



**XIth
International
Meeting**

7-9th June 2017

Nicosia, Cyprus

VENUE PROGRAM ABSTRACTS

Organising committee

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With the help of

Juwana Chahoud & Remi Berthon



ΤΜΗΜΑ ΑΡΧΑΙΟΤΗΤΩΝ ΚΥΠΡΟΥ
DEPARTMENT OF ANTIQUITIES CYPRUS



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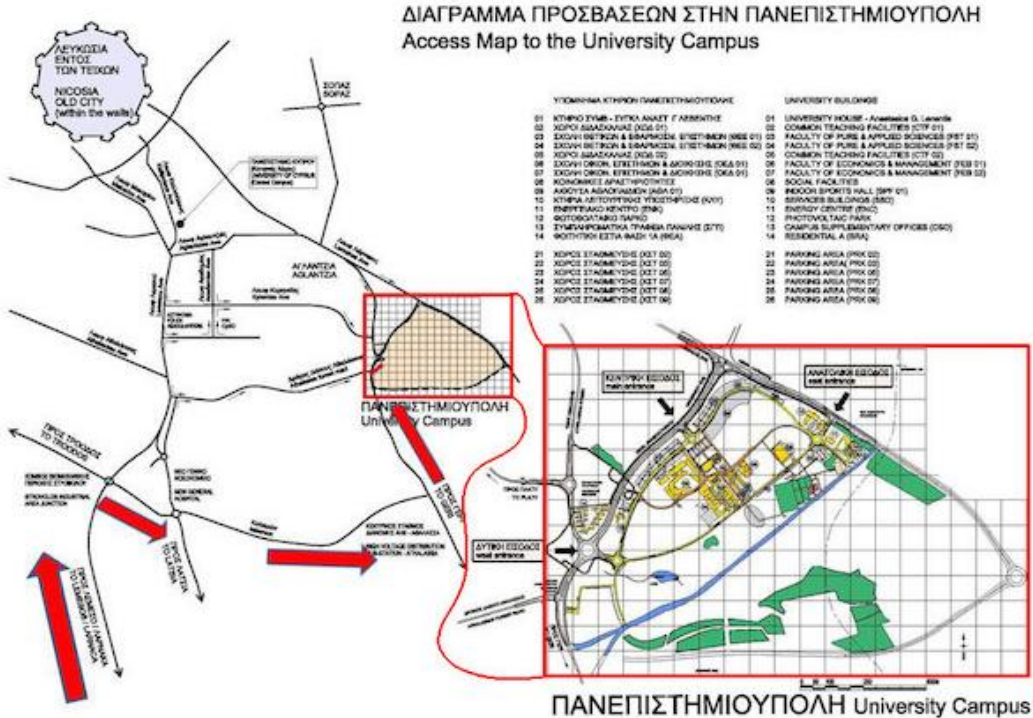
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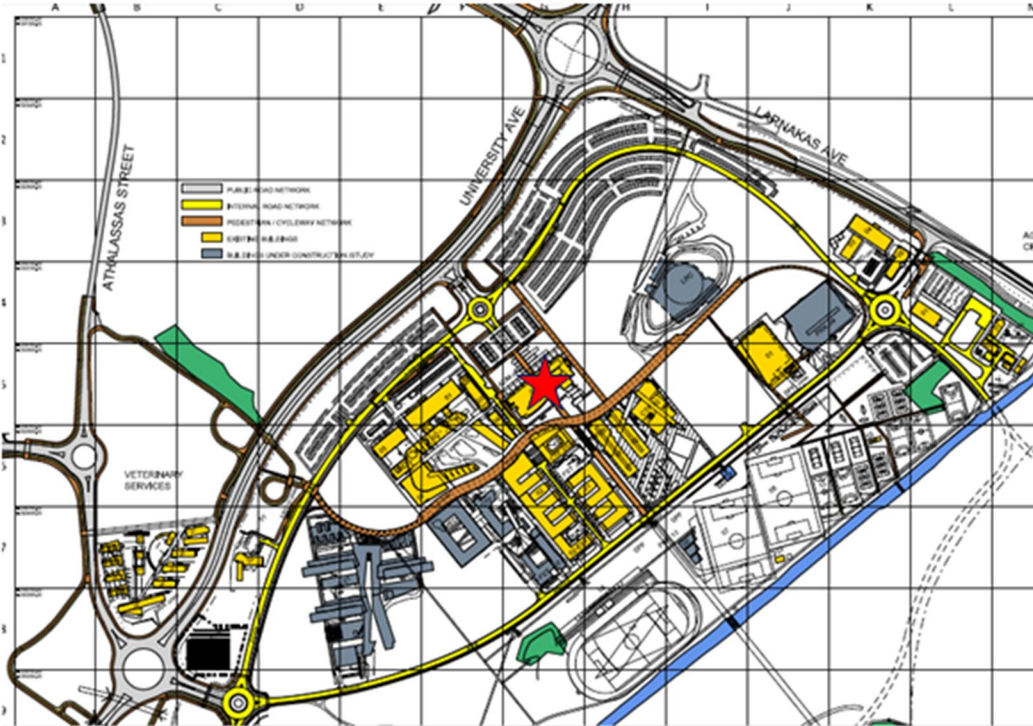
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VENUE

Location of the campus of the University of Cyprus



Map of the campus of the University of Cyprus: location of the Conference room
University House Anastasios G. Leventis ADM



ASWA - 13th International Meeting: Full Program

Tuesday 6th June

14:00-19:00 - Registration (Archaeological Research Unit 12 Gladstonos 1095 Nicosia)

Wednesday 7th June

8:30: Bus from the Centre to the Cyprus University new campus

09:00-09:45 - Registration (at the New University campus) and coffee

09:45-10:20 - Welcome addresses:

- Prof. Vasiliki Kassianidou, University of Cyprus
- Prof. Terry O'Connor, President of ICAZ
- Dr Marjan Mashkour, liaison ASWA Working group of ICAZ
- Dr Jean-Denis Vigne, practical information

10:20-10:50

- Dr Marina M. Solomidou-Ieronymidou, Department of Antiquities of Cyprus:
Presentation of the activities of the Department

Session 1: Humans and biodiversity (Chair: Joris Peters)

Oral presentations

10:50-11:10 - **Koolstra Franciscus**, Küchelmann Hans Christian & Çakırlar Canan
An ancient taboo? Marine turtle consumption in the Eastern Mediterranean

11:10-11:30 - **Cucchi Thomas**, Lior Weissbrod, Fiona Marshall, François Valla, Hamoudi Khalaily, Guy Bar-Oz, Jean-Christophe Auffray & Jean-Denis Vigne
Of mice and men in Southern Levant: new evidence for the role of the Natufian sedentism process in the origin of the house mouse

11:30-11:50 - **Papayiannis Katerina**, Régis Debruyne & Thomas Cucchi
Mousetrack: tracking the earliest evidence for the house mouse dispersal in Cyprus and Anatolia using geometric morphometrics analysis and aDNA

11:50-12:10 - **Vigne Jean-Denis**, Salvador Bailon, Isabelle Carrère, Paul Croft, Thomas Cucchi, Julie Daujat, Angelos Hadjikoumis & Antoine Zazzo
Evolution of the Cypriot vertebrate fauna during the Neolithic transition, 13th-9th millennia BP

12:10-12:25: Poster speed dating presentations

Daujat Julie

Establishing phenotypic variations in fallow deer: a geometric morphometric approach

Marjanyan Margarit Boris Gasparyan & Noushig Zarikian

The entomofauna of Cave Areni-1 (Vayots Dzor, Armenia)
Fried Tal, Lior Weissbrod, Yotam Tepper & Guy Bar-Oz
A snapshot of an ancient agricultural landscape in the Negev desert, based on remains of small mammals

- - **Lunch time** - -
(12:25 - 13:30)

Session 2: Domestication I (Chair: Guy Bar-Oz)

Oral presentations

13:30-13:50 - Hongo Hitomi & Saiji Arai

Domestication and spread of domestic animals in the Upper Tigris

13:50-14:10 - Stiner Mary, Kassi Bailey, Hilke Buitenhuis, Güneş Duru, Susan Mentzera, Natalie Munro, Joris Peters, Nadja Pöllath, Jay Quade, Georgia Tsartsidou & Mihriban Özbaşaran

The forager-herder trade off, from broad spectrum hunting to sheep management at Aşıklı Höyük, Turkey

14:10-14:30 - Alcántara Fors Roger, Josep Fortuny, Miquel Molist, Carles Tornero & Maria Saña Seguí

Assessing changes in mobility/activity patterns during first domestication and husbandry stages on archaeological samples of Capra: Tell Halula (Syria) as a case study

14:30-14:50 - Makarewicz Cheryl

The transition from hunting to herding in the Pre-Pottery Neolithic of southern Jordan

14:50-15:10 - Arai Saiji, Azad Zeynalov, Mansur Masurov, Farhad Guliyev & Yoshihiro Nishiaki

Faunal assemblages in the Mesolithic-Neolithic transition of the Southern Caucasus: a view from Damjili cave, West Azerbaijan

15:10-15:30 - Starkovich Britt, Simone Riehl, Alexander Weide, Mosen Zeidi & Nicholas Conard

Subsistence strategies at the Aceramic Neolithic site of Chogha Golan, Iran

- - **Coffee break** - -

Session 3: Domestication II (Chair : Hitomi Hongo)

Oral presentations

16:00-16:20 - Arbuckle Benjamin

Prehistoric horse exploitation on the central Anatolian plateau: assessing the hypothesis of local domestication

16:20-16:40 - Marom Nimrod, Yotam Tepper, Baruch Rosen & Guy Bar-Oz

A dovecot in the Negev: pigeon management in a marginal region of the Byzantine Empire

16:40-16-55: Poster speed dating presentations

Davoudi Hossein, Roya Khazaeli, Mohammed Hossein Azizi Kharanaghi & Marjan Mashkour

Domestication process in Southwest of Iran, the case of Tepe Rahmat Abad

Perry Gal Lee, Holly Miller, Ophélie Lebrasseur, Laurent Frantz, Greger Larson & Naomi Sykes

Our first chicken dish: factors for the integration and dispersal of chicken in/to the Greco-Roman diet

Zimmermann Michaela, Joris Peters & Nadja Pöllath

Pathological alterations of the humerus as a possible marker of early caprine management and domestication

Session 4: Strategies for animal exploitation from the Palaeolithic to the Neolithic

(Chair: Mary Stiner)

Oral presentations

16:55-17:15 - Yeshurun Reuven & Guy Bar-Oz

Ungulate skeletal element profiles: a possible marker for territorial contraction and sedentism in the Levantine Epipaleolithic

17:15-17:35 - Yeomans Lisa

Effects of environmental change, human mobility and hunting strategies on food procurement during the Natufian and PPNA in Eastern Jordan: the evidence from Shubayqa

17:35-17:55 - Beech Mark Marjan Mashkour, Antoine Zazzo, Gourgen Davtian, Abdulla Khalfan Al Kaabi, Terry O'Connor, Ahmed Abdulla Elhag Elfaki, William Hiigs, Sonia O'Connor, Keryne Debue, Ann Mortimer, Kirk Roberts, Adrian Parker & Ash Parton

Baynunah Camel site, a Neolithic kill-site in the Arabian Peninsula

17:55-18-05: Poster speed dating presentations

Vitezović Selena, John Gorcyk & Krum Bacvarov

Exploitation of animal resources in the Early Neolithic of Thrace: preliminary results from the site of Nova

Harutyunova Laura, Boris Gasparyan & Noushig Zarikian

Mollusks from the archaeological excavations of Areni-1 cave (Armenia)

To the French Institute

18:30: Bus from the new campus of the University of Cyprus to the French Institute (Strovolos Ave. 59)

19:15-20:30 - Plenary conference at the French Institute: *Early Neolithic Cyprus* by J.-D. Vigne

20:30-22:00 - Cocktail dinner offered by the French Institute at Cyprus
and visit of the exhibition of photographs, *Claude Lelouch cinema through
photographies*

22:00: Bus from the French Institute to the Centre of Nicosia

Thursday 8th June

8:30: Bus from the Centre to the new campus of the University of Cyprus

Session 5: Animal economy during the Chalcolithic and Bronze Age (Chair: Benjamin Arbuckle)

Oral presentations

09:00-09:20 - Eger Jana

*Stable isotope evidence for subsistence patterns at prehistoric Monjukli Depe,
South Turkmenistan*

09:20-09:40 - Hourani Yasha, Hadi Choueri & Assaad Seif

Faunal remains from the Chalcolithic levels of RML 79 (Beirut, Lebanon)

09:40-10:00 - Crabtree Pam

Animal Bones from the Early Bronze Age Site of Shengavit, Yerevan, Armenia

**10:00-10:20 - De Cupere Bea, Elena Mrinova, Delphine Frémondeau, Plamen Goergiev,
Lazar Ninov, Ivanka Christova, Kassimir Nikov, Christo Popov**

*Subsistence economy and land use during the Late Bronze Age and Iron Age in
south-eastern Bulgaria*

10:20-11:05: Poster speed dating presentations

Crabtree Pam & Douglas Campana

*Faunal remains and worked bone objects from the Chalcolithic levels at Tepecik-
Çiftlik, Southern Cappadocia, Turkey*

Emra Stephanie & Galik Alfred

*The archaeozoology of household activities from the Early Bronze Age site of
Çukuriçi Höyük in western Anatolia*

Greenfield Haskel, Tina Greenfield, Itzick Shai & Aren Maeir

*Production, consumption and disposal - a consideration of spatial variation in
faunal distributions at Early Bronze III Tell es-Safi/Gath, Israel*

Hadjikoumis Angelos

*Emergence of complexity in Neolithic-Early Bronze Age in Greece: new
zooarchaeological evidence*

Maini Elena, Antonio Curci & Nicolò Marchetti

Animal economy at Karkemish from the Middle Bronze to the Iron Age

Rufolo Scott

Exploring Ubaid-Period agriculture in Northern Mesopotamia: the fifth-millennium BC animal remains from Tell Ziyadeh, Syria

Kamjan Safoora

The birth of the private household economy in Aegean Anatolia: spatial analysis of zooarchaeological remains at the later Neolithic site of Ulucak Höyük

Slim Francesca & Canan Çakırlar

Investigating the animal economy of Kaymakçı, a regional center of the Late Bronze Age, in Western Turkey

Strolin Laura

The terrestrial fauna of Early Iron Age Salut (Oman)

