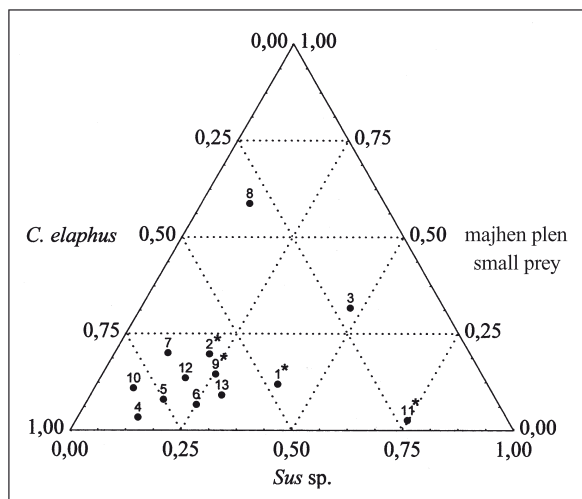## 16.5 ALOPATRIC COMPARISON

Sl. 16.9: Deleži (% NISP) ostankov jelena (*Cervus elaphus*), prašiča (*Sus* sp.) in majhnega plena (tj. *Lepus*, *Mustela*, *Martes*, *Meles*, *Lutra*, *Felis*, *Lynx* in *Vulpes*) v paleontoloških vzorcih iz različnih najdišč Krasa in sosednjih regij. Zvezdica (*) označuje najdišča, kjer je bil material pred pregledovanjem spran. Identifikacija simbolov: 1 – Viktorjev spodmol (režnji 10–19), 2 – Pupićina peć pod Učko (N=5.177; Miracle 1997), 3 – Pod Črmukljo pri Šembijah (N=30; Pohar 1986), 4 – Breg-Škofljica pri Ljubljani (N=107; Pohar 1984), 5 – Mala Triglavca pri Divači (N=370; Pohar 1990), 6 – Šebrn Abri pod Učko (N= 521; Miracle *et al.* 2000), 7 – Želvina jama pri Briščikih – *Grotta della tartaruga* (N=130; Cremonesi 1984), 8 – *Grotta Lonza* (N=130; Meluzzi *et al.* 1984), 9 – Pečina na Leskovcu pri Samatorci – *Grotta azzurra* (N=222; Cremonesi *et al.* 1984), 10 – Jama na Sedlu pri Šempolaju – *Grotta Benussi* (N=671; Riedel 1975), 11 – Pečina pri Bjarču v dolini Nadiže – *Riparo di Biarzo* (N=972; Rowley-Conwy 1996), 12 – Šentašca pri Praproti – *Grotta dell'Edera* (N=142; Boschin in Riedel 2000) ter 13 – Riparo Gaban pri Trentu (N=461; Kozłowski in Dalmeri 2002).

Fig. 16.9: Shares (% NISP) of remains of red deer (*Cervus elaphus*), boar (*Sus* sp.) and small game (i.e., *Lepus*, *Mustela*, *Martes*, *Meles*, *Lutra*, *Felis*, *Lynx* and *Vulpes*) in palaeontological samples from various sites on the Kras and neighbouring regions. An asterisk (*) marks a site where the material was sieved before examination. Identification of symbols: 1 – Viktorjev spodmol (spits 10–19), 2 – Pupićina peć below Učka (N=5.177; Miracle 1997), 3 – Pod Črmukljo by Šembije (N=30; Pohar 1986), 4 – Breg–Škofljica by Ljubljana (N=107; Pohar 1984), 5 – Mala Triglavca by Divača (N=370; Pohar 1990), 6 – Šebrn Abri below Učka (N= 521; Miracle *et al.* 2000), 7 – Želvina jama by Briščiki – *Grotta della tartaruga* (N=130; Cremonesi 1984), 8 – *Grotta Lonza* (N=130; Meluzzi *et al.* 1984), 9 – Pečina na Leskovcu by Samatorca – *Grotta azzurra* (N=222; Cremonesi *et al.* 1984), 10 – Jama na Sedlu by Šempolaj – *Grotta Benussi* (N=671; Riedel 1975), 11 – Pečina pri Bjarču in the valley of the Nadiža – *Riparo di Biarzo* (N=972; Rowley-Conway 1996), 12 – Šentašca by Praprot – *Grotta dell'Edera* (N=142; Boschin and Riedel 2000) and 13 – Riparo Gaban by Trento (N=461; Kozłowski and Dalmeri 2002).

