

POPULATION HISTORY AND COMMUNITY FORMATION IN EARLY MEDIEVAL EAST-CENTRAL EUROPE: INTEGRATING GENETIC, ISOTOPIC, ARCHAEOLOGICAL AND HISTORICAL PERSPECTIVES

Theme: 3. The Carpathian Basin: Integration, Mobility and Diversity

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Keywords: ancient DNA, mobility, population history, social structure, burial archaeology, Early Medieval Europe

Few parts of Europe witnessed as many population shifts as the Middle Danube region between 400-900 CE. In this macro-region, Pannonians, Romans, Goths, Gepids, Longobards, Avars, Bulgars, Slavs and many other groups came, settled and/or continued their migration or expansion towards other regions of Europe. Several very different social models coexisted here or replaced each other (e.g. the complex Christian and Barbarian societies, realms of steppe nomads and communities under their rule). The cohabitation and later the amalgamation of locals and newly-arriving foreign groups led to a continuous cultural transformation during this period that affected both lifestyle and material culture. The abundance of archaeological finds and the series of historical-political changes attested by the written sources make this region an intriguing test case for the relationship between ethnic identities constructed in texts, cultural and social habitus attested in the archaeological record and isotopic signatures, biological ancestries and relatedness attested by biomolecular analysis of human remains.

Recent bioarchaeological investigations and discoveries provide new perspectives on the role of mobility and kinship, social structure and organizations of these communities. This session aims to explore the people and their communities through comprehensive case studies from East-Central-Europe. The contributions should be based on interdisciplinary approaches, which interpret ancient DNA, isotope and other bioarchaeological results in the context of archaeology and history. Both fine-scale and large-scale studies are welcome. Furthermore, methodological papers on the integration of different disciplines are also invited to join the discussion.

Abstracts for session #371

INTEGRATIVE ARCHAEOLOGICAL AND ARCHAEOGENOMIC DATABASE FOR STUDYING THE POPULATION HISTORY OF THE HUN PERIOD

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The Migration period in the Eurasian steppe and forest-steppe is a bizarre pattern of population processes. Hunnic invasion to the East European steppes in the 3rd started dramatic and wide-scale relocations of the local groups of different origins. It resulted in intensive population admixture and formation of heterogeneous societies, which were the main actors during the whole period. The sophisticated nature of the migrations process caused by the Huns and the associated groups requires a multi-proxi study based on integrated archeogenomic and archaeological records.

To perform multidisciplinary analysis, we developed a Web-based and GIS-driven database, integrating archaeogenomic and archaeological data. From the archaeological side, our database deals with both cultural and stylistic interpretations and relative chronological sequences as well as absolute datings. It is based on the use of a graph database (Neo4j) that allows us to store, analyze and manage complex relationships between the archaeological evidence, its context, and interpretations. The functionality of our multi-user system includes data mapping, visualization, selection, and processing. Published genome-wide archaeogenetic data from the Allen Ancient DNA Resource are stored in the database and linked to respective burials. The web-GIS toolkit enables users to select certain groups of burials and archaeological sites and perform simple analyses of genetic data: hierarchical clustering of genetic distances, PCA (both basic and with projection on user-defined axes), ADMIXTURE, f-statistics, and qpWave/qpAdm. The database also enables users to store connections between ancient individuals revealed by the identity by descent (IBD) methodology. IBD sharing (autosomal haplotype sharing) is a high-resolution method of genetic analysis that recently became applicable to ancient DNA samples due to advances in genotype imputation and phasing for ancient DNA data in the Reich Lab.

We hope that this database and a simple toolkit will help to cross the divide between research in archaeology and archaeogenetics.

