

ANNEX B.
FLINT AND CHERT TYPES FROM THE MIDDLE DNIESTER VALLEY, REPUBLIC OF MOLDOVA

1. STUDY AREA AND FIELD DATA

The focus of this study are the geological materials derived from field surveys along the Middle Dniester Valley (Republic of Moldova). The area covered by these field surveys is herein referred to as Middle Dniester (MidDn) research perimeter. From a tectonic point of view, the researched area overlaps the Moldavian Platform (the south-western part of the Eastern-European Platform), while from a physiographic point of view it overlaps the Dniester Tableland (a sub-unit of the Northern Moldavian Tableland). This is an undulating landscape with altitudes of 190–200 m a.s.l., delimited to the East by the deep valley of the Dniester River and dominated by the widespread Miocene limestones (Ciobotaru 2018, p. 56–57, 64). According to some geological sources (Văscăuțanu 1923, p. 295; Osadchaya *et alii* 1969), the Upper Cretaceous deposits (containing or not flint) extend along the Dniester Valley from Naslavcea all the way to Cot village (Climăuții de Jos commune, Șoldănești District) or SE of Vadul Rașcov town (Șoldănești District).

The field research in the Republic of Moldova was conducted in October 2024 within a very short period of time: five surveys in five days, including travel in and out of the country, while covering a strip of land (about 177 sq. km) along the Middle Dniester Valley between Bîrnova, Naslavcea (Ocnița District) and Vadul Rașcov (Șoldănești District) localities (Tab. B1; Pl. B1). Siliceous rocks of archaeological interest were identified in three subsectors of the MidDn research perimeter (Tabs. B2–B6; Pls. B2–B3).

In Naslavcea subsector (Ocnița District), siliceous rocks were found in several geological contexts:

- a) black flints in a whitish chalk (Pl. B4/1–3);
- b) black flints in an eluvium deposit (Pl. B4/4–6);
- c) dark grey cherts in an eluvium deposit (Pl. B5/1–3);
- d) medium-light grey cherts in an eluvium deposit (Pls. B5/4–6, B6/1–5);
- e) flint and chert cobbles in the gravel lenses of the Miocene sand deposits (Pl. B6/4–6);
- f) flint and chert cobbles in the Quaternary gravel deposits (Tab. B2).

In Cureșnița-Vertiujeni subsector (Soroca and Florești districts), siliceous rocks were found in several geological contexts:

- a) black flint concretions scattered in a whitish layered chalk (Pl. B7);
- b) opaque medium-grey flint nodules and poorly silicified chalk nodules arranged in parallel rows in a whitish layered chalk (Pl. B8);
- c) opaque medium-grey and translucent medium brownish flints in an eluvium deposit (Pl. B9);
- d) flint cobbles and pebbles in the Quaternary talus, colluvial, and gravel deposits (Tab. B3).

In Climăuții de Jos subsector (Șoldănești District), the Upper Cretaceous flint was identified in unsecure contexts (Tab. B4) as the dominant geological deposits outcropping in the area are the Sarmatian (Miocene) Reefal limestones (Pl. B10).

Although more field data is needed in order to make a definitive conclusion about this topic, no Volhyno-Podolian flint was encountered in the gravel deposits of this research perimeter.

2. PETROGRAPHIC CHARACTERISATION OF THE SILICEOUS ROCKS FROM THE STUDY AREA

During the field surveys a total of 138 samples were collected from 44 geological locations (Tabs. B2–B4; Pl. B1). Added to these, there are two extra batches of samples: 1) flint and metamorphic rocks (15 samples, geological location Cos 02) from Cosăuți village (Soroca District) representing a legacy collection in the Lithoteque of Romania at the “Vasile Pârvan” Institute of Archaeology in Bucharest (material brought back by Al. Păunescu from a traceology summer camp in the Republic of Moldova, August of 1991); 2) one flint sample (geological location Clim 01) from Climăuții de Jos village (Șoldănești District) donated to the Lithoteque by A. Doboș (“Vasile Pârvan” Institute of Archaeology in Bucharest) and collected by him in July 2024. Both locations are without a secure geological context. The samples collected during the field surveys and those from additional geological locations were macroscopically classified and grouped into rock categories and subcategories (Tabs. B7–B8), and 42 of them were used in the microscopic analysis.

All samples were submitted to a petrographic analysis (for a basic methodological description and chert microfacies criteria see Ciornei *et alii* 2014), which in this case included: a) the macroscopic examination (naked eye, hand lens) of all geological hand samples collected during the field surveys or derived from previous research; b) the microscopic analysis of water-immersed unprepared samples (in reflected light under a Nikon SMZ 800N trinocular stereomicroscope

with magnifications ranging from 10× to 160×) and thin sections of representative geological materials (in transmitted light under a Nikon Eclipse E200 Pol trinocular microscope with magnifications ranging from 40× to 400×). Photomicrographs of the thin sections and unprepared samples were taken with a Nikon D5600 DSLR camera mounted on the above-mentioned microscopes. The petrographic analysis was conducted in November-December 2024 at the Petroarchaeology Laboratory of the “Vasile Pârvan” Institute of Archaeology in Bucharest.