- - **Coffee break** - -

Session 6 (1/2): Animal economy during the historical times (Chair: Marjan Mashkour)

Oral presentations

11:35-11:55 - Çakırlar Canan & Marston John

Provisioning and agricultural economy at Roman Gordion: integrating archaeobotany and zooarchaeology

11:55-12:15 - Vila Emmanuelle, Lionel Gourichon, Jwana Chahoud & Moussab Albesso

Impact of geographical position, political influences and trade activities on animal economy in the Early Islamic periods in Syria and Lebanon

12:15-12:35 - Bangsgaard Pernille

Caprines, dromedaries and parrotfish, archaeozoology from an early Islamic trade center

- - **Lunch time** - -

(12:15 - 14:00)

Session 6 (2/2): Animal economy during the historical times (Chair: Canan Çakırlar)

Oral presentation

14:00-14:20 - Hamdeen Hamad Mohamed & Tahir Yahia Fald

Animals remains from Christian complex of El Hamra in El Ga'ab depression, west Dongola (Sudan)

14:20-14:45: Poster speed dating presentations

Khazaeli Roya, Marjan Mashkour, Homa Fathi, Safoora Komijani, Hossein Davoudi, Azadeh Mohaseb & Hayedeh Laleh

A review of recent archaeozoological investigations from the Islamic period in Iran

Lehnig Sina

Stopover on the incense route. What faunal remains can tell about diet, daily life and economy in the Nabataean town Elusa

Serrone Eleonora, Simone Mantellini, Elena Maini & Antonio Curci

Animal exploitation in the Samarkand Oasis (Uzbekistan) at the time of the Arab conquest: zooarchaeological evidence from the excavation at Kafir Kala

Van Neer Wim, Achilles Gautier, Ernie Haerinck, Wim Wouters & Eva Kaptijn

The exploitation of terrestrial and aquatic animals at ed-Dur (Umm al-Qaiwain, United Arab Emirates)

Session 7: Animal, bones and archaeology: theories and methods (Chair: Julie Daujat)

14:40-15:25: Poster speed dating presentations

Bar-Oz GuyB, Avshalom Karasik, Nimrod Marom

Printable comparative collections: short- and long-term potentials

Beller Jeremy, Haskel Greenfield & Thomas Levy

Butchering technology during the Early Bronze Age I: an examination of microscopic cut marks on animal bones from Nahal Tillah, Israel

Böhm Herbert

Zooarchaeological insights into non-elite funeral customs of the early dynastic/early Old Kingdom inhabitants of Memphis, Egypt

Brown Annie, Haskel Greenfield & Aren Maeir

Sweating the small stuff: heavy fraction collection and analysis from EB Tell es-Safi/Gath

Kunst Günter Karl & Herbert Böhm

Bad contexts, nice bones - and vice versa? Reflexions on depositional processes around the monumental building of Oymaağaç Höyük

Orbach Meir

Manot Cave (Western Galilee, Israel) as a late Pleistocene hyena den: new evidence from Area D

Pöllath Nadja, Sevag Kevork, Ricardo García González, Mihriban Özbaşaran, Ursula Mutze & Joris Peters

Ageing lambs - non-linear prediction models for estimating age from breadth measurements

Spiciarich Abra, Oded Lipschits, Israel Finkelstein & Lidar Sapir-Hen

Identifying dietary customs in zooarchaeology: Kashrut as a case study

Vitezović Selena & Ivan Vranić

Bone artefacts from Kale-Krševica: a Late Classical and Early Hellenistic period 'Hellenised' site in south-eastern Serbia

- - **Coffee break** - -

16:00-17:15 - Poster session

17:30: Bus from the new campus of the University of Cyprus to the Centre of Nicosia

- - Free time - -

20:00 - Gala dinner (Mezostrati Tavern, 18E Evagorou Avenue)

Friday 9th June

08:00-09:30 - Free visit of the Cyprus Museum (after a short presentation by Dr. Despo Pilides, Cyprus dept. of Antiquities)

9:45: Bus from the Cyprus Museum to the new campus of the University of Cyprus

Going to the University of Cyprus new campus

Session 8 - Animal management and husbandry (Chair: Haskel Greenfield)

Oral presentations

10:15-10:35 - Meiggs David, Benjamin Arbuckle & Aliye Öztan

Origins of land tenure? Integrating isotopic evidence from caprines and equids at Chalcolithic Köşk Höyük, Central Anatolia

10:35-10:55 - Hadjikoumis Angelos, Jean-Denis Vigne & Marie Balasse

Summer loving means births in autumn and winter: sheep and goat seasonality of birth in recent and Neolithic Cyprus

10:55-11:15 - Amiribeirami Sarieh & Marjan Mashkour

Mobile and sedentary pastoralism in Central Zagros from the Neolithic to the Iron Age, Iran. The contribution of new archaeozoological data

11:15-11:35 - Price Max

Pigs in between: pig husbandry in the Late Neolithic in Northern Mesopotamia

Session 9 - Symbolic use of animals during the Neolithic and Bronze Age

(Chair: Emmanuelle Vila)

Oral presentations

11:35-11:55 - Walter Sebastian & Norbert Benecke

Hatching bees - identification and possible meanings of insect figures at Göbekli Tepe

11:55-12:15 - Metzger Mary, Patricia Fall & Steven Falconer

Households, feasting, and community at a Middle Bronze village on Cyprus

12:15-12:35 - Turgeman-Yaffe Zohar, Guy Bar-Oz, Karen Covello-Paran & Yotam Tepper

The living and the dead: zooarchaeological comparison between domestic and mortuary faunal assemblages in a Middle Bronze Age village in Northern Israel

12:35-12:55 - Ikram Salima & Megan Spitzer

The cult of Horus and Thoth: a study of Egyptian animal cults in Theban Tomb 11, 12 and 66

12:55-13:00: Poster speed dating presentation

Pawłowska Kamilla

Small carnivores from a Late Neolithic burial chamber at Çatalhöyük, Turkey:
pelts, rituals, and rodents

- - **Lunch time** - -

(12:25 - 13:30)

Session 10 - Symbolic and funeral practices during the historical times

(Chair: Angelos Hadjikoumis)

Oral presentations

14:30-14:50 - Bouchnick Ram

Ethnicity and social stratification: information from Late Second Temple Period
assemblages

14:50-15:10 - Galik Alfred, Michael Kerschner, Janina Janssen & Gerhard

Forstenpointer

Cockles and oysters witness ritual ceremonies in the Artemis Cithone sanctuary
on the Kalabaktepe near Miletus

15:10-15:30 - Mutze Ursula, Cornelius Pilgrim, Wolfgang Müller & Joris Peters

Old dentitions and young post-crania: sheep burials in the Ptolemaic-Early Roman
animal necropolis at Syene/Upper Egypt

15:30-15:50 - Bartoziewicz László & Gábor Kalla

Interpreting AD 6th century Byzantine bird representations from the monastery of Tall
Bī'a, Northern Syria

15:50-16:00: Poster speed dating presentation

Chahoud Jwana, Khaldoun Rajab, Hanna Fakhry & George Abi Diwan

Roman horse burials in Beirut

- - **Coffee break** - -

16:20-17:00 - General discussion & next ASWA conference

17:20: Bus from the new campus of the University of Cyprus to the Centre of Nicosia

Saturday 10th June: Excursion

08:00: Departure from Nicosia Centre (Bus)

08:00-9:00: Travel from Nicosia to Amathus

09:00-10:45: ~ Guided visit of the site of Amathus (1,100 BC - 654 AD)

by Yiannis Violaris (Cyprus Department of Antiquities),

~ Ongoing excavations, by Ludovic Thély, École Française d'Athènes

~ Comments on the landscape around Amathus and on the location of the Pre-Pottery Neolithic site of Klimonas

by Jean-Denis Vigne, CNRS-MNHN



10:45-11:30: Travel from Amathus to the Limassol Museum

11:30-12:45: Guided visit of the Limassol Museum, Akotiri pigmy hippos and the new exhibition about Amathus (with information about Klimonas and Shillourokampos), by Yiannis Violaris, Dept of Antiquities of Cyprus

12:45-13:15: Journey from Limassol to Kourion beach

13:15-16:30: Kourion - lunch on the beach, swimming, free visit of the archaeological site (Classical antiquity, Middle Ages)

16:30-17:30: Travel from Kourion to Khirokitia

17:15-19:30: Guided visit of the Neolithic village of Khirokitia (7th millennium BC) and of the new environmental path, by Jean-Denis Vigne, CNRS-MNHN

19:30-20:30: Travel back to Nicosia, via Larnaca (drop-off at Larnaca airport)

Assessing changes in mobility/activity patterns during first domestication and husbandry stages on archaeological samples of *Capra*: Tell Halula (Syria) as a case study

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Tell Halula (Syria) is an archaeological site located in the middle Euphrates valley with a continued occupation of more than 2000 years. This site is structured in 37 occupation phases ranging from the MPPNB until Halaf period (7800-5200 cal. BC). Its privileged location allowed its inhabitants to access different biotopes (riverside, low mountain and steppe) that granted a rich environment where to develop a full farmer economy. Concerning goat, both *Capra aegagrus* and *Capra hircus* are documented since the earlier occupations of the site. Until the occupation phase 8 (7590-7520 cal. BC), when domestic sheep is adopted, goat is the main domestic resource. Distinction between wild and domestic specimens is particularly difficult close to the earlier domestication and husbandry stages. Considering domestication as a process through which humans imposed a significant degree of influence over the descendants for multiple generations, choosing particular anatomical and behavioural traits that accomplished their needs we can assume that wild and domestic specimens should differ in their range and intensity of mobility. Taking this into account and considering that bone growth relates to adaptation to different levels of physical stress, the aim of this work is to detect potential variations in the development of bone, and specifically in cortical bone mass. We discuss in this presentation the preliminary results obtained from the analyses of a sample composed of 87 humerii of *Capra* recovered from occupation phase 1 to occupation phase 37. The applied procedure is based on Computed Tomography (CT), analysing the main diaphysis cross-sections features in order to evaluate changes in animal stress patterns related to variations in animal mobility and activity. Finally, we test if this approach could be valid to better understand domestication and earlier husbandry stages.

Topics : Archaeozoology; Animal domestication; Methods

Keywords : Computed Tomography; Syria; Domestication; Mobility; Biomechanics; *Capra*

Mobile and sedentary pastoralism in Central Zagros from the Neolithic to the Iron Age, Iran. The contribution of new archaeozoological data

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Central Zagros is a suitable area for the study of the development of pastoralism. It is located in a Semi-arid environment, with strong seasonality in rainfalls and composed of intermountain valleys with highland and lowland pastures. In the present time, villages are surrounded by agricultural fields, while nomadic and semi-nomadic people practice bi-annual transhumance in the same area. Wild caprines were intensively exploited by human communities that inhabited these landscapes during the Palaeolithic, while domestic goat and sheep became the backbone of the subsistence economies in all periods during the Holocene. Mobile pastoral nomadism, seem to have emerged in the Kermanshah region, the most northerly province in the Central Zagros, between the Late Chalcolithic and Early Bronze Age, according to the archaeological surveys and excavations. The aims of this paper is to review the zooarchaeological studies along the Central Zagros in Kermanshah, Hamadan and Luristan, from the Neolithic to the end of the Iron Age, in order to investigate this question in the light of new archaeozoological studies of the multi-period site of Qela Gap in Luristan that shows a slightly different picture of the development of pastoralism. Based on the material culture, and the analysis of kill off pattern, it seems that, in this part of the Central Zagros, prehistoric communities were present year-round at site during the Late Neolithic and chalcolithic, while permanent residency is firmly attested in the following periods. These differences may result from various environmental setting that have impacted herding activities.

Topics : Archaeozoology

Keywords : Evolution of Pastoralism; Central Zagros; Neolithic; Chalcolithic; Bronze Age; Iron Age

Faunal assemblages in the Mesolithic-Neolithic transition of the Southern Caucasus: a view from Damjili cave, West Azerbaijan

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The increasing number of excavations in this decade has significantly advanced our understanding of the beginning of the Neolithic food production economy in the Southern Caucasus, and most researchers now agree that it took place at around the late 7th to early 6th millennium BC. However, the processes of the Mesolithic-Neolithic transition themselves remain to be further investigated due to the lack of well-dated Mesolithic sites in the region. For example, occupations of the oldest known Neolithic sites such as Hacı Elamxanlı Tepe, Aratashen, and Aknashen are dated to the beginning of 6th millennium BC, whereas Mesolithic sites such as Kmlo 2, Kotias Klde layer B and Bavra-Ablari layer IV to the 8th millennium BC. The information gap for the subsistence economy in the 7th millennium BC has thus prevented it from addressing the transitional processes in a more complete chronological framework.

In this situation, the Azerbaijan-Japan joint excavations at the cave site of Damjili (west Azerbaijan) in 2016 partially filled the gap. Although in a small excavation area, the succession of archaeological layers dated to late 7th to early 6th millennium BC was revealed. Our preliminary observations on the Mesolithic faunal assemblage of the late 7th millennium BC, admittedly limited in number and preservation, shows marked differences from those of the Neolithic layers of the early 6th millennium BC: the frequency of caprine is low. The composition of wild animal assemblages also differs, less cervids and more gazelles in the Mesolithic. The occurrence of these changes, despite the chronological proximity, sheds new lights on our interpretation of the Mesolithic-Neolithic transition in the Southern Caucasus.

Topics : Development and diffusion of animal husbandry

Keywords : Southern Caucasus; Mesolithic; Neolithic; Cave

Prehistoric horse exploitation on the central Anatolian plateau: assessing the hypothesis of local domestication

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In this paper, I review new zooarchaeological evidence for the presence of horses (*Equus ferus*) on the central Anatolian plateau in the early and middle Holocene. Presenting new data from the sites Achemhöyük and Çadır Höyük, I argue that an indigenous tradition of human-horse interaction can be documented on the central Anatolian plateau extending from the earliest Neolithic (c. 8500 BC) through the Early Bronze Age (c. 3000 BC). I explore the nature of this relationship and suggest that the role of central Anatolia in the processes leading to the domestication of horses and their diffusion south of the Taurus needs to be carefully assessed.

