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## Contribution to the determination of the chronology of the Brînzeni local group of Trypolye culture

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The author focuses on the chronology of the Brînzeni (Brynzen) group of the Tripolye culture in the context of the radiocarbon dates obtained from two settlements sites in Moldova - Văratîc Holm i Brînzeni XI (IX). Thanks to the conducted analyzes and the results of the latest research, it is possible to place the discussed results in a wider context, including materials in relation to the inner-Trypolye context and contacts with other communities in Central and Eastern Europe.

KEY WORDS: neolithic, Trypolye culture, Brînzeni, western Ukraine, Moldova, chronology

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### INTRODUCTION

At the beginning of the 4<sup>th</sup> millennium BC, western Ukraine and northern Moldova, were a new cultural borderland of two different socio-economic models and strategies connected with the Funnel Beaker (TRB) culture and communities of the late stage of the Trypolye culture (TC). The main differences are visible in pottery production, house features, and settlement model (cf. Dergachew 1980; Harper et al. 2019; Hawinskyj, Rybicka 2021; Müller et al. 2016; Kruk, Milisauskas 1999; Videiko 2004). However, both groups did not live in complete isolation, and the interactions between them are visible in the archaeological material, e.g. through the presence of culturally different artifacts in both the TC and TRB contexts interpreted as imports, the use of raw materials that confirm some form of exchange or trade, as well as in manufacturing combining various technologies and stylistic of pottery (Movscha 1985; Rybicka 2017; Rybicka, Diachenko 2016; Zacharuk 1955; Zbenovich 1976). The main aim of the article is to analyze the chronology of interactions between a specific variant of the Late Trypolye community – the Brînzeni local group, both in terms of its relationships with its inner cultural context, as well as based on the analysis of materials confirming the interaction with TRB.

The first studies of the settlements considered now as a Brînzeni local group took place at the beginning of the 20<sup>th</sup> century. However, formal separation of them among others was not made until the 1970s (Dergachev 1980; Movsha 1971). The area where Brînzeni local group's sites are recorded covers the northern Prut and middle Dniester regions, mainly in the northern part of today's Moldova. The group is characterized by a settlement model in the type of medium-sized settlements

(up to several hectares) established mainly in the area of uplands. According to the research carried out in the 1970s at Brînzeni III and Costești IV, they can be described as settlements predominantly on a circular or oval plan, consisting of about 30 houses preserved in the form of burnt constructions, the so-called *ploshchadkas* (Markevich 1981). Based on Valentin Markevich's work (1981), the economy was based on agriculture with the use of domesticated types of cereals – wheat and barley, legumes, oilseeds and fruit trees (Markevich 1981, 136-137). The lithic industry was differential and in fact even some raw material from Volhynia ware probably used (Jastrzębski 1989; Rybicka 2015; 2017; Rybicka, Diachenko 2016).

The characteristics of the Brînzeni local group constitute an important starting point for further analysis of the chronology. Currently, this issue is widely discussed in a number of publications aimed at defining the specificity of changes, as well as precisely specifying their chronology (cf. Diachenko, Harper 2016; Rybicka 2017; 2020; Sirbu et al. 2020). It should be emphasized that the influence of the Brînzeni local group was associated with the acceleration of the dynamics of social interactions, including relations with the TRB culture in western Ukraine, which in the archaeological material manifested themselves in syncretic ornamentation and forms of pottery. The evidence of contacts are numerous examples of settlements with components of the Brînzeni decoration style as an important and clearly different influence or even imports in the context of other local groups of TC (Rybicka 2017; 2020). Such communities were noticed not only in northern Moldova, but much further, to the Prut, Dniester and Bug interfluvium (Movscha 1985; Ryzhov 1998; 2007; Tkachuk 1998; Videiko 2000; 2003).

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In general, many scholars agree that the appearance of the Brînzani local group is parallel, or even marks the beginning of the CII phase of TC (ca. 3400-3300 – 3000/2900 BC, cf. Kruts, Ryzhov 2000; Rassamakin, Menotti 2011, for different opinion see: Kadrow 2013; Tkachuk 2005a). However, the precise framework of initial phase of the Brînzani group is problematic. The current research does not provide detailed analyzes of the absolute chronology covering the period of its appearance in the group's formative area in northern Moldova (Diachenko, Harper 2016, 88). Therefore, the chronology so far was based primarily on the <sup>14</sup>C samples for Zhvanets including set for Brînzani and Gordinești local groups. The results span between 3480-2700 BC (cf. Videiko 1999, 40-41) and allowed to determine the existence of Brînzani local group between 3400-3100 BC (Rassamakin 2012). At least the backgrounds of the Brînzani local group needs more careful attention. Nevertheless, certain remarks regarding the chronology of Zhvanets are important in the context of presence of the TRB's influences. Moreover, syncretic materials with features of Brînzani from Volhynia let us assumed that the appearance of the group in question and took place earlier (Diachenko, Harper 2016, 88; Rybicka 2017, 136). Strong relations have been documented at Nowomanlin-Podobanka, outside its formative area (eg. Król et al. 2013; Król, Rybicka

2016; Rybicka 2015; 2017; Rybicka, Diachenko 2015; Vertel'skiy 2016). Hence, it should be assumed, that in northern Moldova the stylistic features of the Brînzani local group were already clearly developed, and were so attractive that they influenced the northern areas. The very nature of the relationship, as well as the genesis of syncretic materials, are uncertain. Definitely, Brînzani communities play an important role in trade with the TRB communities and others representing different variants of the Trypolye culture. Two options seem likely: from an extreme proposal suggesting a direct migration of small groups of Brînzani communities to the north (Dergachev 1980, 132; Diachenko, Kirilenko 2016; Ryzhov 2007; Tkachuk 1998), to the transmission of patterns and ornaments of pottery beside the trade of Volhynia flint (Dergachev 1980, 133; Rybicka 2020).