2.1. CRETACEOUS FLINT AND CHERT TYPES FROM NASLAVCEA SUBSECTOR

Based on macroscopic and macroscopic traits and in accordance with field observations, several Cretaceous flint and chert types (Tabs. B7–B8; Pls. B11–B15) were differentiated for the Naslavcea subsector:

Dniester flint type BF – siliceous material of black colour with whitish-greyish spots, very fine-grained, semi-opaque, greasy lustre (Pl. B11/1); the cortex is thick whitish chalk with a thin medium grey subcortical band, dull, semi-opaque; microscopically it can be described as a bioclastic microfacies; bioclastic wackestone, very fine sand, moderately sorted, with siliceous groundmass; particles (20 to 30%) are represented predominantly by bioclasts (echinoderms, mollusc shells, and sponge spicules), phytoplanktonic remains, planktonic and benthic foraminifera, rare radiolarians, sporadic mica and rounded detrital quartz (Pl. B12); this material was identified in a whitish chalk deposit as layered nodules (Pl. B4/1–3);

Dniester flint type FFB – siliceous material of very dark grey colour with whitish-greyish spots, fine-grained, translucent, greasy to dull lustre (Pl. B11/2); the cortex is thin whitish chalk; microscopically it can be described as a spiculitic microfacies; bioclastic wackestone, very fine to fine sand, moderately sorted, siliceous groundmass; particles (40%) are represented predominantly by sponge spicules, algae, echinoderms, and bivalves fragmented in various degrees, planktonic foraminifera (3%), with a very low content of phytoplankton (Pl. B13); this material was identified in an eluvium as nodules supporting each other in a whitish, powdery, non-cohesive, siliceous-chalky matrix (Pl. B4/4–6);

Dniester chert type GDG – siliceous material of dark grey-brownish colour with greyish spots, medium-grained, translucent, dull to greasy lustre (Pl. B11/3); the cortex is whitish-beige granulated limestone; microscopically it can be described as a detrital-rich spiculite microfacies; bioclastic-intraclastic packed wackestone to packstone, fine to medium sand, moderately sorted, siliceous groundmass; particles (>60%) are represented by sponge spicules, algae, echinoderms, bivalves, fragmented in various degrees (but with many well-preserved sponge spicules), benthic and planktonic foraminifera (indicating the Upper Cretaceous), intraclasts and detrital quartz (Pls. B14); this material was identified in an eluvium as lenses and ellipsoidal nodules supporting each other in a grey-greenish, clay-marly matrix (Pl. B5/1–3);

Dniester chert type GLG – siliceous material of medium grey-brownish to medium-light grey colour (with a light blueish hue) with greyish spots/patches or milky-white colour with medium grey translucent patches, medium-grained, rough appearance, translucent to semi-opaque (for the whitish-grey varieties), dull to greasy lustre (Pl. B11/4); the cortex is whitish-beige granulated limestone; microscopically it can be described by the same detrital-rich spiculite microfacies (Pl. B15) associated with type GDG; this material was identified in an eluvium as lenses and ellipsoidal nodules supporting each other in a whitish, granulated, weakly cohesive, sandy-siliceous matrix (Pls. B5/4–6; B6/1–5).

2.2. CRETACEOUS FLINT TYPES FROM CUREȘNIȚA-VERTIUJENI SUBSECTOR

Based on macroscopic and macroscopic traits and in accordance with field observations, several Cretaceous flint types (Tabs. B7–B8; Pls. B16/1–3, B17–B21) were differentiated for the Cureșnița-Vertiujeni subsector:

Dniester flint type BFF – siliceous material of blackish colour with whitish chalky dots, very fine-grained, semi-opaque, greasy lustre (Pl. B16/1); the cortex is whitish chalky with a subcortical band, medium grey dull semi-opaque; microscopically it can be described as a phytoplanktonic-bioclastic microfacies; phytoplanktonic-bioclastic wackestone, coarse silt, moderately-well sorted, siliceous groundmass; particles (20–30%) are represented by very fragmented remains of phytoplanktonic organisms (coccolithophores, dinoflagellates, planktonic cyanobacteria), variable amounts of bioclasts (echinoderms, mollusc shells, and sponge spicules), planktonic and benthic foraminifera (Pl. B17); this material was identified in a whitish chalk as scattered concretions (small, rod-like or finger-like) and irregularly shaped nodules (Pl. B7);

Dniester flint type PSCN – poorly siliceous material of whitish-grey, beige or whitish-yellowish colour with dark grey patches, very fine-grained, opaque, dull to greasy lustre (Pl. B16/2); the cortex is whitish chalky; microscopically it can be described as a spiculitic-pithonellid microfacies; spiculitic-pithonellid wackestone, coarse silt to very fine sand, moderately-well sorted, siliceous groundmass; particles (40–50%) are represented by sponge spicules, *Pithonella* and other phytoplanktonic organisms, planktonic foraminifera (5%), and rare benthic foraminifera (Pl. B18); this material was

identified in a whitish chalk as poorly silicified nodules arranged in parallel rows at more or less equal intervals (Pl. B8/4–6);

Dniester flint type OMG – siliceous material of medium grey colour with dark grey or whitish spots, sometimes banded, very fine-grained, semi-opaque, greasy lustre (Pl. B16/2); the cortex is whitish chalky; microscopically it can be described by the same spiculitic-pithonellid microfacies (Pl. B19) associated with type PSCN; this material was identified both in a whitish chalk as nodules arranged in parallel rows at more or less equal intervals (Pl. B8/1–3), but also in an eluvium as nodules supporting each other in a whitish powdery, non-cohesive, chalky-siliceous matrix (Pl. B9/3);