Keywords

aDNA, Migration period, Web-GIS, IBD sharing, genetic analysis toolkit

Note/comment

Y-CHROMOSOME ANALYSIS OF GOTHs FROM THE MASŁOMECZ GROUP CEMETERIES IN SOUTHEASTERN POLAND

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The Goths were an important part of European history from the 1st to the 8th century AD. For many years, various hypotheses have emerged among researchers regarding their origin and dispersal. Unknown is also the scale of assimilation of the local people they encountered during their migrations across Europe. The aim of this study was to determine the origin and genetic structure of the male lineages of the Goths from the Masłomęcz group who inhabited the Hrubieszów Basin (southeastern Poland) from the 2nd -4th century AD using Y chromosome. The material for analysis consisted of skeletal fragments collected from 43 individuals. Samples with the highest endogenous DNA content were sequenced directly to low genome coverage. For the others, after sex determination, we performed targeted enrichment with a custom panel of 10k Y chromosome SNPs. This allowed us to determine the Y chromosome haplogroup of 18 individuals. A total of 14 individuals (78%) represents the Y chromosome haplogroups most closely related to the Scandinavian population. Thirteen individuals were classified into subclades of haplogroup I1, four to haplogroup R1a and one to haplogroup J2b. Haplogroup I1 currently occurs mainly among people living in Scandinavia. Ancient DNA analyses showed that I1 has been present in the Scandinavian population since at least the Bronze Age. One of the individuals belonging to haplogroup R1a-Z284 belongs to a subclade found almost exclusively in the ancient and modern Scandinavians. The remaining four individuals belong to haplogroups R1a and J2b most probably represent the effect of assimilation of local people, met by Goths during their numerous war expeditions and settlement expansion.

The research is part of the project „Genetic history of Poles” (2018/31/B/HS3/01464) financed by the National Science Centre, Poland.

Keywords

ancient DNA, Goths, Y chromosome

Note/comment

SNAPSHOT INTO KINSHIP STRUCTURE AND POPULATION HISTORY OF A LATE AVAR-PERIOD COMMUNITY FROM GENOME-WIDE ANALYSES OF THE WHOLE RÁKÓCZIFALVA CEMETERY.

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Recent ancient DNA studies revealed the Avar period in the Carpathian Basin was characterized by the appearance of a population with an East Asian ancestry traceable to the ancient Mongolian steppe. This eastern profile is tightly associated but not exclusive to the early elite burials found in the core of the Avar empire. This finding opens many new questions about the population history of the Avar period. How did these eastern migrants interact with the “western” populations already living in the region? Did they admix with the local population? What happened to them after the fall of the Avar dominion in the Carpathian Basin? Only a multidisciplinary approach combining the co-analyses of complete cemeteries from an archeological and genomic perspective could allow to gain new insights into these complex societal phenomena. The site of Rákóczifalva 8 dated between the end of the 7th beginning of the 9th century located at the border of the core Avar region, represents a unique opportunity to this end. The cemetery spans the second half and end of the Avar rule in the Carpathian Basin and the archaeological record, as well as the spatial situation shows connections with other middle and late Avar period sites. At the same time, it reveals several elements of discontinuity with earlier cemeteries of the Transisza region. We sampled the entire cemetery and produced genome-wide data for all the individuals, which were integrated together with archaeological, anthropological, isotopic analyses in the framework of the ERC funded project ‘HistoGenes’. Our results reveal unprecedented insights into the kinship structure of this late Avar-period community and provide a glimpse into the dynamics of populations transformations occurring in this period.

Keywords

Ancient DNA, Archaeogenetics, Early Medieval, Carpathian Basin, Migration Period, Avars

Note/comment

KINSHIP RELATIONS AND SPATIAL ORGANIZATION IN A LATE AVAR-PERIOD CEMETERY: ARCHAEOLOGICAL PERSPECTIVES ON THE RÁKÓCZIFALVA SITE (CENTRAL HUNGARY)

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Two Avar-period (late 6th – early 9th c.) cemeteries were excavated in 2006–2007 in the area of Rákóczifalva, in close proximity to each other. The sites are located in the Great Hungarian Plain, east of the Tisza River, along the Tisza's middle course. Cemetery No. 8 and 8A contains 58 and 249 graves, respectively. Early burials of the sites suit the cultural traits of Avar-period communities in the Transtisza region (steppean nomad features, early Byzantine imports), whereas later burials blend into the more uniform material culture and burial rituals of the entire Carpathian Basin in the 8th century. We investigate both sites using an interdisciplinary approach as part of the ERC HistoGenes project, conducting archaeological, anthropological, isotopic, and aDNA analysis.

In our presentation, we discuss the relationship between the two sites from an archaeological and anthropological point of view. We look at the demographics of the cemeteries as well as the health status of the people buried there. The new genomic analyses of the smaller Rákóczifalva burial place allow us to map the familial links of the deceased as well as the site's spatial organization. As a result, we will be able to learn more about community organization in the Avar period than ever before. We are also looking for answers to how funerary representation, grave goods and family relations of the cemetery are linked.

