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Andrii Sorokun
Pavlo Shydlovskyi

# KYIV DNIEPER REGION SITES WITH KUKREK INVENTORY IN ARCHAEOLOGICAL AND CLIMATE CONTEXTS

The article presents an attempt to analyse the archaeological and climate backgrounds of the spread of Kukrek technocomplex together with the traditions of ceramic production in the Kyiv Dnieper Region. One of the main results of the study is the conclusion about the complexity of migration processes in the Early Holocene, which is manifested in significant variability of sites, and in various combinations of Janislawice, Kukrek, Bug-Dniester and Dnipro-Donetsk components in lithic and ceramic assemblages.

Settlement dynamics was marked by significant fluctuations and uneven population of the Kyiv Dnieper Region. At the base of this dynamic was global climate change, the main ones being the coolings of the Young Dryas and the 6,200 BC event.

*Keywords*: Early Holocene, Mesolithic, Neolithization, past global change, Kukrek, Janislawice, Middle Dnieper Region

Research in the field of paleoecology in recent years has confidently proven the vulnerability and sensitivity of human networks to climate and landscape changes. It is impossible to understand the processes of cultural dynamics, migration, ways of technology dissemination without the involvement of data from paleoclimatology and paleogeography. This is especially true in addressing the issues of gradualness – discontinuity in the development of cultural phenomena of the late Pleistocene – early Holocene.

## ARCHAEOLOGICAL BACKGROUND

Among domestic scholars, it is quite common to understand the process of cultural dynamics as a continuous replacement of one cultural phenomenon with another, which gives the impression of the gradual development of culture. L.L. Zalizniak developed a general scheme for the distribution of Final Palaeolithic – Mesolithic cultures for the territory of the Middle Dnieper valley and gives a general description of the natural and climatic situation in the region in the late Pleistocene – early Holocene (Zalizniak 2005; 2016). However, modern study of fluctuations in Greenlandic glaciers, together with the rapid development of methods of radiocarbon dating and calibration of the obtained data allow us to consider in more detail the paleoecological processes in the past (Alley et al. 1997; Rasmussen et al. 2014; Bronk Ramsey 2017; Reimer et al. 2020).

The isotopic scale of the Greenland Glaciers shows several drastic changes during Pleistocene – Holocene transition that have had a direct impact on the development of the biosphere, including human groups in Europe. In particular: final Pleistocene fluctuations – 14.9 – 12.9 ka cal BC; Younger Dryas and the beginning of the Holocene – 10.9 – 9.6 ka cal BC; together with sharp cold climate events – 9.4 ka, 7.3 ka and 6.2 ka cal BC.

Various cultural groups were widespread on the territory of the Kyiv Dnieper, which in domestic archaeology are called Final Palaeolithic, Mesolithic and Neolithic. Such division is quite conditional, due to the fact that all the sites of the region, until the appearance of Trypillia culture, are remnants of the activity of hunting groups. It should be noted that despite the rather good study of the region in terms of archaeology, it is noteworthy the insufficient use of natural sciences, namely the lack of radiocarbon dating, palynological and zooarchaeological analyses. This situation is partly a consequence of the geographical and topographical location of the sites – a significant part of them is in the zander

**Andrii Sorokun**, Junior Researcher of the Institute of archaeology of NAS Ukraine; 12, Heroiv Stalingrada Ave., Kyiv, 04210, Ukraine; sorokun_a@i.ua **ORCID:** 0000-0002-8506-4817

**Pavlo Shydlovskyi**, PhD, associate professor of the Taras Shevchenko National University of Kyiv; 60, Volodymyrska St., Kyiv, 01033, Ukraine; prehist@knu.ua **ORCID:** 0000-0001-6771-812X

zone and are dune sites, which makes it impossible to preserve organic remains. Currently, it should be noted that there are no reliably dated assemblages within the entire Younger Dryas and Early Preboreal. In this case, determining the age of the sites is quite justified by searching for stratigraphic and technological equivalents from the surrounding areas.

It should be noted that the biggest problem when interpreting collections is the conditions of their detection. Materials often come to us in a postdeposited state. Unfortunately, this is a common situation for most sites in the region. According to these findings, we can only state the presence or absence of certain categories of material culture in some settlements. Most questions arise about the specifics of combinations of certain cultural features in the considered assemblages and in their correlation with each other. This complicates the understanding of the processes that took place in the past, on the other hand, it becomes clear the importance of continuing research and accumulating new materials.

The sharp decrease of the sites on the territory of Kyiv Dnieper Region in the Final Palaeolithic is recorded with the presence of only few sites with characteristic low trapezes and Federmesser-type points (Velykyi Dyvlyn E, Velyka Buhaiivka and Zhurivka) (Nuzhnyi 2015, p. 344-357; Shydlovskyi, Lyzun 2017). In recent years, Zhelon and Kelembet sites in the Ovruch ridge have been added to these settlements. Based on stratigraphic observations and a specific type of lithic technology, the author of the study attributed these vestiges to the Final Palaeolithic (Zalizniak 2017). Lithic assemblages and a set of microliths from these sites are quite characteristic of the Federmesser group of Central European lowlands, dated back in the frames of 12,200–10,800 cal BC (Sobkowiak-Tabaka 2017).

In the time of the Younger Dryas, the territory of Polissia was included in the area of distribution of cultures with arrowheads on blades, represented by sites of the Ahrensburgian (Krasnosillia) and Swiderian cultures. Instead, the territory of Kyiv region remained practically uninhabited at that time. The sites with Ahrensburgian and Swiderian points were found in the northwest of the region in the basins of the Uzh River (Prybir) and Teteriv River (Raska) (Zalizniak 2016, 12-15).

The occupation of the Kyiv Dnieper region was on the bound of Preboreal and Boreal, proof of which are Mesolithic sites of Zymivnyky culture (10,000-8,400 cal BC) and Kudlaiivka culture (9,300-8,000 cal BC), which genetically associated with different geographical regions of Eastern Europe. Practically the only one homogeneous site that can be attributed to the Preboreal by the nature of lithic processing is Zahay I site in Kaniv Left Bank Region. The site was located on the dune elevations of the left bank of the Trubizh at its confluence with the Dnieper. Among the material derived from a single lens of flint products, the series of medium-high and high symmetrical trapezes from wide blades and flakes attracts the most attention (Savchuk 1974, p. 43-45; 1997, p. 108-109). Such trapezes of the "Surskyi type" with concave edges are a culturally defining feature of the Zymivnyky culture, dating to the Final Palaeolithic – Early Mesolithic (Dvoryaninov 1978, p. 32-34; Zalizniak 1994, p. 236-237). Features of flint inventory and stratigraphic data have allowed researchers to attribute the site to the Sursky V type, or to the Zymivnyky culture dating back to the early Mesolithic (Nuzhnyi 1986; 1992, p. 39-42). Sites of this community were spread on the border of the steppe and forest-steppe of the Dnieper and Donbass. The nearest territorially is the Viazivok settlement on the right tributary of the Sula River – Sliporod River. Radiocarbon dates of Viazivok 4a indicate a fairly wide time span in the range of 9,800-8,500 cal BC (Havrylenko 2000, p. 82).

The early Mesolithic of the Kyiv Dnieper is represented mainly by the Kudlaiivka culture, the sites of which are spread in the Polissia Dnieper in a fairly large area, including Desna valley (Kudlaiivka, Chernihiv, Vyhurivshchyna), Trubizh valley (Korzhi, Selishche) and Kyiv-Zhytomyr Polissya (Bilosoroka, Tatsenky) (Zalizniak 1984, p. 90-92; 2009, p. 97). Arrowheads on blades are distributed mainly in the inventory of northern sites of Kudlaiivka culture, while on sites of the southern part of Kyiv Dnieper Region (Vyhurivshchyna, Tatsenky, Selische, Korzhi) this type of points did not receive significant distribution. This made it possible to distinguish two variants of culture – the northern type of Kudlaiivka and the southern type of Tatsenky. The appearance of points on the blades in the northern regions is associated with contacts with the post-Swiderian population of the Upper Dnieper (Zalizniak 1984, p. 93).

L. Zalizniak in a number of works expresses the opinion about the genetic connection of Kudlaiivka culture with the Epigravettian background (Zalizniak 1976; 1984, p. 96-97; 2009, p. 98). The researcher sees the basis of the Kudlaiivka culture in the Final Palaeolithic sites of the Zhurivka type, which were influenced by the Komornice population at the beginning of the Mesolithic (Zalizniak 1981, p. 13). On the other hand, the researcher connects the sites of this community with the area of early Mesolithic cultures of

Duvensee circle in Northern Europe, the genesis of which is seen in the Federmesser culture with a characteristic set of microlithic points, namely with the Komornice culture of the Polish lowlands. Calibration of dates from the Komornice layers of Chvalim, Calowane and Kabalai settlements testifies to the spread of this culture in Central and Eastern Europe between 9,300 and 7,500 cal BC. There is a significant chronological gap between the last Epigravettian sites in the region and the dated Kudlaiivka-Komornice assemblages, in frames of several millennia in calibrated dates. This gap generally indicates the depopulation of the region, which remained uninhabited during the Younger Dryas until the appearance of the Kudlaiivka sites, which indirectly indicates the migration of this population.

Settlements of Janislawice culture are represented in Kyiv Dnieper by a rather representative number. Among the most important sites are the DVS north of Kyiv, Rudyi Ostriv, Borodianka 3в, Prybirsk 3, Obolon and others. The Janislawice complex combines a microlithic set of the post-Maglemose type (narrow triangles, lancets) with southern proto-Neolithic technology (single-platform unilateral, narrow faced cores for regular pressure bladelets that used as blanks for microliths) (Stupak 2018). The author attributes the sites of Kyiv-Zhytomyr Polissia to a special – eastern – Rudyi Ostriv Type, which is characterized by a certain specificity in the technology of lithic processing. This specificity is manifested in less lamellarity, reduced variety of microliths, the presence of Kukrek elements – burins with a flat burin spall, Kukrek type inserts (Zalizniak 2005, p. 82-86).

Calibration of radiocarbon dates from the main settlements – Kabalai 2, Krynytsia 4, Denby 29, Janislawice – indicates the spread of culture between 6,200 – 5,400 cal BC. Interesting is the fact of a quite early dating of the Rudyi Ostriv site – 6,800-6,600 cal BC (table 1) (Zajceva et al. 1997). Such dating once again raises the question of the southern origin of the Janislawice culture and the ways of this community spreading (Yanevych 1993).

L. Zalizniak writes that *"the influence of the Hrebenyky bearers of the Balkan-Danube type pressure technique on the formation and development of the Janislawice culture cannot be ruled out". "The migration of the late Janislawice population to the east in the Polissia Dnieper was apparently stimulated in the middle of the 6th millennium BC by pressure from the west by Neolithic LBK colonists ... The resettlement of the Janislawice population in Polissia to the east seems to have led to the displacement of the local Kudlaiivka population to the Desna."* (Zalizniak 2005, p. 86).

The spread of Janislawice technology falls on the first half – the middle of the Atlantic period, after a sharp cooling 6,200 cal BC. At the same time, there is an active penetration of the southern elements into Kyiv-Zhytomyr Polissia in the form of such innovations as ceramic production and Kukrek technique of flint processing (fig. 1).

## KYIV-ZHYTOMYR POLISSIA SITES WITH KUKREK INVENTORY

Almost a century has passed since the discovery of the first assemblage with Kukrek lithic inventory in the Middle Dnieper. Over the last 50 years, in particular in the last two decades, the source base has expanded considerably. This necessitated a more thorough study of the question of the time and ways of penetration of the Kukrek industry in Kyiv-Zhytomyr Polissia. The first discovered vestige with Kukrek inventory in Kyiv Region is a multi-layered settlement in Pischane locality (near village Narodychi), investigated by stationary excavations by I. Levytskyi in 1925 (Levytskyi 1931, p. 191–235). The events of the second quarter of the twentieth century led to the loss of collections, which did not allow to publish all materials and get acquainted with them by other researchers.

Significant discoveries in the study of the Neolithic of the Kyiv Dnieper have occurred since the early 70s of the twentieth century, which are associated with the active research of D. Telehin and L. Zalizniak. Stationary excavations were carried out on a series of vestiges – Lazarivka, Borodianka III, Korma 1, Krushnyky 1, also search pits were laid in the already known Pischane settlement (Zalizniak 1977, 1979; Piasetskyi 1979; Okhrimenko, Telehin 1982; Zalizniak et al. 1987). These studies have intensified researchers in studying the processes and ways of neolithization of the region (Telehin 1982).

The next stage in the study of Kukrek sites of Central Ukraine was large-scale research by L. Zalizniak of the Neolithic settlements near the village of Dobrianka (2001, 2003 – 2006) (Zalizniak 2009, p. 178–206).The work carried out allowed to collect quite representative collections that were fully published (Zalizniak et al. 2013). Simultaneously with this study (2003), in the southern suburbs of Kyiv, excavations of the multi-layered settlement of Khodosivka-Zaplava were carried out, where an assemblage of Neolithic artifacts with a series of Kukrek inserts was discovered (Hotun et al. 2007).

In 2015, a study was renewed at the settlement of Krushnyky 1, which allowed to obtain a large collection of Neolithic products that fully correspond to the findings discovered in 1983 (Zalizniak et al. 2016). At the same time, according to

the surface material, another locality with Kukrek inventory were recorded – Motiiky-Vivcharnia. The materials obtained in recent decades have significantly supplemented our knowledge of the spread of the Kukrek industry in the forest zone of the Middle Dnieper Region. A large series of sites that have their own specific features need to be studied and systematized in detail.

*Pischane 1.* I. Levytskyi discovered a multilayered settlement at the confluence of the Zherev River with the Uzh River in the 1920s (fig. 1: 4) (Levytskyi 1931, p. 191–235). In 1925, the researcher conducted stationary excavations. A part of the site with a well-preserved stratigraphy and a number of objects and ash lenses were recorded. Unfortunately, apart from the previous publication, no reports or materials have been preserved. In the 80s of the twentieth century, L. Zalizniak re-examined the site by search pits. Among the materials from different times, along with the Janislawice points, Kukrek inserts were also found (Zalizniak 2009, p. 176).