The temporal determination of finds from the upper seven spits of Viktorjev spodmol (IzA phase) is fairly loose. We must be aware in this that essential differences exist between different time periods of prehistory, in, e.g., the importance of breeding livestock, their level of development, the (non)exploitation of various secondary products, and not least, also in the role of hunting itself (e.g., Bökönyi 1974). All this is, of course, reflected in the specificity of archaeozoological samples of different periods, which are not therefore completely comparable. Because of this, in this contribution we have limited ourselves in the presentation of a comparison of our findings with those from a number of other contemporary sites in the region exclusively to the temporally satisfactorily placed Mesolithic sample (IzA phase). We are far from thus avoiding all the difficulties. Above all, mention must be made of the problem of different methods and techniques of excavation and sampling used at individual sites. This is potentially a very disruptive factor, which could have an essential impact on the final conclusions (e.g., Payne 1972b). Because of the aforementioned, we also did not state the number of remains of each individual species individually. Instead of this, we preferred to compare the share of red deer and (wild) boar, together with roe deer the then two main hunted animals, with the share of all so-called small game together (*Lepus*, *Mustela*, *Martes*, *Meles*, *Lutra*, *Felis*, *Lynx* and *Vulpes*).

It appeared that the majority of the sites form a uniform group (Fig. 16.9). The Mesolithic sample from Viktorjev spodmol also does not essentially differ. It is true that in our case the share of remains of the genus *Sus* is slightly higher than elsewhere, but this could also be a result of overestimation because of the way of quantifying the finds. Among the group of 50 excavated remains of wild boar, some 32 percent of all finds were teeth (with red deer only 6.8%). The same applies to phalanges, of which we counted 17 (34 %; Table 16.2). Since we expressed the number of remains of individual taxa with the number of identified specimens (NISP), we did not attempt to assess to how many animals the excavated skeletal elements could belong (*cf.* Grayson 1984). Certainly such a large share of boar teeth among all the excavated finds of this species allows the possibility that these actually belonged to a relatively small number of animals.

16.6 INSTEAD OF A CONCLUSION

We already mentioned that the relatively modest number of available finds from Viktorjev spodmol put in question many of the theses and interpretations

Časovna opredelitev najdb iz zgornjih sedmih režnjev Viktorjevega spodmola (faza IzA) je dokaj ohlapna. Pri tem se moramo zavedati, da obstajajo med različnimi časovnimi obdobji prazgodovine bistvene razlike v npr. pomenu živinoreje, njeni razvojni stopnji, (ne)izkoriščanju različnih sekundarnih produktov in ne nazadnje tudi v sami vlogi lova (npr. Bökönyi 1974). Vse to seveda odseva v specifičnosti arheozooloških vzorcev različnih obdobij, ki zato niso povsem primerljivi. Zaradi tega smo v tem prispevku predstavljeno primerjavo naših ugotovitev s tistimi iz več drugih sočasnih najdišč v regiji omejili izključno na časovno zadovoljivo umeščen mezolitski vzorec (faza IzA). S tem pa še zdaleč nismo zaobšli vseh težav. Predvsem moramo omeniti problematiko različnih metod in tehnik izkopavanj ter vzorčenj, ki so bile uporabljene na posameznih najdiščih. Gre namreč za potencialno zelo moteč dejavnik, ki lahko bistveno vpliva na končne sklepe (npr. Payne 1972b). Zaradi navedenega tudi nismo navajali številčnosti ostankov vsake posamezne vrste posebej. Namesto tega smo delež jelena in (divjega) prašiča, ob srni takratnih dveh poglavitnih lovnih živalih, raje primerjali z deležem vsega t. i. majhnega plena skupaj (*Lepus*, *Mustela*, *Martes*, *Meles*, *Lutra*, *Felis*, *Lynx* in *Vulpes*).

Izkazalo se je, da večji del najdišč oblikuje enotno skupino (sl. 16.9). Od nje se bistveno ne razlikuje niti mezolitski vzorec iz Viktorjevega spodmola. Res je sicer, da je v našem primeru delež ostankov rodu *Sus* nekoliko višji kot drugje, vendar bi to lahko bila tudi posledica precenjenosti zaradi načina kvantifikacije najdb. Med skupno 50 izkopanimi ostanki divjega prašiča je bilo namreč kar 32 odstotkov vseh najdb zob (pri jelenu le 6,8 %). Podobno velja za prstnice, ki smo jih našteli 17 (34 %; razpredelnica 16.2). Ker smo številčnost ostankov posameznih taksonov izrazili s številom določenih primerkov (NISP), nismo poskusili oceniti, kolikim živalim bi izkopani skeletni elementi lahko pripadali (glej Grayson 1984). Vsekakor pa tako velik delež prašičjih zob med vsemi izkopanimi najdbami omenjene vrste dopušča možnost, da so ti dejansko pripadali razmeroma majhnemu številu živali.