Dniester flint type TMB – siliceous material of medium-light brownish or medium-dark grey colour with whitish-greyish spots, fine-grained, translucent to very translucent, greasy lustre (Pl. B16/3); the cortex is whitish chalky with a subcortical strip, medium grey dull semi-opaque / rusty-brownish translucent; microscopically it can be described as a spiculitic-phytoplanktonic microfacies; bioclastic wackestone, fine sand, moderately sorted, siliceous groundmass; particles (25–40%) are represented mainly by sponge spicules, echinoderms and mollusc shells, remains of phytoplanktonic organisms, planktonic and benthic foraminifera (Pls. B20–21); it has a subcortical area with sponge spicules and phytoplanktonic remains (Pl. B20/1–4); this material was identified in an eluvium as nodules supporting each other in a clay-marly matrix / whitish powdery, non-cohesive, chalky-siliceous matrix (Pl. B9/4–5).

2.3. CRETACEOUS FLINT TYPES FROM CUREȘNIȚA-VERTIUJENI SUBSECTOR

Based on macroscopic and macroscopic traits, one type of Cretaceous flint (Tabs. B7–B8; Pls. B16/4, B22) was differentiated for the Climăuții de Jos subsector:

Dniester flint type TGB – siliceous material of dark grey colour with whitish-greyish spots, fine-grained, translucent to very translucent, greasy lustre (Pl. B16/4); the cortex is whitish chalky with a subcortical band of rusty-brownish colour, greasy lustre, translucent; microscopically it can be described by the same spiculitic-phytoplanktonic microfacies (Pl. B22) associated with type TMB; this material was recovered from unsecure contexts (at the surface of the soil) as subrounded to rounded pebbles and cobbles with neocortex or very well rolled chalky cortex.

3. OCCURRENCE, ABUNDANCE AND AVAILABILITY

The field observations and samples collected during these surveys are adequate for a preliminary characterisation and classification of the flint and chert from the Middle Dniester Valley, although their full petrographic variability is still to be determined. The data is not sufficient for a robust account on nodule shape and size, abundance and availability, or to fully comprehend their stratigraphic distribution. Each of the sampled sections represents a part of the entire stratigraphic column, but these sections only partially overlap (see Pls. B2–B3), hence the stratigraphic order of the types or their physiographic occurrence might not correspond completely to the geological reality.

The Cretaceous flint and chert types defined for Naslavcea subsector follow a strict vertical distribution in the stratigraphic sequence (Pl. B2): type BF in the chalk deposit, type BFF in the whitish eluvium above the chalk; type GDG in the lower part of the eluvium with large siliceous sandstone blocks, while type GLG in the medium and upper part of the eluvium.

The Cretaceous flint types for Cureșnița-Vertiujeni subsector have a more complicated vertical distribution (Pl. B3): type BFF in the lower chalk deposit; types PSCN and OGM in the upper chalk deposit; type OMG in the lower and mid part of the eluvium and type TMB in the upper part of the eluvium.

The Cretaceous flint type defined for Climăuții de Jos subsector (type TGB) has a similar microfacies to type TMB, but it has an unsecure context and cannot be placed in the general stratigraphic sequence.

Due to the unsystematic character of the sampling centred on obtaining samples for the petrographic characterisation, what can be inferred regarding the shapes and sizes of the flint and chert blocks is limited to a few observations/educated assumptions:

a) the nodules of type BF have an irregular ovoidal shape with sizes around 10 cm in diameter, with a smooth chalky exterior surface without asperities (Pls. B4/2–3, B11/1);

b) the nodules of type FFB have an irregular to oval/globular shape with sizes around 5–10 cm in diameter, with perforation (tube-like) and a rough and uneven chalky exterior surface (Pls. B4/5–6, B11/2);

c) types GDG and GLG occur as tabular lenses (5–10 to more than 20 cm thick) and ellipsoidal nodules (around 5–20 cm in diameter) with grainy and rough carbonaceous exterior surface (Pls. B5/2–3, B5/5–6, B6/2–3, B11/3–4);

d) type BFF occurs as rod-like or finger-like concretions (2–5 cm in diameter and from a few cm to more than 20 cm in length) and irregularly shaped nodules (around 10 cm in diameter), with a smooth chalky exterior surface without asperities (Pls. B8/2–3, B7/5–6, B16/1);

e) the nodules of types PSCN and OMG have globular or ovoidal shapes ranging from 5 to 10 cm in diameter, with smooth chalky exterior surface (Pls. B7/3, B8/5–6, B9/2–3, B16/2);

f) the nodules of type TMB have an irregular to ovoidal/globular shape around 10 cm in diameter), with rough and uneven chalky exterior surface (Pls. B9/4–5, B16/3).

