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RADIOCARBON DATA FROM THE CUCUTENI-ARIUŞD LEVELS AT PĂULENI-CIUC (CIOMORTAN) "DÂMBUL CETĂȚII", HARGHITA COUNTY

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Abstract: *The Cucuteni-Ariuşd settlement at Păuleni-Ciuc lies at the foot of the Eastern Carpathian Mountains, connecting the Ariuşd settlements in southeastern Transylvania with the Cucuteni A settlements in Sub Carpathian Moldova. Three radiocarbon samples from complex 41 in the Eneolithic Păuleni III level were analyzed at the Center for Applied Isotope Studies at the University of Georgia. Based on the results of this analysis, we believe the late Ariuşd occupation at Păuleni-Ciuc dates to 4,210-4,050 B.C. The settlement at Păuleni-Ciuc was contemporaneous with the Cucuteni A_2 settlement at Poduri and the Cucuteni A_{2-3} settlement at Malnaş Băi, indicating a possible line of communication between Transylvania and Moldova, via Păuleni-Ciuc and the Ghimeş-Făget pass.*

Rezumat: *Aşezarea Cucuteni-Ariuşd de la Păuleni-Ciuc se află poziționată în zona centrală a Carpaților Răsăriteni şi reprezenta probabil un punct de*

legătură între aşezările de tip Ariuşd din sud-estul şi estul Transilvaniei, cu aşezările culturii Cucuteni A, aflate la est de Carpaţi. Cele trei probe radiocarbon prelevate din locuinţa eneolitică (Complex 41) de la Păuleni-Ciuc, nivel eneolitic III, au fost analizate la Centrul pentru Studii Aplicate Izotopilor de la Universitatea din Georgia, SUA. Pe baza rezultatelor acestei analize, considerăm că aşezarea târzie de tip Ariuşd de la Păuleni-Ciuc, a fost locuită în intervalul 4.210-4.050 B.C. Aşezarea de la Păuleni-Ciuc a fost contemporană cu aşezarea Cucuteni A_2 de la Poduri, jud. Bacău şi aşezarea Cucuteni A_{2-3} de la Malnaş Băi, jud. Covasna, indicând o posibilă linie de comunicare între Transilvania şi Moldova, prin intermediul aşezării de la Păuleni-Ciuc, probabil prin pasul Ghimeş-Făget.

Keywords*: Transylvania, Eneolithic, Cucuteni-Ariuşd Culture, dwelling, radiocarbon, chronology*.

Cuvinte cheie: *Transilvania, Eneolitic, Cultura Cucuteni-Ariuşd, locuinţă, radiocarbon, cronologie*.

Introduction

In this article we present the results of the radiocarbon analysis from the later Ariuşd levels at Păuleni-Ciuc (also referred to as Ciomortan, Şoimeni, *Várdomb* or *Dâmbul Cetății* in the archaeological literature). The samples were acquired during the 2010-2011 field seasons, when the team from Muzeul Național al Carpaților Răsăriteni (MNCR) welcomed Archaeotek Canada's international team of archaeologists and students. During the excavation the team acquired multiple carbon samples, of which four were analyzed to determine absolute dates for the Eneolithic and Middle Bronze Age occupations of the site. A single Bronze Age sample, from a well-preserved timber found in the destruction layer of a structure, and three Eneolithic samples were analyzed. The Bronze Age sample dates to 1,830-1,680 B.C. Of the Eneolithic samples, one was from a poor context and yielded an unlikely date, while the remaining two samples date the Ariuşd occupation to between 4,200-4,000 B.C.

The archaeological site is located in the Ciuc Basin, approximately 8 km east of Miercurea Ciuc, in the hills above the village of Şoimeni. It is positioned on a small natural promontory, referred to locally as *Dâmbul Cetății* ("*The Hill Fortress*"), in small saddle between ridgelines of the Ciuc Mountains (Fig. 1). The Ciuc Mountains are part of the Eastern Carpathian Mountain range, and separate the Ciuc Basin from Moldavia to the east. To the west, the Harghita Mountains separate the Ciuc Basin from central Transylvania. The promontory on which the site rests has an oval shape, 90 m long and 60 m wide (Fig. 2), giving it an area of

approximately ½ hectare (5,400 m^2). The promontory is defined to the north by a small, unnamed stream and to the south by the Trotuş stream, both of which flow westward into the Olt River. From Păuleni-Ciuc, the Olt may be followed downriver through the Tuşnad Pass, where it flows into the Sfântu Gheorghe and Braşov Basins, and then into central Transylvania. Moldavia may be accessed from Păuleni-Ciuc via the Ghimeş-Făget Pass, whose western entrance is located only 10 km north of the site and whose eastern entrance lies near the archaeological site Poduri-*Dealul Ghindaru*.

Alexander Ferenczi made the first record of the site between the world wars, including it in the inventory of Transylvanian Dacian fortresses. Some decades later Székély Zoltan, of the National Szeckler Museum, carried out the first archaeological excavations in 1954, with subsequent excavations following in 1954, 1960, and 1967 (Székély 1959; Székély 1970). Heidentified multiple levels underlying the Dacian material, belonging to the Middle Bronze Age, Wietenberg and Ciomortan cultures, the Coţofeni culture, and the Eneolithic Cucuteni-Ariuşd culture. The site's Bronze Age components included an embankment which accentuated the natural promontory.

The early excavations took the form of narrow trenches, ideal for inventorying the stratigraphy and variety of material present at the site but inadequate for determining the nature of inhabitation at the site. Unfortunately, following the cessation of the early excavations the site suffered poaching from relic hunters. Some of this material came into the possession of the MNCR which began a new investigation of the site in 1999. As of this writing the MNCR project is still active, directed by Valerii Kavruk and Dan Buzea and including collaborators Gheorghe Lazarovici, from "Lucian Blaga" University of Sibiu, Mihai Rotea, from Muzeul Naţional de Istorie a Transilvaniei, Székély Zsolt, from the Romanian Institute of Thracology in Bucureşti, and Gheorghe Dumitroaia, from the Complexul Muzeal Judeţean Neamţ. During the 2000-2001 field seasons the team was joined by students from the "Lucian Blaga" University of Sibiu, directed by Sabin Adrian Luca and Cosmin Suciu.

Björn Briewig, archaeologist of Berlin, took part at Păuleni-Ciuc excavations between 2005-2010 and 2012-2013.

