VISUALIZING CONNECTIONS BETWEEN EGYPT AND THE SOUTHERN LEVANT USING MAPPING AND NETWORK ANALYSIS

AUTHORS
Evgenia Filimonov, Inna Kizhner, Guy Bar-Oz, Shirly Ben-Dor Evian

AFFILIATIONS
University of Haifa, Israel

INTRODUCTION

1 Objective

The objective is to visualize possible connections between Egypt and the Southern Levant by comparing **Egyptian representations of animals** and **zooarchaeological records** from controlled excavations in the **Southern Levant.**

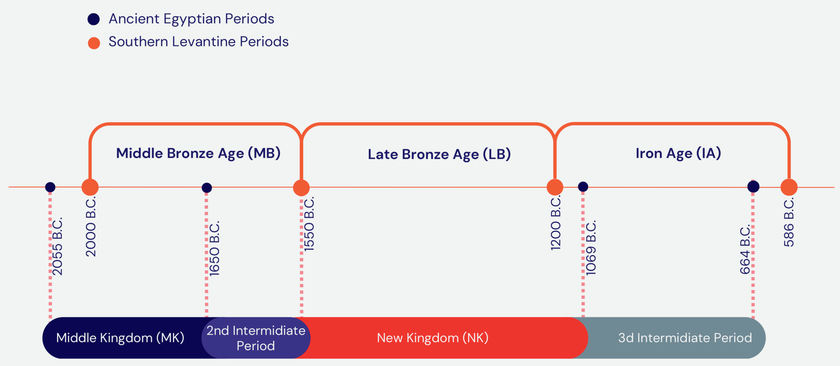
2 Methods

Such a comparison is possible through the use of **GIS** and **network analysis** that will connect the iconographic and zooarchaeological data

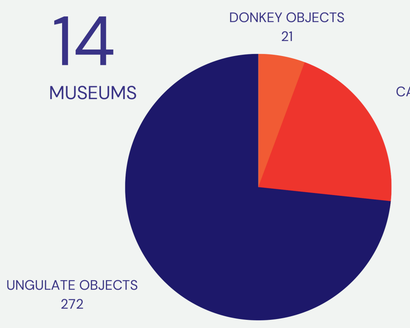
3 Data

Networks will be based on the corpus of data including archaeological sites with the same animals, either as artistic representations or as zooarchaeological remains, within similar timeframes

- Egypt from the Old Kingdom to the New Kingdom and Levant between the Intermediate Bronze Age to the early Iron Age demonstrate numerous examples of connections.
- The representation of animals in Egyptian art has been used to show the Egyptian influence on Canaanite .
- The effects of human-animal relations in Canaanite Egyptian interrelations were observed mostly in local site studies.
- This research seeks to show a broader perspective to cover a wide area including Egypt, the Southern Levant and relevant sites.



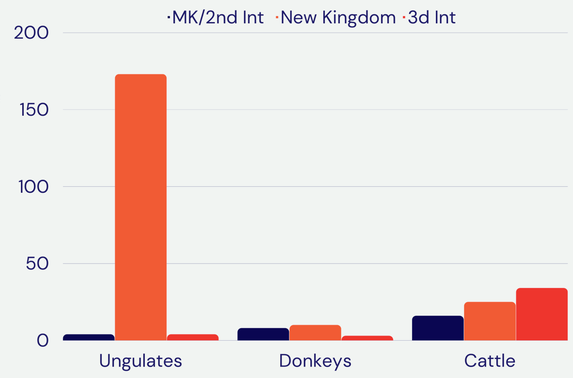
DATA



- Penn Museum
- Brooklyn Museum
- Metropolitan Museum of Art
- "Institute for the Study of Ancient Cultures The University of Chicago"
- British Museum
- National Museum of Scotland
- The Ashmolean Museum at the University of Oxford
- The Museum of Archaeology and Antropology at the University of Cambridge
- The Louvre Museum
- State Museums in Berlin, Egyptian Museum and Papyrus Collection
- The Dutch National Museum of Antiquities
- MUDIRA

data presented
no data

- Kunsthistorisches Museum Vienna
- Staatlische Kunstsammlungen /Dresden
- The Petrie Museum of Egyptian Archaeology at
- University College London The Manchester Museum