16.6 NAMESTO SKLEPA

Omenili smo že, da razmeroma skromno število razpoložljivih najdb iz Viktorjevega spodmola postavlja pod vprašaj mnoge zgoraj predstavljene teze in interpretacije. Dodatno težavo predstavlja dejstvo, da je bil material zbran v treh zaporednih fazah izkopavanj, ki so se razlikovale po uporabljenih tehnikah in metodah. Njihova neprimerljivost je namreč pozneje onemogočala oblikovanje enotnega (in s tem večjega) vzorca. Smo pa po drugi strani prav zaradi takega načina izkopavanj lahko natančno analizirali prednosti in slabosti posamezne uporabljene metod, s tem pa tudi opozorili na nekatere pasti, ki se jih v naših krogih včasih premalo zavedamo.

presented above. There was the additional difficulty that the material was collected in three successive phases of excavations, using different techniques and methods. The fact that they could not be compared meant that we were prevented from creating a uniform (and thus larger) sample. On the other hand, precisely because of such a method of excavation, we could analyse the advantages and weaknesses of individual methods used, so that we could also draw attention to some traps of which we are sometimes too little aware in our circles.

There is no doubt that the simultaneous collection of bones and teeth during the excavation itself is not a suitable method for collecting the remains of small mammals. Very similar applies for the sampling of macrofauna, since only wet sieving of the sediments enables (although does not also guarantee!) the creation of a representative sample. In order to demonstrate this statement, below we will present some comparisons between samples obtained by classical excavations (i.e., Viktor phase) and those obtained by re-examination of sediment already examined during the Viktor phase, but this time previously wet sieved (Viktor and IzA phase).

Perhaps the clearest advantage of sieving is that we obtain a larger number of finds, and thus of course increase the informative value of the sample itself. In addition, it should not be overlooked that wet sieving essentially changes the ratio between the shares of skeletal elements of individual species (Table 16.10; Fig. 16.10). Thus the classical way of collecting the remains from sediments enables obtaining a larger share of long bones of large mammals (e.g., red deer, bison, pig) and lower and upper jaws, while all other skeletal elements were clearly underestimated. Re-examination of excavated sediments by a professionally more proficient examiner contributed to a partial completing of the sample, in the main by the addition of isolated teeth and a small number of phalanges, carpal and tarsal bones, mainly of larger animals. Only with wet sieving and examination of the material under a dissecting microscope was it possible to collect from the sediment the majority of remains of smaller animals (*Lepus*, *Mustela*, *Martes*, *Meles*, *Lutra*, *Felis*, *Lynx* and *Vulpes*) and the remaining phalanges, and carpal and tarsal bones. It is therefore clear that without sieving we cannot avoid underestimating the number of smaller skeletal elements in relation to the larger.

Classical excavation and sampling of material without sieving thus normally also leads to an underestimation of the share of bones and teeth of smaller animals in relation to larger ones. The extent of the error depends on which method of quantification of remains we choose; from this point of view, NISP is undoubtedly the least suitable. However, even the use of indices, such as the smallest number of animals (MNI) or the smallest number of animal units (MAU) does not exclude error if the most frequent skeletal element in the sample (on which their calculation is normally based) was not ef-

Nobenega dvoma ni, da sprotno pobiranje kosti in zob med samim izkopavanjem ni primerna metoda za zbiranje ostankov malih sesalcev. Zelo podobno velja tudi za vzorčenje makrofavne, saj le spiranje sedimenta skozi sita omogoča (čeprav ne tudi zagotavlja!) oblikovanje reprezentativnega vzorca. Da bi dokazali umestnost navedene trditve bomo v nadaljevanju predstavili nekaj primerjav med vzorcem, pridobljenim s klasičnimi izkopavanji (tj. fazo Viktor), in tistim, ki smo ga dobili s ponovnim pregledovanjem med fazo Viktor enkrat že pregledanega sedimenta, a smo ga tokrat predhodno sprali skozi sita (tj. fazo Viktor in IzA).