Keywords

Avar period, Carpathian Basin, archaeogenetics, funerary representation

Note/comment

CHILDHOOD OF THE AVARS AND GEPIDS: RECONSTRUCTING DIET AND WEANING PRACTICES USING STABLE ISOTOPIC ANALYSIS AND MULTIPLE TISSUES

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This presentation explores the breastfeeding, weaning and overall dietary practices in non-adults of Avar and Gepidic period populations in the Great Hungarian Plain during the Migration Period (5th-8th century). This research investigated hypothesis that breastfeeding and weaning practices (BWPs) differed between Avar and Gepid populations due variation in overall subsistence practices and general cultural practices. Bone collagen samples from 131 individuals (60 non-adults) from five sites (Berettyóújfalu, Tiszapüspöki, Tiszabura, Rákóczi falva sites 8 and 8/A), were analyzed for nitrogen and carbon stable isotopes. Collagen samples from non-adults were assessed using a Bayesian model called WARN. First permanent molars were also samples from 37 (16 adults, 21 non-adults) individuals across the five sites with tooth dentine incrementally sampled to analyze for nitrogen and carbon isotopic values. No significant differences in isotopic values from bulk collagen analysis was found between adults and non-adults at each of the sites analyzed, apart from breastfeeding or weaning non-adults. BWPs patterns drawn from the stable isotope data and the WARN program revealed no specific similarities between sites or populations. Incremental sampling of the first molars also suggests no specific patterns of BWPs within populations, as each site analyzed revealed different BWPs.

With no clear BWPs within the populations and a generally similar diet, it is suggested through the lens of life course theory that cultural practices, generational cohort differences and agency are responsible for variations in BWPs within the sites and populations. Additionally, the dietary practices found in non-adults paired with other archaeological evidence offer indications of the roles non-adults played in Avar and Gepid society.

Keywords

bioarchaeology, breastfeeding and weaning, stable isotopic analysis, Migration Period, Childhood

Note/comment

HOW ARCHAEOLOGY AND ANTHROPOLOGY CAN BUILD ON ADNA ANALYSES OF ENTIRE CEMETERIES

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Within the ERC-funded HistoGenes project, we assess several hundred inhumations from Austrian cemeteries dated between the 4th and the 9th century A.D. The interdisciplinary analysis encompasses archaeological, anthropological as well as molecular methods, including aDNA and isotope analyses. Ancient DNA data creates new possibilities to reevaluate and interpret funerary customs and chronological sequences by tracking generations and families in the population. Based on preliminary data from the cemetery of Leobersdorf (7th to 8th c. A.D.), located at the periphery of the Avar empire, we will demonstrate new possible investigations on demography and disease burden.

This interdisciplinary perspective will show the impact of the integrated analyses on the anthropological, archaeological, and ultimately the overall cultural-historical interpretation. Joint interpretations shed new light on aspects of chronology, age at death, biological sex estimations gender, pedigrees, and maternity. Our data on these aspects will open up new perspectives on social life which previously could not have been recognised or verified.

This project has received funding the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement n° 856453 ERC-2019-SyG).

Keywords

aDNA, Leobersdorf, population history, Early Medieval Period, Avar empire

Note/comment

ANCIENT DNA REVEALS THE SETTLEMENT OF AVAR COMMUNITY IN LOWER AUSTRIA DURING EARLY MEDIEVAL PERIOD

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The archaeogenetic evidence of the Avar period in Europe records a group of people coming from the East Eurasian steppe. So far, the study of Avar-period individuals in Europe has been around the Carpathian Basin, where most of the rich archaeological material associated with the Avars has been found. That is also in concordance with historical records that designate this area as the core of the Avar Empire, waging wars against Byzantium. While eastern Austria is located in the periphery of the presumed Avar territory, there are also numerous finds associated with the Avar period, including a considerable amount of human skeletal remains buried during and after the Avar period. Within the HistoGenes project, we study the genetic architecture of several hundreds of samples from Austrian cemeteries dated to between the 4th and the 8th century A.D. One such cemetery, studied in detail by several disciplines involved in the project, is the cemetery of Leobersdorf. Located south of Vienna, it has been dated from the first half of the 7th until the beginning of the 9th century A.D. This is a particularly good example for studying Avar communities in Austria through a thorough archaeological, anthropological and genetic analysis of this necropolis. Within the ERC HistoGenes project, we show that the application of archaeogenetic approaches will allow us to uncover the past of population movements and admixture even in recent times. Ancient DNA studied in its archaeological, anthropological and historical context, and for an entire cemetery, enables us to jointly reconstruct the genetic origin, family relationships, social structure and demography of the inhabitants of Leobersdorf and gives us an insight into their genetic connections to the wider region.

