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KABAZI V: INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS-MOUSTERIAN CAMP SITES

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Chapter
15

Kabazi V: Bone and Stone Tools Used in Flint Knapping

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Bone and stone retouchers and hammerstones are an artefact category long attested in studies of the Crimean Middle Palaeolithic (Bonch-Osmolovski 1940; Gvozdover, Formozov 1960; Kolosov 1983; Kolosov 1986; Kolosov, Stepanchuk, Chabai 1993; Stepanchuk 1990; Stepanchuk 1993; Yevtushenko 1998b; Chabai 2004b, 2004c). The collection of bone and stone tools for flint treatment recovered from Kabazi V is, however, the largest ever to have been recovered. In total, there are 255 items: 205 bone retouchers, 35 pebble retouchers, and 15 hammerstones.

The dispersion of bone and pebble retouchers / hammerstones throughout the archaeological occupations is heterogeneous in character. Bone retouchers were found in all archaeological levels of sub-units III/1, III/2, III/4, III/5, III/7, as well as in some levels of sub-units III/3, III/6, and in Unit IV, whereby nearly 80 % of pieces stems from sub-units III/1 and III/5. Pebble retouchers and hammerstones were discovered in practically all archaeological levels of sub-units III/1 and III/3, and also in level III/4-1. The most numerous collection of tools on pebbles was discovered in archaeological levels of sub-unit III/1 where they constitute about 70 % of the total number from the entire Kabazi V sequence. A total of 27 of the 34 pebble retouchers / hammerstones from sub-unit III/1 stems from level III/1A. The analysis of such a large collection of flint treatment tools has revealed some important typological characteristics with which comparative analyses can now be undertaken.

Classification of Bone and Stone Tools Used in Flint Knapping

In the last decade some different approaches have been suggested for classifying bone and stone retouchers and hammerstones. For example, Yevtushenko and Chabai defined bone and pebble retouchers on the basis of size and the positions of their working surfaces (Yevtushenko 1998b; Chabai 2004b, 2004c). In this study these characteristics are complemented by four further attributes. Thus, a total of six attributes of flint treatment tools from all archaeological levels

of Kabazi V has been studied. These attributes are the number of working surfaces, the number of working zones, the degree of utilisation, dimensions, weight, and raw material.

1. According to the number of working surfaces bone and pebble retouchers / hammerstones are differentiated as either one-sided (unifacial), two-sided (bifacial), three-sided (trifacial), etc.

2. Each bone and pebble retoucher / hammerstone is classified according to the number of working areas (working zones) which it displays, i.e. concentrations of transverse cuts and longitudinal scratches. Accordingly, there are pieces with one working zone (simple), two working zones double), three working zones (triple), etc.

3. A basic criteria for the classification of retouchers and hammerstones into different groups is the degree to which they have been utilised, i.e. the state of their working surfaces. Accordingly, three types of bone and pebble retouchers / hammerstones are distinguished: slightly utilised, moderately utilised, and heavily utilised. Tools with only a slight degree of utilisation are characterised by pieces with only a small number of cuts on their working surfaces. Retouchers and hammerstones of this type usually display a small working zone that is not overly covered by cuts and artificial striations, and where intact areas of the tool's primary surface remain. Bone and pebbles with moderate and heavy degrees of utilisation display more extensively affected working surfaces with a high density of cuts and scratches, particularly in form of peculiar crumbled cavities, within the limits of the working zone.

4. Dimensions are in mm, and relate to the maximum length, maximum width, and maximum thickness of a piece.

5. Weight in grams. This attribute is of relative significance, particularly due to the obvious difference in the weight of fresh and fossil Pleistocene bones.

6. The type of raw material refers to the material used as a retoucher / hammerstone.

The Bone Retouchers

The six attributes listed above have been recorded for all bone retouchers from all archaeological levels of Kabazi V. All bone retouchers found at Kabazi V are characterised by the presence of a single flat or slightly convex working surface. Among tube bone fragments the exterior surfaces were used as working surfaces. Two types of bone retoucher have been discovered at Kabazi V, the simple bone retoucher (Fig. 15-1, *1-2*; 15-2; 15-3; 15-4, *1, 2*; 15-5; 15-6; 15-7, *1*) and the double bone retoucher (Fig. 15-7, *2*; 15-8; 15-9; 15-10; 15-11; 15-12). All three degrees of utilisation are attested among these pieces, i.e. slight utilisation (Fig. 15-1, *1, 2*; 15-2; 15-3; 15-4, *1*; 15-7, *2*; 15-8; 15-9), moderate utilisation (Fig. 15-4, *2*; 15-5), and heavy utilisation (Fig. 15-6; 15-7, *1*; 15-10; 15-11). Among the double retouchers 2.45 % comprise bone tubes with different degrees of utilisation (Fig. 15-12), and each is characterised by its own quite individual dimensions and weight characteristics. On the basis of these data, statements can be made with regard to the role of bone retouchers in the overall system of flint treatment, and in comparison say with other types of instruments, such as stone retouchers and hammer-stones. As a rule, "blanks" used for the production of bone retouchers comprised fragments of tube bones from animal extremities, and in rare cases rib fragments were also used (Chabai, 2004b, p. 408). The "raw material" for bone retouchers consisted of the remains of animals processed at the site.

Description of Bone Retoucher Assemblages

Sub-Unit III/1

In sub-unit III/1, tube bone fragments were used as retouchers; this collection of artefacts numbers 107 items, thus constituting 52.2 % of all retouchers from Kabazi V. In all archaeological levels of sub-unit III/1 simple types prevail (Table 15-1; Fig. 15-1, *1, 2*; 15-4, *2*; 15-7, *1*), and double retouchers make up about a quarter of all retouchers from sub-unit III/1 (Fig. 15-7, *2*; 15-10; 15-11). A level-by-level analysis of the

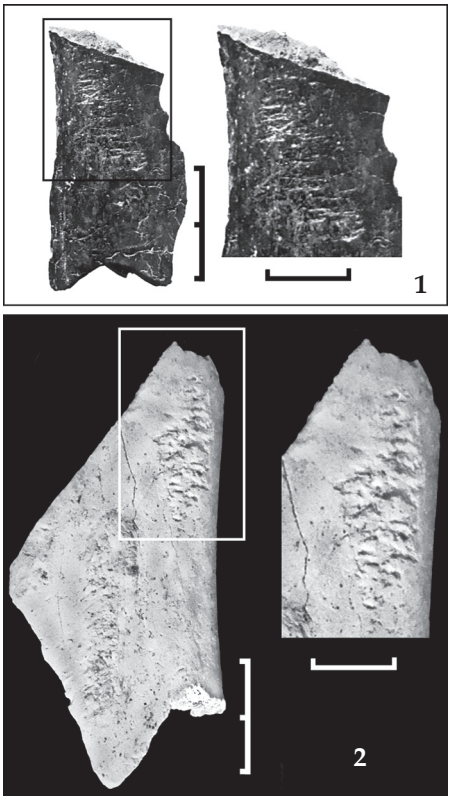


Fig. 15-1 Kabazi V, levels III/1A (1), III/1B (2), bone retouchers: 1, 2 – one-sided simple, slightly utilised.

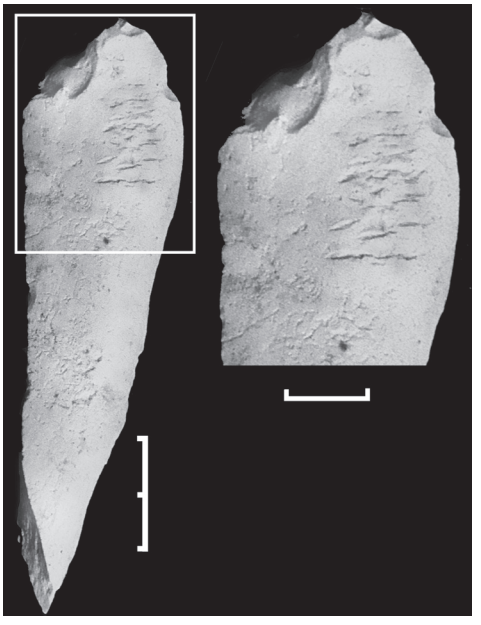


Fig. 15-2 Kabazi V, level III/4-5, bone retoucher: one-sided simple, slightly utilised.

Fig. 15-3 Kabazi V, level III/5-3, bone retoucher: one-sided simple, slightly utilised.

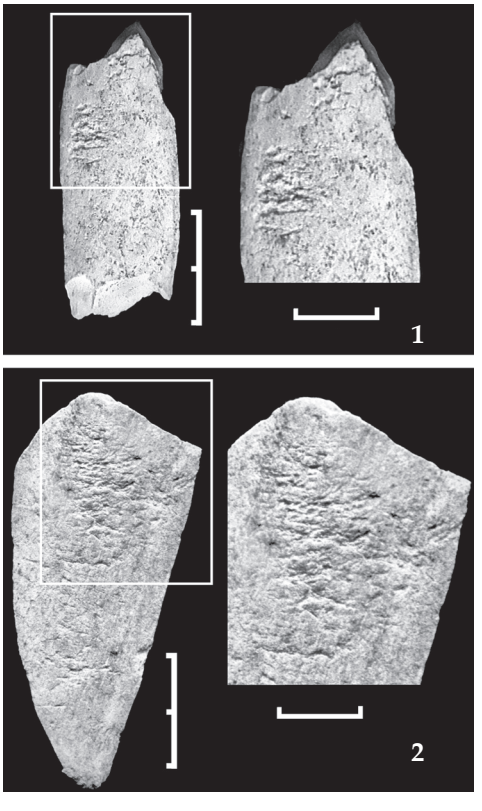


Fig. 15-4 Kabazi V, levels III/6-1-2 (1), III/1A (2), bone retouchers: 1 – one-sided simple, lightly utilised; 2 – one-sided simple, moderately utilised.

		One-side simple bone retouchers			One-side double bone retouchers				
		light	moderate	heavily	ligth	moderate	heavily	combined *	Total:
Sub-unit III/1	III/1B	5	4	8	·	·	4	·	21
	III/1	8	12	21	5	6	5	3	60
	III/1A	10	6	5	·	·	2	·	23
	III/1C	·	·	2	·	1	·	·	3
Sub-unit III/2	III/2	1	·	1	·	·	·	1	3
	III/2A	1	1	1	·	·	·	·	3
Sub-unit III/3	III/3-1	1	·	·	·	·	·	·	1
	III/3-1B	·	1	·	·	·	·	·	1
	III/3-2A	·	·	1	·	·	·	·	1
	III/3-3	1	·	·	·	·	·	1	2
	III/3-3A	1	·	·	·	·	·	·	1
	III/3-4	·	·	1	·	·	·	·	1
	III/3-5	·	·	·	·	·	1	·	1
Sub-unit III/4	III/4-1	·	·	1	1	1	·	·	3
	III/4-2	·	2	·	·	·	·	·	2
	III/4-3	·	1	1	·	·	·	·	2
	III/4-4	·	·	·	1	·	·	·	1
	III/4-5	1	1	2	·	1	·	·	5
	III/4-6	·	·	·	·	1	·	·	1
Sub-unit III/5	III/5-1	1	1	2	·	·	·	1	5
	III/5-1A	·	1	1	·	·	·	·	2
	III/5-1B	·	1	1	·	·	·	·	2
	III/5-2	2	1	4	·	2	1	·	10
	III/5-2-1	·	1	·	·	·	·	·	1
	III/5-3	·	1	4	·	·	1	·	6
	III/5-3B + III/5-3B1	7	3	2	1	3	2	·	18
	III/5-3B2	2	1	4	·	1	·	·	8
Sub-unit III/6	III/6-1	1	2	1	1	1	·	·	6
Sub-unit III/7	III/7-1	2	·	1	·	1	·	·	4
	III/7-2	1	1	·	·	·	2	·	4
	III/7-3	·	1	·	·	·	1	·	2
Unit IV	IV/2	·	1	·	·	·	·	·	1
	IV/3	·	·	1	·	·	·	·	1
	Total:	**45**	**43**	**65**	**9**	**18**	**19**	**6**	**205**

*one-sided double retouchers with varying degrees of utilisation

Table 15-1 Kabazi V. Classification of bone retouchers.