Topics : Archaeozoology; Animal domestication

Keywords : Horse; Domestication; Anatolia; Turkey; *Equus ferus*, *Equus caballus*

Caprines, dromedaries and parrotfish, archaeozoology from an early Islamic trade center

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Aylah is located on Jordan's Red Sea coast and the site was an important trading emporium and one of the first urban entities of purely Islamic origin and planning. During the early Islamic period (c. 650 -1100 e.v.t.) Ayla functioned as a major urban settlement and an influential trading center. A substantial collection of faunal remains have now been studied from the site and these originate from two excavation projects: the excavations by the Oriental Institute, University of Chicago (1986-1995) and the current Aylah Archaeological Project by University of Copenhagen. Combined these collections represent a wide range of contexts, such as monumental buildings, houses, shops, streets, occupation and rubbish layers of Late Antiquity, Umayyad to Ayyubid date.

This paper will present a first summary of the analysis of these Early Islamic faunal remains, their treatment and subsequent depositing. The aim is to identify the ways that the people within Aylah

were procuring and utilizing various animal populations and recourses, which enabled the settlement to flourish in the early Islamic period.

Topics : Archaeozoology

Keywords : Early Islamic; Urban; Subsistence; Reconstructing economies

Printable comparative collections: short- and long-term potentials

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Many field projects in southwest Asia are carried out in places where comparative osteological collections are not available, forcing archaeozoologists to either spend precious time on gathering and cleaning animal carcasses, export many bones to places where such collections cannot be found or rely solely on bone atlases and virtual collections. Both solutions are imperfect, since locally-prepared field collections are usually limited to present-day livestock taxa, and the ability to export bones depends on country-specific regulations and is costly to do *en masse*.

To address these difficulties, we suggest compiling a database of printable 3D scan files of animal bones of different taxa. Such files can be downloaded and printed in many regional centers in SW Asia for a reasonable cost, or transported as luggage from a researcher's country of origin to the field. Our presentation will address the technical procedure of scanning and printing, estimated costs, and practicality. We will strengthen the secondary utilization of the cloud-based, open data source for GMM based taxonomies.

Topics : Archeozoology; Methods

Keywords : Comparative collections; 3D scans; 3D printing

Interpreting AD 6th century Byzantine bird representations from the monastery of Tall Bī'a, Northern Syria

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The monastic complex of Tall Bī'a is located north of the Euphrates, near the confluence with the Balikh river, its left bank tributary, SE of present-day Raqqa in northern Syria. The site is best known for having been identified with the Babylonian city of Tuttul. Remains of an early Byzantine monastery came to light at the site's highest, so-called E mound during the course of 1980–1995 excavations. The mosaic images of birds under discussion here decorated rooms of this building. Those found in the largest set (Mosaic 1) are unambiguously dated to August 509 AD by a Syriac inscription. This mosaic contained naturalistic depictions of 49 birds whose ornithological identification is well worth attempting. A second set of images dated to 595 AD (Mosaic 2) and another set (Mosaic 3) possibly dated in-between the first two also contained images of four birds each. While zoological information in artistic representation cannot always be taken at face value due to the discrepancies between the geographical distribution of avifauna and their free movement as decorative motifs, the large number and high quality of these images deserves attention from an archaeo-ornithological point of view. Thanks to the naturalistic style of representation, at least three

influences may be worth considering in this rich imagery: classical Greek scholarship including ornithology, early Christian symbolism and observations of the local avifauna in Western Asia. They interplay between these factors potentially characterizes relationships between people and birds in an important time period through the representation of birds in art beyond the meagre osteological record.

Topics : Socio-symbolic use of animals

Keywords : Avifauna; Byzantine; Iconography; Osteology; Syria

Baynunah Camel site, a Neolithic kill-site in the Arabian Peninsula

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The Baynunah camel site is located approximately 130km south-west of Abu Dhabi city in the United Arab Emirates. The site was discovered during oil pipeline construction in 2003. The desert surface was littered with white fragments of ancient camel bones, with some concentrations of bones in many low mounds, where the outlines of camel skeletons could be made out. With the exception of a single flint arrowhead found on the surface, and a few pottery sherds of Bedouin pottery, no other cultural material could be associated to the site that is located in an interdunal area. Field investigations have been undertaken since 2008 at the Baynunah site in order to answer the key question regarding the accumulation process. Was it a catastrophic natural death or evidence of prehistoric people hunting camels on a large scale? According to the large set of radiocarbon dates, the camel assemblage was formed between 4300 and 3800 BC. In 2015 a Late Neolithic flint arrowhead was found still embedded in the rib cage of a big male camel. The site represents the first kill-site ever known in the Arabian Peninsula where over one hundred camels were hunted in multiple events. This has given an unexpected and unique opportunity to study subsistence of a mobile Neolithic communities and how they used the landscape and resources around them.

Topics : Archaeozoology; Subsistence economy; Others

Keywords : Wild camels; Neolithic; Kill-site; Interdunal area; Abu Dhabi

Butchering technology during the Early Bronze Age I: an examination of microscopic cut marks on animal bones from Nahal Tillah, Israel

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It is commonly assumed that the introduction of bronze metallurgy, which signals the beginning of the Bronze Age (ca. 3500-1200 BCE) of the southern Levant, is associated with a shift in the raw material technology used in daily activities from stone to metal. However, there are two major changes in bronze metallurgy that occur during the Early Bronze Age (EB): the introduction of bronze as a soft alloy (<5% tin) and the introduction of a hard alloy (10% tin). The former occurs toward the beginning of the Bronze Age, while the latter occurs during the later EB III and is not widespread until the EB IV or Middle Bronze Age. Although bronze technology is first utilized for prestige objects (e.g. ornaments, mace heads), it is unclear when this material is adopted for specific quotidian activities, such as carcass butchering. It is not definitive whether the introduction of bronze triggers a shift in butchering technology, or if it is slightly or even significantly delayed until higher quality and harder (hence sharper) alloys (e.g. bronze-tin) are available. Furthermore, it is unclear if the advent of bronze automatically signals the decline in use of the other stone. This study tests whether the adoption of metal technology for utilitarian tools, such as those used for butchering, may have occurred early in the EB (after the introduction of a soft bronze alloy) or only occurred later and is associated with a hard tin-bronze metallurgy that developed in the later EB (likely EB III or IV). Microscopic butchering marks on faunal remains from the EB I site of Nahal Tillah in central Israel are evaluated to determine if the primary butchering tools were made of chipped stone or metal.

Topics : Archaeozoology

Keywords : Butchering; Levant; Early Bronze Age; Cut marks; Metallurgy; Scanning electron microscopy

Zooarchaeological insights into non-elite funeral customs of the early dynastic/early Old Kingdom inhabitants of Memphis, Egypt

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The necropolis of Helwan, situated just south of today's Cairo, can be constituted as the main burial ground for the low and middle-class population of the ancient city of Memphis. Covering an area of approx. 100 hectares, this site takes up more than 80% of the known tombs in the Memphite region of the early dynastic time period. While Egyptian archaeologist Zaki Saad had unearthed more than 10.000 graves during the first half of the 20th century, another 218 burials were added by the excavations of E. Christiana Köhler from 1998 to 2011 (Operation 4), supplementing and qualifying this enormous set of data. The zooarchaeological finds of these more recent excavations build the basis for this presentation. During the excavation of Operation 4 in Helwan, thousands of animal remains of different tomb-related feature contexts were unearthed, building a substantial corpus of data. Even if skeletal remains of domestic ruminants are most numerous, a remarkable diversity of other species, including other mammals, birds, fish and reptiles, can be noted. The distribution of

this variety of species within the grave structures seems to be highly influenced by taphonomic processes, underlining the importance of a context-orientated analysis of zooarchaeological remains. In this sense, these finds are of major relevance not only for the interpretation of use and meaning of various animals and their body parts regarding the funeral customs but also for reconstructing site formation processes and taphonomic histories. The representation of skeletal parts and their economic, culinary and possibly religious or symbolic value is another key issue. This material indicates a high selectivity on certain body parts and highly standardised processes related to them. This standardisation concerned not only the representation of species and their body parts, but also their spatial distribution within the tomb contexts as well as processes of carcass dismemberment, as human-induced bone modifications suggest. Finally, this material gives the opportunity to gain insight into the funeral customs of the poorly known low- and middle class Memphite population and provides valuable comparisons to well-known elite grave contexts at the focal point of early urbanism in times of ancient Egypt's state formation.

Topics : Archaeozoology; Socio-symbolic use of animals

Keywords : Egypt; Old Kingdom/Early Dynastic; Funeral customs; Helwan

Ethnicity and social stratification: information from Late Second Temple Period assemblages

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This paper provides preliminary results from the ongoing analysis of archaeological faunal remains from sites in Judea. In this study, we compared meat consumption characteristics between three Late Second Temple Period (Early Roman) sites. The first two sites, located in the temple city of Jerusalem, are: the Kidron-city dump and Pilgrims Street, which leads from Siloam pool to the temple complex. The third site is the fortress of Herodium, slightly south of Jerusalem. The Herodium site is exceptional from the above sites, since it includes evidence of activities from two different periods: King Herod's construction team engaged in designing his tomb, and the Great Revolt rebel. In this study we compared meat consumption patterns between these sites, focusing on dietary choices and butchery patterns, and how they correspond with Roman practices and Jewish Halacha rules. Generally, our findings indicate a high degree of exploitation of livestock species, including sheep and goat, followed by cattle, while swine remains were found only in the Herodium site. Interestingly, some evidence of social stratification is suggested by the presence of luxury foods and especially edible fish remains. The taxonomic composition shows that meat consumed in the Jerusalem sites, and in the Herodium site for the Great Revolt assemblage, was of kosher animals only. Yet, the King Herod's construction team assemblages reflects different dietary pattern, which included ritually unclean animals (swine and hare).

An interesting observation arose during the analysis of livestock bones. Evidence to specialized butchery was drawn from cut marks at the bone surface, whose shapes are typical to heavy butchery tools. Specifically, cut marks typical to Roman urban butchery were discovered in animal bones from Pilgrim's Street (mainly cattle) as well as in King Herod's construction team assemblages. While ethnicity may explain the Herod's construction team evidence for uncleaned animal consumption, this factor cannot explain the pilgrim's street evidence for Roman's butchery patterns. Animal remains found along this street indicate Jewish origin of the slaughterers, kosher animals consumption, delicate marks on neck bones, as well as absence of decapitation which was typical in

Roman slaughter houses. Hence the appearance of Roman cuisine characteristics shown in Herodium and pilgrim's street assemblages reflect a significant social stratification and a fingerprint of state construction projects: the Herod's tomb, and pilgrim's street development.

Topics : Archaeozoology

Keywords : Ethnicity; Social stratification; Butchery patterns; Roman urban butchery

Sweating the small stuff: heavy fraction collection and analysis from EB Tell es-Safi/Gath

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Most modern excavations intensively collect data from floatation, including both light and heavy fractions. While the light fraction (floated) is usually extensively analysed by archaeobotanists, the heavy fraction (or micro-residue) is often ignored or minimally examined since it requires intensive efforts at the microscopic level to recover and identify the remains. In recent years, a few studies have demonstrated the utility of intensive examination of the heavy fraction from archaeological sites as a means for investigating behaviour on the microscopic level. When collected systematically across floors within a house or building, the analysis allows for the identification of different activities that are often less visible with macroscopic remains.

This paper will describe and document the goals and collection methods, and present some preliminary analysis of the heavy fraction from the excavations of the Early Bronze III non-elite residential neighbourhood being excavated at Tell es-Safi/Gath, located in central Israel overlooking the coastal plain. The paper will show how the results from heavy fraction analysis may significantly contribute to our understanding of early urban lifeways among the urban non-elite.

Topics : Methods

Keywords : Tell es Safi/Gath; Heavy Fraction; Methods; Micro debris; Israel; Early Bronze Age; Neighbourhoods; Households

Provisioning and agricultural economy at Roman Gordion: integrating archaeobotany and zooarchaeology

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Diachronic change in agricultural economies and land use at the urban center of Gordion in central Turkey has been studied and published extensively. One period, however, has not included in this study: Roman Gordion, when the once-large city became a small military encampment. In this paper, we couple zooarchaeological data (taxonomic composition, mortality profiles, prevalence of weight-induced pathologies, and biometry) with archaeobotanical data in an effort to characterize the agricultural economy at the Roman military base of Gordion. We propose a model where the garrison developed durable social and economic relationships with rural farmers, who provisioned the site with wheat and young cattle, and local pastoralists, who focused on secondary products and provided mainly older caprines to Gordion. Economic risk was further managed by the garrison

through household husbandry (of pigs and chickens), while environmental risks were managed by farmers using intensive irrigation but exacerbated by extensive pastoral production. Gordion, as a rare integrated faunal and botanical study of the Roman Near East, provides a model for further study of the Roman agricultural economy in the eastern provinces.

Topics : Subsistence economy

Keywords : Roman period; Risk management; Agricultural economy; Military base; Roman Near East

Roman horse burials in Beirut

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Around 25 burials have been uncovered in the city of Beirut dating back to the first century AD of the Roman era. A minimum number of 30 horses have been buried in the outer walls at the gate entrance of the city. Mainly adult and male individuals have been recorded. The stratigraphy shows a contemporary date for all the burials with a long term use of the cemetery. Most horses were deposited on the side with flexed upper limbs and extended lower limbs. The field study confirms a filled space of primary single inhumation for most of the burials. This discovery is exceptional by the good number of individuals recorded, the gender and age selection and the very good preservation of complete skeletons of horses. The importance of these finds consists of its unique mortuary practices and space allocated for selected individuals of horses especially regarding horse burials during the first century AD in the Near East.

Topics : Archaeozoology; Socio-symbolic use of animals

Keywords : Horse; burials; Roman period; Beirut; Lebanon

Animal Bones from the Early Bronze Age Site of Shengavit, Yerevan, Armenia

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The Early Bronze Age Site of Shengavit in Yerevan, Armenia has a long history of excavation dating back to the 1930s. New excavations at the site were begun under the direction of Hakop Simonyan in 2000 and continued until 2008. In 2009 Professor Mitchell Rothman joined the team as co-PI, and he and Simonyan conducted three seasons of excavation between 2009 and 2012. The initial work on the 2009 faunal remains was carried out by my colleague, Dr. Jennifer Piro. I joined the team in 2012, and I completed work on the animal bones collected in 2009, 2010, and 2012. The 2009-2012 excavations identified a series of stratigraphic levels dated to between 3200 and 2500 cal. BCE. The extensive faunal collection from the site sheds light on the economic basis of the Kura-Araxes culture and its development through time. One of the most striking features of the Shengavit Early Bronze Age assemblage is the small number of equid remains that were recovered from the 2009-12 excavations. Those that could be identified to species appear to be donkey (*Equus asinus*) or onager

(*Equus hemionus*) rather than horses. This presentation will trace changes through time in animal use at Early Bronze Age Shengavit and address the role of equids in the Shengavit economy.