Morda je najočitnejša prednost spiranja ta, da tako pridobimo večje število najdb, s tem pa se seveda poveča izpovedna vrednost samega vzorca. Poleg tega ne gre spregledati, da spiranje bistveno spremeni razmerja med deleži skeletnih elementov posameznih vrst (razpredelnica 16.10; sl. 16.10). Tako je klasično pobiranje ostankov iz sedimenta sicer omogočalo pridobitev večjega dela dolgih kosti velikih živali (npr. jelena, goveda, prašiča) ter spodnjih in zgornjih čeljustnic, vse druge kategorije pa so bile očitno podcenjene. Ponovno pregledovanje prekopanega sedimenta s strani strokovno bolj podkovanih pregledovalcev je prispevalo k delni izpopolnitvi vzorca, v glavnem z dodatkom izoliranih zob ter manjšega števila prstnic, karpalnih in tarzalnih kosti predvsem večjih živali. Šele s spiranjem in pregledovanjem materiala pod lupo pa je bilo mogoče iz usedlin pobrati večino ostankov manjših živali (*Lepus*, *Mustela*, *Martes*, *Meles*, *Lutra*, *Felis*, *Lynx* in *Vulpes*) ter preostanek prstnic, karpalnih in tarzalnih kosti. Očitno je torej, da se brez spiranja ne moremo izogniti podcenjevanju številčnosti manjših skeletnih elementov na račun večjih.

Klasično izkopavanje in vzorčenje materiala brez spiranja tako navadno privede tudi do podcenjevanja

ficiently collected. Irrespective of the method of quantification, we can therefore justifiably expect that by using sampling without wet sieving, we are *a priori* rejecting the possibility of creating a representative sample. Thus, in the case of remains from Viktor phase, the share of fragments of smaller animals is barely 20%, while after the addition of all remains obtained by wet sieving, it was almost doubled (Fig. 16.11).

Finally, a few words about the technique of excavation by trenches with constant, previously specified dimensions of spit. In general, animal remains are grouped on the basis of phases defined with archaeological finds. Such grouping implies the idea that each characteristic change in a sample of bones corresponds to a characteristic change in e.g., pottery, stone tools, etc., that, in other words, within the same archaeological phase, characteristic change e.g., in the form of livestock rearing, the importance of individual secondary products or the roles of hunting, are not likely. It is not difficult to understand why such thinking is dubious. From that point of view it is better that we analyse different materials from the same site (e.g., pottery, chert, bones etc.) independently of each other. Not least, precisely in Viktorjev spodmol such a method of excavation during the IzA phase, with subsequent analysis of remains of small mammals, enabled the identification of the boundary between ecologically two completely different samples (*cf.* Toškan and Kryštufek, this volume). It is interesting to note that the aforementioned boundary does not correspond with the »archaeological« boundary between the Mesolithic and Prehistoric spits as given by Turk (this volume). It is true that a sufficiently large sample is needed for such a conclusion, but even if the number of finds is not as large as we would like it to be, such an »impartial« approach can draw attention to