Nevertheless, the assumption about the possibility of separating two or more stages of the Brînzani local group's development requires more detailed chronological analysis based on both, relative chronology and absolute dates. The contribution for these considerations may be the analysis of new <sup>14</sup>C damples for the sites of Brînzani XI (IX) and Văratice Holm and their characteristics in the context of the functioning of the Brînzani local group outlined above.

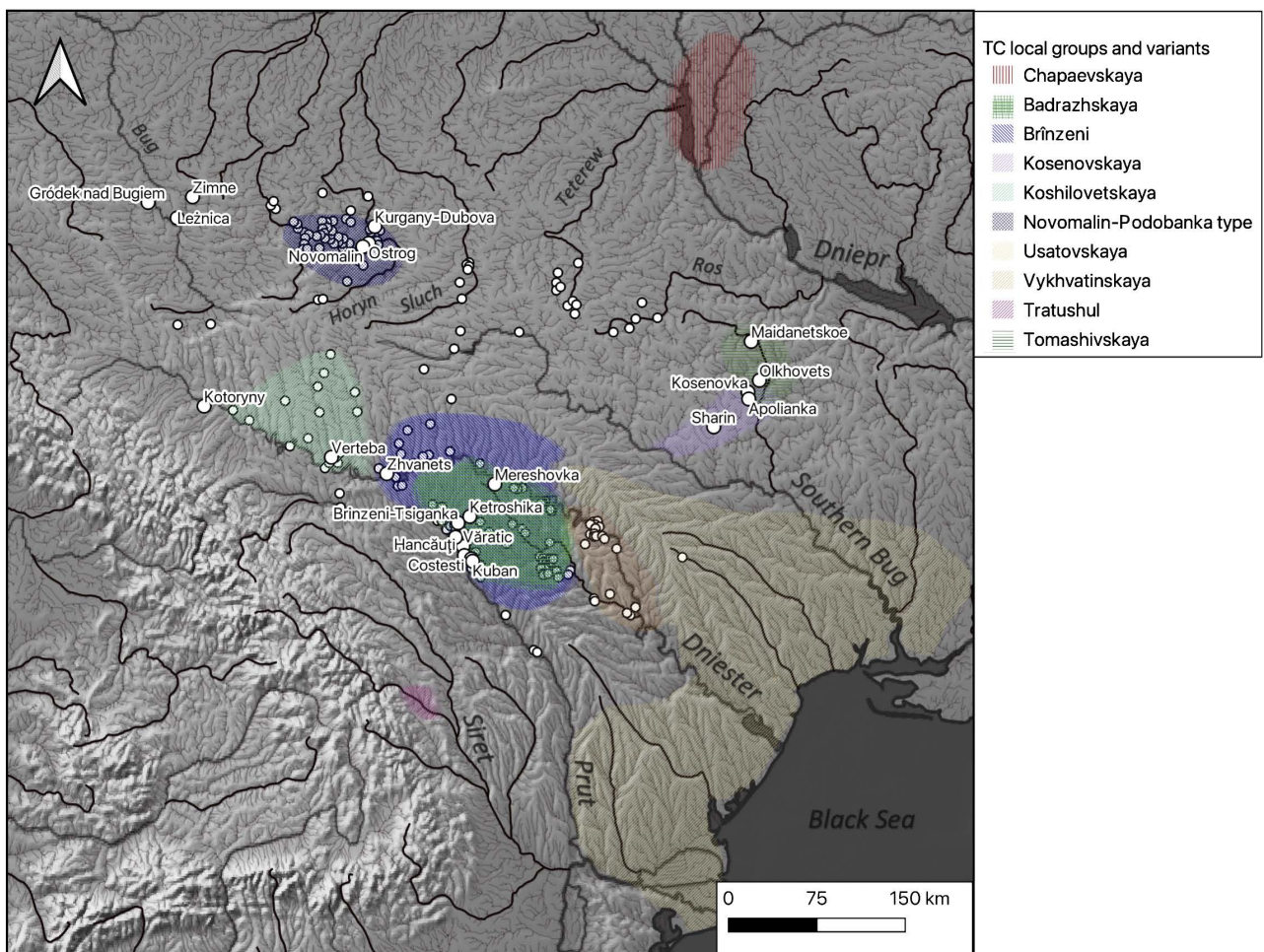


Fig. 1. The general distribution of Late Tripolye local groups (ca. 3800–3100 BC). After Tkachuk 2004; with additions according to Diachenko, Harper 2016

Ryc. 1. Rozmieszczenie lokalnych grup późnotrypolskich (około 3800–3100 BC). Wg Tkachuk 2004; z uzupełnieniami za Diachenko, Harper 2016

### Vărativ III Holm

The Vărativ Holm is located in a settlement microregion in northern Moldova (Edineț district) near the Prut, which marks the contemporary Moldovan-Romanian border. The settlement was discovered in 1958 by Nikolai A. Ketratu, and was excavated by Vsevolod I. Markevich in 1974. The results of the research were presented only in brief, after-conference paper and a few references in the publications of Valentin Dergachev (1980) and Vsevolod I. Markevich (1981).

