

# PALEOLITHIC AND MESOLITHIC OF CROATIA : PRESENT STATE OF INVESTIGATIONS

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## 1. INTRODUCTION

On many quaternary sites in Croatia the cultural and skeletal remains of men have been found in the strata from Early Pleistocene, interglacial Riss/Wurm, and the Last Glacial to the Holocene. Šandalja I has provided evidence for human existence during the Early Pleistocene. Until now, in the Middle Pleistocene, cultural and skeletal remains have not been discovered. Upper Pleistocene, Early Postglacial and Holocene localities are rich with human skeletal remains, and with the corresponding material culture as well as faunal communities. They have been discovered so far on numerous sites, among which the most important are Krapina, Vindija, Velika pećina, Veternica, Šandalja II, Romualdova pećina, Vergotinova pećina, and Cerovačke pećine.

Among the investigated localities, the caves are prevailing due to the geomorphology of Croatia. Many of the sites have yielded archaeological and paleontological assemblages from different Upper Pleistocene time sequences and are presented separately.

Because a data base collected from published literature show a lack of palynological and radiometric information's, a majority of the assemblages (faunal and/or archaeological) has been grouped chronologically primarily on the basis of archaeological or faunal remains into four periods: Middle Paleolithic (MP), Early Upper Paleolithic (EUP), Late Upper Paleolithic (LUP) and Mesolithic (MES).

## 2. PALEOENVIRONMENT AND PALEOCLIMATE

During the Upper Pleistocene Croatia was within the southeastern subalpic periglacial zone. The northwestern parts were quite near to the ice cover of the Alps; northeastern was part of huge steppe areas of Pannonian basin. Istria as well as the Adriatic coast was in the same time influenced both from Mediterranean sea and from Alps, while the Dinarides (southeastern extension of the Alps parallel to the coast) played a role of a physiographic barrier between north and south.

Depending on the sea-level changes, reconstruction of the Pleistocene geography suggest two major landscapes in the Adriatic region: the exposed Adriatic plain and the

karstic hinterland. The plain would have supported grassland habitat with patches of trees along rivers. In the same time, karstic area was a mosaic of exposed karst and stands of trees.

Reflecting the changes of climate and altitude, Dinarides (with many peaks over 2,000 meters high) were covered with forests of deciduous or conifer trees. They, although not glaciated to day, have supported isolated glaciers during the Upper Pleistocene.

During the last glacial and the Holocene the areas of Pannonian basin were featured by a different geomorphology and different climatic changes, and as a result they had a different vegetation. The plain of Pannonian basin was characterised by the dominance of sand steppe meadows, grassy steppes and riparian forests under continental climatic conditions. The hilly regions, mostly in north-western part of this region, were dominated by mixed deciduous or conifer forests

Investigations of quaternary deposits have yielded data about various types of sediments originating from the glacial and periglacial environments: moraines (Dinarides, northwards from Zadar), kameterraces (islands of Krk, Pag), cryoturbations and ice-wedges (Vindija, Slavonija), loess (eastern part of Pannonian basin, islands Susak, Unije, Srakane, Lošinj, Rab, Pag, Hvar). The polygonal pattern is well visible in the NE inland of Croatia reflecting former permafrost area. Therefore, the border of the last glaciation maximum must be extend much further south-eastwards, over Dinarides and part of the Adriatic.

### 3. HUMAN REMAINS

The Neanderthals were found in the Upper Pleistocene sediments of the rock-shelter Hušnjakovo (Krapina), as well as in the cave Vindija. The oldest finding of the early modern man (frontal bone) from the level j in the cave Velika pećina is more than 33,000 years old. The Late Paleolithic human remains (Aurignacian and Gravettian) were discovered in Šandalja II, as well as in the caves Romualdova and Vergotinova pećina (Istria), in the caves Cerovačke pećine (Lika), Veternica and Vindija (NW Croatia).