Fig. 15-5 Kabazi V, level III/5-3B2, bone retoucher: one-sided simple, moderately utilised.

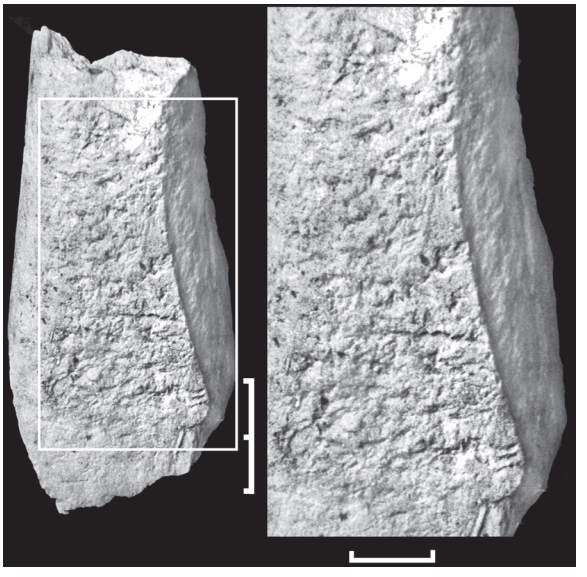


Fig. 15-6 Kabazi V, level III/5-1, bone retoucher: one-sided simple, heavily utilised.

◀ **Fig. 15-7** Kabazi V, level III/1, bone retouchers: 1 – one-sided simple, heavily utilised; 2 – one-sided double, slightly utilised.

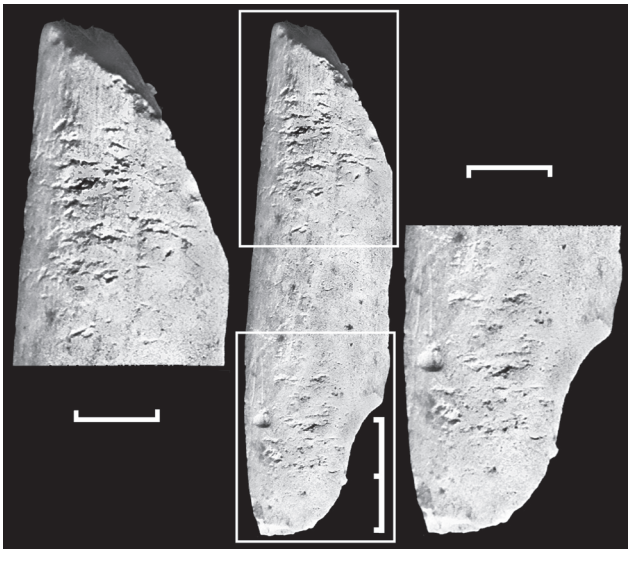


Fig. 15-8 Kabazi V, level III/4-6, bone retoucher: one-sided double, slightly utilised.

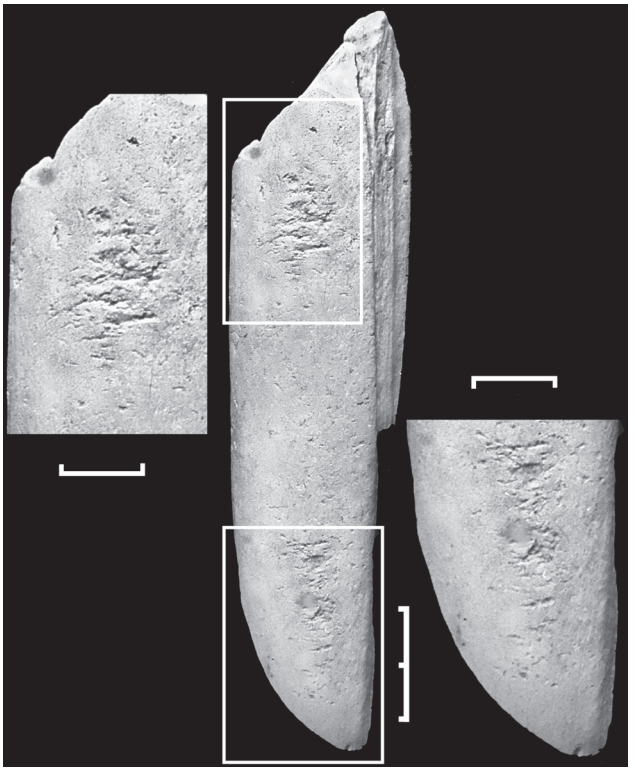


Fig. 15-9 Kabazi V, level III/5-3B, bone retoucher: one-sided double, slightly utilised

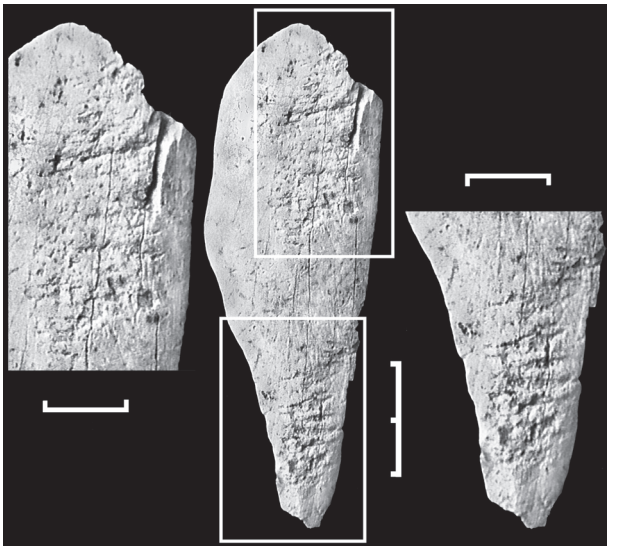


Fig. 15-10 Kabazi V, level III/1, bone retoucher: one-sided double, heavily utilised.

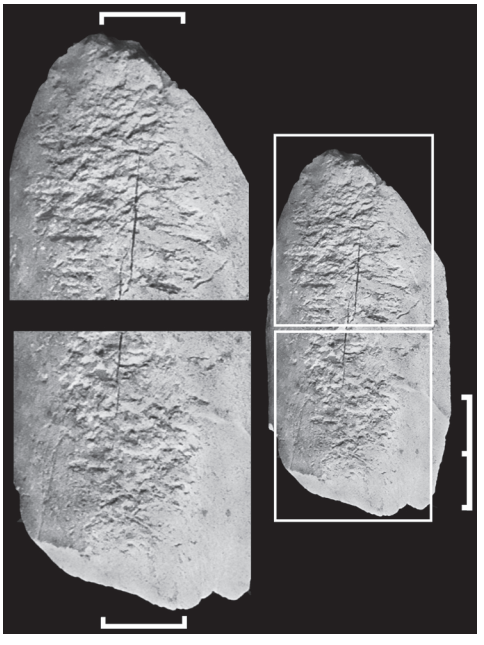


Fig. 15-11 Kabazi V, level III/1A, bone retoucher: one-sided double, heavily utilised

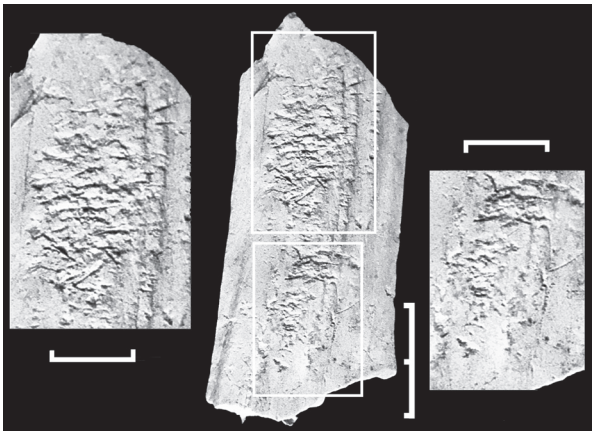


Fig. 15-12 Kabazi V, level III/5-1, bone retoucher: one-sided double, light / moderately utilised.

ratio of simple and double retouchers shows that the greatest numbers of double types occur in archaeological levels III/1 (31.67 %) and III/1C (33.33 %). In levels III/1A and III/1B their ratios are considerably lower, with 8.7 % and 19.5 %, respectively.

Among both simple and double retouchers from sub-unit III/1 heavily utilised items predominate (Table 15-1; Fig. 15-10; 15-11), with the exception of the level III/1A assemblage (Fig. 15-1, *1*) in which only slightly utilised pieces are the most numerous among simple retouchers (Table 15-1). Among the double retouchers in archaeological levels III/1A and III/1B heavily utilised items prevail. Double retouchers in level III/1 comprise slightly, moderate and heavily utilised items in practically equal ratios. The only bone retoucher with a moderate degree of utilisation is the double retoucher from archaeological level III/1C. There are three double retouchers from level III/1, all of which are characterised by different degrees of utilisation; whereas two pieces display slightly and moderately utilised working areas, one piece has one slightly and one heavily utilised surface.

Generally speaking, a prominent feature among bone retouchers from sub-unit III/1 assemblages is a well-defined prevalence of heavily utilised over lightly utilised retouchers, a feature which is characteristic for both simple and double retouchers. For simple retouchers this feature is expressed most clearly in archaeological levels III/1A and III/1B (Table 15-2), while for double retouchers in level III/1 (Table 15-3).

Further, in sub-unit III/1 the heaviest examples of simple and double retouchers were also the most exploited (Tables 15-2 and 15-3). In other words, the most significant attributes when choosing a bone to serve as a retoucher would have been weight, length, width, and thickness. This selection process, which is evidenced in the collection of 107 items, shows very precisely that larger and heavier retouchers were used more intensively than small and lightweight tools.

Sub-unit III/2

The collection of bone retouchers from sub-unit III/2 comprises six items (Table 15-1), all made on fragments of tube bone; five instruments are simple retouchers, with only one double retoucher.

Among simple bone retouchers there are near equal ratios of pieces with heavily, moderately and slightly utilised working surfaces; the double retoucher has one working zone with traces of a slight utilisation, while the other is heavily utilised.

Retouchers from level III/2 differ considerably from other Kabazi V retouchers not only in their recorded width and thickness, but also, and especially, in their weight (Table 15-2). While bones used as retouchers at Kabazi V were usually horse bones, in level III/2 fragments of much larger, but unidentified, animal than *Equus hydruntinus* were used. These heavyweight retouchers show more intense (heavier) signs of utilisation than lightweight pieces; at the same time, the heavyweight retouchers are shorter than the lightweight tools.

Sub-unit III/3

In sub-unit III/3 eight bone retouchers were discovered through seven archaeological levels (Table 15-1); in all cases these retouchers were fragments of tube bones.

With the exception of two double retouchers from levels III/3-3 and III/3-5, all other tools are simple retouchers. Whereas three of the latter are characterised by only a slight utilisation, one is moderately utilised, and two are heavily exploited. The double retouchers are represented by two types of utilization: heavily and light / heavily.