According to the mentioned authors, the site can be characterized as a settlement consisting of dwellings preserved in the form of burnt-out field (Dergachev 1980, 52, Kruts 2012, 232). During the research, a kiln for firing pottery was also noted (Markevich 1981, 37–38). Fragments of the pottery represent the typical forms and ornamentation for other Brînzeni sites in this area. Particularly noteworthy is the high percentage of table pottery with painted decorations – approx. 50–55% (Dergachev 1980, 61). Among other, numerous stone, bone and antler tools were indicated, including a fragment of an axe and triangular dagger, which has some far reference to the Aegean zone (Dergachev 1980, 64–65; Markevich 1981, 65, 97, fig. 51:5, 52:12). Also some fragments of anthropomorphic statues have been identified. Documented flint tools were made from local as well as imported raw materials (Markevich 1981, 91).

### Brînzeni XI (IX)

The present-day Brînzeni is located in northern Moldova (Edineț district) near the border with Romania. The villidze is surrounded by the complex of TC settlements. The site was discovered by Vsevolod I. Markevich in 1976, who gave its number IX at that time. Due to the existence of a site with this name (Mersâna), some correction was made and now it is mainly refers as Brînzeni XI or Brînzeni XI (IX). Brînzeni XI (IX) is located in the Bucșu River valley on a slightly flattened headland. The first excavations by Markevich took place in 1977. The main interest focused on the discovery of the remains of the burnt house (dwelling no. 1). Excavations were continued by Moldavian teams (dwelling No. 2, pit) and researchers from the Lomonosov State University in Moscow in 1981 (dwelling No. 3).

In total, the remains of three dwellings and one pit were excavated. So far, the results of the research, apart from minor announcements, have not been fully elaborated. A detailed discussion of the results is not possible due to the partial lack of preserved documentation. This is crucial for works carried by the Moscow expedition. However, in the time following the research, some information about the excavations was presented in short communications or catalogues (Markevich 1985, 101; Stratulat 2008, cf. Țerna, Heghea 2017, 316, 319).

On the basis of the preserved materials, certain characteristics of the discovered objects can be determined. The dimensions of the dwellings were varied – house no. 1 – 6.4×5.7 m; No. 2 – 9.45×6.25 m, and the largest house No. 3 – 12.5×9 m. More detailed information concerns the first two structures. They were located along the NW-SE axis. The upper storey of hut no. 1 rested on roof beams covered with a 5–8 cm layer of clay. On the remains of the walls,

there were imprints of bundles and branches. Additionally, during the research of the dwelling no. 2, western remnants of a collapsed wooden structure with structural impressions were discovered. Under the ground floor of the house no. 1, a several-dozen-centimeter layer of a mixture of wastes: animal bones and pottery was documented. According to Stanislav Țern and Sergiu Heghei (2017, 319), it was the material for leveling the slope on which the building was constructed. It seems likely that there was also a small wooden outbuilding at the dwelling no. 2, which burned out completely during the destruction of the structure. Inside the dwelling no. 2 there are two fireplaces and a clay bank, while at dwelling no. 3 – two clay benches, including one on the upper floor and a stove were documented. The discovered and examined pit was located in the vicinity of dwelling no. 1. There were fragments of pottery, numerous tools made of bone and antlers, as well as post-consumer wastes.

The pottery discovered at the site can be divided into two main categories: fragments of tableware constitute 75% of the entire collection, while the rest is “thick-made” kitchen pottery. In terms of technology, the first group is characterized by a well-formed pottery mass without any visible admixture, while shells are the traditional addition to the clay from which kitchen pottery were made. The outer surfaces are often polished. The morphology of the vessels includes various forms: amphorae, pear-shaped pots, small vases. In most cases, the decorations were painted with black without primer. More rarely, ornamentation was done in red. Ornamentation includes forms typical of the entire complex of sites around Brînzeni. The most characteristic are decorations in the form of multiplied lines and ovals, festoons and anthropo- and zoomorphic images (Țerna, Heghea 2017, fig. 26, 27; cf. Bicbaev 2016, fig. 10:11). A small findings include three partially preserved female figures, decorated spuns and weaving weights of various shapes.

### Contribution to the chronology of the Brînzeni local group – radiocarbon markings for Vărativ III Holm and Brînzeni XI (IX)

The specificity of inner-Trypolie contacts is complex issue, especially in the context of general cultural changes of the turn of the CI and CII phases (Dergachev 1980; cf. Diachenko, Harper 2016 – further references there). It was related, among others, to the phenomenon of increasing the mobility of local communities, a change in the settlement and economic strategy, the emergence of new pottery decoration and contacts with communities representing by a different cultural set. Detailed considerations regarding the interpretation of radiocarbon dates for the late TC communities were carried out, among others by Yuri Rassamakin (2012) and latter by Aleksander Diachenko and Thomas K. Harper (2016). In this case, it is also possible to supplement them with new results.

In northern Moldova, the Brînzeni local group was preceded by the communities of the Badrazhskaya local group, with which it is probably genetically linked. Currently, four radiocarbon dates for the Hancăuți I site are known. They represent the second stage of development of this group at the turn of the CI–CII period. They maximum range spans between 3980–3636 BC ( $\sigma$ ) and 4039–3532 BC ( $2\sigma$ ) (Diachenko, Harper 2016, table 1; Lazarovich 2010). The synchroni-

zation of the origins of Brinzeni communities in the context of their relations with the areas of central Ukraine seems to be more problematic. It seems reasonable to indicate the parallel between Brinzeni and Kosenovskaya local groups (Ryzhov 2007), especially since both groups indicate certain relationships with the genetic sequence concerning large settlements. Sergii Ryzhov believes that the establishing of both groups was the result of partial migration and gradual acculturation of the community of the Tomashovskaya group, representing a variant of the Trypolje culture within which large settlements functioned. According to him, along with gradual decline of gigant settlement, some communities undertook a journey to the west, which was initially marked by the time of intensification of mutual contacts. The so-called imports of Brinzeni pottery in Majdanetskoie identified by Taras Tkachuk could be treated as a some evidence of the presence of relation between both communities (Diachenko, Menotti 2015; Tkachuk 2005, 49; 2008, 39). In the opinion of Alexander Diachenko and Thomas K. Harper (2016, 87–88), the analysis of radiocarbon samples from Majdanetskoie allows establishing the chronology of these contacts for the period in which the settlement functioned in the years 3750/3700–3650 BC, along with a possible slight extension of the range of the Tomashovskaya group by approx. 50 years. This suggestion meets with Müller et al. (2016), whose enlabeled chronology of Majdanetskoie for 3800–3670 BC.

