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EXCAVATIONS AT DZUDZUANA CAVE, WESTERN GEORGIA (1996–1998): PRELIMINARY RESULTS.

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Introduction

In recent years, a renewed interest in the emergence and dispersals of Modern Humans has been generated, mainly due to genetic studies that indicate a recent origin for this species. The dating of the cultural transition from the Middle to the Upper Paleolithic, the nature of the process of Modern Human diffusion, and the need to test the hypothesis that the migration began in either East Africa (Klein 1995) or the Levant (Stringer 1989), draws attention to intermediate regions. In particular, countries that lie at the Eurasian-African crossroads, such as Turkey and Georgia, have in recent years become the focus of new field projects (*e.g.*, Otte *et al.* 1999).

Western Georgia, located between the Caucasus Ranges, the Likhi hills, and the Black Sea, is a region known for its wealth of prehistoric sites (fig. 1). It is here that the majority of the Upper Paleolithic sites of the southern Caucasus (incorporating Georgia, Armenia and Azerbaijan) have been discovered. Yet past excavations in several Upper Paleolithic sites failed to establish a valid sequence of assemblages and/or cultures (Kozlowski 1972; Liubin 1989; Meshveliani 1989), although numerous tool types (including antler points) clearly resemble known types from Eastern Europe.

The previous excavations of Upper Paleolithic sites suffered from several problems:

1. Stratigraphic observations were not systematic and excavation units were thick.
2. Mixing of layers created the false impression that there are "transitional MP/UP" assemblages.
3. The study of animal bones was carried out for paleontological reasons, resulting in lists of the presence/absence of species. Fragments were rejected and dumped, and the available collections cannot serve as a basis for studying patterns of butchering, cut and gnaw marks or for calculating the percentage of burnt bones.
4. Radiocarbon readings are scarce and largely unpublished.
5. Most cave sites were emptied in the course of the excavations.

We decided to renew the excavation at Dzudzuana Cave because it is one of the few sites that preserved most of its prehistoric deposits.

The current project has several aims:

1. To establish well studied sequences of lithics and animal bones on the basis of properly controlled excavations.
2. To facilitate zooarchaeological studies of animal bones in order to detect patterns of hunting and butchering (*e.g.*, Speth and Tchernov 1998; Stiner and Tchernov 1998).
3. To enable technological and typological studies of a series of lithic assemblages collected with the aid of wet sieving.
4. To search for other sources of information concerning past environments through pollen analysis, phytoliths, and the nature of the sediments. This will be achieved without abandoning the issues of site formation processes and the role of anthropogenic imports.

Site Location and General Stratigraphy

Dzudzuana cave, in the Chiatura region, is situated on the right bank of the Nikrissa River, a tributary of the Kvirila River, which drains most of Western Georgia. The cave is a large, elongated hall, emerging as a tunnel from which a small creek flows (fig. 2). Today, the water channel is next to the northern wall, but its course has shifted over time.

The wide opening of the cave (22 meters) and high ceiling (ca. 15 m), in addition to surface finds,

