

A CROSSROADS BETWEEN THE CONTINENTS - INTERDISCIPLINARY APPROACHES TO INTERCONNECTEDNESS IN THE ANCIENT MEDITERRANEAN

Theme: 4. Globalisation and archaeology

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Keywords: Interdisciplinary Approaches, Mediterranean, Connectivity, Bioarchaeology, Demography, Mobility

Since the first transition of hominins out of Africa, the Mediterranean – with its unique landscape and central position – has served as a pathway between Africa, Asia and Europe. It saw the rise and collapse of vast interaction networks, and has been (and still is) mediating the movement of people, and along with them the exchange of objects, technology and cultural practices. These human interactions took place at different temporal and spatial scales that can be traced by an ever-growing array of methods that in turn require increased integration and communication between disciplines.

The inquiry into Mediterranean interconnectedness is not answered with the mere description of interactions, but encompasses questions about both their catalysts and effects, such as the roles of health – especially technological innovations, social organization, the spread of diseases and pandemics, and climate.

We welcome contributions that use inter- and cross-disciplinary approaches to study connectivity between the regions surrounding the Mediterranean during the main periods of what could be termed "ancient globalization" in the 2nd millennium BC to the 1st millennium AD: from the emergence of regional kingdoms and first territorial entities with their "international relations" in the Middle and Late Bronze Age, until the intensified mobility and cultural entanglement associated with the trade networks, colonies and imperialist expansions of the Greek, Phoenician and Roman cultures. Such approaches may include, but are not limited to: stable isotope analysis, aDNA of humans, animals and pathogens, proteomics, material source analysis, network analysis, and statistical modelling. In this session, we aim to gather a broad scope of methodological approaches and research questions into the individual and large-scale movements seen in the ancient Mediterranean, their causes and demographic effects, and what this can potentially reveal about the response of societies to demographic, political and environmental changes, as well as to catastrophes and crises.

Abstract book ISBN:

978-80-907270-8-3

Abstracts for session #511

Abstract #: 01

RETHINKING MEDITERRANEAN CONNECTEDNESS

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For many decades, the Mediterranean has been understood as a world of utmost connectedness through the ages with the sea, landscape and food linking societies. In the last decade, scientific approaches have not only underlined the extent of this connectedness, but also added complexity to our image of the past Mediterranean. Dimensions of human mobility and trade over large distances have become obvious as well as their inherent transformative dynamics. Now, Globalization Studies are forcing us to rethink connectedness and emphasize the duality of dis:connection which means that connection and disconnection always condition each other and that thinking about connection needs to take into account corresponding disconnections.

In my presentation, I will first provide an overview of recently published scientific datasets which have brought to light novel insights into the scales and diversity of mobility of humans and goods in the Bronze Age Eastern Mediterranean. I will then take this as a basis to conceptualize dis:connection and appropriate the related field of debate in Globalization Studies for archaeological thinking. Finally, I will rethink current interpretations of scientific dataset within a framework of dis:connectedness.

Keywords

Bronze Age, Mediterranean, Bioarchaeology, Globalization, Connectedness, Mobility

Note/comment

Abstract #: 02

THE HONEY BEE, HER LIQUID GOLD, AND HER SIGNIFICANCE IN THE MEDITERRANEAN

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Honey, as the primary sweetening agent of the ancient Mediterranean world before the introduction of cane sugar, was recognized as a vital commodity among the Egyptians, Greeks, and Romans alike. Some scholars even claim that honey was as important and prevalent in trade as wheat, oil, and wine. The ancient sources, especially the Roman authors Virgil, Pliny the Elder, Columella, and Cato expend many pages to record the characteristics of bees, the craft of beekeeping, and the myriad of uses for honey and beeswax. Beekeeping was enough of a common practice to afford this attention and yet there is little current scholarship regarding the actual trade and distribution of bee products between regions and kingdoms in a cross-Mediterranean exchange. Both the literary and archaeological evidence help to map a vast network of honey and wax exchange, including the insatiable demands of Middle Kingdom Egypt, Bronze Age Israel, classical Greece, and the Roman Empire's. Evidenced by honey's status as a medicinal remedy, votive offering with divine connections, and a display of wealth, it is readily apparent why this liquid gold and beeswax were in such high demand throughout the Mediterranean.

This research combines several lines of evidence: literary sources, archaeological sites, reverse engineering techniques, biological characteristics of honey bees, in addition to ceramic and lipid analyses to determine how lucrative the ancient honey and beeswax industry could be. In considering sites that preserved beehives in a fire, it is possible to determine a hive's productivity and total yields of beeswax and honey for trade.