### 4. PALEONTOLOGICAL ASSEMBLAGES

In most Upper Pleistocene faunal assemblages, cave bears were dominating: during the EUP, the cave bear dominated assemblages are with 74% most common; in the MP they are frequently (65%), and during the LUP very rare (7%).

The large carnivores are most frequently found in assemblages from the EUP. This suggests a greatest competition between carnivores for the use of the cave and also harsher environmental conditions during EUP than any of other periods. Also, the large carnivores are more frequently in MP than LUP assemblages, indicating that the conditions were relatively harsher during MP, and that most of the LUP assemblages date late in the process of climatic amelioration.

During the last glacial (Wurm), steppe or cold adapted species (bison, elk, horse, reindeer, blue fox, wolverine, and marmot) are more abundant in assemblages. Reindeer

and marmot are more frequently in the deposits from the LUP, while blue fox and wolverine are characteristic for the EUP.

Species commonly found in MES assemblages (pig, roe deer, wild cat, fox, badger) cannot be considered to be indicators of interglacial or interstadial conditions. They have been, namely, frequently found also in LUP assemblages, as well as in EUP assemblages. The alpine-adapted ungulates (ibex, chamois) were most commonly during the relatively warmer conditions of the MES (Holocene). Therefore, they cannot be considered as animals strictly adapted to cold periods.

## 5. ARCHAEOLOGICAL ASSEMBLAGES

Archaeological remains have been grouped into the following four chronological periods (after Gamble 1986): Middle Paleolithic (MP), Early Upper Paleolithic (EUP), Late Upper Paleolithic (LUP) and Mesolithic (MES). The lack of absolute dates makes it necessary to rely primarily on the archaeological remains themselves to chronologically sort out the assemblages. Relatively broad groupings have been deliberately chosen to match the coarseness of much of the archaeological data, and yet pick out some of the important changes through time. It is important to keep in mind that many of the typological assignments used in the relative dating of assemblages were based on very small numbers of formal tools, in many cases far fewer than the 100 tool standard considered necessary for accurate chronostratigraphic analyses. As a result, one can justifiably question the assignment of some layers and sites to particular time periods. Nonetheless, the existing absolute dates are consistent with the scheme presented above and are taken as strong support for these broad temporal groupings.

### 5.1. MIDDLE PALEOLITHIC ASSEMBLAGES (Fig. 1)

From the standpoint of the archaeological materials, MP assemblages are defined by preponderance of flake and core/chopping "tools" and in many cases have been typologically classified as Mousterian. Assemblages so classified probably date from 128-35 kyr (thousands of years BP), although we have only 2 absolute dates on MP assemblages: Krapina and level K at Vindija about 130 kyr, level G3 at Vindija 42 kyr. Climatic conditions progressively deteriorated from warm, interglacial (oxygen isotope stage 5e, ca. 128-118 kyr), to more temperate (oxygen isotope stages 5d-5a, ca. 118-75 kyr), to glacial during the first half of the Wurm (oxygen isotope stage 4, ca. 75-35 kyr).

### 5.2. UPPER PALEOLITHIC AND MESOLITHIC ASSEMBLAGES (Figs. 2-4, Tabl. 1-3)

In later artifact assemblages (EUP, LUP), formal tools are most commonly made on blades as opposed to flakes. This follows the classic differentiation between the Middle and Upper Paleolithic periods in European Prehistory. The EUP assemblages are characterised by formal "tools" made on large blades and include those typologically identified as Aurignacian and Gravettian. The earliest and latest dates for EUP assemblages are 33,850 BP (Velika pećina) and 18,388 BP (Pećina u Brini) respectively. It is therefore assumed that EUP assemblages date from between about 35 and 20 kyr. LUP assemblages are identified by an increased importance of formal tools made on

small blades, "bladelets" and microlithic tools. LUP assemblages include those assemblages typologically identified as Tardigravettian, Epigravettian and Magdalenian. The upper time boundary for the LUP is arbitrarily set at the end of the Pleistocene, here placed at 10,000 BP. As it is often difficult to identify distinct Mesolithic assemblages in the Mediterranean region on purely typological grounds, criteria including the characteristics of the associated sediments, absolute dates, and faunal communities have also been used in the identification of MES assemblages. Most MES assemblages probably date to between 10 kyr and the appearance of farming communities (roughly 7-6 kyr in the region).