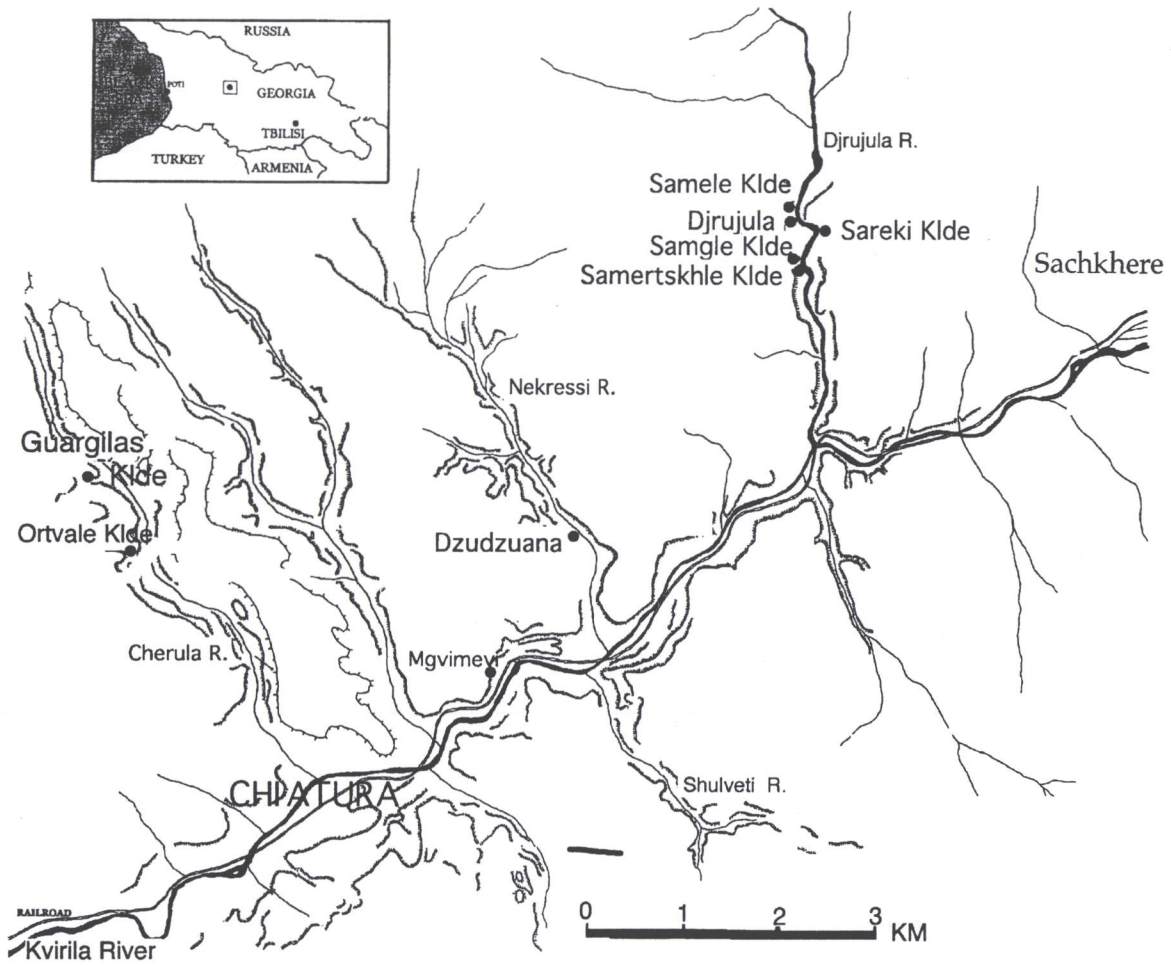

Figure 1. Map of Western Georgia.

attracted the late D. M. Tushabramishvili (Tbilisi State Museum). He excavated in the site from 1966 to 1975 (Liubin 1989).

The stratigraphy exposed in the western and northern sections contains a deposit about one meter thick, with "Eneolithic" (or Chalcolithic) to Early Bronze Age deposits, labeled as layer I. The 2.5 meter sediments below this layer are subdivided as layers II1 through II8, from which Upper Paleolithic lithic and bone assemblages were retrieved.

Although most of the layers contain a large amount of clay there are observable differences between layer I and within the series of layers II1-II8.

In layer I, the anthropogenic component includes lithics, bones, ceramics, and ashes which provide the main bulk of the deposit.

In layers II1-II8, there is a clear break where a series of large blocks - rockfall from the ceiling - separates layer II5 from the lower layers.

Historically, on the basis of the techno-typological criteria, D. Tuschabramishvili attributed the Upper Paleolithic of Dzudzuana, together with the material from the near-by site of Samertskhle Klde, to a local and distinct variant of the West Georgian Upper Paleolithic, its unique feature being the low percentage of the microlithic component in the lithic inventory. The lower layers II7-II4 were assigned to the earliest group of the Georgian Upper Paleolithic sites, on the basis of the recovery of "archaic forms" in the respective assemblages (*i.e.* some Levallois-like cores and a number of side-scrapers). More importantly, according to D. Tuschabramishvili, the working of the Upper Paleolithic endscrapers was done in a bifacial manner, reminiscent of a tradition from previous periods.