At a later stage, the Bug-Dniester interfluvium was occupied by the communities of the Chechelnytskaya group, which significantly influence the formed Brinzeni and Kosenovskaya communities. For the groups mentioned, Diachenko and Harper propose the following chronological frames: up to about 3650 BC for the Chechelnytskaya group, and 3700–3550 BC for the Badrazhskaya group, and finally, 3500–3400 BC for the Kosenovskaya group (Diachenko, Harper 2016, 89, fig. 3). Furthermore, some materials from Sharin in the Uman area put our considerations in some doubt. According to the Dymytro Kushtan (2015, 438) findings from the mentioned site represent a Koshilovetskaya local group with some general features typical for other local groups, including some common among Brinzeni one. The chronology of Sharin could be put in the range of 3600–3200 BC (Bicbaev et al. 2017; Kuştan 2015, 438; Rassamakin 2012, table 2.5, nos. 35–40). Perhaps those two examples could be treated as a continuation of contacts between the communities started just after the fall of settlement system during subphases T3/T4 in Müller et al.'s scheme (2016, 165) of Trypolje culture? Therefore this hypothesis needs more further confirmation in archeological finding, but remains as an intriguing proposition.

Due to the consistent and characteristic type of pottery production of the Brinzeni group, the task to distinguish a traditional model of its development, covering the formative, classical and final stage is extremely difficult. The results of proceed radiocarbon analyzes are certainly facilitate this attempt. Two samples were selected for dating and examined by the AMS method in Poznań Radiocarbon Laboratory. The first of them, from Väratic III Holm, was a fragment of an animal bone, derived from layers excavated in 1974. The second one from Brinzeni XI (IX), is also a fragment of an animal bone taken from trench No. 1 obtained in 1981. The results present as follows: Väratic Poz-109779 4830 ± 40 BP (3656–3535

BC for  $\sigma$ ; 3698–3523 BC for  $2\sigma$ ) and for Brinzeni Poz-109778 4630 ± 40 BP (3499–3361 BC for  $\sigma$ ; 3620–3342 BC for  $2\sigma$ )<sup>1</sup>.

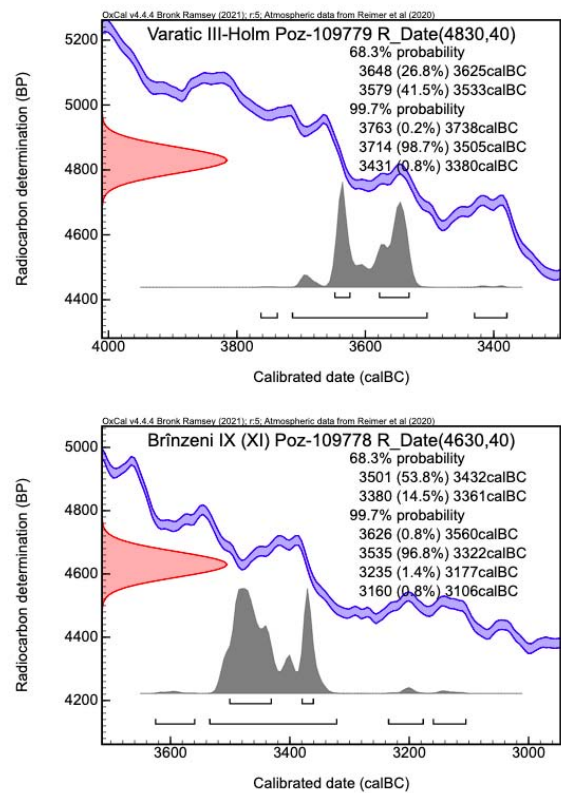


Fig. 2. Calibration of radiocarbon samples from Brinzeni XI (XI) and Väratic III Holm. Calibration with OxCal v4.4.4 (Bronk, Ramsey 2021), r5 IntCal20 atmospheric curve (Reimer et al. 2021)

Ryc. 2. Kalibracja próbek datowań rediowęglowych z Brinzeni XI (XI) i Väratic III Holm za pomocą OxCal v4.4.4. (Bronk, Ramsey 2021) oraz krzywej atmosferycznej r5 IntCal20 (Reimer et al. 2021)

It seems that it is possible to postpone the beginning of the Brinzeni group formation earlier, then it was previously suggested (cf. Rassamakin 2012; Bicbaev et al. 2017). A similar tendency in the establishing of chronology for the influences of Brinzeni stylistics can be observed concerning its influence on other local groups (cf. Diachenko, Harper, 2016; Nikitin et al. 2010; Ryzhov 1998; 2007; Tkachuk 1998; 2005).