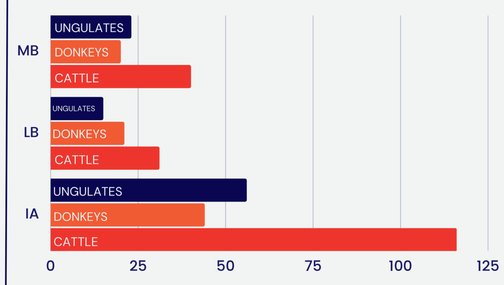


Iconographic data obtained from online collections of cultural heritage with open source data, consist of archaeological evidence - objects and artifacts with animals depictions of certain species identified in database by keywords related to three animal groups.

Database of zooarchaeological remains at the Laboratory of Archaeozoology at the University of Haifa

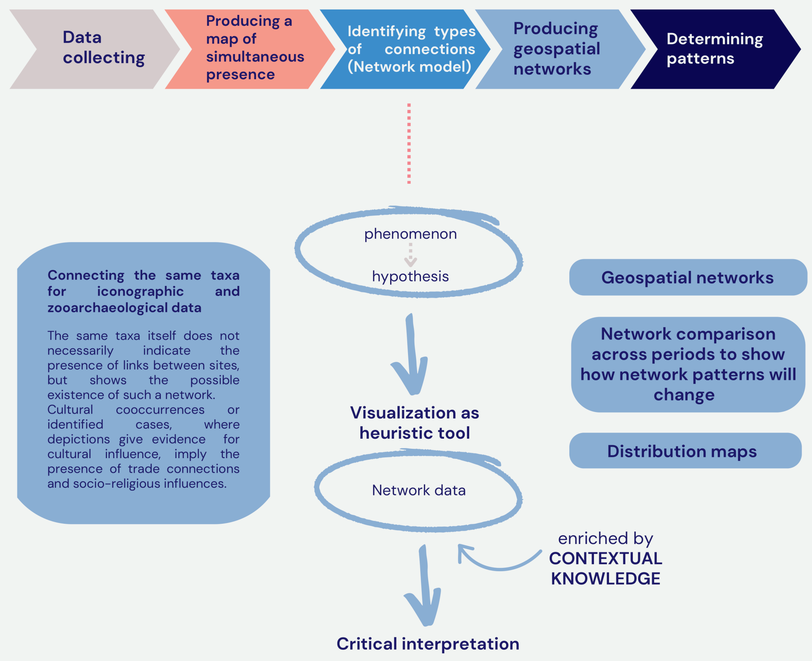
Over **130 zoological species** across **25 time periods** and over **500 sites** that have been collected from multiple sources, such as edited volumes and journal papers

Collected for the research: **gazelle, donkey, cattle** species distribution for **Middle** and **Late Bronze Ages** and **the Iron Age.**



Number of sites with zooarchaeological assemblage in Southern Levant

METHODOLOGY



NETWORK MODELS

"Cattle" model

Phenomenon

- Expansion of dry-farming in Levant in later LB , ploughing cattle quantity growth
- DNA anbalysis shows breeds with Egyptian Zebu (from LB to IA)

Hypothesis

Egyptian agricultural influence on Levant – adaptation of agricultural industries

Conceptualization

Agricultural practices involving cattle imply influencial links and/or probable exchange links of animals or harvest

Network DATA

Nodes : Sites with simiar taxa within ploughing context in both - depictions and archaeozoological assemblage

Edges : interregional interactions

Asset number 36586001. COMPASS Image Caption: From Egypt, Middle Kingdom, about 2040-1750 BC;Wooden model of a man ploughing with oxen