These chronological assignments were based on a typological analysis, since no radiometric dates were available at the time to test the validity of the proposed archaeological sequence (Zamiatnin 1957).

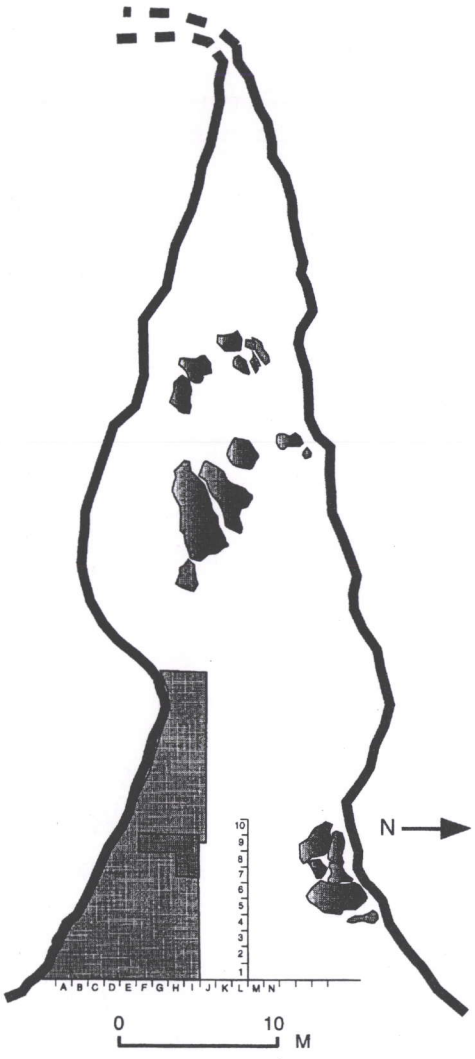

Figure 2. Plan of Dzudzuana Cave.

In 1983 and in 1986, the senior author succeeded in cleaning a section in square E and obtaining preliminary results of the pollen analyses. The three uppermost layers contained pollen of vegetation similar to that of Holocene flora, while the other layers yielded pollen indicating arid conditions with only sparse forest vegetation. At the same time, bone samples dated in Moscow's radiocarbon laboratory provided a reading of ca. 5,500 B.P. for the "Eneolithic-Early Bronze Age" layer. An Upper Paleolithic date of ca. 14,000 B.P. was derived from a sample from layer II6. Although further investigations were made, including granulometric and geochemical analyses, they did not succeed in clarifying the cultural and chronological sequence.

Unfortunately, the above comments seem also to be valid for the other Upper Paleolithic sites in Western Georgia.

The new project was initiated in 1996, and three field seasons have been conducted to date. The grid system replicated the original one, subdivided into 1 square meters which were further sub-divided into four equal parts, excavated in segments no more than 5 cm deep at a time. All of the excavated sediment was wet-sieved by sieves with 1-2 mm mesh. This has not been an easy endeavor because of the clayey nature of the local sediment. All the retrieved material, whether lithics or bones, was processed according to its spatial location.

The area excavated is ca. 8 square meters to a maximum depth of 2 m, encompassing the Upper Paleolithic layers II2-II5.

Geological Observations

The natural depositional agencies in the cave were both allochthonic and autochthonic, each with its own variability. The allochthonic deposits include fluvial accumulations deposited by water rich in MnO_2, including small, water-worn pebbles. The manganese incrustations indicate some seasonal or periodical drying, when the mineral became embedded and crystallized. The clay originated from the weathering of the limestone bedrock. Under warmer climatic conditions, this process could be rather rapid. The water-saturated limestone and the creek that flows inside the cave created the conditions necessary for an accelerated chemical transformation. In such a karstic environment, chemical weathering is generally enhanced near the entrance to the cave, due to temperature changes. In addition, in this area, physical weathering is more frequent, and thus adds to the chemical processes.

