraviti z uporabo analize glavnih komponent, pri čemer sem velikostno informacijo iz izvirne množice podatkov odstranil s t.i. Burnabyjevo metodo odstranitve velikosti. Če namreč tako modificirane podatke v obliki korelacijske matrike ponovno vpeljem v analizo PCA, lahko načeloma vse ugotovljene statistično značilne razlike med primerjanimi vzorci v vrednosti posameznih glavnih komponent interpretiram kot odraz razlik v obliki.

V okviru analize oblike sem primerjal tako metakarpalne kosti enega in drugega spola iste geološke starosti (npr. Mc III samcev in samic iz vzorca Db–A), kot tudi istemu spolu pripisane primerke iz dveh različnih vzorcev (npr. Mc II samcev iz vzorcev Db–A in Db–C). Ker posamezne glavne komponente pojasnjujejo razmeroma enakomeren delež variance,[16] sem v nadaljevanju analize upošteval vrednosti prvih štirih do šestih glavnih komponent na posamezno primerjavo. Takšna odločitev mi je omogočila operirati z vsaj 84 odstotki variabilnosti velikosti prostega nabora podatkov (celoten razpon: 84 % do 95 %; Me = 88,5 %).

Rezultati bilateralnih primerjav kažejo, da so odstopanja med vrednostmi posameznih glavnih komponent statistično značilna le v treh (od skupno 25) primerih (Mann-Whitney U-test: $p < 0,05$). To kaže na odsotnost večjih razlik v morfologiji tako med dlančnicami enega in drugega spola iste geološke starosti kot tudi med samcem ali samicam pripisanimi primerki različne geološke starosti. V tem smislu predstavljajo edini izjemi samicam pripisane četrte dlančnice, kjer obstaja med primerki iz Db–A in tistimi iz Db–C statistično značilna razlika v morfologiji proksimalne epifize (Mann-Whitney U-test: $p = 0,002$), ter tretje dlančnice samcev (*sl. 17.8*), kjer se primerki obeh vzorcev razlikujejo v obliki proksimalne epifize ($p = 0,003$) in diafize ($p = 0,020$).

Pri jamskem medvedu je bila plantigradnost domnevno bolj izražena, kot to velja za rjavega medveda (Couturier 1954; Chagneau 1985; Krklec 1997). Ker se na nivoju metapodijev takšen način hoje praviloma kaže v pahljačasti razširitvi distalnih delov epifiz in distalnih epifiz (npr. Ewer 1973; Kurtén, Poulianos 1977), so ugotovljene razlike v morfologiji dlančnic oz. nartnic različne geološke starosti iz Divjih bab I do neke mere presenetljive. Glede na tezo o progresivno vse bolj plantigradni hoji jamskega medveda in njegovi specializirani uporabi prednjih šap pri izkopavanju podzemnih delov rastlin (a glej tudi Pinto Llona, Andrews (2001)) bi namreč razlike prej pričakoval v oblikovanosti distalnih delov metapodijev (npr. Kurtén 1969; Viranta 1994;



Sl. 17.8: Projekcija tretjih dlančnic samcev jamskega medveda (*Ursus spelaeus*) iz vzorcev Db–A (●) in Db–C (○) iz Divjih bab I na prvo in drugo glavno komponento, ki sta bili izračunani na osnovi korelacijske matrike velikosti prostih podatkov osmih merjenih dimenzij. PC 1 pojasnjuje 34 odstotkov, PC 2 pa 19 odstotkov vse v izhodiščnem naboru podatkov zaobjete variance. Variable, pri katerih absolutne vrednosti faktorskih uteži presegajo vrednost 0,70, so: gL, gdB in dB pri prvi glavni komponenti ter pB pri drugi. Osi so bile rotirane z metodo *varimax normalized* (StatSoft Inc., 2001). Legenda: PC – glavna komponenta. Za obrazložitev glej besedilo.

Fig. 17.8: Projection of male third metacarpals of cave bear (*Ursus spelaeus*) from samples Db–A (●) and Db–C (○) from Divje babe I to the first and second principal components, which were calculated on the correlation matrix of the size-free measurements of third metacarpals. PC 1 and PC 2 account for 34 percent and 19 percent of the total variance in analysed metacarpals, respectively. Variables in which the absolute values of factor loadings exceed 0.70 are: gL, gdB and dB in the case of the first principal component (PC 1) and pB in the case of the second principal component (PC 2). Axes were rotated by the method of *varimax normalized* (StatSoft Inc., 2001). Legend: PC – principal component. See text for explanation.

Krklec 1997). Chagneau (1985) je sicer pri *os scapholunare* opazil nekatere specifične morfološke modifikacije, ki naj bi jim botrovali prav plantigradna hoja in/ali uporaba prednjih šap pri kopanju (ker navedena karpalna kost artikulira s četrto dlančnico, bi določene prilagoditve torej lahko pričakovali tudi v oblikovanosti njene proksimalne epifize). Brez odgovora pa ostajata vprašanji, zakaj je do morfoloških modifikacij prišlo le pri enem od obeh spolov ter zakaj česa podobnega ni opaziti tudi na proksimalni epifizi katere od drugih dlančnic? Morfometrična študija karpalnih kosti jamskega medveda je namreč izpostavila tudi kopico drugih prilagoditev na vse bolj izraženo plantigradnost (Chagneau 1985).

[16] Gre za pričakovano posledico Burnabyjeve odstranitve velikostne informacije.

SKLEP

Obravnava metapodijev jamskega medveda iz Divjih bab I z uporabo multivariatnih statističnih metod je razkrila nekatere slabosti "klasičnih" morfometričnih raziskav. Poleg tega je učinkovito ovrgla tezo, po kateri naj dlančnic in stopalnic jamskega medveda ne bi bilo mogoče grupirati po spolu (prim. Withalm 2001).[17] Ocenjena spolna struktura se sicer nekoliko razlikuje od tiste, ki temelji na metričnih podatkih podočnikov (Debeljak 2002a), se pa zato v celoti ujema z rezultati biometrične analize dolgih kosti (poglavje 16 v tem zborniku; *sl. 16.3a, b*). Predstavljeni izsledki tako obenem tudi nakazujejo, da sicer zelo popularna metoda ocenjevanja razmerja (!) med spoloma na osnovi metričnih podatkov podočnikov ni vedno zanesljiva (prim. Turk *et al.* 1989).

Namen pričujočega prispevka pa ni le opozoriti na metodološke pomanjkljivosti "klasičnih" morfometričnih raziskav. Pridobljeni podatki namreč ponujajo tudi zanimivo izhodišče za poglobljen vpogled v življenje jamskega medveda in v njegove odzive na klimatska nihanja. Izsledki sedimentoloških, paleontoloških, palinoloških in antrakotomskih raziskav kažejo, da naj bi bila klima v OIS 3 bistveno bolj hladna, vlažna in manj stanovitna kot v OIS 5a-5d (Šercelj, Culiberg 1991; Turk *et al.* 2002b; poglavja 6, 8, 10 in 11 v tem zborniku). Izhajajoč iz biologije recentnih medvedov je s takšnimi ugotovitvami skladna tudi spolna struktura jamskega medveda. Spolno specifična izbira brloga pri fosilnih in recentnih vrstah rodu *Ursus* naj bi bila sicer odvisna predvsem od velikosti jame, njene nadmorske višine, naklona in lege pobočja, vegetacije v okolici ter oddaljenosti od različnih motečih točk (Slobodyan 1976; Rogers 1981; Camarra 1983; Groff *et al.* 1998; Stiner *et al.* 1998; Reisinger, Hohenegger 1998). Vendar pa ima pri tem zelo pomembno vlogo tudi klima. Kot kažejo študije recentnih medvedov, določa fiziološko pripravljenost na "zimsko spanje" in grobo tempiranje njegovega začetka cirkanualni ritem, ki je vezan na sezonski cikel rastlin (Ewer 1973). Odločilen impulz za dejanski prehod v letargično stanje pa naj bi sprožilo predvsem splošno poslabšanje vremena v kombinaciji z zmanjševanjem količine razpoložljive hrane (Johnson, Pelton 1980). Za današnje črne (*U. americanus*) in rjave (*U. arctos*) medvede vemo, da v klimatsko ugodnih pogojih brloge prve zasedejo breje samice. Sledijo jim subadultni osebki in nazadnje še samci (Slobodyan 1976; Pasitschniak-Arts 1993). Zamik (pri samcih včasih celo popoln izostanek) v začetku "zimskega spanja" lahko sprožijo obilne letine žira, želoda ipd. (Johnson, Pelton 1980; Germonpré, Sablin 2001). Drugače je ob ostrejših klimatskih pogojih in/ali pomanjkanju hrane. Takrat naj bi pričeli namreč samci hibernirati približno sočasno s subadultnimi osebki in (brejimi) samicami (Slobodyan 1976; Pasitschniak-Arts 1993), kar vodi do povečane konkurence za ugodne, bolj zaščitene brloge (Johnson, Pelton 1980; Stiner 1998b). V takšnih razmerah so seveda pri izbiri brloga v prednosti samci, saj se breje samice oz. samice v spremstvu subadultnih mladičev pred njimi običajno umaknejo drugam.

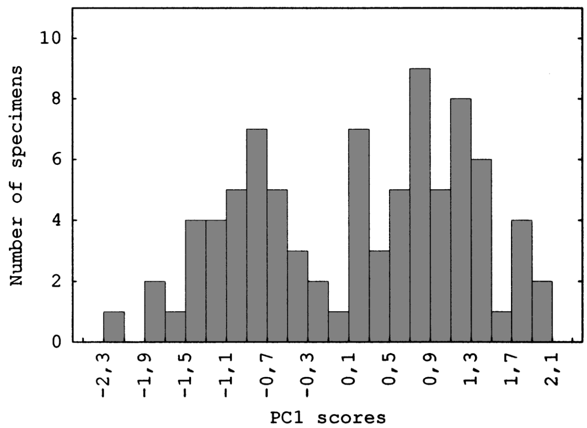
Podobno vedênje je bilo verjetno prisotno tudi pri jamskem medvedu. Na to kažejo nadpovprečno visoke vrednosti $\delta^{15}N$ pri osebkih iz hladnih faz würma, kar naj bi bilo povezano z reciklažo uree pri sintezi aminokislin med hiberniranjem (Fernández Mosquera *et al.* 2000; 2001). V manjšem deležu samic znotraj interpleniglacialnih vzorcev Db–A in Db–B se tako verjetno kaže predvsem povečan pritisk samcev na potencialne brloge zaradi manj ugodnih klimatskih razmer v OIS 3 glede na tiste v OIS 5a-5d. Takšno tezo potrjuje tudi podatek, da spolna struktura medvedov iz edinih dveh razmeroma toplih in/ali suhih faz interpleniglaciala[18] ne kaže na večinski delež samcev, kot je to sicer značilno za preostalo gradivo iz OIS 3. Namesto tega je delež samcev v gradivu iz omenjenih dveh faz praktično enak deležu samic, tako kot to velja za zgodnjeglacialni vzorec Db–C (*sl. 17.9*; glej tudi *sl. 17.2* in *sl. 17.4*).

Alternativno razlago spolnemu dimorfizmu kot vzroku za obstoj različno velikih metapodijev jamskega medveda v mlajšepleistocenskih najdiščih Italije, Avstrije, Nemčije, Slovenije in Hrvaške podajajo Withalm (2004; 2005) in Hofreiter s sodelavci (2004). Po videnju omenjenih avtorjev naj bi bil povečan delež večjih in bolj zavaljenih metapodijev na nekaterih najdiščih posledica imigracije robustnejših jamskih medvedov, ki jih obravnavajo kot samostojno vrsto *Ursus ingressus* Rabeder *et al.*, 2004 (Rabeder *et al.* 2004b,c). Po naselitvi alpskega prostora pred približno 50.000 leti naj bi namreč omenjena vrsta na tem območju v celoti nadomestila vrsto *U. spelaeus* (Rabeder, Hofreiter 2004).[19] Vendar pa odsotnost statistično značilnih razlik v obliki metapodijev različne geološke starosti iz Divjih bab I takšni razlagi v našem primeru nasprotuje. Withalm (2004; 2005), Hofreiter s sodelavci (2004) ter Rabeder s sodelavci (2004c) namreč jasno navajajo, da se vrsti *U. spela-*

[17] Skladne s tem so tudi ugotovitve, ki jih podajajo Krklecova (1997) ter Quiles, Monchot (2004).

[18] V takih pogojih naj bi nastala sklopa plasti 2 do 5 (brez plasti 5a) in 6 do 7. Žal je zaradi krioturbacije sklop plasti 2 do 5 naguban, tako da posameznih najdb ni mogoče z zanesljivostjo ločiti od tistih iz plasti 5a, ki je sicer nastala v obdobju hladne in razmeroma vlažne klime. Kljub temu je zanimivo, da je število dlančnic samcev, ki sem jih pogojno uvrstil v plast 5a, visoko statistično značilno večje od števila dlančnic samic, ki sem jih pogojno uvrstil v isto plast (χ^2 test: p = 0,000). Drugače je s preostalimi dlančnicami iz sklopa plasti 2 do 5, kjer razlika v številu primerkov vsakega od obeh spolov ni statistično značilna (χ^2 test: p = 0,144).

[19] Skladen s takšnimi razmišljanji je tudi obstoj sočasnih, a med seboj domnevno reproduktivno izoliranih populacij jamskega medveda (Hofreiter *et al.* 2004; a glej tudi Orlando *et al.* 2002).



Sl. 17.9: Porazdelitev vrednosti prve glavne komponente (PC 1), izračunane na osnovi korelacijske matrike standardiziranih podatkov osmih dimenzij dlančnic jamskega medveda (*Ursus spelaeus*) iz Divjih bab I: primerki iz plasti 6 in 7 (N = 85). Vrednosti so bile standardizirane po podatkih iz vzorca Db-B. PC 1 pojasnjuje 72,8 odstotka vse v osnovnem naboru podatkov zaobjete variance. Za obrazložitev glej besedilo.
Fig. 17.9: Distribution of first principal component (PC 1) scores, calculated on the correlation matrix of standardised measurements of cave bear (*Ursus spelaeus*) metacarpals from Divje babe I: specimens from layers 6 and 7 (N = 85). Measurements were standardised using sample Db-B as reference. PC 1 accounts for 72.8 percent of the total variance in analysed metacarpals. See text for explanation.

eus in *U. ingressus* razlikujeta tudi v morfologiji metapodijev (Toškan 2007). Prav tako je izpovedna odsotnost statistično značilnih razlik v vrednostih indeksa zavaljenosti med prvimi dlančnicami iz vzorca Db-A in tistimi iz Db-C, čeprav naj bi bil prav to eden boljših diagnostičnih znakov za razlikovanje med obema vrstama jamskih medvedov (Rabeder *et al.* 2004c). Metapodiji iz facije C so namreč časovno umeščeni v OIS 5 in so zatorej (za razliko od tistih iz facije A) starejši od 50.000 let, ko naj bi se v Alpah prvič pojavil *U. ingressus*. Glede na navedeno se zdi tako obstoj različno velikih metapodijev jamskega medveda v Divjih babah I vendarle bolj utemeljeno povezovati z razlikami med spoloma znotraj ene vrste (tj. *U. spelaeus*), kot pa z razlikami med osebki vrste *U. spelaeus* na eni strani in tistimi vrste *U. ingressus* na drugi.

Sprememba klime ob koncu zgodnjega glaciala naj bi na mikrolokaciji Divjih bab I odsevala predvsem v obilnejši in dlje časa trajajoči snežni odeji ter posledično v izrazito sezonski razpoložljivosti rastlinske hrane. Zaostritev klimatskih pogojev je od domnevno rastlinojedega jamskega medveda (Bocherens *et al.* 1994; 1997; Nelson *et al.* 1998) zahtevala oblikovanje obilnejših energetskih zalog v obliki adipoznega tkiva (prim. Searcy 1980). Pri večjih živalih dane vrste predstavlja namreč maščoba večji odstotek telesne mase kot pri manjših (Lindstedt, Boyce 1985), zato naj bi bili v okoljih z izrazito sezonsko razpoložljivo hrano večji osebki favorizirani v primerjavi z manjšimi (Millar, Hickling 1990). Ugotovitev, da so Divje babe I v OIS 3 obiskovali statistično značilno večji jamski medvedi kot v OIS 5a-5d (*tab. 17.3*; *sl. 17.7*), je torej iz tega zornega kota povsem pričakovana. Res je sicer, da se v nihanju mase recentnih medvedov kaže tudi obilo drugih dejavnikov (npr. populacijska gostota, energetska vrednost razpoložljive hrane, starost samic ob prvi kotitvi). V okoljih z razmeroma nizko primarno produkcijo in izrazito sezonsko razpoložljivostjo hrane pa naj bi bila za povečanje mase vendarle odločilna prav potreba po obilnejših energetskih zalogah pred začetkom "zimskega spanja" (Ferguson, McLoughlin 2000).

Žal hipoteze o povečevanju mase medvedov zaradi nastopa ostrejših klimatskih razmer ne morem testirati na fosilnih metapodijih iz sosednjih najdišč, ker je ustrezno podanih objav premalo. Zanimiv, čeprav izoliran podatek ponuja Torres s sodelavci (2000). Pri riških (OIS 6) jamskih medvedih iz takrat domnevno hladnejšega osrednjega dela Španije so namreč opazili značilno večje dimenzije zob kot pri primerkih iz sočasnih najdišč priobalnega, severnega dela države, kjer je bila klima domnevno milejša. Isti avtorji še dodajajo, da so bili vsi navedeni primerki hkrati v povprečju manjši od tistih, ki so priobalni pas naseljevali v še hladnejšem pleniglacialu I (OIS 4).[20] Načeloma bi lahko velikost medvedov iz Divjih bab I pojasnili tudi (predvsem?) s specifičnimi genetskimi in/ali epigenetskimi dejavniki. Vendar pa raziskave na recentnih medvedih dokazujejo, da je pretežni del intraspecifične variabilnosti v velikosti mogoče razložiti že s spremenljivimi ekološkimi dejavniki (npr. Rausch 1962; Rogers 1976; Herrero 1978).

ZAHVALA

Zahvaljujem se dr. Ivanu Turku, ki mi je omogočil študij fosilnih metapodijev iz Divjih bab I. Članek je v pretežnem delu povzetek lastne doktorske disertacije, zato bi se želel na tem mestu zahvaliti mentorici prof. dr. Vidi Pohar ter članoma komisije prof. dr. Jerneju Pavšiču in prof. dr. Borisu Bulogu. Podiplomsko usposabljanje je financiralo Ministrstvo za šolstvo, znanost in šport. Za spodbudne razprave med raziskavo sem hvaležen dr. Ivanu Turku in dr. Ivanu Kosu, za nasvete v zvezi s statistično obdelavo pa dr. Andreju Blejcu.

[20] Zobje so sicer podvrženi specifičnim selekcijskim pritiskom, zato pri njih ugotovljene evolucijske vzorce ni utemeljeno *a priori* posploševati na preostale skeletne elemente (Patterson 1983; Dayan *et al.* 2002).

17. MORPHOMETRIC STUDY OF CAVE BEAR METAPODIALS FROM DIVJE BABE I

BORUT TOŠKAN

Abstract

Morphometric analysis of 1,598 cave bear metapodials from the Upper Pleistocene (OIS 3 and OIS 5) layers of Divje babe I showed that the metric data allow differentiation between the sexes. It was found that the share of the two sexes among the material from OIS 5a-5d is comparable, while approximately two thirds of metapodials from OIS 3 are male. The increased share of males in OIS 3 is explained by longer, colder and damper winters in this period than in OIS 5a-5d. Namely, studies of recent brown and black bear have highlighted a causal link between the occurrence of harsher climatic conditions, on the one hand, and increased intersexual competition for available lairs on the other. The sex ratio from the only two relatively warm/dry phases in OIS 3, with which the comparative share of representation of the two sexes does not differ from the sex structure of material from the relatively warm and dry OIS 5a-5d, is in line with such an interpretation.

Cave bear (*Ursus spelaeus* Rosenmüller, 1794) is often the best represented species in the fauna of European Upper Pleistocene sites (Miracle 1991; Argant 1996a). This is also the case in Divje babe I (western Slovenia; 450 m asl.), where its share exceeds 99 percent of all animal remains. Because of the large number of finds, it was possible to process some skeletal elements in more detail biometrically (e.g., Debeljak 2002a; Chapter 16 in this volume). This included metapodials, the study of which is presented below. In view of their role in the biomechanics of walking (Opavský 1990) this contribution provides an in depth view of the extent and direction of micro-evolutionary changes in the morphology of metacarpals and metatarsals and into the sex structure of cave bear from Divje babe I, including factors which would have had an impact on it.

MATERIAL AND METHODS

Only 1,598 of a total of several thousand cave bear metapodials obtained during extended excavation of Divje babe I were processed within the framework of the study presented here. In order to optimise comparison between metacarpals or metatarsals of different geological age, only specimens excavated from excavation fields A and B were processed. On these two excavation fields, Turk (2003a) analyzed the vertical distribution of the structure of aggregates and more than 3 mm large bone fragments of large mammals. On the basis of the results obtained, geological layers determined on site during the excavation were replaced by new basic stratigraphic units, i.e., facies A, B and C, which consist of various stratigraphic levels. Since such redistribution allows litostratigraphic and biostratigraphic units to be equated, the previously uniform sample of 1,598 metapodials was divided into three sub-samples: Db-A (including specimens from facies A), Db-B (facies B) and Db-C (facies C). Such a division provided a starting point for analysis of variability in the size and/or morphology of metacarpals and metatarsals of different geological ages.[1]

Detailed data on the site and course of the fieldwork are given by Turk (Chapter 1 in this volume), so only the methodology of processing the metapodials is presented here. Using a calliper gauge, eight different dimensions were measured (Fig. 17.1): greatest length (gL), medio-lateral breadth of the proximal end (pB), antero-posterior breadth of the proximal end (pH), smallest medio-lateral breadth of the diaphysis (sDB), smallest dorso-palmar or dorzo-plantar breadth of the diaphysis (sDH), greatest medio-lateral breadth of the distal end (gDB), medio-lateral breadth of the distal epiphysis (dB) and antero-posterior breadth of the distal end (dH). Only fully fused specimens were included in the analysis.[2] X-ray pictures of the paws of black bear (*Ursus americanus*) have shown that growth of the epi- and diaphyses of met-

[1] Facies A and B were deposited in OIS 3 (i.e., Interpleniglacial), and facies C in OIS 5a-5d (i.e., Early Glacial). OIS 4 (i.e., Pleniglacial I) is almost not represented in the cave, since there was a hiatus in sedimentation (Chapters 6 and 7 in this volume).

[2] Studies of the skeletons of some species of ungulates have highlighted the possibility of appreciable growth of bone tissue even after the bone was fully fused. However, mention is mainly made of the scapula, the distal part of the humerus or astragalus, which all ossify very early in ontogenetic develop-

acarpals ends at the end of the second year, and in the following few months the ridge of the distal epiphysis is finally formed (Marks, Erickson 1966). With cave bear, the development of the metapodials is thought to have ended on average somewhat later (i.e., only just before completing the third year), since the ontogenetic development of the skeleton with the latter species is thought to have been slower (see Debeljak 2002b). In addition, the tempo of fusion of epi- and diaphyses in the study of Marks and Erickson is probably slightly underestimated, since their conclusions derive from analysis of X-ray pictures (1966; see also Moran, O'Connor 1994).

Fully preserved specimens predominate among the analysed metapodials, with which it was possible to take all eight dimensions. In order to create the most extensive (and thus representative) sample, partially damaged metacarpals and metatarsals with which one measurement could not be taken were also analysed. The missing data for these was replaced with an estimate obtained by the method of Forward Stepwise Regression. This is a procedure in which, by the analysis of undamaged specimens, a linear combination of dimensions which could be taken also on partially fragmented metapodials is created. The cited dimensions are included in the combination gradually, step by step, until further addition no longer contributes to an essentially better estimate of the "missing" dimension (StatSoft Inc. 2001). The success of the forecast was tested on undamaged specimens. The absence of statistically significant differences between the measured and estimated values (F-test: $p < 0.05$) shows that the method was successful.

The sexing of metapodials is based on the results of principal components analysis (PCA). This method enables the variations of a given number of basic x variables to be satisfactorily explained with (significantly) fewer principal components (PC_i), which very much facilitates the interpretation of the within-sample variability (Manly 1994; StatSoft Inc. 2001). Prior to carrying out the principal components analysis I first standardised the available metric data. By doing so I was able to substitute the absolute differences in values of individual dimensions between metacarpals (Mc I to V) / metatarsals (Mt I do V) with the relative deviation[3] of individual specimens from the average value of the given dimension in a reference sample. These relative deviations were then transferred to further analysis. Consequently, all metacarpals/metatarsals could be pooled together to form a uniform statistical sample, which was thus essentially more representative. Metric data were standardised according to the formula:

$$\text{standardised value} = (x - M) / S$$

where x represents the individual measurement to be standardised, and M and S the average and standard deviation for the same dimension in a reference sample.

By means of principal components analysis an attempt was also made to identify differences in the morphology of metapodials of different geological ages. Metric data from which the size component had been removed (i.e., Burnaby size-out) were used as a starting point. In morphometry, size generally explains the highest share of variance. Since in principal components analysis the first of them (i.e., PC 1) generally describes the highest share of variance of the original data set, it can be understood as a size vector or bearer of size information (Lemen 1983). The residuals of regression analysis with a rectangular projection of the matrix of original (i.e., size containing) data set to PC 1 are thus presumably size free and can be included in further multi-variant analysis (Burnaby 1966).

The programme package StatSoft 2001, Statistica for Windows, version 6.0, and NTSYS-pc, version 2.0 were used for statistical processing.

All the analysed cave bear metapodials from Divje babe I are kept by the National Museum of Slovenia in Ljubljana.

SEX PROFILE

Cave bear males were on average about a third heavier than females (Viranta 1994), which indicates a very pronounced sexual dimorphism (e.g., Kurtén 1955; Reisinger, Hohenegger 1998; Grandal D'Anglade 2000). Nevertheless, analysis of 4,459 metacarpals and metatarsals of *U. spelaeus* and *U. deningeri* from eight Austrian and one Italian site showed that it is not possible to group them by sex on the basis of purely linear dimensions (Withalm 2001). Because of this, the sexing of cave bear metapodials from Divje babe I was done by principal components analysis (PCA), enabling the simultaneous treatment of several parameters (in this case eight). Because of the prior standardisation of the metric data[4] the variability in size/shape of metapodials could be compared within a pooled sample of all metacarpals/metatarsals.

The correlation matrix of standardised values of all eight parameters was used as entry data, separately for metacarpals and metatarsals. PC1 accounts for 83.7 % of variability of the original data set with metacarpals and 72.8 % with metatarsals. Factor loadings of all eight parameters are negative and range between -0.76 and -0.94. The communalities are high, and the residual correlations between them are low. Most of the variance of the

ment (e.g., Legge, Rowley-Conwy 1988, Payne, Bull 1988; Luff 1993). Nevertheless, metapodials with visible exostosis were preventively excluded from the analysis.

[3] Deviations are expressed as standard deviations.

[4] Metapodials from facies B were used as a reference sample, since in terms of their dimensions, they are ranked between specimens from facies A and C (see *Annex 17A–17J*).

original data set can therefore be satisfactorily explained by both first principal components alone.

The frequency of distribution of PC 1 scores is explicitly bimodal both with metacarpals/metatarsals from sample Db-A and with those from sample Db-C (*Fig. 17.2* and *Fig. 17.3*).[5] Such a distribution was interpreted as a reflection of sexual dimorphism, thus enabling at least an approximate estimate of the sex ratio. Overlapping between scores of the two sexes is slightly greater with metatarsals than with metacarpals. Because of the constitution of the cave bear, such a finding is entirely to be expected and has also been shown in the long bones of both pairs of extremities (Reisinger, Hohenegger 1998).

It follows from the frequency of distribution of PC 1 scores that the number of metacarpals and metatarsals of the two sexes is roughly equal in the early glacial sample Db–C (= OIS 5a–5d). The material of Interpleniglacial age (i.e., sample Db-A) is different, with approximately two thirds of specimens being male.[6] In this sense, none of the metapodials (i.e., Mc I to V, Mt I to V) show any essential deviation. In the case of three out of a total of five metacarpals, differences in the sex structure between samples Db-A and Db-C are even highly statistically significant (χ^2 test: $p < 0.01$). However, individual specimens were not as a rule divided into left and right, because the samples were too small for this. The only such attempt was done with the second metacarpal, since it is best represented of the metapodials (Mc II: N = 96). It is noteworthy that in this case, too, the ratio between the sexes is balanced in the early glacial sample (= OIS 5a–5d) while male-ascribed second metacarpals predominate in the interpleniglacial sample Db–A (= OIS 3) (*Tab. 17.1*).