In 2010 and 2011 an international team of Archaeotek volunteers, directed by Raymond Whitlow (State University of New York at Buffalo) joined the field excavations. The Archaeotek team included volunteers from the United States, Australia, Greece, Japan, Ireland, Denmark and Slovakia.

In establishing a major new research project the MNCR team determined the objective was to examine the horizontal relation between various features, thereby determining the nature of the various occupations at the site. To this end the

team adopted a large area excavation strategy (Fig. 3). Under the new approach the archaeologists were able to discern multiple occupation layers, which informed their new stratigraphic interpretation of the site (Buzea 2004; Cavruc *et al*. 2001; Cavruc *et al*. 2002; Cavruc *et al*. 2003; Cavruc *et al*. 2004; Kavruk (Cavruc) *et al.* 2006; Kavruk (Cavruc) *et al.* 2008; Kavruk (Cavruc) *et al.* 2009; Kavruk (Cavruc) *et al.* 2010; Kavruk (Cavruc) *et al.* 2012; Lazarovici *et al*. 2000; Lazarovici *et al*. 2002; Buzea, Lazarovici 2005). The Bronze Age strata contain two occupations, belonging to the Wietenberg and Ciomortan cultures. Following extensive excavations, Dr. Cavruc defined the Ciomortan culture as a local Transylvanian variant of the Costişa culture (Cavruc 2000; Cavruc 2001; Cavruc 2002; Cavruc 2005). The large area excavation also led to the discovery of multiple Eneolithic Ariuşd-Cucuteni dwellings spread across three occupation layers.

The extensive research program established at Păuleni-Ciuc has resulted in a number of publications and exhibits which explore the many dimensions of modern excavations and prehistoric life at the archaeological site. In 2011 the MNCR hosted a large exhibit, *Aşezarea preistorică Păuleni-Ciuc "Dâmbul Cetății"*, presenting the results of a decade of research at Păuleni-Ciuc. The MNCR staff has also run numerous educational outreach programs at the site. The most recent program, *Tabăra de arheologie experimentală "CronOs" de la Păuleni-Ciuc "Dâmbul Cetății"* taught experimental archaeology methods and bone production techniques to 14 students camping at the site. These programs build on a legacy of scholarship about Păuleni-Ciuc, including experimental archaeology research (Buzea *et al*. 2008) and the recent book by (Beldiman *et al*. 2012), which analyzed faunal remains and bone and antler tools and jewelry from over 100 prehistoric species. In 2010 the archaeologists conducted a GIS research project, producing a geodatabase, as well as a three dimensional model and visibility analysis of the site and its surroundings (Whitlow 2010).

The Ariuşd-Cucuteni Presence at Păuleni-Ciuc

Three levels of Eneolithic occupation are present at Păuleni-Ciuc: Păuleni I, corresponding to the Cucuteni A_1 phase, Păuleni II, corresponding to the Cucuteni A_2 phase, and Păuleni III, corresponding to a late Ariuşd stage. The Eneolithic levels are best preserved in the promontory's extremities, where the Bronze Age embankment covered the Eneolithic surface, preserving it as a buried A horizon. Inside the embankment, the Eneolithic material was disturbed by the Bronze Age occupation. In addition to posthole and pit cut intrusions, the Bronze Age occupants excavated Eneolithic soils to use as building material in the construction of the embankment. Along its southern edge the site grades quickly into a steep valley slope, creating an area of high erosion. Soil accumulation in the southern trenches

was notably thinner than in the north, and we assume erosion affected the archaeological materials in these trenches as well.

The Eneolithic levels were identified based on the superimposition of structures discovered under the embankment in the northern area of the site. Remains of eight structures were discovered across the three Păuleni levels. The structures share certain characteristics. They were partially built on raised wooden foundations to account for the slight slope of the promontory, with the imprints of wooden beams apparent in burnt clay from the floors (Buzea, Lazarovici 2004, Fig. 5; Buzea 2006, 128-129). The walls were built with structural clay which included a mixture of sand and local gravel; the floors used a similar mixture but with a greater inclusion of pebbles. All of the structures so far identified were destroyed through burning, a common phenomenon in Romania (Dumitrescu 1968; László 2000; see also László, Cotiugă 2005; Monah *et al*. 2005). In addition to the structures, a number of other complexes, including pits and hearths, were present in the Eneolithic levels.

Level Păuleni I contained material belonging to the Cucuteni A_1 phase. A dwelling (L_{24}) and a disturbed structure which may have been a hut (complex 23) were identified in this level. Several hearths, constructed on the surface or directly on the bedrock, were identified outside of these structures. Complex 17, a large (5 m x 2.5 m) scatter of Cucuteni-Ariuşd pottery, animal bones, horns, and burnt wood and ash was discovered near the hearths. A number of miniature clay tables were recovered from the Păuleni I level, including a nearly intact piece near one of the hearths (Buzea 2006). While uncommon at Cucuteni-Ariuşd sites, these altars were present at many early Neolithic sites, and have been interpreted as votive altars used for the burning of animal oils and offerings (Lazarovici, Maxim 1995, 148).

Four structures (L_5, L_{5A}, L_{21}, L_{31}) were discovered in the Păuleni II level. Of these L_5 is the largest, 12 m long and 4 m wide. The structure may in fact be larger, since it is possible that L_{5A} (6.5 m x 3.5 m) may be an extension of L_5 rather than an independent structure (Lazarovici *et al*. 2002, 19-20). However, the Bronze Age embankment prevented the full excavation of L_{5A} and so the exact relation of these two structures is unknown. L_5 was built slightly after L_{21} burned down, as evidence by the superimposition of L_5 over part of the L_{21} destruction layer. L_5 also overlies the structures and complex from Păuleni I. L_{21} is notable for the presence of a supply pit dug into the bedrock, in which a tureen was stored. The final structure, L_{31}, was found in association with an external hearth, complex 30. The hearth was constructed in a shallow depression carved into the bedrock, with fragments of pottery, grindstones, and flint found nearby (Kavruk *et al*. 2007; Kavruk *et al*. 2008; Kavruk *et al*. 2009). The material culture recovered in the Păuleni II level matches Cucuteni A_2 styles. Of particular note are two anthropomorphic statues, both over

25 cm long, discovered on and underneath the floor in structure L_5 (Buzea 2006, 132, Fig. V/1-2). Anthropomorphic figurines are uncommon in the Transylvania Ariușd sites, and figurines of such large dimensions are a rare throughout the Cucuteni culture.