The research of the settlement in Bilshivtsy indicated that in the layers referred to the Koshlyovickaya local group, both ceramics linked to the Brinzeni style and Funnel Beaker culture were found (Tkachuk 2001–2002, 210). The absolute chronology of this site could be established with the consideration of only one date (3695–3370 BC). For more precise series of dates from Verteba Cave's corresponding Koshlyovickaya local group provide other arguments (Nikitin et al. 2010; Kadrow 2013). Following the suggestions of Sławomir Kadrow about the earlier dating of the CI/CII phase around 3600–3500 BC, it is

<sup>1</sup> The following calibrations were made with OxCal v4.2.3 Bronk Ramsey (2013) during the examination of samples by Poznań Radiocarbon Laboratory; further calibrations with OxCal v4.4.4 Bronk Ramsey (2021) are presented in fig. 1.

possible to indicate it even about 100 years earlier (Kadrow 2013; Diachenko, Harper 2016, 88; Rybicka 2017, 128; see different opinion in Nikitin et al. 2010). This considerations fits also to the results to the radiocarbon dates for the pottery of Koshlyovickaya pottery from that site (Nikitin et al. 2010, table 1, fig. 8). These results are valuable in the context of new radiocarbon samples and also previous research at Brînzeni (Markevich 1981; Movsha 1985), Costești IV (Markevich 1981) and Zhvanets (Movsha 1985), as well as for the some sites in Volhynia region (Rybicka 2017, 2020).

The chronology could be also established according to the relations of Brînzeni local group with south-eastern group of Funnel Beaker Culture. According to the preliminary outline the contacts of Trypolye and Funnel Beaker cultures should be extended far beyond CI/CII phase and relation to the specific group. For examples, a cases of long-term settlements at Gródek and Zimne can be given (Gumiński 1989). According to the radiocarbon dating and relative chronology, Gródek was settled in two phases. The first one is dated for 3650–3400, while the second one covers the time between 3400–3100 BC. For both the imports of Trypolye pottery were confirmed. Nevertheless, the earlier stage is characterised by the relations to the Brînzeni local group, while the second one to the later Gordinești. (Rybicka 2017; Rybicka et al. 2020, 88; Włodarczyk 2006; Zawislak 2013). Similar situation with relation to both local groups of TC was noted at Zimne with dates of 3700/3600–3400 BC (Bronicki et al. 2003; 2004; Hawinskyj et al. 2013; Kadrow 2005). Also some materials combining TC and TRB were recorded in Leźnica at that time, but without the Brînzeni influences. From the other perspective some imports of pottery typical for Funnel

Beaker culture took place. Tatiana Movsha (1985) recorded some vessel during the excavations at Zhvanets. The findings could be synchronized to the settlements at Gródek, Zimne and Leźnica as well.

The strength of interactions also led to the development of syncretic settlements in the Volhynia area, e.g. from Novomalin-Podobanka (3627–3363 BC; Rybicka 2017, *passim*) and from Liuczyn-Zawidov (33502–3105 BC; Verteletskyi 2020). These range of this interaction can be situated in the period 3500–3200 BC. The findings from Nowomalin bear a strong influence of Brînzeni style, especially visible on painted conical bowls. It seems likely that the materials from the Ostroh region may determine the earliest settlements of the CII period of the TC and intense relations, which contributed to the formation of syncretic settlements. (Rybicka et al. 2019, 41).

The later finds from Volhynia have a much different specificity. There are no features typical of Brînzeni ornamentation. For this main of concern the dates from the settlement at Kurgany-Dubova 3336–3105 BC (Król, Rybicka 2016, fig. 6) and Myrogoszcz (Verteletskyi, Bardetskyi 2018) are especially important. Pottery from the first site is different than those from Novomalin-Podobanka. The bowls are made in a technology much closer to the TRB, and their surface is completely covered with red paint. Bearing in mind the aforementioned features, a fundamental change in the technology of cookware can be observed, which shows increasingly strong references to TRB technology. It seems that this site could be treated as a link that marks the beginning of the formation of a younger phenomenon, which would be the Kostianets-Kurgan horizon (Rybicka 2017, 103; Verteletskyi 2016, 39–54).

**Table 1. Radiocarbon dates from sites of Brînzeni local groups and other mentioned in paper. Cf. Diachenko, Harper 2016, table 1**

**Tabela 1. Datowania radiowęglowe z lokalnych stanowisk gupy Brinzeni i innych wspomnianych w tekście. Por. Diachenko, Harper 2016, tabela 1**

No.	Site	Lab. Code	Sample	BP	BC		Local group/culture	References
					68,2%	95,4%		
1.	Hancăuți I	Hd-18678	Charcoal	5127±47	3980–3810	4039–3797	Badrazhskaya (TC)	Lazarovici 2010
2.	Hancăuți I	Hd-19426	Charcoal	5106±49	3967–3805	4033–3783		Lazarovici 2010
3.	Hancăuți I	Hd-17930	Charcoal	4938±42	3762–3659	3797–3643		Lazarovici 2010
4.	Hancăuți I	Hd-18936	Charcoal	4884±54	3712–3636	3789–3532		Lazarovici 2010
5.	Bilshivtsy	Ki-8273		4770	3642–3383	3695–3370	Koshilovetskaya	Tkachuk 2003
6.	Bicze Złote	Ki-13068	Pottery	4810±100	3697–3384	3794–3365		Nitkin et al. 2010
7.	Bicze Złote	Ki-13069	Pottery	4730±90	3634–3378	3703–3341		Nitkin et al. 2010
8.	Bicze Złote	Ki-13066	Pottery	4729±110	3635–3374	3711–3106		Nitkin et al. 2010
9.	Sharin	Ki-11872	Pottery	4700±100	3631–3371	3695–3111	Kocherzhintsy-Shulgovka (previously attributed to Kosenovskaya)	Kushtan 2015
10.	Sharin	Ki-11869	Clay	4670±80	3626–3364	3644–3119		Kushtan 2015
12.	Sharin	Ki-11870	Pottery	4610±100	3621–3116	3635–3030		Kushtan 2015
12.	Sharin	Ki-11867	Clay	4590±80	3509–3113	3628–3030		Kushtan 2015
13.	Sharin	Ki-11873	Pottery	4580±100	3501–3103	3632–3017		Kushtan 2015
14.	Sharin	Ki-12050	Animal bone	4575±60	3496–3114	3516–3094		Kushtan 2015
15.	Sharin	Ki-11871	Pottery	4560±100	3496–3097	3097–2935		Kushtan 2015
16.	Sharin	Ki-11866	Clay	4530±80	3363–3101	3506–2931		Kushtan 2015