This project considers questions regarding the uses of honey bee products, their social and economic significance, potential shipping containers, how much wax is needed for lost-wax casting of certain bronze objects, and product trade estimates across the Mediterranean.

Keywords

honey bees, honey, beeswax, lost-wax casting, cross-Mediterranean trade

Note/comment

INSIGHTS INTO ADMIXTURE HISTORY AND SOCIAL PRACTICES IN THE PREHISTORIC AEGEAN FROM ANCIENT DNA

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European genetic history went through major transformations during the Neolithic and Bronze Age. Despite the significance of the Aegean for European prehistory, preservation challenges have hindered a comprehensive understanding of human mobility and population dynamics in this region through time. In this paper, we present insights from ancient DNA (genome-wide) analyses on Early Neolithic and Bronze Age individuals from Mainland Greece, Crete and the Aegean islands. Our results indicate multi-phased genetic shifts in the Aegean populations since the early Neolithic that can be traced to populations related to Anatolia and then, during the Late Bronze Age, to Central-Eastern Europe. Besides the long-lasting biological connections with these adjacent regions, we also found that Bronze Age Aegeans exhibited endogamy in high frequencies so far unobserved in the rest of the ancient West Eurasia. These close-kin marital practices, likely equivalent to first-cousins unions, were substantially higher in Crete and other Aegean islands than in Mainland Greece. Our study highlights the potential of novel biomolecular methods to unravel the interplay of genetic admixture and cultural entanglements in the Aegean and beyond.

Keywords

ancient DNA, Aegean prehistory, marital practices, human mobility

Note/comment

The following people contributed or treated in a dedicated ancient-DNA lab the archaeological material mentioned in the presentation: Anagnostis Agelarakis, Philip Betancourt, Birgitta Hallager, Olivia A. Jones, Olga Kakavogianni, Athanasia Kanta, Robert Koehl, Joseph Maran, Tina McGeorge, Anastasia Papathanasiou, Lena Papazoglou-Manioudaki, Kostas Paschalidis, Eleanna Prevedorou, Gypsy Price, Eftychia Protopapadaki, Michael Schultz, Naya Sgouritsa-Polychronakou, Kim Shelton, Maria Vlazaki, Raffaella Bianco, Marta Burri, Căcilia Freund, Anja Futwängler, Florian Knolle, Nuno Felipe Gomes Martins, Gunnar Neumann, Anthi Tiliakou.

MOBILITY AND MIGRATION AT THE END OF THE BRONZE AGE IN THE SOUTHERN LEVANT

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Living in 'an age of migration' has significantly affected how archaeologists, scientists and social scientists view this very complex phenomenon. Most archaeologists who study prehistoric migrations still believe that the main stimulus behind such movements was human agency, not climatic or environmental change. In fact, human migrations have multiple, complex and often historically specific causes, but archaeological explanations tend to be monothetic. This paper looks critically at migration scenarios proposed for the end of the Bronze Age in the southern Levant. After presenting a brief but critical examination of current archaeological views on the so-called Philistine migration around 1200 BC, I consider the current state of evidence from palaeogenetics (aDNA) and strontium isotope analyses related to this phenomenon. Although such analyses have enabled us to ask — but all too seldom to answer — questions that would never even have been raised a decade ago, in the case of the 'Philistine migration' most studies published to date have been inconclusive and are inadequately invested in the wider archaeological, social science and palaeogenetic literature. The conclusion attempts to look anew at this enigmatic period of mobility and connectivity, of transformation and social change, alongside the hybridised practices of social actors old and new.

Keywords

migration, southern Levant, palaeogenetics, mobility

Note/comment

INVESTIGATING DIETARY PATTERNS IN MEDITERRANEAN LATE ANTIQUITY THROUGH A BAYESIAN META-ANALYSIS OF HUMAN ISOTOPIC DATA

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The main subject of our research was the interplay between subsistence practices, cultural traditions and population movements within the Mediterranean region of the Roman Empire during Late Antiquity. We employed a meta-analysis of a large collection of bioarchaeological data to determine the extent to which migrating populations impacted local food traditions and subsistence practices.