Păuleni III structures are limited to L_{16} and L_{12}. The former was found under the Bronze Age embankment, while the latter was destroyed by the embankment's construction (Cavruc *et al.* 2007). Outside of the structures large scatters of Ariușd sherds were found underneath the embankment. In grids L-M/4-5 multiple fragments of obsidian tools were found intermixed in the layer of Ariușd fragments. A small amount of Bodrogkeresztúr and Coțofeni material was also found amid the Ariușd materials. Due to the absence of decoration compared to material in the Păuleni I and II levels and the presence of late Eneolithic material culture, the Păuleni III level is interpreted as belonging to a late stage of the Ariușd culture.

It should be noted the Păuleni levels are best preserved in the northern section of the site, where the Bronze Age embankment protected a large area of the Eneolithic settlement. Furthermore, the identification of these levels is based on the superimposition of structures, and bolstered by the presence of Cucuteni A_1 and A_2 material culture in the Păuleni I and II levels. However, the fortunate stratigraphic circumstances which make it possible to identify levels is absent in the central area of the site, where Bronze Age activity disturbed the Eneolithic material, and in the southern area of the site, where erosion prevented the same accumulation of material.

The Context and Analysis of the Radiocarbon Samples

During the 2010 and 2011 field seasons the team made every effort to locate and preserve charcoal from closed contexts for use in radiocarbon dating. As a result, the team acquired multiples samples from the Eneolithic and Bronze Age complexes at the site. From among these samples three were selected from Eneolithic contexts to attempt to determine the absolute age of the Ariușd-Cucuteni occupation. The samples are all from complex 41, located in grids B-E/4'-5' in the south of the site.

Complex 41 was first identified in the 2010 season. It was a fan of burnt, red-orange waddle and daub and clay with a roughly east-west orientation (Fig. 4-5). The visible complex measures approximately 5 m by 2.6 m, however the exact dimensions are unknown as the western and southern portions are disturbed. The western component of the complex was the first identified, and interpreted as a possible hearth or firing installation due to the presence of blackened clay. An Eneolithic vessel was found in a primary deposition above this hearth material. In

the eastern half of the complex the density of the burnt clay increased. There the clay was flattened and very compacted, suggesting the possibility of a floor or similarly constructed surface. The northern half of the complex rested directly on top of the bedrock. While the bedrock slopes down to the south, the complex maintained a relatively flat surface. In the south the complex is cut by complex 40, a Bronze Age intrusion. Complex 40 is a ditch or cut aligned to the contour of the promontory, likely constructed to increase the steepness of the slope along the southern edge of the site where the embankment was not so tall. The inclusions in complex 40 consisted of a mixture of fractured bedrock and Eneolithic and Bronze Age sherds (Fig. 5-6).

Complex 41 was notable for the density of sherds and intact vessels found mixed in with the burnt clay. The sherds were primarily a bright orange or black, with a very fine surface; notable Ariușd-Cucuteni characteristics. In total, seven vessels, broken *in situ*, were recovered from the complex (Fig. 7). These include a storage vessel, a *fruitstand* and a *cup with a stand*. The storage vessel was found broken just above the *fruitstand*, resting on the upper level of burnt clay. Even more notable is the deposition of the *fruitstand*: it appears to be broken in situ, by a downward force. This type of vessel is defined by a short or tall stand which elevates a wash-basin shaped bowl. The remains of the bowl were found in a circular layout, directly overlying the *fruitstand* stand. Underneath the *fruitstand* a third vessel, also broken in situ, was found. The *cup with a stand* was found approximately two meters to the south. It is also largely intact and broken in situfrom a fall to the side. Three more vessels were also found within a meter of the *cup with a stand*, including two fine ware cups broken in situ and the base of a vase. All of these vessels were discovered roughly in the center of complex 41, all within a space of approximately three meters.

Given this level surface, the compacted clay, and the hearth, we interpret the complex either as the remains of a structure or as an Eneolithic installation designed to create a level workspace, possibly linked to a firing facility. The relative thinness of the burnt clay horizon, and the fact the vessels were not covered by any substantial amount of burnt clay, make it difficult to identify the feature as a building. However, external hearths are not unknown at Păuleni-Ciuc; complexes 17 and 30 were both external hearths. Like complex 17, complex 41 features a hearth in close proximity to a number of artifacts. Due to the high presence of ceramic vessels it is possible the inhabitants of Păuleni-Ciuc used complex 41 as a space for crafting ceramics. Open air ceramic kilns and workshops are present at some Cucuteni sites (Ellis 1984, 133, 147, 162), a similar situation may exist at Păuleni-Ciuc. Located just above a steep south facing slope, the complex is well-

situated to benefit from the strong gusts of wind which blow up the valley from the Ciuc Basin.

Sample	UGAMS#	Years BP	+/-	σ 1	σ 2
PAC-8	CAIS 12283	5.920	25	4,840-4,720 B.C.	4,850-4,720 B.C.
PAC-12	CAIS 12284	5.450	25	4,290-4,265 B.C.	4,350-4,255 B.C.
PAC-13	CAIS 12285	5.230	25	4,045-3,985 B.C.	4,070-3,960 B.C.

Table 1: Radiocarbon Samples from Păuleni-Ciuc.

While all three radiocarbon samples were recovered from complex 41, they differ significantly in their contexts. The first sample, PAC-8, was recovered from the surface of the burnt clay horizon in the west, in an area that we later identified as highly disturbed by the complex 40 cut. While this sample is from a disturbed section of complex, we included it in the event that it would provide a corroborating date for the complex. PAC-12 was recovered from what we deem the most secure context, between the storage vessel and the *fruitstand* discovered in the center part of the complex. The sample was a piece of charcoal, greater than one centimeter in diameter, found in association with a fragment of burnt clay. The last sample, PAC-13, was a large piece of burnt wood also intermixed in the burnt clay horizon. The sample was recovered from the southern edge of the complex, near the complex 40 cut. While the sample was close to the cut,it was found in contact with a piece of burnt clay and an Eneolithic sherd.

