*PhD Project in Archaeology**

THE HUMAN SETTLEMENT BETWEEN THE 7TH AND 4TH MILLENNIUM BC, BETWEEN TAGUS AND MONDEGO VALLEYS (PORTUGAL): A TERRITORIAL APPROACH THROUGH GIS

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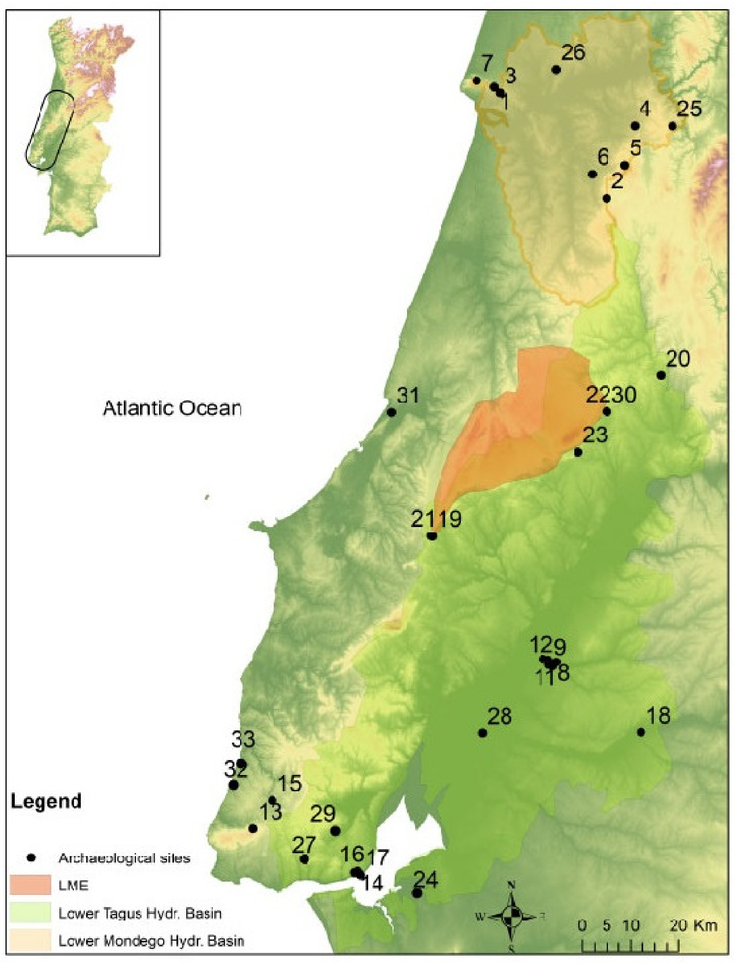
INTRODUCTION

Landscape occupation and exploitation dynamics on the Portuguese coast between Tagus and Mondego valleys, between the 7th and 4th millennium BC (6200~3800 cal B.C.), have suffered profound changes as a consequence of cultural and economic transformations during the transition from an exclusive hunter-gatherer economy to one that is based on agriculture and domestication.

In this project, I aim to understand how the environmental, cultural and symbolic factors influenced human settlement during this phase. By using Geographical Information System (GIS) tools, I seek to detect new settlement areas, trace possible mobility routes, and explain the Human-Environment relationship on a heterogeneous territory.



Map of the author. Digital Elevation Model based on ASTER GDEM (courtesy of METI and NASA), modified. Archaeological sites(1-4): 1-Várzea do Lírio, 2-Buraca Grande, 3-Junqueira, 4-Eira Pedrinha, 5-Cova do Ladrão, 6-Pelónia, 7-Prazo, 8-12-concheiros de Muge, 13-S.Pedro do Canaferrim, 14-Lumiares/Ludovice, 15-Lameiras, 16-Encosta de Sant'Ana, 17-Armazéns Sommer, 18-Casas Novas, 19-Forno da Telha, 20-Caldeirão, 21-Abrigo Grande das Bocas, 22-Pena d'Água, 23-Almonda, 24-Gaio, 25-Senhora da Alegria, 26-Forno da Cal, 27-Carrascal, 28-Monte da Foz 1, 29-Correio-Mor, 30-Costa do Pereiro, 31-Meu Jardim, 32-Magoito, 33-S.Julião.

OBJECTIVES

- Identify the territory occupation patterns for each chrono-cultural phase.
- Analyze the regional variation of the identified settlement dynamics.
- Characterize the human relationship with the physical landscape, resources exploitation and mobility for hunter-gatherers and neolithic communities.
- Detect if the identified patterns are human responses to environmental factors.
- Verify if the settlement dynamics that occur during the Late Mesolithic phase continue or stop during the Early and Middle Neolithic.
- Identify and understand the preponderance of the social-economic, cultural and symbolic factors on the settlement patterns observed.

STATE OF THE ART

Key aspects:

- Demic diffusion (7)
- Cultural exchanges
- Mobility strategies
- Environmental exploitation
- Agriculture and domestication process
- Different types of sites: open-air, shell-middens, cave, shelter, funerary sites

- Scarcity of sites on the coast.
- Scarcity of studies using GIS technologies for Mesolithic and Neolithic.
- Lack of detailed study that focuses on territorial characterization, settlement and mobility of human communities.
- Lack of knowledge on the preponderance of each environmental element in choosing the location of sites with different functionalities.

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METHODS(5,6)

Stage 1 Bibliographic and cartographic collection

- Field reports
- Altimetric, geological and environmental data, aerial photography

Stage 2 Database construction on ArcGIS (ESRI)

- Dependent variables (type of site, chronology)
- Independent variables (slope, orientation, distance to water)
- Behaviour simulation tests (intervisibility, accessibility, cost-surface)

Stage 3 a) Spatial and statistical analysis

- Univariate and exploratory statistical analysis of the data

b) Spatial and predictive models

- Creation of multiple spatial and predictive models

Stage 4 Test and model validation

- Surface field surveys

Stage 5 Analysis and results interpretation

- Analysis and interpretion of the relationships between patterns and tendencies
- Comparison of the models to each chronological phase and area for its efficiency