Razpredelnica 16.10: Učinkovitost pobiranja živalskih ostankov pri prvem (sonda 1.) in drugem (sonda 2.) pregledovanju nespranega sedimenta iz faze Viktor ter pri tretjem pregledovanju istega vzorca po predhodnem spiranju (S.). Za obrazložitev glej besedilo.
Table 16.10: Effectiveness of collecting animal remains during the first (test trench 1) and second (test trench 2) examination of non-sieved sediments from Viktor phase and with a third examination of the same sample after prior wet sieving (S.). See text for explanation.
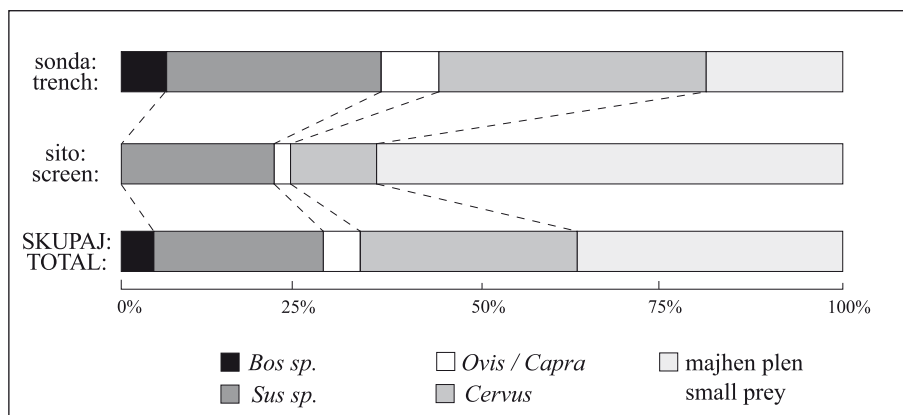
Material Material	*Bos sp.*			*Sus sp.*			*Ovis / Capra*			*Cervus*			Majhni sesalci Small prey		
	Sonda Trench		S.	Sonda Trench		S.	Sonda Trench		S.	Sonda Trench		S.	Sonda Trench		S.
	1.	2.		1.	2.		1.	2.		1.	2.		1.	2.	
Izolirani zobje Isolated teeth	1	1	–	6	16	1	–	6	2	2	3	1	–	5	11
Sp. in zg. čeljustnica Maxilla & mandibula	1	–	–	5	2	1	–	–	–	7	–	–	2	2	–
Dolge kosti, metapodiji Long bones, metapodia	–	–	–	11	2	2	4	–	–	32	5	–	13	7	19
Prstnice, karp. in tarzalne kosti Phalanges, carp. and tars. bones	4	5	–	3	6	11	1	1	–	10	10	7	–	5	14
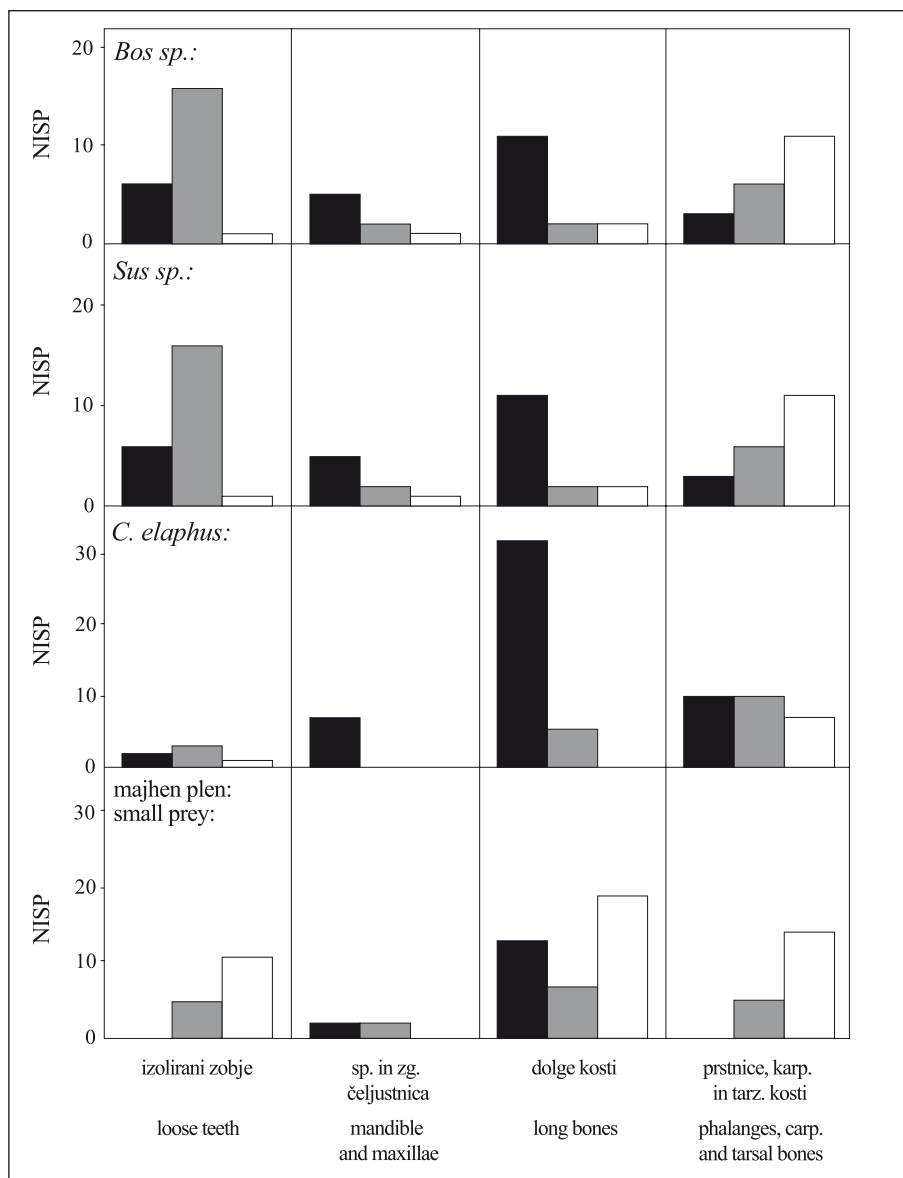
Sl. 16.10: Učinkovitost pobiranja živalskih ostankov pri prvem (polni stolpiči) in drugem (šarafirani stolpiči) pregledovanju nespranega sedimenta iz faze Viktor ter pri tretjem pregledovanju istega vzorca po predhodnem spiranju (prazni stolpiči). Za obrazložitev glej besedilo.
Fig. 16.10: Effectiveness of collecting animal remains with the first (full column) and second (dotted column) examination of not-sieved sediments from Viktor phase and with the third examination of the same sample after previous wet sieving (empty column). See text for explanation.