The length, width, thickness, and weight of retouchers from sub-unit III/3 are presented in Tables 15-1 and 15-2.

Sub-unit III/4

A total of 14 bone retouchers were discovered in archaeological levels from sub-unit III/4; all were made on fragments of tube bones (Table 15-1). Whereas archaeological level III/4-5 yielded the most retouchers (5 pieces), in levels III/4-4 and III/4-6 bone retouchers are represented by single items.

In sub-unit III/4 simple retouchers are the most common with nine items(Fig. 15-2), and there are five double retouchers (Fig. 15-8). Level III/4-1 is the only archaeological level of sub-unit III/4 in which double retouchers occur more frequently than simple retouchers (Table 15-1).

There is just one simple retoucher with a slightly utilised working surface (Fig. 15-2), while there are four pieces with moderately utilised and four pieces with heavily utilised surfaces. Double retouchers are represented by both lightly (Fig. 15-8) and moderately utilised pieces (Table 15-1). There are no heavily utilised double retouchers in sub-unit III/4 assemblages.

In the case of level III/4-5 it is of interest that bigger and heavyweight simple retouchers are

		light				moderate			
		length (mm)	width (mm)	thickness (mm)	weight (gr)	length (mm)	width (mm)	thickness (mm)	weight (gr)
Sub-unit III/1	III/1B	52.08	20.63	6.91	6.40	42.8	17.48	7.52	4.75
	III/1	61.25	25.99	7.58	10.75	64.81	25.58	8.65	15.58
	III/1A	59.79	23.08	8.49	9.20	57.57	24.47	9.12	11.00
	III/1C	·	·	·	·	·	·	·	·
Sub-unit III/2	III/2 *	130.88	30.82	18.73	57.00	·	·	·	·
	III/2A *	55.50	23.88	9.41	11.00	96.22	16.91	10.03	20.00
Sub-unit III/3	III/3-1 *	92.01	31.36	9.83	18.00	·	·	·	·
	III/3-1B *	·	·	·	·	61.32	24.68	8.86	8.00
	III/3-2A *	·	·	·	·	·	·	·	·
	III/3-3 *	60.83	17.11	7.93	7.00	·	·	·	·
	III/3-3A *	110.12	45.98	12.37	51.00	·	·	·	·
	III/3-4 *	·	·	·	·	·	·	·	·
	III/3-5	·	·	·	·	·	·	·	·
Sub-unit III/4	III/4-1 *	·	·	·	·	·	·	·	·
	III/4-2 *	·	·	·	·	55.01	21.06	9.07	7.50
	III/4-3 *	·	·	·	·	37.93	20.81	4.06	3.00
	III/4-4	·	·	·	·	·	·	·	·
	III/4-5	111.76	25.92	10.56	34.00	100.34	27.34	6.87	17.00
	III/4-6	·	·	·	·	·	·	·	·
Sub-unit III/5	III/5-1	74.37	22.16	11.76	14.00	59.53	19.73	8.78	9.00
	III/5-1A *	·	·	·	·	70.08	20.6	7.15	10.00
	III/5-1B *	·	·	·	·	59.78	20.83	9.17	9.00
	III/5-2	102.82	26.02	7.98	19.50	55.6	21.65	10.28	13.00
	III/5-2-1 *	·	·	·	·	58.17	28.92	10.64	20.00
	III/5-3	·	·	·	·	98.79	30.43	9.67	30.00
	III/5-3B + III/5-3B1	59.62	23.37	7.72	8.86	71.13	24.43	7.66	12.33
	III/5-3B2	77.89	19.19	6.42	8.00	92.07	22.11	5.75	11.00
Sub-unit III/6	III/6-1	72.42	26.65	9.43	16.00	59.63	20.43	10.78	11.00
Sub-unit III/7	III/7-1	77.41	18.41	8.97	10.00	·	·	·	·
	III/7-2 *	66.22	31.91	8.83	17.00	56.54	28.23	9.49	12.00
	III/7-3 *	·	·	·	·	71.76	26.21	7.32	11.00
Unit IV	IV/2 *	·	·	·	·	48.5	21.66	7.7	5.00
	IV/3 *	·	·	·	·	·	·	·	·

*single piece

Table 15-2 Kabazi V. Average dimensions of simple bone retouchers.

less utilised than smaller and lightweight tools (Table 15-2), thus a quite opposite trend to that observed for sub-unit III/1, even though double retouchers from both level III/4-5 and sub-unit III/1 are still of similar sizes and weight (Table 15-3) However, in archaeological level III/4-3 bigger and heavyweight simple retouchers are once again more intensely exploited than smaller and lightweight pieces (Table 15-2).

It is likely that the observed correlation between metric measurements and utilisation for simple retouchers in both sub-unit III/1 and archaeological level III/4-5 might best be explained by varying availabilities of large fragments of bones. In other words, a deficit of long bone fragments led to the selection of heavyweight pieces (Table 15-2; levels III/1B, III/1 and III/1A). In other levels, such as level III/4-5, where bone fragmentation is not so pronounced, longer fragments of tube bones were selected as retouchers.

heavily			
length (mm)	width (mm)	thickness (mm)	weight (gr)
62.81	25.95	8.02	12.5
68.03	24.24	7.95	13.05
63.64	28.95	9.68	18.20
69.79	25.09	8.58	13.00
94.67	39.1	29.25	70.00
77.72	26.7	9.56	20.00
.	.	.	.
.	.	.	.
94.8	29.66	11.35	25.00
.	.	.	.
.	.	.	.
70.65	20.61	10.83	13.00
.	.	.	.
71.43	15.4	4.08	4.00
.	.	.	.
37.76	25.74	9.8	8.00
.	.	.	.
70.33	21.41	8.01	10.50
.	.	.	.
63.47	30.14	8.66	22
45.44	30.3	5.16	6.00
76.34	39.09	8.89	17.00
58.87	23.52	9.44	11.75
.	.	.	.
52.81	27.09	7.92	8.25
57.71	23.76	11.79	10.50
79.02	29.32	9.72	20.00
42.72	21.43	9.78	8.00
32.93	14.55	8.73	4.00
.	.	.	.
.	.	.	.
.	.	.	.
45.65	23.12	7.45	7.00

Table 15-2 Continued.

Sub-unit III/5

With the exception of two rib fragments in levels III/5-3B + III/5-3B1 and III/5-3B2, all bone retouchers in sub-unit III/5 were made on the fragments of tube bones. The assemblage of bone retouchers from sub-unit III/5 is the most numerous after the aforementioned collection from sub-unit III/1. Retouchers were found in all archaeological levels and number 52 pieces (Table 15-1). The highest number of retouchers (18 items) in this sub-unit stems from level III/5-3B, with ashy cluster III/5-3B1.

More than 76 % of all bone retouchers are simple retouchers (Fig. 15-3; 15-5; 15-6), the rest being double retouchers (Fig. 15-9; 15-12).

In most archaeological levels of this sub-unit simple bone retouchers are usually heavily utilised (Fig. 15-3; Table 15-1), although in archaeological levels III/5-3B + III/5-3B1 slightly utilised retouchers prevail (Table 15-1). Among the double retouchers of sub-unit III/5 moderately utilised pieces are the most common. The only tool with a slight degree of utilisation stems from archaeological level III/5-3B + III/5-3B1 (Fig. 15-9). One more double retoucher shows different degrees of utilisation on its two working areas (Fig.15-12).

Concerning size, two trends can be observed among simple retouchers from sub-unit III/5. First, there is an increase in the size and weight of retouchers relative to their degree of utilisation (Table 15-2). Among bone retouchers from level III/5-3B2 a loss of length is compensated by other factors, such as width, thickness, and weight. Second, in level III/5-2 an opposite trend can be observed; in this case there is a reduction in size among simple bone retouchers relative to the state of utilisation, i.e. from slightly utilised to heavily exploited (Table 15-2). For retoucher assemblages from levels III/5-1 and III/5-3B + III/5-3B1 such correlations are not observed here, the weight of simple heavily utilised retouchers considerably surpasses that of slightly utilised instruments.

In sub-unit III/5, items with all described levels of utilisation occur in level III/5-3B + III/5-3B1. In this level there is also a characteristic reduction of size and weight that is relative to the state of utilisation (Table 15-3).

Sub-unit III/6

In the three archaeological levels of this sub-unit, bone retouchers were found only in level III/6-1-2; all were made on bone fragments. The collection of bone retouchers from sub-unit III/6 comprises 6 tools (Table 15-1): four simple retouchers (Fig. 15-4, *1*), and two double retouchers (Fig. 15-8). Among the simple retouchers, pieces with moderately utilised working zones prevail (Table 15-1). Double retouchers are represented by lightly and moderately utilised pieces in equal ratios, while heavily utilised retouchers are absent (Table 15-1).

On the whole, among simple retouchers a reduction in size and weight is relative to the state of utilisation (Table 15-2).

		light				moderate			
		length (mm)	width (mm)	thickness (mm)	weight (gr)	length (mm)	width (mm)	thickness (mm)	weight (gr)
Sub-unit III/1	III/1B	·	·	·	·	·	·	·	·
	III/1	66.08	19.44	5.29	7.00	66.73	21.42	7.71	11.50
	III/1A	·	·	·	·	·	·	·	·
	III/1C **	·	·	·	·	54.69	17.38	7.35	9.00
Sub-unit III/2	III/2 **	·	·	·	·	·	·	·	·
Sub-unit III/3	III/3-3 **	·	·	·	·	·	·	·	·
	III/3-5 **	·	·	·	·	·	·	·	·
Sub-unit III/4	III/4-1 **	71.23	29.81	8.60	24.00	87.13	36.13	6.91	15.00
	III/4-4 **	61.30	23.43	8.01	11.00	·	·	·	·
	III/4-5 **	·	·	·	·	78.40	44.70	8.36	36.00
	III/4-6 **	·	·	·	·	87.06	25.42	10.71	21.00
Sub-unit III/5	III/5-1 **	·	·	·	·	·	·	·	·
	III/5-2 **	·	·	·	·	58.03	5.13	8.92	12.00
	III/5-3	·	·	·	·	·	·	·	·
	III/5-3B + III/5-3B1 **	118.33	27	9.17	36.00	91.57	28.16	8.26	22.25
	III/5-3B2 **	·	·	·	·	63.74	29.27	6.9	11
Sub-unit III/6	III/6-1 **	60.31	23.63	6.05	9.00	114.69	12.69	10.09	11.00
Sub-unit III/7	III/7-1	·	·	·	·	80.57	35.17	7.93	39
	III/7-2 **	·	·	·	·	·	·	·	·
	III/7-3 **	·	·	·	·	·	·	·	·

* one-sided double retouchers with varying degrees of utilisation
** single pieces

Table 15-3 Kabazi V. Average dimensions of double bone retouchers.

Sub-unit III/7

Sub-unit III/7 yielded a total of 10 bone retouchers (Table 15-1); all were made on fragments of tube bones.

Simple retouchers are more common than double retouchers. Among simple retouchers, slightly utilised instruments are the most numerous; only one heavily utilised simple retoucher was recovered from archaeological level III/7-1. At the same time, among double retouchers heavily utilised instruments prevail (Table 15-1); slightly utilised double retouchers are absent.

On the whole, the size and weight of double retouchers from sub-unit III/7 exceed values recorded for simple retouchers (Tables 15-1 and 15-2).

Unit IV

Bone retouchers were found in levels IV/2 and IV/3. The collection of bone retouchers from Unit IV is the smallest at Kabazi V (Table 15-1). These tools are exclusively simple retouchers with moderate and heavy degrees of utilisation of their working surfaces. Further, these retouchers are the smallest and lightest among the retouchers from Kabazi V. All pieces were made on tube bone fragments.