Inside the cave, flowing water is the main agency of deposition. The small pebbles could have been the result of frost shattering that occurred during the Last Glacial (perhaps during the Last Glacial Maximum dated in Georgia to 16-15 ka BP), and subsequently subjected to chemical weathering and mechanical abrasion which gave them the rounded shape. It seems that during the Late Glacial Maximum, the Nikrissa River was flowing higher than its current course.

The Current Excavation

The uppermost cultural level - the "Eneolithic-Early Bronze" - was supposedly entirely removed in previous years, yet during the present excavations the two uppermost layers of the Upper Paleolithic cultural strata were discovered to

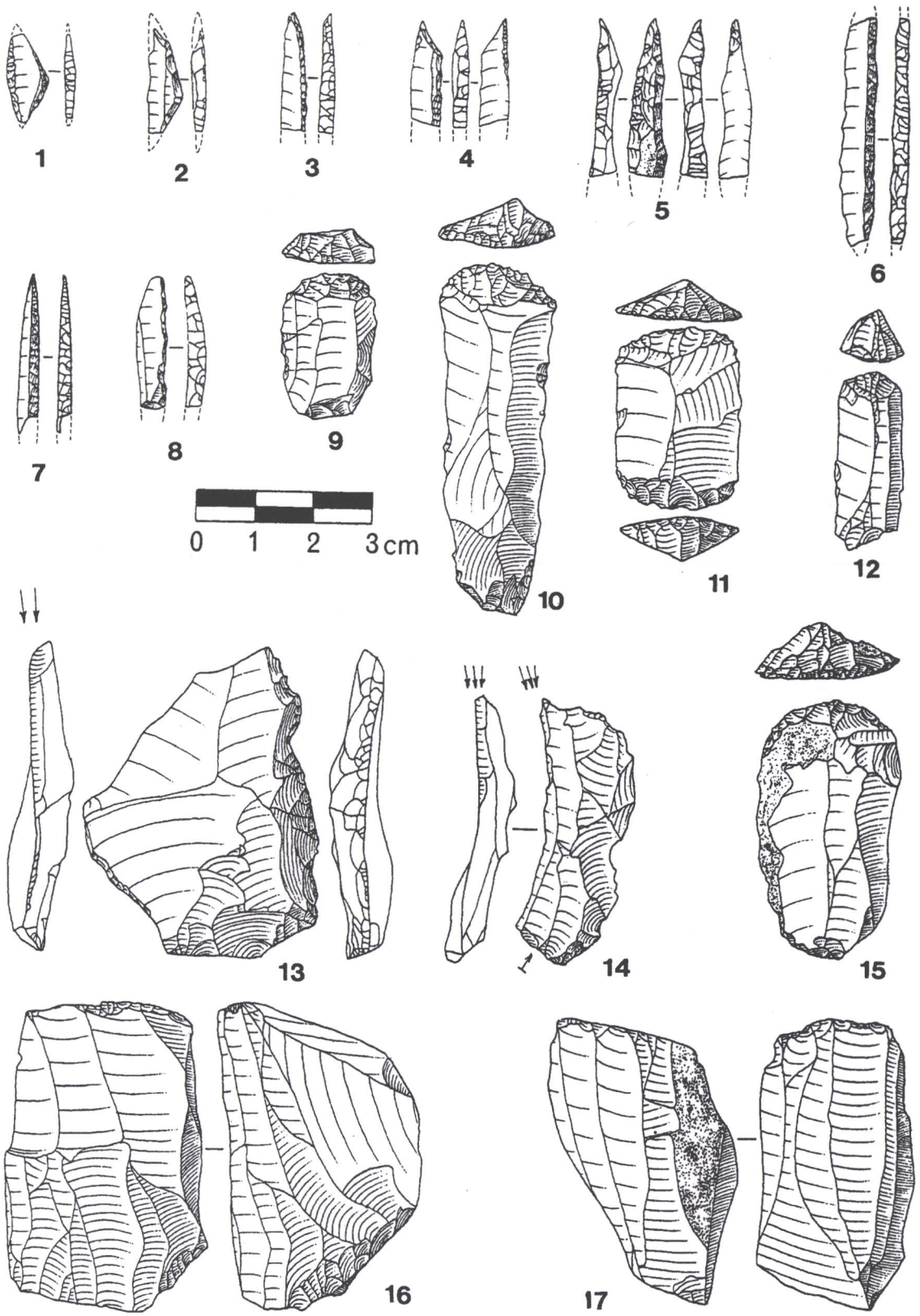

Figure 3. Flint artefacts from the upper layers (II-2 to II-5) of Dzudzuana Cave.

contain many ceramic fragments, as well as lithics typical of later periods, such as a polished axe and a couple of bifacially flaked arrowheads.