Our main data sources were the IsoArch and CIMA stable isotope databases that assembled human isotopic data from the Roman and Medieval periods, respectively. Both IsoArch and CIMA are part of the IsoMemo initiative that brings together a network of isotopic databases. This initiative, based at the Max Planck Institute - Science of Human History includes also access to modelling tools to model spatio-temporal archaeological and historical phenomena. We employed the modelling of human isotopic data to visualise spatio-temporal shifts in the diet of late Roman populations and to determine the relationship between dietary shifts, population movements and political crisis. We adopted a transdisciplinary approach in which the modelling of isotopic data was combined with archaeological data to better characterize dietary shifts and their causes.

Results revealed significant changes in dietary habits of populations residing within locations associated with the Western Roman Empire (e.g. Portugal, Spain, Italy, Tunisia), whereas these were mostly absent in the Eastern Roman Empire (e.g. southern Balkans, Greece, Palestina). However, there was an overall decrease in marine protein consumption in Mediterranean areas. Results also reveal that Longobards migrating from Pannonia into northern Italy maintained dietary traditions that were based on the consumption of large amounts of millet and/or sorghum.

Our results show clear links between dietary traditions in Mediterranean populations and major changes in political systems and broad migratory movements.

Keywords

Late Antiquity, Stable Carbon and Nitrogen Isotope Analysis, Bayesian Modelling, Human Diet, Bioarchaeology, Mediterranean Archaeology

Note/comment

THE PUNIC MEDITERRANEAN - A NEW ANCIENT DNA PERSPECTIVE

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Towards the end of the 6th century BCE, the former colony Carthage in present-day Tunisia emerged as a hegemonial power in the Western Mediterranean. While keeping the Phoenician language as well as many aspects of cultural practices, a new set of "Punic" customs spread rapidly from the Northwest African coast throughout the Western Mediterranean, including coastal sites in Iberia, Ibiza, Sicily and Sardinia. In this study we produced novel ancient DNA evidence from human remains buried in Western Mediterranean Punic necropoli. So far, ancient DNA data from Punic sites has been sporadic, and here we generated genome-wide ancient DNA as well as new Radio Carbon dates to fill this gap. Together, this new data allowed us to probe whether cultural links to North Africa are also accompanied by North African genetic ancestry. Moreover, we studied putative genetic connections to the Levant and Aegan. Finally, we investigated the complex interaction with local populations.

Keywords

Punics, Carthaginians, Ancient DNA, Population Genetics

Note/comment

Abstract #: 07

EXPLORING THE GENETIC DIVERSITY OF MAGNA GRAECIA - THE CASE OF CAMPANIA

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Starting in the 8th century BCE, coastal Campania in Southern Italy became a melting pot of various cultures and peoples when Etruscan and Greek colonizers joined local Italic tribes. By establishing cities and trade posts, the contact networks of Campania were further expanded across the Mediterranean and inland.

We generated ancient genomes from Campania, spanning the 8th to 3rd century BCE, i.e. the Orientalizing, Archaic and Hellenistic-Roman period in this region. While most individuals can be attributed to a genetic ancestry that arose on the Italian mainland, we also discover descendants of migrants from the Aegean and Eastern Mediterranean. Most notably, an individual dated to the 8th century at the first Greek settlement, Pithekoussai, a site that also yielded the earliest example of writing in the Euboean alphabet, was genetically of Aegean origin, and we find that this type of ancestry persisted at the site for several centuries. We compare the genetic composition of these descendants of Greek settlers to the local Campanians represented by individuals from the site San Marzano and Etruscan immigrants from Pontecagnano.

We integrate a thorough analysis of the associated material culture and, where available, strontium isotopes to establish temporal and cultural patterns of mobility, ancestry and admixture that shaped the genetic landscape of Campanian Magna Graecia.

Keywords

mobility, Magna Graecia, ancient DNA, migration, bioarchaeology

Note/comment

GLOBALIZING SCENTS AND SPICES. EXCHANGE OF AROMATIC PLANTS ALONG THE INCENSE TRADE ROUTE

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Some of the most highly desired natural products that moved along ancient trade routes were not substantive, calorie-laden foods, but aromatics, powders and extracts that nonetheless packed substantial flavor and aroma. Not only did these substances possess the ability to transform cuisines or to perfume people and their environment, they also played significant roles in economic, cultural, and ritual contexts. Control over and access to these trade goods became the source of great wealth and political power. Thus, to understand the dispersal of goods and early forms of globalizations, it is key to identify the origins and use of these aromatic substances. Traditionally, it has been difficult to study them in the archaeological record due to their ephemeral nature. Moreover, macroremains of spices or plant exudates are scarce in archaeobotanical assemblages in contrast to more tangible remains such as seeds and fruits. However, recent advances in biomolecular analyses of organic residues in artefacts make it possible to also trace the “invisible” commodities of trade.