Pebble Retouchers and Hammerstones

In the following, stone retouchers / hammerstones from Kabazi V are described in much the same way as bone retouchers above, i.e. on the basis of the same six attributes.

Number of working surfaces

Pebble retouchers / hammerstones differ from bone retouchers in the number of potential working surfaces; indeed this can be explained quite simply

heavily				combined *			
length (mm)	width (mm)	thickness (mm)	weight (gr)	length (mm)	width (mm)	thickness (mm)	weight (gr)
77.11	21.45	8.11	14.25	.	.	.	.
74.07	25.81	8.62	15.80	78.04	20.55	8.26	13.33
62.14	31.28	11.05	18.00	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	77.61	28.86	10.64	18
.	.	.	.	86.1	16.31	5.72	10.00
58.52	36.18	8.95	29.00	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	68.3	31.22	9.95	20.00
66.61	15.93	9.92	9.00	.	.	.	.
60.1	26.18	13.39	19.00	.	.	.	.
66.89	23.78	7.23	11.00	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
53.97	18.47	8.60	7.00	.	.	.	.
72.83	23.61	10.92	18.00	.	.	.	.

Table 15-3 Continued.

by the natural characteristics of pebbles. Generally speaking, pebbles from the present day Alma River can be assigned to one of two different shapes. First, there are flat pebbles with sub-rectangular or sub-oval outlines, and, second, there are rounded / spherical shaped pebbles. The latter were never used as retouchers / hammerstones in Kabazi V occupations. Depending on the number of working surfaces, pebble retouchers / hammerstones are referred to as either one-sided (Fig. 15-13, *1*, *2*; 15-14; 15-15), two-sided (Fig. 15-16; 15-17; 15-18; 15-19; 15-20), three-sided (Fig. 15-21) or four-sided. The two-sided retouchers and hammerstones are subdivided into two-sided opposite (Fig. 15-16; 15-18; 15-19) and two-sided adjacent pieces (Fig. 15-17).

Number of working areas/zones

According to the number of working areas, stone retouchers and hammerstones are assigned to the following types: simple (single) (Fig. 15-13, *2*; 15-14; 15-15; 15-16; 15-17), double (Fig. 15-13, *1*; 15-18), triple and fourfold (tetrad) tools. Also, some pebbles feature different numbers of working areas on working surfaces (Fig. 15-19; 15-21). Such pieces are referred to as combined forms. To simplify matters, in the following, the combined number of working areas on these pieces will be displayed according to the number of working surfaces using a slash «/». For example, the retoucher in Figure 15-19 is a double-side combined (2/1) piece, i.e. the double-sided retoucher has two working areas on one surface, and on its opposite surface just one working area.

Degree of utilisation

Pebble retouchers and hammerstones comprise three different types; they can be slightly utilised (Fig. 15-13, *1*; 15-16; 15-17; 15-18), moderately utilised (Fig. 15-13, *1*, 15-14) or heavily utilised (Fig. 15-15). Of 28 pebbles, 20 have two or more working surfaces which show different states of utilisation on each surface. The most frequently observed combinations is slight / moderate (N=9) (Fig. 15-19) and slight / heavy (N=9) (Fig. 15-20) utilisation. The combination moderate / heavy (Fig. 15-21) utilisation is less common

Size

Maximum length, width and thickness were measured and recorded.

Weight of retouchers and hammerstones

Concerning the weight of retouchers and hammerstones, each pebble is unique. Complete tools weigh a minimum of 13 grams and a maximum of 554 grams.

Type of material

River pebbles picked up in the floodplain of the Alma River served as "blanks" for stone retouchers and hammerstones at Kabazi V. In 71 % of cases pebbles are of sandstone, with limestone pebbles making up 25 % and quartz pebbles 4 % of raw materials.

Description of Pebble Retouchers and Hammerstone Assemblages

Sub-unit III/1

The assemblage of pebble retouchers and hammerstones from sub-unit III/1 is the most numerous discovered at Kabazi V, it constituting about 70 % of all pebble retouchers and hammerstones from the site. Of the 34 pebble retouchers and hammerstones from this sub-unit, 27 stem from archaeological level III/1A (Table 15-4).

Retouchers on pebbles are represented by 23 pieces (Table 15-4), comprising 6 one-sided tools (Fig. 15-13, *2*), 9 two-sided pieces (Fig. 15-17; 15-18), and 3 three-sided items; 5 pieces could not be assigned to a particular type (Fig. 15-20).

Among one-sided and two-sided retouchers simple types prevail (Fig. 15-13, *2*; 15-17); these include 5 one-sided simple (single) tools, and 4 two-sided simple (single) tools (Table 15-4). Double types comprise 1 one-sided retoucher, and 3 two-sided retouchers (Fig. 15-18). Among the latter, one retoucher displays a combined system of working areas (two-sided combine; 2/1). The three-sided retouchers were assigned to simple, combined and unidentifiable types, respectively.

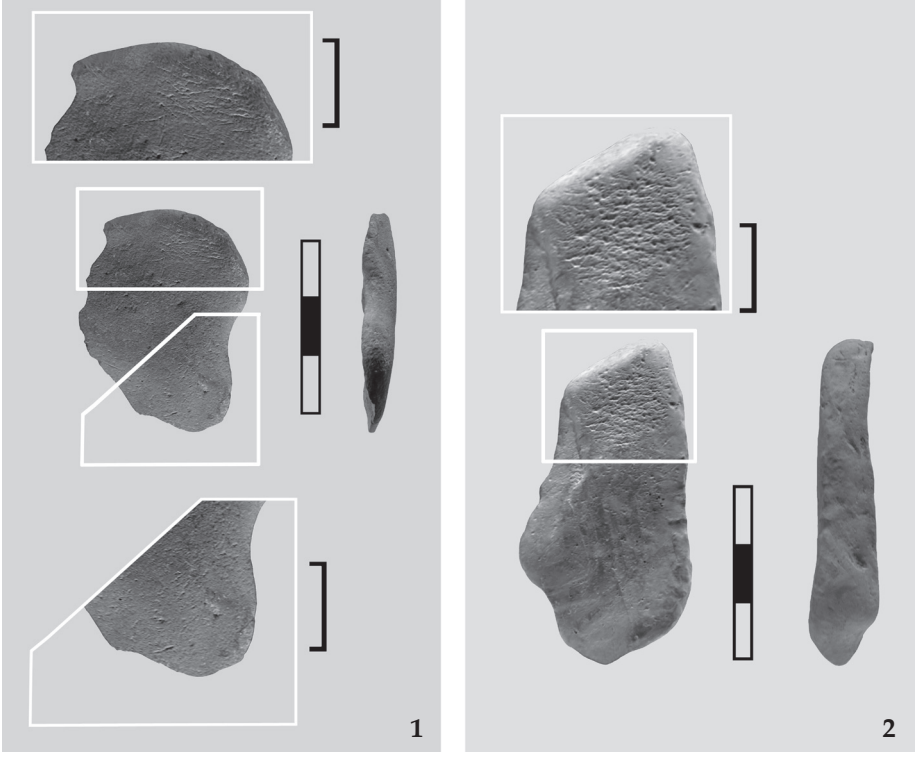


Fig. 15-13 Kabazi V, levels III/3-3A (1), III/1A (2), pebble retouchers: 1 – one-sided double, slightly utilised; 2 – one-sided simple, moderately utilised.

Fig. 15-14 Kabazi V, level III/1A, pebble hammerstone: one-sided simple, moderately utilised.

Fig. 15-15 Kabazi V, level III/3-3, pebble hammerstone: one-sided simple on distal end, heavily utilised.

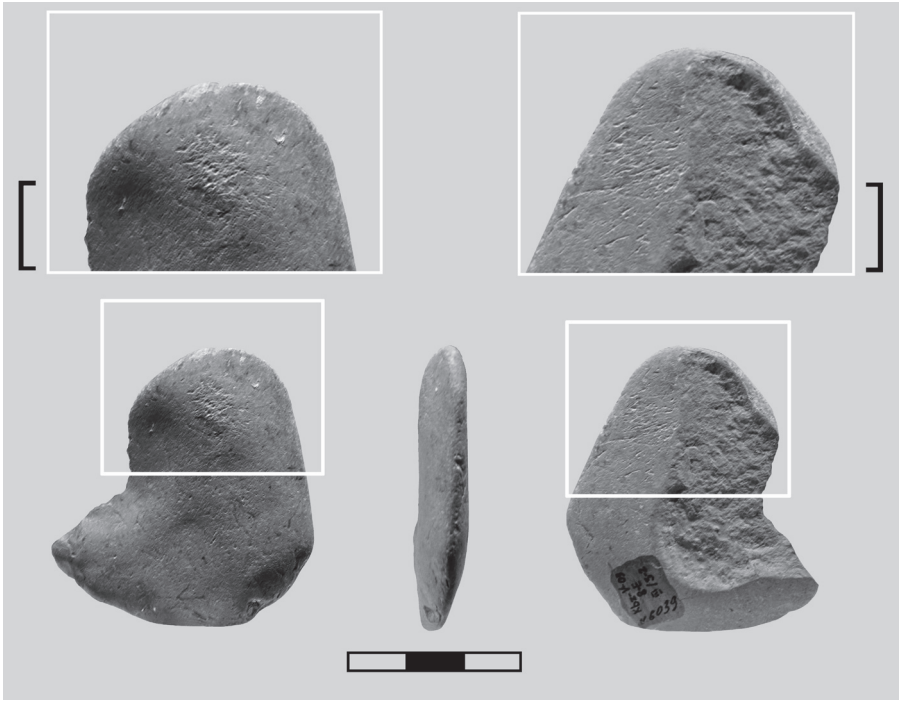


Fig. 15-16 Kabazi V, level III/3-2, pebble retoucher: two-sided simple, lightly utilised.

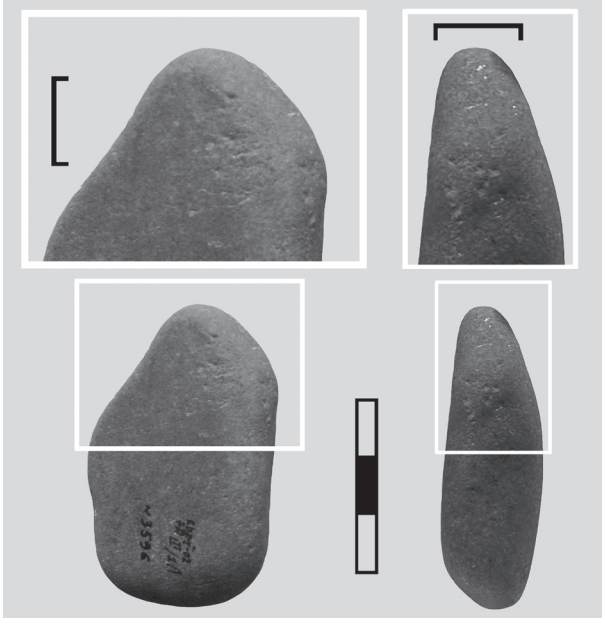


Fig. 15-17 Kabazi V, level III/1A, pebble retoucher: two-sided simple, adjacent, lightly utilised.