In the geological literature of the Republic of Moldova, the chalk (12–16 m/13–22 m thick) with black flint (types BF and BFF) from Naslavcea-Călărășeuca and Vărăncău-Vertiujeni areas has been considered as Lower Cenomanian based on the presence of *Neohibolites ultimus* Orb., molluscs and foraminifera specific for this substage (Sobetsky, Yanovskaya 1969, p. 124–125). The chalk deposit from Vărăncău-Vertiujeni area (containing the flint types OMG and PSCN) was assigned to the Upper Cenomanian based on molluscs and foraminifera species specific to this substage (Sobetsky, Yanovskaya 1969, p. 124–125). As for the deposits here called eluvium, they have been assigned to the Lower Miocene (Roșca 1969, p. 137, 149). The association of planktonic foraminifera observed in many samples from the chalk and eluvium deposits indicate the Upper Cretaceous, but the absence of a specialized micropaleontological analysis impedes a more constrained chronostratigraphic assignment of the Dniester flint and chert types.

Types BF (Naslavcea) and BFF (Cureșnița-Vertiujeni) are contained in a similar whitish chalk of Lower Cenomanian age (Pls. B4/1–3, B7), they have a similar macroscopic appearance (Pls. B11/1, B16/2), but they differ in terms of nodule shape (BF occurs as irregular nodules, while BFF as small rod-like or finger-like concretions and more rare as irregular nodules) and microfacies (Pls. B12, B17). This warrants their treatment as distinct, yet chronostratigraphically equivalent types of the Lower Cenomanian substage.

In Naslavcea-Călărășeuca area, the geologists describe a tripoliform microgranular white limestone with siliceous concretions (11–17 m thick, Lower Cenomanian) above the chalk deposit (see Tab. B5), which probably corresponds with the eluvium with flint type FFB from Naslavcea (Pl. B4/4–6). In this view, the eluvium with type FFB (Pl. B13) would represent a condensed part of the Lower Cenomanian chalk, but with a different microfacies than type BF. According to the same geological source, above this tripoliform limestone there are three more layers of shallow-water detrital limestones (5.5–10.5 m thick) without siliceous concretions (the last two representing the Upper Cenomanian substage). No such deposits were encountered during the surveys near Naslavcea. Here, the outcropping eluvium deposits, sitting above the eluvium with flint type FFB and directly under the Miocene sands (Tab. B5; Pls. B4–B6), contain two chert types (GDG and GLG) with the same microfacies, i.e. detrital-rich spiculite packstone to packed wackestone (Pls. B14–B15), indicating a depositional setting (marine deep-water environment) different than the previous ones.

Flint types OMG and PSCN have the same microfacies (Pls. B18–B19), only their macroscopic appearance is a bit different (Pl. B16/2). The sections from Cureșnița and Vertiujeni (Pls. B3, B8) could not be correlated, thus it is not clear if type OMG follows type PSCN in the stratigraphic column or if they alternate, in which case type PSCN can be seen as a poorly silicified variant of type OMG. Given that type OMG is also found in the lower and mid part of the eluvium (Tab. 6; Pls. B3, B9), it follows that this part of the eluvium represents a condensed part of the Upper Cenomanian chalk. Type TMB occupies the upper part of the eluvium from Cureșnița-Vertiujeni sector (Pls. B3, B9) directly under the Miocene sands, but both the macroscopic appearance (Pl. B16/3) and the microfacies (Pls. B20–B21) are different from those of type OMG. It is not clear how type TMB correlates stratigraphically with type TGB from Climăuții de Jos subsector or types GDG and GLG from Naslavcea subsector, but they share a common spiculitic aspect. In its entirety, the sequence with flint and chert above the chalk with black flint (BF and BFF) is predominantly spiculitic.

There are two distinct geological sequences for the Naslavcea and Cureșnița-Vertiujeni sectors (Tabs. B5–B6; Pls. B2–B3), and, as it can be seen from the above petrographic descriptions, the flint and chert types occurring in these two sectors are very different from each other. Thus, they show evidence of different depositional settings from top to bottom and between the two sectors, in general agreement with the observed differences between the geological deposits that contain them (Tabs. B5–B6).

From the correlation of the geological information and the data at hand it becomes clear that somewhere around Călărășeuca (Ocnița District), 17 km South of Naslavcea, there is a change in facies and depositional settings. If this is correct, then flint types BFF, PSCN, OMG and TMB should extend Northwest from Vertiujeni up to Călărășeuca where they are replaced by flint and chert types BF, FFB, GDG and GLG. The current field data suggests that in Climăuții de Jos sector (Șoldănești District) there are no geological deposits with flint preserved in their original context, but there might be some secondary deposits (Miocene gravels, and later, with reworked and transported material from upstream).

All visited outcrops suggest an overwhelming abundance of flint and chert on the Middle Dniester Valley. For Naslavcea sector, the black flint type BF seems to be less abundant than type FFB, but the exact thickness of the chalk with BF flint is unknown (Pl. B2). The chert types GDG and GLG occupy the largest volume of the stratigraphic column from this area. For Cureșnița-Vertiujeni sector, the chalk deposits (with types BFF, PSCN, and OMG) occupy the largest volume of the stratigraphic column (Pl. B3), but the flints are less frequent than the OMG and TMB types from the eluvium. Type OMG from the eluvium seems to be the predominant type in this area.

The sources of knappable siliceous materials from the Middle Dniester Valley can be characterized as physiographically extended (from Naslavcea to Climăuții de Jos) with several flint and chert types available in various shapes and sizes and extreme abundance.