The results presented above are in conflict with the opinion of Withalm (2001), according to whom metapodials are not suitable for assessing the sex profile of cave bear assemblages. Despite measuring entirely the same dimensions as the cited author, it was possible using a multivariate statistical approach to identify the sex of roughly 90 percent of all metacarpals and approximately 75 percent of all metatarsals. What is surprising about the results obtained is the deviation of the metapodial-based sex profile of cave bear assemblage from Divje babe I from the one based on the size of canines of adult animals from the same site (Debeljak 2002b). In the case of the sample from OIS 5a–5d, the results of the two approaches correspond, with both showing an approximately equal representation of each of the two sexes. It is otherwise with the material from OIS 3, where the study of canines did not show a majority share of males (for the sake of comparability only canines belonging to animals more than three years old were taken into account, since younger age categories are not represented in the sample of metapodials).

The established difference between the two sex ratio estimates is probably not a result of the unsuitability of either of the methods. The distribution of both canine metric data and metapodial PC1 scores are, namely, explicitly bimodal. It is true that in the case of canines all the available specimens of interpleniglacial age (= OIS 3) were taken into account, while only PC 1 scores of metapodials from layers 2 to 7 (= sample Db–A) are shown in *Fig. 17.2* and *Fig. 17.3*. The remaining metacarpals/metatarsals from OIS 3 (= sample Db–B) were not sexed to this point of the research because they were used as reference in the standardisation (see above). However, as shown on *Fig. 17.4*, the distribution of PC 1 scores of standardised[7] metric data of metacarpals from sample Db–B entirely confirms the hypothesis of the predominance of males in the material from OIS 3. The difference in the two sex profiles therefore probably derives from an actual discordance in the share of each of the two sexes between the interpleniglacial samples of canines and metapodials. In this sense, it is interesting to note that the quotient of the number of left first lower molars of bears above three years of age and left first lower canines of the same age group in the early glacial (= OIS 5a–5d) sample is statistically significantly lower than the value of the same quotient in the material from OIS 3 (*Tab. 17.2*), suggesting a “lack” of canines in the interpleniglacial sample (= OIS 3).

There are no indications of a similar lack in the case of metapodials. The coefficient of correlation between the number of all morphometrically analysed metacarpals and metatarsals, on the one hand, and the number of all cave bear bone fragments larger than 3 mm on the other, is very high (Spearman $R = 0.89$; $p = 0.000$).[8] It is true that the number of bone fragments per metapodial in facies A is statistically significantly higher than in facies B (Mann Whitney U-test: $p = 0.022$), but this is probably due to a greater fragmentation of remains in the upper stratigraphic levels (*Fig. 17.5*; sub-chapter 12.3 in this volume). It is also worth mentioning the higher quotient value between the number of metapodials and the number of patellae in the sample from facies A in relation to the sample from facies B (sub-chapter 12.4

[5] Since metapodials from sample Db–B were used as a reference sample in standardisation, they were excluded in this phase of the research.

[6] Due to negative factor loadings, the large (i.e., male-ascribed) metacarpals / metatarsals form the left of the two peaks in *Fig. 17.2* and *Fig. 17.3* and small (i.e., female-ascribed) specimens the right one.

[7] Values were standardised according to data of the complete sample of cave bear metacarpals / metatarsals from Divje babe I (i.e., Db–A + Db–B + Db–C).

[8] The correlation between the number of cave bear canines and the number of bone fragments larger than 3 mm cannot be estimated, since data on the number of bone fragments (just as this also applies to the number of metapodials) refer only to excavation fields A and B, while canines were collected from the whole excavation field.

in this volume), since this could indeed indicate a "lack" of metapodials in the material from facies B. Even if this is the case, however, the hypothesis of the larger share of males in the material from OIS 3 should not be rejected since a predominance of male-ascribed metapodials was also found in the other interpleniglacial sample, i.e. sample Db-A.

Taking the above into account it appears that the sex ratio estimate between the samples of metapodials and canines can actually be linked to the "lack" of the latter. It is less clear why there is such a lack. The age structure of cave bears from Divje babe I suggests that the accumulation of their remains is related to natural mortality during hibernation or immediately afterwards (Debeljak 2002a). If this is true, then the "lack" of canines is not ascribable to specific agencies of bone collection but, rather, to a variety of post-depositional factors (activity of carnivores and man, water transport, oscillations in temperature and humidity etc.). Turk and Dirjec (1991) have already shown that taphonomic loss in Divje babe I was actually quite substantial. Their analysis in many respects confirmed the existence of powerful carnivorous (presumably mainly bear) destruction of long bones. However, since the role of carnivores in fragmenting cave bear teeth would have been essentially smaller, the cause of the "lack" of canines in facies A and B must be sought elsewhere. The role of differential preservation of teeth also seems fairly marginal. As preliminary studies of the numbers of bone fragments of various size classes for the lower part of Layer 8 and upper part of the complex of layers 10 to 14 showed, the relatively greater "lack" of canines does not correspond stratigraphically to a larger share of more fragmented teeth/bones (Turk *et al.* 1988–1989). The ratio between the number of tooth fragments and the number of non fragmented teeth in individual layers shows the same (*Fig. 17.5*), with statistically significant differences being found only between the two interpleniglacial (= OIS 3) samples Db–A and Db–B (Mann-Whitney U-test: $p = 0.000$), but not also between Db–B and the early glacial (= OIS 5a–5d) sample Db–C (Mann-Whitney U-test: $p = 0.882$). Note that there is no significant difference between samples Db–A and Db–B in the ratio between the number of left C_1 and left M_1 of cave bears over three years old (χ^2 test: $p = 0.818$),[9] and the two samples are also very similar in terms of the share of metapodials of the two sexes. That stratigraphic layers showing the greatest "lack" of canines do not stand out in terms of a large number of tooth fragments is also confirmed by the analysis of cave bear remains from the profiles (Toškan 2004). It is true that the volume of examined sediment was significantly smaller in this case (Turk 2003a), but because of careful control we have the absolute assurance that even the smallest tooth fragments were collected from it.

Palaeolithic people are one of the factors that could have contributed to the "lack" of canines of cave bears more than 3 years old. Various papers have been presented on the importance and extent of the cave bear cult (e.g., Kurtén 1972; Chase 1987). Among other things, mention is made of (cave) bear canines formerly (as indeed still today) being considered trophies, so people may have removed a lot of them (Turk *et al.* 1988–1989; Turk 2003b). Several pierced cave bear canines are known from the Upper Palaeolithic (e.g., Schreve, Currant 2003; Tejero *et al.* 2005; Vercoutère *et al.* 2006), and similar specimens of fox teeth are even older (Vercoutère 2002; Valde-Nowak, Charles 2003). Pierced phalanges of reindeer, for which Middle Palaeolithic people were perhaps similarly responsible, are also worth noting (Chase 2001). Archaeologists have even reported well documented cases of the deliberate burial of Neanderthals and certain decorative or otherwise unusual items which are thought to prove the existence of symbolism, religion and art (e.g., Chase 1987; Germonpré 2001; Horusitzky 2003; Turk *et al.* 2003a; Valde-Nowak, Charles 2003; Maureille 2004).

That the "lack" of canines among the material from OIS 3 is perhaps really (also) based on a link with Palaeolithic man is shown by *Figure 17.6*. As can be seen, the vertical distribution of metapodials fully corresponds with the distribution of all bone fragments larger than 3 mm. The number of metacarpals and metatarsals per stratigraphic level thus seems to reflect the natural mortality of bears in Divje babe I in individual periods. It is therefore more interesting to compare distributions of metapodials or root-filled canines with the distribution of stone artefacts. Peaks in the number of metapodials in fact correspond with peaks in the number of canines only in layers in which the number of microflakes, flakes, tools, cores and debris collected is negligible (e.g., sediment from a depth of –309 to –417 cm). It is otherwise with sedimentation levels in which the large number of collected stone artefacts indicates an increased frequency or duration of human visits to the cave (e.g., sediment from –237 to –297 cm depth). In these, the number of root-filled canines remains small, despite the peak in the number of metapodials and bone fragments. One must bear in mind, of course, that a larger number of collected microflakes, flakes, tools, cores and debris is not a reliable indicator of extended human presence in the cave. Similarly, stratigraphic levels with a pronounced "lack" of canines do not also always deviate in terms of a relatively large number of stone artefacts. However, it is possible nevertheless to explain the "lack" of canines better with the suspected greater frequency of human visits to the cave than with climatic variations in the period in question. The similarity between the vertical distribution of dentine filled C_1 and the share of congelifracts represented in the sediment (an indicator of temperature oscillations) or between the vertical distributions of den-

[9] Data on the number of teeth is provided by Debeljak (2002a).

tine filled C_1 and the share of aggregates represented in the sediment (an indicator of humidity oscillations) is, namely, practically nil (Toškan 2004).

Insofar as people actually removed the canines of cave bear from Divje babe I in OIS 3, one would expect them to have preferentially collected the largest specimens, belonging to adult males. A preference for larger trophy canines has recently been clearly expressed even with modern excavations of archaeological and palaeontological sites (e.g., Kurtén 1972; Weinstock 2000). Such a selective removal of specimens would of course modify the original sex profile and thus contribute to an underestimation of the share of male canines in Debeljak's analysis (2002b). An assumption of man's preference for larger, trophy teeth also corresponds with the finding that the "lack" of canines is statistically significant only in the sample of teeth from adult animals (χ^2 test: p = 0.032), and not also in the material containing specimens of all cave bears more than 2 years old (χ^2 test: p = 0.118). This finding is noteworthy since specimens of young (<3 years) animals, which are hollow and relatively small (Debeljak 1996), greatly predominate in the sample of canines of all bears more than two years old (Debeljak 2002a). As such, they were probably uninteresting to potential "collectors", so their removal from the cave was probably negligible.

ANALYSIS OF SIZE

Metric data of long bones enables a more reliable assessment of the size (mass) of fossil cave bear than is the case for metapodials (e.g., Jackson 1989; Damuth, MacFadden 1990; Christiansen 1999). Within the framework of analysis of size, no absolute but only relative differences in the mass of cave bears of different geological age were therefore analysed. The results obtained are nevertheless significant, since the number of completely preserved metapodials in the fossil material from Divje babe I is essentially greater than the number of undamaged long bones ($N_{metapodials}$ = 1.598; $N_{long\ bones}$ = 272).

Relative differences in the size of metapodials of different geological age are shown in *Figure 17.7*. Because of the greater burden carried by the front extremities, differences in values of PC 1 with metacarpals[10] are significantly greater than with metatarsals, which do not exceed the limit of statistical significance (males: F = 0.20, p = 0.650; females: F = 0.46, p = 0.495). In contrast, differences with metacarpals are even very highly statistically significant (*Tab. 17.3*).[11]

The results presented show that larger cave bears visited Divje babe I in OIS 3 than in OIS 5a-5d. Without comparative data from at least a few other caves in the region, of course, this finding cannot *a priori* be generalised to the entire population, since one site cannot satisfactorily cover the heterogeneity of former biotopes.[12] Unfortunately, the majority of published metric data on cave bear metapodials from the vicinity (e.g., Rakovec 1967; Pohar 1981; Krklec 1997; Withalm 2001; 2004) and slightly further away (e.g., Torres 1988; Argant 1991) is unusable for this purpose, since the excessively loose time framework of samples, unknown sex ratios and/or unsuitable method of presentation of the results without giving at least basic descriptive statistics, all significantly reduce their comparative value.

ANALYSIS OF SHAPE

In distinction from ecophenotypically plastic size, the shape is a more conservative component of morphological variability, which gives it a significantly greater "filetic weight". Possible differences in the shape of cave bear metapodials of different geological ages may therefore be linked with (micro-) evolutionary changes. Morphometric and morphogenetic studies of metacarpals and metatarsals from the complex of layers K to M of the Vindija cave by Donja Voća, Croatia (Krklec 1997; Gužvica, Radanović-Gužvica 2000) and from Jama pod Herkovimi pečmi cave on Kozjak, Slovenia (Pohar 1981) show just that. On the basis of the obtained results, it was possible to confirm the contemporary presence of both "classical" cave bears and smaller "latecomers" of the circle of *deningeri* for the period of transition from the Riss-Würm interglacial to the Würm glacial.

The analysed metapodials from Divje babe I are geologically significantly younger than those from Vindija (layers K to M) and from Jama pod Herkovimi pečmi,[13] so direct comparison between the aforementioned sites is not possible. From this point of view, metric data of cave bear metacarpals and metatarsals from several Austrian and one Italian cave published by Withalm (2001) are more useable. Unfortunately, their comparative value is somewhat reduced by the excessively loose and sometimes dubious time framework of some samples (see Turk *et al.* 2003b). Even more problematic is the unknown sex ratio, which prevents the differentiation between sexual and phylogenetic conditioned dif-

[10] PC 1 accounts for over 70 percent of variability in the original data set.

[11] The difference is highly statistically significant regardless of how the metrically "intermediate" metacarpals (N = 47), which cannot reliably be ascribed to either sex, are actually sexed (Toškan 2004).

[12] The representativeness of the available remains is already to some extent dubious because the remains found in the cave primarily reflect the property of animals which died during the hibernation (and not the property of all formerly living animals) (Fenster *et al.* 1992).

[13] Presumably not even the oldest analysed specimens from Divje babe I (i.e., those from Layer 16a) reach a geological age of 80,000 let BP.

ferences in the morphology of metacarpals and metatarsals. Thus, according to Withalm (2001; 2004), increasing values of the index of plumpness[14] in Central European cave bear metapodials during the Würm indicate the appearance/immigration of ever more advanced forms (even species) of cave bears. However, as the results given here show, it is not necessarily so. A similar trend was indeed initially established with the material from Divje babe I, but only on a sample which combines specimens of both sexes! When male and female metacarpals/metatarsals were compared separately, differences in the value of the index of plumpness were no longer statistically significant (*Tab. 17.4*). According to values of I_z female-ascribed metacarpals from Divje babe I roughly correspond to specimens from Austrian sites Windener Bärenhöhle (approx. 35,000 BP), Gamssulzenhöhle (approx. 40,000–25,000 BP) and Ramesch-Knochenhöhle (approx. 60,000–30,000 BP). In contrast, male-ascribed metacarpals are on average slightly plumper and, as such, closer to those from Potočka zijalka (approx. 35,000–26,000 BP; Withalm 2001; 2004).

Even more dubious than calculating the index of plumpness with samples of unsexed metapodials is the use of the K index[15] (e.g., Gužvica, Radanović-Gužvica 2000; Withalm 2001; 2004). Because a linear measurement (gL) is expressed in the denominator, while the numerator is a product of two linear measurements (pB*pH), the increase in the value of the denominator is essentially slower than the increase in the value of the numerator, even in (hypothetical) cases when the values of all three dimensions (pB, pH and gL) are increasing evenly. The use of the K-index in morphometric studies is thus inappropriate even when the ratio between the sexes is known (see Atchley, Anderson 1978).

A significant deficiency of "classical" approaches to morphometric analysis of the shape of skeletal elements is also that they do not as a rule allow reliable differentiation between shape and size (as an exception see, e.g., Grandal d'Anglade (1993b) and Grandal d'Anglade, López-Gonzáles (2005)). An attempt was made in this study to overcome this problem by using principal components analysis, whereby size information was extracted from the original data set by the Burnaby's size-out method. If such a modified (= size-free) data set is reintroduced into the PCA in the form of a correlation matrix, in principle all the statistically significant differences in the values of the individual PC found between the compared samples can be interpreted as a reflection of differences in shape.

[14] Index of plumpness (I_z) is defined as the quotient of the greatest medio-lateral breadth of the distal epiphysis (gdB) and the greatest length of the metapodial (gL), expressed as a percentage.

[15] The K-index is defined as (pB*pH)/gL, where gL is the greatest length of the metapodial, and pB/pH the medio-lateral/antero-posterior breadth of the proximal end.

Within the framework of the shape analysis presented here, both metacarpal bones of one or other sex of the same geological age (e.g., male- and female-ascribed Mc III from sample Db–A) and specimens ascribed to the same sex from two different periods (*e.g.* male-ascribed Mc II from samples Db–A and Db–C) were compared. Since individual PCs explain relatively equal shares of variance,[16] the values of the first four to six PCs were taken into account in each individual comparison. Such a decision made it possible to operate with at least 84 percent of the variability in the size-free data set (full range: 84 % to 95 %; Me = 88.5 %).

Statistically significant differences in PC scores were found in only three (of a total of 25) bilateral comparisons (Mann-Whitney U-test: $p < 0.05$). This indicates an absence of major differences in morphology between the metacarpals of one and the other sex of the same geological age, and between specimens of the same sex ascribed to different geological ages. The only exceptions are female-ascribed fourth metacarpals, in which there is a statistically significant difference in the morphology of the proximal epiphysis between specimens from Db-A and those from Db-C (Mann-Whitney U-test: $p = 0.002$), and male-ascribed third metacarpals (*Fig. 17.8*), in which specimens from the two samples differ in the shape of the proximal epiphysis ($p = 0.003$) and diaphysis ($p = 0.020$).

Plantigrady in cave bear was presumably more pronounced than is the case for brown bear (Couturier 1954; Chagneau 1985; Krklec 1997). Because of this, a fan-shaped enlargement of metapodials due to the enlargement of distal parts of diaphyses and distal epiphysis (e.g., Ewer 1973; Kurtén, Poulianos 1977) has been reported for cave bears. Differences in the morphology of metacarpals or metatarsals of different geological age from Divje babe I are thus to some extent surprising. In terms of the hypothesis of the progressively increasing plantigrady in cave bears and their specialised use of the forepaws in excavating the underground parts of plants (but see also Pinto Llona, Andrews (2001)), differences in the shape of distal parts of metapodials are to be expected (e.g., Kurtén 1969; Viranta 1994; Krklec 1997). It is true that Chagneau (1985) noticed some specific morphological modifications of the *os scapholunare,* which he related to a plantigrad way of walking and/or use of the forepaws for digging (because the cited carpal bone articulates with the fourth metacarpal, certain adaptations could also be expected in the design of its proximal epiphysis). Nevertheless, no straightforward explanation exists for why something similar was not observed at the proximal epiphysis of any of other metacarpals from Divje babe I, although Chagneau (1985) highlighted a range of adaptations to plan-

[16] This is an expected consequence of Burnaby's out-size method.

tigrady in other carpal bones, too. Similarly, the question of why the observed morphological modifications only occurred in one of the two sexes still remains unanswered.

CONCLUSION

The treatment of cave bear metapodials from Divje babe I by the use of multivariate statistical methods revealed some weaknesses in "classical" morphometry research. In addition, it effectively proved that cave bear metacarpals and metatarsals can be grouped by sex (see Withalm 2001).[17] The estimated sex ratio is slightly different from that based on metric data of canines (Debeljak 2002a), but fully corresponds to the results of metric analysis of long bones (Chapter 6 in this volume; *Fig. 16.3a, b*). The results presented thus simultaneously show that, although a very popular method, assessing the sex ratio on the basis of metric data of canines is not always reliable (see Turk *et al.* 1989).

The purpose of the present contribution is not just to draw attention to methodological deficiencies of "classical" morphometric research. The data obtained also offer an interesting starting point for in-depth examination of the life of cave bear and its response to climatic oscillations. The results of sedimentological, palaeontological, palinological and anthracotomical research show that the climate in OIS 3 was significantly colder, damper and less stable than in OIS 5a-5d (Šercelj, Culiberg 1991; Turk *et al.* 2002b; Chapters 6, 8, 10 and 11 in this volume). Taking the biology of recent bears into account, it seems that the observed sex profile of cave bear from Divje babe I also accords with such a climatic picture. A choice of lair by fossil and recent species of the genus *Ursus* is thought to be greatly dependent on the size of the cave, its altitude, inclination and location of the slope, vegetation in the surroundings and distance from various disturbance points (Slobodyan 1976; Rogers 1981; Camarra 1983; Groff *et al.* 1998; Stiner *et al.* 1998; Reisinger, Hohenegger 1998). However, climate also has a very important role in this. As studies of recent bears show, their physiological readiness for entering hibernation is determined by circannual rhythm tied to the seasonal cycle of vegetation (Ewer 1973). This is responsible for an approximate timing of the beginning of hibernation, while the actual transition to the lethargic state is thought to be triggered by an interaction of certain climatic factors (amount and frequency of precipitation, dense clouds, general deterioration of weather) and smaller quantities of available food (Johnson, Pelton, 1980). As far as choice of lair is concerned, present-day pregnant female black and brown bears are known to be the first to occupy a lair in good climatic conditions, followed by subadult individuals and finally by males (Slobodyan 1976; Pasitschniak-Arts 1993). Postponement (in males sometimes even a complete absence) of the beginning of hibernation can be caused by abundant crops of beech-nuts, acorns and the like (Johnson, Pelton 1980; Germonpré, Sablin 2001). In view of the above, it might be inferred that females have a wider choice of appropriate lair in mild winters and/or periods of relatively large amounts of available food. A different picture emerges at the onset of severe climatic conditions and/or shortage of food. In these circumstances, males enter the hibernation approximately contemporaneously to subadult individuals and pregnant females (Slobodyan 1976; Pasitschniak-Arts 1993), thus significantly increasing intersexual competition for appropriate lairs (Johnson, Pelton 1980; Stiner 1998b). Since pregnant females and females with subadult young usually avoid solitary males when choosing a lair (Slobodyan 1976; Wielgus, Bunnell 1994), the onset of climatically severe conditions undoubtedly favours males.

Cave bear probably behaved similarly, as is indicated by the increased $\delta^{15}N$ values in males from the cold phases of Würm (Fernández Mosquera *et al.* 2000; 2001). The increased $\delta^{15}N$ values are thought to be tied to the earlier beginning (and thereby longer duration) of hibernation, during which urea recycling in amino acid synthesis occurs. This realisation is important in the context of the observed sex ratio of cave bears from Divje babe I. There is, in fact, no doubt that the climatic conditions in OIS 5a-5d south of the Alpine glaciation were significantly more favourable and more stable than those in OIS 3. It is therefore to be expected that pregnant females and females with subadult young went into hibernation before males in OIS 5a-5d. This provided them with much more freedom in choosing a lair, since although in recent bears females tend to avoid males when looking for a lair, males do not usually occupy an already occupied cave, even when inhabited by a female (Slobodyan 1976; Wielgus, Bunnell 1994). An approximately equal representation of the two sexes in the Db-C sample from Divje babe I could thus be efficiently explained by the wider choice for females in looking for a lair. A colder and more humid climate in OIS 3 certainly contributed to a more pronounced seasonal availability of vegetable food. The winters of that period are thought to have been longer, with substantially more abundant snowfall (Turk *et al.* 2002), leading to a more or less synchronous autumnal occupation of caves by bears of both sexes. Pregnant females or females with subadult young probably avoided solitary males in choosing their lairs and the latter probably also often occupied caves that had formerly been occupied by females in the warmer and less humid OIS 5a-5d. The increased share of males choosing Divje babe I as their lair in OIS 3 does not therefore seem problematic.

[17] The findings given by Krklec (1997) and Quiles, Monchot (2004) are also in line with this.

Such a thesis is corroborated by the fact that the sex ratio in metapodials from the only two relatively warm and/or arid phases of OIS 3[18] does not show a majority share of males, as is characteristic of the rest of the material from OIS 3. Instead, the share of males in the material from the aforementioned two phases is practically equal to the share of females, just as in the Db-C sample from the relatively warm OIS 5a-5d (*Fig. 17.9*; see also *Fig. 17.2* and *Fig. 17.4*).

An alternative explanation to sexual dimorphism as the cause of size differences in cave bear metapodials in the Upper Pleistocene sites of Italy, Austria, Germany, Slovenia and Croatia is given by Withalm (2004; 2005) and Hofreiter *et al.* (2004). In the view of these authors, the increased share of larger and bulkier metapodials at some sites is a result of the immigration of a more robust cave bear, which they treat as an independent species *Ursus ingressus* Rabeder *et al.*, 2004 (Rabeder *et al.* 2004b,c). After the immigration into the Alpine space approximately 50,000 BP, this species is claimed to have completely replaced *U. spelaeus* in this region (Rabeder, Hofreiter 2004).[19] However, the absence of statistically significant differences in the shape of metapodials of different geological ages from Divje babe I contradicts such an interpretation in our case, given that Withalm (2004; 2005), Hofreiter *et al.* (2004) and Rabeder *et al.* (2004c) clearly state that *U. spelaeus* and *U. ingressus* also differ in the morphology of the metapodials (Toškan 2007). Similarly noteworthy is the absence of statistically significant differences in the values of the index of plumpness between first metacarpals from sample Db-A and those from Db-C, although this is supposed to be one of the better diagnostic signs for distinguishing between the two species of cave bear (Rabeder *et al.* 2004c). Metapodials from facies C are dated to OIS 5 and are therefore (in contrast to those from facies A) older than 50,000 years, when *U. ingressus* is supposed first to have appeared in the Alps. In view of this, it seems that different sizes of cave bear metapodials in Divje babe I are more thoroughly connected with sexual dimorphism within one species (*U. spelaeus*), than with differences between bears of two distinct species (*U. spelaeus* and *U. ingressus*).

The change of climate at the end of the Early Glacial would have been reflected at the micro-location of Divje babe I mainly in more abundant and longer lasting snow cover and, consequently, explicitly seasonable availability of plant food. The worsening climatic conditions presumably required the herbivorous cave bear (Bocherens *et al.* 1994; 1997; Nelson *et al.* 1998) to deposit more abundant energy stocks in the form of adipose tissue (see Searcy 1980). With larger animals of the given species, fat represents a higher percentage of body weight than with smaller animals of the same species (Lindsedt, Boyce 1985), so larger individuals would be favoured over smaller ones (Millar, Hickling 1990) in circumstances of explicitly seasonal availability of food. The finding that statistically significantly larger bears hibernated in Divje babe I in OIS 3 than in OIS 5a-5d (*Tab. 17.3*; *Fig. 17.7*) is therefore entirely to be expected from this point of view. It is true that an abundance of other factors appears to affect the oscillation of weight of recent bears (e.g., population density, energy value of available food, age of females at first whelping). In circumstances of relatively low primary production and explicitly seasonal availability of food, however, precisely more abundant energy stocks prior to the beginning of hibernation would nevertheless have been decisive for increased body weight (Ferguson, McLoughlin 2000).

Unfortunately, the hypothesis of the increased body weight of bears because of the onset of harsher climatic conditions cannot be tested on fossil metapodials from neighbouring sites, because of the lack of appropriately published data. Interesting, though isolated, data is provided by Torres *et al.* (2000). In the case of Riss (= OIS 6) cave bears from the then presumably colder central part of Spain, they noticed a significantly larger dimension of teeth than with specimens from contemporary coastal sites in the northern part of the country, where the climate is thought to have been milder. The same authors add that all the aforementioned specimens were at the same time smaller on average than those from bears that settled the coastal belt in the even colder Pleniglacial I (= OIS 4).[20] Although the size of cave bears from Divje babe I could also be explained by specific genetic and/or epigenetic factors, such an explanation does not seem as credible as the one presented above. The research on recent brown bears, namely, shows that the predominant part of intraspecific variability in size can be effectively explained by variable ecological factors alone (e.g., Rausch 1962; Rogers 1976; Herrero 1978).

[18] Complex of layers 2 to 5 (without Layer 5a) and Layer 6 to 7 would have been deposited under such conditions. Unfortunately, because of cryoturbation, the complex of layers 2 to 5 is folded, so that individual finds cannot be reliably distinguished from those from Layer 5a, which was deposited in a period of cold and relatively damp climate. Nevertheless, it is interesting that the number of male-ascribed metacarpals which were provisionally ascribed to Layer 5a is highly statistically significantly greater than the number of female-ascribed metacarpals which were conditionally placed in the same layer (χ^2 test: p = 0.000). This contrasts with remaining metacarpals from the group of layers 2 to 5, where the difference in the number of specimens of each of the two sexes is not statistically significant (χ^2 test: p = 0.144).

[19] The existence of contemporary but presumably reproductively isolated populations of cave bear (Hofreiter *et al.* 2004; but see also Orlando *et al.* 2002) accords with such thinking.

[20] Teeth are subject to specific selection pressure, so an evolutionary pattern found with them cannot *a priori* be generalised to remaining skeletal elements (Patterson 1983; Dayan *et al.* 2002).

ACKNOWLEDGEMENT

I would like to thank Dr. Ivan Turk for enabling me to study the fossil remains from Divje babe I. The article is to a large extent a summary of my own doctoral dissertation, so I would like to take this opportunity to thank my supervisor, Prof. dr. Vida Pohar, and members of the commission, Prof. dr. Jernej Pavšič and Prof. dr. Boris Bulog. The Ministry of Education, Science and Sport financed the post-graduate education. I would like to thank Dr. Ivan Turk and Janez Dirjec for the stimulating discussions during the research and Dr. Andrej Blejc for advice on the statistical processing.

PRILOGE / ANNEXES

Pril. 17A: Seznam analiziranih prvih dlančnic s pripadajočimi metričnimi podatki. Za globine režnjev glej poglavje 1 v tem zborniku, opomba 5. Za korelacijo sedimentacijskih nivojev in kvadratov/režnjev glej *tabeli 1.1a* in *1.1b* prav tam. Globine sedimentacijskih nivojev so navedene prav tam.