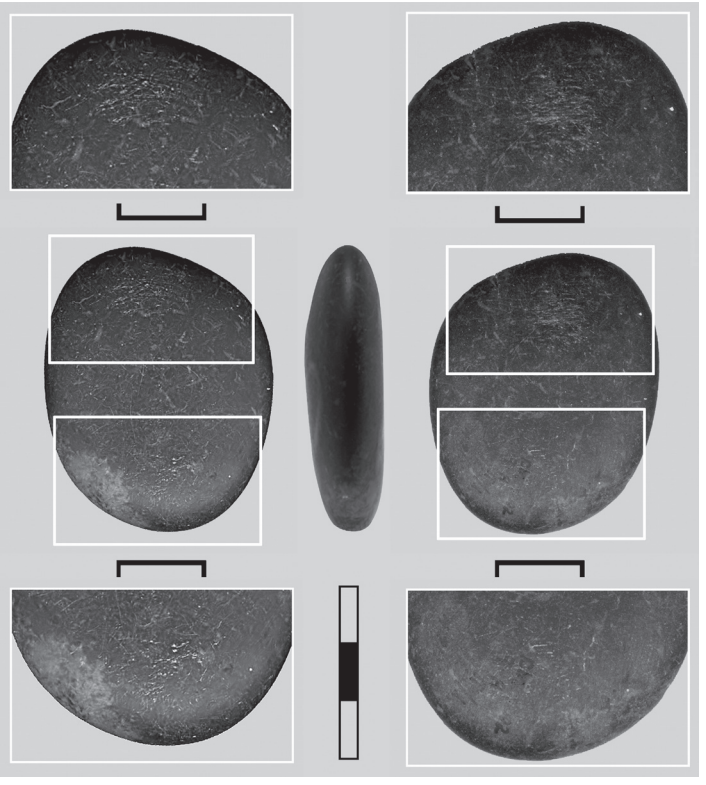


Fig. 15-18 Kabazi V, level III/1, pebble retoucher: two-sided double, lightly utilised.

Among retouchers from sub-unit III/1 there can be observed a tendency towards an increased degree of utilisation relative to the number of working surfaces. Whereas 5 of 6 pebbles used as one-sided simple retouchers show only a slight utilisation of their working surfaces, with the remaining pebble displaying moderate utilisation (Fig. 15-13, *2*), only 2 two-sided retouchers are slightly utilised (Fig. 15-18), with one tool showing slight/moderate degrees of exploitation, two pieces with slight/heavy utilisation (Fig. 15-20), one moderately utilised, one medium/heavily utilised, and two heavily utilised pieces.

Retouchers from sub-unit III/1 are characterised by the following parameters – maximum length: 94.5 mm, minimum length: 31.17 mm; maximum width: 68.89 mm, minimum width: 27.16 mm; maximum thickness: 31.7 mm, minimum thickness: 8.28 mm; maximum weight: 93 gram, minimum weight: 14 gram.

Among the pebbles used as retouchers 18 pieces are on sandstone, 4 are on limestone, and 1 piece is on a sedimentary stone.

The collection of hammerstones from sub-unit III/1 comprises a total of 11 tools (Table 15-4); 10 stem from archaeological level III/1A (Fig. 15-14; 15-21) and one from level III/1C.

The hammerstone assemblage features 3 one-sided tools (Fig. 15-14), 4 two-sided tools, 3 three-sided tools (Fig. 15-21), and one four-sided piece. All one-sided hammerstones are characterised by just one working zone (Fig. 15-14). In the case of two hammerstones, working areas are located at the distal end of pebbles. There are two simple, two-sided hammerstones, one of which has adjacent working surfaces. Among the remaining tools are 1 two-sided double and 1 two-sided combined (3/1) piece. Three-sided hammerstones are all combined types; these feature both three-sided combined (1/2/1) (Fig. 15-21) and three-sided combined (2/1/2) types.

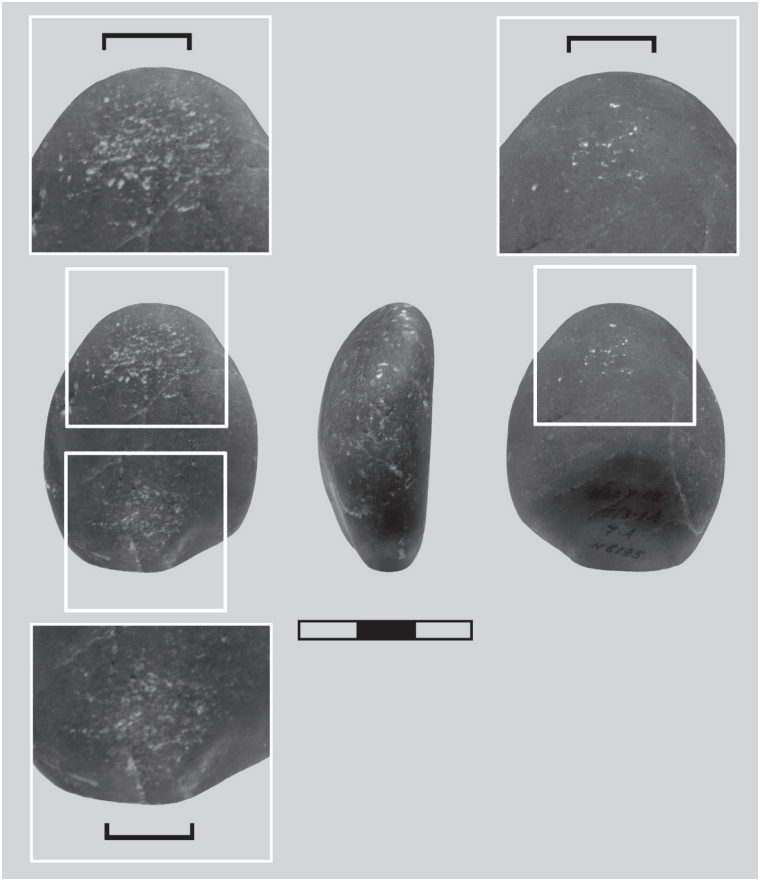


Fig. 15-19 Kabazi V, level III/3-1, pebble retoucher: two-sided combined – 2/1, moderately / slightly utilised.

Further, there is 1 simple (single) and 1 four-sided hammerstone; the latter is of a combined type (4/1/1/1).

Once again, among stone retouchers from this sub-unit it can be observed that the number of working surfaces is relative to increased utilisation of working zones. One-sided hammerstones consist of equal numbers of slightly utilised and moderately utilised pieces (Fig. 15-14), with only one heavily utilised pebble. Among two-sided hammerstones there are heavily, slightly/moderately, slightly/heavily and moderately/heavily (Fig. 15-21) utilised pebbles. Further, three-sided and four-sided hammerstones are characterised by slight/heavily utilisation of their working zones. There is only one three-sided hammerstone with slight/moderate exploitation.

Hammerstones are much heavier than retouchers. The metric parameters of hammerstones are as follows – maximum length: 90.75 mm, minimum length: 54.42 mm; maximum width: 84.76 mm, minimum width: 37.73 mm; maximum thickness: 49.22 mm, minimum thickness: 22.01 mm; maximum weight: 356 grams, minimum weight: 126 grams. Hammerstones were made on sandstone (10 items) and limestone (1 item) pebbles.

Sub-unit III/2

Only one stone retoucher was discovered in sub-unit III/2 (Table 15-4). This is a bifacial backed tool (Fig. 15-22) made on a flint plaquette. Use traces are located adjacent to its back. Retouchers on flint are known from a number of Crimean Middle Palaeolithic sites, such as Chokurcha I, Zaskalnaya V, and Zaskalnaya VI (Stepanchuk 1993; Chabai 2004b, fig. 24-11, p. 399). However, in these assemblages the working zone was situated at the bulb of percussion.The retoucher from level III/2 is a one-sided simple (single) retoucher with a heavily utilised working zone (Fig. 15-22). It is 88.44 mm long, 40.98 mm wide, 15.88 mm thick, and it weighs 61 grams.

Fig. 15-20 Kabazi V, level III/1C, pebble retoucher: two-sided unidentifiable, heavily / slightly utilised.

Sub-unit III/3

The collection of stone retouchers and hammerstones recovered from sub-unit III/3 comprises a total of 13 tools, with 11 retouchers and 2 hammerstones (Table 15-4). Among the pebbles used for retouchers 4 are on sandstone, 6 are on limestone, and 1 is on quartz. Both hammerstones were made on sandstone pebbles.

Retouchers are represented by three one-sided (Fig. 15-13, *1*), five two-sided (Fig. 15-16; 15-19), one three-sided, and two unidentifiable pieces. Whereas the one-sided retouchers all have two working areas (Fig. 15-13, *1*), the two-sided retouchers comprise 2 two-sided simple (single) pieces, 2 two-sided combined pieces, and one unidentifiable item. The only three-sided retoucher belongs to the combined (2/1/2) type. Most pieces are slightly to moderately utilised, whereby one-sided retouchers display generally slight states of utilisation (Fig. 15-13, *1*); only 1 one-sided retoucher features a combination of slight/moderate utilisation. Two-sided retouchers comprise one slightly utilised tool (Fig. 15-16), three slightly/moderately utilised pieces (Fig. 15-19), and one slightly/heavily utilised tool. The unidentifiable retouchers show slight and moderate degrees of utilisation.

The retouchers from sub-unit III/3 display the following metric parameters – maximum length: 68.43 mm, minimum length: 39.3 mm; maximum width: 44.57 mm, minimum width: 29.1 mm; maximum thickness: 21.25 mm, minimum thickness: 6.22 mm; maximum weight: 69 grams, minimum weight: 13 grams.

One hammerstone was found in each of the archaeological levels III/3-3 and III/3-3A (Table 15-4). Typologically, these are one-sided simple (single) tools with slight and heavy (Fig. 15-15) degrees of working zone utilisation. The hammerstone from level III/3-3 is 132.32 mm long and 67.78 mm wide. It has a maximum thickness of 44.47 mm, and weighs 554 grams. The other hammerstone is 103.79 mm long and 67.67 mm wide. It has a maximum thickness of 49.26 mm, and weighs 339 grams.