No.	Site	Lab. Code	Sample	BP	BC		Local group/ culture	References
					68,2%	95,4%		
17.	Brînzeni IX (XI)	Poz-81797	Animal bone	4770±40	3636–3524	3644–3381	Brînzeni (TC)	Rybicka et al. 2020
18.	Brînzeni IX (XI)	Poz-109778	Animal bone	4630±40	3499–3361	3620–3342		_____
19.	Costești IV	Poz-81803	Animal bone	4710±35	3627–3378	3632–3373		Rybicka et al. 2020
20.	Varatic III-Holm	Poz-109779	Animal bone	4830 ± 40	3656–3535	3698–3523		_____
21.	Varatic V-Holm	Poz-81798	Animal bone	4690±35	3519–3376	3629–3369		Rybicka et al. 2020
22.	Costești IV	Poz-81799	Animal bone	4635±35	3498–3364	3517–3354		Rybicka et al. 2020
23.	Brînzeni III-Țiganca	Poz-81800	Animal bone	4560±35	3368–3124	3489–3104		Rybicka et al. 2020
24.	Zhvanets	Ki-6745	Human bone	4530±50	3357–3111	3483–3033		Videiko 1999; Rassamakin 2012
25.	Zhvanets	Ki-6743	Animal bone	4480±40	3331–3095	3349–3026		Videiko 1999; Rassamakin 2012
26.	Zhvanets	Ki-6754	Charcoal	4380±60	3089–2913	3328–2892		Kasperovskaya (TC)
27.	Zhvanets	Ki-6744	Animal bone	4355±60	3082–2904	3322–2881	Videiko 1999; Rassamakin 2012; Tkachuk 2003	
28.	Zhvanets	Ki-6753	Charcoal	4290±55	3011–2877	3090–2699	Videiko 1999; Rassamakin 2012; Tkachuk 2003	
29.	Gródek nad Bugiem (pit no. 15a)	GrN-16124	_____	4665±40	3515–3370	3626–3361	TRB	Włodarczak 2006
30.	Novomalin-Podobanka	Poz-81715	Animal bone	4965±35BP	3782–3702	3905–3655	TC-TRB	Diachenko et al. 2016
31.	Novomalin-Podobanka	Poz- 62227	Animal bone	4900±30BP	3697–3652	3762–3638	TC-TRB	Diachenko et al. 2016
32.	Novomalin-Podobanka	Poz-55979	Pottery	4670±40	3516–3372	3627–3363	TC-TRB	Rybicka, Diachenko 2016
33.	Liuczyn-Zawidov	Poz-127134	Animal bone	4585 ± 35	3491–3193	3502–3105	TC	Verteletskyi 2020
34.	Kurgany Dubova	Poz-77974	Vegetal remains in the pottery	4500±35	3336–3105	3355–3091	TC-TRB	Król, Rybicka 2016; Rybicka 2017
35.	Zimne	Ki-6873	Animal bone	4920±50BP	3761–3648	3894–3636 BC	TRB	Bronicki et al. 2003
36.	Zimne	Ki-6874	Animal bone	4770±60BP	3640–3386	3653–337 BC	TRB	Bronicki et al. 2003
37.	Zimne	Ki-6878	Animal bone	4740±45BP	3632–3384	3638–3337	TRB	Bronicki et al. 2003
38.	Zimne	Ki-6877	Animal bone	4660±55BP	3516–3368	3632–3349	TRB	Bronicki et al. 2003
39.	Zimne	Ki-6875	Animal bone	4390±55BP	3089–2920	3327–2899	TRB	Bronicki et al. 2003
40.	Zimne	Ki-6879	Animal bone	4350±55BP	3022–2904	3310–2888	TRB	Bronicki et al. 2003
41.	Zimne	Ki-6872	Animal bone	4295±60BP	3012–2878	3095–2696	TRB	Bronicki et al. 2003
42.	Zimne	Ki-6880	Animal bone	4260±50BP	2921–2760	3016–2678	TRB	Bronicki et al. 2003
43.	Zimne	Ki-6876	Animal bone	4230±50BP	2906–2703	2920–2634	TRB	Bronicki et al. 2003
44.	Zimne	Ki-6871	Animal bone	4160±50BP	2874–2674	2886–2586	TRB	Bronicki et al. 2003
45.	Zimne	Ki-6870	Animal bone	4120±50BP	2860–2585	2876–2506	TRB	Bronicki et al. 2003
46.	Zimne	Ki-6869	Animal bone	4080±55BP	2851–2498	_____	TRB	Bronicki et al. 2003

## Summary and proposition for general chronology of Brînzeni local group

<sup>14</sup>C dates from Văratîc III Holm and Brînzeni XI (IX) can be interpreted differently. The formative period could be synchronized with the final phase of the Tomashovskaya group, and the final duration of Majdanetskoe, functioning approximately in the period 3800–3650 BC (cf. Müller et al. 2016). The imported pottery (only 6 pieces has been found) identified by Taras Tkachuk, could prove the mutual contacts in very beginning of the group. In reference to discussion about the absolute chronology of Văratîc III Holm and Brînzeni XI (IX) sites, it could be suggest that both settlements functioned between 3600–3400 BC. The very nature of contacts of Brînzeni group in the beginning can be difficult to describe. For main matter of concern about the chronology the consideration about migration, acculturation, or the transmission of ideas, should be left aside. Undoubtedly, it should be stated that if the aforementioned pieces of pottery should be associated with some sort of influence. Nevertheless, it can be underline that already during Tomashovskaya group, the different type of fine decorated pottery was available, or even it found interest among the inhabitants of the “gigant settlements”. So, those observations allowed to enlabel the formation period of the Brînzeni group several decades in advance, then the mentioned <sup>14</sup>C results suggest, perhaps by about 50–100 years to 3650/3700 BC.