Annex 17A: List of analysed first metacarpals with relevant metric data. For depth of cut see Chapter 1 in this volume, note 5. For a correlation of sedimentation levels and quadrats/cuts see *Table 1.1a* and *1.1b* ibid. Depths of sedimentation levels are also given there.

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
A	-44	34a/3	67.7	16.5	11.4	26.3	24.2	20.9	18.3	17.1
A	-44	41b/4	65.6	13.8	10.2	22.5	22.4	18.2	17.2	16.9
A	-56	41c/5	65.8	15.1	12.2	27.8	22.2	20.7	19.7	19.0
A	-56	36/2	67.0	11.6	9.2	25.1	20.9	19.4	17.7	18.0
A	-68	31/2	58.7	12.6	9.9	21.5	18.5	16.3	15.3	17.5
A	-81	40/3	60.6	12.3	9.1	22.6	20.3	18.2	16.6	16.3
A	-81	19/4	56.9	12.8	10.1	21.6	17.0	17.5	17.5	15.6
A	-81	20/4	70.4	15.6	11.4	26.4	26.0	22.0	19.7	20.1
A	-81	16/5	52.5	10.1	8.8	21.9	21.0	15.1	14.3	14.7
A	-81	41c/7	61.3	12.4	9.5	22.9	18.3	16.9	16.0	16.2
A	-81	48b/7	68.3	15.2	11.9	26.8	22.0	21.4	21.4	20.4
A	-81	48c/7	67.9	13.7	10.8	26.0	22.1	20.3	18.5	18.6
A	-81	55c/7	64.7	14.2	11.3	26.4	22.6	21.1	17.8	18.6
A	-94	35/6	64.4	10.3	7.9	21.7	21.7	16.6	15.2	13.6
A	-106	31/5	61.2	13.2	9.1	23.9	20.9	18.3	16.6	16.8
A	-106	34/7	63.1	14.3	10.8	23.6	21.8	18.5	16.9	17.0
A	-117	25/7	59.9	11.2	9.8	20.6	17.5	16.5	14.9	15.5
A	-117	34c/10	68.3	16.1	11.9	27.5	23.1	22.0	20.5	19.3
A	-117	34c/10	56.1	12.7	10.8	24.6	25.2	18.6	18.3	16.9
A	-117	48b/10	61.0	14.6	11.4	28.3	23.8	20.4	18.5	18.2
A	-129	25/7	65.9	14.7	11.4	26.7	23.6	21.1	19.8	18.7
A	-129	17/9	71.0	13.7	10.6	26.9	22.9	21.6	20.2	20.7
A	-129	62a/10	65.1	14.8	11.5	26.2	23.1	21.2	19.8	19.2
A	-129	55c/11	68.0	16.5	11.8	29.2	24.6	22.9	22.0	19.3
A	-129	55c/11	66.8	13.9	10.3	26.5	21.8	20.4	19.9	18.8
A	-141	31/8	65.7	13.4	11.1	23.2	21.3	17.7	15.9	16.6
A	-141	32/8	66.2	14.1	9.8	26.4	23.3	20.2	19.0	19.2
A	-141	14/10	65.0	14.3	11.5	28.4	22.2	20.2	17.9	17.2
A	-141	34c/12	59.0	11.5	9.3	19.8	17.5	16.8	16.5	16.5
A	-153	41c/13	64.9	13.7	10.8	26.1	19.8	19.4	16.6	16.8
A	-153	48c/13	66.2	16.0	12.8	27.4	22.9	19.6	18.2	19.7
A	-165	48a/13	67.0	13.2	10.3	25.2	18.8	19.8	19.9	17.1
A	-177	32/11	55.2	11.4	8.7	19.4	18.5	16.0	14.8	15.4
A	-177	39/11	72.9	14.6	11.6	26.8	24.2	21.4	18.6	17.5
A	-177	34a/14	69.8	15.9	12.9	30.7	26.2	22.9	21.9	19.6
A	-201	34a/16	66.5	15.7	11.4	28.9	22.3	20.3	19.0	18.1
A	-225	41a/17	69.2	14.1	11.7	25.1	21.5	20.8	19.9	19.0
A	-225	20/16	60.3	14.1	9.3	23.6	20.4	19.0	17.7	15.5
A	-225	26/16	55.9	12.9	10.3	21.2	18.4	16.1	14.8	15.5
A	-225	26/16	68.3	15.2	11.3	25.2	20.6	19.8	18.5	17.2
A	-225	17/17	65.3	14.0	10.5	27.9	21.0	20.6	18.9	17.2
B	-237	31/16	65.0	13.9	11.2	24.9	22.2	19.6	18.1	17.6
B	-237	19/17	59.0	12.1	9.6	21.7	19.4	16.3	15.2	15.1
B	-237	23/17	60.1	12.3	10.3	21.7	19.3	19.8	17.8	17.6
B	-237	26/17	66.0	14.2	10.2	25.3	22.4	19.6	18.0	17.8
B	-249	34a/19	61.7	13.2	9.9	23.1	21.6	18.9	18.2	17.4
B	-249	55b/20	69.0	14.4	12.0	26.0	23.4	21.6	20.6	19.4
B	-249	28/17	66.2	15.0	10.8	27.1	24.0	20.6	18.6	18.9
B	-249	29/17	61.7	13.0	10.2	22.2	18.7	18.8	17.5	17.3
B	-249	31/17	61.9	13.5	10.0	22.9	19.2	19.1	18.5	18.0
B	-249	31/17	64.2	13.9	11.4	26.8	28.2	19.4	18.3	18.5
B	-249	26/18	51.3	10.9	8.6	20.9	20.7	15.5	14.6	14.2
B	-249	36/18	57.6	11.9	8.2	21.8	17.1	16.9	17.7	15.6
B	-249	13/19	66.3	17.4	13.9	26.6	23.5	23.8	22.9	21.3
B	-261	39/18	59.0	14.7	12.9	25.5	24.7	20.5	18.2	17.8
B	-261	22/19	58.7	13.6	11.1	22.8	19.2	17.8	16.3	17.6
B	-261	22/19	62.0	12.7	9.9	22.3	18.7	17.5	17.9	17.0
B	-261	26/19	56.0	12.4	8.9	22.8	23.7	16.6	15.6	15.6
B	-261	37/19	64.1	13.8	12.4	26.5	22.1	20.3	19.5	19.3
B	-261	38/19	57.1	13.1	9.6	23.9	20.8	17.9	17.3	15.9

continued....

Pril. 17A / Annex 17A (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-261	38/19	63.3	14.1	11.0	26.1	23.2	18.9	18.8	18.3
B	-273	22/20	66.1	16.0	11.1	28.0	23.7	20.5	19.6	19.8
B	-273	25/20	64.4	12.5	9.8	23.2	21.8	19.2	16.7	16.6
B	-273	16/21	64.8	15.0	11.2	26.6	23.5	23.0	21.8	18.7
B	-285	28/20	58.2	13.1	9.3	23.3	20.5	18.1	16.4	16.4
B	-285	32/20	63.1	13.6	11.7	25.5	22.7	21.3	20.8	18.9
B	-285	19/21	65.1	13.7	10.0	24.8	21.8	19.7	18.1	17.5
B	-285	37/21	70.3	16.2	12.1	26.8	23.4	21.5	20.0	19.6
B	-285	16/22	64.3	14.3	10.1	25.7	21.7	20.9	18.1	17.0
B	-285	34/22	56.0	12.5	9.6	23.3	20.7	19.7	17.8	16.6
B	-297	25/22	66.9	14.1	11.5	26.9	23.8	19.2	18.2	18.9
B	-297	26/22	67.5	15.1	12.4	29.0	25.8	21.9	22.4	19.8
B	-297	22/23	67.1	14.9	11.0	27.8	22.8	21.5	19.0	19.0
B	-297	34/23	70.7	14.5	12.6	29.3	23.3	22.8	22.5	21.0
B	-309	29/22	66.6	13.5	10.8	25.6	23.8	20.2	18.8	18.2
B	-321	32/23	58.6	11.4	9.0	20.5	18.6	17.5	16.4	14.4
B	-321	32/23	62.3	13.9	10.6	25.2	22.5	19.7	17.5	17.3
B	-321	23/24	65.3	14.6	11.1	25.6	22.6	19.8	17.9	17.5
B	-321	25/24	63.4	14.5	10.0	26.9	21.2	20.6	20.0	18.6
B	-321	26/24	62.6	13.3	10.1	23.5	22.0	17.3	16.3	16.8
B	-321	26/24	58.1	11.4	9.0	22.1	16.8	17.6	17.0	15.8
B	-321	36/24	67.6	14.8	10.1	25.0	21.0	16.9	14.6	16.1
B	-321	13/25	67.0	16.3	11.7	29.5	21.8	20.8	19.1	17.9
B	-321	17/25	61.0	12.9	9.2	23.7	20.3	18.9	18.2	16.5
B	-333	29/24	66.5	15.6	11.5	28.5	21.9	22.7	20.9	19.4
B	-333	32/24	64.1	13.6	9.8	25.9	22.7	21.2	19.9	18.8
B	-333	19/25	67.4	15.9	12.0	27.3	23.0	20.2	18.2	19.2
B	-333	20/25	64.1	14.7	10.0	26.1	22.4	20.5	19.0	18.1
B	-333	23/25	73.3	14.0	11.8	28.4	23.3	21.8	20.5	20.1
B	-333	26/25	68.4	15.6	11.1	26.6	24.4	21.4	20.0	19.1
B	-333	26/25	57.6	11.8	9.4	21.4	17.6	16.6	15.5	14.8
B	-333	26/25	66.4	17.2	12.8	28.5	26.9	23.3	21.9	20.4
B	-333	37/25	60.3	14.2	10.5	24.6	23.4	18.9	17.0	17.0
B	-345	31/25	67.8	15.0	11.7	25.9	22.3	20.8	18.6	17.8
B	-345	32/25	57.4	11.3	9.8	21.8	24.4	17.2	14.1	15.1
B	-345	40/25	68.9	16.3	13.0	29.7	24.1	22.2	21.9	20.5
B	-345	19/26	62.3	13.1	10.5	23.8	20.5	19.0	18.1	17.7
B	-345	22/26	63.5	14.8	11.1	25.1	22.4	20.1	18.8	17.1
B	-345	13/27	64.1	14.5	10.7	23.7	21.8	19.2	17.9	17.3
B	-357	40/26	71.8	15.3	10.6	26.3	21.7	20.7	20.1	19.1
B	-357	40/26	58.9	11.9	9.7	22.9	19.5	16.9	16.2	15.8
B	-357	40/26	66.6	14.2	11.5	24.1	27.1	19.8	19.4	17.5
B	-357	40/26	57.7	11.7	9.3	21.2	18.8	16.6	16.1	15.2
B	-357	22/27	58.6	10.4	8.5	20.1	16.7	15.9	15.0	15.0
B	-357	25/27	65.0	13.1	10.1	25.6	22.2	20.4	19.5	18.0
B	-357	37/27	64.5	12.9	10.4	26.4	19.8	18.6	17.9	16.7
B	-357	16/28	62.7	11.0	10.0	22.3	21.3	17.1	16.1	16.4
B	-357	34/28	67.2	14.9	10.4	27.1	21.3	20.6	18.6	17.6
B	-369	29/27	61.1	13.0	8.9	24.5	18.7	19.0	19.7	17.7
B	-369	39/27	59.4	13.1	10.3	23.1	21.0	18.4	16.4	16.0
B	-369	40/27	60.4	13.0	9.2	22.6	18.9	18.7	15.7	17.7
B	-369	40/27	64.9	12.5	10.0	24.5	22.4	19.2	16.9	17.3
B	-369	22/28	68.4	14.5	10.1	25.1	22.5	20.4	18.4	19.5
B	-369	36/28	63.4	13.1	10.3	25.0	23.4	20.5	19.2	18.7
B	-369	36/28	65.6	14.7	10.7	27.7	23.3	21.1	20.2	18.5
B	-369	17/29	58.7	11.8	8.9	22.9	18.7	16.8	14.9	15.3
B	-369	35/29	68.9	14.2	10.9	26.0	21.8	20.7	19.6	18.5
B	-369	35/29	55.1	11.6	9.6	20.8	18.1	16.7	15.7	16.8
B	-381	32/28	61.4	13.0	10.7	24.0	21.2	19.7	18.3	16.6
B	-381	40/28	67.1	14.1	10.8	25.2	22.6	20.2	19.8	19.7
B	-381	20/29	58.5	12.2	9.4	22.1	18.8	17.0	15.4	15.1
B	-381	26/29	64.9	15.4	11.6	26.5	22.3	21.1	17.6	19.3
B	-381	36/29	60.3	12.7	9.0	22.1	18.9	18.0	16.5	15.2
B	-381	37/29	65.4	14.0	10.4	25.5	20.4	19.5	17.9	15.9
B	-381	14/30	61.9	14.2	10.8	26.4	19.7	19.7	18.6	17.7
B	-393	13/31	59.3	11.6	8.0	21.8	18.6	17.0	16.8	17.1

continued....

Pril. 17A / Annex 17A (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-393	35/31	58.9	11.7	9.4	22.2	16.4	17.2	14.9	14.9
B	-405	19/31	66.7	13.2	10.0	26.0	23.2	20.0	19.5	18.0
B	-405	26/31	62.0	14.1	10.8	25.7	21.8	19.6	18.7	19.0
B	-405	14/32	59.2	13.2	9.7	22.8	18.3	18.6	15.2	16.3
B	-405	14/32	63.3	14.3	10.4	25.5	22.1	19.8	17.6	18.3
B	-405	16/32	55.0	12.4	10.7	21.7	24.6	18.9	17.8	16.8
B	-405	17/32	62.0	14.4	10.4	26.2	24.6	21.2	19.5	18.4
B	-405	34/32	57.3	11.5	8.6	21.3	15.6	17.1	16.5	15.3
B	-417	29/31	60.7	12.4	9.7	23.4	18.5	19.2	17.4	16.9
B	-417	17/33	57.1	11.6	9.3	21.4	17.0	16.9	15.3	15.8
B	-417	17/33	62.1	13.6	9.4	25.2	21.7	20.0	18.2	16.3
B	-429	19/33	65.0	15.8	11.1	29.5	21.5	21.4	18.2	18.9
B	-429	25/33	59.4	13.3	10.5	22.4	19.2	18.4	18.3	16.9
B	-429	36/33	67.9	15.1	11.2	24.8	23.1	17.9	16.2	17.2
B	-429	13/34	69.4	15.8	10.2	27.2	23.4	21.3	19.8	19.1
B	-429	17/34	55.4	11.8	8.5	19.9	16.9	16.3	14.9	14.7
B	-429	17/34	64.7	14.3	10.4	24.7	20.0	18.9	18.2	17.4
B	-429	34/34	62.6	13.7	10.1	24.3	19.8	19.9	18.8	17.5
B	-429	35/34	65.5	14.4	11.4	25.2	20.8	19.7	17.4	18.1
C	-441	19/34	57.5	13.6	9.7	22.5	19.4	17.5	16.3	15.8
C	-441	36/34	59.0	11.1	8.1	20.9	17.1	16.9	15.9	14.4
C	-441	36/34	58.5	11.3	10.0	21.9	16.7	15.3	14.7	15.5
C	-441	34/35	56.5	11.4	8.7	20.9	17.0	16.6	15.5	14.7
C	-441	34/36	57.0	11.6	8.5	21.1	18.8	17.3	17.5	15.3
C	-465	19/36	60.6	13.6	10.4	22.1	20.0	17.5	16.5	16.9
C	–	155-157/13	59.8	13.0	9.2	21.6	19.9	18.2	16.1	15.6
C	–	164/13	59.3	12.8	10.5	23.6	21.0	18.5	18.5	18.3
C	–	169/13	54.9	12.1	10.1	20.3	17.2	16.4	14.5	14.1
C	–	179/13	56.4	13.4	10.0	21.1	17.5	16.8	16.2	14.7
C	–	181/13	58.1	10.8	8.3	19.2	16.0	15.7	14.9	13.9
C	–	182/13	63.0	14.8	12.1	25.5	21.0	18.9	17.1	16.4
C	–	182/13	59.6	12.2	9.7	22.5	16.7	16.6	16.1	15.9
C	–	184/13	63.2	13.6	10.8	27.0	20.2	20.6	20.1	18.1
C	–	188/13	59.4	12.5	9.8	22.0	18.4	17.3	14.1	15.4
C	–	190/13	56.6	11.0	8.1	20.8	16.4	16.0	15.2	15.4
C	–	191/13	61.4	11.6	9.1	23.4	17.9	17.6	14.9	15.9
C	–	192/13	61.1	11.8	9.2	22.3	17.2	17.9	17.2	16.7
C	–	202/13-14	55.3	12.7	10.0	22.5	16.8	17.1	15.4	14.4
C	–	203/13-14	56.6	11.6	9.0	22.1	16.9	17.4	14.8	14.4
C	–	168/14	59.4	11.6	9.3	21.0	17.0	17.3	16.1	14.2
C	–	171/14	66.8	13.9	10.1	26.2	20.8	19.8	17.1	18.7
C	–	171/14	61.0	11.8	9.2	20.4	17.1	17.1	15.7	16.3
C	–	178/14	66.1	13.8	11.2	25.5	20.6	20.2	19.5	19.1
C	–	179/14	58.4	12.1	9.3	22.7	15.7	18.6	17.3	15.9
C	–	180/14	63.4	15.0	9.8	28.7	19.0	20.9	17.4	16.9
C	–	181/14	56.5	11.4	8.6	21.0	16.1	16.5	16.0	14.9
C	–	182/14	67.5	14.6	13.1	26.2	23.1	21.3	19.3	17.9
C	–	184/14	59.4	13.8	9.7	21.9	17.6	18.3	16.3	14.8
C	–	187/14	56.6	11.8	9.2	21.0	17.9	16.4	14.7	14.6
C	–	188/14	67.0	13.9	10.4	28.3	22.0	21.3	19.3	19.1
C	–	191/14	68.4	13.7	10.4	24.8	20.8	21.0	20.1	19.5
Σ sample A			x = 64.27 SD = 4.72	x = 13.80 SD = 1.61	x = 10.63 SD = 1.56	x = 25.08 SD = 2.76	x = 21.61 SD = 2.30	x = 19.42 SD = 2.02	x = 18.06 SD = 1.99	x = 17.58 SD = 1.65
Σ sample B			x = 62.99 SD = 4.20	x = 13.65 SD = 1.44	x = 10.41 SD = 1.11	x = 24.68 SD = 2.32	x = 21.41 SD = 2.41	x = 19.38 SD = 7.19	x = 18.05 SD = 1.88	x = 17.51 SD = 1.55
Σ sample C			x = 60.12 SD = 3.77	x = 12.62 SD = 1.21	x = 9.73 SD = 1.09	x = 22.84 SD = 2.42	x = 18.42 SD = 1.96	x = 17.95 SD = 1.70	x = 16.56 SD = 1.69	x = 16.04 SD = 1.63
Σ all samples (A+B+C)			x = 62.8 SD = 4.4	x = 13.5 SD = 1.5	x = 10.3 SD = 1.2	x = 24.4 SD = 2.6	x = 20.9 SD = 2.6	x = 19.1 SD = 1.9	x = 17.8 SD = 2.0	x = 17.3 SD = 1.7

Pril. 17B: Seznam analiziranih drugih dlančnic s pripadajočimi metričnimi podatki.
Annex 17B: List of analysed second metacarpals with relevant metric data.

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
A	-44	48b//4	82.80	19.1	14.86	21.95	28.54	26.53	21.89	20.49
A	-68	37//3	78.81	20.41	15.17	21.10	30.12	28	24.47	22.04
A	-68	19//3	77.28	20.29	11.61	18.82	27.3	26.53	21.87	20.56
A	-68	14//4	77.40	20.32	14.3	20.29	29.03	27.37	23.61	20.98
A	-68	28//2	80.14	20.59	16.03	19.51	29.61	27.16	22.53	19.66
A	-68	28//2	80.95	19.58	14.35	23.40	32.45	27.99	24.09	21.65
A	-68	17//4	81.13	19.98	15.2	19.99	32.26	29.46	25.9	21.75
A	-81	20//4	72.69	17.03	12.53	19.58	26.62	23.88	20.79	19.16
A	-81	37//4	76.09	19.46	15.03	20.22	27.8	26.36	22.88	19.53
A	-81	39//3	78.36	18.79	14.13	19.31	26.49	26.67	23.45	21.35
A	-81	22//4	78.93	19.51	14.52	20.21	29.55	27.57	21.27	20.19
A	-81	36//4	83.55	19.38	14.69	20.08	31.06	26.88	22.61	20.38
A	-94	29//3	80.28	20.5	14.96	22.02	29.9	27.38	23.08	21.43
A	-94	36//5	75.61	18.47	13.18	18.22	29.17	27.19	22.96	19.43
A	-94	37//5	79.01	19.56	14.99	22.25	31.16	28.93	24.82	22.96
A	-94	32//4	79.99	18.86	15.05	21.26	31.18	26.78	23.46	21.72
A	-106	38//6	68.18	15.16	10.37	17.13	24.28	21.96	18.24	17.72
A	-106	55b//9	74.72	15.25	11.65	18.06	26.54	24.19	19.68	18.7
A	-106	55c//9	78.05	19.18	14.34	22.26	27.35	26.23	19.96	19.48
A	-106	55c//9	81.57	20.48	16.57	22.40	31.97	28.56	22.29	22.92
A	-106	41c//9	83.38	19.65	14.74	21.97	30.11	26.51	22.79	22.33
A	-117	48a//9	76.16	19.68	14.33	22.17	31.17	27.8	23.36	21.84
A	-117	34a//9	79.52	19.64	13.45	19.42	28.39	28.19	23.07	20.83
A	-129	16//9	79.57	20.51	13.16	20.00	27.7	26.71	22.38	20.1
A	-129	55b//11	77.44	19.53	15.47	20.01	30.16	28.58	23.19	21.97
A	-129	48a//10	82.17	20.41	15.02	20.41	27.1	28.27	23.88	20.5
A	-129	41a//10	83.13	20.23	13.8	20.07	30.44	28.95	23.39	21.35
A	-141	38//9	67.77	18.03	12.49	16.20	25	23.55	19.56	18.41
A	-141	48c//12	72.90	17.83	12.7	16.56	23.5	23.56	19.69	18.05
A	-141	48b//12	80.51	19.63	12.7	19.30	30.21	27.22	23.7	21.54
A	-141	40//8	81.21	20.24	14.61	20.15	29.49	28.67	23.11	20.7
A	-153	26//10	81.85	20.35	13.54	21.61	29.54	28.04	23.81	21.58
A	-153	39//9	82.73	20.49	14.85	21.94	30.9	29.08	25.26	21.75
A	-153	36//10	82.87	19.28	13.99	21.85	27	27.39	21.74	20.1
A	-153	55b//13	80.69	19.89	14.83	18.83	29.28	27.22	22.59	19.12
A	-153	62a//12	80.80	20.54	15.9	20.67	29.1	27.5	21.54	20.3
A	-153	62a//12	82.90	20.81	14.93	22.09	29.51	29.06	24.34	22.02
A	-165	62c//14	80.08	20.78	13.7	21.38	30.03	28.27	23.19	20.72
A	-165	48c//14	82.14	21.41	14.52	22.80	29.94	28.71	25.1	21.9
A	-177	34b//15	68.07	15.83	10.94	18.08	24.75	22.46	19.8	17.75
A	-177	34b//15	80.16	19.16	14.62	21.61	29.49	27.33	23.61	21.38
A	-177	55b//15	85.38	21.92	15.77	24.79	30.99	29.48	24.06	20.83
A	-201	34b//17	86.51	20.89	15.47	21.44	32.87	28.26	24.76	22.37
A	-233	37//15	65.88	16.46	11.34	17.92	24.9	23.2	20.66	18.59
A	-233	26//15	67.99	16.09	11.46	15.33	22.37	22.25	17.65	16.6
A	-233	16//16	74.54	16.81	12.21	18.32	25.64	24.08	19.49	17.96
A	-233	22//15	75.74	19.6	14.87	19.52	29.11	27.61	23.82	20.28
A	-233	22//15	76.86	17	13.55	19.09	24.66	24.12	20.52	18.7
A	-233	29//14	77.08	19.59	13.98	20.36	30.38	27.73	25.19	21.57
A	-233	26//15	81.88	20.05	13.84	20.03	29.06	26.77	22.45	20.16
A	-225	23//16	64.20	15.42	10.86	15.42	21.15	20.71	16.88	16.1
A	-225	16//17	71.49	17.66	12.72	17.84	24.47	25.58	20.64	18.4
A	-225	23//16	77.79	20.09	15.91	21.21	30.5	29.28	24.98	20.51
A	-225	31//15	78.77	18.9	13.19	20.68	26.8	25.89	21.42	19.38
B	-237	41b//19	76.41	18.34	14.5	19.78	27.89	25.54	20.94	19.6
B	-237	41a//18	82.83	21.4	15.03	20.29	28.73	27.56	22.35	20.4
B	-237	25//17	68.03	16.39	10.91	15.65	22.7	22.97	18.46	16.9
B	-237	28//16	70.28	17.32	12.83	17.31	22.14	22.3	18.35	16.3
B	-237	26//17	71.94	17.47	12.29	19.76	26.81	25.42	21.86	19.51
B	-237	13//18	72.09	16.94	12.04	15.92	22.96	22.3	18.55	16.42
B	-237	25//17	73.39	18.54	11.62	19.66	27.94	24.71	21.39	19.28
B	-237	25//17	73.63	16.46	11.49	16.5	24.87	21.24	17.95	17.37
B	-249	28//17	64.85	15.82	11.4	16	23.65	22.06	18.27	17.01
B	-249	23//18	70.00	16.93	11.29	16.98	25.31	23.31	20.07	16.67
B	-249	32//17	79.00	20.5	14.5	19.6	28.7	26.6	22.4	20.2
B	-249	28//17	71.06	14.48	11.73	16.02	20.54	21.65	17.52	16.1
B	-249	28//17	71.43	15.5	10.99	16.49	23.38	22.06	19.42	17.4

continued....