Topics : Animal domestication; Subsistence economy

Keywords : Shengavit; Kura Araxes; Early Bronze Age; Subsistence economy; Equids

Faunal remains and worked bone objects from the Chalcolithic levels at Tepecik-Çiftlik, Southern Cappadocia, Turkey

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Large-scale excavations have been carried out at Tepecik-Çiftlik in the Niğde region of Southern Cappadocia, Turkey, since 2001 under the direction of Professor Erhan Bıçakçı of Istanbul University. These excavations have revealed evidence for Pre-pottery Neolithic (PPN), Pottery Neolithic (PN), and Early Chalcolithic occupation at the site. We joined the project in 2014, and our initial focus has been on the study of the bone tools and unmodified animal bones from the Early Chalcolithic (ca. 6100-5800 cal. BCE) levels excavated during the 2013 and 2015 seasons. Sheep and goat bones make up only about two-thirds of the Chalcolithic mammal remains. The remainder includes a range of wild equids (*Equus ferus* and *Equus hemionus hydruntinus*), deer (*Cervus elaphus* and *Capreolus capreolus*), domestic and wild cattle (*Bos taurus* and *Bos primigenius*), hare (*Lepus europaeus*), fox (*Vulpes vulpes*), bear (*Ursus arctos*), and small mammals. The bone tool collection is dominated by tools made on split sheep and goat metapodia, but it also includes a substantial number of “idols” made on the first phalanges of both wild horses and hydruntines. This poster will examine the subsistence and ritual uses of animals and their bones in Chalcolithic Central Anatolia.

Topics : Archaeozoology; Subsistence economy; Socio-symbolic use of animals

Keywords : Tepecik Ciftlik; Chalcolithic; Anatolia; Subsistence economy; Idols

Of mice and men in Southern Levant: new evidence for the role of the Natufian sedentism process in the origin of the house mouse

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We assess whether the main driving force in the earliest commensal interactions between humans and murine rodents and underlying niche construction involved sedentism or the transition to agriculture. Tchernov proposed correlating early mouse and rat commensalism with Natufian sedentism. However, the environment of PPNA and PPNB villages with large scale grain storage, field cultivation and greater size of human dwellings and demography was also thought to have caused important ecological changes that could initially sustain an anthropodependant population of mice. To test these hypotheses we studied a 200,000-year sequence of *Mus* remains from the southern

Levant, covering the transition from to Natufian sedentism and early farming in the PPNA. We employed high-resolution, geometric morphometric taxonomic analysis of *Mus* molars (n=372) in order to pinpoint the arrival and spread of commensal *M. m. domesticus* in the anthropogenic environment overtime. To assess the ecological mechanism underlying the relationship between changes in human mobility within settlements and changes in the relative proportions of mice in commensal rodent communities, we used an ethnozoological study of rodent communities in contemporary small-scale settlements of mobile herders in southern Kenya. Our results demonstrate that house mice began associating with humans with the earliest phase of Natufian sedentism and niche construction, long preceding the advent of agriculture. They also reveal the degree to which variability in Natufian mobility impacted rodent community dynamics, providing strong evidence for the use of fluctuations in mouse taxa as a bio-indicator of fluctuating human mobility in early pre-farming and farming communities.

Topics : Archaeozoology; Biodiversity in the past

Keywords : Rodent; Commensalism; Natufian sedentism; Mobility; Geometric morphometrics

Establishing phenotypic variations in fallow deer: a geometric morphometric approach

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The complex and inter-related histories of fallow deer, both – European and Persian – with each other and with humans, is reaching back over millennia. A very special and ancient relationship with humans that is evidenced by their deliberate and repeated translocation far outside their natural range, and management as early as the Neolithic. It was traditionally accepted that the natural geographic distributions of both sub- species, specifically in Southeastern Anatolia did not overlap. However, there has been increasingly suspicions that it might not be as clearly defined, suggesting that contact might have occurred and perhaps even hybridisation. If we are to understand this long, multiple and close human/deer relationship that has followed many pathways, whether they were different or similar through time and space, it is crucial to be able to separate the remains of *D. d. dama* from those of *D. d. mesopotamica* and identify hybrids in the archaeological record. Morphoscopic criteria and biometry are not precise enough to do so. This paper will discuss the use of 2D Geometric Morphometric (GM) onto fallow deer teeth (lower M3), and 3D GM onto the astragalus and the distal humerus to establish reference of phenotypic variation for the two subspecies, and potential hybrids, deriving from modern and zooarchaeological material.

Topics : Archaeozoology; Biodiversity in the past; Methods

Keywords : Fallow deer; *Dama dama*; 2D-3D Geometric Morphometrics; Biogeographies; Phenotypic variations

Domestication process in Southwest of Iran, the case of Tepe Rahmat Abad

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Bioarchaeological investigations in the Zagros highlight the importance of this region in the emergence of the Neolithic way of life on the Iranian Plateau. In parallel, absolute dating of Neolithic sites in the southwest and northeast of Iran show the progressive spread of the Neolithic to other parts of Iran. Fars province, in southwest of Iran is a region where the process of the Neolithisation can be followed from the late glacial to early Holocene. Rahmat Abad in Dasht-e Kamin plain is a newly excavated site with Pre-pottery Neolithic (end of 8th-first quarter of 7th mil. BC) and Pottery Neolithic (second half of 7th mil. BC) occupations. Approximately 3000 animal bones were recovered during two seasons of excavations. A majority came from Pottery Neolithic period, which was divided in two phases: Formative Mushki and Mushki. Rahmat Abad has a highly specialized economy based on exploitation of caprines. From the PPN, sheep and goat are both domesticated, but during the Formative Mushki phase, wild goats are still hunted, along with boar, red deer, gazelle and hemione in small quantities. Also, cattle seem to be still in the early steps of domestication.

Topics : Animal domestication

Keywords : Neolithisation; Iranian Plateau; Specialized economy; Goat/Sheep; Cattle

Subsistence economy and land use during the Late Bronze Age and Iron Age in south-eastern Bulgaria

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During the Late Bronze Age and Iron Age period (1600 BC-100/50 BC), modern south-eastern Bulgaria underwent major social and economic changes, including an increased stratification of society, production intensification and the development of a market economy. All this likely induced the necessity of ancient societies to adapt their agricultural economy and animal husbandry practices to the local situation. The aim of this paper is to present the results of archaeozoological and archaeobotanical analyses of various sites within this region, complemented with the data of stable isotope analysis performed on a selection of both plant and animal samples. Further, we will focus on the animal economy of several Late Iron Age sites, considering their environmental context.

Topics : Archeozoology; Subsistence economy

Keywords : Subsistence; Late Bronze Age; Iron Age; Archaeozoology; Archaeobotany; carbon and nitrogen stable

isotopes; South-East Bulgaria

Stable isotope evidence for subsistence patterns at prehistoric Monjukli Depe, South Turkmenistan

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The measurement of stable carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) isotopes from a sample of fauna (n=49) and human (n=4) bone collagen from the late Neolithic to early Aeneolithic site of Monjukli Depe in southern Turkmenistan permits to assess animal isotope diversity and has provided indications for human and animal diet as well as herd management. This paper presents the results of an ongoing multi-isotopic (oxygen, strontium, carbon and nitrogen isotopes) investigation, which was designed to explore food resources, animal husbandry and mobility patterns of the dominant animal specimen at Monjukli Depe (sheep/goat). The aim is to gain a better understanding of animal exploitation over the time span of the settlement and thereby providing complementary information to the other research on human-animal relations. Likely due to the arid characterization of the environment, results from carbon and nitrogen isotope analysis demonstrate a rather large range of $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values in animal tissues. That might refer to seasonal patterns of movement towards areas with higher salinity and a larger proportion of C4-plants.

This is confirmed by results from carbon and oxygen ratios of sequentially sampled tooth enamel from sheep/goat individuals, which demonstrate both seasonal variation and cyclical similarity in $\delta^{13}\text{C}$, whereas the combined study of strontium and oxygen suggest that ovicaprids did not move across areas with different geological formations. This result does not, I maintain, exclude the possibility that there might have been a wide range of habitats in the lowlands that were exploited by herders and their animals.

Topics : Subsistence economy

Keywords : Stable isotope analysis; Bone collagen; Tooth enamel; Sheep/goat husbandry; Turkmenistan; Aeneolithic/Chalcolithic

The archaeozoology of household activities from the Early Bronze Age site of Çukuriçi Höyük in western Anatolia

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The excavations at Çukuriçi Höyük, a tell settlement in western Anatolia, is one of the oldest sites on the western Mediterranean coast. Pioneer settlers started at the beginning of the Pottery Neolithic and continued into Early Chalcolithic Period. After a hiatus, the settlement phases document human activities from the late Chalcolithic into the EBA I dating to the Early Bronze Age I, 2,900-2,750 cal. BC. The excavations in the EBA I settlement revealed very early metal production activities on the one hand and an abundance of obsidian coming from the island Melos, on the other. However, daily life, production of metal as well as the storage of possible exchange goods took place in agglutinating housing of similar architectural structures. The archaeological remains were recorded following a high level of contextual information. This high-resolution data permits the rare

opportunity of a detailed analysis of the spatial distribution of archaeological and zooarchaeological remains within and between households. This allows for a 'bottom up' approach, using the household as a unit to inform us about nature of social organization at the settlement at the dawn of the Bronze Age, something which currently is poorly understood. Using zooarchaeology and malacological remains – information on the daily lives of the inhabitants concerning herding, slaughter behaviours and food preparation specifically can be investigated. Differentiation between households in terms of species, element and manner of food preparation in combination with archaeological study of the contexts, as well as anthropological input may give us insights as to if and how the people of Çukuriçi used food that could be interpreted as a social marker. Here is presented the preliminary results and selected examples from Çukuriçi Höyük on zooarchaeological remains as social markers.

Topics : Archaeozoology; Subsistence economy; Socio-symbolic use of animals; Methods

Keywords : Archaeozoology; Households; Bronze Age; Anatolia; Social organization

A Snapshot of an Ancient Agricultural Landscape in the Negev Desert, based on remains of small mammals

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Agriculture in the Negev desert in the Byzantine period (4th-7th cent. CE) is thought to have altered local landscapes, due to widespread construction of terraces and dams for collecting flood waters and alluvium. Agricultural installations strewn across this landscape include pigeon towers (columbaria), which were built near fields to produce fertilizers, enriching the nutrient-poor desert soils. Within such pigeon towers we uncovered large amounts of small mammalian remains (rodents and insectivores), which provide a new line of evidence for reconstructing the paleo-agro-ecosystem and assessing levels of anthropogenic impact.

We conducted detailed analysis of assemblages from three pigeon towers from the sites of Shivta and Sa'adon, located at the heart of Byzantine Negev settlement. Species composition and skeletal preservation shed light on accumulation history. Gerbils (*Gerbillus* spp. and *Meriones* spp.) are the most frequent species (79% of molar teeth), followed by the shrew (*Crocidura* sp.), lesser Egyptian jerboa (*Jaculus jaculus*) and house mouse (*Mus musculus domesticus*). Asian garden dormouse (*Eliomys melanurus*), rat (*Rattus rattus*), mole rat (*Spalax ehrenbergi*) and sand rat (*Psammomys obesus*) were found in low frequencies. We noticed that materials from the stage of human use of the structures, superimposed on floors, are characterized by low quantities of remains and presence of commensal mice and rats, whereas the abandonment stage is characterized by much higher quantities of remains and diversity of species. Digestion marks are present in low frequencies (20% of long bones and teeth) and evince slight levels of impact, indicating the likely role of a raptor such as the barn owl (*Tyto alba*) in accumulation.

Species composition was similar to that of a modern barn owl assemblage, collected in sand dunes in the western Negev, where there is limited influence of modern settlement and agriculture.

Interestingly, though diversity is high and the level of anthropogenic impact low in these assemblages, the gerbil component comprises nearly equal frequencies of *Gerbillus* and *Meriones*. This feature does not correspond with any of our modern owl assemblages, where *Gerbillus* predominates in sandy environments and *Meriones* in loessy ones. Studies in modern cultivation plots in the Negev documented the tendency of gerbils to enter the agricultural environment. The high frequency of gerbils in the pigeon towers could indicate a long history of gerbils as commensals,

possibly agricultural pests and indigenous ancient markers of anthropogenic impact. Further actualistic research is needed to fine-tune these paleo-environmental reconstructions.

Topics : Archaeozoology; Biodiversity in the past

Keywords : Commensalism; Small mammals; Gerbils; Desert agriculture; Byzantine period; Taphonomy; Environmental reconstruction

Cockles and oysters witness ritual ceremonies in the Artemis Cithone sanctuary on the Kalabaktepe near Miletus

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Excavations at the Kalabaktepe near the ancient city of Miletus uncovered a sanctuary at its hilltop in the years 2006-2008. The sanctuary was dedicated to the goddess Artemis Cithone and it was in use from the 8th century BC onwards and continued to the 5th century BC. An early classical settlement emerged on the hilltop after a devastating siege by the Persians in 494 BC and the final destruction of the sanctuary.

Although most of the archaeozoological remains come from secondary depositional positions, they definitely represent refuse originally accumulated in the ritual ceremonies over the centuries.

However, the composition of the archaeozoological assemblage is heavily dominated by diverse mollusks species and with only very few evidences of mammalian remains. Besides various gastropod and bivalve species the assemblages are dominated by remains of the lagoon cockles (*Cerasto dermaglaucum*) in all phases. An increase of oysters (*Ostrea edulis*) becomes visible in the later phases. These two bivalve species are the main components, which obviously had been consumed in the course of ritual activities and afterwards the shells had been disposed of in heaps surrounding the sanctuary. However, the mollusks certainly reflect more meanings in the ritual activities at the sanctuary on the Kalabaktepe rather than being food waste only.

Besides the implementation of mollusks into the ritual behaviour of the inhabitants at the Kalabaktepe the shells provide the opportunity to reconstruct their ecological and living conditions in the surrounding costal area of Miletus as well.