#### 6. SOURCES IN:

- GAMBLE C., 1986: *The Paleolithic Settlement of Europe*. Cambridge Univ. Press, 471 pp., Cambridge.
- KARAVANIĆ I., PAUNOVIĆ M., 1998: *Epipaleolithique et Mesolithique en Croatie*. Actes V. Congrès Inter. UISPP, Grenoble, in print.
- MALEZ M., 1980: Sites of fossil Men in Croatia. *Coll. Antropol.*, 4, 13-29, Zagreb.
- MONTET-WHITE A., 1996: *Le Paleolithique en ancienne Yougoslavie*. J. Millon, 268 pp., Grenoble.
- MIRACLE P., 1991: Carnivore Dens or Carnivore Hunts? - A Review of Upper Pleistocene Mammalian Assemblages in Croatia and Slovenia. *Rad Hrv. akad. znan. umjetn.*, 458/25, 193-219, Zagreb.
- SMITH F.H. & SPENCER F. (Eds.), 1984: *The Origins of Modern Humans*. Alan R. Liss, 590 pp., New York.

TABLE 1 - ABSOLUTE AGE OF AURIGNACIAN SITES (EUP)

CITE	LAYER	14C AGE
ŠANDALJA	G	27.800
(layers d-h)	F	25.340
	E	23.540
VELIKA PEĆINA	i	33.850
(layers j-f)	g	31.140
VINDIJA	G1	33.000
(layers G1-Fd)	Fd/d	26.600
	Fd	26.970

TABLE 2 - ABSOLUTE AGE OF GRAVETTIAN SITES (LUP)

CITE	LAYER	14C AGES
ŠANDALJA		
(layers D-C)	C	21.740
	C/d	20.750
	C/s	13.130
VELIKA PEĆINA	e	26.450
VINDIJA	E	18.500
(layers F-E)		

TABLE 3 - ABSOLUTE AGE OF EPIPALEOLITHIC /  
MESOLITHIC SITES (LUP/MES)

CITE	LAYER	14C AGES
ŠANDALJA (layers C-B)	C/s	13.130
	B/C	13.070
	B/d	10.990
	B/d	10.140
	B/s	12.320
	B/g	10.830
VETERNICA (layers d-b)	d	11.884
	c	13.660



Fig. Mousterian sites of Croatia

1-Krapina, 2-Vindija, 3-Velika pećina, 4-Martijanec, 5-Varaždinske toplice, 6-Veternica, 7-Samobor, 8-Ražanac, 9-Panjorovica, 10-Krševanje polje, 11-Gospodska pećina, 12-Mujina pećina

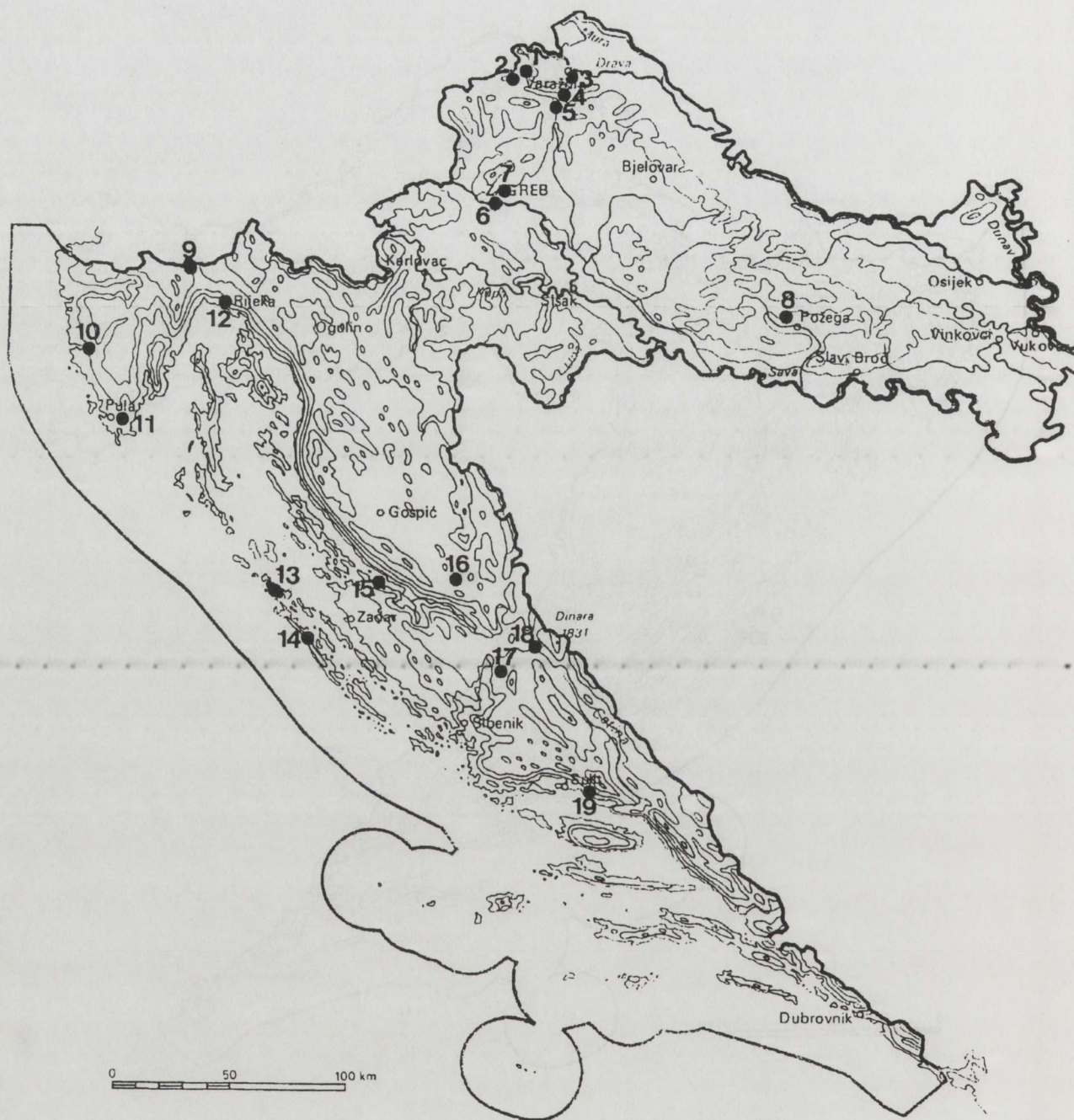


Fig.2 Aurignacian sites of Croatia

1-Vindija, 2-Velika pećina, 3-Martijanec, 4-Vuglovec, 5-Vilenica, 6-Veternica, 7-Šupljata pećina, 8-Zarilac, 9-Pećina na gradini, 10-Romualdova pećina, 11-Šandalja, 12-Sabljićevo, 13-Zapuntelsko polje, 14-Panjorovica, 15-Ražanac, 16-Cerovačke pećine, 17-Pećine u Brini, 18-Gospodska pećina, 19-Sumpetar

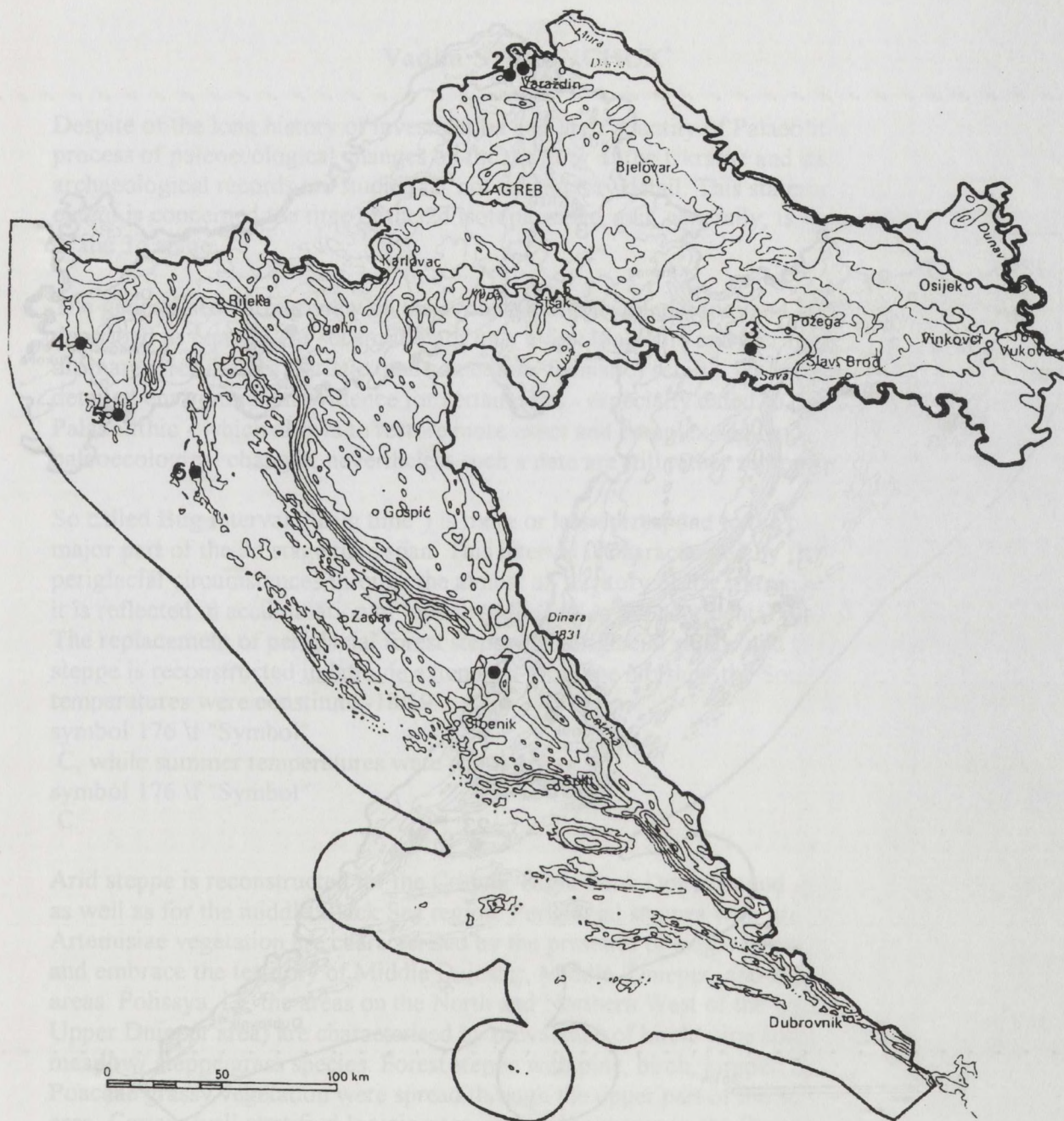


Fig.3 Gravettian sites of Croatia

1-Vindija, 2-Velika pećina, 3-Kamenika, 4-Romualdova pećina, 5-Šandalja, 6-Vela spilja, 7-Pećine u Brini