Keywords

Leobersdorf, aDNA, Austria, Avars, Early Medieval

Note/comment

BIOLOGICAL KINSHIP PATTERNS IN AN EARLY MEDIEVAL GRAVEYARD OF THE RHEINLAND AS PART OF THE FRANKISH KINGDOM

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The Frankish kingdom included vast areas of western Europe and has undergone intense archaeological examination. Ancient DNA studies on the other hand have not been performed so far. Here I present an interdisciplinary project regarding an early medieval graveyard of the Rhineland in northwestern Germany. We are using the archaeological record for chronological placing and interpreting social status; perform osteological analyses with focus on age estimation and identification of non-metric traits; and analyse genome-wide aDNA data to determine biological sex and kinship, as well as the broader ancestry patterns observed with contemporary and present-day genetic data. First, we reconstruct close genetic multigenerational kinship patterns among individuals, portraying the exploitation of the cemetery by a continuous population throughout its 400 years of usage. Second, we demonstrate a relatively high degree of genetic diversity as seen in ancestry profiles in these samples. Third, we compare genetic kinship patterns with kinship patterns obtained by non-metric traits, which have been traditionally used in anthropometric research. Finally we interpret our results in light of comparison with contemporary patterns observed in East-Central Europe.

Keywords

Archaeogenetics, Early medieval north-western Germany, Population genetics, Kinship analyses, Physical anthropology

Note/comment

Abstract #: 09

POPULATION DYNAMICS AND HISTORY OF SOUTH MORAVIA DURING THE 2ND HALF OF THE 5TH AND THE 6TH CENTURIES AD.

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The contribution presents a new project of the Institute of Archaeology of the CAS in Brno “Lombard population in Moravia. Interdisciplinary research of the Migration Period necropolises” (granted by the Czech Science Foundation GACR). The revision of previous research but especially based on geophysical prospecting and field excavation of the selected cemeteries is aimed to bring new information about the structure, dynamics and mobility of populations. The horizon of the end of the 5th and the beginning of the 6th century AD deserves special attention as groups of the newly arriving Lombard population appear in the area of interest inhabited by the Germanic populations (Herules, remains of the local Suebian tribes, etc.). The project, which is currently in its initial phase, is based on an interdisciplinary approach; archaeological-historical interpretations will be validated through the analyses of strontium, carbon and nitrogen isotopes; palaeopathological analysis, analysis of metals and textiles. Through the involvement in the international project “Histogenes”, aDNA data from the Moravian cemeteries will be part of the European database and thus contribute to tackling the issue of migration and the formation of the Early Medieval Europe

Keywords

population history, mobility, burial archaeology, interdisciplinarity, Early Medieval, South Moravia

Note/comment

CONTINUITY AND DISCONTINUITY PRECEDING THE FORMATION OF GREAT MORAVIA IN POHANSKO REGION

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To this day, the question of the impact of migrations in the period predating the formation of the first Slavic states in East Central Europe is still debated. Traditionally accepted consensus is that Slavs migrated from East into the rest of Europe in the 5th or 6th century AD. There are however voices that question this narrative and suggest that the Slavic languages arrived in the region without a large migratory event. Even in the presence of a demographic shift in the population, the process itself is not well described and the social structure of the presumed incomers might have played a strong role (e.g. elite migration versus slow immigration distributed over generations). The situation is complicated by geographical and cultural variability throughout Central Europe at this time. To overcome this challenge, in this part of the project FORMOR (GAČR grant The Formation of Multi-ethnic Complex Societies in Early Medieval Moravia. Collective Action Theory and Interdisciplinary Approach), we focus on an archaeologically well-defined region near Pohansko (Břeclav, South Moravia, Czechia) where there was a settlement that was a part of one of the first states where Slavic language has been used (Great Moravia) and where there are skeletal remains also from preceding (“Early Slavic” and “pre-Slavic”) occupation. We analyze whole genomes of medium coverage from these contexts and investigate continuity with various methods including explicit coalescent modeling. We also investigate the genetic relationship of these individuals to each other and known reference data in the wide region.

Keywords

Slavs, aDNA, Czechia, Early Medieval, Pohansko

Note/comment

Abstract #: 11

**SLAVS OR MAYBE NOT? RADIOCARBON DATING OF CREMATED BONES FROM
"PĂUCA - HUNGARIAN CHURCH SITE" (ROMANIA, SIBIU COUNTY)**

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Archaeological research in the site of "Păuca - Hungarian Church" has started in 2010, and between 2010-2021 has uncovered over 90 graves, some being simple cremation graves with the deposit of remains in the urns, others being double graves (with two urns) and a single one is a mixed double grave (incineration and inhumation).