Topics : Others

Keywords : Ritual; Sanctuary; Artemis Cithone; Miletus; Mollusks

Production, consumption and disposal - a consideration of spatial variation in faunal distributions at Early Bronze III Tell es-Safi/Gath, Israel

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Most studies of the faunal remains from archaeological excavations tend to lump the data into a single large amorphous category. Yet, the recent shift in emphasis to analysis of household debris allows for inter-household comparisons. In this paper, we will present the results of our analysis of the faunal remains from (2004-2012) of the Early Bronze Age III domestic neighbourhood (Area E) from Tell es-Safi/Gath, Israel. Even though there are four closely linked house complexes within the excavation area, there is significant variation between each of them in terms of their faunal remains that yield insight into food production, consumption, and disposal activities in an early urban context.

Topics : Archaeozoology

Keywords : Spatial analysis; Fauna; Early Bronze; Urban; Household

Emergence of complexity in Neolithic-Early Bronze Age in Greece: new zooarchaeological evidence

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The Neolithic period in Greece was characterised mainly by subsistence economies engaged in localised economic and social activities of modest scale. Only few glimpses of complexity in these activities have been produced by research so far. This state of affairs renders the later sub-periods of the Neolithic and the Early Bronze Age particularly important as firm evidence of increased socioeconomic complexity and cultural interaction during those periods emerges from around the Aegean. In this context, zooarchaeological research has just started to contribute in the shaping and refinement of the emerging picture. This paper contributes new zooarchaeological evidence from 4 Neolithic and Early Bronze Age sites in areas where little was previously known (i.e. south Peloponnese and Attica). The evidence is indicative of well-developed animal economies with a certain degree of specialisation in some cases (i.e. milk, wool, traction), as well as new expressions of social and cultural identity involving animals. Such expressions include evidence of feasting generated by seasonal surpluses of animal products, introductions of new species (e.g. possibly horse) and consumption of dog meat in specific occasions. The specific case studies presented are also integrated in the developments of the wider Aegean region, thus contributing in the further refinement of our knowledge for the transformation of human societies from Neolithic subsistence to the kingdoms of the Late Bronze Age.

Topics : Archaeozoology; Socio-symbolic use of animals

Keywords : Neolithic; Bronze Age; Complexity; Greece; Aegean

Summer loving means births in autumn and winter: sheep and goat seasonality of birth in recent and Neolithic Cyprus

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This paper presents a stable isotope study conducted on sheep/goat remains from Neolithic Cyprus, combined with freshly-collected ethnoarchaeological data on birth seasonality in recent traditional sheep/goat management in Cyprus. Stable oxygen analysis was applied on two samples of sheep and goat third molars from two Pre-pottery Neolithic (8th mil. cal. BC) sites to explore the seasonality of birth. The oxygen stable isotopes revealed interesting patterns in the seasonality of birth with broad similarities but also subtle differences between the two sites. The isotopic results are integrated with the archaeological context and, with the help of the ethnoarchaeological data it is proposed that the main birth season for sheep/goat in 8th mil. cal. BC Cyprus was likely to be autumn and early winter rather than spring. This scenario is further discussed in relation to the environmental and economic conditions it was developed into. More specifically, autumn/winter rains generating lush plant growth in combination with mild winter temperatures increase the chances of lamb/kid survival. In addition to that, the period of lowest availability of naturally occurring food for sheep/goat herds in Cyprus (i.e. summer) coincides with the availability of agriculturally-derived animal food. On the basis of the analogy with recent traditional sheep/goat management, it can be argued that the climatic and economic (mainly agricultural) parameters must have also constituted the dominant forces shaping the seasonality of birth in Neolithic sheep/goat herds.

Topics : Development and diffusion of animal husbandry

Keywords : Stable isotopes; Ethnozoarchaeology; Birth season; Seasonality; Sheep; Goat; Cyprus; Near East

Animals remains from Christian complex of El Hamra in El Ga'ab depression, west Dongola (Sudan)

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The animals remains will dealt in this paper was recovered from the three sites in El Hamra Christian complex, these sites excavated by archaeological, ethnographical and ecological project of El Ga'ab depression team, during two seasons: fourth (2013-2014) and fifth season (2014-2015). A total of 110 fragments of animals bones were collected and examined. These bones assemblages, which was recovered from the site EH-04-008, EH-04-010 and EH-3-2. The identification of animals remains depended on anatomical analysis of osteological remains, and also was based on the interpret anatomical distribution the skeleton has been divided into seven groups of bones which represent respectively the most and least attractive parts of the carcass in terms of nutritional value. The species were identified include the sheep (*Ovis aries*) and goat (*Capra hircus*), and other animals remains include ostrich eggs, molluscs species (*Pila ovate*, *Melanoides tuberculata*, *Lanistes carintus*), and there are a few fragments could not be identified. Some cut and chopping marks reported on bones. These animals remains indicator there are similar characteristic in livestock,

husbandry and subsistence patterns in early Christian periods in the in Dongola region, but the economy in El Ga'ab oases depended on small mammals like sheep and goats to provide the milk and meat.

Topics : Subsistence economy

Keywords : Sudan; El Ga'ab depression; El Hamra complex; Christian economy

Mollusks from the archaeological excavations of Areni-1 cave (Armenia)

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The famous Areni-1 cave, which is known also as the Bird's cave situated east of Areni village (Vayots Dzor region) and is located in rocky limestone formations at the left bank of Arpa River (a tributary of the Arax). Located at an altitude of 1080 meters above sea level. The excavators found that Areni-1 cave is a monument consists of several cultural layers. The relics which have been revealed belong to Chalcolithic or the so-called Copper Stone Age and presented as a complex clay made constructions that serves in ritual and economic purposes. Artifacts have been found in different cultural layers, which dated to the end of the first half of the V and IV millennium BC. The cave was also used during the middle Ages (From early until late). Therefore, by the excavation beside the archaeological material have been found freshwater and terrestrial mollusks remains in different preserving degree belonging to the class Gastropoda: 6 families, 9 genera, 9 species.

Topics : Archaeozoology

Keywords : Cave Areni-1; Mollusks; Armenia

Domestication and spread of domestic animals in the upper Tigris

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Zooarchaeological evidence in the upper Tigris Basin in southeastern Anatolia during Prepottery and Pottery Neolithic periods will be examined. Our analyses cover the period of about 3000 years from the 10th to 7th millennium cal. BC, using the animal bone remains from Hasankeyf Höyük (9,500-9,000 cal. BC), Çayönü (10,000-6,500 cal. BC), Sumaki Höyük (7500~7000 cal. BC), and Salat Cami Yanı (6,800-6,300 cal. BC). Relative proportion of taxa, size and kill-off patterns of major species are compared to illustrate the shift from hunting to animal husbandry.

Although we witness that a considerable degree of social complexity already existed at the PPNA sites in the upper Tigris and Euphrates region, all the animal bone remains excavated are morphologically wild. Wild sheep was intensively hunted at the early sedentary village of Hasankeyf Höyük located on the eastern part of the upper Tigris Basin. All the PPNA settlements in the eastern upper Tigris were abandoned in the end of the 10th millennium cal. BC and there was a hiatus of occupation for about 2000 years. During this period, the process of animal domestication progressed in the middle and upper Euphrates Basin as well as in the western part of the upper Tigris. The process of animal domestication is well documented in the PPNB sequence at Çayönü. By the late 9th

Millennium, domestic sheep, goats, pig, and cattle all appeared at the site, and domestic sheep became dominant in the faunal assemblage by c. 7,500 cal. BC.

When the eastern upper Tigris region was settled again, the residents of the newly-formed Neolithic sites were accompanied by domestic animals and crops, as well as pottery. We present a preliminary result of analysis of faunal remains at Sumaki Höyük, one of the oldest pottery Neolithic sites in the region, as well as at Salat Cami Yanı which was also occupied from the beginning of Pottery Neolithic.

Topics : Animal domestication

Keywords : Domestication ; Upper Tigris ; Southeastern Anatolia ; Prepottery Neolithic ; Pottery Neolithic

Faunal remains from the Chalcolithic levels of RML 79 (Beirut, Lebanon)

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Levels of occupation dating to the Chalcolithic (c. 4700-3500 BC) have been recorded on several coastal (e.g. Byblos, Sidon-Dakerman, Minet-ed-Dalieh) and hinterland sites (e.g. Menjez, Kfar Gerra) in the Lebanon. Settlement patterns, socio-political organization, as well as funerary and cultic practices were put forward in the few published reports. Meanwhile, subsistence strategies relying on the analysis of archaeobotanical and archaeofaunal remains were rarely investigated, leaving a gap in an overall comprehension of Chalcolithic cultures in Central Levant.

Recent rescue excavations in Beirut, at lot RML 79, uncovered a level of occupation dating to the Chalcolithic. A small number of faunal (cattle, ovicaprid, pig) remains was recovered from layers related to what appeared to be a seasonal settlement. Furthermore, along the shore of a ravine that makes up the landscape during the Chalcolithic period, were laid a dozen circular pits of approximately 1.6m of depth. Two pits delivered few materials that consisted exclusively of faunal (cervid, cattle, tortoise) remains, while the other pits were empty and their function remains somehow unclear at the current level of interpretations.

Herein, we present the results of the analysis of the faunal remains recovered from the Chalcolithic layers at RML 79. Although the small amount of faunal remains (NISP=39) does not allow making accurate inferences concerning subsistence strategies, the discovery of this settlement sheds some light on the Chalcolithic occupation of the Lebanon.

Topics : Archaeozoology

Keywords : Lebanon; Chalcolithic; Seasonal settlement; Faunal remains

The Cult of Horus & Thoth: a study of Egyptian animal cults in Theban Tomb 11, 12, and 366

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Animal cults have been a feature of ancient Egyptian religion since c. 3000 BC, enjoying intermittent popularity until the 4th century AD and the Christian dominion. Under the direction of J. Galan a Spanish-Egyptian team has been working in the area of the 18th Dynasty tombs of TT 11 and TT 12. Parts of these tombs, subsequent to their initial use, became the site of an animal cult dedicated to Horus and Thoth. This paper explores the nature of the cult, the types of animals interred, their acquisition and mummification, and speculates on their relationship to the different gods to whom the area was dedicated.

Topics : Archaeozoology; Biodiversity in the past; Socio-symbolic use of animals

Keywords : Egypt; Religion and animals; Funerary and animal cult

The birth of the private household economy in Aegean Anatolia: spatial analysis of zooarchaeological remains at the later Neolithic site of Ulucak Höyük

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Through a spatial analysis of zoo-archaeological remains at Ulucak Höyük-Turkey, this study aims to analyse the communal vs. private nature of economic activities with a view toward understanding the household formation, during the Late Neolithic Period (Level IV, 6000-5700 cal. BC). Ulucak Höyük is a multi-layered settlement that was occupied from the Neolithic to the Early Byzantine Period (6800 cal. BC- 330 AD). At Level IV (6000-5700 cal. BC), a spatial plan of eight, seemingly residential buildings and non-domestic areas have been excavated, while a high concentration of various animal remains of domestic and non-domestic species were collected, including domestic sheep, wild and domestic goat, domestic cattle, pigs, fallow deer, red deer, canidae, hares, testudo, and marine molluscs. In order to understand the nature of economic strategies at Level IV, the distribution of faunal remains was analyzed in relation to the architectural features. In this context, only the bones from the immediate floor surfaces and the bones recovered below the collapse of the roofs were considered. The differences in the distribution of the faunal remains was then evaluated in relation to the distribution of other artifacts, such as loom weights, spindle-whorls, figurines, ovens, grinding stones, bone tools, lumps of hematite, polishing stones, and storage jars, found within these contexts. The resulting picture revealed different patterns of acquisition, production, and consumption within each architectural unit, particularly in the case of hunted animals. The uneven distribution of other artefacts also supports an observation that each architectural unit began to specialize in different types economic activities. Ultimately, the results indicate that, in contrast to the previous mode of communal consumption during the Early Neolithic, a “household” centered private economy began to be emphasized during the Late Neolithic Period at Ulucak. Although we have identified possible evidence for the existence of independent household in the

Level IV of Ulucak, there may be an earlier developmental phase to this phenomenon which is going to be the topic of our future studies.

Topics : Subsistence economy; Socio-symbolic use of animals; Methods

Keywords : Western Anatolia; Late Neolithic; Zooarchaeology; Household; Spatial analysis

A review of recent archaeozoological investigations from the Islamic period in Iran

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Recent development of archaeological investigations on historical periods has provided the opportunity to work on faunal assemblages of Islamic period that spans over 1400 years. Meanwhile the number of available assemblages is low compared to the length of this period. The earliest assemblages date back to the 8th-9th century AD, and the latest to the 19th century. According to written texts, Islamic rules for consumption, diet and hygiene have been fundamental in everyday life and have shaped the subsistence practices during this period. However local variations are also visible, in particular in coastal areas. The licit mammalian meats in Islamic rules are basically sheep/goat, cattle, dromedary and camel. Consequently these constitute the main sources of meat supply and also by-products. One of the questions that raised with these studies is how Islamic rules have affected butchery practices. The variability of caprines and bovine populations of the studied assemblages will also be addressed. Finally, this paper will also address questions regarding the importance of agriculture and trade as major components of this period.

Topics : Subsistence economy

Keywords : Islamic period; Iran; Islamic law; Domesticates; Butchery practices

An ancient taboo? Marine turtle consumption in the Eastern Mediterranean

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Remains of marine turtles occur regularly in the archaeological record of the Eastern Mediterranean, usually in low frequencies. In this paper, we will discuss two archaeological contexts, Iron Age Kinet Höyük in Turkey and Early Bronze Age Tell Fadous-Kfarabida in Lebanon, where they occur in relatively high proportions. Based on the results of our species-specific analysis, we will argue that these remains represent very different types of marine turtle- human interactions at these two largely unrelated contexts. We will question what the differential capture, consumption, and refuse

patterns tell us about the resilience of these two multi-period tell sites. Finally, we will assess the value of our findings for conservation purposes in the eastern Mediterranean.