Pril. 17B / Annex 17B (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-249	37//18	72.43	16.55	13.87	16.67	23.3	22.2	19.17	17.4
B	-249	23//18	72.56	16.37	12.76	16.67	23.77	22.12	20.14	17.7
B	-261	23//19	75.12	17.32	12.27	19.3	24.59	24.45	20.81	18.6
B	-261	28//18	80.09	20.6	13.72	22.07	28.24	27.25	23.56	19.24
B	-261	31//18	81.34	20.92	15.4	22.05	31.16	30.5	25.51	22.44
B	-261	25//19	87.17	21.38	15.83	21.29	31.77	28.99	24.07	22.53
B	-273	17//21	81.55	20.13	14.61	21.86	29.66	27.8	24.39	23.23
B	-273	26//21	70.33	18.74	14.7	20.11	27.76	26.43	22.73	20.83
B	-285	16//22	68.36	16.02	11.13	18.14	25.99	23.16	20.38	18.43
B	-285	13//22	71.23	15.68	11.28	16	23.29	23.92	19.92	18.07
B	-285	35//22	77.39	20.11	14.28	20.78	32.43	26.99	23.67	21.41
B	-285	32//20	78.55	18.66	13.95	22.3	30.51	26.66	22.8	21.18
B	-297	39//21	80.47	18.71	14	22.32	31.3	26.93	24.17	22
B	-309	36//23	82.36	21	15.34	22.02	31.82	30.23	26.52	22.97
B	-321	17//25	69.60	17.21	11.85	19.37	25.02	24.04	20.58	17.97
B	-321	19//24	70.59	20.82	14.58	19.55	28.13	28.05	23.4	21.21
B	-321	14//25	72.41	18.48	12.67	17.95	26.82	26.37	20.43	18.96
B	-321	40//23	72.80	19.22	14.14	18.33	27.14	25.47	21.8	19.11
B	-321	40//23	77.19	18.94	14.5	19.79	28.27	26.57	23.36	19.95
B	-321	23//24	77.62	19.32	14.52	20.69	30.27	26.95	22.71	20.84
B	-333	31//24	72.06	18.04	12.51	18.14	27.69	26.56	21.73	20.35
B	-333	22//25	73.94	20.34	14.71	20.93	28.06	27.25	22.79	20.28
B	-333	31//24	76.09	18.37	12.72	18.49	28.11	24.37	19.85	19.2
B	-345	40//25	65.97	16.37	11.57	17.2	23.88	21.87	18.55	17.55
B	-345	34//27	66.74	18.19	11.76	17.12	25.31	23.31	19.72	18.68
B	-345	23//26	73.04	15.58	10.94	15.94	22.44	21.89	19.72	17.8
B	-345	16//27	75.26	20.08	14.15	19.4	27.2	27.89	24.1	20.03
B	-345	36//26	76.56	20.05	13.74	21.15	29.2	26.66	23.76	22.09
B	-345	26//26	77.74	20.5	15.54	22.43	29.71	29.52	24.41	22.05
B	-345	31//25	78.78	17.72	13.8	19.98	26.66	25.15	22.19	19.7
B	-345	31//25	82.22	20.39	14.98	21.97	31.29	28.11	24.16	22.35
B	-357	39//26	69.47	16.04	11.59	17.06	24.91	22.51	20.86	17.45
B	-357	36//27	69.99	16.37	10.01	17.83	24	23.1	19.25	17.89
B	-357	40//26	75.50	18.05	13.32	19.72	27.11	26.13	21.64	19.75
B	-357	13//28	76.01	19.05	14.21	21.25	28.9	27.24	22.99	21.17
B	-357	31//26	76.95	20.48	14.78	21.76	35.11	27.25	23.57	21.17
B	-357	28//26	80.12	18.32	13.72	22.33	29.16	26.82	23.83	20.68
B	-357	40//26	82.72	19.18	14.59	22.57	31.62	28.88	25.37	21.66
B	-369	40//27	66.34	15.9	10.67	17.51	23.16	21.96	18.38	17.5
B	-369	39//27	72.17	17.21	12.86	18.75	26.5	24.36	20.62	19.69
B	-369	39//27	80.65	18.8	14.88	20.91	29.82	27.35	21.52	21.15
B	-381	37//29	68.03	17.19	12.32	17.72	24.32	23.67	20.72	18.89
B	-381	32//28	70.02	15.15	11.21	19.32	24.03	22.05	19.66	17.93
B	-381	20//29	70.74	15.56	11.59	15.86	23.2	21.82	18.03	16.31
B	-381	26//29	73.54	14.59	12.21	18.53	23.32	21.32	18.26	17.96
B	-381	34//30	82.51	19.61	14.68	21.25	31.4	27.7	23.86	22.17
B	-381	38//29	82.62	21.62	14.44	21.86	30.14	29.17	24.82	22.19
B	-381	40//28	84.21	19.41	15.83	22.13	29.17	28.32	24.14	22.34
B	-393	13//31	70.60	15.76	9.74	17.01	22.3	21.02	18.65	16.9
B	-393	34//31	79.57	18.46	13.75	20.53	28.71	26.64	23.16	20.76
B	-405	17//32	76.01	17.81	14.78	20.61	27.99	26.26	22.29	20.61
B	-417	35//33	68.14	15.81	11.32	15.99	21.68	22.31	18.67	16.36
B	-417	35//33	68.89	15.69	10.77	14.85	21.53	21.85	18.73	16.5
B	-417	22//32	70.10	15.61	11.39	17.43	23.53	22.36	18.87	17.34
B	-417	19//32	79.17	18.59	13.98	19.9	27.65	26.83	23.09	20.16
B	-417	37//32	79.52	19.24	15.12	21.64	29.81	27.19	23.17	19.03
B	-417	34//33	82.18	18.89	13.38	20.76	27.66	27.34	22.29	20.37
B	-429	22//33	70.75	15.07	11.7	17.53	23.8	22.67	19.12	18.05
B	-429	22//33	71.51	16.77	12.9	19.28	25.21	24.33	21.1	19.04
B	-429	19//33	72.00	17.01	11.98	17.16	24.35	23.57	20.19	18.1
B	-429	35//34	74.59	18.96	12.49	20.92	28.28	25.62	22.99	21.24
B	-429	14//34	78.34	16.47	12.98	20.83	27.78	25.8	21.63	19.92
C	-441	14//35	66.96	14.94	10.06	16.09	23.1	21.74	17.39	17.07
C	-441	36//34	67.27	15.83	11.22	16.50	20.77	21.92	18.76	15.88
C	-441	14//35	71.70	15.75	10.85	17.70	25.4	22.6	19.49	17.97
C	-441	23//34	72.65	15.69	11.9	18.45	25.84	24.77	20.56	19.8

continued....

Pril. 17B / Annex 17B (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
C	-441	19//34	74.03	19.6	14.73	18.93	28.79	28.25	22.58	20.73
C	-441	14//35	74.85	18.52	13.78	18.62	26.9	26.72	21.69	19.6
C	-441	34//35	76.84	18.78	14.03	19.64	28.32	27.56	22.7	20.54
C	-453	36//35	71.78	17.74	11.23	16.61	23.59	23.39	19	17.02
C	-453	13//36	77.66	17.11	12.48	19.44	26.26	25.33	20.66	19.2
C	–	187//14	65.28	15.1	10.86	14.84	23.47	21.28	17.32	16.58
C	–	171//14	66.68	16.18	10.67	14.99	21.54	21.91	17.91	16.11
C	–	173//14	67.31	16.06	11.68	16.99	22.25	22.64	18.94	17.48
C	–	192//13	67.53	16.4	10.62	15.35	24	21.49	17.75	16.32
C	–	165//13	67.88	15.81	10.34	16.61	24.01	22.93	19.22	17.46
C	–	181//14	68.24	15.82	10.91	16.32	23.86	22.3	18.97	18.05
C	–	163//13	68.57	16.01	11.31	18.37	23.96	23.69	19.6	17.71
C	–	181//14	68.66	16.12	10.57	15.88	22.59	22.84	19.32	17.27
C	–	180//13	69.19	15.54	11.81	18.06	22.18	22.42	19.53	17.6
C	–	173//14	69.37	15.92	11.01	16.78	24.52	22.81	18.56	16.33
C	–	184//13	70.10	17.81	13.69	16.79	25.14	23.17	20.57	17.72
C	–	187//14	70.73	16.45	11.68	17.54	24.02	23.4	17.53	17
C	–	171//14	70.90	17.36	11.3	17.20	23.11	23.62	19.74	17.99
C	–	193//13	70.92	15.69	10.82	15.93	23.13	22.34	18.77	17.45
C	–	183//14	71.79	17.17	10.91	17.47	25.47	23.29	20.18	18.11
C	–	203//13-14	75.12	17.63	12.96	17.24	24.28	25.15	20.69	18.32
C	–	204//13-14	75.46	16.91	12.66	18.79	26.95	24.29	20.52	19.23
C	–	167//14	75.47	18.68	14.25	17.73	25.49	26.78	22.58	19.11
C	–	203//13-14	77.62	20.14	13.97	18.52	26.9	26.64	20.17	19.2
C	–	203//13-14	77.84	17.33	13.58	20.68	28.72	26.35	22.39	20.7
C	–	191//13	77.85	18.71	16.47	19.63	28.02	28.32	22.81	21.23
C	–	168//13	78.00	20.32	14.51	20.90	31.76	27.42	23.44	21.39
C	–	167//14	78.04	16.99	13.78	19.59	30.16	29.2	23.33	20.47
C	–	188//14	78.55	19.36	14.74	20.88	28.16	27.41	23.95	21.23
C	–	180//14	79.08	21.14	16.29	19.33	27.04	27.9	22.79	19.7
C	–	173+179/1	80.51	17.77	13.09	19.43	28.99	27.35	22.53	20.84
C	–	165//13	80.64	20.45	15.44	21.67	29.55	29.9	24	21.7
C	–	184//14	80.71	18.88	13.02	19.99	28.21	26.22	21.32	20
C	–	167//14	80.95	19.17	14.22	19.96	28.63	27.3	22.62	20.34
C	–	202//13-14	84.85	19.66	14.21	19.60	29.61	27.28	21.54	20.52
Σ sample A			x = 78.1 SD = 5.03	x = 19.2 SD = 1.63	x = 13.9 SD = 1.46	x = 20.1 SD = 1.97	x = 28.5 SD = 2.65	x = 26.7 SD = 2.12	x = 22.4 SD = 2.02	x = 20.3 SD = 1.57
Σ sample B			x = 74.7 SD = 5.11	x = 18.0 SD = 1.88	x = 13.1 SD = 1.55	x = 19.2 SD = 2.15	x = 26.8 SD = 3.15	x = 25.2 SD = 2.52	x = 21.5 SD = 2.21	x = 19.4 SD = 1.93
Σ sample C			x = 73.5 SD = 5.09	x = 17.4 SD = 1.68	x = 12.6 SD = 1.76	x = 18.1 SD = 1.75	x = 25.8 SD = 2.71	x = 24.9 SD = 2.49	x = 20.5 SD = 1.96	x = 18.7 SD = 1.70
Σ all samples (A+B+C)			x = 75.5 SD = 5.37	x = 183 SD = 1.87	x = 13.2 SD = 1.65	x = 19.2 SD = 2.13	x = 27.1 SD = 3.06	x = 25.6 SD = 2.51	x = 21.6 SD = 2.20	x = 19.6 SD = 1.86

Pril. 17C: Seznam analiziranih tretjih dlančnic s pripadajočimi metričnimi podatki.
Annex 17C: List of analysed third metacarpals with relevant metric data.

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
A	-56	41b/5	76.8	17.5	14.0	21.1	28.7	24.6	21.4	20.7
A	-56	19/2	79.4	16.5	12.4	19.6	27.6	24.4	21.1	19.6
A	-56	37/2	85.7	18.1	15.7	23.4	32.4	28.5	22.7	21.6
A	-56	38/2	88.1	19.1	14.1	22.7	33.0	28.1	23.8	23.3
A	-56	17/3	81.6	19.0	14.0	20.2	30.9	27.0	22.6	22.4
A	-68	39/2	89.3	19.7	15.8	22.4	32.9	28.9	24.8	22.7
A	-68	19/3	83.6	18.5	15.0	20.5	30.3	27.7	23.3	22.4
A	-68	22/3	80.7	17.3	14.2	19.2	27.4	24.9	18.8	20.7
A	-68	36/3	83.5	21.2	13.8	23.7	32.8	28.7	24.8	22.6
A	-68	35/4	83.3	20.7	15.2	23.6	31.7	26.0	22.8	20.4
A	-68	35/4	80.8	16.3	12.7	19.7	27.2	26.2	21.9	19.8
A	-68	34a/5	90.9	20.1	17.6	23.2	34.5	30.2	26.1	24.9
A	-81	19/4	77.2	16.4	12.7	17.8	26.5	24.7	20.6	19.6
A	-81	20/4	82.4	19.4	13.8	19.5	29.9	27.3	24.0	21.7
A	-81	25/4	75.2	17.7	12.5	19.1	27.8	24.4	21.1	20.9
A	-81	25/4	75.5	15.0	11.3	19.9	26.5	23.0	18.9	19.0
A	-81	26/4	85.2	18.2	14.2	22.3	31.4	27.6	23.8	23.0
A	-81	35/5	85.4	20.2	15.7	23.2	31.9	29.3	25.2	22.3
A	-81	34a/6	90.0	18.4	13.8	21.6	30.7	27.8	24.8	22.4
A	-81	41c/7	77.5	15.2	13.0	18.3	26.6	24.0	19.5	20.7
A	-94	37/5	80.5	18.3	14.1	21.4	29.8	25.6	22.6	20.7
A	-94	34/6	80.6	18.6	15.0	21.9	29.2	27.9	23.2	21.9
A	-94	35/6	81.3	19.3	16.3	21.9	30.3	28.6	24.2	22.8
A	-106	38/6	85.5	19.1	17.0	20.6	32.0	26.4	22.7	22.4
A	-106	48a/8	83.9	18.6	15.2	21.8	29.4	29.5	24.7	22.8
A	-106	41c/9	84.1	20.3	15.3	21.2	30.2	27.5	24.0	23.4
A	-117	55a/9	87.8	19.0	14.6	21.9	32.0	28.9	23.7	23.7
A	-117	55a/9	72.2	16.6	13.1	18.5	24.4	23.8	20.4	19.2
A	-117	55b/10	85.9	19.9	15.8	21.2	30.9	28.3	23.5	23.1
A	-129	36/8	82.3	19.0	14.2	21.1	30.5	28.8	24.8	22.2
A	-129	38/8	82.5	18.0	14.5	20.5	29.9	26.4	23.0	21.7
A	-129	34c/11	84.5	18.0	14.1	22.2	30.4	27.9	23.7	22.1
A	-129	55c/11	82.6	20.0	15.2	22.2	31.4	29.6	23.4	23.5
A	-141	23/9	83.4	18.0	15.0	20.5	31.3	26.6	21.8	22.4
A	-141	55a/11	71.1	13.1	10.0	16.7	23.1	21.2	17.2	18.0
A	-153	16/11	77.5	15.2	11.8	17.9	25.9	23.4	19.8	18.8
A	-165	40/10	82.2	18.5	14.1	22.5	31.6	28.8	23.9	22.4
A	-165	14/12	81.0	18.9	14.7	20.0	30.6	25.9	21.9	21.2
A	-165	16/12	72.4	15.3	11.2	17.8	24.7	22.9	19.6	18.8
A	-165	62b/14	87.1	18.9	15.0	19.7	30.8	26.5	23.4	22.2
A	-165	62c/14	85.2	20.2	15.9	21.9	33.7	28.7	24.9	23.1
A	-177	41c/15	83.0	18.8	14.1	22.7	32.9	29.3	24.1	22.4
A	-201	38/14	86.1	19.8	15.1	21.7	32.3	29.4	25.6	23.5
A	-213	29/14	79.2	18.2	13.5	20.2	26.8	23.8	20.3	19.7
A	-213	29/14	81.7	19.6	15.5	21.3	29.5	28.6	24.7	22.7
A	-213	37/15	72.5	15.8	12.1	18.4	27.3	23.8	20.3	19.4
A	-225	41b/18	85.8	18.6	14.4	20.8	31.6	28.3	21.2	22.7
A	-225	48b/18	72.3	15.4	11.2	18.8	25.1	23.8	20.0	19.3
A	-225	19/16	84.7	19.9	14.2	20.6	30.7	27.8	22.9	20.4
A	-225	22/16	74.0	16.2	12.3	18.7	24.0	24.3	19.5	19.9
A	-225	26/16	73.7	16.1	11.2	18.5	26.0	24.1	19.0	19.5
A	-225	16/17	76.4	16.1	11.7	18.1	26.4	22.3	18.4	19.0
B	-237	28/16	72.9	15.3	12.1	18.0	25.8	23.6	18.8	17.8
B	-237	28/16	74.8	17.2	11.5	19.5	22.5	23.1	19.4	17.9
B	-237	31/16	71.8	13.0	11.1	17.0	23.9	21.5	18.4	18.7
B	-237	32/16	87.0	20.2	14.4	23.0	33.0	28.9	23.1	22.2
B	-237	22/17	82.1	18.0	15.7	21.7	27.6	26.6	21.3	21.2
B	-237	22/17	69.6	15.3	12.2	16.9	19.6	21.6	17.6	17.3
B	-237	26/17	74.1	17.3	12.8	18.9	25.5	23.7	19.2	19.2
B	-237	14/18	79.7	17.1	13.1	19.0	27.7	24.9	19.1	19.8
B	-249	28/17	84.7	18.8	14.0	21.2	28.0	25.2	21.5	20.7
B	-249	28/17	77.7	16.2	11.3	18.6	25.3	24.2	19.8	18.8
B	-249	28/17	76.4	15.4	12.2	18.1	24.1	22.2	18.5	18.2
B	-249	29/17	74.5	14.9	12.2	15.6	21.8	21.1	17.1	16.3
B	-249	32/17	85.9	19.4	14.3	22.6	28.9	27.9	23.2	21.6
B	-249	32/17	78.9	16.5	12.8	18.4	23.1	23.1	20.0	18.9
B	-249	39/17	71.4	15.0	11.7	15.1	22.2	20.4	16.5	16.9
B	-249	40/17	72.5	16.4	12.6	18.3	23.6	23.0	18.9	18.6

continued...

Pril. 17C / Annex 17C (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-249	23/18	84.8	18.2	14.5	22.3	29.3	27.1	21.9	21.9
B	-249	23/18	70.4	15.8	11.1	18.2	23.8	23.1	19.5	18.3
B	-249	38/18	84.8	19.3	15.3	20.2	32.9	28.0	24.6	23.8
B	-261	28/18	75.5	15.8	13.3	20.0	26.3	27.0	20.9	20.2
B	-261	22/19	81.2	18.0	14.9	20.0	30.4	28.3	23.1	22.7
B	-261	34/20	73.0	16.6	12.3	17.8	22.9	20.7	18.8	18.2
B	-273	22/20	79.4	18.9	14.1	22.5	30.4	28.4	24.8	21.7
B	-273	13/21	77.5	16.6	12.9	19.5	26.1	24.7	21.5	20.0
B	-273	34/21	69.1	15.3	11.6	18.0	26.6	24.1	19.9	18.6
B	-285	16/22	82.0	20.0	15.9	21.8	30.7	29.4	24.0	23.5
B	-285	16/22	84.7	19.1	14.8	22.0	29.3	28.3	23.1	20.9
B	-285	35/22	84.4	19.1	15.0	22.1	32.7	29.3	23.9	23.3
B	-297	31/21	80.0	18.1	14.9	21.4	28.8	27.2	22.8	21.2
B	-297	39/21	78.7	17.3	14.6	20.0	29.3	26.3	22.0	21.3
B	-297	39/21	77.2	17.6	14.8	20.0	27.0	25.8	22.0	21.2
B	-297	40/21	78.9	17.0	14.4	20.6	29.3	26.4	21.8	20.9
B	-297	20/22	85.7	19.4	16.8	23.8	35.2	29.6	25.1	23.7
B	-297	20/22	79.3	17.7	14.7	21.3	29.9	29.3	23.5	22.2
B	-309	28/22	79.7	17.7	15.4	21.1	32.0	27.7	22.8	22.2
B	-309	32/22	77.8	17.8	15.0	21.4	30.5	28.0	23.7	22.5
B	-309	26/23	76.6	17.6	14.6	20.1	28.7	25.3	22.1	21.0
B	-309	13/24	78.3	17.6	14.7	21.4	29.7	27.8	22.4	21.3
B	-309	14/24	70.7	15.2	12.4	19.3	24.7	22.5	18.4	19.2
B	-309	16/24	72.9	18.1	13.4	19.6	28.4	25.1	22.0	20.1
B	-309	35/24	83.2	21.4	15.7	23.6	33.0	28.4	25.4	23.6
B	-321	31/23	77.3	15.9	12.9	19.5	28.3	25.6	22.1	21.0
B	-321	40/23	78.8	17.4	15.7	20.0	30.5	27.4	22.1	21.6
B	-321	22/24	84.0	18.1	13.0	22.1	30.5	28.1	24.7	22.1
B	-321	23/24	69.9	16.4	12.1	16.3	26.4	23.5	19.6	18.6
B	-321	25/24	71.1	14.8	11.6	17.6	26.3	23.1	19.6	18.4
B	-321	26/24	69.0	16.3	12.2	17.9	25.7	23.6	19.8	18.9
B	-321	38/24	73.5	15.0	10.9	18.5	23.9	22.5	18.9	18.5
B	-321	13/25	82.4	17.2	14.6	22.1	31.1	26.8	22.6	20.9
B	-321	14/25	85.1	19.1	15.4	22.8	31.4	30.5	25.8	23.8
B	-321	34/25	87.3	18.0	15.0	22.0	28.9	29.6	25.2	22.7
B	-321	34/25	82.8	19.6	14.5	21.1	27.5	27.8	21.7	20.9
B	-321	35/25	81.5	18.5	14.0	19.3	31.4	27.9	23.2	21.4
B	-333	28/24	78.8	18.3	12.9	20.1	26.6	26.0	22.0	20.1
B	-333	39/24	81.0	17.6	14.6	22.3	29.3	26.0	22.2	19.6
B	-333	40/24	81.1	18.6	14.2	21.5	30.0	26.9	22.9	22.9
B	-333	37/25	85.4	19.0	14.5	22.2	30.2	26.6	22.0	21.7
B	-333	16/26	81.3	19.1	16.1	22.9	32.0	29.0	24.8	22.4
B	-333	16/26	87.0	18.1	14.2	22.1	32.7	27.8	23.7	23.1
B	-345	31/25	87.7	18.4	14.4	22.8	33.8	29.3	25.9	23.4
B	-345	13/27	84.0	17.8	14.7	21.6	30.3	27.0	22.9	22.1
B	-345	14/27	83.2	18.2	14.1	20.0	28.7	26.7	21.7	23.3
B	-357	20/27	81.8	18.3	16.3	22.3	28.8	29.2	23.2	23.1
B	-357	25/27	76.1	16.9	12.8	20.9	27.3	23.6	20.7	19.5
B	-357	16/28	80.7	18.4	14.3	21.6	29.4	26.7	22.4	21.4
B	-357	16/28	75.1	15.7	11.8	18.9	24.4	24.7	19.8	21.1
B	-357	35/28	72.7	16.8	11.9	18.1	25.1	22.5	18.5	17.9
B	-369	39/27	69.5	14.7	10.6	17.3	24.8	22.2	19.4	18.3
B	-369	40/27	76.4	15.2	11.5	20.0	23.8	24.2	20.2	19.7
B	-369	19/28	74.9	15.5	11.3	19.2	26.4	24.0	17.8	19.1
B	-369	19/28	69.5	15.3	11.8	16.9	23.7	22.2	19.2	18.1
B	-369	19/28	78.9	16.2	13.9	20.1	28.3	24.2	21.4	20.9
B	-369	13/29	84.3	18.3	14.2	21.4	30.5	27.2	23.2	22.2
B	-369	17/29	85.7	17.0	14.0	23.1	29.1	26.7	21.5	21.4
B	-369	35/29	73.4	15.3	12.4	18.2	22.9	23.6	19.3	19.2
B	-381	32/28	82.9	19.2	15.0	23.6	31.7	29.1	24.6	22.7
B	-381	22/29	83.3	16.4	13.4	20.8	29.3	26.7	22.5	21.4
B	-381	22/29	74.6	17.4	12.8	19.4	24.6	23.1	19.2	18.4
B	-381	22/29	81.8	18.6	14.8	20.6	25.8	24.9	19.8	20.4
B	-381	38/29	81.1	18.5	14.6	20.2	30.6	28.5	23.8	21.5
B	-381	13/30	73.6	14.8	11.8	17.7	25.2	22.5	18.1	18.7
B	-381	14/30	68.9	13.8	10.6	17.0	23.3	21.4	18.3	16.4
B	-381	35/30	67.5	15.5	11.2	17.0	23.5	23.1	18.6	18.6

continued...

Pril. 17C / Annex 17C (nadaljevanje / cont.)

Facies	**Sediment. level (cm)**	**Square / cut**	**gL**	**sDB**	**sDH**	**pB**	**pH**	**gdB**	**dB**	**dH**
B	-393	19/30	75.9	15.4	12.1	18.3	24.4	23.1	18.4	19.4
B	-393	17/31	77.2	17.7	11.1	18.0	25.4	24.0	20.7	20.3
B	-405	14/32	84.8	17.2	13.9	20.8	28.4	24.4	21.2	20.3
B	-417	25/32	78.7	15.9	12.1	20.0	27.0	25.3	21.6	20.6
B	-417	36/32	73.0	15.3	11.9	16.8	25.0	22.9	18.5	18.5
B	-417	17/33	76.6	16.9	12.4	21.0	28.7	23.3	20.9	19.5
B	-417	35/33	79.2	18.3	14.8	21.1	25.4	25.9	21.4	20.9
B	-429	19/33	82.4	15.7	14.6	21.4	29.4	26.8	22.0	21.2
B	-429	19/33	83.3	16.8	13.1	21.6	26.4	25.5	20.8	20.4
B	-429	19/33	74.0	17.0	12.7	19.2	26.7	25.0	20.1	19.5
B	-429	22/33	75.6	14.6	11.5	20.7	24.5	23.4	19.4	18.3
B	-429	22/33	74.3	14.5	11.8	19.1	26.1	23.3	20.0	19.5
B	-429	22/33	74.2	15.2	10.4	19.6	22.1	23.3	19.0	19.1
B	-429	22/33	76.0	15.9	12.5	20.7	26.7	25.0	20.3	19.4
B	-429	36/33	76.5	15.0	11.3	20.1	25.5	23.2	19.9	19.0
B	-429	37/33	74.4	16.1	11.2	18.9	25.4	23.3	19.2	19.3
B	-429	13/34	85.5	16.9	11.9	22.2	27.7	25.4	21.0	20.2
B	-429	16/34	82.2	17.0	14.0	21.8	30.5	27.8	22.8	22.0
B	-429	35/34	80.8	18.3	14.5	20.2	27.6	27.1	21.1	21.9
B	-429	35/34	74.8	16.2	12.5	18.2	24.1	23.0	19.7	19.1
C	-441	36/34	79.0	16.3	12.4	20.5	26.6	23.6	21.6	20.7
C	-441	13/35	75.7	16.3	12.2	19.6	27.1	25.2	20.9	20.0
C	-441	17/35	68.8	13.3	10.8	16.9	22.1	21.7	18.6	17.6
C	-441	34/35	81.8	19.3	14.1	21.7	31.6	28.7	23.6	22.4
C	-441	16/36	83.1	17.8	11.9	22.1	28.2	26.1	21.5	21.9
C	-453	19/35	75.3	16.2	11.1	18.1	23.6	22.2	18.3	17.1
C	–	165/13	82.8	20.0	15.9	21.7	30.5	27.7	22.7	21.5
C	–	169/13	67.8	14.5	10.7	16.1	20.5	21.1	16.5	16.3
C	–	170/13	74.1	15.7	12.1	18.0	24.2	22.2	18.9	19.0
C	–	173+179/1	81.9	18.6	14.4	21.2	30.2	27.7	22.7	21.5
C	–	178/13	77.4	17.8	11.9	19.3	26.3	23.8	20.4	18.4
C	–	179/13	76.5	16.7	13.9	19.3	25.9	23.8	19.4	18.4
C	–	180/13	80.5	16.7	13.0	22.1	27.2	24.9	20.4	20.5
C	–	181/13	73.1	14.6	11.1	17.6	24.1	22.8	18.6	16.8
C	–	183/13	71.0	14.2	12.0	16.9	22.0	21.9	17.7	17.3
C	–	184a/13	71.4	14.3	10.0	18.3	20.9	20.0	16.2	16.2
C	–	188/13	89.5	17.9	13.9	22.0	27.3	23.6	20.2	19.5
C	–	191/13	80.3	17.8	14.8	23.5	29.6	28.6	24.1	21.9
C	–	177/13-14	80.3	17.2	12.8	20.8	28.6	25.7	21.0	20.2
C	–	203/13-14	83.2	19.6	15.3	21.1	29.9	27.7	22.7	21.3
C	–	203/13-14	87.8	18.0	13.4	23.1	30.8	26.5	22.2	20.8
C	–	168/14	88.0	17.2	12.7	22.5	29.4	28.0	23.2	19.7
C	–	171/14	74.8	18.6	13.1	20.8	27.5	26.4	21.6	19.8
C	–	172/14	73.9	15.7	11.8	17.7	24.0	22.0	19.0	18.5
C	–	174/14	81.6	18.6	14.1	20.3	29.4	27.2	22.6	21.8
C	–	178/14	72.7	14.2	10.2	17.1	23.9	21.5	17.1	17.4
C	–	182/14	86.3	19.3	15.5	22.9	33.3	30.4	24.8	22.9
C	–	182/14	80.8	16.7	13.1	20.9	27.2	25.2	21.0	19.9
C	–	189/14	84.1	16.8	13.8	21.4	28.7	25.5	20.6	20.0
C	–	189/14	83.3	18.8	12.9	23.2	29.9	27.5	23.7	21.7
C	–	190/14	83.7	18.4	14.8	23.4	34.3	29.3	25.3	22.8
C	–	191/14	82.1	17.7	12.6	20.5	27.7	25.5	20.7	20.6
Σ sample A			x = 81.4 SD = 4.99	x = 18.1 SD = 1.76	x = 14.0 SD = 1.60	x = 20.6 SD = 1.75	x = 29.5 SD = 2.77	x = 26.6 SD = 2.29	x = 22.4 SD = 2.16	x = 21.4 SD = 1.62
Σ sample B			x = 78.3 SD = 5.14	x = 17.0 SD = 1.58	x = 13.3 SD = 1.53	x = 20.1 SD = 1.93	x = 27.5 SD = 3.13	x = 25.5 SD = 2.45	x = 21.2 SD = 2.15	x = 20.4 SD = 1.80
Σ sample C			x = 79.1 SD = 5.69	x = 17.0 SD = 1.77	x = 12.9 SD = 1.54	x = 20.3 SD = 2.17	x = 27.3 SD = 3.45	x = 25.1 SD = 2.73	x = 20.9 SD = 2.38	x = 19.8 SD = 1.95
Σ all samples (A+B+C)			x = 79.3 SD = 5.35	x = 17.3 SD = 1.72	x = 13.4 SD = 1.60	x = 20.3 SD = 1.93	x = 28.0 SD = 3.21	x = 25.7 SD = 2.50	x = 21.5 SD = 2.26	x = 20.6 SD = 1.86

Pril. 17D: Seznam analiziranih četrtih dlančnic s pripadajočimi metričnimi podatki.
Annex 17D: List of analysed fourth metacarpals with relevant metric data.