The dating of three samples from the necropolis would suggest that Păuca necropolis is contemporary with the final phase of the late Germanic period (Gepids) and the early Avar period. If we admit that it is more accurate to date to the upper limit of the range (7th century A.D.), the necropolis at Păuca could be connected with historical events spent between 567-630 A.D., i.e. the establishment and consolidation of Avars power in the Pannonian-Transylvanian space.

The C14 dating of the cremated bones from the Păuca necropolis is intending to launch a debate on the need for more samples of C14 data for the cremation necropolises attributed to the so-called Mediaș group and at the same time may represent a starting point for a re-discussion of the chronology for the period between 6 to 9 Century A.D. in the eastern part of Carpathian Basin.

Keywords

Cremation, Migration Period, Funeral Archaeology, C14 dating, Transylvania, Romania

Note/comment

AN INTEGRATIVE GENETICS APPROACH FOR STUDYING DISEASE IN EARLY MEDIEVAL EUROPE

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In the fields of archaeology, anthropology, and history, the study of human health and diseases have always played an important role as they have a substantial impact on individuals and societies. However, this is often limited to diseases that either leave traces on the skeleton or are documented in historical sources. Applying genetic methods, the field of archaeogenetics could add to our understanding of numerous pathogens that do not leave visible lesions on the skeleton. However, meaningful interpretation of genetic results is only possible following an integrative approach by combining information from all disciplines. In the ERC funded project 'HistoGenes', researchers and scholars from various fields work together to study the population history of Early Medieval Eastern Central Europe to understand more about human migration and mobility, the structure of past societies, such as kinship, as well as health and diseases.

One pathogen that can be observed across sites and through time is the hepatitis B virus, the causative agent of chronic hepatitis, cirrhosis and hepatocellular carcinoma in humans, which can be transmitted vertically from mother to child and horizontally as a sexually transmitted disease. Combined with our knowledge about relatedness and kinship within these social groups, we can interpret infections in much more detail, potentially tracing back chains of transmission and gain insights about the impact this disease might have had on individuals in the past.

Here we present first genetic results about the hepatitis B virus in Early Medieval Europe that are discussed and interpreted in an interdisciplinary context.

Keywords

Carpathian Basin, Early Medieval Eastern Central Europe, Diseases, Hepatitis B virus, Interdisciplinary study

Note/comment

WHAT WAS IT LIKE LIVING WITH LEPROSY IN THE AVAR AGE COMMUNITY OF KISKUNDOROZSMA-KETTŐSHATÁR I (HUNGARY)? - A CASE STUDY

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The aim of our study is to demonstrate an individual (KK61) from the 8th-century-CE cemetery of Kiskundorozsma-Kettőshatár I (Hungary), who appears to have lived with leprosy (Hansen's disease). The severity and extent of the detected bony changes imply that KK61, a middle-aged male, suffered from the disease for a long time prior to his death. It has affected not only the rhinomaxillary region of his face but also his lower limbs, with severe deformation and disfigurement of the involved anatomical areas. Consequently, he would have experienced disability in performing the basic activities of daily living; and thus, he would have required regular and substantial care from others to survive. Despite his very visible disease and associated debility, that clearly marked the middle-aged male as afflicted with leprosy, he has not been segregated but buried within the cemetery boundaries, among others from his community. His grave has conformed to the mortuary practices characteristic of the Kiskundorozsma-Kettőshatár I cemetery. Based on the above, there seems to have been no distinction, leper from non-leper, in death in the late Avar Age community of Kiskundorozsma-Kettőshatár I. These findings are in accordance with the results of previous studies on other Avar Age cemeteries from the present-day territory of Hungary, indicating that prior to the 13th century CE, lepers have not been segregated from the healthy population, at least in death. It should be noted that distinction or segregation in life do not preclude normative treatment in death. Nevertheless, the long-lasting survival of KK61 with Hansen's disease indicates that he would not have been abandoned but cared for by others. The detailed contextual analysis of KK61 illuminates both the biological and social consequences of living and dying with leprosy in the late Avar Age community of Kiskundorozsma-Kettőshatár I.

Keywords

palaeopathology, leprosy, disfigurement, debility, social stigma, late Avar Age

Note/comment

POSTMARITAL RESIDENCE PRACTICES IN THE AVAR PERIOD EASTERN TRANS-DANUBIA, HUNGARY

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In 568 AD the Avars, an Asian-originated tribal confederation appeared in the Carpathian Basin. The Avar conquerors united under their rule the whole territory, subjugated its inhabitant and eventually established the Avar Khaganate. The provision of the regions was mainly implemented in a nomadic way. Thus, the established polity constituted a different way from the early European development.