*Lazarivka.* L. Zalizniak opened the settlement in 1973 on the right bank of the Zdvyzh River, where an unnamed stream fell into it (fig. 1: 10). The research was conducted in 1973 and 1975 on an area of 57 m$^2$ (Zalizniak 1977, p. 23–44; 1979). In total, about 2,000 flint products and 30 fragments of pottery were found (fig. 2). Such a small collection, the author of the study defines as homogeneous. In view of this statement, L. Zalizniak defined out sites with materials containing Kukrek inventory and Samchyntsi type ceramics in Kyiv-Zhytomyr Polissia as a separate Lazarivka Type sites (Zalizniak et al. 2016, p. 8).

*Borodianka 3в.* L. Zalizniak systematically surveyed the bush of Neolithic settlements near Borodianka village during 1974-1978. Borodianka 3в is located on the right bank of the Zdvyzh River (fig. 1: 14). The site was explored on an area of 150 m$^2$ (Zalizniak 1979, p. 74; 2009, p. 272). The collection of flint products includes 2,338 units corresponding to the Janislawice and Kukrek industries (fig. 3). The ceramic assemblage is small and consists of 35 fragments, which the researcher divides into early Dnipro-Donetsk materials according to D. Telehin and Neman culture according to H. Okhrimenko (Zalizniak 2009, p. 272-273).

*Borodianka 4б.* It is located 1 km south of Borodianka 3 on the right bank of the Zdvyzh River (fig. 1: 13). All material comes from the surface collection. The assemblage includes 793 flint products corresponding to the Janislawice culture, and one Kukrek insert (fig. 4: 1-25) (Zalizniak 1979, p. 57-58). Ceramic materials are few. Among them there are fragments ornamented with triangular incisions, which find direct analogies among the materials of Mykilska Slobidka II (Danylenko 1956, p. 176) and Vita Lytovska (Telehin 1968, p. 92).

*Havronschyna.* L. Zalizniak discovered the settlement in 1973 on the right bank of the Zdvyzh River, 15 km upstream from Borodianka 4б (fig. 1: 12). The collection comes from a surface material and consists of 543 flint products (fig. 4: 26-44) and 20 fragments of ceramics. In the publication, the author of the study considers this assemblage together with the materials of Borodianka 4б based on the typological similarity of their materials (Zalizniak 1979, p. 57–59).

*Korma 1, 1б.* The bush of Meso-Neolithic settlements around the Korma peat bog was first discovered by V. Piasetskyi in 1974 in the basin of the left bank of the Ubort River (fig. 1: 1-2) (Piasetskyi 1979, p. 46-48). A few years later, in 1977, an expedition led by D. Telehin conducted an additional survey of the site, which allowed to more clearly establish the boundaries of the distribution of surface material and identify a number of new localities (Okhrimenko, Telehin 1982, p. 73–75).

In 1983, stationary excavations were carried out at the Korma 1 settlement under the direction of L. Zalizniak. A new excavation of 58 m$^2$ was added to a small trench of V. Piasetskyi (Piasetskyi 1979, p. 48) and the total investigated area reached 72 m$^2$. This research has greatly expanded the collection. In particular, 5,021 flint products and 240 fragments of Neolithic pottery were found. Among the microlithic toolset there are series corresponding to the Janislawice, Kukrek and Kudlaiivka cultures (fig. 5: 1-53) (Zalizniak et al. 1987, p. 64–66). The ceramic assemblage fully corresponds to the materials of Neman culture (fig. 6), and researchers find the closest analogies to it in the collection of the Mostva settlement (Levytskyi 1952, p. 70–77; Zalizniak et al. 1987, p. 68).

Kukrek inventory was also recorded in the neighboring Korma 1б site (fig. 5: 54-56) (Zalizniak 1991, p. 42). It is also worth noting that the settlements of Korma 1, 1a and 1b are located next to each other, occupy one dune, and their division into separate sections should be perceived as quite conditional (Piasetskyi 1979, p. 47; Okhrimenko, Telehin 1982, p. 73).

*Krushnyky 1.* L. Zalizniak discovered a number of Stone Age settlements on the right bank of the Uzh River near the village Motiiky in 1983 (fig. 1: 5). Stationary excavations investigated 36 m$^2$ of the area of Krushnyky 1 site, during which a collection of 2,384 flint products and about 100 fragments of pottery was obtained,

most of which had a poor degree of preservation (fig. 7) (Zalizniak et al. 1987, p. 69–70). A year later, the survey was conducted 200 m from the previous locality at the Krushnyky 2 site. Researchers attributed the obtained materials of the latter settlement to the Neman culture (Okhrimenko 2001).

A larger collection from the Krushnyky 1 settlement was obtained during renewed research of the site in 2015. At that time, excavations were carried out on an area of 81 m$^2$ and 11,820 flint products and 420 fragments of pottery were found (Zalizniak et al. 2016, p. 8). In the course of 2015 research, the sieving of the cultural layer was actively used, which resulted to the detection of a significant number of microlithic products (fig. 8).

In general, the lithic assemblage of Krushnyky 1 settlement corresponds to the Janislawice and Kukrek industries (fig. 7: 1-39; 8, 9). New research revealed a series of microliths that L. Zaliznyak refers to the of Abuzov Balka type. Based on the presence of the latter, the researcher argues the spread of Kukrek traditions in Polissia from Southern Bug valley, leaving on the way the Dobrianka 1, 2, 3 settlements (Zalizniak 2009, p. 178–206).

The ceramic assemblage is heterogeneous (fig. 10). Most of the products, according to a number of indicators, correspond to the Samchyntsi type of Bug-Dniester ceramics, which is also recorded in the settlements of Lazarivka and Dobrianka 1, 2, 3 (Zalizniak 2009, p. 267–271). However, some series of products should be attributed to the Dnieper-Donetsk and Neman cultures (Zalizniak et al. 1987, p. 72, fig. 7: 1–8; Zalizniak et al. 2016, p. 14, fig. 7: 29–35).

*Prybir 7a.* The settlement was discovered at the same time as Krushnyky 1 by L. Zalizniak in 1983 and was located 300 m east of the previous one (fig. 1: 6) (Zalizniak 1991, p. 43). Flint products, which are 1,331 units, were gathered from the surface (fig. 11). The collection of microliths corresponds to the Kukrek industry (Zalizniak 2009, p. 272).

*Khodosivka-Zaplava.* The study of a multilayered settlement in the southern suburbs of Kyiv was conducted under the supervision of I. Hotun in 2003 (fig. 1: 17). The total area of the excavations was 2,572 m$^2$, where a 1,469 flint products and 264 fragments of Neolithic pottery were found (Hotun et al. 2007, p. 95–117). D. Haskevych attributes the flint materials to the Kukrek industry pointing to the presence of inventory characteristic of the Mesolithic Kudlaivka culture (fig. 12-13). The researcher correlates the Dnieper-Donetsk ceramic assemblage (fig. 14) with the Kukrek materials of the settlement. At the same time, D. Haskevych draws attention to the problems of synchronization of ceramic and flint assemblages in the region and raises the question of the correlation of Kudlaiivka lithic materials with Neolithic ceramics (Haskevych 2007).

*Sporadic finds of Kukrek inventory in Kyiv-Zhytomyr Polissia.*

In addition to the above mentioned sites, where the findings of the Kukrek industry are pronounced, the researchers mention a number of individual locations with isolated manifestations of this technology. Most of the materials of such assemblages come from surface collections and correspond to a wide range of Stone Age cultures. It is worth noting a series of four Kukrek inserts found on the Teteriv 3 site (fig. 1: 9; 16: 7-10). Kukrek inventory is also noted in the Rudyi Ostriv (fig. 1: 16; 16: 3-4), Abramivka (fig. 1: 15; 16: 1), Protereb (fig. 1: 8; 16: 5-6), Smolianykovo (fig. 1: 3; 16: 2) settlements (Zalizniak 1991, p. 42–43), Zavalivka (fig. 1: 11; 15) (Haskevych 2001, p. 45) and Motiiky-Vivcharnia (fig. 1: 7) (discovered in 2015 by an expedition led by L. Zalizniak).

## ISSUES OF CULTURAL AND CHRONOLOGICAL INTERPRETATION

*1. The problem of determining the level of influence, or assimilation between the Kukrek and Janislawice population.*

An important argument for the predominant influence of the local Janislawice on the new Kukrek population is the change in the technique of primary flint knapping that corresponds to the first. The absence of classical conical and pencil-like cores characteristic of steppe and forest-steppe Kukrek collections in the above-mentioned assemblages is explained by poor quality of raw materials in Kyiv-Zhytomyr Polissia (Zalizniak 1991, p. 42). V. Manko explains the use of narrow faced cores characteristic of the Janislawice industry by the transition to "traditional manual pressure technique" which was corresponded to the quality of local raw materials (Manko 2016b, p. 29).

It can also be noticed that among the different technical parameters of Zhytomyr moraine flint, ancient masters chose better quality isotropic raw materials for pressure splitting, which was practiced on a small number of suitable for this process pebbles (in particular, this can be traced on a large number of cores from Krushnyky 1, fig. 9). On the other hand, some high-quality samples of Zhytomyr flint are not inferior in quality to the raw materials recorded at the bush of Neolithic settlements in the vicinity of

the Dobrianka village, where conical and pencil-shaped cores are represented by series (Zalizniak et al. 2013, p. 203, 208, 216, 223, 236-237). L. Zaliznyak in Zavalivka site found one pencil-like core, along with Kukrek insert and Samchyntsi-type pottery, in the 1970s (fig. 15). These materials were later researched and published by D. Telehin (Telehin, Titova 1998, p. 77; Haskevych 2001, p. 44–45).

It is important to understand under what conditions the Kukrek population, when moving to the north, could abandon their own established technology of primary knapping, retaining in full a set of tools. Presumably, the transition in primary flint processing technique could take place earlier than the currently recorded sites, and only the expansion of the source base can bring it closer to solving this problem. Researchers pay attention to the active contacts of the Kukrek and Janislawice population, which are recorded among the materials of a number of sites of different landscape zones (Ihrin 8, Popiv Mys, Kinetspil) (Zalizniak 1991, c. 42, Manko 2016b, c. 29-30). It is possible that the known settlements of Kyiv-Zhytomyr Polissia reflect only the active phase of relations between the Kukrek and Janislawice population, and the change in the tradition of primary flint knapping took place in the forest-steppe contact zone.

To further clarify the processes of cultural interaction of the Kukrek and Janislawice population, it is advisable to conduct a detailed technological analysis of all existing flint collections from the Kyiv Right Bank and the Middle reaches of the Southern Bug to establish the degree of similarity of lithic assemblages.

*2. The issue of movement directions of the Kukrek population (from Southern Bug Region; from Dnieper Rapids Region, by the Dnieper River valley).*

For the first time, V. Danylenko expressed the idea of infiltration of the Kukrek population from the south into the Middle Dnieper (Danilenko 1969, p. 30). At the same time, the researcher noted that the neolithization of the Middle Dnieper could not take place without contact with the population of the southern territories, and the only "reliably established source of such interaction" is the Bug-Dniester culture (Danilenko 1969, p. 34).

Later, L. Zalizniak repeatedly wrote about the formation of the Dnieper-Donetsk Neolithic culture as a result of the contact of the Janislawice population with the Bug-Dniester settlers (Zalizniak 1978, p. 12–21; 1991, p. 28–41; 1998, p. 184–192; 2005, p. 82–89; 2009, p. 133–206). The main arguments of the researcher are based on the analysis of lithic inventory that has all the features of the Southern Bug Kukrek, but not Dnieper Rapids assemblages.

In particular, L. Zalizniak draws attention to the presence of numerous backed microblades with abrupt retouching in the Kyiv region Kukrek assemblages, in contrast to the small retouching of microblades from Dnieper Rapids Region, as well as the presence of *"typical Southern Bug microliths – Abuzova Balka points"*. There are also burins with flat burin spalls, including bilateral notched on truncated flakes, which are characteristic of the Southern Bug version of Kukrek, in contrast to the angle burins that are characteristic of the Dnieper Rapids assemblages (Zalizniak et al. 2016, p. 9-12).

At the same time, L. Zalizniak mentions "single sites" in the Trubizh River valley, which have Kukrek inventory, pointing out that if the colonization took place from Dnieper Rapids Region, *"Kukrek sites on the left bank of the Dnieper would be more numerous."* (Zalizniak et al. 2016, p. 14). The materials of the Borshchiv settlement (left bank of the Trubizh River) are really quite interesting in considering the issue of spreading of Kukrek traditions up by the Dnieper River (fig. 1: 18). In the collection of Yu. Kostenko formed by years of surface gathering there are conical cores, Kukrek-type inserts, a series of microliths and a fragment of an ornamented talc shuttle, that really correspond to the materials of Dnieper Rapids Region. Next to them, there is a series of ceramic products with comb, linear and subtriangular ornamentation (fig. 16: 11-40) (Kostenko, Titova 1988, p. 58-60). The findings of the conical regular core, truncated and backed bladelets together with the rounded scrapers at the Zahay II site at the mouth of the Trubezh attract attention. Another similar locality from which the pencil-like core originates in the context of backed bladelets and rounded scrapers is the Velykyi Balychyn site 12 km north of the Trubezh estuary (Savchuk 1974, p. 45-49).

Unfortunately, stationary studies that could establish the conditions for the formation of the cultural layers were not conducted. Despite the fact that the collection indicates the spread of Kukrek from Dnieper Rapids Region to the Middle Dnieper, it remains the extreme locations in advancing north along the left bank of the Dnieper. At the same time, these materials evidences the complex processes of neolithization of the Middle Dnieper Region, and may be the marks of several waves of migration that took place independently of each other. V. Manko also speaks about the complicated nature of the infiltration process of the Kukrek population into the right bank of the Middle Dnieper, pointing to several

migration waves that took place throughout the VI millennium BC (Manko 2016b, p. 27).

V. Manko divides Kukrek assemblages of the Right Bank Polissia into two types based on the correlation of flint and ceramic products. The first type includes materials of Lazarivka, Krushnyky 1 and Prybir 7a, where there is Samchyntsi ceramics of the "so-called Bug-Dniester culture". The second – Khodosivka type, with comb ceramics of the *"so-called Kyiv-Cherkassy culture of Dnieper-Donetsk cultural and historical region"* (Manko 2016b, p. 27). This division raises the questions with the definition of the "second type".