These samples were submitted to the Center for Applied Isotope Studies (CAIS) at the University of Georgia for analysis. The CAIS pre-treated the samples to remove any contaminants and measured their age via accelerated mass spectrometry methods (Taylor 1997). The uncalibrated data (Table 1) are presented in radiocarbon years before 1950, using a C14 half-life of 5568 years with one standard deviation of error. The samples were calibrated using the OxCal 3.1 software (Ramsey 1995; Reimer *et al.* 2004) atmospheric data and calibration curve. The calibrated results and their confidence levels for the samples are as follows (see also Fig. 8):

Sample	σ 1	σ 2
PAC-8	4,840-4,720 B.C. @68.2%	4,850-4,720 B.C. @ 95.4%
PAC-12	4,345-4,320 B.C. @ 30%	4,350-4,255 B.C. @ 95.4%
	4,290-4,265 B.C. @ 38.2%	
PAC-13	4,045-3,985 B.C. @ 68.2%	4,070-3,960 B.C. @ 89%
		4,160-4,130 B.C. @ 4.3%
		4,230-4,200 B.C. @ 2.1%

Table 2: Absolute Dates and Confidence Intervals for C14 samples.

These dates present some challenge to the interpretation of the absolute age of complex 41. Given the unsecure context and remarkably early date of PAC-8, we do not believe the sample is suitable for interpretation. The earliest Proto-Cucuteni and Ariuşd data for the region suggest ages between 4,600-4,450 B.C. (Laszlo 1997, 262; Mantu 1998), over a hundred years after the date indicated by PAC-8. While PAC-8 may be in line with some Precucuteni data, so far no Precucuteni data has been recovered from Păuleni-Ciuc. Furthermore, the materials recovered from the complex 41 are all indicative of late stage Ariuşd categories, which implies a much later time period than indicated by the sample. For these reasons we have omitted the PAC-8 data from our analysis.

While a potential area of temporal overlap exists between PAC-12 and PAC-13, the confidence level for this overlap is small at 2%. Interpreting the data with the greatest degree of confidence, we assume PAC-12, the charcoal recovered from in between vessels, dates to 4,350-4,255 B.C., while PAC-13, the carbonized wood recovered from the southern edge of the complex, dates to 4,070-3,960 B.C., a difference of over 200 years. We may then hypothesize that complex 41 was subject to two distinct burn events, each creating a horizon of burnt daub. However, this hypothesis is unsupported by the excavation. We observed no evidence of an interface between soils or the dispersion of burnt clay; on the contrary, the burnt clay and ceramics formed a continuous layer from north to south. Nor does the arrangement of material suggest a pit or midden. In plan, the complex has a rectangular shape with at least one well defined corner, and in profile the complex is a consistently thin layer. If, on the other hand, we begin with the assumption that complex 41 represented a single structure resulting from related events, we may analyze PAC-12 and PAC-13 together. In this case the complex dates to 4,210-4,050 B.C. at a 77.3% level of confidence. Both the PAC-12 and PAC-13 data are in line with our expectations for later stage Ariuşd/Cucuteni A dates.

On the basis of the material culture, which included undecorated fineware and a small number of Coţofeni sherds, we placed complex 41 in the Păuleni III

level. Therefore the data represent the terminal stage of Eneolithic occupation at Păuleni. While the Păuleni III level has thus far been interpreted as a late stage Ariuşd, it should be noted that the chronological range indicated by the radiocarbon data, especially the PAC-12 sample, is contemporaneous with Cucuteni A_2 data from other nearby settlements, while the PAC-13 sample is contemporaneous with dates obtained from Cucuteni A_3 settlements Hăbăşeşti and Scânteia (Laszlo 1997, 2006). Therefore, we may now state with some certainty that the Ariuşd occupation at Păuleni-Ciuc, which began in the Cucuteni A_1 stage, continued through the Cucuteni A_2 until sometime between 4,200-4,050 B.C.

Comparison to local Ariuşd and Cucuteni Absolute Dates

Radiocarbon data are available for two nearby sites, Poduri-*Dealul Ghindaru* (located 50 km east) and Malnaş Băi (located 42 km south). Both of these sites are especially suitable for comparison with Păuleni-Ciuc because all three sites share similarities in their location and likely function. Poduri-*Dealul Ghindaru* is located on a hill rising above the Tazlăul Sărat River, controlling access to the eastern entrance to the Ghimeş-Făget pass. Located in a narrow river valley, Malnaş Băi overlooks the Olt River where it drains out of the Ciuc Basin through the Tuşnad pass. Together, these passes connect central Transylvania to Moldavia through the Ciuc Basin (Fig. 9). While alternative corridors are found to the south at the Oituz path and to the north through the Bicaz Gorge, the Ghimeş-Făget/Tuşnad route is the only avenue in which Cucuteni-Ariuşd sites are found at both entrances to the passes.

Absolute dates from Păuleni-Ciuc, Poduri-*Dealul Ghindaru* and Malnaş Băi are presented in Table 3 and Fig. 10. The samples from Poduri come from the settlement's four Cucuteni A_2 occupation levels (Preoteasa 2011, 62). Assuming an average occupation of 75 years, Preoteasa places the Cucuteni A_2 settlement between 4,450-4,150 B.C. The most extensive deposits of material are found in the A_2 level, suggesting the settlement at Poduri may have reached its peak in the A_2 phase. At Malnaş Băi, László (1988) identified four levels of occupation belonging to the Cucuteni A_{2-3} phases. Absolute data for the two earliest levels places the occupation sometime between 4,450-4,250 B.C., possibly as late as 4,050 B.C (László 1997, 2006). These data were acquired from first two levels, thus the site's occupation likely continued beyond the period indicated by these data.

Site	Phase	Lab #	BP	+/-	σ 95	σ 65	Source
Păuleni-Ciuc	A	CAIS 12284	5.450	25	4,350-4,255	4,345-4,265	
Păuleni-Ciuc	A	CAIS 12285	5.230	25	4070-3960	4,045-3,985	
Malnaş Băi	A2-3	Hd-15082	5.407	20	4,330-4,235	4,330-4,280	László 1997
Malnaş Băi	A2-3	Hd-14118	5.663	42	4,610-4,360	4,540-4,4,55	László 1997
Malnaş Băi†	A2-3	Hd-14109	5.497	100	4,550-4,050	4,460-4,240	László 1997
Malnaş Băi†	A2-3	Hd-15278	5.349	40	4,270-4,050	4,210-4,160 /4,130-4,070	László 1997
Malnaş Băi	A	Gd-5858	5.940	60	4,990-4,690	4,900-4,720	László 2006
Malnaş Băi	A	Gd-5861	5.880	80	4,950-4,540	4,850-4,650	László 2006
Malnaş Băi†	A	Gd-5860	5.490	80	4,500-4,220	4,450-4,250	László 2006
Malnaş Băi†	A	Gd-4682	5.420	150	4,600-3,900	4,370-4,040	László 2006
Malnaş Băi	A	Gd-4690	4.950	100	3,970-3,620	3,810-3,640	László 2006
Poduri	A2	Hd-15401	5.575	35	4,464-4,361	4,500-4,351	Preoteasa 2011
Poduri	A2	GrN-31713	5.535	20	4,445-4,340	4,450-4,330	Preoteasa 2011
Poduri	A2	Hd-15324	5.529	29	4,452-4,352	4,460-4,343	Preoteasa 2011
Poduri	A2	Bln-2824	5.500	60	4,452-4,337	4,470-4,240	Preoteasa 2011
Poduri	A2	Lv-2153	5.470	90	4,452-4,240	4,500-4,045	Preoteasa 2011
Poduri‡	A2	Bln-2802	5.420	150	4.454-4.042	4.654-3.970	Preoteasa 2011