deleža kosti in zob manjših živali na račun večjih. Obseg napake je sicer odvisen od tega, kateri način kvantifikacije ostankov izberemo; v tem pogledu je brez dvoma najmanj primeren NISP. Vendar pa tudi uporaba indeksov, kot sta najmanjše število osebkov (MNI) ali pa najmanjše število živalskih enot (MAU), ne izključuje napak, če najpogostejši skeletni element v vzorcu (na katerem navadno temelji njihov izračun) ni bil učinkovito pobran. Ne glede na način kvantifikacije lahko torej upravičeno pričakujemo, da se bomo z vzorčenjem brez spiranja *a priori* odrekli možnosti oblikovanja reprezentativnega vzorca. Tako je bilo tudi v primeru ostankov iz faze Viktor, kjer je bil delež fragmentov manjših živali komaj 20-odstoten, po dodatku vseh ostankov, ki smo jih pridobili s spiranjem, pa se je skoraj podvojil (sl. 16.11).

Ob koncu še nekaj besed o tehniki izkopavanja po izkopih s konstantnimi, vnaprej definiranimi dimenzija-

certain peculiarities which can be additionally analysed subsequently. It would thus certainly be interesting in the future to study the division shown in Fig. 16.6 between the upper and lower parts of the graph, which flows somewhere along spit seven. Insofar as it is not an artefact of the oscillation of the total number of finds, it could be perhaps interpreted as a boundary between the Mesolithic and the Prehistoric sample. It is interesting to note that its position in such a case would correspond with the above mentioned boundary between the two samples of small mammals.

mi režnjev. V splošnem se živalski ostanki grupirajo na osnovi faz, opredeljenih z arheološkimi najdbami. Takšno grupiranje implicira razmišljanje, da se vsaka značilna sprememba v vzorcu kosti časovno ujema z značilno spremembo npr. v keramiki, kamnitem orodju ipd., da torej znotraj iste arheološke faze značilne spremembe npr. v obliki živinoreje, pomenu posameznih sekundarnih produktov ali pa vlogi lova niso verjetne. Povsem razumljivo je, da je takšno razmišljanje sporno. S tega vidika je bolje, da različne materiale iz istega najdišča (npr. keramiko, kremen, kosti ipd.) analiziramo neodvisno drug od drugega. Ne nazadnje je v Viktorjevem spodmolu prav takšen način izkopavanj med fazo IzA pri poznejši analizi ostankov malih sesalcev omogočil identifikacijo meje med dvema ekološko povsem različnima vzorcema (glej Toškan in Kryštufek, ta zbornik). Zanimivo pri tem je, da se ta ne ujema z "arheološko" mejo med mezolitskimi in prazgodovinskimi režnji, kot jo podaja Turk (ta zbornik). Res je sicer, da je za podobne sklepe nujno potreben dovolj obsežen vzorec. A tudi če število najdb ni tako veliko, kot bi si želeli, lahko z "neodvisnim" pristopom opazimo posebnosti, ki jih je mogoče dodatno analizirati v nadaljevanju. Tako bi bilo v bodoče vsekakor zanimivo dodatno proučiti na sliki 16.6 nakazano ločnico med zgornjim in spodnjim delom grafa, ki poteka nekje vzdolž režnja sedem. Koliko ne gre za artefakt nihanja skupnega števila najdb, bi jo bilo morda mogoče interpretirati tudi kot mejo med mezolitskim in prazgodovinskim vzorcem. Zanimivo pri tem je, da bi se njena lega v tem primeru popolnoma ujemala z zgoraj omenjeno mejo med obema vzorcema malih sesalcev.

Zahvala: