



PALEOGENOMIC INSIGHTS INTO A MEDIEVAL HUMAN SETTLEMENT: THE COMMUNITY OF SANTA SEVERA (ROME, 7th–15th CENTURY CE)

PhD Student: Giulia Orefice

Supervisor: Prof. Cristina Martínez-Labarga / *Co-supervisor:* Prof. Claudio Ottoni

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This PhD project aims to investigate the Medieval population of Santa Severa (Rome, Italy) through a multidisciplinary approach combining paleogenomic and metagenomic analyses of human remains.

The Castle of Santa Severa was built during the Medieval period on the Etruscan settlement of *Pyrgi* noted as one of the most important harbours of the Etruscan city of *Caere*, which handled a Mediterranean-wide scale trade and was frequented by Greek and Phoenician navigators. A Roman maritime colony was founded in the same place. On the ruins of the Roman buildings, a large cemetery in use during the transition between the Early and Late Medieval period was uncovered. The cemetery areas of Casa del Nostromo and Piazza della Rocca confirm that the cemetery area was in use from the 7th to 15th centuries CE.

For this project, starting from a skeletal collection of 455 individuals, will be selected remains from 100 individuals based on archaeological and anthropological information. Ancient DNA analysis will make it possible to reconstruct genetic ancestries of this Italian Medieval population, so as to investigate its origin, understand its relationship with Etruscans, and assess potential kinship relationships among some individuals. Also, paleopathological analysis previously conducted revealed the presence in some individuals of periostitis, osteomyelitis, *cribra* and dental abscesses, which could be related to a manifestation of infectious diseases. For this reason, a secondary objective of this project is to evaluate the presence of pathogenic microorganisms responsible for the above infectious diseases via metagenomic analysis.

Ancient DNA will be extracted from teeth and petrous bone samples with a silica column-based protocol and will be converted into Illumina double-stranded libraries, as described in Meyer and Kircher (2010). Genomic libraries will be initially shotgun sequenced at shallow depth to screen the degree of endogenous DNA preservation. Samples showing endogenous DNA yields greater than 10% will be deep sequenced, while for samples returning yields between 0.1 and 10% DNA enrichment protocols will be done. Targeted enrichment will be useful to increase the output of endogenous DNA and obtain more information from the sequences to determine genetic ancestry and kinship estimation. Dental pulp is a more suitable sample to extract DNA with the aim of detecting pathogens responsible of infectious diseases. Among the samples examined, those showing signs of infectious diseases will be sampled for metagenomic screening, which will be done via shotgun sequencing and taxonomic analysis with Kraken2.

These integrated approaches offer a contribute to a holistic characterization of the Medieval population of Santa Severa.



CONTRIBUTED PRESENTATION

2023

Giulia Orefice, Patrizia Serventi, Marica Baldoni, Fabrizio Vallelonga, Olga Rickards, Claudio Ottoni, Cristina Martínez-Labarga. “Unraveling the history of the first alum miners in Central Italy through a multi-omic approach”. Presented at XXV Congress Associazione Antropologica Italiana. Torino, Italy. 6th – 8th of September 2023. Poster presentation.

Patrizia Serventi, Giulia Orefice, Flavio De Angelis, Valentina Monteleone, Marco De Martino, Flavio Enei, Pamela Cerino, Fabrizio Vallelonga, Gabriella Serio, Francesca Romana Stasolla, Cristina Martínez-Labarga, Olga Rickards. “Inside the communities of Central Italian Peninsula in the Middle Ages: exploring human mobility and social organization through ancient DNA”. Presented at SMBE23 Congress. Ferrara, Italy. 23rd – 27th of July 2023. Poster presentation.

Giulia Orefice. “Identità genetica dei primi minatori dell’allume” - SETTE MONDI: "ALUM: Archeoantropologia molecolare e gamification per scoprire la storia della produzione dell’allume". Presented at Museo Civico Archeologico Naturalistico Minerario "A. Klitsche De La Grange" (<https://museocivicoallumiere.it/sette-mondi/>). Allumiere, Roma. 24th of February 2023. Oral presentation.