Poduri	A2	Bln-2805	5.400	70	4.346-4.158	4.360-4.040	Preoteasa 2011
Poduri	A2	Hd-15039	5.385	37	4.335-4.164	4.345-4.048	Preoteasa 2011
Poduri	A2	Bln-2766	5.350	80	4.336-4.042	4.360-3.990	Preoteasa 2011
† László considers these dates the most likely to accurately reflect Cucuteni A2-3 occupation. ‡Preoteasa does not consider this date an accurate reflection of Cucuteni A2 occupation.							

Table 3: Comparison of C14 Samples from Păuleni-Ciuc, Malnaş Băi, and Poduri-Dealul Ghindaru.

The chronological overlap between the Poduri Cucuteni A_2 settlement and Malnaş Băi A_{2-3} settlement has already been noted (Preoteasa 2011, 63) and now it is possible to include Păuleni-Ciuc in this set as well. The temporal range indicated by PAC-12 is contemporaneous with five of the eight Poduri A_2 radiocarbon samples. Furthermore, since the PAC samples originated from a context in the Păuleni III level, we may assume the early Păuleni I and II occupations were contemporaneous with the early stages of the Poduri A_2 settlement. Similarly, three of the four radiocarbon samples deemed representative of the first two Malnaş Băi levels overlap with PAC-12, and two of the four overlap with PAC-13. As with Poduri, the radiocarbon data from Malnaş Băi indicate the occupation may have begun sometime between 4,500-4,400, possibly contemporaneous with the earlier Păuleni I and II levels.

By establishing the contemporaneity of these three sites we are now able to poise interesting questions regarding the relationship between Cucuteni settlements in Moldavia and the Ariuşd-Cucuteni settlements in Transylvania. Together, Poduri, Păuleni-Ciuc and Malnaş Băi, indicate a communication and transportation network via the Ciuc Basin. This transportation corridor cements the importance of the Olt River, and may explain the presence of paired sites, such as Olteni-*În Dosul Cetații* and Olteni-*Cetatea Fetii"* or Ariuşd-*Dealul Tyiszk* and Bod-*Dealul Popilor*. Furthermore, as has been noted by Transylvanian archaeologists (Lazarovici, Buzea 2004, 43) the greatest quantities of Cucuteni A_1 materials are found within the vicinity of Transylvanian sites and the Carpathian Mountains. As we are presenting an analysis of data from only a single site, it is not our intention to foist a new

argument onto the debate concerning the appearance of Cucuteni sites in Transylvania (Lazarovici C.-M., Lazarovici Gh. 2006); we simply wish to note, with the addition of radiocarbon data from Păuleni-Ciuc, we now have an absolute chronology which indicates the possibility of a contemporaneous communication network between Transylvania and Moldavia.

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Figures

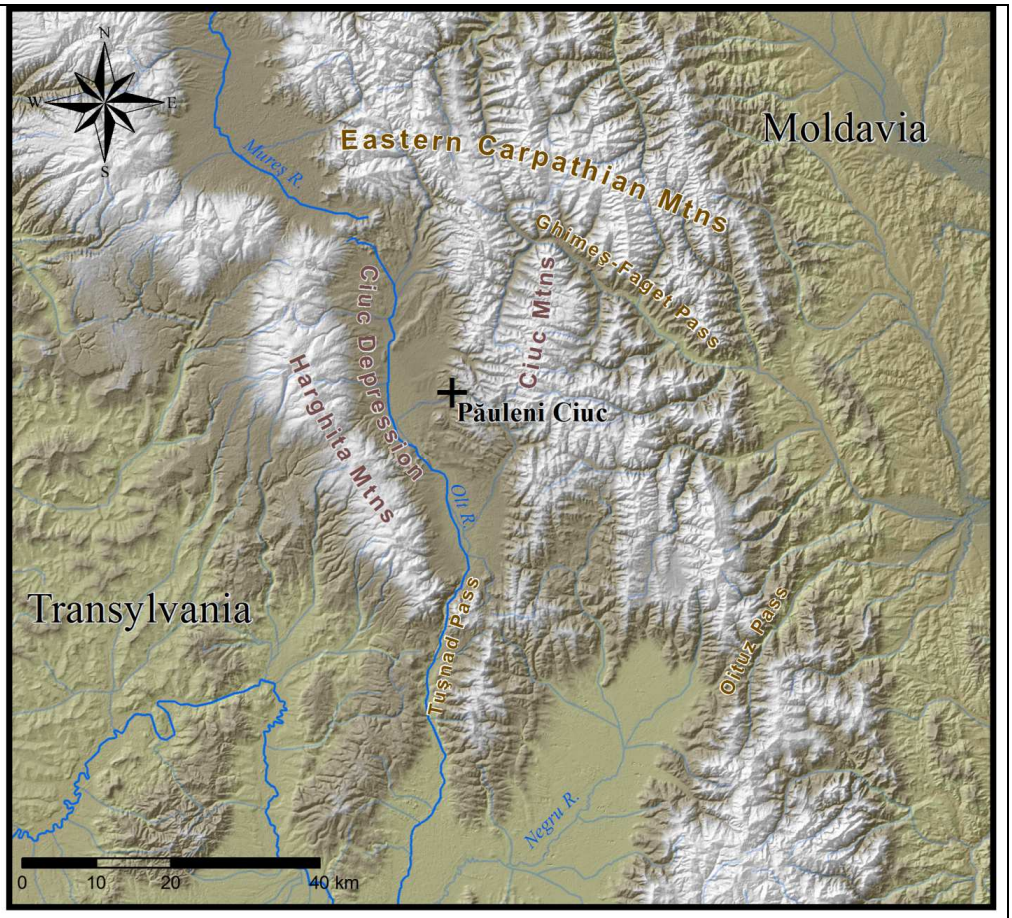
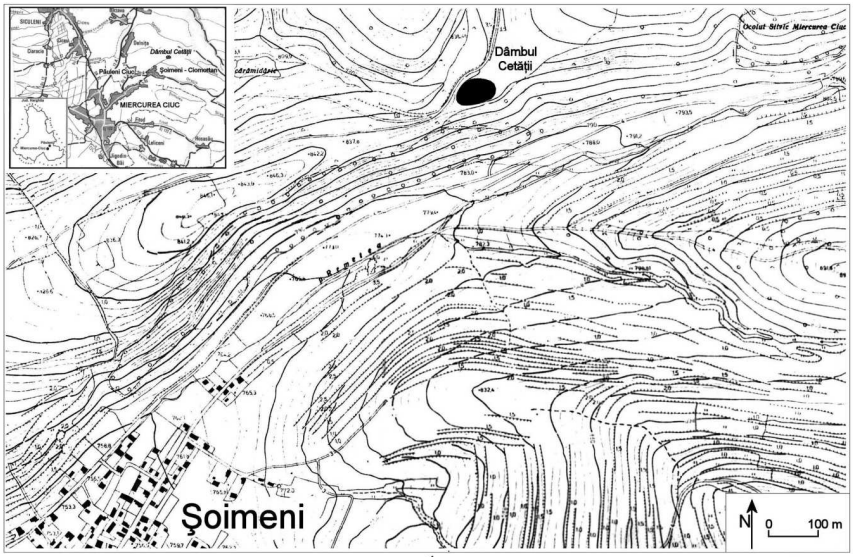