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
A	-32	62a/2	87.0	21.2	14.5	23.5	33.9	28.6	24.2	21.6
A	-44	17/2	93.1	23.7	17.7	24.9	34.9	34.2	26.1	26.1
A	-44	17/2	75.8	14.8	11.6	19.0	25.8	21.5	19.2	18.0
A	-56	25/2	76.3	16.2	11.5	20.6	30.7	23.1	18.8	18.8
A	-56	16/3	80.5	16.6	12.0	20.9	29.1	24.6	20.6	19.9
A	-68	16/4	72.0	17.6	12.4	19.2	27.7	24.7	20.3	19.1
A	-68	34a/5	76.8	16.4	12.6	20.5	29.0	24.7	20.5	20.2
A	-68	41a/5	85.9	19.7	15.4	23.8	33.5	29.4	24.0	23.6
A	-81	20/4	87.5	22.2	16.7	25.0	35.4	31.2	26.7	22.5
A	-81	55a/6	90.4	19.7	15.5	23.7	32.4	26.0	21.7	23.0
A	-81	34b/7	87.6	20.7	16.0	23.5	32.3	29.2	25.5	22.9
A	-94	37/5	81.4	18.2	13.3	22.3	27.6	24.2	21.2	19.7
A	-106	13/7	75.2	15.7	15.0	20.8	27.5	23.4	20.1	19.5
A	-106	41b/9	87.9	22.5	15.7	24.5	33.8	29.4	25.2	24.6
A	-106	41c/9	82.6	18.2	13.3	20.9	31.8	24.0	21.0	19.9
A	-106	55c/9	85.4	19.2	16.8	23.1	31.7	25.9	20.9	21.2
A	-117	28/6	75.6	19.2	11.1	20.3	27.2	25.5	21.8	20.8
A	-117	34c/10	84.2	21.4	16.0	26.0	33.6	28.5	25.1	22.7
A	-117	41b/10	75.9	18.1	12.1	18.7	28.5	22.7	18.3	20.1
A	-117	55c/10	86.9	21.5	15.7	24.9	34.8	31.0	25.0	24.2
A	-129	41a/10	80.1	17.6	12.6	20.0	28.7	24.6	21.6	21.1
A	-129	55c/11	92.0	21.2	17.3	25.9	37.6	30.1	27.5	24.1
A	-141	32/8	86.4	19.2	14.5	23.6	33.0	28.6	23.9	23.8
A	-177	26/12	93.1	21.6	17.3	24.1	34.5	30.6	24.0	24.5
A	-177	34c/15	93.3	19.8	16.8	22.9	33.7	30.1	24.9	23.0
A	-189	34/14	87.1	20.2	15.0	23.9	33.6	29.6	23.6	24.3
A	-189	41b/16	89.5	20.7	16.1	22.3	34.9	30.3	25.6	23.8
A	-201	38/14	76.0	17.9	11.5	21.0	29.7	24.6	22.5	20.4
A	-201	17/15	90.3	20.1	14.9	22.7	32.9	28.8	24.7	22.2
A	-201	55b/17	94.0	20.6	17.6	25.0	35.1	30.2	25.8	25.7
A	-201	62c/17	88.9	21.5	15.0	25.2	35.3	30.3	23.1	23.4
A	-213	19/15	80.5	19.0	12.9	21.7	32.3	24.2	19.7	19.4
A	-225	29/15	80.0	18.6	13.1	21.1	28.6	25.1	21.4	20.3
A	-225	39/15	88.0	19.1	12.9	21.2	31.1	25.8	21.9	21.0
B	-237	25/17	79.6	17.2	11.7	20.5	27.2	24.7	22.3	20.2
B	-237	26/17	85.5	19.6	15.9	23.0	32.9	27.7	24.1	22.6
B	-237	25/17	77.0	17.6	12.6	20.5	27.2	25.6	20.4	18.2
B	-249	41a/19	80.9	17.6	11.1	18.5	26.4	23.6	21.1	19.2
B	-249	28/17	76.3	17.4	13.8	19.9	26.7	23.0	21.0	19.1
B	-249	31/17	92.4	21.8	18.2	24.6	36.6	29.7	25.3	22.3
B	-249	32/17	75.4	18.0	11.9	19.8	27.1	23.8	18.7	18.6
B	-249	19/18	87.7	21.7	15.1	23.1	31.3	30.8	25.7	21.8
B	-249	20/18	81.4	17.7	11.4	21.2	28.2	26.1	22.6	20.9
B	-249	25/18	78.8	18.9	12.6	19.0	28.6	25.6	20.9	19.9
B	-249	13/19	86.4	19.8	16.8	23.6	32.7	27.8	23.3	23.1
B	-261	34b/21	82.8	21.3	16.6	22.0	31.7	31.8	28.0	22.7
B	-261	28/18	76.1	17.0	11.0	18.4	31.5	23.8	19.6	19.1
B	-261	39/18	91.1	20.7	16.2	22.6	34.8	30.1	23.0	22.9
B	-261	39/18	83.0	20.4	16.5	22.0	31.8	29.0	24.4	21.5
B	-261	22/19	77.2	19.1	13.8	19.9	27.7	26.4	23.9	21.3
B	-261	37/19	85.6	20.1	16.3	21.8	34.9	29.3	26.9	22.1
B	-261	23/20	83.2	19.9	14.3	22.0	34.0	29.0	22.9	21.5
B	-273	36/20	76.0	18.9	12.4	20.2	27.9	24.9	21.0	19.4
B	-273	35/21	82.4	21.1	14.8	20.5	31.3	29.4	24.2	22.1
B	-285	32/20	77.1	18.3	11.7	21.2	28.9	23.2	19.6	18.6
B	-285	16/22	90.5	20.6	16.2	24.7	31.9	28.3	24.5	23.8
B	-297	38/21	81.0	18.6	14.8	23.7	32.5	28.4	24.1	23.1
B	-297	31/21	89.4	20.6	14.7	23.1	31.9	28.5	23.6	22.5
B	-297	40/21	77.7	16.3	10.6	20.1	27.0	23.7	18.6	18.7
B	-297	40/21	81.4	19.1	14.1	20.6	32.0	26.2	21.1	20.2
B	-297	16/23	85.5	21.5	16.5	26.7	33.0	31.4	25.2	23.7
B	-309	29/22	84.7	21.8	15.0	25.0	35.1	28.8	24.2	23.3
B	-309	20/23	77.0	18.5	14.5	21.0	31.3	27.0	23.2	20.6
B	-309	23/23	89.5	20.0	15.8	23.0	33.3	27.8	23.4	23.3
B	-309	25/23	79.6	19.3	14.5	23.3	29.5	26.9	21.2	22.7
B	-321	32/23	79.6	19.6	15.6	22.0	32.8	28.4	23.5	22.5

continued...

Pril. 17D / Annex 17D (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-321	40/23	79.1	20.3	15.9	22.8	32.7	27.8	23.8	22.3
B	-321	25/24	81.4	18.8	14.4	21.6	30.6	28.0	22.9	21.5
B	-321	37/24	88.8	20.2	16.5	22.3	34.5	30.6	27.9	25.0
B	-333	28/24	85.1	20.5	14.7	21.7	34.1	28.3	24.5	22.8
B	-333	28/24	71.2	16.9	12.3	18.1	27.2	23.8	20.6	19.0
B	-333	23/25	75.9	16.6	11.5	18.5	27.8	23.2	19.5	19.6
B	-333	34/26	82.6	21.9	15.7	22.9	32.0	30.6	25.0	21.1
B	-345	29/25	84.2	17.8	13.9	21.3	30.9	26.3	22.1	21.4
B	-345	31/25	82.0	20.0	14.4	21.9	30.7	28.4	23.8	22.0
B	-345	32/25	84.0	19.7	14.1	22.8	30.6	28.0	22.6	21.1
B	-345	39/25	85.5	18.8	14.3	22.7	31.6	28.5	24.5	22.7
B	-345	26/26	75.5	17.6	12.9	19.3	27.7	23.8	20.8	19.6
B	-345	37/26	87.0	20.4	15.1	22.2	32.2	29.7	24.7	23.4
B	-345	14/27	75.4	16.2	21.0	27.6	23.2	18.8	18.3	19.2
B	-357	32/26	86.3	19.6	14.9	23.3	31.6	29.0	22.7	21.1
B	357	32/26	85.3	22.0	17.2	21.1	33.6	31.4	25.7	22.9
B	357	39/26	84.2	18.0	14.3	21.8	30.6	25.6	21.2	22.2
B	357	40/26	92.3	21.2	16.6	26.2	35.8	29.5	25.9	24.3
B	357	20/27	89.0	21.2	15.3	22.1	32.3	29.4	24.5	24.5
B	357	22/27	73.8	16.1	13.4	18.9	28.9	23.4	19.5	19.7
B	357	22/27	88.6	21.1	17.3	22.6	34.8	30.9	28.1	23.2
B	357	37/27	89.5	21.8	17.5	24.1	34.7	30.5	26.9	24.5
B	357	34/28	82.1	19.3	15.0	23.0	30.0	27.4	23.7	22.4
B	-369	40/27	80.6	16.8	12.9	21.0	27.5	23.0	19.7	21.5
B	-369	40/27	83.1	19.2	15.2	22.1	31.8	26.8	24.2	23.4
B	-369	40/27	84.2	19.9	14.7	22.9	33.8	28.7	25.2	23.1
B	-369	40/27	79.0	16.3	12.8	18.9	29.0	24.9	21.3	21.0
B	-369	20/28	84.1	18.9	14.8	20.8	34.6	28.3	25.3	22.9
B	-369	26/28	80.1	16.9	12.2	21.1	28.3	24.1	20.7	19.5
B	-369	13/29	80.0	16.4	12.0	20.3	27.1	24.2	19.8	21.1
B	-369	35/29	83.8	19.5	13.9	23.4	32.9	27.9	24.4	22.0
B	-381	32/28	75.4	15.5	12.6	20.6	26.8	22.6	20.3	19.6
B	-381	22/29	73.1	16.3	12.5	21.0	26.7	25.1	19.8	19.3
B	-381	23/29	78.9	19.0	13.4	22.3	30.8	27.1	22.8	21.0
B	-381	36/29	82.9	17.2	13.4	20.3	29.9	25.9	23.0	21.3
B	-381	16/30	82.5	19.8	14.5	22.0	30.5	26.4	22.4	20.0
B	-393	20/30	79.3	16.5	12.7	20.5	27.6	24.3	20.4	20.6
B	-393	17/31	75.3	17.3	12.3	21.3	28.2	23.2	20.1	18.7
B	-393	34/31	80.8	18.1	13.1	21.0	29.7	25.2	21.4	21.0
B	-393	35/31	78.8	17.7	12.4	19.1	28.0	23.7	20.5	20.1
B	-405	14/32	79.2	16.8	10.9	20.3	28.2	22.7	19.3	20.2
B	-429	22/33	82.7	18.2	13.7	20.3	30.7	27.0	24.0	21.1
B	-429	25/33	82.5	17.2	12.1	21.5	28.3	26.6	22.5	20.9
B	-429	14/34	82.1	20.0	14.8	22.2	30.1	26.6	23.2	20.9
B	-429	17/34	85.4	19.7	17.9	21.6	32.9	26.7	23.8	22.5
B	-429	17/34	87.9	19.4	15.9	23.8	33.5	28.9	24.0	22.8
C	-441	22/34	71.7	15.9	13.3	20.1	27.2	22.6	21.5	20.0
C	-441	14/35	86.8	21.4	16.5	22.7	31.6	29.9	25.3	24.3
C	-441	17/35	77.0	18.8	11.3	19.3	27.1	25.0	20.4	19.8
C	-441	34/36	74.0	15.3	12.4	19.6	26.9	22.5	19.5	18.4
C	-441	34/36	75.0	17.0	11.1	18.1	25.8	23.6	19.8	19.2
C	–	155-157/13	80.2	17.9	14.6	22.4	31.0	28.3	26.1	23.1
C	–	163/13	76.5	16.0	12.2	18.9	26.5	24.5	18.7	18.2
C	–	163/13	86.2	19.8	17.8	23.6	33.2	28.5	25.4	23.6
C	–	164/13	86.7	20.9	14.8	25.3	33.9	30.4	24.1	24.5
C	–	164/13	76.7	16.8	12.7	19.4	25.5	24.2	19.4	18.1
C	–	170/13	74.5	18.3	12.2	18.9	27.0	23.5	19.5	18.3
C	–	178/13	84.1	18.6	15.0	21.8	28.8	26.5	22.1	20.7
C	–	180/13	85.3	16.9	14.1	21.7	24.6	25.5	20.9	21.6
C	–	181/13	91.1	19.4	15.9	23.1	31.4	27.1	22.9	21.6
C	–	181/13	80.6	18.7	14.4	23.3	30.6	26.5	21.7	21.4
C	–	181/13	75.0	14.4	10.1	17.7	26.3	21.5	18.7	17.9
C	–	184a/13	82.2	19.0	12.9	21.4	27.3	24.7	20.7	20.2
C	–	189/13	82.4	18.3	13.4	20.8	31.3	24.8	21.0	18.9
C	–	189/13	74.8	16.4	12.0	19.4	24.6	22.8	19.2	17.3
C	–	189/13	85.1	20.3	13.9	22.9	32.0	27.2	22.4	22.0

continued...

Pril. 17D / Annex 17D (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
C	–	189/13	76.1	16.3	10.7	19.0	25.7	23.1	19.3	19.6
C	–	203/13-14	79.9	19.0	12.8	21.5	29.4	24.6	20.6	19.1
C	–	204/13-14	85.5	19.0	13.9	22.0	30.9	27.7	23.8	21.4
C	–	204/13-14	80.1	18.4	13.1	23.1	30.1	26.8	23.0	21.4
C	–	168/14	87.4	20.2	16.2	23.0	31.5	29.5	27.2	24.0
C	–	173/14	71.2	16.3	11.9	18.6	26.2	23.6	20.7	19.2
C	–	173/14	75.9	15.2	11.9	18.4	25.9	22.9	20.6	17.5
C	–	180/14	77.5	17.7	12.9	20.1	26.0	23.9	19.6	19.8
C	–	182/14	86.3	20.1	14.4	23.4	31.7	27.4	23.1	22.7
C	–	184a/14	94.1	21.1	14.8	25.7	32.1	28.1	23.8	23.2
C	–	184a/14	79.7	17.1	11.6	20.9	26.1	24.4	19.5	19.7
C	–	184a/14	84.6	20.5	16.8	24.4	33.3	29.6	23.6	22.1
C	–	188/14	89.0	20.3	15.3	24.3	33.4	28.4	24.5	23.3
C	–	190/14	82.4	17.8	13.7	20.9	28.5	28.2	22.2	21.2
C	–	191/14	79.0	17.0	13.5	20.2	27.6	25.0	21.3	21.1
C	–	191/14	77.2	18.3	11.2	19.7	27.1	24.7	19.7	17.9
C	–	192/14	83.2	20.3	14.6	20.3	30.3	27.4	23.8	20.1
Σ sample A			x = 84.3 SD = 6.29	x = 19.4 SD = 2.08	x = 14.5 SD = 2.02	x = 22.5 SD = 2.07	x = 31.8 SD = 2.98	x = 27.2 SD = 3.12	x = 22.8 SD = 2.47	x = 21.9 SD = 2.13
Σ sample B			x = 82.1 SD = 4.78	x = 19.0 SD = 1.72	x = 14.3 SD = 1.97	x = 21.7 SD = 1.87	x = 30.7 SD = 2.77	x = 26.8 SD = 2.65	x = 22.8 SD = 2.32	x = 21.4 SD = 1.65
Σ sample C			x = 80.9 SD = 5.56	x = 18.2 SD = 1.82	x = 13.5 SD = 1.81	x = 21.2 SD = 2.12	x = 28.9 SD = 2.82	x = 25.8 SD = 2.40	x = 21.8 SD = 2.25	x = 20.6 SD = 2.06
Σ all samples (A+B+C)			x = 82.3 SD = 5.44	x = 18.9 SD = 1.86	x = 14.1 SD = 1.97	x = 21.8 SD = 2.02	x = 30.5 SD = 3.00	x = 26.7 SD = 2.73	x = 22.5 SD = 2.37	x = 21.3 SD = 1.92

Pril. 17E: Seznam analiziranih petih dlančnic s pripadajočimi metričnimi podatki.
Annex 17E: List of analysed fifth metacarpals with relevant metric data.

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
A	-44	48C/4	78.9	15.5	12.5	24.4	28.6	24.3	22.6	18.4
A	-44	37/1	83.1	22.5	17.1	36.2	34.7	30.4	28.1	22.2
A	-56	48A/4	75.2	17.1	14.4	27.2	32.4	26.3	23.9	19.5
A	-68	19/3	90.1	21.2	15.0	32.9	35.6	29.8	29.3	22.8
A	-81	28/3	86.8	20.3	17.3	32.9	36.1	31.8	28.9	23.0
A	-81	39/3	91.4	19.9	14.5	33.2	36.2	32.0	30.4	24.4
A	-81	39/3	77.8	18.0	13.9	28.9	29.8	26.1	23.6	20.2
A	-81	22/4	90.1	20.6	17.7	32.3	36.1	29.9	28.8	22.8
A	-81	38/4	78.3	16.3	11.6	25.1	27.8	25.2	24.2	19.9
A	-81	34/5	88.5	20.0	15.6	31.7	38.2	31.1	28.4	23.6
A	-81	48A/6	91.8	21.9	17.2	30.4	35.1	30.7	28.0	21.0
A	-81	55C/7	88.1	19.9	15.0	29.1	30.9	28.4	25.5	21.6
A	-94	35/6	91.9	22.3	17.5	36.1	37.3	34.5	32.3	24.8
A	-94	48B/8	84.6	21.2	16.8	34.9	32.9	32.9	27.5	24.0
A	-106	34/7	90.1	21.2	17.1	32.3	34.1	31.7	28.8	22.8
A	-106	35/7	87.7	20.1	15.7	31.1	35.6	31.2	27.7	21.9
A	-117	38/7	79.4	18.4	11.8	29.3	31.7	28.5	24.7	20.6
A	-117	48A/9	91.2	20.8	15.9	31.5	37.7	29.6	25.8	23.2
A	-117	41C/10	88.5	21.4	16.3	33.5	34.3	31.9	25.0	21.3
A	-117	48C/10	85.6	21.3	16.4	29.5	28.9	29.8	25.5	20.4
A	-129	34/9	86.3	21.2	17.4	35.0	40.4	32.7	30.9	23.8
A	-141	32/8	87.0	19.6	15.7	33.2	36.3	31.8	27.2	23.9
A	-141	34B/12	81.4	17.9	12.2	27.4	32.2	26.3	25.8	21.4
A	-141	48B/12	88.2	19.9	15.1	32.2	38.7	28.4	27.0	22.2
A	-153	32/9	76.7	17.9	13.5	29.9	31.1	27.9	23.8	21.4
A	-153	26/10	93.2	20.6	16.2	35.6	38.5	33.9	31.7	25.4
A	-153	48B/13	85.1	22.6	14.5	33.3	31.1	30.9	27.4	21.5
A	-156	16/12	88.0	20.6	15.4	30.3	34.7	30.0	26.6	21.5
A	-201	23/14	83.1	20.7	15.7	31.2	34.1	30.3	27.7	21.4
A	-201	38/14	74.1	16.6	13.6	27.0	31.7	25.6	24.8	19.1
A	-201	34/15	95.0	23.2	16.9	33.6	38.2	32.1	29.5	23.0
A	-201	30/16	82.2	19.9	15.5	30.2	31.7	28.5	25.2	20.7
A	-225	55A/17	84.5	21.6	14.8	33.1	33.8	32.1	28.5	21.8
A	-225	28/15	80.3	16.6	13.3	26.2	28.9	24.7	23.1	19.8
A	-225	29/15	89.2	19.7	16.2	32.9	37.4	31.4	29.2	22.0
A	-225	40/15	80.3	17.5	15.5	28.4	30.7	26.4	25.6	21.0
A	-225	23/16	76.5	17.6	14.2	25.5	30.2	24.9	22.7	18.5

continued...

Pril. 17E / Annex 17E (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-237	19/17	77.3	17.1	12.2	29.9	27.9	26.4	25.7	18.9
B	-237	22/17	90.7	20.5	16.8	32.3	37.6	31.8	30.2	22.7
B	-237	13/18	85.9	21.8	15.4	29.0	34.6	30.3	27.2	22.0
B	-249	29/17	76.0	18.0	12.8	27.7	31.3	26.6	24.0	19.8
B	-249	20/18	87.1	21.2	16.0	32.4	37.6	31.6	29.1	23.0
B	-249	34A/19	87.1	22.4	15.5	32.2	35.7	30.1	28.6	23.3
B	-249	34A/19	96.0	15.1	12.4	26.7	35.0	28.9	27.0	20.0
B	-261	62A/20	73.4	17.4	12.9	27.1	29.5	27.2	24.2	19.5
B	-261	28/18	85.6	17.3	15.4	31.8	31.1	27.4	25.3	18.6
B	-261	39/18	77.4	17.3	12.1	27.2	30.4	26.2	26.2	19.9
B	-273	28/19	84.4	19.9	17.1	31.8	35.9	31.8	27.9	22.9
B	-273	29/19	82.4	22.3	16.8	32.1	37.9	31.7	31.1	23.2
B	-273	31/19	77.0	16.5	12.4	27.5	30.1	26.9	23.8	18.9
B	-273	22/20	87.2	23.0	18.8	35.0	36.7	33.2	29.9	23.3
B	-273	13/21	73.4	17.9	14.0	27.5	32.3	25.7	26.0	20.2
B	-285	17/22	85.7	23.0	17.9	33.1	39.2	35.0	32.0	24.9
B	-285	26/21	88.4	22.6	17.0	31.1	36.2	31.3	28.3	23.2
B	-297	40/21	83.1	20.4	16.3	33.4	37.2	30.0	29.2	22.7
B	-297	40/21	82.6	22.4	18.1	32.1	37.8	32.6	29.1	24.0
B	-297	37/22	84.0	19.7	15.7	31.7	36.2	29.7	28.5	21.6
B	-297	34/23	81.7	23.1	16.4	32.5	38.3	33.0	30.0	22.0
B	-309	32/22	82.2	19.3	16.5	32.7	37.8	31.2	28.4	22.6
B	-309	32/22	76.3	17.1	12.9	26.0	30.9	25.6	24.4	20.6
B	-309	40/22	81.1	21.5	18.1	32.6	37.3	30.3	29.3	22.5
B	-309	20/23	83.8	22.0	20.2	34.1	35.1	33.4	30.4	22.8
B	-321	31/23	73.4	16.4	13.4	26.6	28.4	25.6	24.8	18.5
B	-321	31/23	82.0	19.7	16.1	31.7	34.2	29.7	24.5	20.0
B	-321	39/23	73.1	16.5	11.7	25.1	27.8	24.8	24.0	18.9
B	-321	40/23	80.0	21.4	18.3	30.4	33.0	30.4	28.4	22.4
B	-321	40/23	78.3	22.9	19.4	32.5	33.2	31.5	28.8	21.2
B	-321	13/25	82.4	19.9	15.6	33.0	33.7	29.5	26.3	21.4
B	-321	16/25	83.2	21.5	16.8	33.8	38.0	31.8	30.6	23.4
B	-321	34/25	90.3	24.7	19.2	33.3	36.2	33.6	29.1	24.1
B	-333	39/24	83.7	19.7	14.1	31.5	36.9	30.4	25.7	21.7
B	-333	39/24	87.8	20.3	16.2	32.0	36.4	30.7	27.6	23.6
B	-333	20/25	82.5	20.6	16.3	29.7	34.1	30.0	27.3	21.5
B	-333	23/25	73.1	15.6	12.8	27.7	31.4	25.1	22.0	19.5
B	-345	28/25	72.6	17.0	12.0	27.2	28.1	24.5	23.1	19.5
B	-345	40/25	84.3	19.0	13.4	31.2	30.4	28.9	26.8	20.9
B	-345	40/25	82.0	19.2	14.6	29.0	33.4	28.4	24.9	20.8
B	-345	13/27	79.5	21.4	17.8	32.9	34.5	32.8	27.5	20.6
B	-345	14/27	85.4	18.3	15.4	33.8	33.9	29.3	29.1	22.0
B	-357	39/26	84.1	20.8	17.3	29.4	34.7	30.9	27.6	21.5
B	-357	38/27	77.8	18.4	13.5	27.6	31.6	25.8	21.9	20.5
B	-357	16/28	88.4	20.5	16.4	33.4	39.5	30.8	28.4	23.2
B	-357	16/28	75.9	18.9	12.8	28.9	28.2	26.5	23.8	18.9
B	-369	40/27	79.8	16.0	13.7	26.0	31.8	24.3	20.7	20.7
B	-369	40/27	87.7	19.1	18.8	30.5	34.9	31.0	27.1	22.5
B	-369	16/29	73.6	16.9	14.1	24.6	29.2	23.3	21.2	17.8
B	-381	39/28	76.6	16.4	13.7	26.7	26.4	25.2	24.1	19.1
B	-381	20/29	75.7	18.4	14.0	28.6	29.3	25.0	24.5	19.0
B	-381	13/30	76.8	16.5	12.4	25.7	29.5	24.8	20.9	19.6
B	-381	17/30	79.0	18.0	13.8	26.8	28.9	27.0	25.4	19.5
B	-381	17/30	85.2	20.0	14.7	31.2	33.8	27.7	26.1	21.7
B	-381	35/30	78.2	17.4	10.5	25.3	29.6	26.0	22.7	19.6
B	-393	36/30	74.7	15.3	14.0	24.7	26.5	24.3	22.5	18.4
B	-393	14/31	85.3	18.0	14.1	30.0	31.1	29.0	26.9	21.9
B	-393	34/31	80.5	17.7	13.8	28.5	30.6	27.0	24.3	20.4
B	-393	34/31	78.8	18.2	12.6	27.6	30.3	25.8	22.4	20.2
B	-393	35/31	77.6	16.7	12.1	28.0	31.8	25.9	22.4	19.8
B	-405	17/32	83.8	20.2	14.9	28.7	33.7	31.3	27.7	21.7
B	-417	32/31	86.5	19.8	17.5	32.9	35.0	30.1	28.9	22.6
B	-417	22/32	81.6	17.0	13.1	28.8	30.4	27.3	24.4	21.0
B	-417	36/32	80.7	19.6	15.7	32.0	35.4	29.8	24.3	20.5
B	-417	37/32	79.7	20.6	15.2	29.1	33.5	28.1	26.5	20.4

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Pril. 17E / Annex 17E (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-417	37/32	82.5	18.6	15.6	28.6	31.4	27.6	26.2	20.8
B	-417	14/33	87.8	21.7	17.4	33.7	36.9	32.4	29.2	23.2
B	-417	14/33	83.4	19.4	14.8	31.1	31.5	28.3	26.4	20.5
B	-417	17/33	84.8	21.3	15.7	33.1	35.8	30.7	27.9	21.5
B	-417	35/33	84.1	19.5	14.6	30.3	32.6	28.3	23.9	21.3
B	-429	19/33	86.1	20.9	17.4	32.3	33.2	30.1	27.5	21.1
B	-429	22/33	76.0	16.5	14.3	26.0	27.1	25.8	22.4	19.0
B	-429	22/33	78.6	17.3	13.7	27.3	28.6	26.4	25.5	19.9
B	-429	13/34	79.2	17.8	13.3	29.1	31.6	27.9	23.2	20.2
B	-429	14/34	90.1	19.3	15.9	32.9	33.3	30.2	29.8	21.8
B	-429	14/34	77.4	17.7	14.1	27.7	29.6	27.2	24.4	18.8
B	-429	17/34	91.2	22.1	15.5	33.6	36.3	31.5	29.2	23.4
B	-429	34/34	89.3	22.3	16.3	33.5	34.0	31.9	28.7	22.4
C	-441	23/34	82.0	18.9	15.0	30.9	32.0	29.4	27.8	21.5
C	-441	36/34	76.7	17.1	13.2	25.9	29.2	25.0	22.0	17.8
C	-453	17/36	77.0	16.6	14.3	26.8	28.0	25.9	22.8	19.4
C	–	164/13	77.6	16.4	12.7	26.7	30.0	25.6	23.6	19.1
C	–	165/13	90.4	20.5	14.8	34.3	36.5	31.7	27.4	20.9
C	–	168/13	75.4	16.2	11.8	27.4	30.0	25.8	23.9	20.0
C	–	169/13	87.2	20.6	15.4	33.0	36.2	30.4	25.4	20.1
C	–	169/13	81.0	16.9	12.9	25.6	26.1	22.6	17.6	15.7
C	–	179/13	74.1	15.4	11.2	25.7	25.3	22.0	17.4	16.0
C	–	179/13	73.5	17.6	12.1	26.2	27.0	24.1	20.2	16.9
C	–	180/13	87.3	20.5	15.1	31.9	34.0	30.9	27.7	20.3
C	–	180/13	72.9	16.3	12.5	25.1	26.5	24.5	20.1	16.2
C	–	182/13	75.0	16.8	13.1	27.1	29.3	25.2	21.7	17.3
C	–	184a/13	88.9	19.8	14.5	33.8	34.7	30.3	27.0	20.6
C	–	188/13	76.4	17.0	13.3	24.9	28.1	25.3	23.3	19.1
C	–	189/13	82.3	20.4	14.0	33.1	31.9	28.4	25.0	20.6
C	–	202/13-14	80.8	19.7	14.3	30.8	33.7	29.5	28.6	21.5
C	–	202/13-14	85.3	19.7	16.2	32.7	37.3	31.5	26.5	20.7
C	–	203/13-14	78.2	17.7	14.3	27.1	29.2	25.0	22.4	18.9
C	–	203/13-14	78.9	16.4	11.9	26.8	30.8	26.5	24.7	20.1
C	–	204/13-14	75.3	17.5	12.9	26.0	27.5	24.0	22.7	17.6
C	–	169/14	86.6	20.0	16.7	32.9	35.4	32.1	27.9	21.8
C	–	172/14	77.5	17.7	14.4	28.3	32.1	28.1	26.4	19.4
C	–	173/14	83.2	20.2	14.5	32.3	34.5	29.5	26.4	21.3
C	–	178/14	74.0	14.1	10.6	25.3	28.0	23.4	22.2	18.5
C	–	178/14	74.5	17.0	11.2	25.9	27.7	24.4	21.3	17.5
C	–	180/14	78.0	18.9	11.3	27.0	28.3	25.4	24.3	19.0
C	–	181/14	75.8	15.9	12.3	27.3	28.0	24.6	23.0	17.9
C	–	184/14	75.9	16.4	12.2	26.4	29.3	24.5	20.5	17.8
C	–	188/14	76.6	16.9	12.1	26.1	29.3	26.6	24.6	18.7
C	–	189/14	75.4	18.2	11.6	26.2	29.3	24.7	22.5	17.3
Σ sample A			x = 85.1 SD = 5.52	x = 19.8 SD = 1.96	x = 15.3 SD = 1.65	x = 31.0 SD = 3.13	x = 33.9 SD = 3.30	x = 29.6 SD = 2.76	x = 26.9 SD = 2.53	x = 21.8 SD = 1.71
Σ sample B			x = 81.5 SD = 5.10	x = 19.3 SD = 2.22	x = 15.1 SD = 2.10	x = 30.0 SD = 2.76	x = 33.1 SD = 3.35	x = 28.8 SD = 2.74	x = 26.3 SD = 2.70	x = 21.1 SD = 1.63
Σ sample C			x = 79.1 SD = 4.98	x = 17.8 SD = 1.76	x = 13.3 SD = 1.57	x = 28.4 SD = 3.09	x = 30.5 SD = 3.33	x = 26.7 SD = 2.89	x = 23.8 SD = 2.95	x = 19.0 SD = 1.72
Σ all samples (A+B+C)			x = 82.1 SD = 5.55	x = 19.1 SD = 2.17	x = 14.2 SD = 2.03	x = 29.9 SD = 3.04	x = 32.7 SD = 3.52	x = 28.6 SD = 2.95	x = 25.9 SD = 2.93	x = 20.8 SD = 1.94

Pril. 17F: Seznam analiziranih prvih stopalnic s pripadajočimi metričnimi podatki.
Annex 17F: List of analysed first metatarsals with relevant metric data.