Topics : Archaeozoology; Biodiversity in the past; Subsistence economy; Others

Keywords : Marine turtle; Eastern Mediterranean; Archaeozoology

Bad contexts, nice bones – and vice versa? Reflections on depositional processes around the monumental building of Oymağaç Höyük

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At the multi-period mound of Oymağaç Höyük, Samsun province, Turkey, the remains of a monumental Hittite building have been excavated between 2007 and 2016. According to its lay-out, position and the associated finds, it is rather interpreted as a temple than as palace. Two building periods can be discerned – the Old Temple (17th/16th-15th/14th c. BCE) and the New Temple (c. 1260/1230-1180 BCE). The younger building consists of walls of 160-190cm thickness and includes a ramp, a gate and a courtyard which was flanked on all other sides by rooms and corridors. It covers an area of 1440m². Both buildings were destroyed by fire and the two phases are separated by a temporal hiatus. Historical sources and text remains found at the site point at an identification with Nerik, a worshipping place for the Storm God.

Finds come mainly from construction and rebuilding fills and destruction levels. Inside the temple, no floors survive. Animal remains could be collected from nearly all contexts. The principal variation of the faunal spectrum, including the Early Bronze Age and the Iron Age layers. Due to ongoing research, it is now possible to link the zoological data to the developmental stages of the building, and to study both vertical and lateral variation. Archaeological contexts are defined during excavation, and their chronological position is assessed by the ceramic assemblages. Thus, closed or single-event, and mixed (time-averaged) contexts are discerned according to the presence of Early, Middle and Late Bronze Age pottery. Through the implementation of a database, it is possible to combine contexts to analytical (contextual) aggregations.

Principally, the definition and interpretation of contexts is corroborated by the variation of faunal composition. Some defined “closed contexts” indeed contain highly structured animal bone assemblages which can be associated to certain functions (e.g. rituals). However, it is namely the large deposits from the courtyards and some room fillings, labelled as mixed or “unreliable” contexts by their ceramic content, which produced the most numerically important, and also the most uniform bone samples – regarding both species and element composition. It is hard to believe that these assemblages should represent unintentional, random fall-out with no specific activity behind them. Possibly, different factors were responsible here for the accumulation of bone and pottery, respectively. On the other hand, some strata thought to be connected with critical stages of building development, and classified as high-resolution units, were very poor in their faunal content and appeared less “structured”, but exhibited greater species diversity.

Further, the dominance of caprines among the main domesticates was found to be highest in contexts immediately linked to building structures. Consequently, the percentages of cattle increase with the distance from them. If excavation squares are taken as reference areas, the greatest variability in the composition of the domestic triad (cattle, caprines, pig) was encountered outside the building. Here, the varied spectrum of context types is directly mirrored in the faunal assemblages. Apart from species composition and skeletal part representation, properties like

butchery marks and percentages of worked bones proved to be valuable tools in the assessment of intra-site faunal variability, and for the recognition of recurrent patterns.

Topics : Archaeozoology; Socio-symbolic use of animals

Keywords : Domestic triad; Hittite period; Intra-site comparison; Temple; Turkey

Stopover on the incense route. What faunal remains can tell about diet, daily life and economy in the Nabataean town Elusa

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The Negev desert, located in present-day Israel, is a harsh and arid environment. Even though it comprises 55% of the country's landmass it is inhabited by only 8.2% of Israel's population. However some 2300 years ago the Nabataeans began to transform the desert into a flourishing hotspot of commerce and agriculture. The former nomads controlled the trade of frankincense and myrrh from the southern part of the Arabian Peninsula to the Mediterranean and installed small waystations on the trade route to ensure the caravan's security. One of their foundations was Elusa (Halutza). Due to floodwater control and run-off irrigation this Nabataean caravan station started to evolve into a regional urban centre during Roman and especially Byzantine times. Paved roads, new buildings, elaborate sewer systems, the only theatre in the Negev region and evidence of winegrowing reflect this settlement at its climax. During excavations, that investigated the urban centre of the town, quantities of faunal remains were discovered. In order to gain insight into past economic systems, landscape use, past diets, social status, butchery practices and even religion in Elusa, an intensive faunal analysis of the material was carried out for the first time. The study revealed that there were five sectors involved in Elusa's food supply: 1) A diversity of domestic livestock dominated by caprines, points to herding activity and food production in the vicinity of the town. 2) Great amounts of pig bones on the other hand indicate the import of domestic livestock that cannot be raised in a desert environment. 3) Furthermore, large quantities of imported mollusc and fish remains place the town in a trading network with frequent access to the resources of the Mediterranean Sea, the Red Sea and the Nile River. 4) The remains of wild game such as gazelle, ostrich, wild boar and deer indicate that the inhabitants of Elusa exploited the natural resources of the Negev desert and the northern woodlands. 5) Final preparation, consumption and disposal of the food centred around Elusa's urban area. The study of butchery marks and body-part-representation indicated that carcass processing was undertaken inside the settlement. Evidence of the subsequent disposal of butchery waste is still visible today by large trash mounds that surround the site.

Topics : Archaeozoology

Keywords : Negev desert; Roman; Byzantine; Marine resources; Herd management; Butchery practices

Animal economy at Karkemish from the Middle Bronze to the Iron Age

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A systematic zooarchaeological study of the faunal assemblages from the excavations carried out between 2011 and 2016 by the Joint Turco-Italian Archaeological Expedition at Karkemish (province of Karkamış, Gaziantep, Turkey) has been based on a sample of about ten thousand osteological remains. The evidence derives from different sectors of the urban settlement, including administrative, cultic, productive, residential and funerary areas, from the beginning of the Middle Bronze Age down to the Iron IV/Achaemenid period. The faunal assemblage presents a good level of preservation with almost 40% of the sample determined to species level. Domestic animals were predominant in all periods, with sheep and goats that cover almost half of the Number of Identified Specimens (NISP), followed by cattle and equids (both donkeys and horses), while pigs, dogs and camels are rather scarce. Wild animals were rare and included deer, fallow-deer and gazelle. The animal economy of Karkemish was consequently based on pastoralism, including the exploitation of both primary and secondary products as showed by the estimation of the age at death.

Topics : Archaeozoology

Keywords : Zooarchaeology; Iron Age; Karkemish; Turkey; Pastoralism

The transition from hunting to herding in the Pre-Pottery Neolithic of southern Jordan

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The southern Levant has often been viewed as a marginal contributor to animal domestication processes in the Near East. However, zooarchaeological and stable isotopic data sets suggests initial management of goats in the Galilee, Judean hills, and Balqa regions during the tenth millennium cal. BP, a development that has been variously argued an indigenous development or the direct result of importation of animals from the north. Southern Jordan, a mountainous region home to both bezoar and ibex populations during the Early Holocene, may have been another locale that supported nascent experimentation with goat husbandry but has been largely neglected in broader discussions of goat domestication processes. Here, zooarchaeological data sets, including biometric and demographic data from goats, recovered from the PPNA sites of Wadi Faynan 16, el Hemmeh, and 'Dhra, the recently re-analysed faunal assemblage from MPPNB Beidha, and LPPNB el-Hemmeh are examined in order to investigate shifts in goat exploitation strategies and how changes in resource availability, landscape use, and social organization may have contributed to this process.

Topics : Animal domestication

Keywords : Pre-Pottery Neolithic; Southern Levant; Goat

The entomofauna of Cave Areni-1 (Vayots Dzor, Armenia)

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Archaeological excavations in Areni-1 cave carried out during 2007-2015 (The excavations led by B. Gasparyan the RA NAS Institute of Atomic Energy). The monument is located on the left bank of the Arpa River near the village of Areni, at the fork on the right side of the leading road to the monastery Noravank. Along the gorge cliffs observed many grottos and small caves. Areni-1 cave is a karst type cave (located at an altitude of 1080 meters above sea level) with an area of approximately 800m² situated under the rock shelter and consists of three main galleries. The soil is fragile, the air is dry and the temperature in the galleries during the summer season reaches 23C °, while in distant corners of the cave -19C °. Cliffs' cracks and crevices allow aeration through them, through which also small sized animals can move. Thereby Areni-1 cave has been noted by constant humidity due to condensation water (Abdurakhmanov and Nabozhenko 2011, Gasparyan, 2014). The revealed remains of the archaeological excavations belong to the culture materials of the Late Chalcolithic period represented by complex clay, economic-industrial and ritual function purpose structures. Among them have been found wine production complexes which represent a special cultural importance. Cultural artifacts were found from different layers, which dates back to the end of the first half of the V and IV millennium BC. The cave was also been used during the Middle Ages (from early to late). The excavations carried out also assembled archaeozoological material of arthropods, which clarify the paleo-environment of the monument area. The material reflects relatively the rich biodiversity of the area and taxonomically belong to the order Coleoptera which is represented by species of the families Carabidae, Histeridae, Scarabaeidae, Ptinidae, Dermestidae, Tenebrionidae, Chrysomelidae, genus *Chilotomus* sp. (Carabidae det. Kalashian), which is rare in Armenia (for verbal communication M. Kalashyan) and *Gallerucella* cf. *luteola* (Chrysomelidae) may be was a random Vagrants. Species of other families which live in the soil, also was remarkable like rodent holes, soil, manure and common warehouses pests. There are remains of rare species (*Copris hispanus*) and endemic Caucasian (Tenebrionidae; *Leptodes semenovi*, *Blaps scabriuscula scabriuscula*). The results revealed also one species of ectoparasites mites *Argas* sp. (Acarina, Argasidae, det K. Dilbaryan.) – Ectoparasite of birds and in the residue there found eaten feathers. Among the insects (Insecta) have been found flea (Siphonaptera, *Ctenocephalides felis*) – ectoparasites of cats, dogs, sheep and goats, which sometimes parasites human.

Topics : Biodiversity in the past

Keywords : Entomofauna; Areni-1 cave; Biodiversity; Armenia

A dovecot in the Negev: pigeon management in a marginal region of the Byzantine Empire

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Excavations in a collapsed pigeon tower located in the agricultural hinterland of the Byzantine village of Subeita (western Negev, Israel) yielded an assemblage of well-preserved pigeon bones from the 6th century AD. These bones represent catastrophic in situ mortality of many different individuals, and therefore provide an opportunity to study questions relating to management and breeding of

pigeons in late Antiquity. These questions will be addressed using comparative metric data obtained from archaeological and recent pigeon specimens – including Darwin’s pigeon collection. The results suggest extensive pigeon management in the Byzantine Negev, with no evidence to breed improvement. The importance of this conclusion will be discussed in view of our knowledge on pigeon domestication and historical management patterns.

Topics : Animal domestication; Development and diffusion of animal husbandry

Keywords : Pigeons; Negev; Byzantine period

Origins of land tenure? Integrating isotopic evidence from caprines and equids at Chalcolithic Köşk Höyük, Central Anatolia

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Isotope analysis of faunal remains allow reconstruction of the geographic and seasonal configuration of pastoral management and hunting practices in the past. Köşk Höyük was a small agricultural settlement occupied from the Early to Middle Chalcolithic (c. 6000-4500 cal. BC). The settlement was located within easy proximity of a variety of lowland and upland resource areas in Central Anatolia. Previous archaeozoological and isotope analysis of caprine and equid remains from the site indicate that there was a dramatic shift in the organization of the pastoral and hunting economy coinciding with significant cultural changes observed between the Early and Middle Chalcolithic periods. These results suggest people intensified production of caprines, abandoned previous hunting activities, and radically shifted the geographic arrangement of grazing areas. We integrate carbon and oxygen isotope data with previous strontium isotope results in caprines and equids to more fully consider the social implications of these changes in the animal economy at Köşk Höyük and the differentiation of herding practices with increasing social complexity.

Topics : Development and diffusion of animal husbandry; Subsistence economy

Keywords : Carbon, oxygen & strontium isotopes; Pastoral management; Chalcolithic; Land use

Households, feasting, and community at a Middle Bronze village on Cyprus

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Current analysis of faunal remains from the Bronze Age village site of Politiko-Troullia in central Cyprus offers the opportunity to add detail to the ongoing effort to characterize societal changes during the transition from the Middle Bronze Age to the Late Bronze on the island. Politiko-Troullia is located in the northern foothills of the Troodos Mountains. Radiocarbon dating indicates an occupation around 2100-1900 cal. BC. Ovicaprid bones dominate the faunal assemblage, with bones from Mesopotamian fallow deer (*Dama mesopotamica*) and cattle following in frequency. Bones were recovered throughout the excavated units that revealed household blocks and larger communal spaces. Significant quantities of sheep, goat, and deer bones were retrieved in a

courtyard area associated with communal feasting activities. In this paper I present several lines of evidence from the bones, the distribution of which varied between the household and communal areas of the site. The faunal data will include: frequencies of sheep to goat and of the sheep/goat herds to deer; carcass distribution and butchery patterns; mortality profiles; and bone biometrics. Differences between household exploitation of animals and communal consumption can augment a developing understanding of village social identity and reflect larger patterns of social change on Cyprus.

Topics : Archaeozoology

Keywords : Cyprus; faunal analysis; feasting; Middle Bronze

Old dentitions and young post-crania: sheep burials in the Ptolemaic-Early Roman animal necropolis at Syene/Upper Egypt

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Excavations at the Ptolemaic–Early Roman animal necropolis at Syene/Aswan in Upper Egypt revealed the presence of more than 300 skeletons of domestic animals. Sheep predominate in this assemblage, but dogs, cats and cattle were ritually buried as well. The animals have been deposited into a shallow pits without prior mummification. On-going archaeozoological analysis of sheep shows some interesting patterns meriting a closer look. Methodologically of particular interest is the discrepancy noted between age estimates based on eruption and/or abrasion of teeth versus the individual's epiphyseal status. To quantify this discrepancy, we compared recordings with those obtained from modern populations of sheep of known age (e.g. the Karakul population housed in the Julius Kühn collection, Halle) as well as (pre)historic sheep (e.g. Manching) exploited in different kinds of environments. The rate at which tooth wear takes place in the different populations will be evaluated and possible causal relationships discussed. Being essential for demographic profiling, an approach for estimating the rate of tooth wear in ancient sheep populations will be presented.