The latter was identified by the collection of the multi-layered settlement of Khodosivka-Zaplava, which has a number of features, related to the conditions of discovery compared to other sites. First, it is worth noting the size of the excavation, which was investigated during one season on an area of 2,572 m$^2$ (Hotun et al. 2007, p. 3), moreover, Neolithic materials were recorded in the late strata together with the findings of the Bronze Age – I millennium BC. 1,469 flint products and 264 fragments of Neolithic pottery were found in the area (Hotun et al. 2007, p. 95, 102). Accordingly, the average concentration of Neolithic artifacts is 2-3 units per 1 m$^2$. These factors do not indicate a possible correlation between flint and ceramics and may correspond to different episodes of settlement.

For ceramics in the Kyiv laboratory were obtained three $^{14}$C dates, which are in the range of approximately 5,900 – 5,300 cal BP (Hotun et al. 2007, p. 95, 104). This dating is quite consistent with other materials with Kukrek inventory of Kyiv-Zhytomyr Polissia. However, it is also worth mentioning that in the Kyiv Laboratory, ceramics from the neighboring settlement of Romankiv 1 was dated, and obtained the date 6130±150 BP (5,380 – 4,700 cal BC) (Manko 2006, p. 17). It also did not raised doubts until updated research by S. Pereverziev in the settlements of Romankiv 1 and 3, according to the results of which, in the same Kiev Laboratory obtained a series of five dates in the range of about 3,996 – 3,000 BP (table 2). This date (6130±150 BP) stand out sharply from the known concepts and indicate caution in the use of absolute dating by ceramics in any cultural and chronological schemes (Pereverziev, Sorokun 2011, p. 211).

The dating of the settlements of Romankiv 1 and 3 was used as an example given that most of the ceramic materials from Khodosivka-Zaplava find direct analogies among their collections. It is also worth noting that during the research of the settlement of Romankiv 1 on the area of 332 m$^2$, only 270 units of flint products were obtained, which is a characteristic feature of the Kyiv region late Neolithic (Pereverziev, Sorokun 2010, p. 254). Due to the large size of the study area in Khodosivka-Zaplava, it is not possible to be sure that the finds belong to one layer or one episode of settlement without conducting planigraphic observations.

The authors do not want to diminish the contribution of the research of the Khodosivka-Zaplava settlement to the understanding of the neolithization of the Middle Dnieper Region, but only point to the high level of relativity in comparing ceramics and the collection of Kukrek products. V. Manko's definition of the "second type" of Kukrek sites in the Middle Dnieper Right Bank does not yet find a clear argumentation. The nature of the Khodosivka-Zaplava lithic assemblage with numerous burins, most of which correspond to the Southern Bug traditions, in combination with the presence of a series of narrow faced cores indicate a direct connection with a number of sites classified as "first type".

It is also difficult to agree with the version of V. Manko, which explains the lack of typical for Dnieper Rapids ceramics among the materials of Kyiv region that *"the production of Surskyi ceramics, as well as ceramics of the Pechera phase of the BDK, could take place in specialized territorial production groups; skills in the production of ceramics could be lost during the movement to the north."* (Manko 2016b, p. 33). This statement is difficult to confirm and is based only on the assumptions of the researcher.

*3. The issue of correlation of flint with ceramics in some settlements.*

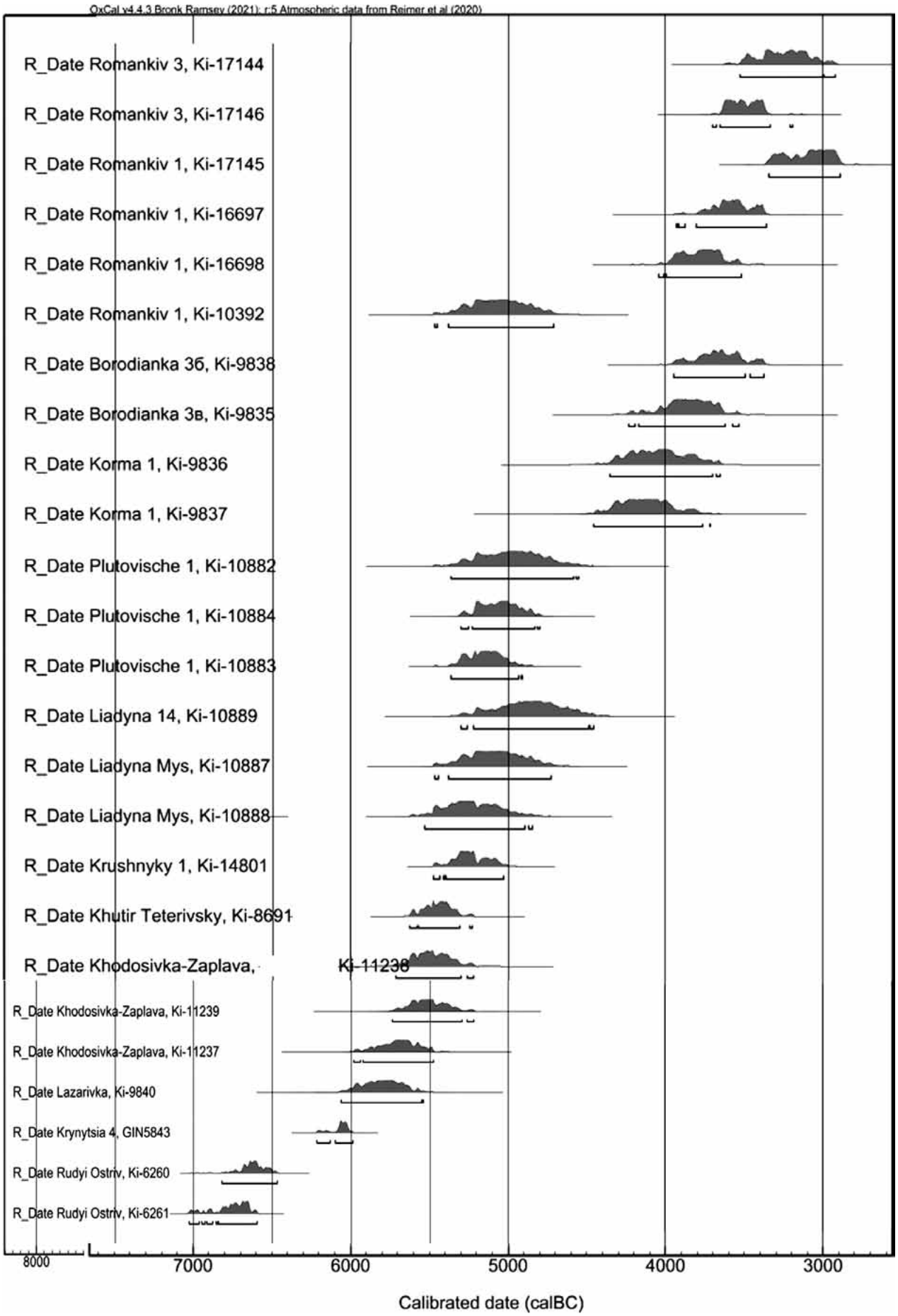
Among the 17 considered sites of Kyiv-Zhytomyr Polissia with Kukrek inventory, ceramic products of the Samchyntsi type are recorded only on four – Lazarivka, Krushnyky 1, Prybir 7a, Zavalivka (three fragments of pottery with an extended comb stamp from the settlement of Prybir 7a have not yet been published and are known from the report of L. Zaliznyak). At the same time, ceramics of the Dnipro-Donetsk type are presented in different quantities in most of settlements. The lack of "clear" assemblages can be explained by the level of preservation of the cultural layer, where in all cases there is no clear stratigraphy. For today, only for four settlements of the forest zone with Kukrek inventory the $^{14}$C dates of ceramics are known – Lazarivka, Krushnyky 1, Borodianka 3в and Khodosivka-Zaplava. At the same time, the Dnipro-Donetsk ceramics from Borodianka 3в have rather late dates, then the products of the same Dnipro-Donetsk type from Khodosivka-Zaplava (table 1, 2). The latter settlement stand almost synchronously with Lazarivka and Krushnyky.

**Table 1.** Radiocarbon dating of Meso-Neolithic sites on the right bank of the Middle Dnieper Region

OxCal v4.4.3 Bronk Ramsey (2021); r:5

| Site | Material, context | Index | $^{14}$C BP | Cal BC, 95.4% probability | Source |
|---|---|---|---|---|---|
| Romankiv 3 | Pottery, cultural layer (c. l.) | Ki-17144 | 4550±100 | 3524 – 3004 | Pereverziev, Sorokun 2011 |
| Romankiv 3 | pottery | Ki-17146 | 4730±90 | 3658 – 3338 | Pereverziev, Sorokun 2011 |
| Romankiv 1 | pottery | Ki-17145 | 4400±90 | 3347 – 2892 | Pereverziev, Sorokun 2011 |
| Romankiv 1 | pottery | Ki-16697 | 4810±110 | 3804 – 3360 | Pereverziev, Sorokun 2011 |
| Romankiv 1 | pottery | Ki-16698 | 4970±120 | 3996 – 3518 | Pereverziev, Sorokun 2011 |
| Romankiv 1 | Pottery, c. l. | Ki-10392 | 6130±150 | 5380 – 4713 | Manko 2006 |
| Borodianka 3б | pottery | Ki-9838 | 4870±120 | 3946 – 3492 | Manko 2006 |
| Borodianka 3в | pottery | Ki-9835 | 5050±140 | 4172 – 3624 | Manko 2006 |
| Korma 1 | pottery | Ki-9836 | 5220±160 | 4351 – 3702 | Manko 2006 |
| Korma 1 | pottery | Ki-9837 | 5305±160 | 4456 – 3768 | Manko 2006 |
| Plutovische 1 | Pottery, c. l. | Ki-10882 | 6055±170 | 5360 – 4582 | Manko 2006 |
| Plutovische 1 | Hearth 1, wooden charcoal | Ki-10884 | 6120±90 | 5224 – 4834 | Manko 2006 |
| Plutovische 1 | Hearth 1, wooden charcoal | Ki-10883 | 6205±90 | 5366 – 4934 | Manko 2006 |
| Liadyna 14, (Janislawice) | Pottery, c. l. | Ki-10889 | 5960±170 | 5222 – 4486 | Manko 2006 |
| Liadyna Mys (Janislawice) | Pottery, c. l. | Ki-10887 | 6150±150 | 5382 – 4723 | Manko 2006 |
| Liadyna Mys (Janislawice) | Pottery, c. l. | Ki-10888 | 6290±150 | 5532 – 4894 | Manko 2006 |
| Krushnyky 1 | Pottery, c. l. | Ki-14801 | 6280±80 | 5390 – 5031 | Manko 2016 |
| Khutir Teterivsky (Janislawice) | Pottery, c. l. | Ki-8691 | 6490±90 | 5571 – 5306 | Manko 2006 |
| Khodosivka-Zaplava | Pottery, c. l. | Ki-11238 | 6540±130 | 5715 – 5298 | Hotun et al. 2007 |
| Khodosivka-Zaplava | Pottery, c. l. | Ki-11239 | 6570±140 | 5736 – 5294 | Hotun et al. 2007 |
| Khodosivka-Zaplava | Pottery, c. l. | Ki-11237 | 6780±140 | 5925 – 5476 | Hotun et al. 2007 |
| Lazarivka | Pottery, dark-yellow sand | Ki-9840 | 6900±150 | 6066 – 5552 | Zalizniak, Manko 2004 |
| Krynytsia 4 (Janislawice) | | GIN5843 | 7210+40 | 6100 – 5990 | Zalizniak 1991 |
| Rudyi Ostriv (Janislawice) | l. 4 | Ki-6260 | 7800+60 | 6822 – 6470 | Zaitseva et al. 1997 |
| Rudyi Ostriv (Janislawice) | l. 9 | Ki-6261 | 7875+50 | 6840 – 6597 | Zaitseva et al. 1997 |

**Table 2.** Comparison of calibrated $^{14}C$ dating of Meso-Neolithic sites on the right bank of the Middle Dnieper



It is also worth noting that for the dating, which requires the presence of as many organic fibres in the moulding mixture, mechanically among the collections from Lazarivka and Krushnyky could be selected exactly Dnipro-Donetsk samples. This circumstance can significantly change our perception of the early assemblages of the region, because with the exception of a small surface collection of the Prybir 7a settlement, we do not yet record "clear" Samchyntsi assemblages in the forest zone. Hence, according to the dating, Dnipro-Donetsk pottery in Kyiv-Zhytomyr Polissia appears at the same time as Samchyntsi pottery, and does not appear on its basis.

**DISCUSSION**

Considering a series of early Neolithic settlements of Kyiv-Zhytomyr Polissya, it is worth agreeing with the opinion of most researchers about the first wave of neolithization of the region by infiltration of the Kurek industry with Samchyntsi pottery to the north. The term of "Neolithization" in this case, the authors mean primarily the appearance of the first ceramics, as one of the manifestations of the classical definition of "Neolithic". This is primarily due to the lack of the features, which would correspond to a clear statement about the emergence of reproductive forms of economy.

In almost all cases, the lithic assemblages have syncretic features of the Kukrek (incoming) with the Janislawice (local) industries. In particular, with the exception of one pencil-like core from the Zavalivka site (fig. 15: 5), which is characteristic of the steppe and forest-steppe Kukrek industry, all considered settlements of the forest zone have mainly narrow faced cores that are usual for the Janislawice industry (fig. 9, 13). At the same time, along with a series of Kukrek inserts and, in some cases, Abuzova Balka points, Janislawice high trapezes and microburins occur in parallel.

Having considered the materials of the Khodosivka-Zaplava settlement, the authors cannot agree with V. Manko's attribution of its collection to the "second type" of Kukrek sites of the Polissia Right Bank, given the problem of correlation of large excavation area with small collection of ceramics.

A special problem is the analysis of ceramic collections. In particular, the presence of Dnipro-Donetsk ceramics in different quantity among Samchyntsi materials has not yet been clearly explained. In recent decades, the idea of the appearance of the first ceramics in the Middle Dnieper under the influence of the Bug-Dniester culture is popular. At the same time, very few radiocarbon dates have been received so far. There is no clear certainty that the pottery samples taken from Lazarivka and Krushnyky 1 really belonged to the Samchyntsi type, and were not taken mechanically in order to use a sample with as many impurities of organic fibres as possible.