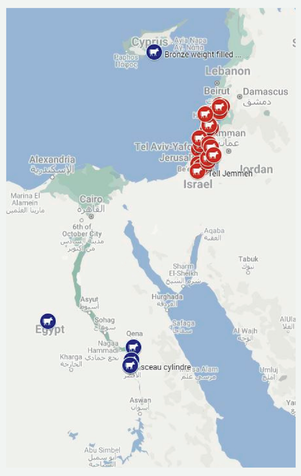
© The Trustees of the British Museum

Criteria for ploughing contexts in archaeozoological assemblages

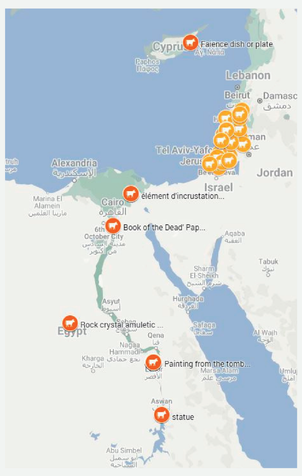
- Bone pathologies
- Demography
- Animal size

Uncertainties and lacks of data for network building at this stage:

- Lack of context data for Levantine sites
- Lack of zebu depictions for MB/LB



Map of the simultaneous presence of cattle depictions in Middle Kingdom and 2nd Intermediate Period in Egypt and relevant zooarchaeological assemblages in Middle Bronze Age in the Southern Levant,
Map data ©2023 Google, Mapa GISrael



Map of the simultaneous presence of cattle depictions in New Kingdom in Egypt and relevant zooarchaeological assemblages in Late Bronze Age in the Southern Levant,
Map data ©2023 Google, Mapa GISrael

"Ungulates" model

Phenomenon

- Depictions of foreigners with ungulates (Procession of asiatics, Tomb of Khnumhotep II, North Wall, Cemetry of Beni Hassan)
- Tribute scenes with a combination of animal species unique to the South Levant (gazelle+ibex+donkey), animals as elite gifts

Hypothesis

Animal trade/or human migration

Conceptualization

Connections between gazelle remains in Levantine sites and gazelle depictions with foreigners imply the existence of trade or migration networks between sites

Network DATA

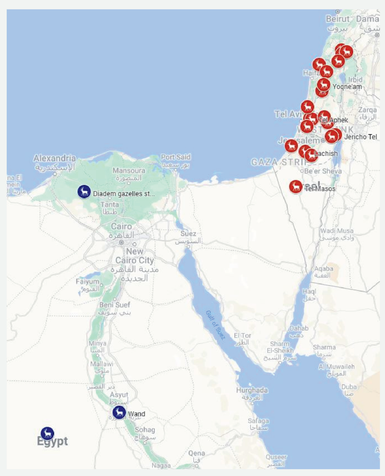
Nodes : Sites with simiar taxa. Egyptian depictions include foreigners or Levantine contexts (siege scenes, inscriptions, combination of animals)
Edges : probable trade or migration routes

Procession of Asiatics, The tomb of Khnumhotep II (Beni Hassan, North wall)

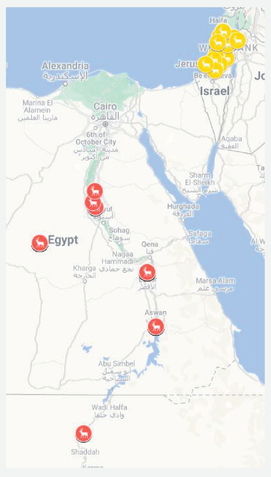
Squatting Man Holding Gazelle, ca. 1938–1759 B.C.E. Faience, 1 3/16 x 11/16 x 5/8 in. (3 x 1.7 x 1.6 cm). Brooklyn Museum, Charles Edwin Wilbour Fund, 37.1054E. Creative Commons-BY

Uncertainties and lack of data for network building at this stage:

- Insufficient iconographic data depicting foreigners or inscriptions next to ungulates from MB/LB
- Difficulties in distinguishing between wild and domestic ungulate bones



Map of the simultaneous presence of ungulate depictions in Middle Kingdom and 2nd Intermediate Period in Egypt and relevant zooarchaeological assemblages in Middle Bronze Age in the Southern Levant,
Map data ©2023 Google, Mapa GISrael



Map of the simultaneous presence of ungulate depictions in New Kingdom in Egypt and relevant zooarchaeological assemblages in Late Bronze Age in the Southern Levant,
Map data ©2023 Google, Mapa GISrael