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
A	-44	41b/4	53.8	13.2	11.8	23.8	30.0	18.6	17.4	17.5
A	-56	39/1	54.3	11.7	9.7	23.7	23.7	16.4	16.4	16.8
A	-56	39/1	52.2	10.3	9.6	21.6	21.0	16.2	15.4	14.8
A	-56	19/2	53.1	9.6	9.4	21.0	21.6	16.6	15.5	15.1
A	-56	25/2	53.1	11.7	9.0	23.4	25.2	15.8	15.3	14.3
A	-68	38/3	55.6	12.9	10.0	24.8	23.5	18.8	18.6	15.8
A	-68	38/3	54.5	13.4	9.8	24.0	26.3	18.7	17.4	16.1
A	-68	17/4	54.7	13.1	10.9	25.0	28.9	17.7	15.5	17.0
A	-68	48a/5	54.3	12.1	10.0	23.3	23.6	17.3	15.6	15.6
A	-68	41c/6	57.4	14.1	11.0	24.8	28.7	18.8	16.9	16.9
A	-68	55c/6	59.7	13.6	11.4	25.8	29.2	18.6	18.2	16.8
A	-81	19/4	55.6	14.1	11.7	24.4	27.0	18.8	17.1	17.3
A	-81	22/4	54.6	11.9	11.4	24.2	23.8	18.3	17.9	16.0
A	-81	37/4	55.3	12.3	11.1	24.7	22.8	17.6	16.3	16.1
A	-81	48a/6	57.0	11.8	10.1	21.7	23.5	18.7	16.0	16.7
A	-81	55a/6	52.9	13.3	10.1	26.7	27.7	18.3	16.6	17.1
A	-81	41c/7	55.2	13.1	10.0	23.5	26.8	18.2	17.4	16.2
A	-81	41c/7	50.4	11.2	9.5	20.5	22.6	14.8	13.9	14.3
A	-81	48b/7	53.0	12.4	10.9	25.5	26.8	18.6	17.0	16.1
A	-94	39/4	54.5	12.5	11.8	24.1	28.0	18.1	17.9	16.6
A	-94	37/5	54.3	14.8	10.8	27.0	24.4	20.8	17.9	17.7
A	-94	37/5	53.8	13.5	11.4	23.3	24.1	18.6	17.7	16.3
A	-94	14/6	56.2	13.2	9.6	24.7	25.8	18.6	18.0	16.5
A	-94	13/7	54.4	13.9	11.9	24.5	28.9	20.4	19.8	16.2
A	-106	17/7	47.7	11.5	10.2	20.0	23.5	16.2	15.4	15.9
A	-106	34b/9	57.0	13.8	11.1	24.3	26.7	19.1	17.3	16.9
A	-117	48a/9	54.5	14.1	12.9	24.1	27.5	18.6	18.1	18.5
A	-117	48a/9	54.8	12.4	11.1	24.9	25.9	20.0	18.4	17.3
A	-117	48b/10	54.4	14.6	11.6	25.9	28.3	18.7	17.8	18.5
A	-129	62a/10	53.6	14.6	11.3	24.4	28.9	19.5	17.7	16.9
A	-129	48c/11	59.4	13.9	11.4	27.0	28.8	19.9	18.3	19.0
A	-141	13/10	53.8	13.4	11.5	22.6	25.7	18.2	16.6	16.4
A	-153	31/9	57.3	10.6	10.4	23.4	24.8	18.0	16.5	17.4
A	-153	34c/13	47.8	10.1	9.7	20.0	19.9	15.2	13.3	14.9
A	-165	41a/13	57.2	13.9	12.0	27.7	31.2	20.0	19.6	18.1
A	-177	38/12	54.0	12.6	10.6	22.7	24.1	17.2	15.9	16.4
A	-189	20/13	54.5	14.5	12.5	23.3	27.6	17.8	15.5	16.5
A	-201	25/14	50.6	11.0	9.2	23.5	23.5	15.9	15.4	15.1
A	-201	14/15	61.4	14.1	10.3	24.4	27.9	18.5	15.5	17.1
A	-213	22/15	53.8	13.6	10.5	24.6	29.5	19.6	17.6	16.8
A	-213	26/15	55.0	14.4	11.2	23.9	25.9	17.0	15.2	16.4
A	-213	38/15	48.0	11.7	10.8	21.8	23.0	15.6	12.8	13.6
A	-213	17/16	53.2	13.3	10.3	22.3	25.7	17.6	16.7	16.1
A	-225	48a/17	47.4	11.4	8.6	19.2	20.6	14.5	11.7	13.5
A	-225	29/15	54.9	12.4	11.1	25.0	28.2	19.5	18.0	16.8
A	-255	40/15	51.3	14.5	11.7	23.9	29.1	17.9	15.3	15.9
A	-225	26/16	53.4	12.9	10.8	22.0	26.0	17.6	17.2	16.0
A	-225	26/16	50.8	11.1	9.0	20.8	20.2	15.1	15.0	13.9
A	-225	16/17	49.6	11.2	8.9	20.2	23.2	14.9	13.4	13.8
B	-237	22/17	55.2	12.0	9.6	23.5	28.2	15.8	14.6	15.1
B	-237	23/17	47.8	12.7	9.1	20.9	23.6	15.5	13.9	12.8
B	-237	26/17	48.5	11.1	8.6	20.0	23.4	15.7	13.8	14.6
B	-237	14/18	54.8	14.4	11.1	25.5	28.0	20.3	19.2	16.0
B	-237	34/18	53.0	11.5	9.4	21.2	23.9	16.5	15.2	14.7
B	-249	28/17	58.3	13.5	12.4	25.2	30.7	18.5	18.5	16.7
B	-249	29/17	46.2	10.5	8.5	19.8	19.0	15.2	15.4	13.6
B	-249	31/17	50.5	9.9	9.4	19.0	20.3	16.2	16.1	14.8
B	-249	38/18	53.6	11.9	9.3	19.5	17.5	15.5	15.1	14.4
B	-249	13/19	51.9	12.5	9.0	21.8	22.9	17.0	16.3	15.3
B	-261	28/18	46.8	11.3	8.0	18.2	22.7	13.9	12.6	13.3
B	-261	28/18	48.1	11.1	8.1	18.8	21.5	14.4	14.4	13.5
B	-261	32/18	53.3	12.1	8.7	21.3	22.9	16.4	16.2	15.7
B	-273	34a/21	55.9	14.5	11.9	26.1	29.3	18.5	17.8	16.9
B	-273	28/19	53.2	15.6	10.4	25.7	28.9	19.8	17.7	16.6
B	-273	39/19	53.6	12.5	10.1	24.6	29.2	19.3	18.0	16.4
B	-273	40/19	49.3	11.3	9.6	21.5	21.9	14.7	13.0	14.6

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Pril. 17F / Annex 17F (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-273	23/20	59.1	13.3	11.2	26.3	29.1	19.8	19.1	18.0
B	-273	14/21	52.7	13.3	10.7	24.3	26.1	18.5	18.5	17.1
B	-273	16/21	54.1	14.5	12.0	24.5	29.0	19.9	18.1	16.5
B	-285	26/21	55.0	13.2	10.6	25.5	26.8	18.2	18.0	17.3
B	-285	26/21	55.8	13.9	12.3	24.4	25.5	19.7	18.6	17.4
B	-285	36/21	52.4	13.0	11.3	24.3	26.7	17.7	17.6	15.6
B	-285	37/21	54.5	13.2	10.1	24.9	27.2	18.1	17.1	16.8
B	-285	37/21	47.1	14.3	10.2	24.6	28.3	18.5	17.2	16.2
B	-285	17/22	59.4	13.2	10.0	25.0	24.6	19.2	18.1	17.8
B	-297	28/21	47.3	11.9	9.4	20.0	23.9	16.4	15.4	14.7
B	-297	39/21	58.9	14.3	12.4	26.9	29.4	19.2	19.4	18.5
B	-297	40/21	53.1	13.3	10.9	25.2	29.6	18.2	18.5	16.0
B	-297	34/23	53.1	13.4	10.4	25.0	29.3	19.1	18.8	16.3
B	-309	28/22	53.5	14.3	9.5	25.8	25.7	19.1	18.6	15.9
B	-309	22/23	57.2	12.8	11.5	26.4	27.7	19.5	19.9	18.0
B	-321	32/23	53.3	12.4	11.0	25.1	25.8	17.8	17.9	15.7
B	-321	22/24	54.5	15.1	12.6	24.4	27.7	18.5	16.8	17.0
B	-321	26/24	53.0	12.4	9.8	22.4	26.5	17.3	15.6	16.0
B	-321	13/25	53.9	13.1	11.4	25.7	27.4	19.1	18.1	16.8
B	-333	28/24	52.1	14.0	10.2	24.9	27.1	18.0	17.3	17.5
B	-333	19/25	52.3	12.5	11.4	25.9	27.1	20.2	19.7	16.6
B	-333	19/25	53.0	13.5	12.2	25.3	28.0	17.9	15.6	15.7
B	-333	20/25	57.1	14.1	11.8	25.1	25.8	17.7	16.1	17.1
B	-333	26/25	54.9	12.5	10.0	25.3	27.3	18.9	14.5	16.5
B	-333	13/26	47.8	11.8	9.1	22.5	20.9	15.0	14.3	14.9
B	-333	35/26	54.7	14.3	10.5	23.5	28.9	18.7	16.0	16.3
B	-345	39/25	48.2	11.9	9.4	21.6	21.9	15.5	15.2	14.1
B	-345	22/26	56.8	13.7	10.5	22.8	28.0	18.2	16.3	17.4
B	-345	22/26	54.8	12.6	9.3	23.3	28.0	17.4	16.4	16.0
B	-345	23/26	52.9	13.3	10.2	22.4	27.9	17.3	16.9	16.1
B	-357	31/26	49.9	11.7	10.2	20.9	24.8	16.2	15.6	14.6
B	-357	39/26	54.0	13.8	11.2	24.9	27.5	18.8	18.5	16.2
B	-357	39/26	50.7	13.5	10.7	23.0	26.3	18.6	18.1	15.6
B	-357	23/27	47.6	11.0	9.8	19.1	21.3	14.8	13.5	13.8
B	-357	37/27	50.3	12.7	10.7	23.0	24.8	18.6	16.8	15.5
B	-357	17/28	52.6	14.2	10.6	22.8	26.0	17.0	15.1	14.7
B	-369	13/29	52.0	13.8	9.7	22.6	24.0	18.8	17.3	15.6
B	-369	14/29	45.7	10.6	8.4	18.1	20.5	14.3	12.4	13.5
B	-381	14/30	51.6	12.4	11.8	23.1	25.0	17.4	15.6	15.7
B	-381	16/30	49.4	10.0	9.6	20.3	24.4	14.5	13.6	14.2
B	-381	16/30	50.9	10.1	10.3	20.3	23.4	15.9	15.2	15.1
B	-381	17/30	47.4	10.3	8.4	17.7	22.7	14.9	13.2	14.6
B	-381	34/30	48.6	11.7	10.5	21.7	21.4	16.6	16.7	14.3
B	-381	35/30	46.5	9.9	7.2	19.3	19.6	13.8	12.3	13.5
B	-393	36/30	50.3	12.0	9.0	22.3	22.7	15.8	14.6	14.6
B	-393	34/31	50.1	12.1	8.6	22.1	24.6	16.0	14.2	14.0
B	-405	38/31	58.7	13.9	11.5	22.2	26.4	16.0	14.6	16.8
B	-405	16/32	48.1	10.1	7.8	20.2	21.9	14.0	12.3	13.7
B	-405	17/32	49.9	9.7	8.0	18.7	20.4	13.8	13.4	14.2
B	-405	34/32	50.2	12.0	10.7	21.1	22.8	15.4	13.1	14.1
B	-417	22/32	47.9	12.6	11.0	23.8	23.9	17.1	16.0	15.4
B	-417	36/32	46.8	10.7	9.0	19.7	22.4	15.9	14.7	13.2
B	-417	36/32	49.6	10.9	8.4	20.4	23.5	15.7	14.1	13.8
B	-417	13/33	53.0	13.1	8.1	23.6	23.8	16.6	15.7	15.0
B	-417	14/33	52.6	12.6	10.2	22.2	24.6	17.1	15.6	16.1
B	-417	35/33	52.7	12.3	11.4	23.0	25.6	18.8	17.4	16.3
B	-429	19/33	54.2	12.3	12.3	23.4	26.4	20.5	18.2	17.8
B	-429	14/34	55.0	13.6	10.7	24.6	27.1	17.9	17.3	16.5
B	-429	35/34	55.4	13.3	10.4	24.6	27.3	19.7	17.4	16.0
B	-429	35/34	48.3	10.8	9.8	20.4	23.1	15.5	14.3	15.1
C	-441	19/34	49.4	11.5	9.5	19.7	25.3	15.9	14.7	14.9
C	-441	19/34	47.4	10.2	8.4	19.5	22.0	15.7	14.4	14.1
C	-441	22/34	49.6	12.2	9.7	21.5	23.6	17.4	16.5	15.4
C	-441	13/35	52.3	13.5	9.7	25.5	28.8	19.4	18.1	16.9
C	-441	14/35	44.3	10.8	8.8	18.5	23.4	14.9	13.3	13.3
C	-441	17/35	55.0	12.1	11.1	24.8	25.3	17.6	16.8	17.4

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Pril. 17F / Annex 17F (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
C	-441	34/35	48.8	11.1	9.5	20.6	23.8	15.3	13.3	14.5
C	-441	34/35	55.2	12.7	11.0	23.2	27.0	18.8	18.1	16.9
C	-453	14/36	46.4	10.8	8.8	18.7	22.4	14.8	12.1	13.1
C	-465	20/36	50.8	10.7	10.2	20.1	22.9	15.5	14.3	14.4
C	-465	20/36	48.1	10.4	9.9	20.6	22.5	16.1	14.5	14.3
C	–	165/13	48.0	11.1	7.9	19.1	21.9	14.9	13.7	13.4
C	–	171/13	55.0	13.4	10.5	23.9	23.0	18.0	16.1	15.1
C	–	175/13	54.4	13.0	10.7	23.9	28.5	18.0	16.4	16.8
C	–	173+179/13	51.2	11.2	9.9	21.3	23.2	16.3	14.1	14.4
C	–	179/13	54.3	13.2	10.8	21.8	26.3	17.1	13.3	14.9
C	–	180/13	53.0	11.7	11.4	23.8	26.0	19.0	17.5	16.4
C	–	180/13	55.6	11.8	10.1	22.5	25.5	18.1	17.5	17.2
C	–	182/13	48.1	10.9	9.3	19.7	24.7	15.3	14.3	14.7
C	–	188/13	52.5	13.3	10.3	21.8	25.9	18.4	16.7	17.1
C	–	192/13	53.2	12.5	10.1	22.4	25.5	17.3	15.6	15.1
C	–	192/13	49.7	10.4	8.4	22.1	24.0	16.0	15.1	14.3
C	–	202/13-14	54.6	13.3	10.5	25.4	27.0	18.0	17.6	16.3
C	–	203/13-14	50.9	12.1	9.7	21.8	25.3	17.1	15.4	15.0
C	–	204/13-14	55.1	12.3	9.5	22.2	22.5	18.0	14.6	15.2
C	–	204/13-14	47.0	12.6	10.1	21.7	21.0	16.9	16.7	15.0
C	–	168/14	46.3	10.4	8.3	20.0	22.2	15.1	14.0	13.7
C	–	170/14	57.0	13.0	11.4	24.2	29.6	18.4	17.0	17.2
C	–	170/14	47.3	11.1	8.7	18.9	20.9	15.1	13.3	13.4
C	–	174/14	52.3	12.2	10.2	21.6	26.6	16.7	15.7	14.6
C	–	178/14	58.1	13.5	10.0	25.2	28.2	17.8	17.3	16.4
C	–	180/14	61.1	13.3	11.6	24.3	24.8	18.7	16.8	16.6
C	–	180/14	49.8	10.5	8.6	20.0	23.9	16.0	14.0	13.3
C	–	184/14	53.8	14.1	11.1	25.3	28.3	18.3	17.3	16.8
C	–	187/14	53.9	14.3	11.4	23.4	27.8	17.8	17.0	17.1
C	–	188/14	52.5	12.5	9.5	23.9	24.0	17.5	15.3	15.4
C	–	188/14	55.0	13.4	10.7	25.4	29.6	19.5	17.1	16.5
C	–	188/14	50.0	10.2	8.5	17.9	21.2	15.3	14.5	14.0
C	–	190/14	58.4	12.6	10.5	24.6	29.1	17.6	16.5	16.7
Σ sample A			x = 54.0 SD = 2.93	x = 12.8 SD = 1.32	x = 10.6 SD = 0.99	x = 23.6 SD = 1.92	x = 25.7 SD = 2.80	x = 17.9 SD = 1.55	x = 16.5 SD = 1.69	x = 16.3 SD = 1.25
Σ sample B			x = 52.1 SD = 3.42	x = 12.5 SD = 1.37	x = 10.1 SD = 1.26	x = 22.8 SD = 2.38	x = 25.2 SD = 2.93	x = 17.2 SD = 1.82	x = 16.2 SD = 1.98	x = 15.6 SD = 1.33
Σ sample C			x = 51.9 SD = 3.81	x = 12.0 SD = 1.19	x = 9.9 SD = 0.99	x = 22.1 SD = 2.24	x = 25.0 SD = 2.53	x = 17.0 SD = 1.39	x = 15.5 SD = 1.60	x = 15.3 SD = 1.33
Σ all samples (A+B+C)			x = 52.6 SD = 3.48	x = 12.5 SD = 1.33	x = 10.2 SD = 1.15	x = 22.9 SD = 2.28	x = 25.3 SD = 2.80	x = 17.4 SD = 1.67	x = 16.1 SD = 1.83	x = 15.7 SD = 1.35

Pril. 17G: Seznam analiziranih drugih stopalnic s pripadajočimi metričnimi podatki.
Annex 17G: List of analysed second metatarsals with relevant metric data.

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
A	-44	38/1	63.4	13.1	10.0	14.9	21.1	17.9	16.7	15.5
A	-44	16/2	72.6	15.2	12.5	16.4	27.0	23.6	19.4	17.6
A	-56	39/1	64.1	14.7	11.1	16.4	24.7	20.9	18.3	16.5
A	-56	36/2	73.6	15.8	12.0	17.2	27.4	23.2	20.7	16.6
A	-56	36/2	69.4	14.7	11.4	15.4	24.7	21.1	17.5	16.5
A	-56	36/2	65.4	14.0	11.2	14.9	22.9	20.1	16.0	15.6
A	-56	35/3	70.3	16.3	12.6	16.0	26.7	23.8	19.9	17.7
A	-56	35/3	70.7	14.7	11.3	15.5	25.4	22.3	18.4	15.9
A	-56	48b/5	65.6	14.9	12.4	15.9	24.5	22.3	17.9	15.9
A	-68	19/3	67.2	13.9	10.9	13.6	22.7	19.5	16.8	14.6
A	-68	36/3	68.6	13.3	10.4	13.5	23.6	19.9	17.2	16.0
A	-68	38/3	72.6	16.5	12.7	16.1	25.8	22.8	20.3	17.6
A	-81	39/3	66.8	15.5	11.0	15.7	25.2	21.7	18.8	16.8
A	-81	19/4	70.1	14.5	11.7	15.4	26.6	21.4	18.5	17.0
A	-81	19/4	67.3	15.4	12.9	16.4	26.5	23.9	19.0	17.9
A	-81	37/4	72.1	16.4	12.1	16.2	26.9	23.3	19.7	17.4
A	-81	38/4	70.7	16.0	12.1	16.5	25.2	23.4	21.4	18.1
A	-81	38/4	70.4	16.2	12.3	16.9	23.4	22.9	19.8	17.5
A	-81	41c/7	68.8	16.9	12.7	17.5	25.8	23.8	19.3	17.1
A	-94	28/4	70.3	18.3	12.8	17.5	27.0	24.0	19.8	17.9
A	-94	36/5	75.4	16.8	12.9	16.5	27.8	24.2	20.2	18.5
A	-94	38/5	71.1	17.3	12.4	17.2	28.2	25.0	20.4	18.9
A	-94	13/6	68.8	16.4	12.7	16.3	26.8	22.9	19.7	17.4
A	-94	13/6	70.4	14.8	12.1	15.3	24.8	22.3	17.9	17.5
A	-106	48a/8	62.4	14.2	11.6	14.8	21.5	19.7	17.0	15.8
A	-117	39/6	71.3	17.5	12.7	17.6	28.5	23.3	19.3	17.9
A	-117	36/7	69.1	14.8	11.4	17.3	24.1	22.1	19.5	17.4
A	-117	41a/9	63.1	13.7	12.3	14.8	21.3	19.9	17.3	15.6
A	-117	41b/10	70.7	16.5	12.5	18.4	25.4	24.0	18.3	17.8
A	-117	55c/10	68.9	15.7	11.9	16.6	25.5	22.3	18.9	17.3
A	-129	38/8	67.8	13.6	10.7	15.6	23.2	20.6	18.1	16.8
A	-129	34/9	69.0	18.0	11.1	18.4	27.6	24.9	20.4	16.7
A	-129	48b/11	65.0	15.5	10.7	15.4	24.6	22.7	19.0	16.7
A	-141	19/9	65.9	16.6	11.5	15.5	25.4	22.0	17.8	16.1
A	-141	20/9	66.9	15.8	11.3	15.9	25.8	22.1	19.1	16.9
A	-141	36/9	65.2	15.3	10.4	15.9	25.5	22.9	19.0	16.3
A	-141	41c/12	72.0	16.0	12.6	17.7	28.6	23.9	20.5	17.7
A	-141	55b/12	76.3	15.4	12.2	17.0	28.7	24.6	20.2	17.9
A	-153	22/10	66.5	13.2	10.6	14.4	21.8	18.6	15.9	14.8
A	-165	62c/14	73.5	16.6	11.8	16.3	27.2	23.3	19.0	17.1
A	-177	31/11	70.1	15.5	12.0	15.4	24.3	21.7	18.6	16.4
A	-177	40/11	67.9	15.8	11.5	16.9	24.1	22.9	19.3	16.9
A	-177	48b/15	72.5	15.4	13.7	16.9	27.4	23.9	17.8	16.7
A	-189	31/12	59.9	12.5	10.2	13.4	21.0	18.5	15.3	14.3
A	-189	34a/15	71.3	15.8	11.2	14.3	27.3	22.1	17.9	16.6
A	-189	48b/16	68.9	15.5	12.6	15.0	26.0	20.6	17.7	16.2
A	-201	34b/17	69.1	15.4	11.0	15.7	22.1	22.1	19.1	16.6
A	-201	41b/17	70.6	16.9	12.4	16.0	26.4	23.4	19.8	17.1
A	-213	28/14	70.6	14.7	11.4	16.9	25.4	22.6	19.7	15.9
A	-213	37/15	62.4	11.9	10.1	12.4	21.4	18.7	14.8	13.6
A	-225	29/15	66.7	14.3	10.0	14.0	21.5	19.6	16.6	14.0
A	-225	19/16	64.6	12.5	10.5	13.5	20.7	17.6	15.9	14.5
A	-225	23/16	69.0	15.0	12.4	14.6	25.5	20.7	17.3	15.9
A	-225	26/16	67.7	13.3	11.4	16.3	24.2	20.4	18.2	16.3
A	-225	26/16	72.4	14.6	11.1	16.2	26.7	21.0	17.1	15.9
B	-237	48a/18	72.1	15.9	12.3	15.5	26.2	22.4	16.6	16.1
B	-237	62b/19	66.6	14.7	12.2	14.1	23.5	21.4	16.8	15.5
B	-237	29/16	62.3	13.0	9.7	13.6	22.1	18.3	15.7	14.8
B	-237	31/16	72.1	15.0	12.4	17.1	26.3	22.4	19.7	16.8
B	-237	31/16	68.4	15.9	12.0	16.7	26.0	22.6	18.2	16.4
B	-237	32/16	69.8	16.4	12.4	16.7	24.5	22.1	19.1	16.5
B	-237	32/16	74.1	16.9	13.3	16.6	27.2	22.3	19.4	17.3
B	-237	23/17	64.9	13.9	10.6	14.3	20.7	20.4	16.4	14.9
B	-237	13/18	68.0	15.2	11.0	15.9	25.0	21.5	17.8	16.5
B	-237	17/18	69.4	16.4	13.0	16.1	23.7	21.4	17.0	15.6
B	-249	41b/20	69.5	17.7	13.8	17.3	22.6	24.1	19.1	16.0