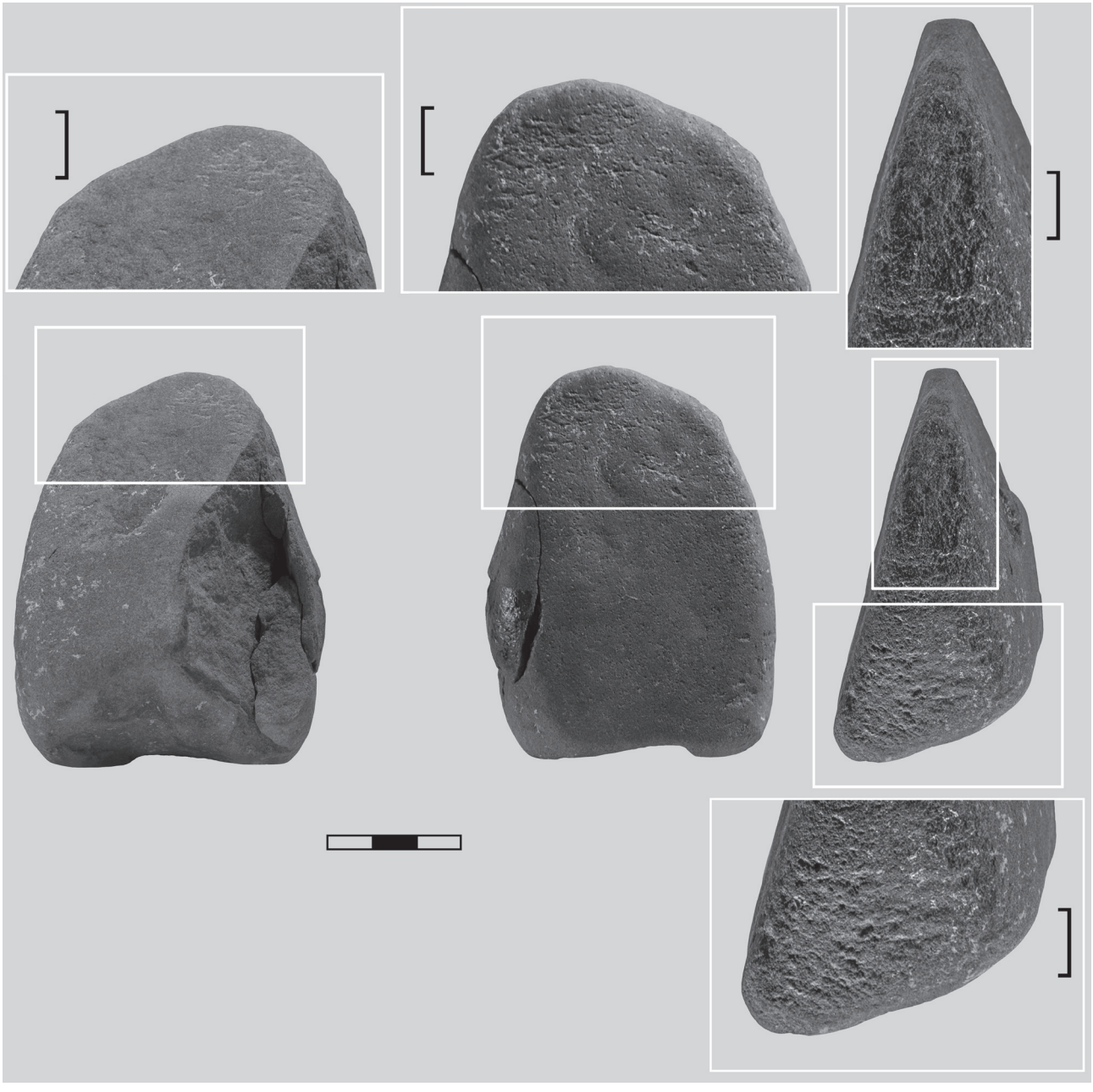


Fig. 15-21 Kabazi V, level III/1A, pebble hammerstone: three-sided combined – 1/2/1, moderately / heavy / moderately utilised.

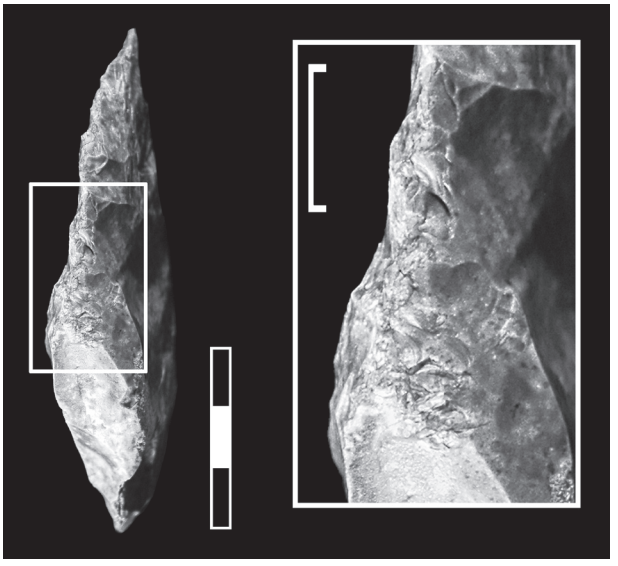


Fig. 15-22 Kabazi V, level III/2, flint retoucher on bifacial tool: one-sided simple, heavily utilised.

Sub-unit III/4

One pebble retoucher and one pebble hammerstone were found in level III/4-1 (Table 15-4). This is a two-side simple (single) retoucher which shows signs of slight/moderate utilisation of its working areas. The retoucher is on a sandstone pebble, 70.43 mm long, 36.63 mm wide, and 17.98 mm thick; it weighs 54 grams.

The hammerstone is a two-sided simple (single) type showing slight/moderate degrees of utilisation in its working areas. It is fragmented. The hammerstone is on a sandstone pebble, 118.7 mm long, 56.99 mm wide, and 15.83 mm thick; it weighs 173 grams.

		Sub-unit III/1			Sub-unit III/2	Sub-unit III/3					Unit III/4	
		III/1	III/1A	III/1C	III/2	III/3-1	III/3-1A	III/3-2	III/3-3	III/3-3A	III/4-1	Total:
Retouchers	one-side simple	1	3	1	1	·	·	·	·	·	·	6
	one-side double	1	·	·	·	·	·	·	1	2	·	4
	two-side simple	·	2	1	·	·	·	1	1	·	·	5
	two-side double	1	1	·	·	·	·	·	·	·	1	3
	two-side combined	·	1	·	·	·	1	·	·	1	·	3
	two-side unidentifiable	·	3	·	·	·	·	·	1	·	·	4
	three-side simple	·	1	·	·	·	·	·	·	·	·	1
	three-side combined	·	·	·	·	·	·	·	1	·	·	1
	three-side unidentifiable	·	1	·	·	·	·	·	·	·	·	1
	unidentifiable	1	4	·	·	1	·	·	·	1	·	7
	Total:	**4**	**16**	**2**	**1**	**1**	**1**	**1**	**4**	**4**	**1**	**35**
Hammerstones	one-side simple	·	3	·	·	·	·	·	1	1	·	5
	two-side simple	·	2	·	·	·	·	·	·	·	1	3
	two-side double	·	1	·	·	·	·	·	·	·	·	1
	two-side combined	·	1	·	·	·	·	·	·	·	·	1
	three-side simple	·	·	1	·	·	·	·	·	·	·	1
	three-side combined	·	3	·	·	·	·	·	·	·	·	3
	four-side combined	·	1	·	·	·	·	·	·	·	·	1
	Total:	·	**11**	**1**	·	·	·	·	**1**	**1**	**1**	**15**

Table 15-4 Kabazi V. Classification of stone retouchers and hammerstones.

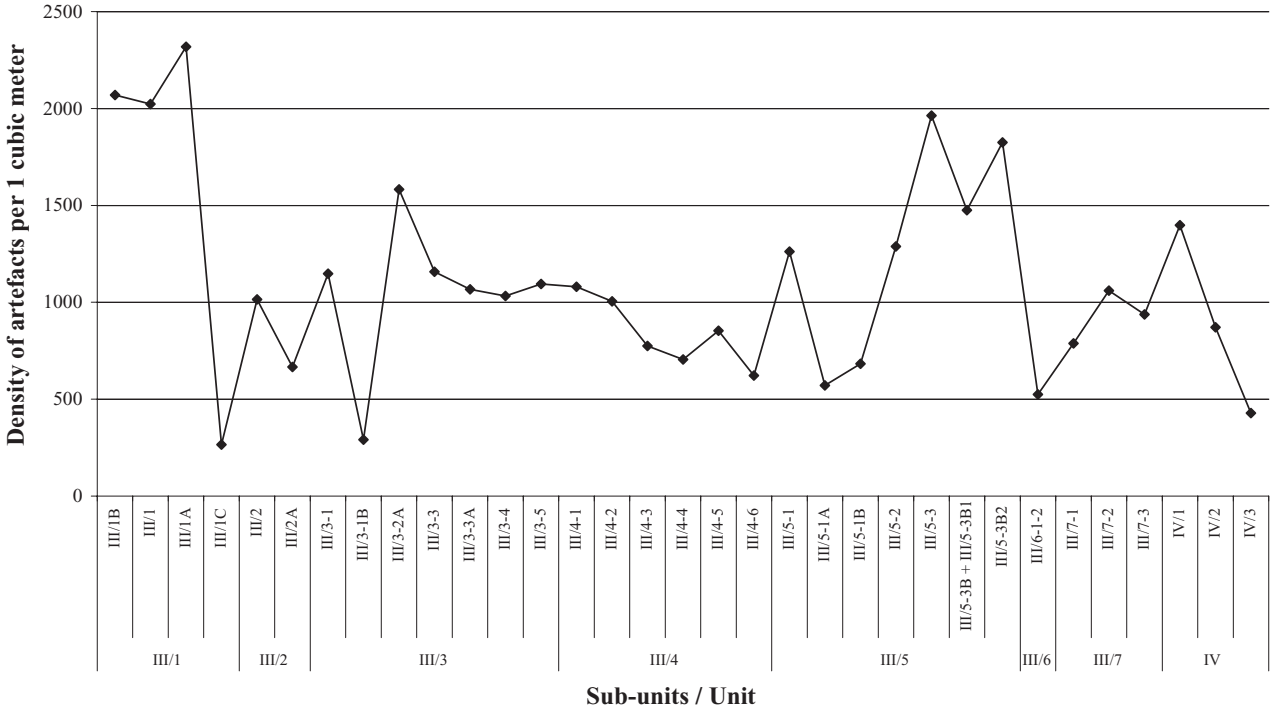


Fig. 15-23 Kabazi V: density of artefacts per cubic metre, by sub-units.

The Comparative Characteristic of Bone Retouchers

Even though investigations at Kabazi V involved the excavation of archaeological levels in an area no larger than 10 square metres, bone retouchers are certainly not equally distributed throughout. Accordingly, bone retouchers are most numerous in the Crimean Micoquian industries of sub-units III/1 and III/5 (Table 15-1). On the other hand, in sub-units with mixed Levallois-Mousterian and Micoquian collections (sub-unit III/4), or in which Levallois-Mousterian collections have been attributed to the Micoquian (sub-unit III/3), far fewer items were recovered; in Unit IV, a Levallois-Mousterian complex that was investigated in an area of about 20 square metres, only two bone retouchers were found. Seeing as bone retouchers are tools used in the treatment of flint treatment it is logical to assume that the quantity of retouchers is relative to the intensity of flint exploitation. A further telltale sign for the intensity of flint treatment in different archaeological levels is the density of stone artefacts per cubic metre (Veselsky 2003, Chabai 2004c). Figure 15-23 shows that this assumption works only for Crimean Micoquian collections; whereas in sub-units III/1 and III/5 high bone retoucher frequency correlates with the greatest intensity of flint exploitation, and in sub-unit III/2 a low intensity of flint processing is apparently confirmed by the smallest number of bone retouchers, in sub-units III/3, III/4 and Unit IV similar correlations cannot be observed. At the same time, the industrial heterogeneity of sub-units III/3 and III/4 assemblages should be underlined, as well as the clear Levallois-Mousterian definition for the Unit IV assemblage. Thus, bone retouchers are a prominent feature of Crimean Micoquian collections. These instruments might be connected with bifacial tool production. For Levallois-Mousterian industries the presence of bone retouchers in archaeological collections is uncommon.

In all occupations at Kabazi V, simple bone retouchers dominate assemblages (Fig. 15-24), the only exceptions being levels III/4-1 and III/4-4 in sub-unit III/4, and sub-units III/6 and III/7, in which double retouchers are more common (Table 15-1).