"Donkeys" model

Phenomenon

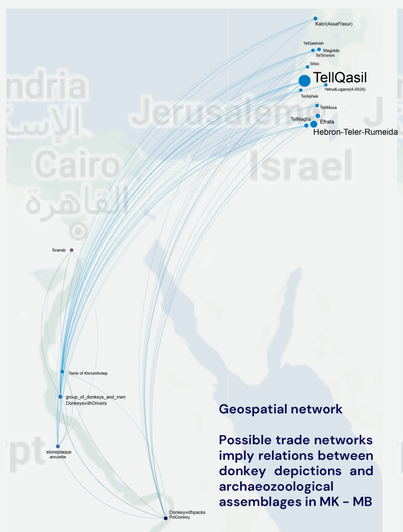
- Donkey as a cultural-ideological marker of high symbolic value in Levant and Ancient Near East
- Donkey as a socially important animal in Egypt (herds of donkeys as a proxy of social status)
- Contemporaneous sacrificial meaning of donkeys in Egypt and the Southern Levant
- Prescence of donkey figurines in both Egypt and the Southern Levant
- Depictions of foreigners with donkeys
- "The rich archival record from Mari and other 'Amorite' centers in Syria (ca. 18th–17th century BCE) provides sample data on extensive trading networks and donkey caravans that operated across the Levant and Anatolia, respectively"

Hypothesis

Socio-religious influence and existence of trading networks with donkey caravans operating across Egypt and the Southern Levant

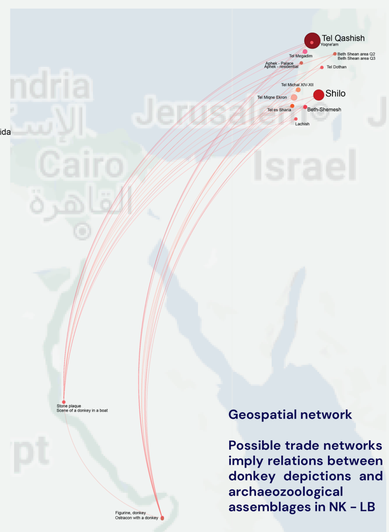
Conceptualization

Donkey remains in Levantine sites and donkey depictions as a beast of burden in Egypt imply the existence of trade networks between sites, where donkey depictions with foreigners are the most probable vertexes



Geospatial network

Possible trade networks imply relations between donkey depictions and archaeozoological assemblages in MK - MB



Geospatial network

Possible trade networks imply relations between donkey depictions and archaeozoological assemblages in NK - LB

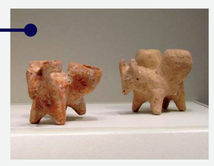
Network DATA

Nodes : Sites with simiar taxa. Egyptian depictions include foreigners or beasts of burden

Edges : probable trade connections

The tomb of Khnumhotep II (Beni Hassan, North wall)
Kanawati, Naguib, and Linda Evans. 2014. *Beni Hassan*. Volume I. The tomb of Khnumhotep II. Oxford: Aris & Phillips Ltd.

Donkey with packs on its back, Second Intermediate Period–Early New Kingdom, ca. 1991–1450 B.C. Metropolitan Museum of Art



Figurines of donkeys carrying produce, Azor and Tzomet Harish, Early Bronze Age, 3500-3000 BCE. The Israel Museum

Abydos donkeys in situ within brick tombs.
doi: 105. 3715-20. 10.1073/pnas.0709692105.

The donkey interment inside the circular installation. Notice the 1992 find of the donkey's skull and bit in situ (on the right).
doi:10.1371/journal.pone.0058648.g003

FURTHER WORK

- Data corpus extension by adding such data as:
  archeozoological data
  - bone pathologies
  - demography

  iconographic data
  - animal depictions in the tombs
  - deep search in museum collections
- Building dynamic networks with extended corpus of data
- Adding to data probability properties based on the cultural interpretations
- Building networks, where the edge weight will show the probability of connections

EGYPT AND THE SOUTHERN LEVANT

Interactive map of simultaneous presence of animal depictions in Egypt and related species archeozoological assemblage in the Southern Levant. The map allows to sort data by periods and species groups.