In general, the number and variability of sites with Kukrek inventory in Kyiv-Zhytomyr Polissia is a direct evidence of a rather large-scale and probably long process of integration of migrants from the South into the forest zone. It is still unclear the time and place where the changes in the technology of primary splitting of the Kukrek technocomplex took place. It is also not yet possible to clearly establish where the stage of formation of early Dnipro-Donetsk pottery took place and how long it lasted. An important task is to supplement the existing data with new materials involving data from the natural sciences, because the study of each new vestige opens the prospect of identifying the main problems of chronology and dynamics of certain categories of material culture.

**CONCLUSIONS**

After analysing the time frame together with the areas of distribution of sites of the late Pleistocene – early Holocene, it is possible to draw the following conclusions. With a good study of the region, there is an almost complete absence of sites within the Younger Dryas – Early Preboreal. The spread of the sites in Mesolithic was possible only after the formation of the modern Dnieper River valley, formed by the breakthrough of Poliske Lake, which was located in the modern basin of Prypiat river at the end of the Pleistocene. According to L. Zalizniak this breakthrough happened in Rauniss, approx. 13.5 ka BP (Zalizniak 2009, p. 28). Changing in regime of the river drain due to the retreat of the Scandinavian glacier has led to changes in the nature of river's meanders and release of large masses of alluvial sand, floodplain formations of which were suitable for the accommodation of Mesolithic-Neolithic population.

At the time of Younger Dryas and early Preboreal in the neighboring territories Ahrensburgian and Swiderian groups was spreading, which in the Kiev Dnieper are represented by several localities in the northwest of the region. There is an almost complete absence of sites on the left bank of the Dnieper, except for a few localities of Tatsenky group, until the appearance of ceramic complexes of the Kyiv-Cherkassy Neolithic. Such a chronological gap is a possible consequence of catastrophic changes in the Dnieper basin, associated with the breakthrough of Polissia Lake and changes in the riverbed of the Dnieper (Shydlovskyi 2018).

The analysis of radiocarbon dates of the Kyiv Right Bank sites showed the presence of several chronological clusters that correlate with the distribution of certain types of settlements (fig 17). The first cluster is associated with the manifestations of Janislawice culture in the region, represented by the dates of the Rudyi Ostriv and Krynytsia 4 sites. The dating of these sites indicates the spread of this group in the range of 7,000 – 6,000 cal BC.

The second cluster combines both sites with Kukrek lithic inventory (Lazarivka, Khodosivka-Zaplava, Krushnyky 1) and sites attributed as Janislawicean (Khutir Teterivsky, Liadyna 14, Mys Liadyna). This cluster is joined by a Plutovishche 1 site interpreted as the Upper Dnieper culture and one date from Romankiv 1 (Manko 2016a, 276). Dating of these sites is in the range of 6,000 – 4,500 cal BC.

The third cluster of dating should be associated with the spread of the Kiev-Cherkassy group of Dnieper-Donetsk Neolithic and Neman culture, among which there are sites as with Kukrek inventory (Borodianka 36, 3в, Korma 1), and without manifestations of Kukrek (Romankiv 1, 3). The dating of these settlements is between 4,500 and 3,000 cal BC (table 2; fig. 17).

Thus, it is possible to draw general conclusions about the spread of various cultural phenomena at the beginning of the Holocene in the Kiev Dnieper. The absence of sites dating back to the Younger Dryas – Early Preboreal indicates the uninhabited area during the catastrophic climate change on the border of the Pleistocene – Holocene (Shydlovskyi 2018). The peopling of this territory takes place during the Preboreal as a result of the penetration of the Tatsenky-Kudlaiivka culture groups into the Kyiv Right Bank region. The spread of advanced technological innovations is observed at the beginning of the Atlantic Time, from 7,000 BC, with the appearance of sites of the Rudyi Ostriv variant of the Janislawice culture with pressure technique of obtaining blade blanks and the use of microburin techniques in secondary lithic processing.

After the cooling of 6,200 BC, groups with a tradition of ceramic production and Kukrek flint inventory are penetrating. There is no doubt about the connection of these groups with the Southern Bug basin, which is reflected in the specifics of flint technology and ceramics. However, it should be noted that after this climate event the assemblages show significant variability in the combination of elements of Janislawice and Kukrek flint industries, Samchyntsi and Dnipro-Donetsk ceramic types, which indicates the complexity of migration and interaction between different cultural groups.

A possible explanation for the synchronous existence of two traditions of ceramic production (BDK and DDK) in the region was the presence of several migration routes of the Kukrek population to the Kyiv Dnieper in the middle of the Atlantic. One of such ways was the possibility of population penetration from the Dnieper Rapids along the floodplain. It should be noted that the settlement of the territory of the Kiev Left Bank region occurs later than the right bank (Sorokun, Shydlovskyi 2013; Shydlovskyi et al 2016, p. 45-94).

Thus, population fluctuations in the territory of the Kyiv Dnieper Region and migration waves are fully correlated with climatic phenomena. Powerful triggers for significant cultural change were cold snaps of the Younger Dryas and the 6.2 ka BC event.

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**Сорокун А.А.,**
*Інститут археології НАН України (Київ, Україна)*
**Шидловський П.С.**
*Київський національний університет імені Тараса Шевченка (Київ, Україна)*

## ПАМ'ЯТКИ З КУКРЕЦЬКИМ ІНВЕНТАРЕМ КИЇВСЬКОГО ПОДНІПРОВ'Я В АРХЕОЛОГІЧНОМУ ТА КЛІМАТИЧНОМУ КОНТЕКСТАХ

У статті подається спроба аналізу археологічного та екологічного бекграундів поширення кукрецької технології обробки кременю разом з першими навичками керамічного виробництва на території Київського Подніпров'я. Одним з основних результатів проведеного дослідження є висновок про складність міграційних процесів в ранньому голоцені, що маніфестується у значній варіативності пам'яток, та у різних комбінаціях яніславицьких, кукрецьких, буго-дністровських та дніпро-донецьких компонентів в крем'яних та керамічних комплексах.

Аналіз радіокарбонових дат пам'яток Київського Правобережжя засвідчив наявність декількох хронологічних кластерів, що корелюються з поширенням певних типів пам'яток.

Заселення цієї території відбувається протягом пребореалу в результаті проникнення на територію Київського правобережжя носіїв таценки-кудлаївської культури. Відсутність пам'яток, датованих молодшим дріасом – раннім пребореалом свідчить про незаселеність цієї території в часи катастрофічних змін клімату на межі плейстоцену – голоцену.

Поширення прогресивних технологічних інновацій спостерігається на початку атлантичного часу, з 7,000 BC, з появою пам'яток рудоострівського варіанту яніславицької культури з відтискною технікою отримання заготовок та використанням мікрорізцевої техніки у вторинній обробці.

Після похолодання 6,200 BC відбувається проникнення груп населення з традиціями керамічного виробництва та кукрецьким крем'яним інвентарем. Безсумнівним є зв'язок цих груп з територією Середнього Побужжя, що відобразилось у специфіці крем'яної технології та керамічних виробів. Однак, слід зауважити, що комплекси пам'яток після цієї кліматичної події демонструють значну варіабельність у поєднанні елементів яніславицьких і кукрецьких крем'яних індустрій та самчинських і дніпродонецьких керамічних типів, що свідчить про складність міграційних процесів та процесів взаємодії між різними культурними групами. Можливим поясненням синхронного існування двох традицій керамічного виробництва (БДК та ДДК) в регіоні була наявність декількох шляхів міграцій кукрецького населення в Київське Подніпров'я в середині атлантикуму. Одним із таких шляхів могло бути проникнення населення з дніпровських порогів по заплаві Дніпра, що поки не знаходить чіткого матеріального підтвердження серед відомих пам'яток.

Популяційна динаміка відзначалась значними флуктуаціями та нерівномірністю заселеності території Київського Подніпров'я. В основі цієї динаміки стояли глобальні кліматичні зміни, найважливішими серед яких слід назвати похолодання молодого Дріасу та подія 6200 рр. до н.е.

Стаття є публікацією матеріалів, що були висвітлені на 26-ій зустрічі Європейської Асоціації Археологів #Networking, 24-30 серпня 2020 р. (Shydlovskyi, Sorokun 2020). Опубліковані матеріали будуть використані при реалізації міжнародного освітнього проекту «Природа і суспільство первісної Європи», що виконується за підтримки Європейського Союзу за програмою House of Europe (http://vovkcenter.org.ua/en/naturesociety/).

*Ключові слова*: ранній голоцен, мезоліт, неолітизація, давні кліматичні зміни, Кукрек, Яніславиця, Середнє Подніпров'я


**Fig. 1.** Distribution of the main sites with Kukrek inventory in the Kyiv Dnieper Region (Google Earth, 2021): ***1*** – Korma 1; ***2*** – Korma 16; ***3*** – Smolianykovo; ***4*** – Pischane 1; ***5*** – Krushnyky 1; ***6*** – Prybir 7а; ***7*** – Motiiky – Vivcharnia; ***8*** – Protereb; ***9*** – Teteriv 3; ***10*** – Lazarivka; ***11*** – Zavalivka; ***12*** – Havronschyna; ***13*** – Borodianka 4б; ***14*** – Borodianka 3в; ***15*** – Abramivka; ***16*** – Rudyi Ostriv; ***17*** – Khodosivka-Zaplava; ***18*** – Borschiv, ur. Kut