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No.	Data	Field survey	Distance (km)	Area (sq km)	Stops*	Collected samples	Objectives
1	2024.10.22	Bîrnova - Naslavcea - Mereșeuca	46.6	20.90	8	34	Assess the occurrence of chert types and identify good outcrops for stratigraphic observations related to chert
2	2024.10.23	Soroca - Râpa lui Bechir (Zastînca) - Cosăuți - Soroca	50.7	1.30	6	4	
3	2024.10.24	Soroca - Cot - Vadul Rașcov - Vertiujeni - Slobozia-Cremene Soroca	201.0	144.00	10	38	
4	2024.10.25	Soroca - Cureșnița - Soroca	23.3	8.80	13	46	
5	2024.10.26	Lencăuți - Naslavcea	15.1	2.30	7	16	
			336.70	177.30	44	138	
* Observation and sampling points							
The field surveys were carried by car and by foot, having broadly predetermined paths (areas to be checked) and specific objectives. All stops and field survey routes were recorded with a handheld GPS (Garmin eTrex 35, accuracy of max. 3 m).							
Field surveys participants for 2024: A. Ciornei and M. Händel.							
The blitz field surveys had two main goals: 1) to assess what types of cherts occur along the Moldavian side of the Middle Dniester Valley; 2) to identify potentially good outcrops for future systematic work (collecting information regarding the geological context, stratigraphic distribution and physiographic occurrence, abundance and availability; sampling for detailed petrographic and geochemical analyses). There were also two secondary goals that underlined and shaped the way the research was carried: 1) to verify the presence of the Volhyno-Podolian flint in the gravel deposits of this research perimeter; 2) to take samples for the geochemical analysis, but this was very early dropped as unachievable within the given time frame.							

Table B1. Field surveys conducted along the Middle Dniester Valley (MidDn research perimeter, Republic of Moldova).

Stops	Elevation (m)	GPS coordinates (Lat. N)	GPS coordinates (Long E)	Context			Rock types sampled	Samples		
				Lithology (predominant)	Geological deposit	Geological period		Co	MA	MiA
Bir 01	213.14	48.44546	27.52866	limestone	Oolitic limestones	Miocene	Limestone	2	2	0
Bir 02	178.02	48.44659	27.52300	gravel	channel bar deposits	Quaternary	Dniester chert, Dniester flint	4	4	1
Bir 03a	197.21	48.44641	27.52236	gravel+sand	Podolsk suite	Miocene	Dniester chert, Dniester flint	8	8	1
Bir 03b	197.21	48.44641	27.52236	"flint breccia"	eluvium (decalcification tripoli) with flint nodules	?	Dniester chert	2	2	2
Bir 04a	194.46	48.44672	27.52138	"flint breccia"	eluvium (decalcification tripoli) with flint nodules	?	Dniester chert, Sandstone	3	3	3
Bir 04b	193.00	48.44703	27.52102	gravel	channel bar deposits	Quaternary	Dniester chert, Dniester flint	5	5	0
Bir 05a	194.07	48.44743	27.51996	"flint breccia"	eluvium (decalcification tripoli) with flint nodules	?	Dniester chert	3	3	3
Carp 01b	143.00	48.45224	27.56616	gravel	channel bar deposits	Quaternary	Dniester chert, Dniester flint	5	5	2
Carp 01a	168.48	48.45244	27.56559	flint in chalk	Chalk with flint nodules	K2	Dniester flint, chalk	3	3	2
Carp 02a	182.27	48.45274	27.56498	"flint breccia"	eluvium (decalcification clay / tripoli) with flint nodules	?	Dniester chert, clay, Dniester flint	7	7	4
Carp 03a	182.89	48.45278	27.56419	"flint breccia"	eluvium (decalcification tripoli) with flint nodules	?	Dniester flint	1	1	1
Carp 03b	176.58	48.45280	27.56388	"flint breccia"	eluvium (decalcification tripoli) with flint nodules	?	-	0	0	0
Carp 04	176.22	48.45305	27.56337	gravel	Podolsk suite	Miocene	-	0	0	0
Carp 06	210.66	48.45313	27.56222	sand	Podolsk suite	Miocene	-	0	0	0
Nas 01	107.04	48.47409	27.59018	gravel	point bar deposits	Quaternary	Dniester flint, Dniester chert	7	7	0
15								50	50	19

K2 – Upper Cretaceous; Co – collected; MA – number of samples in the macroscopic analysis; MiA – number of samples in microscopic analysis.

Table B2. Stops recorded near Naslavcea village (Ocnița District, Republic of Moldova).