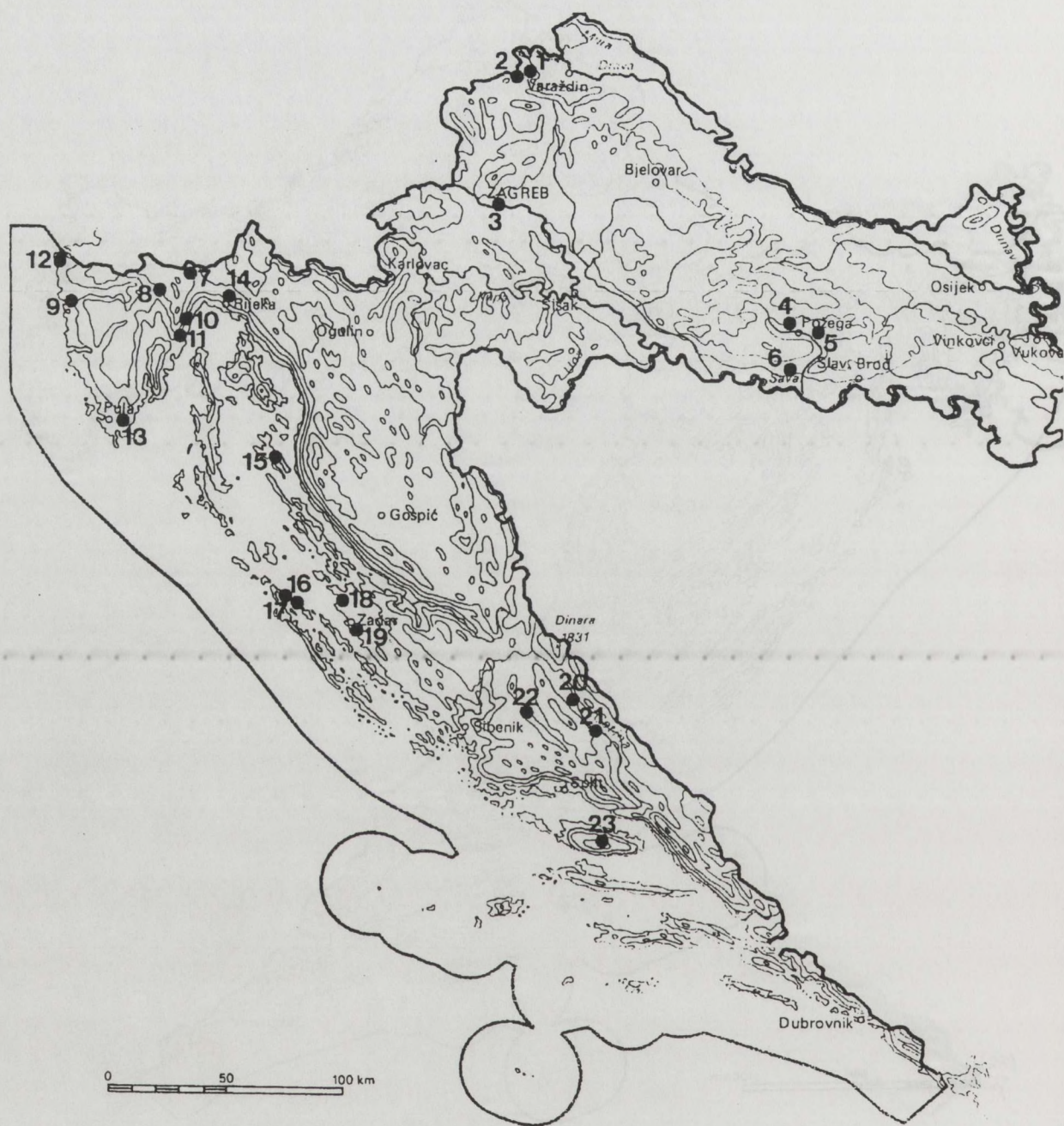


Fig.4 Epipaleolithic/Mesolithic sites of Croatia

1-Vindija, 2-Velika pećina, 3-Veternica, 4-Lakušje, 5-Ruševo, 6-Brodski drenovac, 7-Loza, 8-Klanjčeva peć, 9-Vergotinova pećina, 10-Oporovina, 11-Podosojna, 12-Savudrija, 13-Šandalja, 14-Pećina kod sv.Ane, 15-Lopar, 16-Ledenice, 17-Dražica, 18-Nin, 19-Borik, 20-Okruglo, 21-Glavičica, 22-Podumci, 23-Kopačina