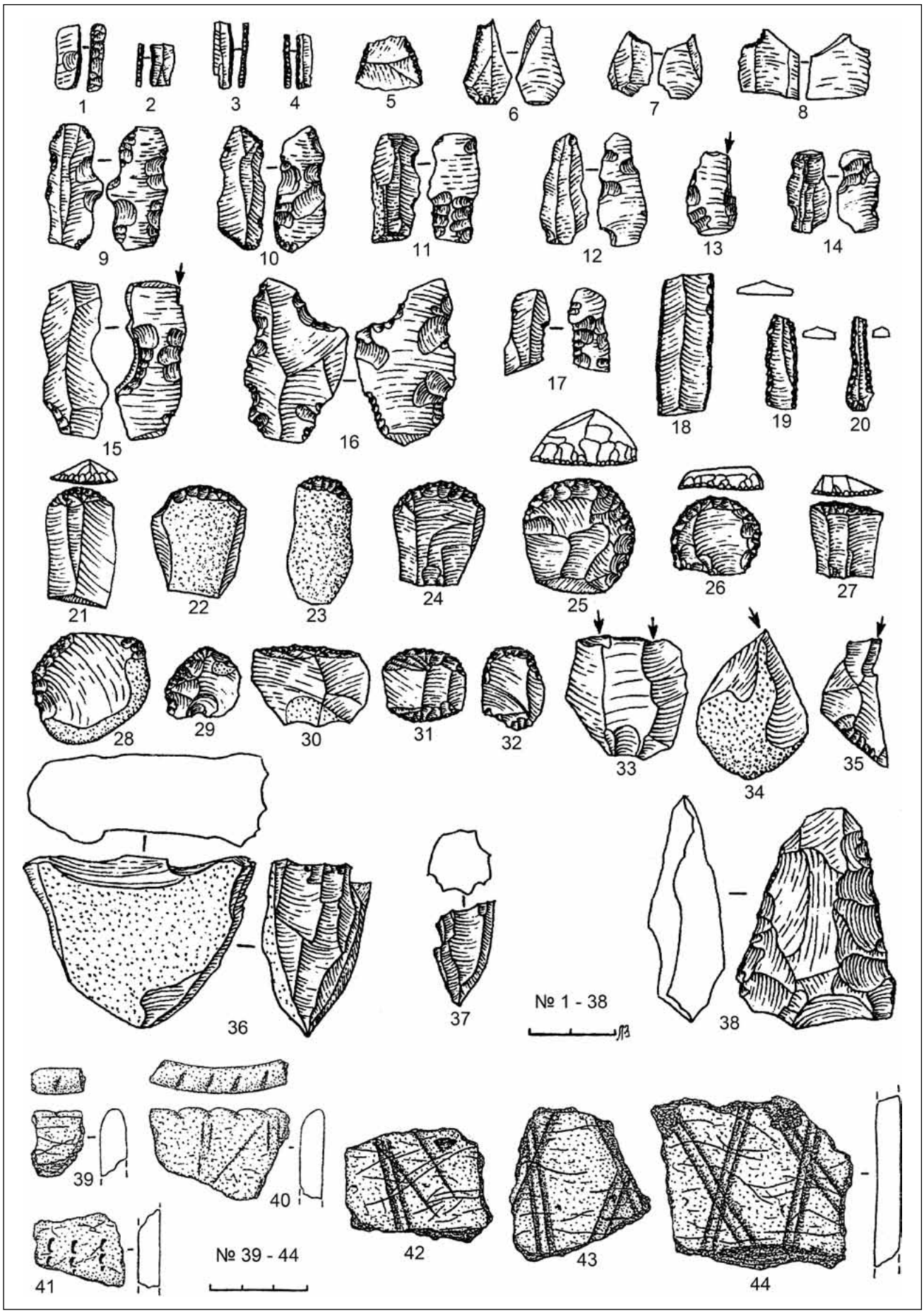


**Fig. 2.** Lazarivka. Flint artefacts and ceramic fragments (Zalizniak 1979)

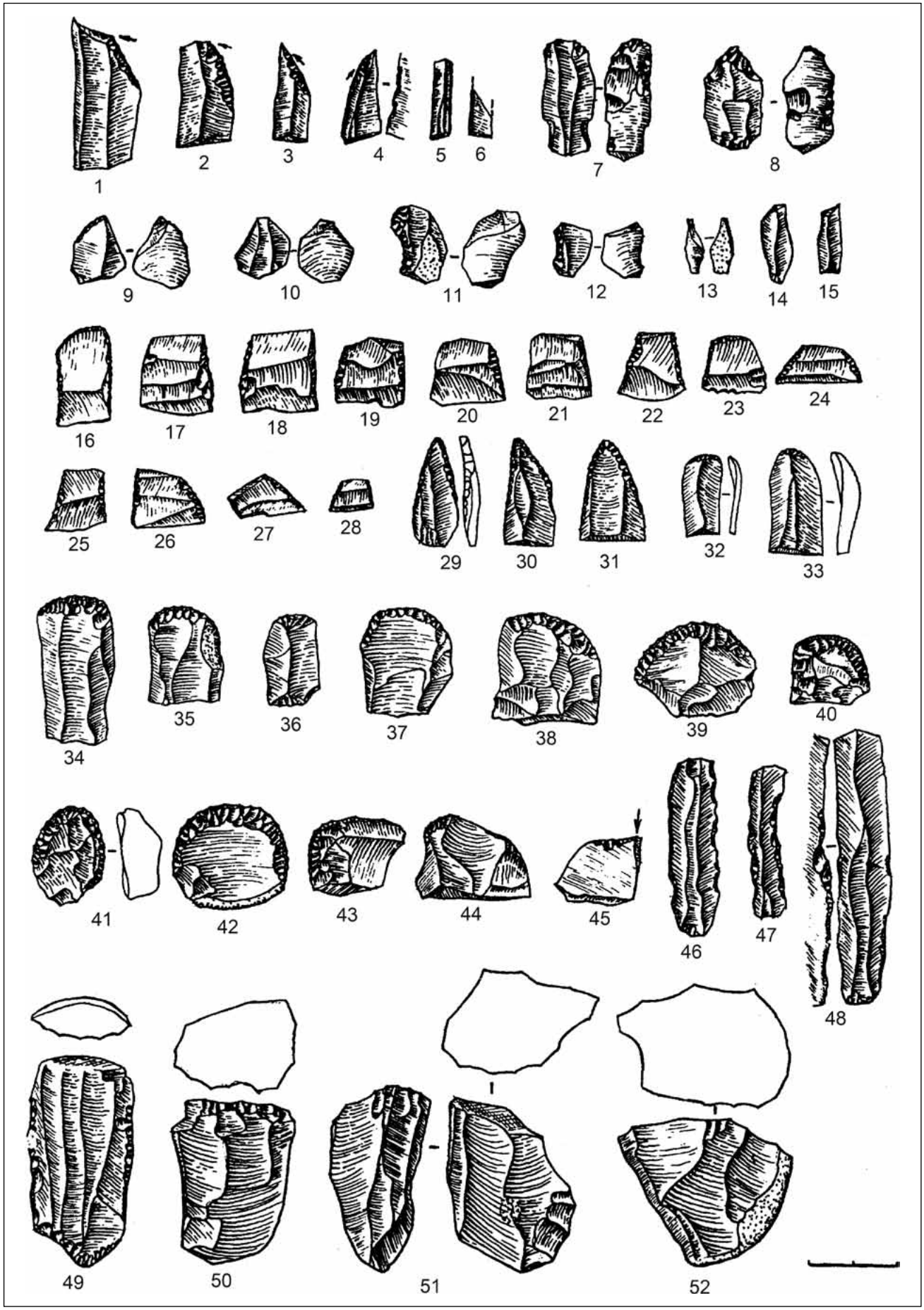


**Fig. 3.** Borodianka 3в. Flint artefacts (Zalizniak 1979)

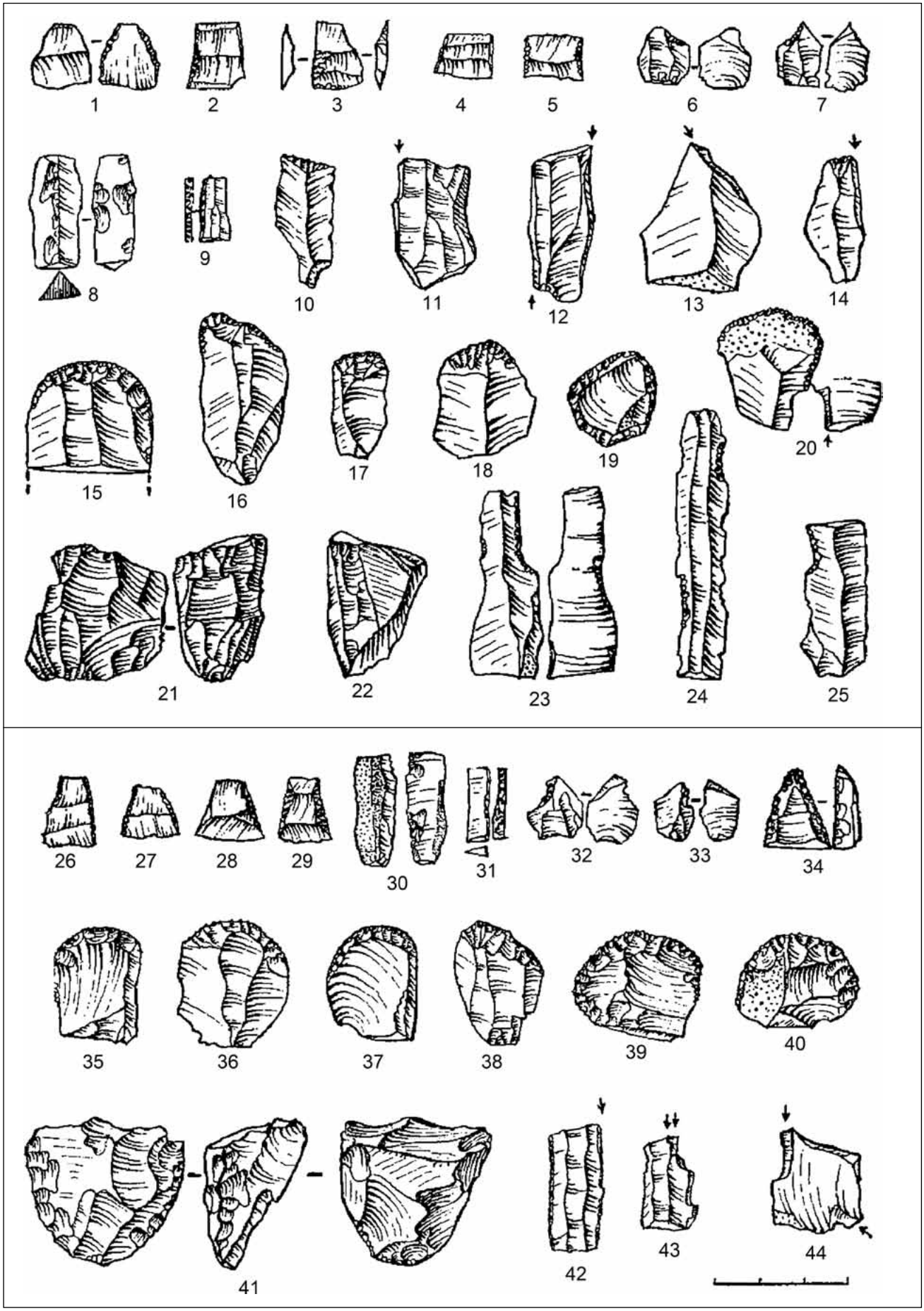


**Fig. 4.** Flint artefacts: *1-25* – Borodianka 46; *26-44* – Havroschyna (Zalizniak 1979)

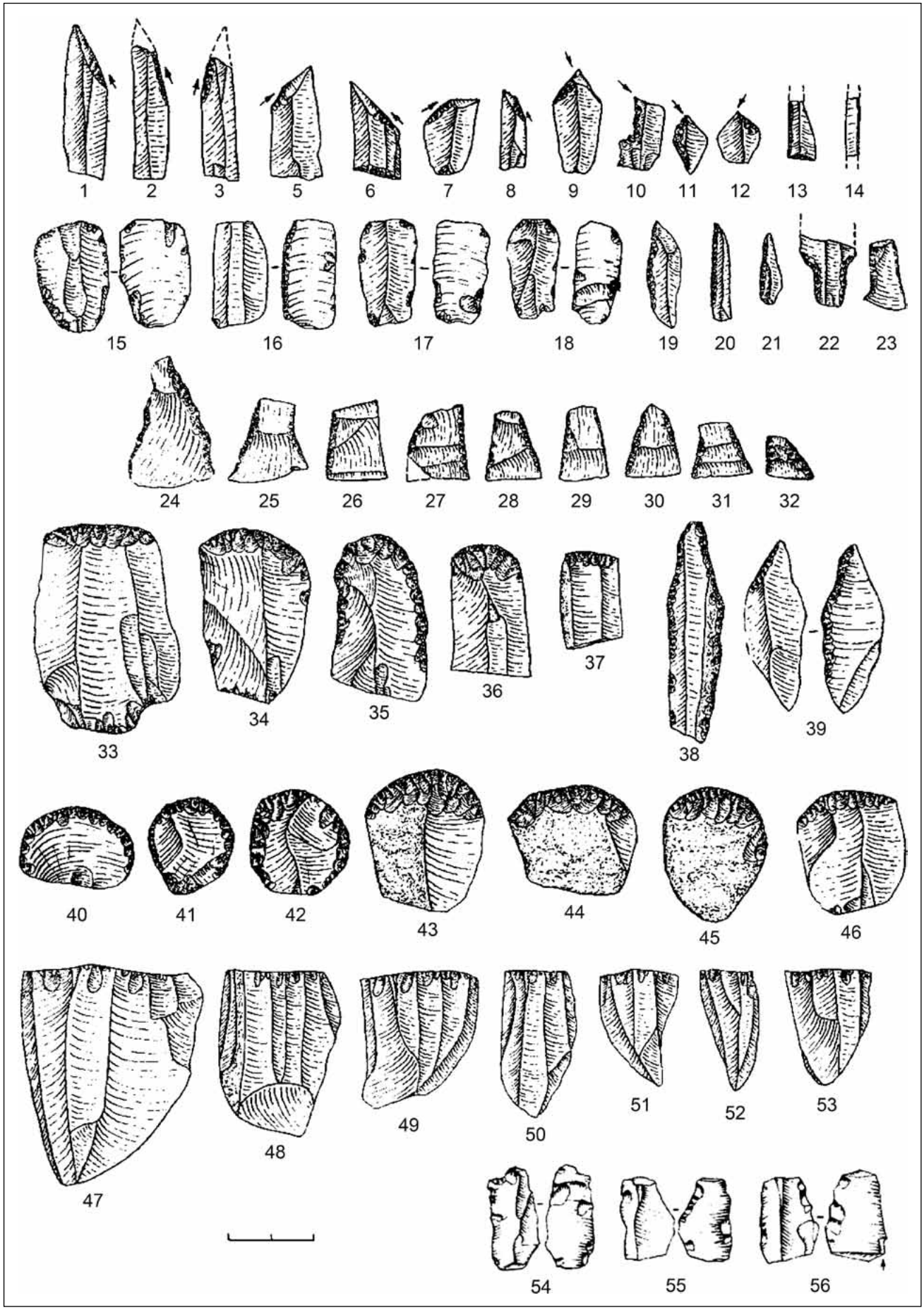


**Fig. 5.** Flint artefacts: *1-53* – Korma 1 (Zalizniak et al. 1987); *54-56* – Korma 1, 16 (Zalizniak 1991)

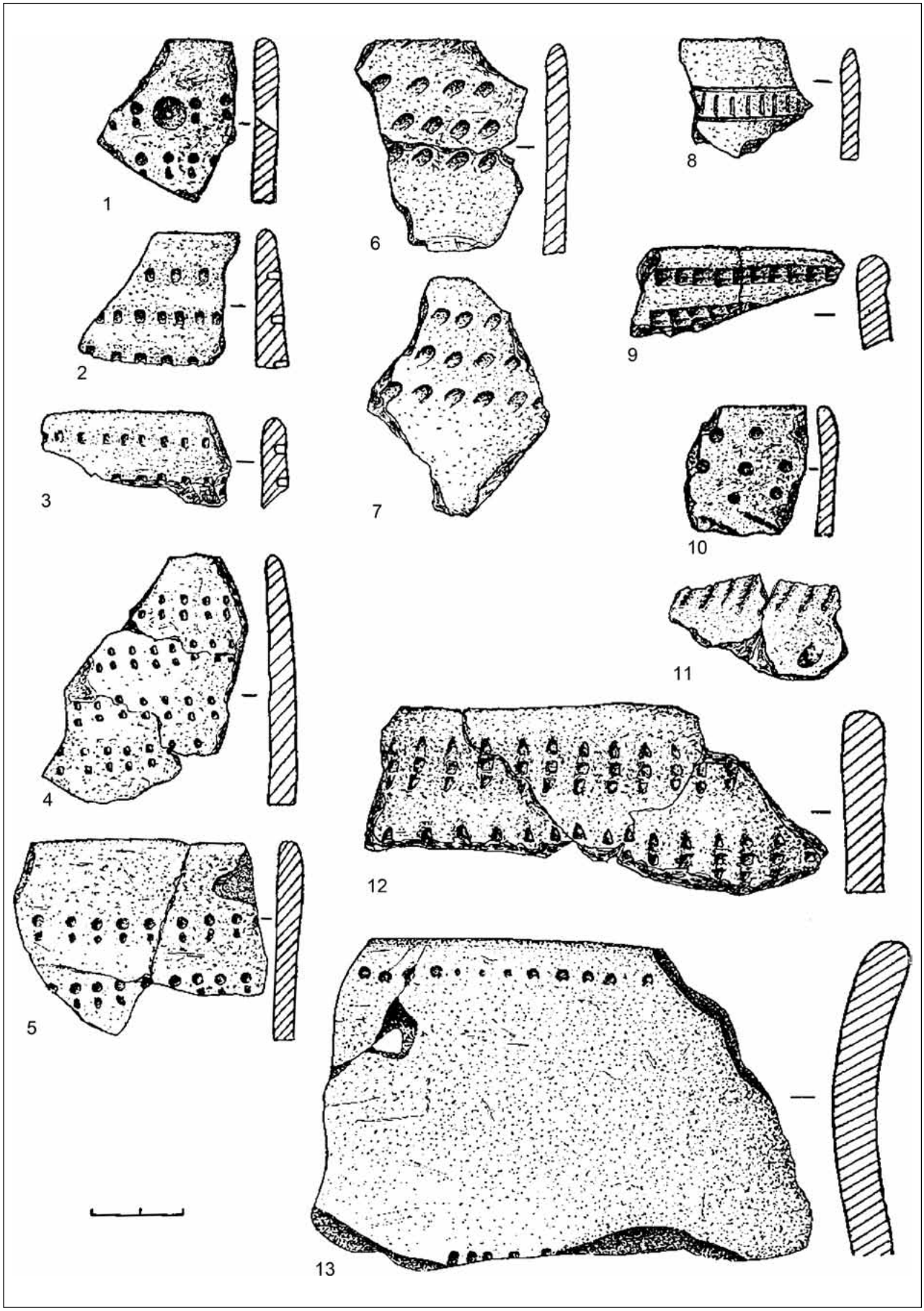