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Pril. 17G / Annex 17G (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-249	29/17	66.2	12.7	10.0	13.3	24.0	18.9	15.8	15.5
B	-249	29/17	63.7	12.9	9.0	12.5	18.2	18.0	15.2	14.1
B	-249	25/18	65.1	14.7	11.6	15.0	23.6	19.3	16.7	15.4
B	-249	26/18	62.7	12.1	10.1	12.9	21.3	18.6	15.4	14.9
B	-249	13/19	70.6	15.5	12.8	16.1	24.6	22.8	19.5	16.0
B	-261	28/18	67.3	15.4	10.9	15.4	20.9	22.1	18.2	15.5
B	-261	31/18	67.5	16.8	12.2	15.2	22.3	21.4	18.3	15.4
B	-261	38/19	69.6	15.5	12.4	16.3	26.1	22.7	19.9	17.8
B	-261	13/20	63.5	14.9	11.9	17.6	26.2	22.4	18.4	16.3
B	-273	32/19	71.8	16.7	12.9	17.5	26.1	24.6	21.2	18.2
B	-273	26/20	68.3	14.4	11.3	15.4	25.7	23.0	20.0	17.2
B	-273	36/20	60.1	12.4	9.3	13.1	21.7	18.0	15.6	14.6
B	-273	14/21	64.2	16.3	12.9	15.6	26.3	22.3	19.2	15.9
B	-285	13/22	69.8	15.3	12.9	16.3	26.1	22.2	19.3	17.3
B	-297	28/21	73.9	16.7	14.2	16.8	27.2	24.7	22.2	18.5
B	-297	28/21	58.3	13.4	11.1	13.5	22.0	20.5	17.6	14.8
B	-297	32/21	67.0	14.9	11.9	15.1	26.2	21.3	18.9	16.8
B	-297	40/21	68.4	13.8	12.5	16.2	23.9	20.3	18.0	15.6
B	-297	20/22	69.6	15.1	11.7	15.4	25.1	21.4	15.5	15.5
B	-297	25/22	67.4	15.8	11.2	16.2	26.0	22.1	17.3	16.0
B	-297	13/23	68.0	14.9	11.4	16.5	25.1	22.1	19.6	16.3
B	-297	16/23	66.2	12.8	9.9	12.5	18.7	18.6	15.8	14.6
B	-297	35/23	72.0	16.0	12.0	17.6	27.3	23.3	22.8	17.8
B	-309	32/22	62.2	13.6	9.9	14.4	21.6	21.9	17.1	15.2
B	-309	20/23	69.4	15.0	12.3	14.8	23.0	20.0	17.0	16.4
B	-309	22/23	68.2	16.4	12.0	16.4	24.5	21.8	18.9	16.5
B	-309	22/23	68.6	16.1	12.0	14.7	24.9	21.3	18.7	16.4
B	-309	25/23	60.7	12.5	9.9	13.2	21.3	19.0	16.6	14.8
B	-309	37/23	70.8	15.8	12.4	16.9	26.2	22.3	19.2	16.9
B	-321	28/23	67.8	13.8	10.7	16.3	24.8	20.8	17.5	16.0
B	-321	28/23	65.9	14.8	11.0	16.2	22.9	22.5	19.5	16.4
B	-321	39/23	67.3	15.4	12.0	16.0	24.5	23.1	20.5	17.2
B	-321	39/23	67.9	15.1	10.8	14.7	25.2	21.6	18.6	15.8
B	-321	40/23	66.0	16.4	11.7	16.0	23.8	21.9	18.5	15.5
B	-321	40/23	67.1	15.0	11.0	15.6	24.5	21.9	18.5	15.6
B	-321	13/25	68.4	15.3	10.8	16.3	26.1	22.3	19.1	17.1
B	-333	25/25	64.7	15.8	12.3	16.7	24.0	22.3	18.1	16.8
B	-333	26/25	69.6	17.7	12.2	17.3	26.5	24.2	19.2	18.2
B	-333	13/26	71.2	15.3	11.9	16.9	27.0	23.0	19.3	16.6
B	-345	29/25	68.5	14.8	12.5	16.3	25.0	23.3	19.2	17.0
B	-345	31/25	62.8	14.6	9.1	13.9	23.0	19.1	14.3	14.0
B	-345	39/25	65.2	13.1	10.2	13.8	23.2	20.2	18.2	16.1
B	-345	19/26	61.4	14.1	10.4	14.4	20.0	21.8	19.0	15.7
B	-345	26/26	69.4	17.5	12.8	16.6	24.4	–	–	–
B	-357	19/27	69.7	13.7	10.9	14.1	24.0	21.4	18.4	14.8
B	-357	20/27	69.4	14.4	11.6	15.5	21.8	22.1	19.3	15.4
B	-357	23/27	72.2	16.5	12.2	15.5	24.3	23.1	18.6	16.4
B	-357	23/27	69.0	14.8	11.9	15.9	23.5	21.9	19.1	16.2
B	-357	36/27	65.7	15.0	10.7	15.9	23.5	22.1	19.4	16.0
B	-357	34/28	68.1	15.3	11.3	16.9	25.2	22.3	19.0	16.0
B	-357	35/28	66.1	15.4	10.8	14.7	25.8	23.5	21.3	16.7
B	-369	28/27	63.4	12.5	9.0	13.5	22.9	18.9	16.5	14.5
B	-369	26/28	69.8	14.7	11.5	15.1	25.1	22.1	18.5	16.0
B	-369	36/28	63.3	14.1	10.7	13.6	22.3	19.9	16.4	14.8
B	-369	13/29	70.4	15.9	11.7	17.0	22.9	23.0	19.6	16.9
B	-369	14/29	65.1	13.3	10.5	13.3	21.5	18.8	16.1	14.0
B	-369	16/29	64.2	11.4	8.9	13.5	20.0	19.1	15.4	14.7
B	-381	20/29	64.5	12.2	8.8	13.4	20.3	17.9	16.2	13.8
B	-381	14/30	71.9	13.2	10.0	15.2	25.5	22.0	16.6	16.2
B	-381	16/30	61.5	13.3	9.1	12.2	18.3	17.6	15.7	12.9
B	-381	16/30	67.1	14.0	10.9	15.5	27.6	20.7	17.1	15.7
B	-393	28/29	67.6	12.9	9.6	13.9	21.9	20.5	17.1	15.6
B	-393	25/30	63.6	12.5	8.6	14.2	21.4	18.9	16.0	14.0
B	-393	13/31	61.9	13.2	9.0	12.4	21.6	18.6	14.9	13.6
B	-393	17/31	68.9	14.0	12.5	15.1	25.4	20.9	18.0	15.4
B	-405	26/31	66.8	13.5	10.2	14.9	24.9	22.1	19.9	16.0

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Pril. 17G / Annex 17G (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-405	38/31	60.8	14.7	10.0	13.7	20.6	18.8	15.4	12.6
B	-417	19/32	69.3	15.3	12.6	17.6	26.7	23.1	20.8	18.0
B	-417	22/32	68.7	16.1	11.0	16.4	24.5	23.0	19.8	16.1
B	-417	36/32	58.8	13.1	8.6	13.3	17.8	18.3	15.2	13.8
B	-417	37/32	60.2	11.5	9.0	12.2	20.2	18.7	15.8	14.0
B	-417	17/33	70.5	16.2	12.2	15.9	23.8	23.2	19.6	16.7
B	-417	34/33	71.7	15.9	11.5	16.4	25.7	22.0	18.1	16.1
B	-417	34/33	72.4	15.3	12.4	17.0	28.5	23.8	20.3	16.6
B	-429	19/33	63.7	13.6	9.7	13.6	21.2	18.7	14.6	13.6
B	-429	19/33	59.1	13.2	10.1	13.2	18.5	17.9	15.5	13.5
B	-429	13/34	64.5	13.9	10.5	15.2	24.8	20.6	17.5	15.9
B	-429	14/34	69.4	15.4	12.2	16.3	26.5	23.9	20.1	17.0
B	-429	34/34	63.7	10.9	8.6	14.1	21.3	18.0	15.0	15.0
B	-429	35/34	66.0	13.7	9.2	13.7	22.6	20.7	17.0	15.7
B	-429	35/34	68.9	15.0	11.2	16.4	25.1	22.1	19.3	17.2
C	-441	19/34	73.2	15.3	11.2	17.1	27.2	23.1	20.4	18.6
C	-441	20/34	65.8	14.5	10.1	14.5	24.4	20.4	18.4	15.7
C	-441	–	68.02	14.9	10.6	15.8	25.3	22.2	18.5	17.3
C	-441	13/35	67.4	15.8	11.7	15.9	25.0	23.7	19.8	16.1
C	-441	13/35	71.7	15.5	11.3	16.0	25.6	20.9	17.5	16.2
C	-441	17/35	58.1	11.6	8.1	13.3	21.1	17.5	14.4	13.7
C	-453	14/36	67.2	15.0	13.8	17.9	27.4	21.5	18.1	16.5
C	-453	34/36	70.0	14.5	11.5	16.4	26.1	22.1	19.1	15.9
C	-453	34/36	65.1	11.9	9.4	13.9	21.5	18.5	16.4	14.8
C	–	164/13	70.4	14.7	11.3	16.9	26.5	23.5	18.6	16.0
C	–	165/13	64.7	13.7	9.6	13.5	21.1	20.3	17.0	15.1
C	–	170/13	71.4	14.9	12.0	14.9	26.0	22.4	18.1	16.0
C	–	174/13	65.5	14.6	9.8	14.9	24.6	20.3	16.7	15.8
C	–	180/13	63.2	14.4	11.5	14.7	24.2	20.1	15.7	14.5
C	–	182/13	65.0	15.4	12.0	14.2	22.7	21.0	17.2	15.2
C	–	182/13	68.7	15.3	9.8	16.7	26.2	21.7	18.6	14.5
C	–	184/13	62.7	12.2	8.1	14.0	22.4	18.5	16.4	15.2
C	–	184a/13	63.3	12.4	7.7	13.4	18.8	17.6	15.3	14.4
C	–	188/13	61.9	13.0	8.7	13.7	21.6	18.9	16.6	14.1
C	–	188/13	59.9	12.1	9.0	13.1	21.0	19.1	16.8	14.5
C	–	190/13	61.1	13.4	9.8	13.7	21.5	19.2	17.9	15.2
C	–	202/13-14	62.4	13.3	9.4	13.7	19.6	18.6	15.5	14.4
C	–	203/13-14	71.1	16.1	11.7	16.4	24.6	22.9	18.4	16.4
C	–	204/13-14	71.7	16.8	11.7	16.1	25.5	23.7	17.9	16.6
C	–	204/13-14	71.5	15.2	10.9	14.8	26.5	22.2	19.2	16.1
C	–	204/13-14	65.2	12.4	9.2	13.4	23.1	18.6	15.7	14.7
C	–	168/14	61.3	11.9	8.7	12.2	22.4	18.7	16.8	14.1
C	–	168/14	67.8	15.7	11.3	16.6	24.1	21.7	19.4	15.6
C	–	169/14	64.8	14.1	10.7	14.1	23.4	20.1	16.9	14.7
C	–	170/14	65.5	12.7	10.0	12.6	21.9	19.8	16.2	15.0
C	–	174/14	70.7	16.3	11.3	15.0	25.3	23.5	19.6	17.7
C	–	179/14	65.0	14.4	9.0	14.2	23.2	20.5	17.5	15.0
C	–	179/14	61.8	11.2	8.4	14.2	22.8	18.0	15.6	15.2
C	–	180/14	60.1	12.8	9.6	13.6	20.7	18.7	15.6	14.8
C	–	187/14	60.8	11.2	8.4	13.1	22.0	17.9	15.3	13.4
C	–	188/14	63.3	14.0	9.7	13.5	22.6	19.6	16.8	14.0
C	–	190/14	61.7	13.6	9.7	15.0	21.9	19.1	15.9	14.7
C	–	192/14	66.7	14.6	11.8	16.0	25.0	22.9	17.7	15.6
Σ sample A			x = 68.8 SD = 3.38	x = 15.3 SD = 1.39	x = 11.7 SD = 0.88	x = 15.9 SD = 1.29	x = 25.1 SD = 2.18	x = 22.0 SD = 1.85	x = 18.5 SD = 1.47	x = 16.6 SD = 1.13
Σ sample B			x = 66.9 SD = 3.60	x = 14.6 SD = 1.47	x = 11.1 SD = 1.32	x = 15.2 SD = 1.45	x = 23.8 SD = 2.39	x = 21.2 SD = 1.82	x = 18.0 SD = 1.82	x = 15.8 SD = 1.21
Σ sample C			x = 65.7 SD = 3.99	x = 14.0 SD = 1.51	x = 10.2 SD = 1.39	x = 14.7 SD = 1.40	x = 23.5 SD = 2.19	x = 20.5 SD = 1.91	x = 17.3 SD = 1.46	x = 15.3 SD = 1.10
Σ all samples (A+B+C)			x = 67.2 SD = 3.77	x = 14.7 SD = 1.52	x = 11.1 SD = 1.32	x = 15.3 SD = 1.45	x = 24.1 SD = 2.36	x = 21.3 SD = 1.91	x = 18.2 SD = 1.70	x = 15.9 SD = 1.25

Pril. 17H: Seznam analiziranih tretjih stopalnic s pripadajočimi metričnimi podatki.
Annex 17H: List of analysed third metatarsals with relevant metric data.

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
A	-32	55a/2	73.5	15.8	10.9	18.3	27.7	20.8	18.4	16.5
A	-44	34b/4	83.9	17.2	13.9	20.1	31.3	23.0	19.4	17.3
A	-56	34/3	72.1	15.6	10.8	20.2	26.3	21.0	16.8	15.4
A	-68	34/4	71.7	15.1	10.6	18.6	27.0	20.6	17.8	16.0
A	-68	35/4	66.1	14.3	9.8	16.8	24.8	19.7	15.6	14.5
A	-68	41a/5	78.9	18.3	13.3	24.1	32.8	25.8	20.8	18.8
A	-81	31/3	80.2	18.2	14.0	22.6	30.9	27.8	22.1	18.2
A	-81	22/4	83.9	18.2	14.6	22.2	32.2	25.4	21.4	19.0
A	-81	16/5	81.0	19.0	13.4	23.8	32.6	23.5	20.5	18.3
A	-81	16/5	78.9	18.0	13.5	23.0	30.2	25.0	19.7	18.3
A	-81	34/5	81.6	19.1	12.3	18.8	32.8	22.5	19.9	18.6
A	-81	34a/6	76.4	16.1	11.9	20.7	27.4	22.2	19.3	15.8
A	-81	48a/6	81.7	17.5	12.0	21.5	32.1	24.4	20.1	18.7
A	-81	48c/7	78.7	18.9	13.3	25.2	30.1	24.7	20.8	17.6
A	-94	39/4	80.9	18.9	11.9	18.9	31.7	23.6	18.9	17.5
A	-94	38/5	80.9	18.3	12.1	22.3	31.4	24.1	21.0	19.3
A	-94	34c/8	81.4	19.9	14.3	27.0	33.1	25.9	21.1	19.1
A	-94	55c/8	82.7	18.4	13.6	24.9	34.2	25.5	21.8	20.5
A	-106	39/5	80.4	19.1	13.2	25.1	32.0	25.9	22.5	20.2
A	-106	41a/8	83.4	19.4	13.4	25.4	30.1	26.5	21.7	18.9
A	-106	32/6	68.6	14.5	10.4	19.2	24.8	19.4	15.7	16.2
A	-106	25/7	69.2	15.9	11.1	21.5	27.2	22.7	19.3	17.1
A	-106	13/8	80.9	19.1	13.2	25.0	30.6	25.6	20.5	19.5
A	-106	35/8	81.5	19.0	12.2	22.0	30.3	24.1	19.7	17.9
A	-129	48b/11	79.4	19.0	14.1	25.9	30.4	25.2	20.4	18.5
A	-129	48c/11	79.6	16.3	13.4	21.0	28.7	24.3	19.8	17.5
A	-129	55c/11	80.5	17.4	13.9	27.2	30.4	24.5	21.0	18.8
A	-129	62c/11	75.4	15.7	10.9	22.1	28.9	22.4	19.8	17.7
A	-141	13/10	84.6	20.1	13.8	26.6	32.9	25.7	21.9	20.1
A	-153	29/9	79.3	15.1	13.1	19.7	26.6	22.5	20.2	18.0
A	-153	32/9	78.9	15.0	12.3	17.3	24.1	20.7	16.1	15.0
A	-153	48b/13	79.5	16.7	12.5	25.0	27.3	23.7	19.5	18.5
A	-177	28/11	80.0	18.3	13.3	28.0	28.7	25.0	20.4	18.6
A	-177	32/11	71.9	14.3	11.5	17.2	26.5	20.3	16.8	16.6
A	-189	13/14	81.3	19.3	13.7	26.5	30.3	25.1	20.9	17.9
A	-189	62a/15	79.4	16.3	12.9	22.8	28.9	23.7	18.9	16.6
A	-201	41b/17	84.8	18.6	14.4	25.3	33.2	25.4	23.0	20.2
A	-201	41b/17	77.9	18.0	12.6	24.2	28.6	25.7	21.0	17.8
A	-213	28/14	78.6	16.8	11.7	22.8	28.3	25.0	19.8	18.1
A	-213	32/14	74.6	18.3	12.0	23.3	27.8	22.9	18.8	17.7
A	-213	19/15	73.4	17.4	13.6	21.5	28.1	22.5	18.1	16.7
A	-213	36/15	71.2	16.5	11.7	21.5	25.4	22.2	18.9	16.9
A	-213	17/16	73.3	15.2	10.7	20.5	27.9	20.6	17.5	15.0
A	-225	23/16	73.9	15.9	11.9	21.4	25.8	21.7	18.7	17.1
A	-225	26/16	84.7	19.2	13.9	24.6	29.7	26.2	21.4	18.7
A	-225	26/16	73.1	14.1	9.9	20.6	23.9	19.4	16.3	15.8
A	-225	26/16	75.5	18.7	11.8	22.6	28.4	23.3	19.2	17.4
B	-237	48a/18	80.3	19.0	13.1	25.5	28.6	24.9	19.8	17.6
B	-237	41b/19	73.5	15.4	10.6	18.8	23.3	19.9	15.8	14.9
B	-237	48c/19	86.2	17.4	14.7	22.6	31.9	23.9	20.8	18.7
B	-237	26/17	72.0	17.1	11.9	18.3	27.6	22.7	19.8	18.9
B	-237	26/17	75.6	15.5	12.3	20.8	27.2	22.4	20.4	17.7
B	-237	14/18	75.3	15.1	10.3	20.0	23.9	19.2	15.4	14.7
B	-237	14/18	78.0	16.9	12.8	21.4	28.3	22.0	18.2	16.9
B	-237	35/18	77.2	17.4	12.3	21.8	30.2	24.3	19.5	17.8
B	-249	34a/19	69.0	12.8	11.2	22.4	25.4	19.9	17.4	15.1
B	-249	20/18	73.0	15.3	10.9	21.2	27.7	21.7	18.6	16.6
B	-249	26/18	80.7	17.5	12.7	24.7	29.5	23.6	19.8	18.1
B	-249	38/18	67.7	15.5	10.8	18.6	24.6	21.0	18.9	14.4
B	-261	39/18	80.4	17.9	13.5	24.6	30.3	25.0	21.4	19.8
B	-273	40/19	76.0	17.9	11.7	20.2	28.1	23.1	19.3	17.8

continued...

Pril. 17H / Annex 17H (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-285	26/21	75.5	17.6	13.5	22.1	29.4	24.8	20.4	17.8
B	-285	26/21	76.4	17.8	12.6	21.4	27.5	23.2	19.2	17.1
B	-285	13/22	78.8	17.4	12.5	24.6	29.3	23.7	19.6	17.7
B	-285	13/22	77.9	17.9	14.1	21.3	31.6	24.3	22.1	18.5
B	-285	14/22	81.9	19.2	12.8	24.8	32.4	25.6	20.6	18.5
B	-285	17/22	79.3	15.6	12.7	18.8	24.3	22.1	18.3	16.6
B	-285	34/22	78.9	19.0	12.4	20.1	29.3	23.3	19.2	18.4
B	-285	34/22	69.8	14.5	11.5	20.2	24.9	21.0	18.2	16.4
B	-297	28/21	78.8	18.2	11.7	24.2	28.9	24.3	19.2	17.8
B	-297	39/21	65.4	15.6	11.2	19.4	27.2	22.6	18.5	15.7
B	-297	40/21	75.9	16.5	11.9	20.9	27.3	22.1	19.8	16.8
B	-297	20/22	78.3	17.6	13.2	22.7	29.4	23.4	19.1	17.6
B	-297	22/22	75.6	18.5	12.3	22.5	29.2	22.6	19.0	18.2
B	-309	40/22	73.4	16.5	11.9	21.9	29.3	22.9	20.2	17.3
B	-309	22/23	77.2	17.6	12.4	19.0	30.0	23.4	19.2	17.7
B	-309	23/23	80.5	17.4	12.7	26.5	32.2	25.0	21.1	18.2
B	-309	25/23	72.3	17.0	11.6	22.8	25.7	23.1	18.8	16.2
B	-309	37/23	73.5	15.4	12.1	19.5	27.0	23.9	20.3	18.0
B	-321	40/23	84.2	17.5	14.4	20.8	31.8	25.1	21.2	20.5
B	-321	19/24	79.2	17.5	12.3	24.9	28.1	25.1	20.2	18.6
B	-321	37/24	80.5	17.8	13.0	21.8	27.9	23.4	19.1	15.9
B	-333	32/24	72.2	17.5	11.9	23.9	27.9	23.4	19.3	17.8
B	-333	39/24	73.8	18.4	11.7	20.7	29.3	24.0	19.7	18.0
B	-333	39/24	80.3	18.1	13.2	25.0	29.5	24.7	19.9	16.3
B	-333	40/24	79.9	17.6	11.8	22.5	27.9	25.2	18.9	19.0
B	-333	20/25	80.2	16.7	14.1	22.5	29.5	23.9	20.4	17.5
B	-333	25/25	74.7	18.9	12.3	20.7	25.6	23.0	18.4	17.1
B	-333	26/25	69.8	15.4	9.8	19.6	24.8	20.2	16.7	14.9
B	-345	29/25	78.6	17.2	11.2	19.9	30.4	23.3	20.3	16.0
B	-345	31/25	77.0	16.4	11.1	20.5	27.3	21.2	19.2	17.6
B	-345	39/25	80.3	19.4	12.9	22.9	30.4	25.3	21.1	19.5
B	-345	23/26	81.3	17.3	12.5	24.7	31.0	24.5	22.3	17.4
B	-345	25/26	70.1	14.1	10.0	21.9	23.0	21.5	17.9	16.1
B	-345	38/26	82.9	18.2	12.6	20.6	30.4	24.0	21.0	18.7
B	-345	38/26	66.4	15.5	11.7	18.7	27.9	22.1	19.0	17.0
B	-345	16/27	78.2	18.8	12.5	23.1	28.4	24.0	21.1	18.4
B	-345	17/27	75.3	16.5	12.9	17.0	28.0	22.6	19.4	17.5
B	-357	36/27	67.0	15.0	10.9	17.0	25.1	21.1	17.3	16.0
B	-357	37/27	80.4	17.2	13.2	19.0	28.0	24.2	19.7	17.9
B	-357	16/28	75.0	16.6	11.1	21.5	28.7	22.2	18.6	17.0
B	-369	28/27	73.0	16.2	11.1	16.7	25.0	21.8	17.2	16.0
B	-369	29/27	72.1	15.6	10.9	20.6	28.0	21.3	17.5	16.0
B	-369	40/27	82.9	15.6	10.8	19.9	25.8	20.0	17.7	15.8
B	-369	40/27	71.3	15.7	10.7	19.6	23.5	20.5	17.0	14.8
B	-369	13/29	77.3	17.9	12.7	18.5	24.9	21.0	16.8	15.8
B	-369	16/29	79.9	17.1	12.0	21.5	29.3	23.4	19.0	17.3
B	-369	16/29	71.9	15.3	10.3	18.4	25.8	20.3	17.0	14.9
B	-369	16/29	75.0	14.7	11.4	17.5	26.6	20.1	17.3	15.1
B	-381	26/29	69.5	15.1	10.8	16.3	24.6	21.0	18.2	16.3
B	-381	35/30	83.1	18.9	12.7	26.5	33.5	24.3	22.9	19.8
B	-393	25/30	70.4	14.7	9.6	20.3	24.6	21.0	16.5	16.1
B	-393	14/31	68.9	14.8	10.2	18.5	23.6	19.5	15.8	13.5
B	-393	16/31	72.7	13.7	9.9	16.0	25.9	18.4	15.0	13.7
B	-393	17/31	82.4	17.0	11.8	21.9	26.9	23.4	18.2	16.2
B	-393	35/31	79.2	17.4	11.0	20.4	26.8	22.8	19.6	17.2
B	-405	36/31	71.3	16.4	12.0	21.3	26.1	21.5	18.6	16.3
B	-405	35/32	67.1	14.2	10.1	19.1	24.8	19.7	16.1	14.2
B	-417	36/32	80.2	15.6	11.8	19.9	27.2	23.6	18.6	16.1
B	-417	35/33	70.4	15.6	11.4	22.0	25.7	20.8	17.6	16.3
B	-417	25/33	72.3	14.3	10.1	22.0	24.9	20.7	17.5	16.0
B	-429	16/34	77.9	16.7	10.9	20.6	27.1	22.9	18.6	16.7
B	-429	17/34	78.7	17.2	12.8	25.4	29.9	23.6	20.1	18.3
C	-441	13/35	77.3	18.3	11.9	22.4	27.1	24.0	19.1	17.0
C	-441	13/35	79.1	16.6	12.8	22.7	30.9	24.8	20.7	19.0
C	-441	34/35	73.4	17.4	11.7	19.8	25.4	21.2	19.1	16.3
C	-441	34/35	78.2	16.0	12.8	24.0	30.8	23.6	20.1	17.9

continued...

Pril. 17H / Annex 17H (nadaljevanje / cont.)

Facies	Sediment. level	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
C	-453	19/35	71.0	14.7	11.2	18.0	25.4	20.5	18.2	15.8
C	-453	20/35	72.9	16.2	10.8	19.6	27.2	20.6	19.2	16.2
C	-465	20/36	76.2	16.8	11.3	23.9	27.4	21.9	19.7	17.7
C	–	155-157/13	74.1	17.0	12.4	22.8	28.2	22.8	19.9	15.5
C	–	163/13	69.5	13.9	9.8	19.7	23.3	19.2	16.6	14.1
C	–	167/13	69.4	15.0	9.5	19.2	23.0	21.4	17.3	14.9
C	–	169/13	79.6	17.5	12.4	22.6	27.3	23.7	19.3	16.7
C	–	169/13	65.6	14.4	10.1	18.3	22.7	20.9	17.1	14.8
C	–	179/13	77.9	15.4	12.7	22.1	28.0	21.2	17.3	16.5
C	–	180/13	79.4	16.6	11.9	18.1	26.1	20.9	18.0	15.9
C	–	180/13	82.6	16.4	11.7	20.4	26.8	22.2	18.0	16.2
C	–	181/13	78.8	17.8	12.6	22.5	27.2	23.3	19.6	17.0
C	–	181/13	68.0	14.4	10.0	20.9	25.3	20.9	17.8	15.4
C	–	182/13	74.1	17.0	11.7	22.8	28.3	22.6	19.7	17.5
C	–	184/13	73.1	14.5	9.7	23.0	25.6	20.5	18.5	15.8
C	–	189/13	72.9	15.8	12.0	21.0	25.8	21.6	17.8	16.2
C	–	189/13	78.5	16.3	12.3	22.8	27.8	23.1	18.0	16.4
C	–	189/13	83.8	16.8	12.1	24.2	26.4	22.4	18.3	16.3
C	–	190/13	72.1	13.8	10.3	20.5	25.3	18.9	16.0	15.4
C	–	190/13	71.0	15.0	10.5	22.9	22.6	20.6	17.5	15.1
C	–	192/13	68.9	13.7	9.7	22.5	23.8	18.8	16.2	14.8
C	–	192/13	79.2	18.4	13.4	23.2	29.1	26.0	22.1	17.2
C	–	193/13	74.4	15.3	9.6	20.6	24.2	21.3	17.8	15.2
C	–	203/13-14	78.1	16.3	11.5	23.8	27.3	22.0	18.4	15.8
C	–	204/13-14	74.2	15.0	10.9	21.8	25.6	21.7	18.0	16.3
C	–	167/14	72.5	15.0	10.8	18.1	23.9	21.2	17.1	15.1
C	–	168/14	80.1	18.0	12.6	21.2	27.7	23.0	19.4	16.6
C	–	170/14	77.7	16.4	11.0	18.3	26.6	22.9	19.2	16.4
C	–	170/14	71.3	14.5	8.9	20.4	22.9	20.0	16.5	16.7
C	–	173/14	71.8	13.8	8.5	18.3	23.2	19.7	13.9	14.0
C	–	174/14	80.6	16.7	11.9	23.7	27.0	23.0	19.2	16.7
C	–	184/14	69.4	12.5	8.9	20.3	24.7	18.7	16.2	15.3
C	–	187/14	69.6	15.4	9.8	20.1	23.6	21.1	16.5	15.0
C	–	188/14	81.3	17.5	13.6	22.5	32.1	25.2	21.4	18.2
C	–	189/14	81.7	17.2	13.0	22.7	30.4	24.4	20.6	17.9
C	–	189/14	72.8	15.2	10.6	21.4	25.7	21.5	18.1	16.5
C	–	190/14	80.3	17.4	12.3	21.0	28.3	23.7	19.1	16.9
C	–	192/14	77.5	15.9	11.3	20.6	28.9	22.4	18.4	17.6
Σ sample A			x = 78.1 SD = 4.62	x = 17.4 SD = 1.70	x = 12.5 SD = 1.27	x = 22.4 SD = 2.85	x = 29.2 SD = 2.67	x = 23.6 SD = 2.10	x = 19.6 SD = 1.79	x = 17.7 SD = 1.43
Σ sample B			x = 75.9 SD = 4.73	x = 16.7 SD = 1.45	x = 11.9 SD = 1.13	x = 21.1 SD = 2.41	x = 27.7 SD = 2.41	x = 22.6 SD = 1.72	x = 19.0 SD = 1.62	x = 17.0 SD = 1.46
Σ sample C			x = 75.2 SD = 4.53	x = 15.9 SD = 1.41	x = 11.2 SD = 1.31	x = 21.3 SD = 1.84	x = 26.4 SD = 2.37	x = 21.9 SD = 1.73	x = 18.3 SD = 1.58	x = 16.2 SD = 1.11
Σ all samples (A+B+C)			x = 76.3 SD = 4.76	x = 16.7 SD = 1.60	x = 11.9 SD = 1.30	x = 21.5 SD = 2.47	x = 27.8 SD = 2.68	x = 22.7 SD = 1.93	x = 19.0 SD = 1.72	x = 17.0 SD = 1.47

Pril. 17I: Seznam analiziranih četrtih stopalnic s pripadajočimi metričnimi podatki.
Annex 17I: List of analysed fourth metatarsals with relevant metric data.