Here, we present the study of organic remains from objects associated with the use of aromatic substances, such as incense burners, perfume flasks and unguent containers, alongside the Arabian incense road and at destinations in ancient Egypt in the 1st millennium BCE using biomolecular fingerprinting of plant secondary metabolites, lipids and proteins. Our study provides a unique insight into the sensual world of the past by shedding light on the consumption practices of aromatics.

Keywords

organic residue analysis, aromatic plants, dispersal of goods, early globalization, archaeology of the senses

Note/comment

INSIGHTS INTO ANCIENT EGYPTIAN GENOMES IN THE FIRST MILLENNIUM BC

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Egypt provides a privileged location to study historical population dynamics as it is at the crossroads between the ancient civilizations in Africa, Asia, and Europe. In the first millennium BC, ancient Egypt witnessed foreign domination by the neighboring populations including Libyans, Nubians, Assyrians, Greeks, Romans, and others, whose roles vary from trade exchange to invasion and rule. Despite being potential to addressing questions on the population's demographic, retrieval of ancient DNA from the Egyptian mummies has greatly been challenged by the presence of contamination. Here we report a preliminary, rigorously tested genome-wide dataset from mummies using high-throughput DNA sequencing and targeted capture techniques. The individuals in our study are recovered from Upper and Lower Egypt sites and spanning around 900 years of ancient Egyptian history, from the Third Intermediate to the Roman period. Our study aims to characterize the major ancestry components for ancient Egyptians and to explore the genetic continuation and admixture through times and regions.

Keywords

Egyptian Mummies, Ancient DNA, Population Genomics

Note/comment

CONNECTING PLACES: THE MATERIAL QUALITY AND PROVENANCE OF ANCIENT PIGMENTS

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Cinnabar (α -HgS, mercury sulfide) forms a bright red pigment when powdered, was expensive and likely widely traded within the Roman Empire. The provenance of raw materials and the use of pigments can reveal how ancient societies were interconnected. Through a combination of pigment surface- and cross section analysis, as well as trace element analysis, we evaluate pigment preparation, raw material quality and provenance of 29 wall painting fragments from Roman Ephesus (western Turkey). Samples were collected from several rooms and living units of Terrace House 2 and Terrace House 1. They were analyzed using optical microscopy and SEM-EDS on cross sections; additionally, surface topography was studied by SEM-EDS. Elemental analyses (by portable XRF and ICP-MS) hint at a preference for combining cinnabar with Fe-rich pigments (earth pigments) rather than with Pb-rich pigments (minium, red lead), which was also confirmed by SEM-EDS analysis. While ochre was often used as an underpainting layer, EDS measurements exclude the prevalence of pigments other than cinnabar on the top layers. Likewise, EDS was unable to determine statistically relevant variation in the stoichiometry of the cinnabar pigment grains. Optical and scanning electron microscopy revealed that there is significant variation in both pigment morphology and surface distribution. These observations suggest that chromatic variation of the final paint layer is likely due to differences in production and application of the cinnabar paint from a single mineral source. Lead isotope analysis of these samples also hints at the use of cinnabar from a similar source (age, location) and/or consistent mixing of cinnabar from similar sources. This work on the use, quality and provenance of archaeological pigments contributes to reconstructing economic networks that existed between Roman provinces.

Keywords

Ancient polychromy, Pigment morphology and chemical composition, Trade in pigments

Note/comment

ANCESTRAL ORIGINS AT THE ROMAN DANUBIAN LIMES

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At its peak, the Roman Empire united all Mediterranean shores under the same rule and law. This, together with great improvements in long-distance communications, brought human mobility across the Mediterranean to an unprecedented scale. From all the areas which were under Roman control, the Balkans is a particularly interesting region as it was the midpoint connecting the Western and the Eastern parts of the Empire; and several peoples groups moved through the region during the Great Migration Period, such as Goths, Huns or Slavs. In this project, we have extracted and analyzed aDNA from ancient Roman and post-Roman individuals (n=69) from 3 settlements located in present-day Serbia: most importantly the capital of Moesia Superior Roman province, Viminacium. Genetic and Radiocarbon dating analyses results point to a high degree of cosmopolitanism in Viminacium during the early imperial period. We observe two major groups of individuals: one with a local ancestral signature likely deriving from Balkan Bronze and Iron Age populations, and other with Near Eastern ancestral origin, suggesting strong population movements from the Eastern parts of Empire impacting not only Rome, but also other major cities like Viminacium. Moreover, we detect remarkable cases of human mobility across the Saharan and the Mediterranean, such as a young male, whose ancestral origins lie in Eastern Africa. These results highlight how dense samplings at specific sites can provide a detailed view on both individual and large-scale human mobility patterns.