In the Upper Paleolithic layers, most of the finds are lithics, although occasionally there are some worked limestone items, groundstone utensils made of basalt, and obsidian artifacts.

It is only in the 3rd Upper Paleolithic layer that the ceramic fragments disappear, but there are still a few very small, intrusive shards in the lower levels down to II5. Intrusive lithics occurred only in layers II1 and II2.

To sum up, it seems that the two uppermost, so called Upper Paleolithic layers are identical and mechanically mixed, containing both earlier and later items. Only by the 3rd lithological layer can we be sure that we have a relatively clean Upper Paleolithic unit which can be assigned to a very late stage of the Upper Paleolithic.

The Lithic Industry

The raw material is essentially radiolarite and various types of flint, commonly found on the plateau above the Kvirila river in places such as Katskhi, which lies *ca.* 10 km away, as well as in gravel deposits within the valley. Thus, without conducting a detailed investigation for sourcing the raw materials, it will be impossible to estimate the distances over which these nodules were transported into the cave. The presence of obsidian (mostly small debitage and retouched pieces) indicates ties with the Lesser Caucasus (some 100 km. away, Blackman *et al.* 1998).

Judging by the percentages of cortical items, cores, and debris, lithic production may have been carried out on site. Due to the factor of the in-cave creek in the deposition, as well as human occupations, micro-chips observable on the edges of numerous items reflect a certain degree of trampling and lateral movement. Other physical observations include a noticeable number of burnt lithics that indicate the use of campfires inside the cave, the traces of which have unfortunately been obliterated by water action.

Technological observations of cores and the derived debitage items, as well as of the tool blanks, indicate a mostly uni-directional reduction sequence, in which the bi-directional scars reflect the maintenance of convexity of the opposed end. During the phases of blade removals, its elongated sides were reshaped in order to maintain the core's cylindrical aspect (fig. 3:16-17).

The blanks are rarely longer than 5-6 cm, with the longest reaching 8 cm. Their dimensions give some idea of the size of the original nodules. The common width of the blades/bladelets is 12-14 mm, slightly wider than the accepted size for bladelets (*e.g.*, Tixier 1963). However, these blanks were later subject to secondary retouch, often backing on an anvil.

From the detailed inventory presented in tables 1-2, it seems that the assemblages are flake dominated. According to the core morphology and the tool blanks, however, the main *chaîne opératoire* aimed to obtain blades and bladelets. Similarly to other industries in which blade/bladelet production was the focal point, the flakes removed during the initial process of blank production were modified into endscrapers, burins and other macro-tools. It should be noted that the percentage of bladelets (of width less than 1 cm) declines from II5 to II1 (table 1).

The main observations concerning the tool categories are as follows:

1. In each layer, endscrapers (fig. 3:9-12, 15) outnumber burins (fig. 3:13-14).
2. The frequencies of the non-geometric microliths, as opposed to the geometric ones (fig. 3:1-2), decrease considerably in layers II1 and II2. Among the non-geometric microliths, the common forms are micro-gravettes (fig. 3:3-8).
3. The micro-gravettes are the dominant component among the microliths. We note that a common subtype with a basal straight obverse truncation differs from the classical type. The backing is bi-polar in most cases. Using the attributes as recorded on the intact items, we sorted the broken pieces into the following categories (table 3): (a) complete micro-gravettes with the two tips retouched obversely or inversely, creating two points; (b) atypical micro-gravettes, which bear one tip with the characteristic retouch of the typical micro-gravettes while the other end has either oblique truncation or bi-polar thinning of the butt; (c) broken mesial pieces with bipolar retouch, which could have been micro-gravettes.