The other argument in favor of the early chronology of the Brînzeni local group is its connections with the Koshylovickaya group and the appearance of syncretic assemblies in Volhynia. This date is indirectly confirmed by radiocarbon markings from Văratîc III Holm (Markevich 1981, 91). The <sup>14</sup>C results seem precise and perhaps they can mark the beginning of mutual contacts between the TRB culture and TC communities, which could be based on the exchange of local raw material. Certainly, the intensification of contacts took place a bit later, as evidenced by import of the specific wares, and finally by the syncretic settlements like at site in Novomalin-Podobanka. What should be mentioned is that not only Brînzeni local group participated in contacts with TRB in western Ukraine. It is evidenced by the lack of any references or Brînzeni features in some settlements as Kotoryny (TRB settlement, where also Baden complex features were present) or Leźnica. Moreover, some analogies to the sites of the TRB and other groups of TC from Volhynia appeared at Zhvanets. The last time Brînzeni components could be recorded in Kurgan-Dubova dated 3350–3100 BC, which already announce further directions of stylistic change related to another group of the TC – Gordinești. The reason why the Brînzeni local group disappear as far uncertain. In opinion of Taras Tkachuk (2002, 112; 2005, 48) some smaller communities form the motherland of Brînzeni local groups moved into the north in the area of Sluch and Horyn rivers, where they become a component for other sites in the Horiw type of Trojanow local group (cf. Kruts, Ryzhov 2000). Otherwise Viacheslav Bicbaev (1994) stressed that the transition from the Brynzenskaya to Gordineshtskaya local is marked by sites of the Kirilen type probably synchronous with early Gordineshtskaya local group (Sirbu 2019).

Summarizing the above considerations, an attempt can be made to describe the general characteristics of the chrono-

logy of the Brînzeni local group. The material from the Starye Badrazhy combines both Brînzeni and Badrazhskaya features (Dergachev 1980; Markevich 1981; cf. Kruts 2012, 232). It can be considered as a link between 3800–3650 BC or narrowing the chronology to 3700–3650 BC based on relations to other late TC communities (Diachenko, Harper 2016, 87). Taking into account the dating of the site in Văratîc Holm, the beginnings of the Brînzeni local group can be established to the turn of 3700/3650 BC. Such dating also corresponds to the chronology of the Maidanetskoe settlement and the finds that can be considered Brînzeni ones. The next stage was marked by tightening the relationship between Trypolye and TRB. With time specific syncretic complexes are formed in Volhynia, which combine the features of both cultures. The appearance of syncretic sites in Volhynia can be dated to the period of functioning of, among others, Nowomalin-Podobanka settlements around 3600–3350 BC. Probably the appearance of such settlements had to be preceded by an earlier interaction. It may be indirectly confirmed by imports or references to Brînzeni vessels, e.g. in Zimne and Gródek, dated 3700/3600–3400 BC. The importance of the Brînzeni group at that time may also be demonstrated by the fact that distant references to the Brynzene style were recorded in Koshylovickaya local group in Werteba cave and the nearby settlement in Bilshywk, radiocarbon dated from 3700\_3380 BC (Tkachuk 2013, 214).

However, this phenomenon was probably not one-way in nature. According to Markevich (1981, 91) raw material was imported in Văratîc Holm. Unfortunately, so far it is impossible to describe it in more detailed categories. The functioning of which can be synchronized with the Funnel Beaker where the imports of Brînzeni pottery were recorded. The importance of the Brînzeni group is diminishing with the emergence of other TC communities taking over contact with the TRB communities, as is evident in the Leźnica relics complex. On the other hand, there are also imports and references to TRB in the Brînzeni context (Zhvanets, Brînzeni Thsyganka; Bicbaev et al. 2017) or even a sporadic imitation of TRB-ledge ornament, recreated by painting or prints of a double cord recorded in northern Moldova (Rybicka 2017, 79). Indirectly, this may indicate the transition from the phase of inspiration with cultural otherness to the creation of direct demand for items produced by other communities. Nevertheless, the chronology of the Zhvanets seems to be debatable. Such a late and wide chronology spans between 3500–2700 BC based on radiocarbon dates should be narrowed, followed the suggestions of Piotr Włodarczyk (2006) among other. He determines the functioning of the settlement for the period 3100–2900 BC. This seems to suggest that the site is younger than other Brînzeni settlements. Is especially visible in the context of the presence of Funnel Beaker in the Trypolye context, falling mainly in the period of 3400–3100 BC (Rybicka 2017, 147), and it fits well the tendency to “borrowing” some TRB elements among the Trypolye community. The situation is perceived differently by Taras Tkachuk (2003, 173), who noticed references to the Tomashovskaya local group in the materials from Zhvanets. Then the settlement at Zhvanets may be treated as a two-phase site. However, Tkachuk (2005a) also believes that the younger <sup>14</sup>C dates should be attributed not to the Brînzeni group, but

to the Kasperovskaya one. The narrowing down the period of settlement in similarly to Piotr Włodarczak's suggestion. The last impulse considered as TRB influence on Brinzeni local group, might be recorded at Zhvanets. It presents analogies to pottery from Ležnica, the functioning of which can be determined up to around 3100 BC. Perhaps, also those dates should be treated as limit of the final stage of settlement in Zhvanets.