**Fig. 6.** Korma 1. Pottery fragments (Zalizniak et al. 1987)

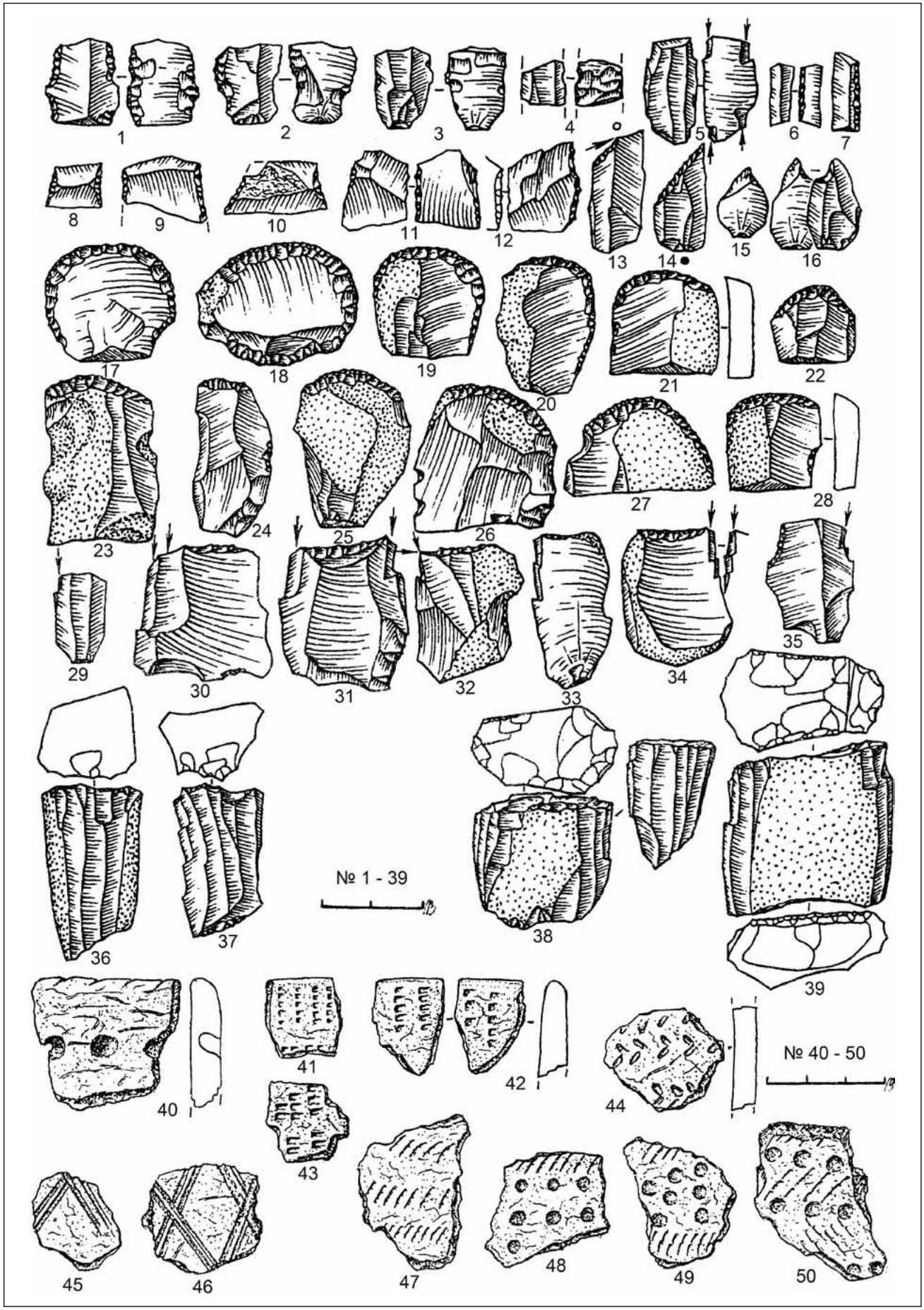


**Fig. 7.** Krushnyky 1. Flint artefacts and pottery fragments (Zalizniak et al. 1987, Zalizniak 2009)

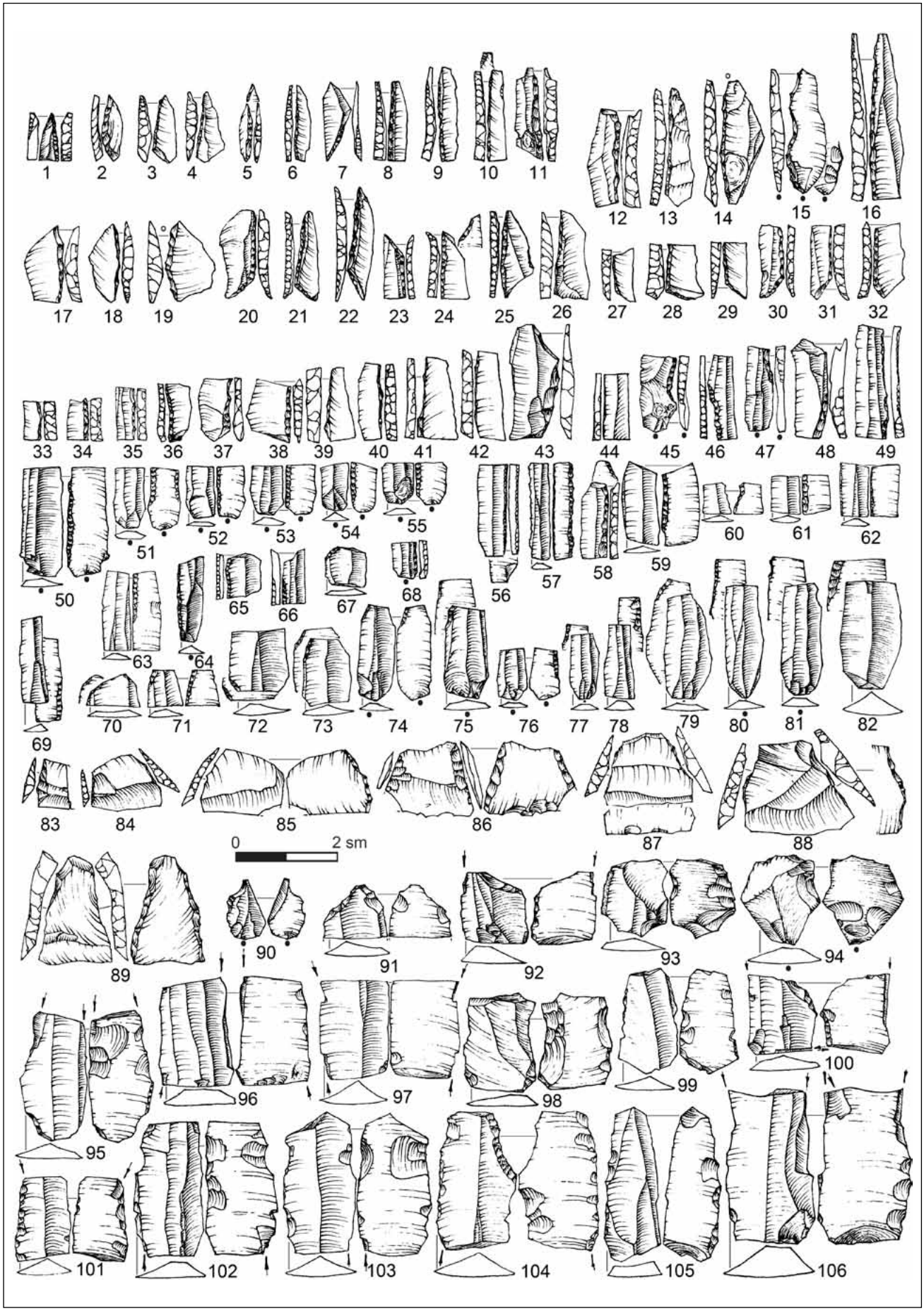


**Fig. 8.** Krushnyky 1. Microlithic tools (Zalizniak et al. 2016)

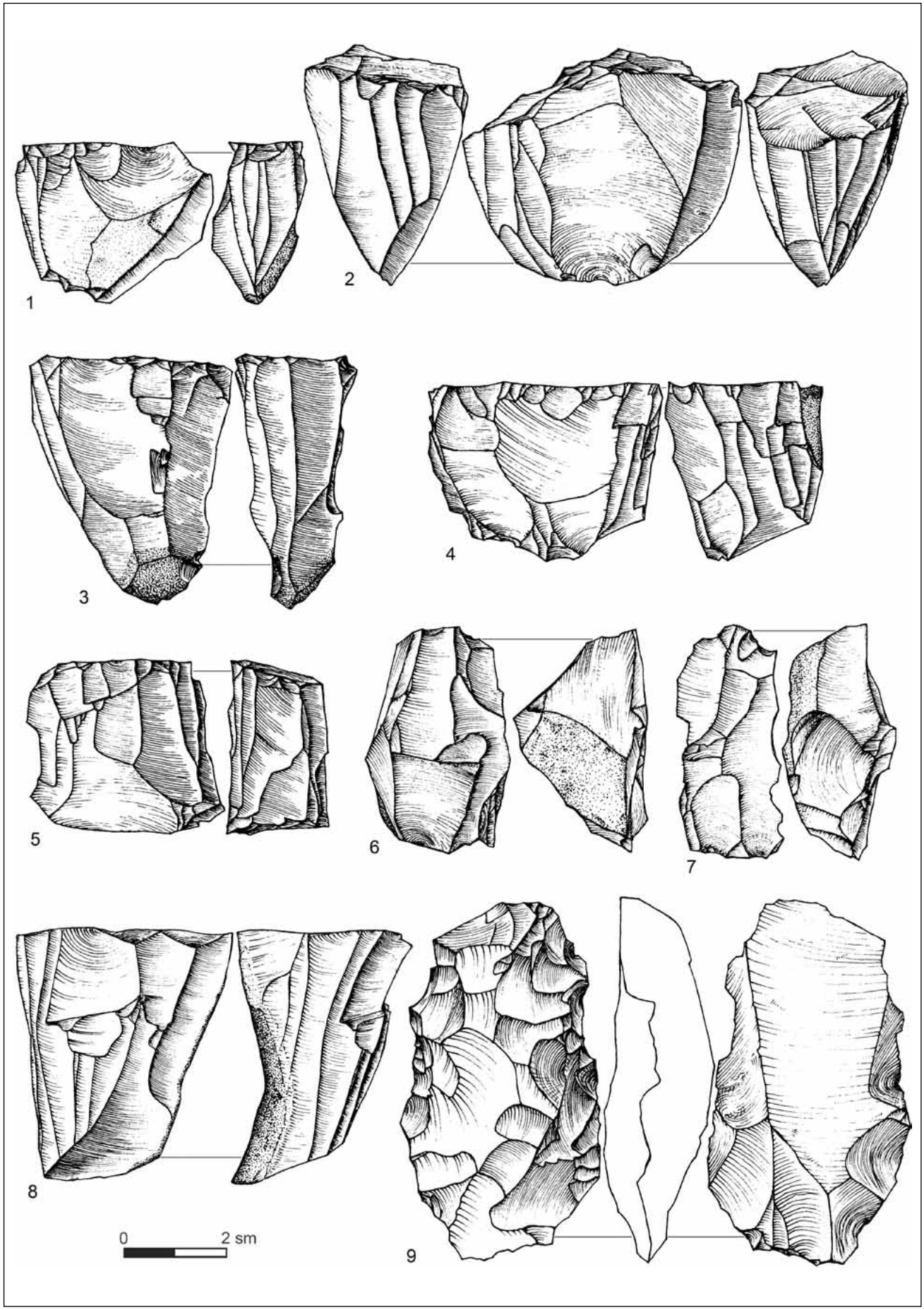


**Fig. 9.** Krushnyky 1. Cores and bifacial axe (Zalizniak et al. 2016)

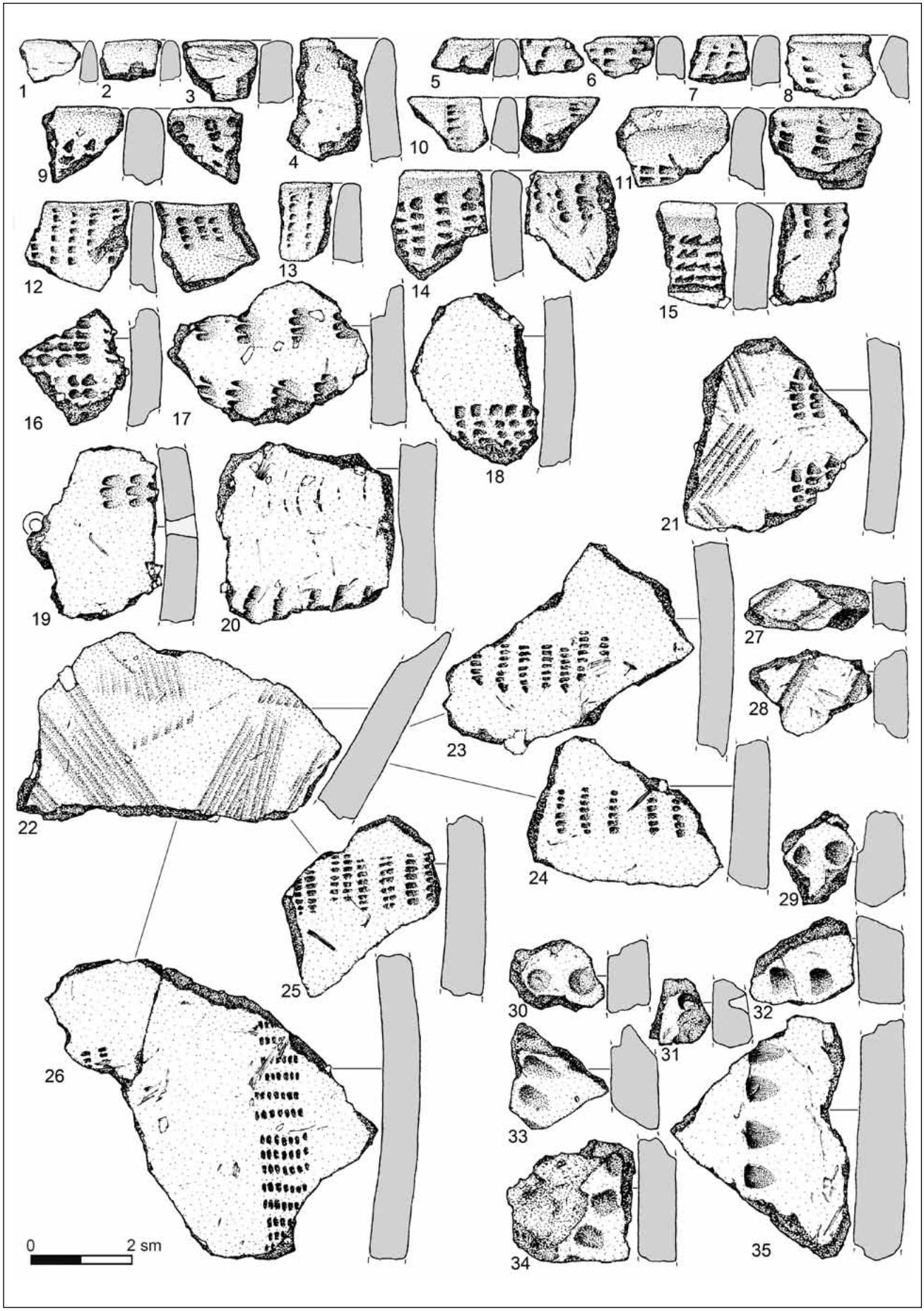