Figure 1. The geographic location of Păuleni-Ciuc.



1

2

Figure 2. Local map of Păuleni-Ciuc: 1 - Geographic position; 2 - view of the site from the west.

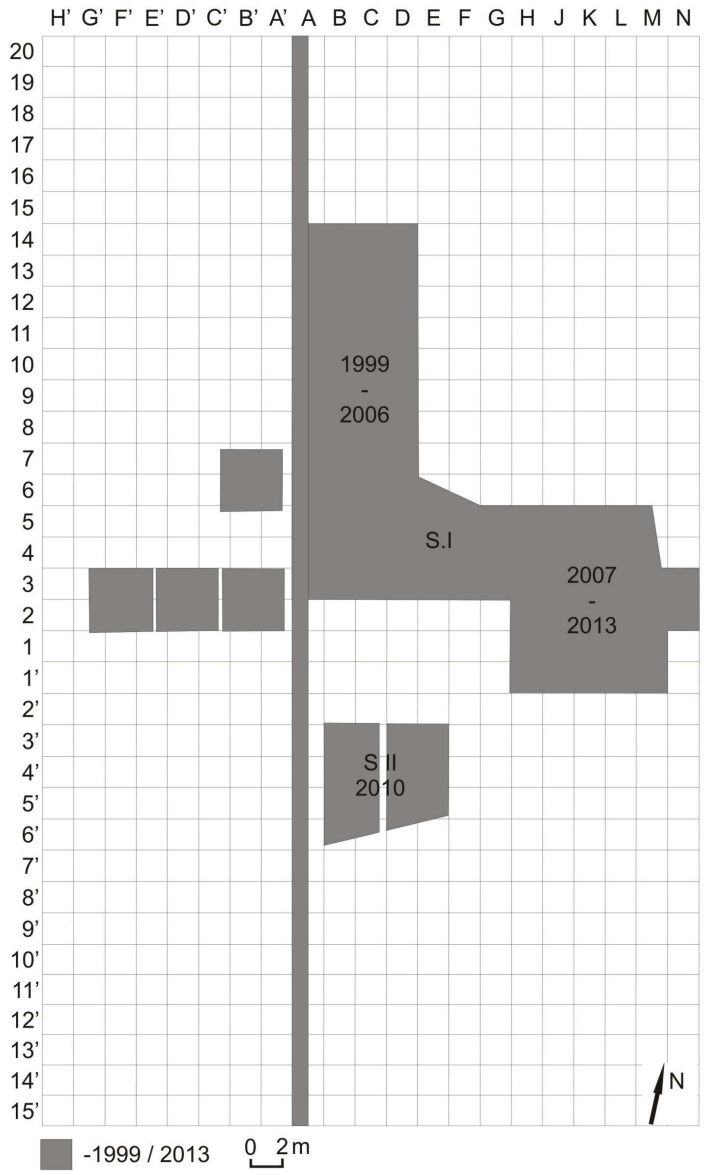
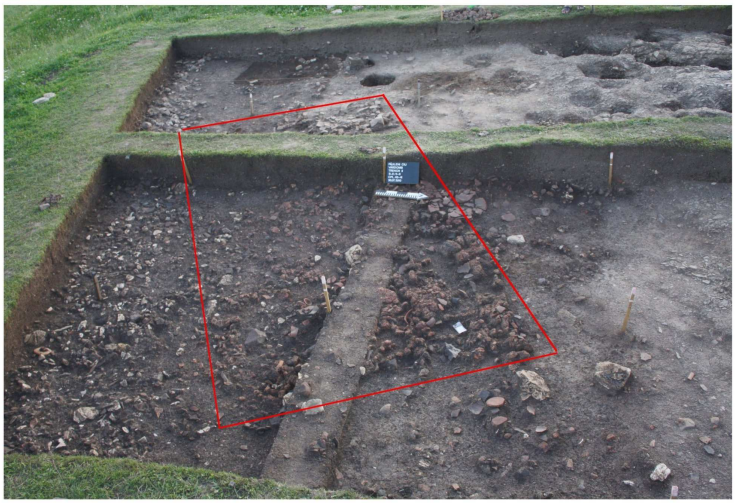


Figure 3. Păuleni-Ciuc trenches (1999-2013).

1



2

Figure 4. Complex 41 photos: 1 - View of the full complex from the west (modified w/guidelines); 2 - view of the eastern section of the complex from the east.