During the early Avar period, Eastern Transdanubia can be regarded as a contact zone between the steppe, the Merovingian and the Mediterranean worlds. The coexistence was not only cultural, but it took also place at the biological level of populations.

Postmarital residence analysis accompanied with biodistance analysis could provide a suitable tool to explore the biological and social interactions between the different populations. Phenotypic traits of the human remains can be used as a proxy to evaluate the diversion between different populations and the extent of sex-specific variation. Significant differences in morphological variability between the sexes could be indicative of a sex-biased pattern of postmarital residence. Postmarital residence analysis in this study is based on the assumption that the sex with a higher migration rate exhibits greater phenotypic variability.

Concerning the between- and within-group variability of the sexes, it is possible to assume a higher rate of female exchange between the communities.

The study was supported by the „HistoGenes” (ERC Synergy grant).

Keywords

Avar Period, Bioarchaeology, Postmarital residence, Mobility

Note/comment

COMPARATIVE ANALYSES OF SOCIOCULTURAL CHANGES AND GENETIC TRANSITIONS IN THE AVAR PERIOD SOUTHERN-TRANSDANUBIA

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Kölked-Feketekapu is one of the largest cemeteries from the Avar Period Carpathian Basin. With more than 1300 graves and well-documented archaeological remains, it provides a unique resource for observing the numerous cultural transitions in the Southern-Transdanubian region. The cemeteries and the attached settlements were used between the 6th and the 8th century AD. This wide timescale gives archeologists and geneticists a great chance to track not only the impact of the Late Antique, Merovingian and eastern nomadic cultures but also the Avar Period transitions in the region. The social stratification can be examined at the site, due to the higher social status of several families in the community. Kölked-Feketekapu A site consists of a traditional Reihengräberfeld that contained around half of the burials excavated at Kölked. The other part of the graves are divided into 16 groups (Kölked-Feketekapu B) and were scattered all over the settlement's area. In the 6-7th centuries, the settlement was divided into households and elite grave groups which could be connected with several economic units of the village. This structure provides great potential in the reconstruction of social stratification. Our main goal in this paper is to 1) better understand the complex sociological and genetic kinship-based structure of the community in Kölked-Feketekapu B cemetery; 2) remodel the genetic and archeological transition in the Southern-Transdanubian region. For these purposes we have sequenced ~200 human DNA samples targeting 1.2 million polymorphic sites genome wide, involved stable isotopic data for most of the samples and analysed them in the context of the HistoGenes ERC project.

Keywords

aDNA, Carpathian Basin, Avar Period, HistoGenes project

Note/comment

DIETARY AND CULTURAL DIFFERENCES BETWEEN NEIGHBOURING COMMUNITIES: A CASE STUDY ON THE AVAR PERIOD CARPATHIAN BASIN

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Stable isotope ($\delta^{15}\text{N}$, $\delta^{13}\text{C}$) and ^{14}C results from two early medieval cemeteries are presented and evaluated in this study in order to draw conclusions about diet, social differentiation and chronology in the Carpathian Basin during the Avar period (7th–9th century CE). At Tiszafüred and Hortobágy, two contemporaneous but distinct groups buried their deceased. The results reflect basic diet deviations between the two communities, which originated in alternative subsistence strategies and/or social differences. The Tiszafüred samples fit well into the general dietary picture of the period. The members of the rustic population consumed mainly cereals and millet, while the proportion of animal protein was significant also. Because of the exceptionally high $\delta^{15}\text{N}$ levels of the Hortobágy-Árkus elite community, their diet was primarily based on animal protein, most probably of freshwater origin. Concerning the low number of our samples that were selected for radiocarbon dating, the present information is insufficient for an exhaustive reconstruction. For now, we intend to grant some new additions to the sporadic data available for dietary reconstruction from this region and period. Our dataset is thought-provoking not only for the two distinct clusters of the plot but also for the rarity of stable isotope results from Avar sites.

Keywords

Early Middle Ages, Avar period, Carpathian Basin, Dietary analysis, Isotope Analysis

Note/comment

THE ISSUE OF CONTINUITY OF POPULATION HISTORY BETWEEN 8-12TH CENTURIES IN CARPATHIAN BASIN BASED ON ARCHAEOGENETIC RESULTS OF FOUR CEMETERIES

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As the Carpathian Basin is reputed as the westernmost point of the Eurasian steppe, it was influenced by movements of many nomadic tribes during migration period, as well. One of the most important question for discussion in archaeology is the continuity or discontinuity of populations in the investigated region. Although the survival of population of e.g. 9th century in the 10th century is taken as evidence in Carpathian Basin (among others Avars and Slavs), based on only archaeological research these observations cannot provide unambiguous data to this day. For example, over half a dozen cemeteries are known in which conquering populations were excavated above or near of the late Avar tombs, and it could not be decided yet whether we could speak of population and/or place continuity in these cases. In this study we try to answer this question in a different extent by examining power centres of Transdanubia with a broader time range: late Avar period, Carolingian period, Hungarian Conquest period and the early Árpáadian Age.