**Fig. 10.** Krushnyky 1. Pottery fragments (Zalizniak et al. 2016)

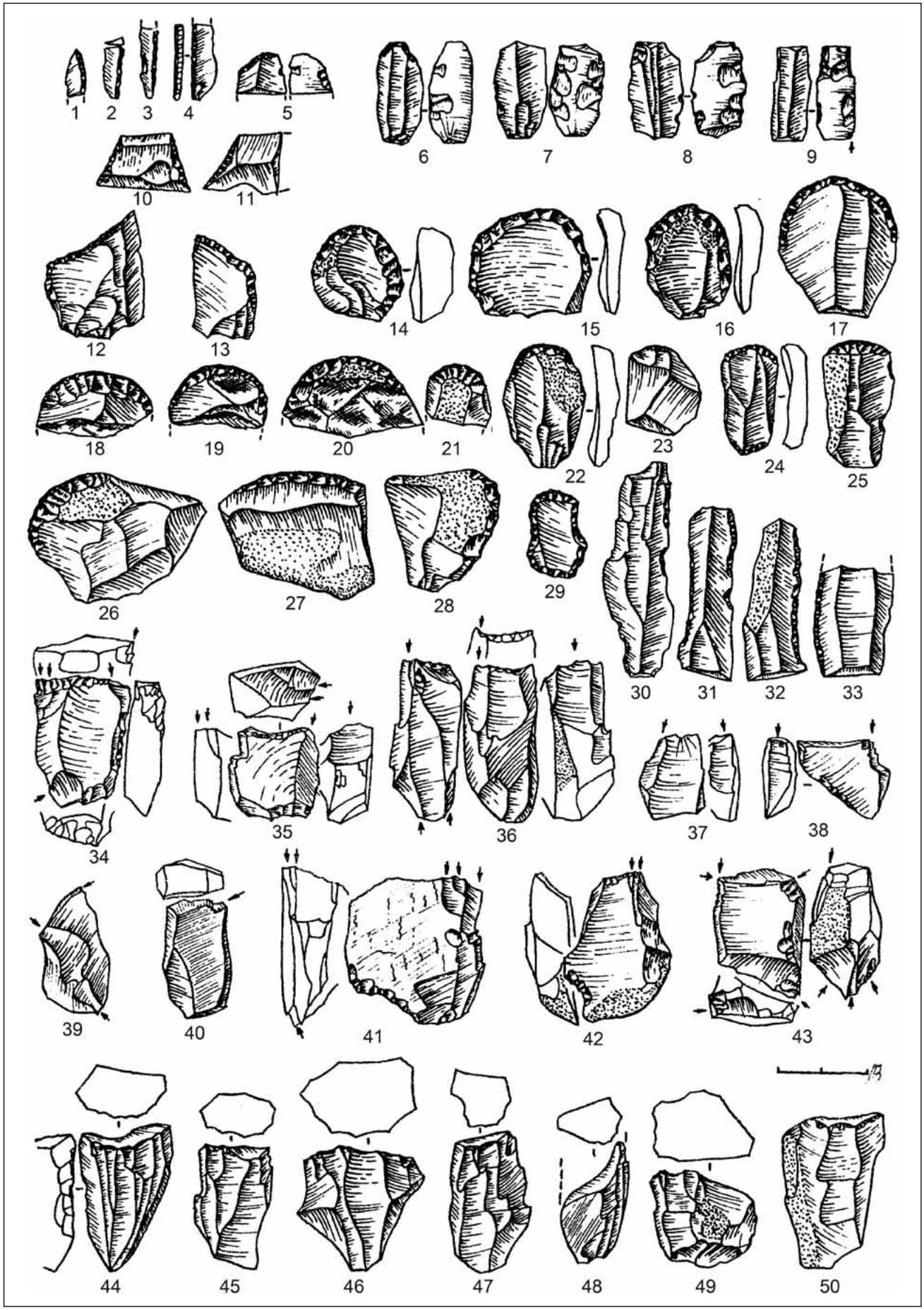


**Fig. 11.** Prybir 7a. Flint artefacts (Zalizniak 1991)

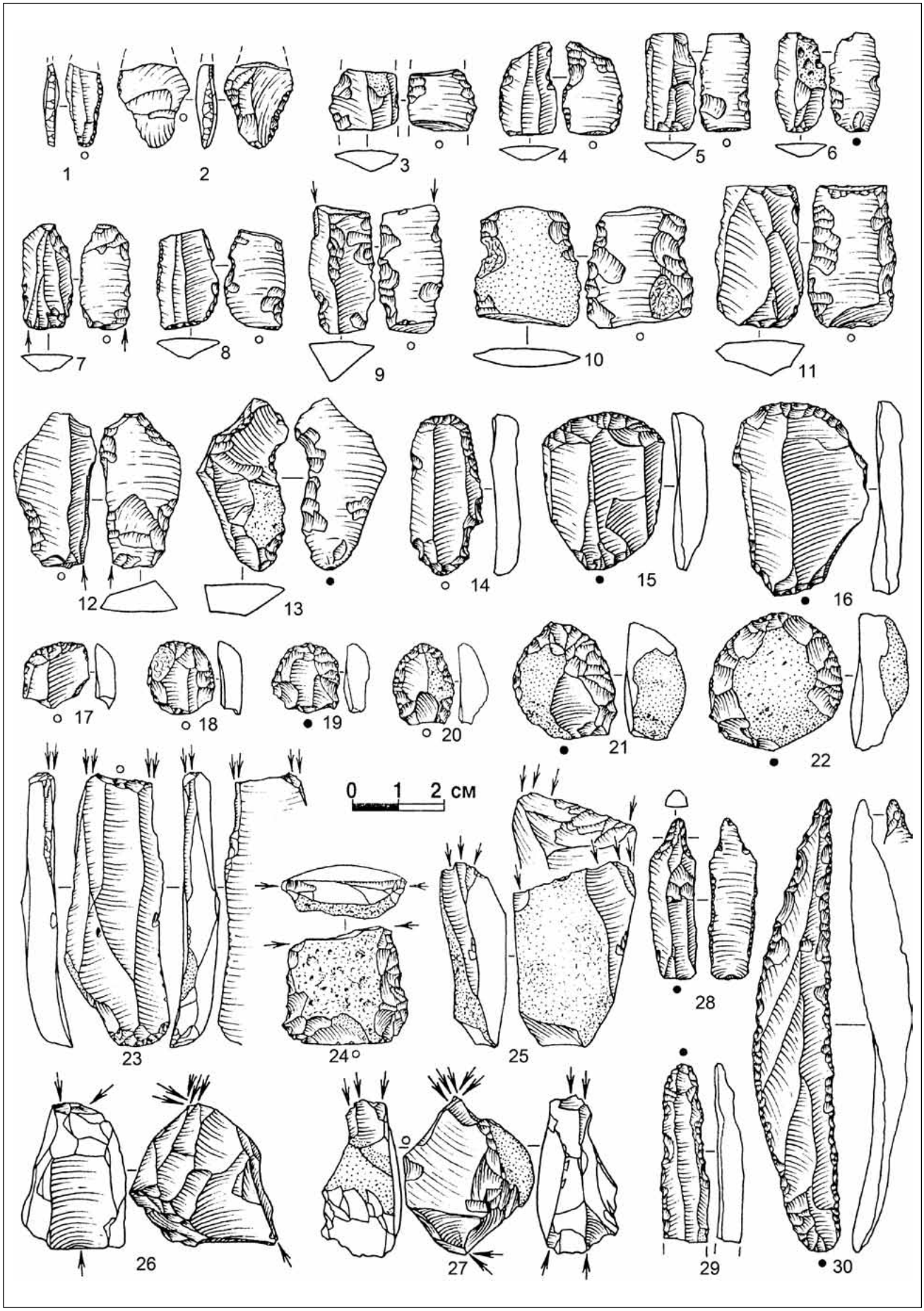


**Fig. 12.** Khodosivka-Zaplava. Lithic tools (Hotun et al. 2007)

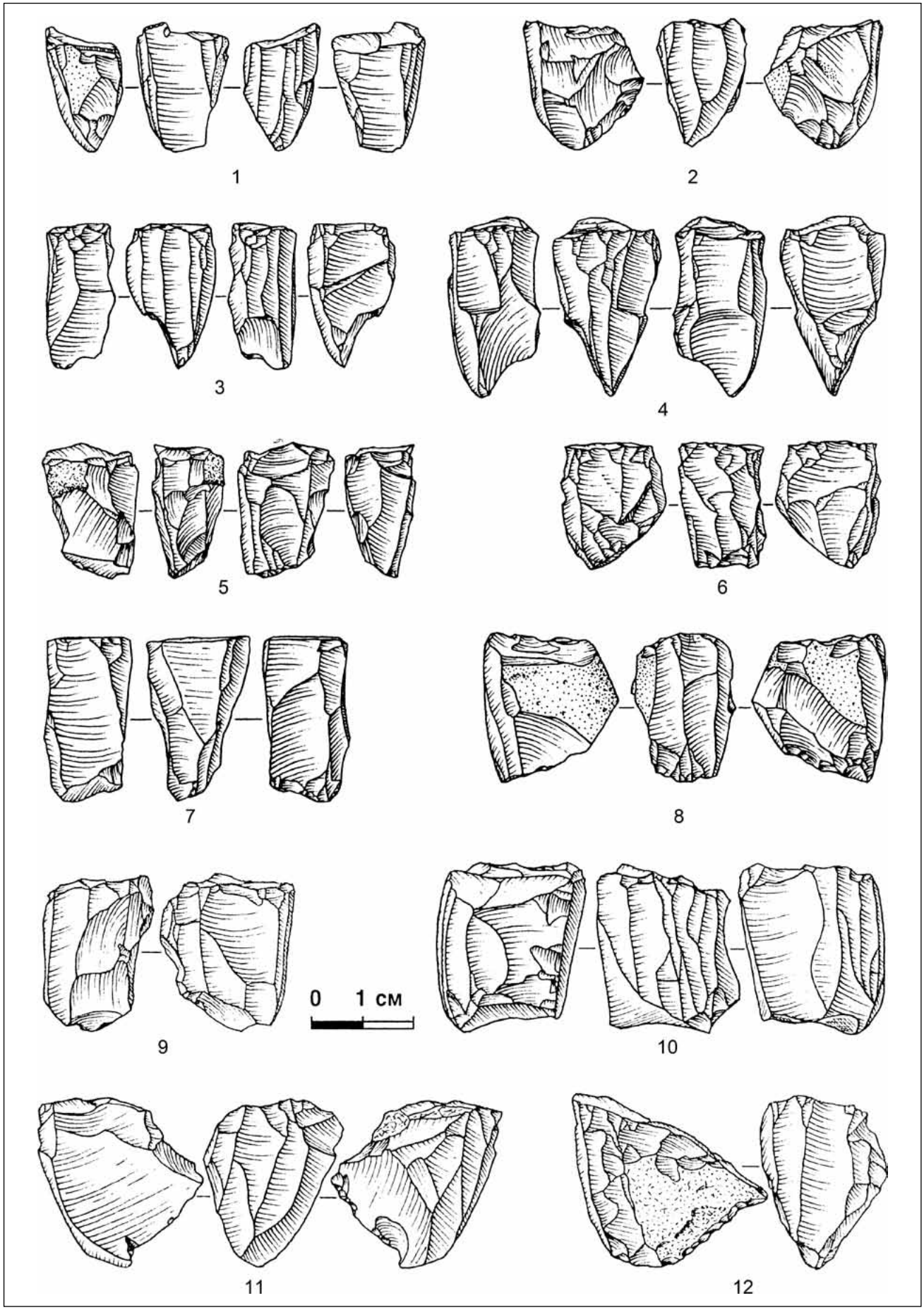


**Fig. 13.** Khodosivka-Zaplava. Cores (Hotun et al. 2007)

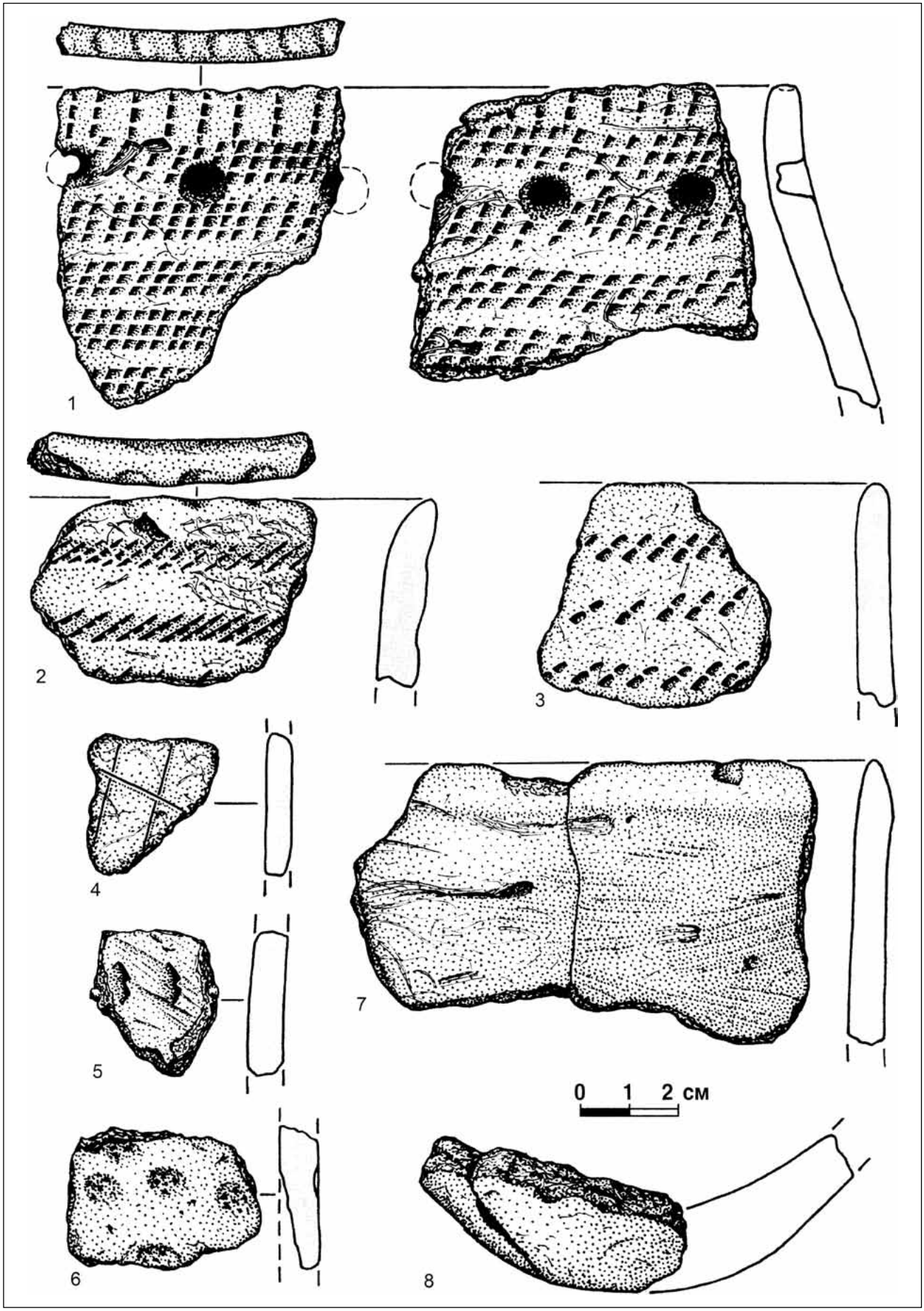


**Fig. 14.** Khodosivka-Zaplava. Pottery fragments (Hotun et al. 2007)

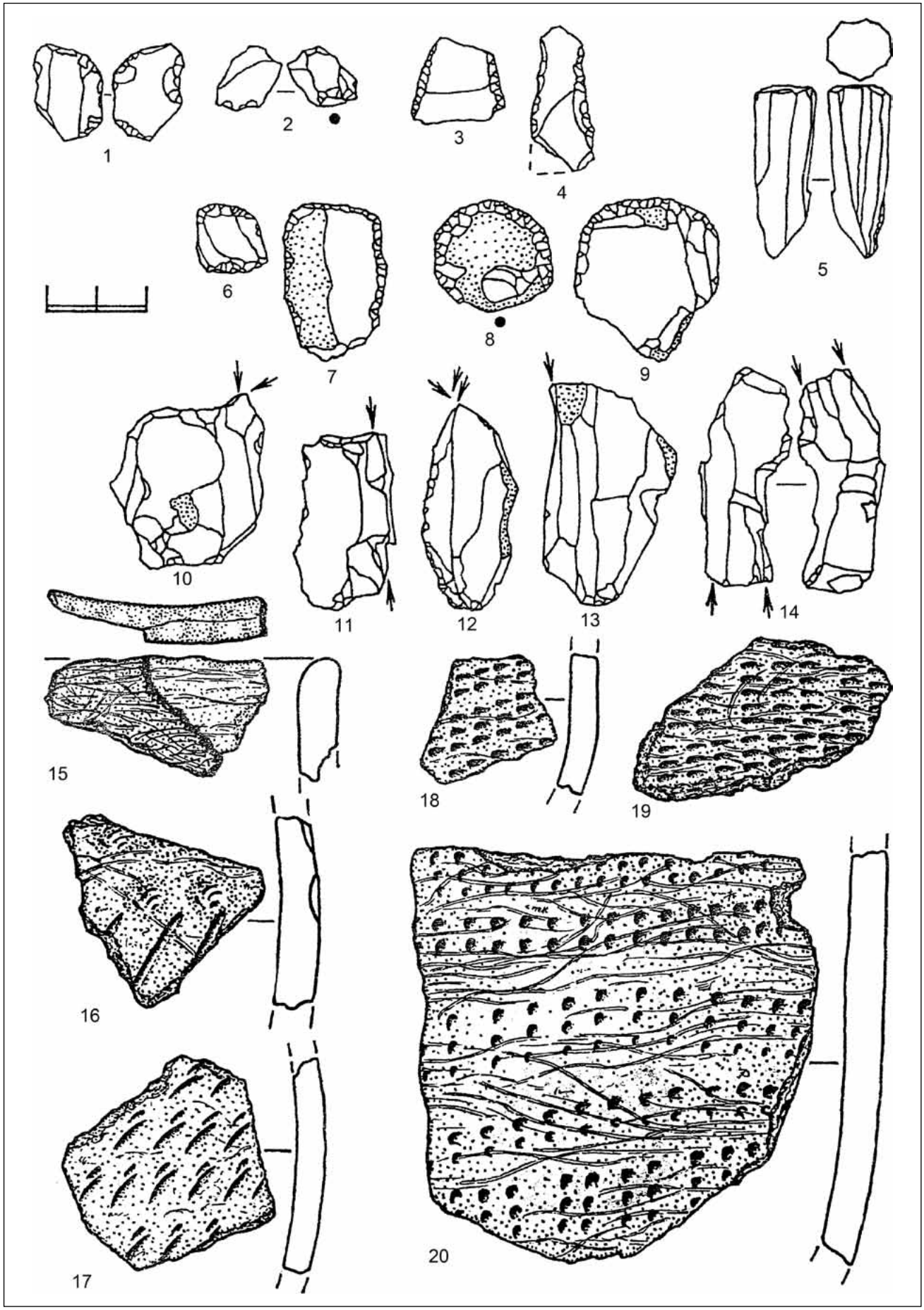