Keywords

Roman Empire, cosmopolitanism, Migration, Great Migration period, Genomic analysis, ancient DNA

Note/comment

FIRST-MILLENNIUM CE PLANT AND ANIMAL EXCHANGE VIA ARCHAEOBOTANY IN COLLABORATION WITH OTHER DISCIPLINES: A MULTI-SCALAR VIEW FROM THE NEGEV HIGHLANDS

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This paper presents three test-cases in which archaeobotanical data deriving from trash middens of 1st-millennium CE Negev Highland sites were integrated with other sources of evidence to track individual and large-scale movement of plants and animals. Although based on the same archaeological contexts, these studies span different temporal and geographic ranges, from millennial-scale Eurasian crop diffusion to micro-regional grazing patterns of individual sheep and goats. First, qualitative changes in crop baskets attest to long-term diffusion, pushing back to Umayyad times introduction of aubergine (an east Asian domesticate) in the Levant, and supporting the Islamic Green Revolution thesis. Yet the plant remains suggest an even greater role for Roman agricultural diffusion, which appears to be a peak period of post-Neolithic, pre-modern crop diffusion in southwest Asia. Second, quantitative changes in key crops attest to the rise and fall of commercial viticulture in the Negev Highlands, centered on the mid-6th century CE, in tandem with ceramic evidence for changing involvement in Mediterranean trade. These results exemplify a globalizing ancient economy's vulnerability to external shocks like plague and climate change. Finally, a multi-proxy archaeobotanical study analyzed seed/fruit remains, phytoliths and pollen within individual sheep/goat dung pellets to identify grazing season and range. This has potentially profound implications for future research on agropastoral regimes, including aspects of seasonality and mobility. Methodologically, these studies exemplify integration of archaeobotanical evidence with textual, ceramic, and geoarchaeological data, respectively. Together, they offer a more holistic, multi-dimensional view of human-plant interaction from the vantage point of a particular microregion, with relevance to much broader scale movements of plants and animals across the Mediterranean and beyond.

Keywords

Mediterranean exchange, plant and animal mobility, archaeobotany, multi-proxy method, Negev Highland, Late Antiquity

Note/comment

This presentation is based on my published and unpublished PhD research, particularly the three studies referenced below which will serve as test-cases for a bird's eye view of Negev Highland plant and animal mobility and exchange based on archaeobotany in collaboration with other disciplines.

(1) Fuks et al. In prep. "Islamic Green Revolution (IGR) or Roman Agricultural Diffusion (RAD)? Archaeobotanical evidence for local foodways and global crop diffusion from the Late Antique Negev Highlands".

(2) Fuks et al. 2020, "The rise and fall of viticulture in the Negev Highlands during Late Antiquity: An economic reconstruction from quantitative archaeobotanical and ceramic data", *PNAS*, 117 (33).

(3) Fuks, D. and Dunseth, Z. 2021, "Dung in the dumps: what we can learn from multi-proxy archaeobotanical study of herbivore dung pellets", *Vegetation History and Archaeobotany*, 30.

THE FUTURE OF MEDITERRANEAN CONNECTEDNESS STUDIES

Tamar Hodos¹

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This presentation outlines future dialogues and future questions pertaining to ancient Mediterranean connectedness as inspired by the papers presented in this panel. Following Stockhammer's conceptualization of dis:connection, it begins with an assessment of emerging evidence for the balance between connection and dis:connection as highlighted in the panel's featured case studies.

These focus on two primary areas of evidence: biological data and commodities. Thus, this paper compares emerging biological data for various migrations around the ancient world, extending from the Neolithic and Bronze Age Aegean to the Bronze and Iron Age Levant and Egypt, as well as first millennium BCE Campania and among western Mediterranean Punic communities, and finally Roman Moesia Superior. It also assesses the mobility of specific organic commodities, such as incense, honey, and the pigment cinnabar, and considers the role commodities and diet play in our understanding of migration and socio-cultural and political developments, particularly in the Roman and post-Roman worlds.

Using these case studies, this paper then reflects upon our past interpretations of complex connectivity in these eras. Finally, it considers future avenues of cross-discipline analysis to more fully identify and understand the complex connections between people in the ancient Mediterranean.

Keywords

Connectivity, Mediterranean Bronze Age, Mediterranean Iron Age

Note/comment