Stops	Elevation (m)	GPS coordinates (Lat. N)	GPS coordinates (Long E)	Context			Rock types sampled	Samples		
				Lithology (predominant)	Geological deposit	Stage/ Period		Co	MA	MiA
Cur 01a	115.82	48.23062	28.15988	flint in chalk	Chalk with flint nodules	K2	Dniester flint, chalk	5	5	1
Cur 01b	122.06	48.23052	28.15995	flint in chalk	Chalk with flint nodules	K2	Dniester flint, chalk	4	4	1
Cur 01c	121.00	48.23057	28.15991	scree	talus	Quaternary	Dniester flint	4	4	0
Cur 02a	133.40	48.22748	28.15335	"flint breccia"	eluvium (decalcification tripoli) with flint nodules	?	Dniester flint	10	10	5
Cur 02b	128.59	48.22766	28.15310	"flint breccia"	eluvium (decalcification tripoli) with flint nodules	?	Dniester flint, altered chalk/tripoli (?)	3	3	2
Cur 02c	127.29	48.22778	28.15306	flint in chalk	Chalk with flint nodules	K2	Dniester flint, chalk	3	3	1
Cur 03	121.90	48.22849	28.15269	chalk	Chalk	K2	-	0	0	0
Cur 04	119.96	48.22873	28.15263	flint in chalk	Chalk with flint nodules	K2	-	0	0	0
Cur 05	119.44	48.22912	28.15246	flint in chalk	Chalk with flint nodules	K2	-	0	0	0
Cur 06a	118.28	48.22945	28.15258	flint in chalk	Chalk with flint nodules	K2	-	0	0	0
Cur 06b	120.03	48.22964	28.15270	flint in chalk	Chalk with flint nodules	K2	-	0	0	0
Cur 07	118.43	48.22976	28.15229	flint in chalk	Chalk with flint nodules	K2	-	0	0	0
Cur 08a	119.97	48.23055	28.15259	flint in chalk	Chalk with flint nodules	K2	Dniester flint, chalk	17	17	4
Cos 01	89.33	48.23394	28.29365	gravel	point bar deposits	Quaternary	Radiolarite	1	1	0
Cos 02	-	-	-	-	surface/at the top of the soil	-	Dniester flint, metamorphic rocks	15	15	0
Sor 01	168.77	48.13711	28.30511	limestone	Oolitic limestones	Miocene	-	0	0	0
Sor 02	156.07	48.13684	28.30374	limestone	Oolitic limestones	Miocene	-	0	0	0
Sor 03	132.21	48.13657	28.30679	-	surface/at the top of the soil	-	-	0	0	0
Sor 04	93.57	48.13622	28.30539	-	surface/at the top of the soil	-	Dniester flint	2	2	0
Sor 05	96.00	48.13618	28.30800	-	surface/at the top of the soil	-	Dniester flint	1	1	1
Slob 01a	131.34	48.03302	28.42637	-	surface/at the top of the soil	-	Dniester flint, mudstone	12	12	0
Slob 01b	123.88	48.03309	28.42604	"flint breccia"	eluvium (decalcification clay) with flint nodules	?	Dniester flint, clay	4	4	2
Vert 00	137.00	47.99455	28.52129	-	surface/at the top of the soil	-	Dniester flint	1	1	0
Vert 01	69.56	47.99121	28.53877	breccia	colluvial deposits	Quaternary	Dniester flint	2	2	0
Vert 02a	87.06	47.99066	28.53997	flint in chalk	Chalk with flint nodules	K2	Dniester flint, chalk	5	5	3
Vert 02b	98.62	47.99071	28.53994	flint in chalk	Chalk with flint nodules	K2	Dniester flint, chalk	3	3	1
Vert 03	85.26	47.99080	28.54027	-	surface/at the top of the soil	-	Dniester flint	5	5	0
27								97	97	21

K2 – Upper Cretaceous; Co – collected; MA – number of samples in the macroscopic analysis; MiA – number of samples in microscopic analysis.

Table B3. Stops recorded between Cureșnița and Vertiujeni villages (Soroca and Florești districts, Republic of Moldova).

Stops	Elevati on (m)	GPS coordinates (Lat. N)	GPS coordinates (Long E)	Context			Rock types sampled	Samples		
				Lithology (predominant)	Geological deposit	Geological period		Co	MA	MiA
Cot 01	50.44	47.97874	28.76605	limestone	Oolitic limestones	Miocene	-	0	0	0
Clim 01	-	47.94836	28.80649	-	surface/at the top of the soil	-	Dniester flint	1	1	1
VdRo 01a	146.43	47.93961	28.82019	limestone	Oolitic limestones	Miocene	Limestone	5	5	0
VdRo 01b	146.00	47.93918	28.82036	-	surface/at the top of the soil	-	Dniester flint	1	1	1
4								7	7	2
K2 – Upper Cretaceous; Co – collected; MA – number of samples in the macroscopic analysis; MiA – number of samples in microscopic analysis.										

Table B4. Stops recorded near Climăuții de Jos village (Șoldănești District, Republic of Moldova).