**Fig. 15.** Zavalivka. Flint artefacts and pottery fragments (Haskevych 2001)

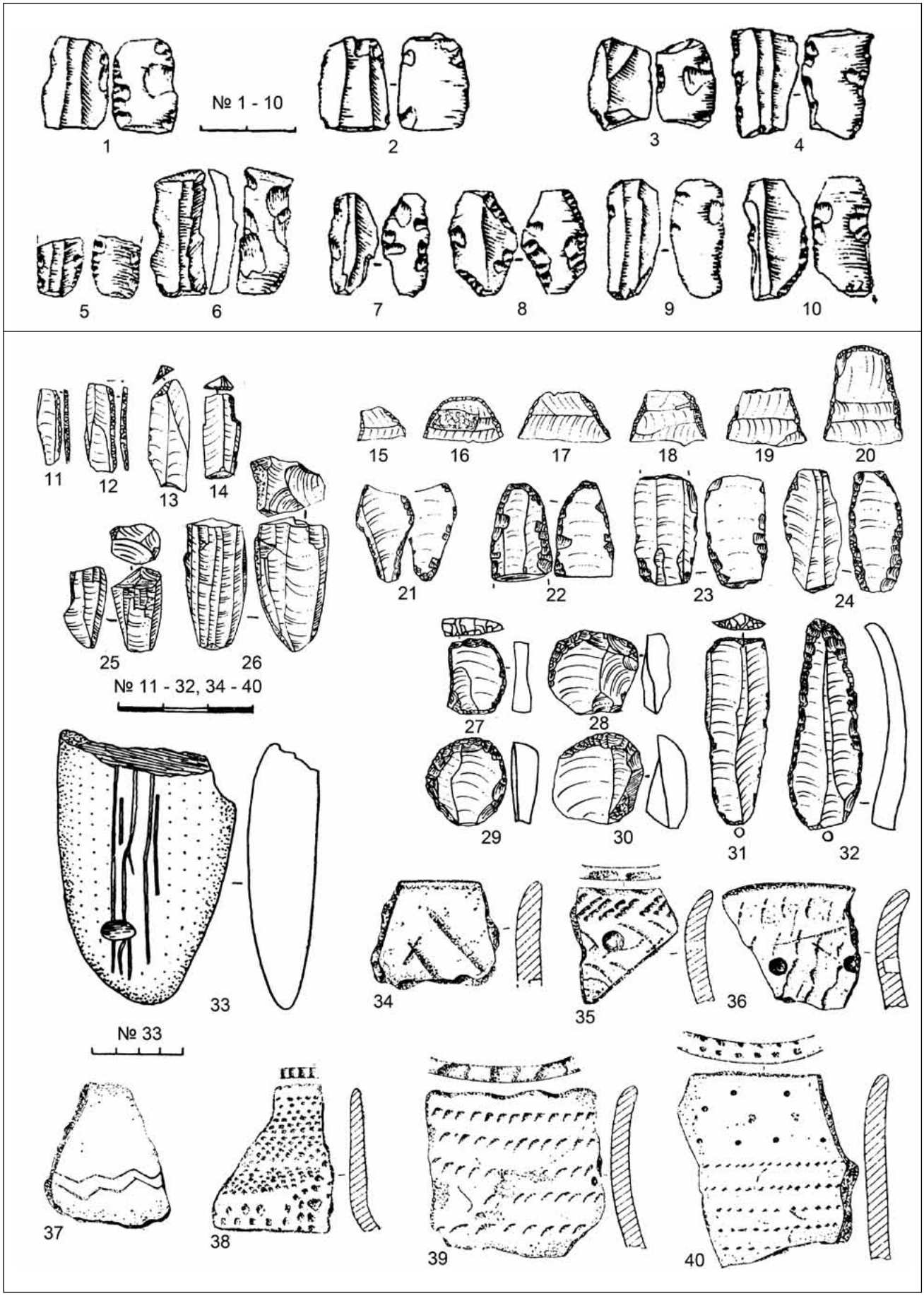


**Fig. 16.** Flint artefacts and pottery fragments: *1* – Abramivka, *2* – Smolianykovo, *3-4* – Rudyi Ostriv, *5-6* – Protereb, *7-10* – Teteriv 3 (Zalizniak 1991); *11-40* – Borschiv, ur. Kut (Kostenko, Titova 1988)

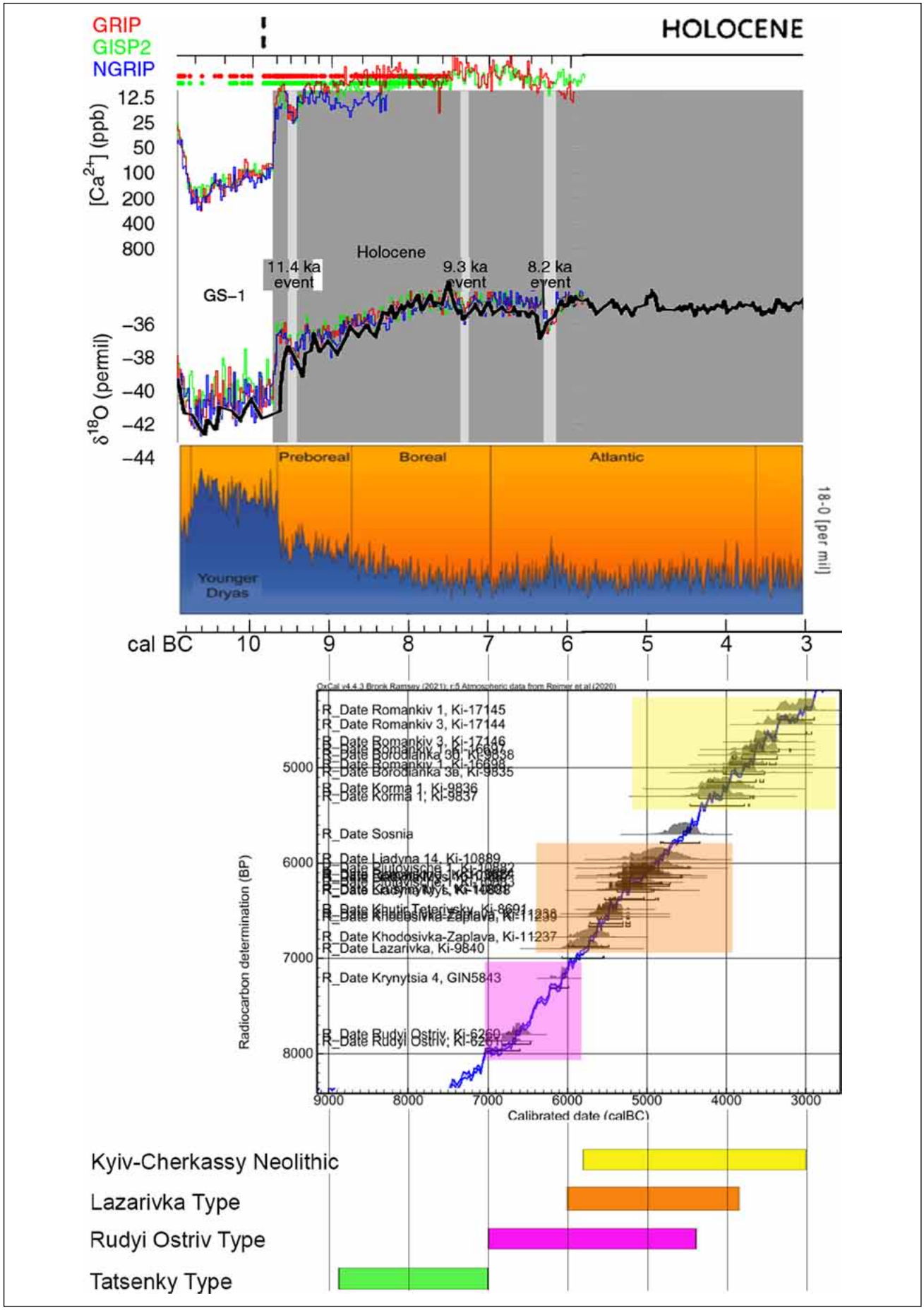


**Fig. 17.** Correlation of climate events with the settlement types in the Kiev Dnieper Region