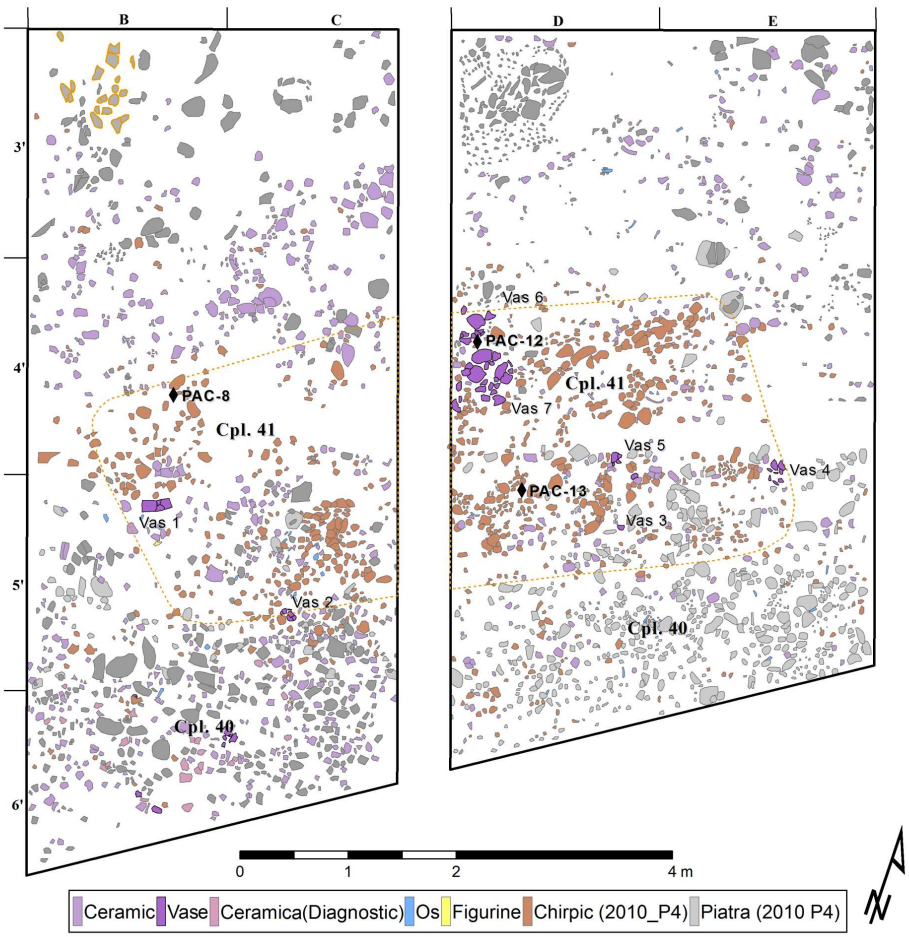


Figure 5. Plan of complexes 40 and 41, with the locations of radiocarbon samples.

1

2

Figure 6. Complex 40 (grey-white stone level) cutting complex 41 (red/burnt clay).

Figure 7. Complex 41 vessels: 1-2 Vessel no. 7, *fruitstand* and *cup* (bottom right); 3 - Vessel no. 6, *cup*; 4 -Vessel no. 5, *base fragment*; 5 - Vessel no. 4, *cup with a stand*; 6 – Vessel no. 2, *cup.*

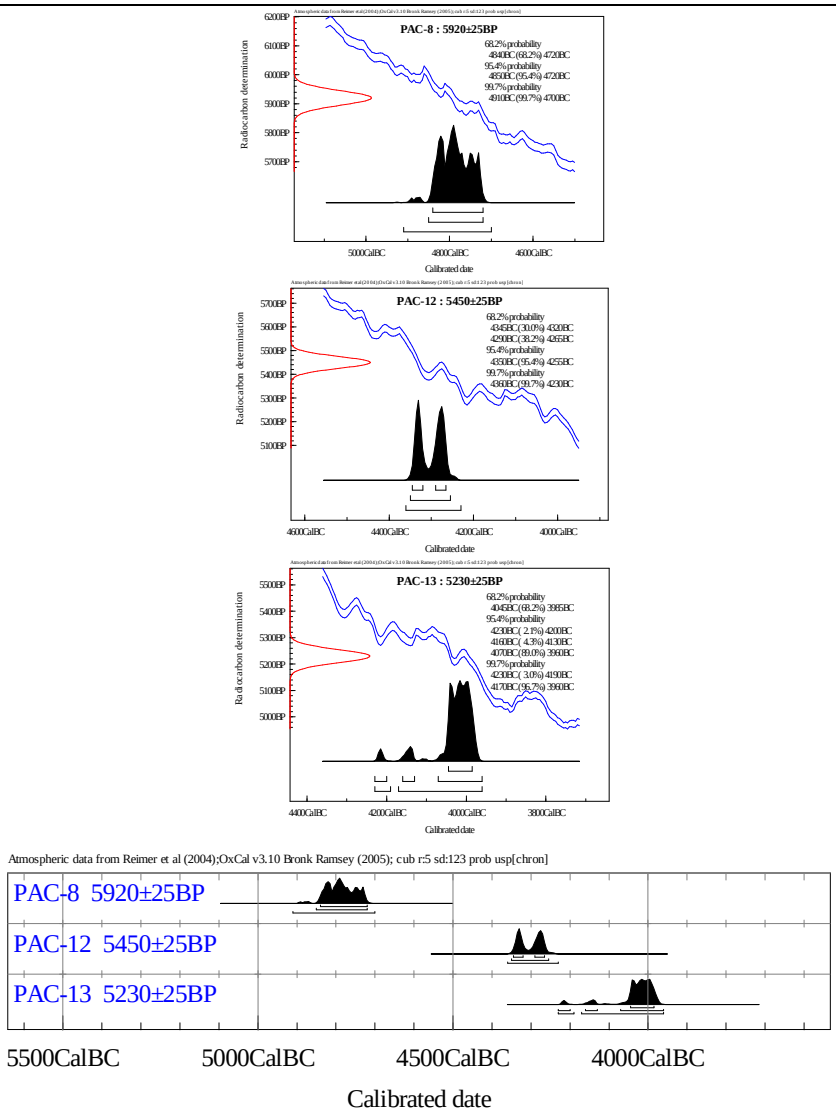


Figure 8. Age ranges of ^{14}C samples from Păuleni-Ciuc.