We investigated 172 individuals from four cemeteries using NGS sequencing methods: Zalavár-Vársziget (9-12th centuries), Himod-Káposztásföldek (9-11th centuries), Visegrád (8-11th centuries), Sárbogárd-Tringer tanya (10th century). At least two of them (Zalavár-Vársziget and Himod-Káposztásföldek) contain well-separable chronological phases, based on which we created groups for population genetic analysis. The statistic and phylogenetic analyses based on whole mitogenomes were completed by whole genomic shotgun results. According to the later one, more precise conclusions have been drawn at individual level, although the different composition of the investigated populations is seen based on mitogenomic results as well.

This research was supported by The House of Árpád Programme (2018–2023) Scientific Subproject: V.1. Anthropological-Genetic portrayal of Hungarians in the Árpáadian Age.

Keywords

Power centres in Transdanubia, Population genetics, Migration period

Note/comment

POPULATION DYNAMICS IN THE ODER AND VISTULA BASINS AS INFORMED BY NOVEL GENOME-WIDE DATA.

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Throughout the history the terrains of Oder and Vistula basins, which now make the Republic of Poland, have been a witness to an intense movement of people caused mainly by trade- or warfare-related factors. Despite the growing amount of the available genetic and genomic information for historic and prehistoric inhabitants of these lands, they remain severely understudied comparing to, for example, these of Germany or Hungary. Our project was designed to fill these gaps in the spatiotemporal genomic map of Central Europe. The skeletal material was obtained opportunistically with aim to cover the most periods and areas possible. We performed genomic analyses for individuals from between the Neolithic and Early Modernity from across today's Poland and neighboring regions. Shotgun sequencing, as well as Human Affinities Prime Plus and custom Y chromosome SNP panel enrichment were used to obtain confirmed aDNA low-coverage genome-wide data for 60 individuals (with the number still growing as our dataset is continuously updated). Using population genomic tools we explore the patterns of demographic changes in the Oder and Vistula basins since the Neolithic, the directions, timing and intensity of gene flow and its relation to the available written and material culture evidence as well as funerary practices and relatedness among the studied individuals within particular cultures and archaeological sites.

Keywords

Poland, ancient DNA, genomes

Note/comment

BIOARCHAEOLOGICAL STUDY OF MEDIEVAL POPULATIONS BETWEEN THE DNEIPER AND DNIESTER VALLEYS

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Genetic data is very scarce on the medieval people of the Dnieper and Dniester Valley. We examine more than 50 human DNA samples from different medieval cemeteries, which can be dated to the 8-10th century AD and linked to different ethnic groups (like Slavs, Pechenegs, Hungarians) based on historical and archaeological findings. This region was the last settlement area (so-called Etelköz) for Hungarian conquerors before arriving in the Carpathian Basin. The archaeological material of some studied cemeteries – dated to the 9th century AD by 14C measurements – shows connections with cultures of the Volga-Ural region and the Carpathian Basin as well.

Our uniparental and genomic analyses also show that several distinct groups lived in the studied area. Moreover, Slavic groups on the left and right bank of the Dnieper have a different genetic composition. Keeping in mind the archaeological data, we examine genetic relations of the studied groups in comparison with other Eurasians at both individual and population levels. In addition to identification of the “Hungarian component” in the region, we compare our results with the data of medieval groups from the Carpathian Basin and Volga-Ural regions. These areas can be related to each other through the early Hungarians, whose migration is not just documented by fresh archaeological data but has been also confirmed by the genetic examinations of the recent years.

Our goals are to gain genetic insight into the composition of the Dnieper and Dniester Valleys’ ethnic groups and to learn about unique stories of the individuals who composed the populations. Our results can not only shed light on the sources of migration events, but also show the impact of the newcomers on the population of the studied area. This research was supported by: Eötvös Loránd Research Network; Thematic Excellence Program (TKP2020-NKA-11); Árpád dynasty program (IV.2).

Keywords

medieval, migration, Dnieper, Dniester, Hungarians, Slavs

Note/comment

DIVERSITY, COMMUNITY FORMATION, AND SOCIAL STRUCTURE IN THE EARLY MEDIEVAL CARPATHIAN BASIN - ARE WE THERE YET?