Field notes (this study)					In geological literature* described as		
GPS points	Geological context		Thickness	Age			
Bir 01	1	Oolitic limestones and conglomerates with pebbles of oolitic limestone	Miocene limestones	> 7 m (?)	Miocene	detrital, oolitic, foraminiferal and clotted limestones, clayey-marly rocks	Lower horizon (20 m) Lower Sarmatian, Upper Miocene, Neogene
Bir 03a	2	yellowish sands with gravel lenses containing pebbles and cobbles of flint and chert (types Dniester FFB and GLG)	Miocene sands	2 m (?)	Miocene	yellow and brownish-yellow clayey quartz sands containing lenticular interlayers of pebbles up to 0.5 m	Podolsk suite (6-20 m) Badenian, Middle Miocene, Neogene
Bir 03b, Bir 04a, Bir 05a	3	Eluvium (grain-supported, breccia-like) with lenticular and nodular chert (type Dniester GLG) and enormous lenses of glauconitic siliceous sandstone in a whitish, granulated, sandy-siliceous, weakly cohesive matrix	Eluvium with chert	6-7 m (?)	?	conglomerate-like deposits composed almost entirely of flint nodules (no traces of rounding) enclosed in a clay-siliceous matrix	Eluvial-diluvial-proluvial formations (20 m) Lower Miocene, Neogene
Carp 02a	4	Eluvium (grain-supported, breccia-like) with lenticular and nodular chert (type Dniester GDG) in a grey-greenish clay-marly matrix	Eluvium with chert	3-4 m (?)	?		
Carp 03a	5	Eluvium (grain-supported, breccia-like) with nodular flint (type Dniester FFB) in a whitish, powdery, siliceous-chalky, non-cohesive matrix	Eluvium with flint	> 3 m (?)	?		
Carp 01a	6	Whitish chalk with layered flint nodules (Dniester BF type)	Chalk with flint	> 3 m (?)	Upper Cretaceous	ash-grey dense limestones (12-16 m) with an admixture of silty material and containing individual concretions of flints and rare marcasite ^{a)}	Lower Cenomanian, Upper Cretaceous, Cretaceous
* Văscăuțanu 1923, p. 288-289, 290-fig. 1; Roșca 1969, p. 137, 149, 152-154; Sobetsky, Yanovskaya 1969, p. 123-124.							
? - Based on its stratigraphic position, the eluvium with flint could have been formed during the interval after the Upper Cretaceous and the Middle Miocene (Badenian).							
(?) – due to insufficient field observations, the total thickness of each deposit could not be established.							
a) This corresponds to layer 3 of the Naslavcea-Călărășeuca section. In this sequence (Sobetsky, Yanovskaya 1969, p. 123-124), layer 3 is followed by tripoliform microgranular white limestones with siliceous concretions (layer 4, 11-17 m thick), detrital-glauconitic light grey limestones with prisms of <i>Inoceramids</i> (layer 5, 2-4 m thick), detrital-glauconitic grey limestones (layer 6, 2-4 m thick), and microgranular white limestones with admixtures of siliceous materials (layer 7, 1.5-2.5 m thick). Layers 1 to 5 were assigned to the Lower Cenomanian based on the presence of <i>Neohibolites ultimus</i> Orb., but also of molluscs and foraminifers specific for this substage, while layers 6 and 7 contain <i>Actinocamax plenus</i> Biv. and other fossils specific for the Upper Cenomanian (Sobetsky, Yanovskaya 1969, p. 124).							

Table B5. Litho-stratigraphy of the pre-Quaternary deposits sampled near Naslavcea village (Ocnița District, Republic of Moldova).

Field notes (this study)					In geological literature* described as		
GPS points	Geological context		Thickness	Age			
Cur 02a, Slob 01b	1	grey-whitish quarzitic sands	Miocene sands	> 3 m (?)	Miocene	grey, coarse-grained, quartz sands and olive-green clays containing a small admixture of angular flints and quartz grains	Podolsk suite (3.7 m) Badenian, Middle Miocene, Neogene
Slob 01b	2	Eluvium (grain-supported, breccia-like) with nodular flint (type Dniester TMB) in a clay-marly matrix	Eluvium with flint	> 3 m (?)	?	conglomerate-like deposits composed almost entirely of flint nodules (no traces of rounding) enclosed in a clay-siliceous matrix	Eluvial-diluvial-proluvial formations (20 m) Lower Miocene, Neogene
Cur 02a, Cur 02b		Eluvium (grain-supported, breccia-like) with nodular flint (types Dniester TMB and OMG) in a whitish chalky-siliceous powdery, non-cohesive matrix		5-6 m (?)			
Cur 02c, Cur 01a, Cur 01b, Vert 02a, Vert 02b	3	Whitish compact chalk with flint nodules (types Dniester OMG and PSCN) arranged in parallel rows at more or less equal intervals	Chalk with flint	7-8 m (?)	Upper Cretaceous	white, microgranular, siliceous limestones, in some places chalky	Upper Cenomanian, Upper Cretaceous, Cretaceous
Cur 03	4	Whitish compact chalk without flint	Chalk	4-5 m (?)	Upper Cretaceous		
Cur 04, Cur 05, Cur 06a, Cur 06b, Cur 07, Cur 08a	5	Whitish compact chalk with scattered flint concretions and nodules (type Dniester BFF)	Chalk with flint	7-8 m (?)	Upper Cretaceous	ash-grey, compact, clayey, limestones (13-22 m) with cephalopods and bivalves, an admixture of silty material and scattered concretions of marcasite	Lower Cenomanian, Upper Cretaceous, Cretaceous
* Văscăuțanu 1923, p. 292-293, 294-fig. 2; Roșca 1969, p. 137, 149; Sobetsky, Yanovskaya 1969, p. 124-125; Ciobotaru 2007: 182.							
? - Based on its stratigraphic position, the eluvium with flint could have formed during the interval after the Upper Cretaceous and the Middle Miocene (Badenian).							
(?) – due to insufficient field observations, the total thickness of each deposit could not be established.							

Table B6. Litho-stratigraphy of the pre-Quaternary deposits sampled between Cureșnița and Vertiujeni villages (Soroca and Florești districts, Republic of Moldova).