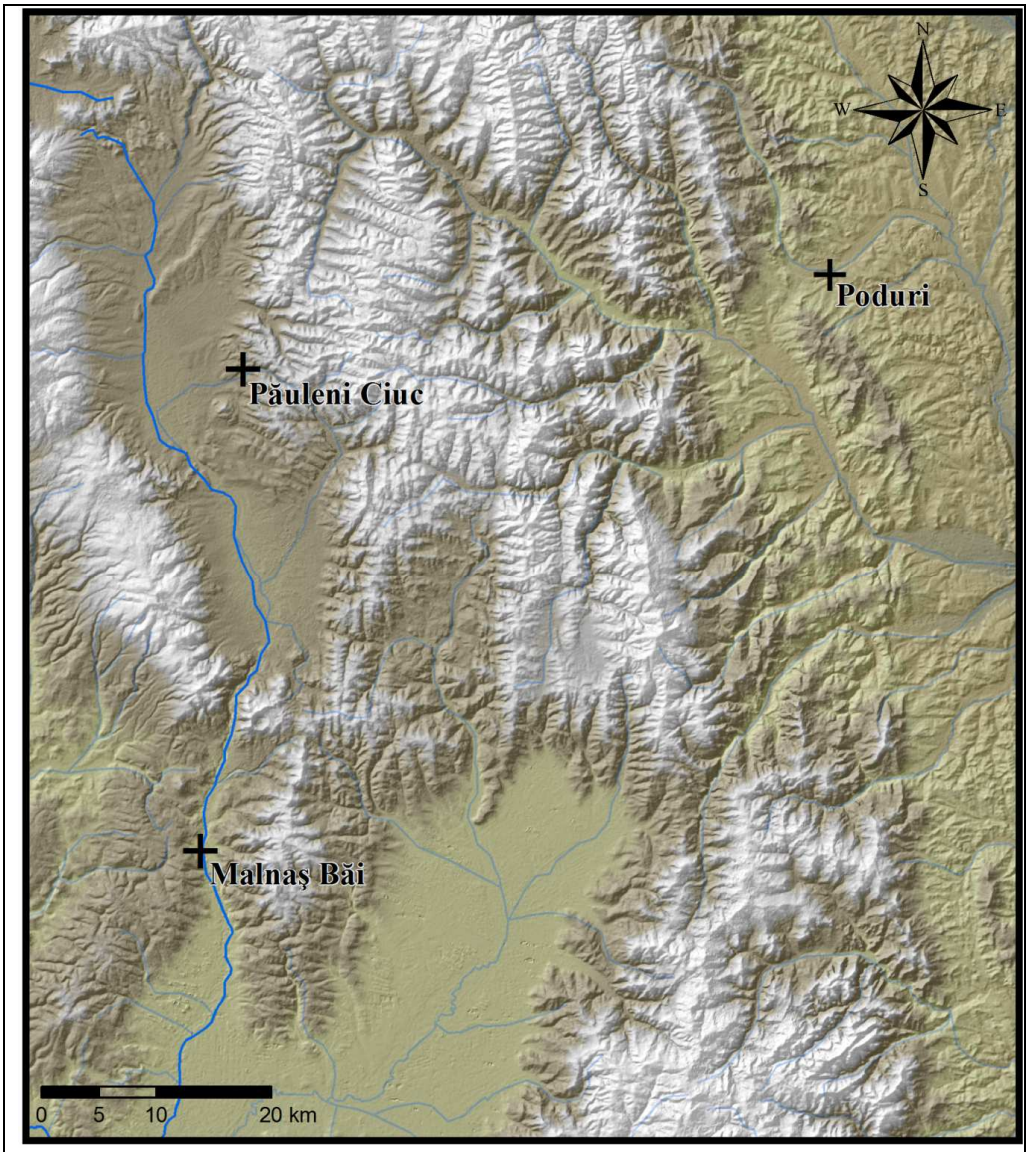


Figure 9. Geographic locations of Păuleni-Ciuc (Ciomortan), Poduri-*Dealul Ghindaru* and Malnaș Băi.

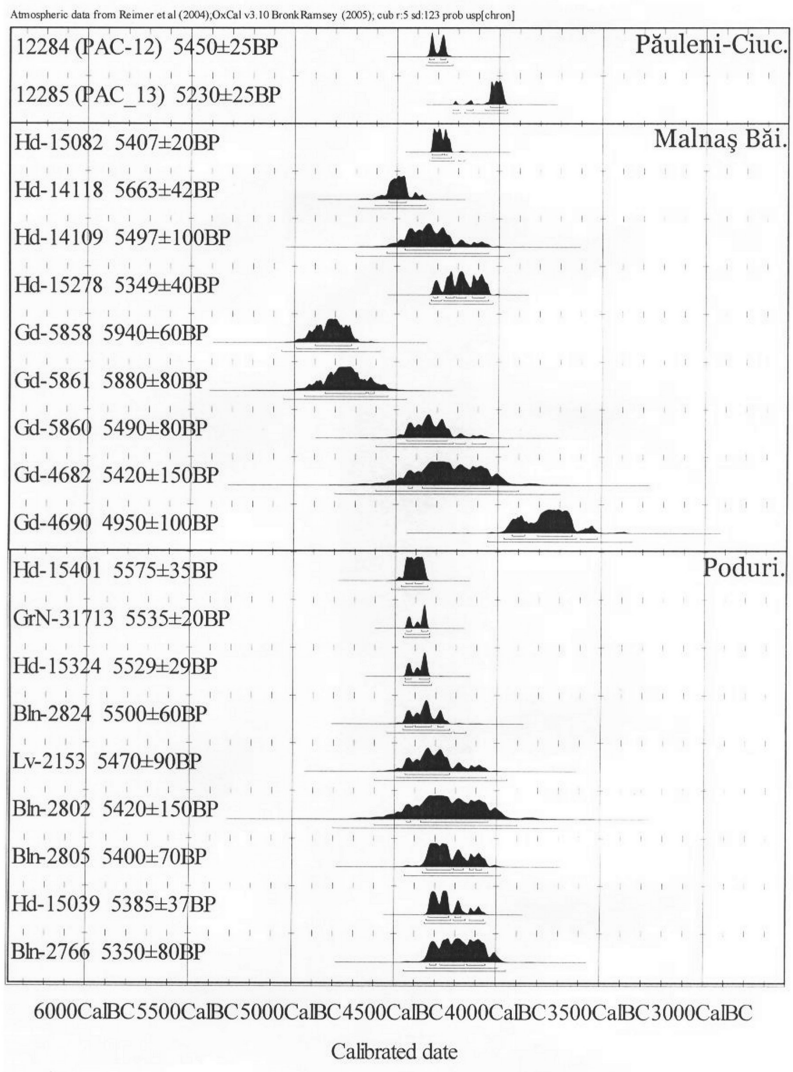


Figure 10. Comparison of ^{14}C Age Ranges from Păuleni-Ciuc, Malnaş Băi and Poduri-*Dealul Ghindaru*.

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