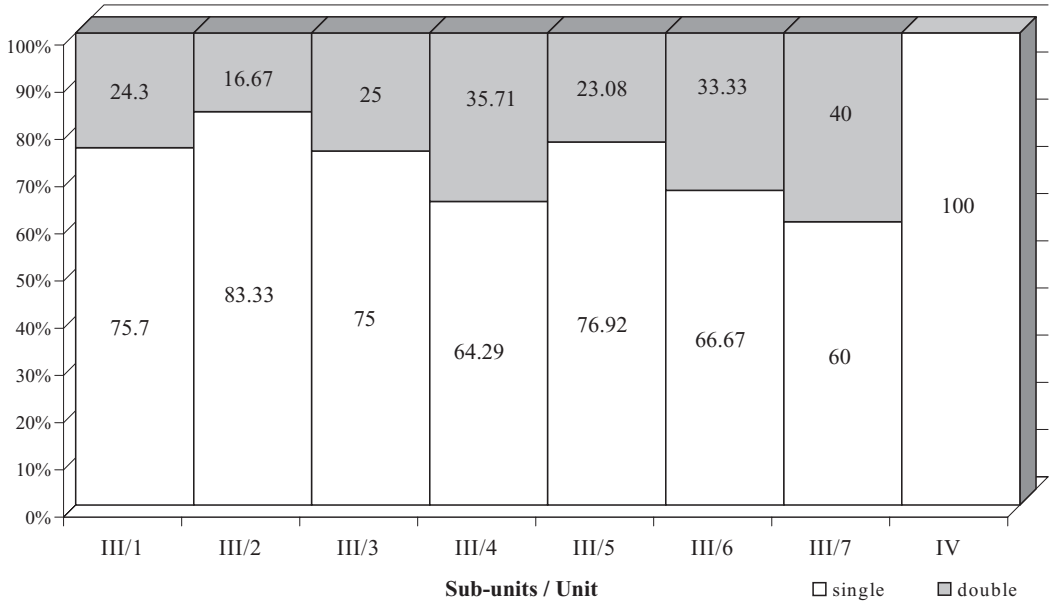


Fig. 15-24 Kabazi V: percentages of simple and double bone retouchers, by sub-units.

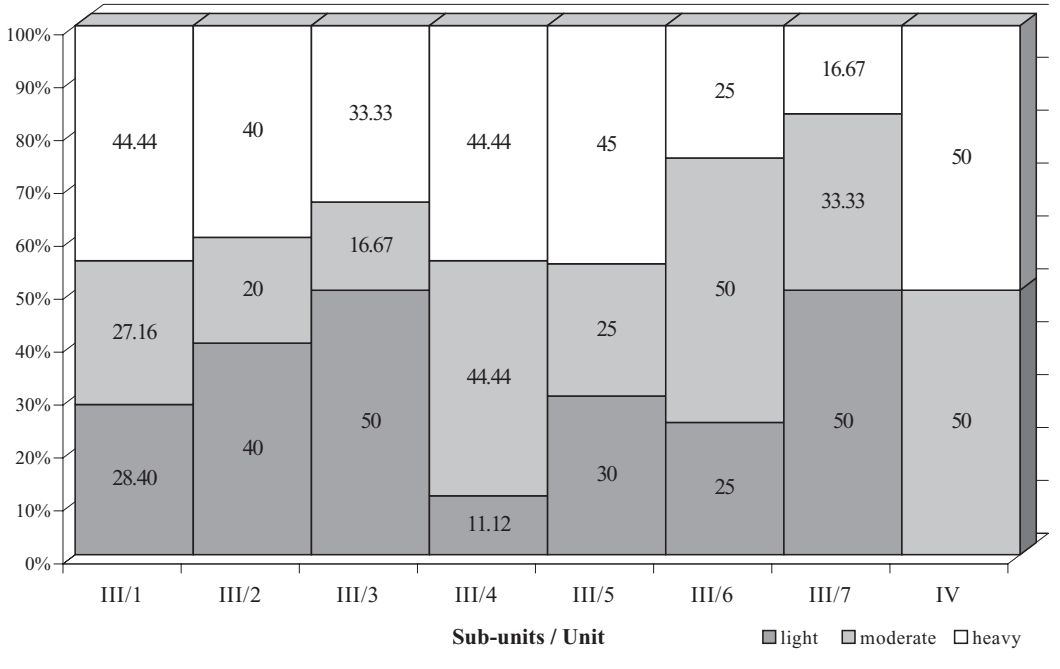


Fig. 15-25 Kabazi V: distribution of simple bone retouchers in sub-units, by degree of utilisation.

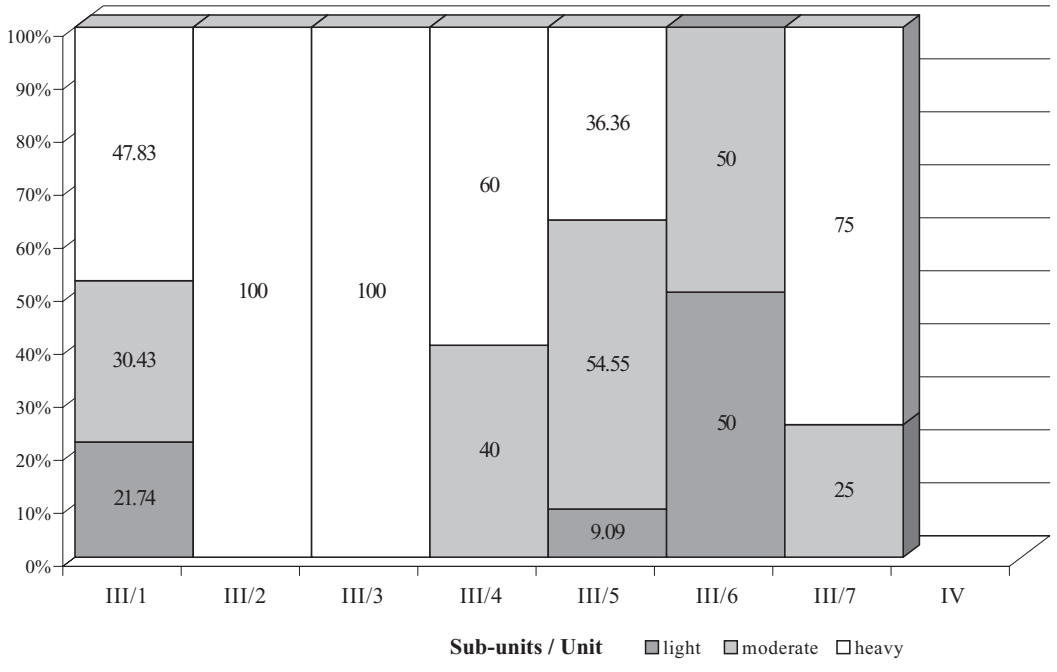


Fig. 15-26 Kabazi V: distribution of double bone retouchers in sub-units, by degree of utilisation.

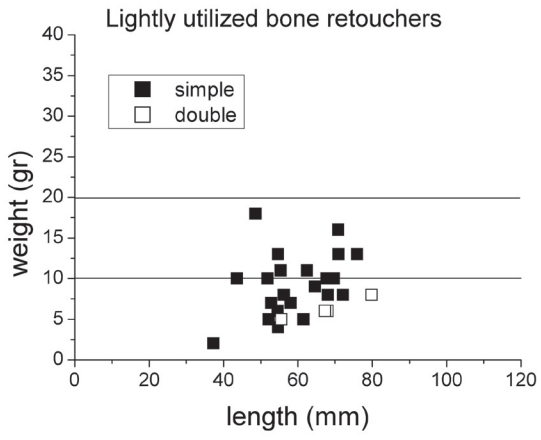
In fact, in sub-unit III/4, as well as in sub-units III/6 and III/7, double retouchers constitute the highest percentages of assemblages (about 33.33 %), while in other sub-units the numbers of double bone retouchers does not exceed 25 % (Fig. 15-24), and in sub-unit IV are completely absent.

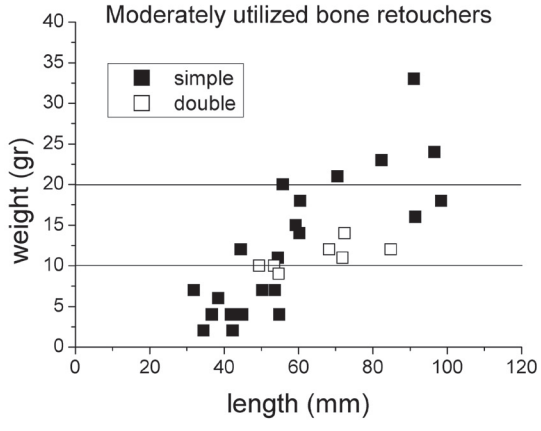
The highest number of slightly utilised simple bone retouchers was found in sub-unit III/3 and III/7 assemblages. In fact, the percentage of slightly utilised bone retouchers is equal to the sum of moderately and heavily utilised instruments (Fig. 15-25). However, the assemblages of sub-units III/1, III/4 and III/5 are characterised by a dominance of heavily utilised simple retouchers over slightly utilised simple retouchers.

Most double retouchers are usually heavily utilised tools (Fig. 15-26), with the exception of pieces from sub-units III/5 and III/6. In sub-unit III/5 retouchers with medium utilisation dominate.

There are two main tendencies regarding correlations between metrical attributes and the state of utilisation among simple bone retouchers. The first of these, which is visible in archaeological levels III/1B, III/1, III/1A and III/5-3B2, is the observation that size and weight increase relative to an increase in utilisation (Table 15-2). The second tendency, noted in archaeological levels III/4-5 and III/5-2, is just the reverse, i.e. that size and weight decrease relative to an increase in utilisation. Similar tendencies are also noted for double retouchers, the first tendency being characteristic for double retouchers from archaeological level III/1, and the second for level III/5-3B + III/5-3B1 (Table 15-3).

An explanation for these two tendencies may lie in the availability of big bone fragments during occupations. During occupations characterised by higher rates of fragmentation of faunal remains (levels III/1B, III/1, III/1A and III/5-3B2) the size and weight of bone retouchers are subordinate to those of pieces from occupations with not so pronounced bone fragmentation (III/4-5, III/5-2 and III/5-3B + III/5-3B1). However, in both cases the main criteria for selection of bones for retouchers would have been weight (Fig. 15-27; 15-28).





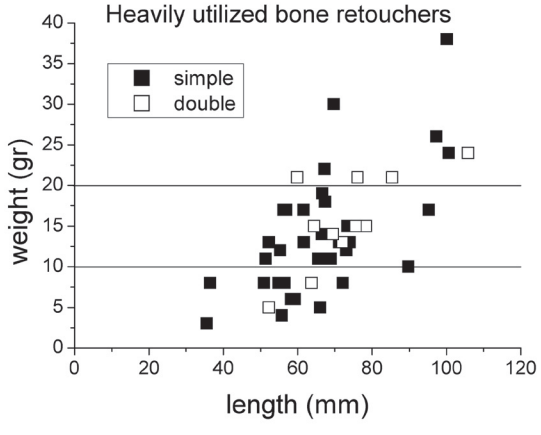
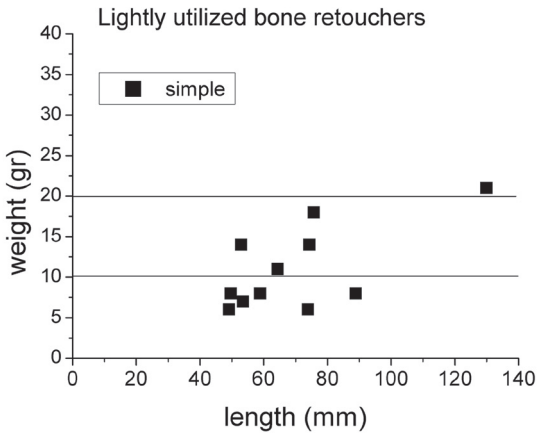
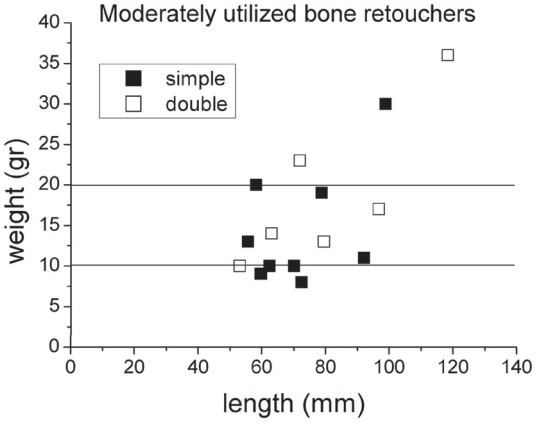


Fig. 15-27 Kabazi V, sub-unit III/1: length/ weight scatter-plot for simple and double bone retouchers, by degree of utilisation.