Topics : Socio-symbolic use of animals; Methods

Keywords : Ptolemaic; Roman Egypt; Animal necropolis; Sheep; Ageing criteria; Teeth

Manot Cave (Western Galilee, Israel) as a late Pleistocene hyena den: new evidence from Area D

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Manot Cave is situated in the western Galilee hills of Israel. Excavations have been conducted since 2010, yielding a rich archaeological record. The cave was used since the Middle Palaeolithic period until a collapse sealed the entrance around 30,000. The human occupation is attributed mainly to the Early Upper Palaeolithic period (46-33ka). The cave structure comprises three halls. Elongated main hall (80m long, 10–25m wide) aligned to the west-east axis and two small lower level chambers connected on both north and south. Area D is located in the main hall of the cave on top of the

western talus less than 15 meters from the assumed cave entrance. Seven sedimentological layers were found and contain flint items, bones, coprolites and stones in varied ratios. The Area D ungulate-dominated faunal assemblage was studied in detail to determine the accumulation agent/sand shed light on the occupation of the cave by humans and carnivores. No evidence of in situ human activities was identified, pointing to the presence of artifacts as being a result of slope sliding. The accumulation of most bones and the coprolites seems to have occurred in situ by carnivore activities. Our taphonomic results match the known criteria for hyena den: juvenile Spotted hyena (*Crocuta crocuta*) bones, numerous coprolites and high proportion of gnawing marks on ungulate bones. Therefore we suggest that Manot Cave served alternately as humans' shelter and hyena den. Several conclusions pertaining to the nature of human-hyena interactions during the Early Upper Palaeolithic in the Levant will be offered.

Topics : Archaeozoology

Keywords : Manot Cave; Early Upper Palaeolithic; *Crocuta crocuta*; Hyena den

Mousetrack: tracking the earliest evidence for the house mouse dispersal in Cyprus and Anatolia using geometric morphometrics analysis and aDNA.

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The house mouse has evolved its commensal behaviour since the Natufian period in the Middle East, the very dawn of sedentary life that triggered the invasive process of the house mouse in the anthropogenic environment. The Neolithic dispersal then initiated its colonization of the globe. Mousetrack explores the first steps of the house mouse diffusion by comparing their dental phenotypes and ancient DNA from PPNB and Aceramic Neolithic sites of adjacent to the Levant regions: Cyprus and Anatolia. Both regions offer us the possibility to track the first steps of the dispersal of this animal towards Europe and at the same time track the origin of the first settlers of Cyprus as well as of the inhabitants of the Anatolian plain. We will also try to shed more light on the colonization event(s) of Cyprus by identifying the origin of the house mice retrieved from PPNB sites of the island. We will compare and discuss the results of the GM analysis with the known migratory routes of Neolithic groups inhabiting the Levant during their north and west movements and possibly identify exchange networks between these adjacent regions.

Topics : Archaeozoology

Keywords : House mouse; Commensalism; Geometric morphometrics; aDNA

Small carnivores from a Late Neolithic burial chamber at Çatalhöyük, Turkey: pelts, rituals, and rodents

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This paper is intended to present results derived from the analysis of small carnivores from a burial chamber at the Late Neolithic Çatalhöyük (TP Area) that shed light on the socioeconomic significance of stone martens, red foxes, and common weasels. All of these are fur-bearing animals, though only the stone marten remains show evidence that this animal was exploited for its pelt. The evidence consists of the observed skeletal bias (only the head parts and foot bones were present) and skinning marks. Two of five sets of articulated feet are most likely linked with an almost completely preserved human infant skeleton. This is very meaningful given the discovery of other human skeletons, largely incomplete and with varying degrees of articulation. It seems that the articulated forepaws were deliberately incorporated into the structure, most likely as a part of burial practice and ritual behaviour. These distinctive deposits, along with rich grave goods, emphasize the uniqueness of the assemblage from the burial chamber, which is decorated by a panel incised with spiral motifs.

Topics : Socio-symbolic use of animals

Keywords : Carnivore; Burial chamber; Rituals; Late Neolithic; Çatalhöyük; Turkey

Our first chicken dish: factors for the integration and dispersal of chicken in/to the Greco-Roman diet

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The Hellenistic southern Levant is currently known as the earliest arena in the western world in which chicken became a part of the local diet. Still, very little is known about the processes which led to this transition in human diet by the Hellenistic period, nor the reasons for chicken's quick dispersal in the region during the Roman time. Moreover, we have no data regarding the physiology and genetic traits of this Greco-Roman chicken, its nutrition, or its special niche in the regional livestock-based economy. This study integrates data from morphometry, stable isotope analysis and genetics, to firstly deal with those scientific gaps.

Our results supply some first insights regarding the physical and behavioural changes in chickens which, as we suggest, resulted from significant progressions in animals managements and hybridization occurred by the Greco-Roman period. We farther suggest that a major factor for the favour of chicken is related to cultural identity. A survey of tens Levantine Roman site shows that high proportions of chicken were observed particularly in typical Jewish sites. Not surprisingly, these sites also presented scarce proportions or absence of pig – which was tabooed for the Jewish population. Plausibly, the ban on pork encouraged those people to quickly adopt poultry and eggs as a sufficient source of animal-based protein.

Topics : Archaeozoology; Animal domestication; Development and diffusion of animal husbandry

Keywords : Chicken; Levant; Diet; Economic exploitation; Hybridization; Hellenistic; Roman

Pigs in between: pig husbandry in the Late Neolithic in Northern Mesopotamia

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Pigs in Between: Pig Husbandry in the Late Neolithic in Northern Mesopotamia Stuck between the agricultural and urban revolutions, the Late Neolithic (7th and 6th millennia BC) often gets glossed over by zooarchaeologists and archaeologists alike. Yet, though the Late Neolithic suffers from a pronounced "middle child syndrome," there are reasons to suspect that it was dynamic in its own right. It was in this period that agriculture expanded across the Near East and into Europe, ceramic technology was adopted for the first time, and new forms of social organization were developed. In this paper, I will discuss the changing patterns of pig (*Sus scrofa*) husbandry during the Late Neolithic in northern Mesopotamia, the region where pigs were first domesticated during the Pre-Pottery Neolithic. I show the evolving nature of pig husbandry at four sites – Jarmo, Domuztepe, Banahilk, and Umm Qseir, using various types of zooarchaeological datasets, including evidence from pathologies, geometric morphometrics, survivorship, and biometrics. Pig husbandry generally transitioned to more intensive forms during this period from the more extensive patterns that predominated in the Pre-Pottery Neolithic. These changes in pig husbandry, I argue, were likely connected to evolving foodways, agricultural expansion, and incipient forms of social complexity in the Late Neolithic period.

Topics : Animal domestication; Development and diffusion of animal husbandry

Keywords : Pigs; Late Neolithic; Animal Husbandry

Ageing lambs - non-linear prediction models for estimating age from breadth measurements

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Traditional methods for estimating age at death are based on dental and epiphyseal fusion data, which have rather large prediction intervals. For understanding the prenatal to early infantile mortality of sheep in prehistoric assemblages, narrow prediction intervals are needed, though. To tackle this issue new age prediction models were tested based on measurements taken from a modern collection of Rasa Aragonesa sheep housed in the Instituto Pirenaico de Ecología (Jaca, Spain). For these animals dates of birth and death are known as well as sex and a series of other data such as weight at slaughter, weight of organs, and health conditions. Based on these data non-linear functions were developed and applied to archaeological material. Two applications will be presented here. The first concerns a sheep foetus found in the grave of a ewe on an animal cemetery at Aswan (Egypt). According to the condition in which the foetus was buried, it must have died shortly before

or during birth. The second case study deals with the age at death calculated for bones of very young sheep unearthed at Aşıklı Höyük (Turkey).

Topics : Archaeozoology

Keywords : Sheep; Non-linear regression; Ageing

Exploring Ubaid-Period agriculture in Northern Mesopotamia: the fifth-millennium BC animal remains from Tell Ziyadeh, Syria

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Excavations at the Syrian site of Tell Ziyadeh in the 1990s yielded a considerable body of archaeological evidence documenting life at a fifth-millennium BC settlement in northern Mesopotamia. The findings include a sizeable faunal assemblage recovered from occupation levels dated to approximately 4800-4200 BC, thus spanning several centuries of the later Northern Ubaid and initial Late Chalcolithic periods of the region. Providing one of the largest zooarchaeological datasets from the Khabur Basin for this temporal range, the Ziyadeh material affords a valuable opportunity to explore the animal-based economy of a rural site during a critical phase of socio-cultural transition in northern Mesopotamia. The closing centuries of the fifth millennium are marked by cultural shifts that would culminate in the emergence of urban life over the course of the fourth and third millennia, the societies of the Ubaid and immediate post-Ubaid commonly viewed as forming a bridge between the Neolithic Revolution and the Urban Revolution. Recent archaeological work makes it clear that an indigenous trajectory towards urbanization was established in northern Mesopotamia by the end of the 5th millennium, and that socio-cultural evolution in the north did not mirror the pattern documented for the south during the Uruk period. The animal remains from Tell Ziyadeh indicate that residents of this site maintained a diverse, localized agricultural practice that likely became more integrated into a regional economy by the end of the fifth millennium BC, highlighting a trend toward greater sedentarization and expanding social networks already recognized by other archaeological analyses for the region.

Topics : Archaeozoology; Subsistence economy

Keywords : Northern Mesopotamia; Syria; Tell Ziyadeh; Ubaid Period; Urban Revolution

Animal exploitation in the Samarkand Oasis (Uzbekistan) at the time of the Arab conquest: zooarchaeological evidence from the excavation at Kafir Kala

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Since ancient times, Central Asian economy is based on a combination of irrigated agriculture and pastoralism. If researches on the ancient irrigation systems are relatively abundant, zooarchaeological studies in Central Asia are instead rather scarce. This poster presents the results

of the zooarchaeological studies of animal bones found at the citadel of Kafir Kala during the Uzbek-Italian excavation. In the Early Middle Ages (6th-7th centuries CE) this site was a major administrative center located along the local Silk Road routes. After the Arab conquest at the beginning of 8th century CE, the site was settled for residential purposes. The preliminary zooarchaeological analysis was conducted over 4600 faunal remains retrieved in the 2001-2014 season. Domestic animals were predominant. Sheep and goats cover ca. 90% of the total, followed by fewer cattle and scarce equids, pigs, dogs and cats. A limited number of bird bones (galliformes) has been also recognized, while wild animals are almost absent. Moreover, the evaluation of the age-at-death provides important information about the diet and the production/processing of secondary products.

Topics : Archaeozoology

Keywords : Kafir Kala; Silk Road; Arab conquest; Domestic animals

Investigating the animal economy of Kaymakçı, a regional center of the Late Bronze Age, in Western Turkey

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Following three excavation seasons (2014-2016) and zooarchaeological analysis, the focus of this study is to assess the character of the animal economy at the site of Kaymakçı. In particular, the degree to which the zooarchaeological remains appear compatible with an interpretation of Kaymakçı as the regional Late Bronze Age capital is investigated. To scrutinize further, the influence of, and resemblance to, the animal economies of contemporary Aegean and Central Anatolian trading contacts are explored. Outcomes of characterizing the animal economy in Kaymakçı can be used to confirm, sharpen, or perhaps challenge interpretations of the political significance and central position of the citadel of Kaymakçı during the Late Bronze Age.

Topics : Subsistence economy

Keywords : Kaymakci; Late bronze age; Lydia; Turkey; Western Turkey; Marmara; Manisa Gygaia Lake

Identifying dietary customs in zooarchaeology: Kashrut as a case study

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Evidence for Jewish dietary practices (Kashrut) in historical periods can be identified through three characteristics of the faunal assemblage: species present, body part frequencies, and butchery patterns. While presence/absence of non-kosher species (i.e. pig and catfish) is commonly used as an indicator for Jewish dietary practices, their presence can be related to a variety of other factors, thus limiting this approach. Rather, a discussion on ancient Kashrut butchering and consumption practices may be another avenue for research. Currently, there is no agreed-upon methodology for identifying sociocultural cut-marks amongst scholars, let alone a consensus on the ability to identify kashrut markings. Consequently, zooarchaeological scholarship on ancient kashrut practices has conflicting modes of identification while relying on various understandings of the textual sources. Based on the faunal analysis of Iron Age IIB, Hellenistic, and Early Roman levels of Jerusalem, a cultic capital in the Hebrew Bible, I mediate the current debate within scholarship and propose future research aimed towards the creation of a standardized methodology. The purpose of this discussion

is to shed light on the development of kashrut practices in ancient Israel as well as propose another approach for identifying Jewish settlements beyond the pig taboo debate.

Topics : Archaeozoology

Keywords : Sumptuary laws; Kashrut; Butchery methodology; Dietary customs

Subsistence strategies at the Aceramic Neolithic site of Chogha Golan, Iran

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In this presentation, we provide an updated analysis of the subsistence strategies of the occupants of Chogha Golan, an Aceramic Neolithic site in the Zagros foothills of western Iran. Archaeologists in the Tübingen-Iranian Stone Age Research project conducted excavations at the site in 2009 and 2010. In subsequent years, we have studied large portions of the ample lithic, ground stone, clay figurine, ornament, archaeobotanical, and faunal remains. The site, which spans 11,700 to 9,600 cal. BP, is an 8-meter deep tell with 11 archaeological horizons and occasional plaster floors and archaeological features. Preliminary zooarchaeological analyses indicate that the inhabitants exploited a range of small and large mammals, as well as birds, tortoise, and fish. The unusually rich archaeobotanical remains preserve 117 taxa including a large number of economically important species, most significantly wild barley, goat grass, and small-seeded pulses. We have also documented different wheat species, lentils, peas, and various vetches, in addition to other edible taxa. In our previous research, we noted two major dietary shifts at Chogha Golan. The first occurred midway through the sequence (between 10,600 and 10,000 cal. BP), and involved an increase in gazelles and small-seeded grasses. The second took place at around 9,800 cal. BP and is evidenced by an increase in cattle exploitation and domesticated-type emmer wheat. Our current study updates these previously identified trends with an increased sample size of faunal and archaeobotanical materials from two different areas of the site. We continue to rely on the fine-scale recovery techniques employed by the excavators in order to make as high-resolution interpretations as possible, and consider the site within the larger context of environmental, cultural, and demographic changes occurring in southwest Asia during the transition from foraging to farming.