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## Przyczynek do określenia chronologii absolutnej grupy Brînzeni kultury trypolskiej

### Streszczenie

W początku IV tysiąclecia BC obszar dzisiejszej Mołdawii i zachodniej Ukrainy stanowił pogranicze pomiędzy dwoma różnymi modelami kulturowymi, reprezentowanymi przez kulturę pucharów lejkowatych oraz regionalne grupy kultury trypolskiej. Sąsiedztwo to wiązało się z szeregiem interakcji o różnym charakterze, częstotliwości i chronologii, manifestowanych w znaleziskach archeologicznych poprzez importy, wymianę, czy wreszcie powstanie zespołów synkretycznych. Szczególną rolę w procesach tych odegrały późnotrypolskie społeczności grupy Brînzeni.

Pierwsze zainteresowania badawcze wspomnianą grupą miały miejsce około 100 lat wstecz, jednak formalne jej wydzielenie nastąpiło dopiero w latach 70. XX w. Przyjmuje się, że główny obszar zasiedlony przez społeczności grupy Brînzeni

obejmuje dzisiejszą północną Mołdawię. Model osadniczo-gospodarczy preferował zakładanie osad (do około 30 domostw), przeważnie na planie koła lub owalu i gospodarkę rolniczą wykorzystująca udomowione gatunki zbóż, roślin strączkowych i olejodajnych. Pośrednio dalekosiężne kontakty potwierdzały znaleziska narzędzi z krzemienia wołyńskiego (wewnątrz samej grupy Brînzeni) oraz obecność importów lub charakterystycznych nawiązań brynzeńskich w stylistyce zdobnictwa naczyń, udokumentowane na stanowiskach innych grup społeczności trypolskiej, ale również kultury pucharów lejkowatych, czy wreszcie pojawienie się zespołów synkretycznych.

Większość badaczy wiąże pojawienie się społeczności brynzeńskich z początkiem fazy CII kultury trypolskiej (3400–3300 – 3000/2900 BC), pozycjonując jej istnienie w przedziale 3400–

3100 BC. Nowe możliwości interpretacji chronologii grupy Brinzeni pojawiły się wskutek nowych badań wykopaliskowych w Ukrainie i Mołdawii oraz pozyskania prób radiowęglowych ze stanowisk badanych jeszcze w ubiegłym stuleciu, w tym tych, znajdujących na obszarze formatywnym grupy. Do badań wytypowano stanowiska Văratice III Holm i Brinzeni XI (IX). Pozyskane oznaczenia radiowęglowe wykonano na próbach kości zwierzęcych. Wynoszą one odpowiednio: dla Văratice Poz-109779  $4830 \pm 40$  BP (3656–3535, for  $\sigma$ ; 3698–3523 BC,  $2\sigma$ ), a dla Brinzeni Poz-109778  $4630 \pm 40$  BP (3499–3361 BC,  $\sigma$ ; 3620–3342 BC,  $2\sigma$ )

Określenie chronologii społeczności bryrzeńskich i interpretacja uzyskanych wyników jest zadaniem trudnym. Wiąże się z prześledzeniem jej skomplikowanych relacji genetycznych, przestrzennych oraz z synchronizacją z innymi wariantami kultury trypońskiej. Obecnie widoczna jest tendencja do wcześniejszego sytuowania pojawienia się równoległych grup kultury trypońskiej, tradycyjnie łączonych z okresem CII. Punktem odniesienia do rozważań są zarówno stanowiska trypońskie, jak i te, potwierdzające wzajemne relacje pucharowo-trypońskie. W pierwszym przypadku dotyczy to m. in. stanowiska w Majdanetskoje, datowanego dość precyzyjnie na okres 3750/3700–3650 BC lub 3800–3670 BC, czy Starych

Badrazhów. Stanowiskami trypońskimi z wpływami KPL są m.in. Bilsziwcy, jaskinia Werteba oraz Żwaniec. Odwrotną sytuację – tj. stanowisk pucharowych z udokumentowanymi wpływami trypońskimi interpretowanymi jako importy – zanotowano w m.in. Gródka nad Bugiem, Zimnem oraz Leżnicy. W Gródku importy bryrzeńskie udokumentowano wyłącznie dla I fazy, datowanej na 3650–3400 BC, podczas gdy w Leżnicy nie zostały one wyróżnione. Szczególny przypadek wpływu grupy Brinzeni i społeczności pucharowych zanotowano natomiast w Nowomalinie-Podobance, na Wołyniu, datowanym na 3627–3363 BC. Tamtejsza ceramika jest przykładem zespołów synkretycznych, łączących w sobie cechy pucharowe i trypońskie, z wyraźnie widocznym piętnem stylistyki bryrzeńskiej.

Analiza pozyskanych dat pozwala na ostrożne oznaczenie ram chronologii grupy Brinzeni. Wstępnie, początek formowania tej grupy można określić na 3700/3650 BC. Kolejną fazę cechuje intensyfikacja kontaktów bryrzeńskich z innymi społecznościami trypońskimi i pucharowymi pomiędzy 3700–3380 BC. W efekcie doprowadziło to do powstania zespołów synkretycznych (ok. 3650 BC). Ostatni etap funkcjonowania wyznaczyłby okres funkcjonowania stanowiska w Żwańcu, przypadający na około 3100 BC.