Rock categories and subcategories	MidDn				Naslavcea				Cureșnița-Vertiujeni				Climăuții de Jos			
	MA	MiA	Stm	Pol	MA	MiA	Stm	Pol	MA	MiA	Stm	Pol	MA	MiA	Stm	Pol
Dniester chert type GLG	24	8	10	0	24	8	10	0	0	0	0	0	0	0	0	0
Dniester chert type GDG	6	4	4	0	6	4	4	0	0	0	0	0	0	0	0	0
Dniester flint type FFB	13	4	4	0	13	4	4	0	0	0	0	0	0	0	0	0
Dniester flint type BF	2	2	3	0	2	2	3	0	0	0	0	0	0	0	0	0
Dniester flint type TMB	22	6	6	0	0	0	0	0	22	6	6	0	0	0	0	0
Dniester flint type OMG	19	5	6	0	0	0	0	0	19	5	6	0	0	0	0	0
Dniester flint type PSCN	11	5	5	0	0	0	0	0	11	5	5	0	0	0	0	0
Dniester flint type BFF	28	5	5	0	0	0	0	0	28	5	5	0	0	0	0	0
Dniester flint type TGB	2	2	2	0	0	0	0	0	0	0	0	0	2	2	2	0
Context rocks (K2 chalk, sandstone, limestone eluvium matrix, Miocene limestone)	22	1	1	0	5	1	1	0	12	0	0	0	5	0	0	0
Other rocks (radiolarite, mudstone, and metamorphics)	5	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0
	154	42	46	0	50	19	22	0	97	21	22	0	7	2	2	0
sampling locations for Naslavcea area: Bir 01, 02, 03a, 03b, 04a, 04b, 05a, Carp 01b, 01a, 02a, 03a, 03b, Nas 01																
sampling locations for Cureșnița-Vertiujeni area: Cur 01a, 01b, 01c, 02a, 02b, 02c, 08a, Cos 01, 02, Sor 04, 05, Slob 01a, 01b, Vert 00, 01, 02a, 02b, 03																
sampling locations for Climăuții de Jos area: Clim 01, VdRo 01a, 01b																
MA – number of samples in the macroscopic analysis; MiA – number of samples in microscopic analysis; Stm – number of subsamples analysed with a stereomicroscope; Pol – number of subsamples (thin sections) analysed with a polarizing microscope.																

Table B7. Rock categories and subcategories characterised by subsectors of the MidDn research perimeter.

Rock categories and subcategories	MidDn				Surface/at the top of the soil, Colluvial deposits and Talus				Quaternary gravels				Miocene deposits				Eluvium with flint/chert				Chalk with flint			
	MA	MiA	Stm	Pol	MA	MiA	Stm	Pol	MA	MiA	Stm	Pol	MA	MiA	Stm	Pol	MA	MiA	Stm	Pol	MA	MiA	Stm	Pol
Dniester chert type GLG	24	8	10	0	0	0	0	0	11	0	0	0	5	0	0	0	8	8	10	0	0	0	0	0
Dniester chert type GDG	6	4	4	0	0	0	0	0	2	2	2	0	0	0	0	0	4	2	2	0	0	0	0	0
Dniester flint type FFB	13	4	4	0	0	0	0	0	8	1	1	0	3	1	1	0	2	2	2	0	0	0	0	0
Dniester flint type BF	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	3	0	0
Dniester flint type TMB	22	6	6	0	12	0	0	0	0	0	0	0	0	0	0	0	10	6	6	0	0	0	0	0
Dniester flint type OMG	19	5	6	0	12	0	0	0	0	0	0	0	0	0	0	0	4	3	3	0	3	2	3	0
Dniester flint type PSCN	11	5	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	5	5	0	0
Dniester flint type BFF	28	5	5	0	13	1	1	0	0	0	0	0	0	0	0	0	0	0	0	15	4	4	0	0
Dniester flint type TGB	2	2	2	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Context rocks (K2 chalk, sandstone, eluvium matrix, Miocene limestone)	22	1	1	0	0	0	0	0	0	0	0	0	7	0	0	0	5	1	1	0	10	0	0	0
Other rocks (radiolarite, mudstone, and metamorphics)	5	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	154	42	46	0	44	3	3	0	22	3	3	0	15	1	1	0	33	22	24	0	40	13	15	0
sampling locations for Surface/at the top of the soil, Colluvial deposits and Talus: Cos 02, Sor 04, 05, Slob 01a, Vert 00, 01, 03; Clim 01, VdRo 01b																								
sampling locations for Quaternary gravels: Bir 02, 04b, Carp 01b, Nas 01; Cur 01c, Cos 01																								
sampling locations for Miocene deposits: Bir 01, 03a; VdRo 01a																								
sampling locations for Eluvium (decalcification clay/tripoli) with flint/chert: Bir 03b, 04a, 05a, Carp 03a; Cur 02a, 02b, Slob 01b																								
sampling locations for Chalk with flint: Carp 01a; Cur 01a, 01b, 02c, 08a, Vert 02a, 02b																								
MA – number of samples in the macroscopic analysis; MiA – number of samples in microscopic analysis; Stm – number of subsamples analysed with a stereomicroscope; Pol – number of subsamples (thin sections) analysed with a polarizing microscope.																								

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