Discussion

The entire sequence of Dzudzuana cave is generally considered important on a regional scale

(*e.g.*, Kozlowski 1998). The collections from the previous excavations demonstrate that the early layers are rich in finely retouched and often curved bladelets. This type of blank was obtained from knapping carinated cores; a shape that may resemble Aurignacian features. However, none of the typical elements that characterize the Aurignacian toolkit, such as nosed and carinated scrapers, scalar retouched blades (known as Aurignacian blades), or the so-called 'strangulated blades', were found in Dzudzuana.

The current excavation, above the large rockfall, revealed a reasonably uniform industry, dominated, as mentioned above, by backed bladelets and micro-gravettes within the microlithic component.

The continued excavations will enable us to carry out detailed studies of the lower assemblages in this site. Bone samples were sent for AMS dating, and will facilitate the establishment of a well-founded chronological sequence.

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Layer	II 1	%	II2	%	II3	%	II4	%	II5	%
p.flake	26	7,9	125	9,7	193	10,2	140	9,6	212	9,1
p.blade	10	3,0	49	3,8	51	2,7	44	3,0	26	1,1
pr.other	2	0,6	16	1,2	17	0,9	6	0,4	1	0,0
flake	143	43,6	464	36,0	708	37,5	474	32,7	856	36,7
blade	73	22,3	323	25,1	415	22,0	279	19,2	450	19,3
bladelet	23	7,0	136	10,6	218	11,6	254	17,5	525	22,5
c.t.e.:ct	2	0,6	12	0,9	33	1,7	13	0,9	18	0,8
c.t.e.:ridge	3	0,9	22	1,7	21	1,1	35	2,4	31	1,3
c.t.e.:other	19	5,8	79	6,1	162	8,6	134	9,2	118	5,1
burin spall	2	0,6	3	0,2	7	0,4	3	0,2	10	0,4
nodule	6	1,8	16	1,2	11	0,6	6	0,4	19	0,8
core	19	5,8	44	3,4	50	2,7	63	4,3	65	2,8
TOTAL	328	100,0	1289	100,0	1886	100,0	1451	100,0	2331	100,0

Table 1. Debitage counts - Dzudzuana (1996–1998).

	Layer 1	%	Layer 2	%	Layer 3	%	Layer 4	%	Layer 5	%
B Endscrapers	12	38,7	43	34,1	66	31,6	49	28,2	47	20,1
D Burins	2	6,5	8	6,3	11	5,3	11	6,3	7	3,0
E Awls and Borers	2	6,5	2	1,6	3	1,4	6	3,4	8	3,4
F Backed Items	0	0,0	4	3,2	5	2,4	0	0,0	2	0,9
G Truncations	2	6,5	8	6,3	11	5,3	7	4,0	8	3,4
H Notches and denticulates	0	0,0	7	5,6	18	8,6	13	7,5	6	2,6
I Special items	0	0,0	1	0,8	2	1,0	1	0,6	4	1,7
J Retouched Items	3	9,7	18	14,3	17	8,1	25	14,4	25	10,7
K Composite Tools	0	0,0	0	0,0	1	0,5	1	0,6	0	0,0
L Macro-varia	4	12,9	13	10,3	10	4,8	5	2,9	19	8,1
M Non-Geometric Microliths	5	16,1	21	16,7	62	29,7	53	30,5	104	44,4
N Geometric Microliths	1	3,2	0	0,0	3	1,4	3	1,7	4	1,7
TOTAL	31	100,0	126	100,0	209	100,0	174	100,0	234	100,0

Table 2. Major groups of tools — Dzudzuana (1996–1998).

	Layer 1	%	Layer 2	%	Layer 3	%	Layer 4	%	Layer 5	%
M5 microgravette	0	0	2	1,6	7	3,3	5	2,9	31	13,2
M5a microgravette ?	0	0	0	0,0	0	0,0	7	4,0	9	3,8
M5b a-typical microgravette	0	0	0	0,0	3	1,4	1	0,6	4	1,7
TOTAL	0	0	2	1,6	10	4,7	13	7,5	44	18,7

Table 3. The detailed percentages of microgravettes and related forms.