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
A	-32	48a/2	76.7	14.0	11.8	18.3	23.0	20.0	17.2	15.8
A	-56	38/2	90.7	17.0	14.4	19.6	31.0	25.0	21.8	17.8
A	-68	37/3	89.3	16.2	15.1	24.1	29.9	25.8	23.7	18.8
A	-68	38/3	83.7	16.4	13.3	19.9	33.0	23.1	20.0	16.7
A	-81	32/3	93.6	19.6	14.8	24.1	33.3	25.3	19.3	19.8
A	-81	25/4	80.8	15.9	12.2	22.3	29.4	21.6	19.0	17.6
A	-81	48b/7	90.1	18.0	16.3	22.2	32.3	26.9	23.9	19.6
A	-94	35/6	92.9	16.8	16.1	21.4	31.6	24.3	22.3	18.4
A	-94	48b/8	82.0	15.9	13.7	20.8	29.8	24.6	21.5	18.3
A	-106	35/7	88.1	18.4	14.8	21.0	31.1	26.3	24.7	19.4
A	-106	48c/9	89.1	17.8	15.0	21.5	28.8	23.4	20.0	18.4
A	-106	55b/9	95.0	18.2	14.3	23.0	33.9	26.9	21.8	19.8
A	-117	13/8	86.7	18.3	13.7	23.9	32.2	25.1	22.0	19.2
A	-117	48a/9	88.8	17.0	13.1	21.5	32.3	22.1	18.3	18.1
A	-117	41c/10	92.9	18.8	15.8	23.8	32.0	27.2	23.4	20.7
A	-117	55b/10	76.2	14.6	12.9	18.5	27.4	21.8	19.2	16.2
A	-129	16/9	92.8	18.9	15.0	22.0	31.6	24.5	21.6	19.1
A	-141	36/9	92.0	17.3	13.7	23.5	31.6	25.1	21.8	20.4
A	-141	34/10	87.4	17.7	14.8	20.5	28.2	24.9	22.4	18.1
A	-153	34c/13	89.0	18.9	12.9	23.4	31.5	25.6	22.7	19.8
A	-165	48c/14	83.1	16.4	11.7	20.1	27.0	21.1	18.2	18.2
A	-177	20/12	77.2	14.3	12.1	18.8	23.2	19.1	17.2	16.4
A	-177	16/13	90.5	17.1	15.1	22.3	30.1	26.0	23.3	19.3
A	-177	41b/15	86.0	17.6	15.4	24.4	31.2	27.8	24.5	20.1
A	-213	28/14	88.4	17.1	13.6	21.9	29.7	25.8	22.8	18.8
A	-213	29/14	88.5	17.1	15.0	18.5	24.0	23.1	19.6	17.5
A	-213	32/14	90.1	17.1	13.8	20.7	28.4	24.2	19.4	18.5
A	-213	38/15	84.7	16.8	12.4	20.7	24.1	22.1	18.5	17.6
A	-213	35/16	75.4	16.4	12.1	19.1	27.2	22.8	18.9	16.0
A	-225	32/15	83.0	14.3	13.5	21.0	26.6	22.7	20.5	17.7
A	-225	39/15	78.1	14.4	12.7	21.2	27.6	19.7	17.1	16.2
A	-225	19/16	90.8	17.7	13.5	22.6	31.5	24.7	21.9	18.8
A	-225	22/16	78.7	14.2	13.1	17.9	26.1	22.0	19.2	17.2
B	-237	41a/18	80.3	16.8	12.3	20.1	25.8	22.8	20.2	16.9
B	-237	41b/19	91.8	18.0	13.7	23.9	31.4	25.5	22.4	19.4
B	-237	25/17	85.8	16.9	12.2	23.3	27.9	23.7	21.5	16.8
B	-237	25/17	89.6	19.9	14.6	22.9	27.4	25.3	21.8	18.1
B	-237	26/17	90.3	16.5	14.8	21.0	30.0	23.3	21.2	18.0
B	-237	26/17	93.5	18.1	13.3	23.0	27.7	24.7	20.4	18.1
B	-249	23/18	81.3	17.7	13.8	21.1	26.4	23.6	19.3	17.9
B	-249	36/18	89.5	17.6	13.8	26.0	30.5	24.2	23.4	19.9
B	-249	13/19	80.2	18.1	12.9	21.0	24.5	24.0	20.2	16.7
B	-261	55a/20	77.8	14.2	11.8	19.1	25.0	20.6	15.7	15.9
B	-261	34b/21	87.7	18.5	13.4	22.8	27.5	23.3	19.1	17.8
B	-261	28/18	90.1	17.7	14.9	22.4	31.3	24.4	21.7	17.5
B	-261	32/18	90.1	18.0	14.6	21.9	31.1	26.4	23.6	19.4
B	-261	20/19	73.0	14.7	12.4	18.8	23.6	21.4	16.7	15.2
B	-261	20/19	92.6	18.5	14.5	23.9	30.1	26.2	21.8	18.2
B	-261	36/19	87.8	17.8	14.2	22.4	30.3	25.4	22.6	19.8
B	-273	19/20	84.3	17.0	14.0	22.9	29.4	23.6	22.5	18.8
B	-273	17/21	86.8	17.6	12.9	21.4	31.1	25.2	22.1	18.3
B	-285	32/20	83.3	19.4	13.3	24.7	25.2	23.2	17.7	17.1
B	-285	39/20	94.3	19.0	16.4	22.4	34.0	27.4	24.8	21.0
B	-285	39/20	83.5	17.3	14.6	20.9	29.0	25.3	21.2	17.4
B	-285	19/21	89.4	17.8	13.4	21.6	30.2	25.9	21.8	18.8
B	-285	34/22	79.8	16.0	13.0	20.9	28.3	23.4	19.0	17.6
B	-297	39/21	78.2	16.2	11.9	21.2	25.9	22.5	18.8	17.1
B	-309	28/22	81.7	18.9	13.2	24.3	31.1	24.6	20.5	19.5
B	-309	20/23	83.0	15.7	12.0	19.5	27.5	22.8	19.9	17.7
B	-309	26/23	83.2	18.1	13.5	21.2	28.7	24.7	21.4	18.2
B	-309	37/23	86.9	19.4	13.5	23.0	32.6	26.7	23.7	20.4
B	-309	34/24	90.5	18.1	15.5	23.3	32.2	26.2	21.7	20.1
B	-321	40/23	84.7	16.7	13.0	22.0	29.4	23.2	20.1	18.5
B	-321	40/23	83.1	15.4	12.1	18.3	27.9	21.7	18.0	17.6
B	-321	37/24	86.0	16.2	13.5	21.4	32.4	25.9	23.0	19.7
B	-321	37/24	94.9	18.9	13.7	21.3	30.6	24.0	19.2	18.7

continued...

Pril. 17I / Annex 17I (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-321	14/25	87.2	18.0	14.7	24.0	29.5	26.3	22.1	19.7
B	-333	19/25	85.5	17.1	13.7	22.9	33.2	25.5	20.1	19.9
B	-333	23/25	87.6	18.1	13.1	23.8	28.6	24.0	22.2	18.5
B	-333	25/25	75.3	14.8	11.9	18.8	27.1	22.9	20.0	17.4
B	-333	26/25	75.9	14.0	11.5	18.0	26.7	21.4	18.7	16.2
B	-333	26/25	91.0	19.6	13.8	25.1	32.8	27.5	23.2	21.4
B	-345	40/25	80.1	15.4	12.4	20.0	26.8	21.1	17.6	16.5
B	-345	40/25	78.2	15.5	13.0	19.2	25.7	22.5	20.1	16.2
B	-345	38/26	79.8	14.9	10.9	17.5	26.7	20.2	18.9	16.5
B	-357	39/26	76.5	13.2	11.6	16.5	24.8	19.1	16.1	15.0
B	-357	40/26	85.8	17.4	12.9	21.8	31.0	25.5	22.5	17.0
B	-369	19/28	79.2	14.6	11.7	20.8	27.8	21.8	19.6	17.6
B	-369	22/28	75.3	15.1	10.5	17.6	23.3	19.2	16.2	14.8
B	-369	25/28	86.5	16.8	15.0	21.3	28.7	26.4	22.0	17.9
B	-369	17/29	80.6	14.8	10.9	19.6	25.9	20.2	17.0	15.7
B	-381	20/29	87.2	17.0	13.3	22.2	31.6	24.9	23.0	19.5
B	-381	22/29	75.9	14.1	11.7	19.2	27.9	20.5	18.6	16.4
B	-381	14/30	80.3	15.5	11.2	19.4	26.6	23.3	20.5	17.1
B	-381	35/30	75.3	13.5	11.2	19.5	24.5	21.0	17.6	16.4
B	-393	17/31	79.7	15.0	11.9	16.8	26.6	21.2	18.2	16.5
B	-393	17/31	76.1	13.3	11.1	18.5	23.5	20.4	15.7	15.2
B	-405	36/31	76.9	13.8	11.0	18.5	25.0	21.0	16.9	14.5
B	-405	16/32	71.7	13.7	10.7	17.1	22.9	17.1	13.7	14.5
B	-405	35/32	80.9	13.8	12.6	19.7	26.0	21.3	18.4	16.2
B	-417	37/32	96.0	19.0	13.5	24.6	32.9	23.7	21.2	20.5
B	-417	29/31	84.9	18.2	14.4	21.1	30.3	25.8	22.7	18.4
B	-417	13/33	87.5	16.9	15.2	23.6	32.3	26.2	23.1	20.7
B	-429	35/34	74.9	15.6	11.8	18.6	25.6	21.7	18.2	16.5
C	-441	20/34	79.0	14.9	13.3	17.6	23.4	21.6	20.8	16.8
C	-441	22/34	84.2	17.3	12.3	22.2	26.4	23.2	20.0	17.9
C	-441	34/35	82.3	15.6	12.6	20.6	26.5	23.5	20.1	17.9
C	-453	14/36	78.2	15.0	10.9	19.3	24.3	22.3	19.2	16.6
C	-453	16/36	98.5	18.9	14.1	24.2	30.1	27.3	22.2	18.8
C	–	163/13	89.1	16.0	13.3	22.5	24.2	23.5	19.8	16.7
C	–	164/13	78.2	14.6	10.8	23.2	23.5	20.8	19.1	16.7
C	–	165/13	87.5	16.2	12.3	24.0	25.7	23.3	20.3	17.4
C	–	168/13	78.0	14.2	11.2	25.3	22.9	19.0	17.8	15.6
C	–	171/13	76.0	14.3	11.0	25.5	23.0	20.9	19.4	16.7
C	–	175/13	88.1	17.7	13.2	22.7	27.5	26.6	22.9	18.3
C	–	179/13	81.7	16.0	13.4	23.3	26.9	23.3	20.3	17.6
C	–	180/13	76.6	14.3	10.5	21.2	21.1	19.6	17.5	15.3
C	–	180/13	73.8	14.7	11.6	23.1	21.8	20.4	15.7	14.5
C	–	182/13	75.9	14.5	10.1	22.6	23.1	21.2	17.6	15.8
C	–	189/13	77.5	14.3	10.7	18.4	21.9	19.6	16.3	14.4
C	–	189/13	78.4	15.6	10.8	26.1	24.6	21.5	19.9	17.5
C	–	203/13-14	88.9	16.7	15.3	22.9	32.3	26.1	23.6	19.6
C	–	204/13-14	99.8	18.2	13.5	26.9	30.0	26.7	24.3	20.6
C	–	204/13-14	81.6	18.9	13.0	23.4	27.6	25.2	22.1	18.3
C	–	167/14	89.9	18.3	12.3	24.3	30.8	25.8	20.7	18.1
C	–	168/14	79.0	15.2	11.5	19.8	21.7	19.7	14.9	13.9
C	–	170/14	87.8	16.5	11.9	25.5	27.8	24.4	20.6	16.9
C	–	171/14	86.2	17.2	13.6	23.8	27.4	24.9	22.1	18.6
C	–	174/14	76.0	15.6	9.7	21.1	22.6	21.5	18.7	16.6
C	–	179/14	78.3	16.0	9.7	25.9	22.4	22.1	18.9	16.3
C	–	181/14	77.6	14.2	10.7	21.7	25.4	21.4	19.2	16.7
C	–	187/14	81.2	17.7	12.2	26.3	28.3	24.1	20.5	17.2
C	–	189/14	92.2	18.9	14.0	28.7	29.5	26.5	23.1	19.8
C	–	191/14	90.8	18.4	13.2	29.2	27.9	26.6	23.5	19.9
C	–	191/14	76.9	15.2	11.5	19.3	23.7	22.0	20.4	16.3
C	–	192/14	83.7	15.7	11.7	21.6	25.3	23.2	20.7	16.7
C	–	192/14	96.7	18.0	14.0	31.6	28.5	24.6	20.9	18.2
Σ sample A			x = 86.4 SD = 5.65	x = 16.8 SD = 1.51	x = 13.9 SD = 1.28	x = 21.3 SD = 1.86	x = 29.4 SD = 3.00	x = 24.0 SD = 2.24	x = 20.8 SD = 2.21	x = 18.3 SD = 1.33
Σ sample B			x = 83.7 SD = 5.99	x = 16.6 SD = 1.82	x = 13.0 SD = 1.34	x = 21.1 SD = 2.26	x = 28.4 SD = 2.85	x = 23.5 SD = 2.29	x = 20.2 SD = 2.40	x = 17.8 SD = 1.69
Σ sample C			x = 83.3 SD = 7.02	x = 16.2 SD = 1.57	x = 12.1 SD = 1.41	x = 23.4 SD = 3.11	x = 25.7 SD = 2.99	x = 23.1 SD = 2.39	x = 20.1 SD = 2.23	x = 17.2 SD = 1.57
Σ all samples (A+B+C)			x = 84.3 SD = 6.27	x = 16.6 SD = 1.68	x = 13.0 SD = 1.48	x = 21.8 SD = 2.60	x = 27.9 SD = 2.23	x = 23.5 SD = 2.31	x = 20.3 SD = 2.31	x = 17.8 SD = 1.61

Pril. 17J: Seznam analiziranih petih stopalnic s pripadajočimi metričnimi podatki.
Annex 17J: List of analysed fifth metatarsals with relevant metric data.

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
A	-44	36/1	83.1	14.2	13.3	26.4	33.3	26.9	23.8	19.4
A	-56	48a/4	82.8	13.3	13.2	25.7	31.7	23.3	21.5	16.4
A	-68	38/3	93.6	16.5	14.3	31.1	33.9	26.2	23.7	20.7
A	-68	17/4	78.9	12.1	12.1	25.6	28.7	20.8	19.8	16.7
A	-68	35/4	90.7	15.1	14.5	26.0	32.7	24.4	19.4	18.4
A	-68	41a/5	94.7	14.1	14.0	26.9	30.0	25.9	21.4	20.5
A	-68	–	92.91	15.6	15.3	32.3	35.8	24.8	23.3	19.6
A	-68	48c/6	79.3	12.4	11.6	27.1	26.6	23.9	20.6	16.8
A	-81	41a/6	85.8	13.2	11.7	24.7	28.6	23.0	20.3	17.4
A	-81	48b/7	87.7	15.4	14.1	30.5	32.3	27.1	23.2	18.6
A	-81	48c/7	97.1	16.1	14.2	32.5	37.6	28.0	24.8	20.3
A	-94	39/4	80.4	12.1	10.8	23.5	26.4	22.0	19.7	16.2
A	-94	41a/7	87.3	15.2	12.7	31.6	31.9	23.2	21.6	18.5
A	-117	48b/10	89.1	15.2	15.0	30.0	34.2	26.9	22.9	18.6
A	-129	16/9	87.7	14.5	14.0	28.9	31.6	22.9	22.7	20.0
A	-129	41c/11	89.4	16.0	13.3	30.8	32.2	28.3	24.5	19.5
A	-129	41c/11	88.2	16.6	15.7	35.5	34.7	30.3	27.7	20.6
A	-129	48b/11	85.0	14.2	13.3	26.0	34.0	21.1	19.7	17.4
A	-141	17/10	80.6	13.9	12.0	22.2	22.6	22.1	21.0	18.1
A	-141	35/10	97.7	17.4	13.3	34.0	36.9	26.1	24.5	20.7
A	-141	35/10	88.0	15.5	14.8	30.0	29.7	25.4	24.3	18.4
A	-141	48b/12	90.8	15.4	13.9	33.1	34.6	27.3	24.8	18.2
A	-141	55b/12	92.6	16.2	14.8	26.7	34.5	24.1	22.9	17.7
A	-153	26/10	83.6	15.5	16.1	27.6	29.3	28.2	25.9	17.9
A	-153	48a/12	86.1	16.2	14.1	30.4	32.7	25.2	24.1	17.4
A	-153	34b/13	88.9	15.3	13.6	33.7	35.4	23.7	23.2	20.5
A	-165	28/10	85.2	15.6	12.5	25.9	29.3	24.4	20.8	17.7
A	-201	29/13	84.5	14.5	13.0	29.6	32.1	24.7	24.0	17.4
A	-201	40/13	86.2	15.2	13.8	30.3	32.1	25.0	23.2	18.5
A	-213	28/14	95.4	14.2	12.7	29.9	33.8	25.7	23.9	18.3
A	-213	36/15	97.3	15.3	14.8	33.5	37.5	28.1	26.7	19.4
A	-213	37/15	77.7	13.2	11.4	23.9	27.6	21.5	20.2	16.7
A	-225	40/15	77.0	12.6	10.4	17.8	22.6	18.6	17.4	15.7
A	-225	26/16	80.5	12.3	12.8	26.4	25.0	21.6	18.9	15.9
A	-225	13/17	97.5	17.2	14.5	34.8	35.2	27.9	27.5	20.3
B	-237	26/17	90.7	17.3	15.2	29.5	32.1	28.6	25.5	19.0
B	-249	55c/20	88.4	15.4	13.1	30.1	32.6	25.3	23.1	17.6
B	-249	29/17	87.0	15.6	12.5	26.6	27.8	24.6	20.5	17.3
B	-249	32/17	98.4	14.2	14.3	30.7	34.4	24.5	24.6	18.4
B	-249	40/17	95.5	16.4	15.5	33.6	34.7	27.4	24.2	19.2
B	-249	36/18	80.0	14.4	11.2	27.0	28.9	22.0	21.9	15.8
B	-249	35/19	90.3	16.7	15.6	33.6	36.1	26.1	23.4	18.9
B	-261	55a/20	82.6	14.1	12.3	25.7	33.7	23.1	21.4	17.2
B	-261	25/19	86.6	14.1	13.5	30.5	30.1	25.1	21.3	18.6
B	-261	38/19	90.7	17.3	14.8	32.0	33.7	26.1	23.5	18.5
B	-273	28/19	79.2	16.6	14.7	30.1	32.4	25.1	24.5	18.2
B	-273	31/19	82.8	17.2	14.3	31.4	33.2	27.4	26.4	18.5
B	-273	31/19	76.8	13.1	11.4	23.6	27.0	21.6	19.3	16.6
B	-273	14/21	86.7	17.7	12.9	32.6	31.8	28.8	24.3	17.4
B	-273	17/21	81.3	14.9	11.7	25.9	23.6	25.8	22.2	17.8
B	-285	23/21	91.3	15.8	14.6	32.7	34.5	26.7	25.1	19.2
B	-285	25/21	96.7	14.9	16.4	36.1	34.0	28.9	27.3	20.6
B	-297	32/21	88.9	14.8	13.6	29.9	33.9	25.7	23.4	18.0
B	-297	32/21	93.1	16.9	15.2	31.6	31.5	27.4	24.6	19.0
B	-309	29/22	84.2	15.5	13.8	32.7	35.3	26.8	25.6	18.4
B	-321	40/23	85.3	13.8	12.0	25.5	28.0	21.8	21.0	17.3
B	-321	40/23	87.7	15.8	14.3	33.2	34.6	27.1	23.9	18.4
B	-321	23/24	80.4	13.5	11.1	25.4	26.6	23.8	21.6	15.3
B	-321	25/24	81.8	13.5	12.3	26.3	31.1	23.1	20.9	17.8
B	-333	35/25	91.8	14.6	15.4	31.5	34.3	25.8	24.2	17.1
B	-333	29/24	79.8	13.7	12.0	29.3	27.3	24.5	23.0	16.8
B	-333	32/24	78.3	13.5	12.8	25.9	26.8	22.2	22.6	16.7
B	-333	39/24	82.2	15.3	12.9	30.4	27.3	24.5	20.4	17.0
B	-333	19/25	80.3	12.9	12.0	21.8	26.0	19.6	16.8	15.4
B	-333	26/25	90.3	16.4	15.5	34.4	33.9	27.5	23.6	20.3
B	-333	26/25	87.3	12.9	11.6	28.6	32.8	24.5	23.2	17.3

continued...

Pril. 17J / Annex 17J (nadaljevanje / cont.)

Facies	Sediment. level (cm)	Square / cut	gL	sDB	sDH	pB	pH	gdB	dB	dH
B	-333	26/25	87.3	14.5	12.5	30.0	30.8	26.5	24.4	17.8
B	-333	26/25	84.8	14.6	12.9	30.6	30.3	25.5	21.9	17.7
B	-333	36/25	75.6	13.5	12.2	24.1	26.3	22.3	21.4	16.5
B	-345	32/25	94.3	16.6	16.3	35.1	35.7	28.2	27.8	19.1
B	-345	39/25	90.1	14.3	13.6	29.6	34.7	27.4	23.0	18.7
B	-345	40/25	78.0	13.8	12.6	26.0	27.6	22.8	21.6	17.6
B	-345	14/27	89.5	14.3	14.3	31.0	32.8	23.6	22.1	17.6
B	-345	17/27	78.1	12.0	10.7	26.3	28.6	21.4	18.7	16.0
B	-345	35/27	90.9	15.3	14.2	30.5	34.5	28.1	26.5	20.2
B	-357	39/26	81.2	13.6	11.8	24.2	29.7	23.2	21.0	16.7
B	-357	40/26	85.1	14.6	14.7	28.0	30.6	23.8	22.9	17.3
B	-357	40/26	81.8	14.7	11.8	29.9	33.6	23.2	23.6	16.3
B	-357	40/26	78.4	13.0	11.2	25.5	27.7	23.2	23.4	16.9
B	-357	37/27	89.2	13.6	13.4	31.9	32.4	25.8	23.0	19.0
B	-357	13/28	74.6	12.0	11.7	25.0	26.0	21.7	18.9	15.8
B	-357	13/28	86.6	15.5	14.8	33.1	35.0	25.7	24.7	18.1
B	-357	13/28	83.6	14.2	12.7	30.2	29.4	28.0	23.5	18.9
B	-369	40/27	92.0	14.4	15.0	31.0	32.0	27.4	23.8	18.2
B	-369	36/28	88.8	17.4	15.7	34.1	35.7	28.5	25.3	19.0
B	-369	37/28	80.8	12.9	12.4	24.9	24.8	22.5	20.5	16.4
B	-369	13/29	84.6	14.5	13.4	31.4	32.5	23.8	20.8	17.1
B	-369	17/29	87.9	17.3	13.1	24.7	31.3	25.8	21.7	18.0
B	-381	32/28	83.7	13.7	14.2	28.0	28.3	25.4	22.3	17.6
B	-381	13/30	75.1	12.4	11.0	25.1	28.8	22.7	19.3	16.4
B	-381	14/30	81.8	12.8	10.5	26.3	27.3	23.2	21.1	16.7
B	-381	14/30	80.9	13.2	10.6	24.5	26.4	21.5	19.4	16.1
B	-393	39/29	74.5	13.5	13.5	24.0	28.1	21.5	19.3	15.9
B	-393	20/30	75.5	12.0	12.4	24.4	26.2	22.7	21.8	17.0
B	-393	13/31	79.1	13.5	11.9	25.7	28.0	22.0	18.6	15.8
B	-405	17/32	91.9	16.3	15.8	29.2	33.7	25.5	23.8	18.1
B	-405	35/32	76.7	13.4	12.1	21.7	25.7	22.3	20.0	16.1
B	-417	36/32	78.3	12.5	11.0	25.7	26.7	22.0	20.3	15.1
B	-417	13/33	81.2	12.2	13.2	25.6	26.1	23.0	21.4	17.2
B	-417	17/33	88.5	14.9	14.8	29.8	32.8	26.2	25.0	18.3
B	-429	22/33	81.2	13.7	12.4	23.9	29.8	24.5	21.7	16.3
B	-429	22/33	86.1	13.4	13.0	26.1	30.1	23.8	21.2	17.2
B	-429	22/33	79.5	12.9	11.4	26.2	27.5	22.9	19.4	16.5
B	-429	37/33	73.4	14.1	12.3	24.6	27.9	24.2	21.1	16.1
B	-429	14/34	94.6	17.4	15.8	30.7	33.6	26.4	25.6	18.7
B	-429	35/34	91.7	16.5	15.5	32.1	36.0	28.3	28.1	18.1
C	-441	19/34	90.0	14.3	14.4	31.5	33.5	27.7	23.1	18.6
C	-441	20/34	78.9	13.4	11.8	25.9	29.9	23.8	21.7	16.5
C	-441	23/34	85.3	13.2	12.7	30.6	28.6	25.7	23.8	17.4
C	-453	20/35	90.2	14.4	13.3	29.1	33.4	25.4	23.0	17.4
C	–	163/13	90.2	15.8	15.0	33.1	34.6	28.7	26.3	19.0
C	–	163/13	91.8	17.0	15.0	34.6	36.0	27.2	23.8	17.7
C	–	164/13	81.9	13.1	10.8	24.6	28.1	20.9	19.9	16.5
C	–	165/13	79.5	14.8	11.2	21.3	25.8	21.0	18.2	15.8
C	–	169/13	88.4	14.9	14.4	30.5	31.9	25.4	22.0	16.9
C	–	180/13	76.2	12.9	10.1	26.1	27.0	22.0	20.4	16.3
C	–	184/13	79.0	11.7	10.9	25.4	26.5	23.4	22.1	17.0
C	–	184a/13	86.5	13.3	12.1	27.0	30.2	23.9	22.0	17.3
C	–	190/13	73.8	13.2	10.6	20.6	26.2	21.1	17.6	14.8
C	–	203/13-14	85.6	15.0	14.4	31.9	32.7	26.5	24.5	17.7
C	–	170/14	75.3	13.1	11.9	28.1	28.1	22.6	22.5	17.0
C	–	173/14	80.2	12.5	11.3	19.9	27.9	20.0	17.3	15.6
C	–	179/14	82.6	14.1	14.0	29.5	33.0	24.6	21.3	17.2
C	–	184a/14	87.3	17.1	13.7	29.7	32.2	24.9	19.7	18.5
C	–	187/14	88.1	16.2	13.6	31.7	30.8	25.6	24.9	18.4
C	–	188/14	80.2	14.1	12.1	26.0	27.9	23.7	22.3	15.9
C	–	188/14	95.2	14.9	14.2	31.4	35.2	26.1	24.3	18.8
Σ sample A			x = 87.5 SD = 5.96	x = 14.8 SD = 1.45	x = 13.5 SD = 1.35	x = 28.7 SD = 3.94	x = 31.6 SD = 3.86	x = 24.8 SD = 2.60	x = 22.7 SD = 2.47	x = 18.4 SD = 1.48
Σ sample B			x = 84.7 SD = 6.02	x = 14.6 SD = 1.54	x = 13.2 SD = 1.57	x = 28.6 SD = 3.48	x = 30.6 SD = 3.34	x = 24.7 SD = 2.26	x = 22.6 SD = 2.33	x = 17.5 SD = 1.22
Σ sample C			x = 84.1 SD = 5.93	x = 14.2 SD = 1.44	x = 12.7 SD = 1.58	x = 28.0 SD = 4.11	x = 30.4 SD = 3.17	x = 24.3 SD = 2.40	x = 21.9 SD = 2.41	x = 17.1 SD = 1.13
Σ all samples (A+B+C)			x = 85.4 SD = 6.09	x = 14.6 SD = 1.50	x = 13.2 SD = 1.52	x = 28.5 SD = 3.70	x = 30.9 SD = 3.47	x = 24.7 SD = 2.37	x = 22.5 SD = 2.38	x = 17.7 SD = 1.35