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It has long been acknowledged that the Carpathian Basin has a great potential in the understanding of the various aspects of transformation during the Early Middle Ages. Due to its geographical position, this territory was a hotspot of changes: communities with diverse backgrounds – the late Roman population and the manifold newly arrived groups of people – created here a fusion of cultures, lifestyles, social models, and probably languages. In the last decade, a growing number of studies have used bioarchaeological tools to better understand the population histories and mobilities in the addressed period. Genetic data has informed about the heterogeneity of populations, multi-isotope analyses have shed light on mobility, migration, and diet, and physical anthropology has provided clues about general health and lifestyles. However, key aspects of the question – how these heterogeneous, probably multi-lingual people, who practised diverse lifestyles formed communities? – have remained unrevealed. The reconstructed diet profiles indicated diverse strategies containing elements of both pastoral and sedentary lifestyles. This paper argues that the processes of community formation – the survival strategies, lifestyles, and social organisation – of these heterogeneous communities cannot be understood without the careful examination of contemporary settlements and their natural environments. The choices of settling places, the use of local resources, the layouts of settlements, the organisation of productive tasks, the crop and animal husbandry strategies, and storage systems are crucial elements of the formation, survival, and ultimately success of a community. Aiming for a deeper understanding of the diversity in the period, this paper proposes a pilot methodological framework, which integrates various disciplines – bioarchaeological evidence on population history, general health, and diet, archaeological data on settlements and cemeteries, environmental data, and historical information – and demonstrates their application through various case studies from the early medieval Carpathian Basin and beyond.

Keywords

early medieval Europe, diversity, community formation, social structures, lifestyles, interdisciplinary approach

Note/comment

YOU EAT WHAT YOU HAVE - SOCIAL DIFFERENCE AND FOOD CONSUMPTION IN AN EARLY MEDIEVAL COMMUNITY

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In the Carpathian Basin during the early Medieval period, i.e. between the 5th and the 9th centuries CE, many graves contained various remains generally described as food offerings, such as animal bones or different types of vessels including pottery, glass or even wooden containers. While they are clearly part of the grave inventory, their purpose is often largely unexplained or they are vaguely interpreted as sacrifices, leftovers from funerary feasts or offerings necessary in the afterlife. Nevertheless, access to good quality food, especially animal protein could be a similar indicator of social status, as certain artifact types, such as weapons or jewellery. But how did the people decide which member of a community should be buried with food offerings? Did it only depend on the social and/or economic standing of the individual or their family, or did personal preference also come into play? Did individuals buried with animal remains consume more meat than those buried without?

We address these questions with the help of the fine-scale analysis of the 6th-century cemetery at Szeleste, Hungary. We combine archaeological and osteological data and results of carbon and nitrogen stable isotope analysis to see whether there is a difference in nutrition among different socially identifiable groups (age, gender, economic or social status, etc.) in a community, where different types of food offerings are much more common - circa half of the graves contained animal remains or vessels - than in case of other contemporaneous sites.

Keywords

early Medieval period, funerary customs, stable isotopes, nutrition, social structure

Note/comment

POPULATION HISTORY OF EARLY MEDIEVAL UKRAINE

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Ancient DNA research indicates that, to a first order of approximation, the genomes of present-day Europeans comprise ancestries of three major groups of people: 1) indigenous Mesolithic hunter-gatherers; 2) Near Eastern early farmers; 3) Steppe pastoralists. However, the detailed genetic history of any given area is always much more complex, calling for more focused and local-scale studies. One such interesting but so far understudied region is modern-day Ukraine which borders with Central European Poland, Slovakia and Hungary to the west while Southern Ukraine is part of the vast Eurasian Steppe. As such, the area has been in the path of several migrating groups, including Yamnaya Steppe pastoralists, mixed-origin Cimmerians and Scythians, Gothic Chernyakhov people, Iranian Alans, Golden Horde Mongols, Turkic Nogais, Slavic Cossacks.

Here we present novel genome-wide shotgun sequencing data from 9 individuals associated with the Alan group of the Early Medieval Saltovo-Mayaki Culture, 11 individuals associated with the preceding Chernyakhov Culture and 4 and 7 individuals, respectively, from the succeeding Golden Horde and Nogai periods. Most of the genomes – 23 out of 31 – have been sequenced to an average coverage of around 1x. The ancestry compositions of the individuals are characterised in the context of modern and ancient samples, and interpreted in the context of archaeological and historical information.

Keywords

population history, migration, ancient DNA, Ukraine

Note/comment