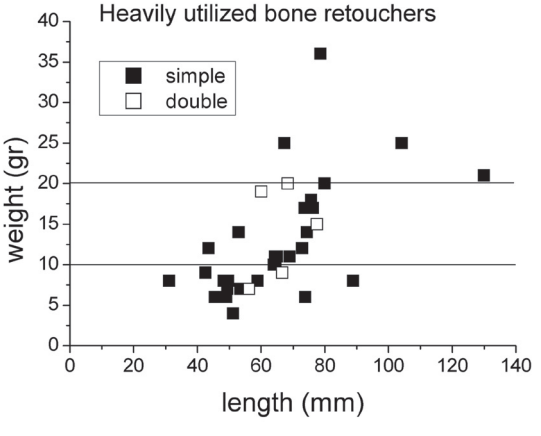


Fig. 15-28 Kabazi V, sub-unit III/5: length/ weight scatter-plot for simple and double bone retouchers, by degree of utilisation.

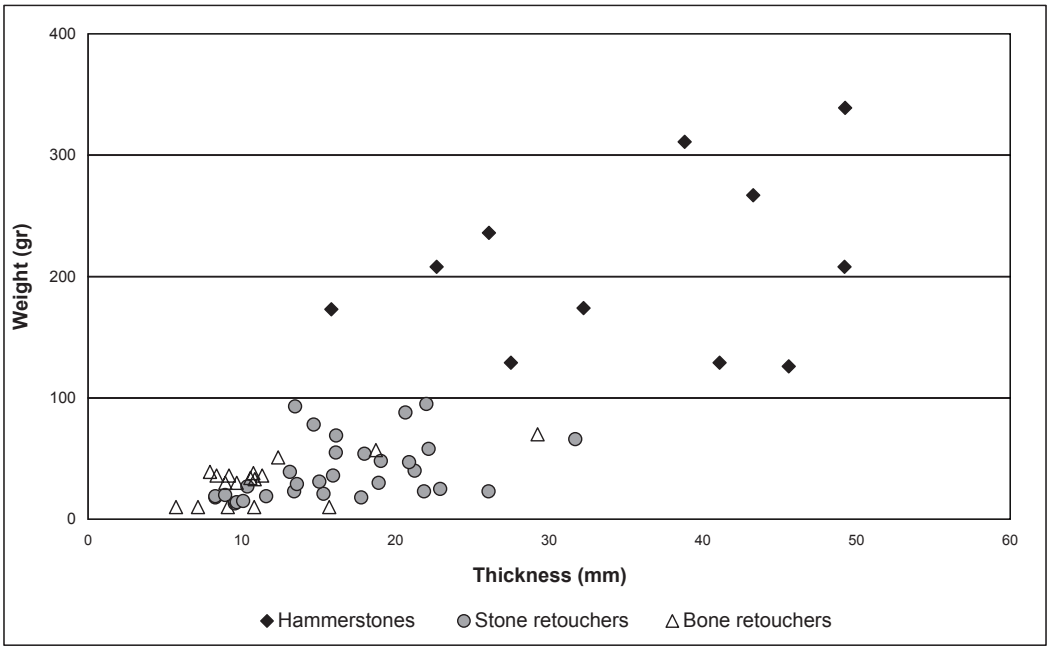


Fig. 15-29 Kabazi V: weight/ thickness scatterplot of distribution of bone retouchers, pebble retouchers and hammerstones.

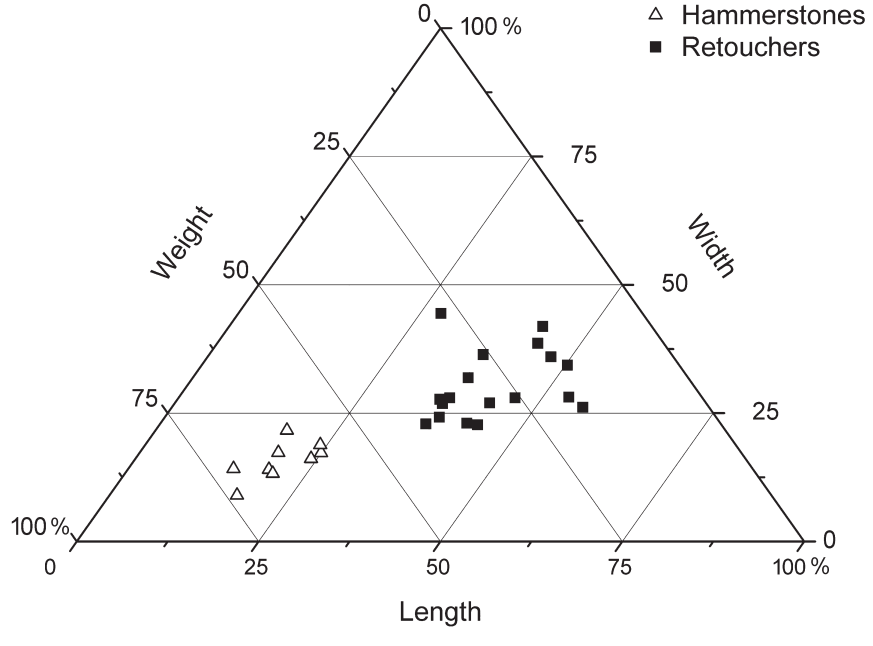


Fig. 15-30 Kabazi V: scatterplot of distribution of pebble retouchers and hammerstones, by length, width and weight.

From a functional perspective, flint treatment tools from Kabazi V comprise retouchers and hammerstones, whereby weight would have been the most important criteria when choosing a particular bone or pebble for this purpose, with all other characteristics secondary. The heaviest bone tool stems from archaeological level III/2 and is 70 grams.

Comparative analyses of stone retouchers / hammerstones and bone retouchers has revealed characteristics which are shared by both tool types, and include such factors as weight and maximum thickness (Fig. 15-29); for example, both pebble and bone retouchers do not exceed 100 grams.

A scatterplot showing length, width and weight of all complete pebble tools suggests the presence of two separate clusters, the first representing stone retouchers, and the second hammerstones (Fig. 15-30).

On the whole, the numbers and typological characteristics of pebble tools used for flint treatment stands in direct relation to the degree of processing of raw materials on site. An increase in the intensity of occupations leads to an increase in the number of tools with poly-sided working surfaces, as well as to and to an increase in exploitation of working areas (Table 15-4; Fig. 15-23).

Traces from blows found on hammerstones are either linear (Fig. 15-21) or conic (Fig. 15-15), which probably attests to the usage of the hammerstone on differently shaped surfaces, e.g. on sharp edges (the edge of a bifacial tool) or a plane (the natural surface of a flint nodule or a core platform).

All bone / pebble tools that were used for flint treatment were employed during different stages of flint tool production or core reduction. It is most likely that bone retouchers were the most important tools in bifacial tool production, their light weight and soft consistency making them particularly practical in the final stages of bifacial tool manufacture, e.g. for the retouching of working edges. It is also possible that bone retouchers were employed at crucial moments, for example when retouching the tips of points on bifacial tools, when excessive weight and hardness may have led inadvertently to the fragmentation of important tool parts.

Abstract

КАБАЗИ V: КОСТЯНЫЕ И КАМЕННЫЕ ОРУДИЯ ДЛЯ ОБРАБОТКИ КРЕМНЯ

ВЕСЕЛЬСКИЙ А.П.

В ходе последних археологических исследований на среднепалеолитической стоянке Кабази V была обнаружена, пожалуй, одна из самых многочисленных коллекций костяных и каменных орудий для обработки кремня. В общей сложности коллекция составляет 255 предметов, среди которых 205 экземпляров являются костяными ретушерами, 49 орудиями на гальках 1 орудие на кремне. Анализ столь многочисленной коллекции орудий кремнеобработки позволил разработать для них типологическую характеристику и провести их сравнительный анализ.

Костяные и каменные орудия кремнеобработки обнаружены в большинстве археологических горизонтов, исследованных на стоянке Кабази V. Почти 78 % всей коллекции костяных ретушеров происходит из двух пачек горизонтов III/1 и III/5.

Наибольшее количество орудий на гальках также характерно для пачки горизонтов III/1, где они составляют почти 70 % от их общего количества. Более того, подавляющее большинство орудий на гальках пачки горизонтов III/1, а именно 27 из 34, происходит из археологического горизонта III/1A.

Принципы классификации орудий для расщепления кремня состоят в следующем. Все орудия кремнеобработки стоянки Кабази V были обработаны по шести основным параметрам: количество рабочих поверхностей, количество рабочих участков, степень утилизации рабочих участков, размер, вес и тип материала.

Статистический анализ орудий на гальках и кости показал, что распределение орудий кремнеобработки по количеству рабочих поверхностей, количеству и степени утилизации рабочих участков непосредственно зависит от интенсивности процессов обработки сырья на памятнике. В целом, эту закономерность можно сформулировать следующим образом: чем выше интенсивность использования кремневого сырья, тем выше содержание орудий кремнеобработки с несколькими рабочими поверхностями и наличием на них большего количества рабочих зон с преобладанием высокой и, в меньшей степени, средней степени изношенности рабочих участков. Одним из основных отличий костяных ретушеров от галечных является то, что все исследованные на стоянке Кабази V орудия на кости характеризуются наличием только одной рабочей поверхности. Этот факт обусловлен типом самой заготовки, использованной в качестве орудия. Заготовками для костяных ретушеров служили преимущественно фрагменты трубчатых костей, в единичных случаях – ребер.

Наличие зависимости между количеством костяных орудий кремнеобработки и степенью интенсивности использования кремневого сырья позволяет сделать еще один важный вывод. Данная зависимость наблюдается исключительно для микокских слоев (пачки горизонтов III/1, III/2, III/5). Для гомогенных леваллуа-мустьерских коллекций эта закономерность не характерна. Даже при наличии высокой интенсивности использования сырья в леваллуа-мустьерских комплексах костяные орудия кремнеобработки полностью отсутствуют. Таким образом, наличие костяных ретушеров является характерной особенностью микокских коллекций, в которых наборы орудий для обработки кремня использовались для производства двусторонних острий и скребел. Для леваллуа-мустьерских индустрий наличие костяных ретушеров в археологических коллекциях не характерно.

Функционально орудия для обработки кремня представлены ретушерами и отбойниками. Все орудия на кости относятся к ретушерам. По сравнению с орудиями на гальках костяные ретушеры значительно легче. Причем, легкость костяных ретушеров и мягкий тип материала позволяет предполагать, что эти орудия использовались на заключительных стадиях производства двусторонних орудий, таких как ретуширование рабочих лезвий. Не исключено, что применение костяных ретушеров имело значение в определенных ответственных моментах изготовления двусторонних острий и скребел, например, ретуширование острийных участков, когда излишний вес и чрезмерная твердость могли привести к фрагментации важных элементов орудия.