Topics : Development and diffusion of animal husbandry; Subsistence economy

Keywords : Neolithic; Zagros; Subsistence strategies

The forager-herder trade off, from broad spectrum hunting to sheep management at Aşıklı Höyük, Turkey

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Aşıklı Höyük is the earliest documented pre-ceramic Neolithic mound site in Central Anatolia. The oldest deposits at the base of the mound (Levels 4 and 5) span 8200 to ca. 8500 cal. BC, associate with round-house architecture and arguably represent the birth of the Pre-Pottery Neolithic in the region. The meat diet of these early occupants consisted of diverse wild ungulate and small animal species and hence was quite broad. The meat diet narrowed gradually over just a few centuries to an exceptional emphasis on caprines (mainly sheep). Age-sex distributions of the caprines indicate selective manipulation by humans by or before 8200 cal. BC. Primary dung accumulations between the structures demonstrate that ruminants were held captive inside the settlement at this time. The zooarchaeological and geoarchaeological evidence together demonstrate an emergent process of caprine management that was highly experimental in nature and oriented to quick returns. Stabling was one of the early mechanisms of caprine population isolation, a precondition to domestication. The village environment meanwhile was invaded by a variety of commensal rodent and anura (mainly toad) species during the early occupations. *Cricetulus migrators* and *Apodemus sylvaticus* are most abundant rodents. Their strong attraction to wheat and barley seeds is well known, but the distribution their skeletal remains and feces within the site is biased to building features. The human-built environment also proved attractive to toads, which greatly outnumber frogs despite the close proximity of the Melendiz river.

Topics : Archaeozoology; Animal domestication; Development and diffusion of animal husbandry; Biodiversity in the past

Keywords : Pre-pottery Neolithic; Central Anatolia; Caprine domestication; Stabling deposits; Commensals

The terrestrial fauna of Early Iron Age Salut (Oman)

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The poster presents the results of the first archaeozoological campaigns held in 2016 at the Iron Age site of Salut, in the Sultanate of Oman. The site has been excavated by the University of Pisa and by the Italian Mission to Oman (IMTO) since 2004. Salut is a complex fortified settlement dating from 1300 to 300 BC, located on a hilltop in the middle of an ancient oasis west of Al-Hajar mountains, not far from the modern town of Bisiyah in eastern Oman. The archaeozoological study has been carried out in collaboration with the Museum of Natural History of Geneva and concerns the evidence found in some selected contexts of the Early Iron Age (1300-600 BC), for which C14 dating is available. The study, focused on terrestrial fauna (the vast majority of the findings), reports about the various species identified, their relative proportion in a diachronical perspective, and contains specific remarks about each taxon. Considerations regarding the preservation of the different anatomical parts are made. Metrical data are presented and compared with those recorded for other contemporary sites in the region. The study takes into account the age profiles of the faunal assemblage and is concluded with a taphonomical analysis casting some light on butchery practices.

Topics : Archaeozoology

Keywords : Archaeozoology; Iron Age; Salut; Oman; Terrestrial fauna

The living and the dead: zooarchaeological comparison between domestic and mortuary faunal assemblages in a Middle Bronze Age village in Northern Israel

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The faunal assemblage from a Middle-Bronze Age village (c. 2000-1550 BC) excavated in the Jezreel Valley in Israel comprises of a high percentage of pigs (>50%), most of which died young. The significant role of pigs in the village culture is also demonstrated by the unique find of an adult pig burial found under the floor of a domestic structure. Its interment may have been associated with the human baby, buried in a jug under the floor of the same structure. This faunal assemblage with its abundance of pig-remains differs significantly from a contemporary assemblage in a nearby burial cave that was dominated by sheep and goats (>80%). Comparisons between the two sites representing aspects of the same settlement system reveal typical differences between faunal assemblages from mortuary and domestic contexts that can be distinguished based on the range of species and body part representation. While the zooarchaeological assemblage of the village is characteristic of the consumption output from a village economy, the fauna from the burial cave recalls offering practices associated with mortuary traditions of honorary ritual banquets.

Topics : Archaeozoology; Subsistence economy; Socio-symbolic use of animals

Keywords : Middle Bronze Age; Subsistence economy; Suidae; Domestic; Mortuary

The exploitation of terrestrial and aquatic animals at ed-Dur (Umm al-Qaiwain, United Arab Emirates)

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Between 1987 and 1994, excavations were carried out by an international consortium of teams from Belgium, Denmark, France and Great Britain at the coastal site of ed-Dur. In contexts dating between the second and fourth centuries AD more than 19,000 identified animal bones were found that allowed a diachronic and spatial analysis. Subsistence relied heavily on domestic animals, in particular sheep and goat, and on fishing. Whereas the exploitation of terrestrial resources seems to have been quite constant throughout the period considered, the aquatic fauna shows changes through time. A shift, possibly linked to overexploitation, is seen both in the proportions of the targeted fish species and in their sizes. The deposition of some of the mammals encountered in burials is also dealt with; dog and ovicaprid can likely be added to the list of mammals used in ritual context in the region. The spatial analysis did not reveal particular concentrations or activity areas.

Topics : Archaeozoology

Keywords : Archaeozoology; Subsistence; Fishing; Herding; Hunting; Animal burial

Evolution of the Cypriot vertebrate fauna during the Neolithic transition, 13th-9th millennia BP

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Cyprus is an oceanic island that has never been connected to the mainland. During the Late Glacial, the mammal fauna was very restricted, with only four endemic species: dwarf hippos and elephants, mice and a genet. The earliest attested presence of human on the island dates to the 13th millennium cal. BP. It initiated a complex process of faunal turnover which developed all along the Neolithic transition, until the 9th millennium. During the last 15 years, new excavations and archaeozoological analyses conducted sites such as Aetokremnos, Klimonas, Asprokremnos, Shillourokambos or Mylouthkia, provided much more information about the impressive phenomenon of early anthropisation of a Mediterranean island. This presentation will summarize this new information. It will deal with the hippo fauna extinction, with the immigration of mice or other wild species such as the Cyprus wild boar or the Mesopotamian fallow deer, with the introduction of early domestic species and with the release to the wild of some of them, and with terminal phase of the evolution of the amphibian and reptile fauna during this major transition. This analyses suggests that voyaging between the continent and Cyprus was much more intense and that navigation techniques were much more sophisticated than one thought before.

Topics : Biodiversity in the past

Keywords : Cyprus; Vertebrate; Late glacial; Holocene; Extinction; Introduction; Voyaging

Impact of geographical position, political influences and trade activities on animal economy in the Early Islamic periods in Syria and Lebanon

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The paper presents the study of faunal remains from Islamic sites occupied during the Umayyad, Abbasid, Ayyubid, Mameluk periods (VII-XV^e c. AD) in Syria. New data are analysed from Madinat al Far and Kharab Sayyar located near the Balikh river in the Syrian Jezirah, from Al Andarin lying between the Limestone Massif to the west and the Syrian steppe to the east, Qasr al Hayr al Sharqi in the Syrian Desert and from the Citadel of Damascus in south-western Syria as well as from Sidon et Byblos on the Lebanese coast. Husbandry and food economy, kill-off patterns and animal products exploitation as well as butchery practices in the early Islamic times in Syria and Lebanon are discussed according to the environmental setting of these different cities and the type of occupation: stopping place or town located on a trading road, cities.

Topics : Archaeozoology

Keywords : Animal economy; Diet; Islamic periods; Syria; Lebanon

Exploitation of animal resources in the Early Neolithic of Thrace: preliminary results from the site of Nova Nadezhda, Bulgaria

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The site of Nova Nadezhda is situated in the fertile floodplain of the Middle Maritsa Valley, Bulgarian Thrace. A large scale rescue project in 2013-2014 revealed the remains of successive occupation throughout the Neolithic and Chalcolithic (early sixth to late fifth mill. BC), and also in the Early Iron Age (11th-9th c. BC), as well as a Muslim cemetery (17th-18th c.).

In this paper we will discuss the preliminary results of the analyses of faunal remains and bone tools from the Early Neolithic strata (Karanovo I period). The faunal analysis showed a mixed herding strategy dominated by caprines, but with significant contributions from wild animals, specifically red and roe deer. Also, approximately 200 osseous artefacts were found: finished tools, ornaments and manufacture debris. Bone was the predominant raw material, mostly from sheep/goats and cattle, and a few antler and shell artefacts were also discovered. Typological repertoire includes awls, needles, heavy points, spatulae, scrapers, and also some chronologically and regionally characteristic techno-types, such as spatula-spoons from cattle metapodials. The presence of manufacture debris also helped the reconstruction of the technological procedures.

Topics : Archaeozoology

Keywords : Early Neolithic; Animal husbandry; Bone tools

Bone artefacts from Kale-Krševica: a Late Classical and Early Hellenistic period 'Hellenised' site in south-eastern Serbia

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The bone industry from the Iron Age is still insufficiently explored topic in the region of South-East Europe. In this paper will be presented some preliminary results on the osseous artefacts from the Late Iron Age site of Kale-Krševica, situated in the vicinity of the town of Vranje in the south-eastern Serbia. Systematic archaeological excavations revealed the settlement remains, including fascinating architectural features, as well as rich portable material, showing strong resemblance with settlements from ancient Macedonia and northern Greece. The bone tools include some widespread common artefact types, such as awls, needles, but also ground astragals and other artefact types. Also manufacture debris was noted, including sheep horn cores with traces of cutting, suggesting that the horns were also used. In this paper we will discuss raw material choices, aspects of production and the typological repertoire, in particular, we will explore possible similarities and differences with the osseous artefacts from the south, in order to explore whether the 'Hellenization process' is noticeable within the Kale's bone industries.

Topics : Others

Keywords : Bone tools; Bone technology; Osseous raw materials

Hatching bees - identification and possible meanings of insect figures at Göbekli Tepe

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Wild animals occupy a central position in the pictorial cosmos of the earliest Neolithic (PPNA) in Upper Mesopotamia. Together with abstract signs, animal figures are part of a "system of symbols", which is so far only rudimentarily analysed (Stordeur 2010). Besides relatively large representatives of mammals, birds and reptiles, also comparatively small animals are depicted in PPNA artworks: At various sites probable representations of arthropods were found (Helmer et al. 2004). Often different suppositions exist which arthropod taxa might be represented. At Göbekli Tepe, bas-reliefs on several pillars of enclosure D show very similar, insect-like animals. It was proposed that at least part of them might depict spiders (Schmidt 2012). Based on anatomical features of the arthropod representations, we attempted to identify the respective animals. The figures appear to be closely related to similar figures from Körtik Tepe. Detailed comparative analyses indicate bee or wasp-like insects. In part probably brood cells and insects hatching from brood cells are depicted. The insects and their development may be connected to Early-Neolithic ideas of a regeneration of life.

Topics : Socio-symbolic use of animals

Keywords : Aceramic Neolithic; Southeastern Turkey; Insect representations; Hymenoptera; Symbolism

Effects of environmental change, human mobility and hunting strategies on food procurement during the Natufian and PPNA in Eastern Jordan: the evidence from Shubayqa

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This paper presents faunal evidence excavated as part of on-going work at sites spanning the Natufian and PPNA at Shubayqa located in the Black Desert of Eastern Jordan. Aside from the small faunal assemblages recovered from Azraq 18 and Khallat Anaza, there is a dearth of published data from this important period in this 'marginal zone' when climatic change, human mobility patterns and hunting strategies were changing and influencing how meat and other resources was obtained from animals. In presenting the data from the occupation of Shubayqa, these influences will be discussed allowing interpretation of the changing faunal exploitation patterns. The large assemblage of avifaunal remains indicate that a wetland environment offered suitable habitats for migrating waterfowl and these birds were exploited on a large scale in some months of the year. At other times of the year similarly extensive exploitation of gazelle was the focus of hunting. Other species, such as a wild sheep, onager, tortoise and occasionally wild cattle were also hunted. By the PPNA dogs were living alongside the human population and probably had been present in small numbers since the Natufian. The presence of dogs and their potential as hunting aids as a means for capture small, fast prey such as hare and fox is considered as an alternative for the increase of these animals in the Late Pleistocene.

Topics : Subsistence economy

Keywords : Natufian; PPNA; Avifauna; Gazelle; Hunting; Dog

Ungulate skeletal element profiles: A possible marker for territorial contraction and sedentism in the Levantine Epipaleolithic

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The Epipaleolithic archaeofaunal sequence of the southern Levant (ca. 24,000-11,500 cal. BP) has been thoroughly investigated to reveal changes in prey abundances, ungulate culling patterns and carcass processing habits. Here we investigate the usefulness of skeletal-element profiles of the major hunted ungulate species in the Epipaleolithic sequence of the Israeli Coastal Plain to shed light on the major research issues of this period, namely the identification of early sedentism that is associated with contracting and more consolidated territories and higher site occupation intensity. We present detailed skeletal-element profiles for mountain gazelle (*Gazella gazella*) and Mesopotamian fallow deer (*Dama mesopotamica*) in Kebaran, Geometric Kebaran and Early and Late Natufian assemblages and assess their preservation biases. Then, we employ the Shannon Evenness Index and utility curves to the observed profiles. Differences were found between the pre-Natufian and the Natufian assemblages, possibly indicating more complete carcass transport in the Natufian. We also zoom in to explore the variability in skeletal element abundances in the intra-site scale in the Natufian. Our results are interpreted according to other archaeological proxies for demographic expansion or territorial contraction in the Natufian, affecting all aspects of life (and the

archaeological record) in this period including skeletal-element profiles observed in the faunal assemblages.

Topics : Subsistence economy; Methods

Keywords : Epipaleolithic; Southern Levant; Skeletal; Element profiles; Gazelle; Fallow deer; Natufian

Pathological alterations of the humerus as a possible marker of early caprine management and domestication

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The transition from foraging to farming had major effects on the lives of humans and ‘their’ animals. Relative to the latter, human interference deprived them from the annual cycle known in the wild ancestor whilst imposing a set of new constraints due to the anthropogenic environment. Early in the domestication process, caprines not only faced reduced mobility but also phases of inappropriate feeding, handling, and stabling. Different kinds of health problems can therefore be expected, but only few of these affected the hard tissues typically found in archaeological contexts. In focus of our research are pathologies of the ankle and elbow joints. Here we present the results of our analysis of the health status in the distal humerus of modern wild and domestic *Ovis* and *Capra* versus early Neolithic populations marking the transition from hunting to herding in South-eastern and Central Anatolia (10th-8th millennium BCE). Anatomically speaking, the sagittal ridge (verticillus) of the Trochlea humerii particularly suitable for classifying archaeological finds. A scoring system has been developed and the different caprine populations compared. Using modern references as baselines, diachronic comparison allows documenting effects of human management in early Neolithic caprines. However, differences in stress-induced responses in the locomotor apparatus of sheep and goat can be observed. Apart from methodological issues and limitations using intra-articular lesions as a marker of early caprine management, possible aetiologies will be discussed as well.

Topics : Animal domestication; Development and diffusion of animal husbandry; Subsistence economy; Methods

Keywords : Near East; Early Neolithic; Palaeopathology; Intra-articular lesions; Caprine management

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