



University of Genova

Department of Earth, Environmental
and Life Sciences

Doctorate Course in Earth and
Environmental Science and
Technology

Università degli Studi di Genova



Dottorato in Scienze e Tecnologie
per l'Ambiente e il Territorio

Curriculum in biology applied to agriculture and the environment

Research Theme n. 2

Titolo: Analisi dei cambiamenti della biodiversità degli artropodi in area mediterranea attraverso studi di entomologia archeo-funeraria

Title: Analysis of the Mediterranean Arthropod biodiversity changes based on funerary archeoentomological investigations

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Program description including the formation program abroad

Variation in distribution and density of organisms through a temporal scale can be performed only if there are well defined time marks and only archaeological studies can provide these elements in association with specific areas. Among the disciplines contributing to the reconstruction of the past, Archaeoentomology is defined as the study of synanthropic insects and other arthropods recovered during archaeological excavations, with the aim to better understand and reconstruct past environmental and climatic conditions and/or cultural practices (Kenward 1978). Archaeoentomology deals with anthropic settlements where insects found microhabitats similar to their natural environments and benefit from their facultative or obligate association with humans. Funerary archaeoentomology focus on the arthropods associated with human remains or with elements part of funerary rituals such as offerings. The results of this approach to the study and the interpretation of the biodiversity in the past have been published in the last years by different authors mainly focusing on the Egyptian area (eg. Panagiotakopulu, 2000) but also from Italy (Tuccia et al., 2022). In fact, the finding of *Hermetia illucens* (Linnaeus, 1758) (Diptera: Stratiomyidae) in the sarcophagus of the princess Isabella of Aragon led to questioning about the beginning of the spread of this fly from the American continent to Europe (Benelli et al., 2014). This species was supposed having colonized the European continent during the 20th century, whereas the Benelli's finding backdates the introduction of the species in the Old continent to the 16th century. On the other hand, investigations conducted on Castelsardo (Sardinia Island) mummies, reveal the presence of *Phormia regina* (Meigen, 1826) (Diptera: Phoridae) which is no longer present in Sardinia (Giordani et al., 2018). Some hypotheses about the disappearance of the species have been suggested but further research needs to be performed to clarify this potential local extinction.

This PhD projects aims to

- 1) Describe the entomofauna associated with funerary contexts in Italy and in other Mediterranean country (Spain, France, etc);
- 2) Describe the past and present distribution of the species compared with climate changes but as with trade route;
- 3) Develop a model to describe how the specie would change their distribution in the future;
- 4) Evaluate the impact, in the past ad in the future, of the carrion-breeding fauna on the ecosystem and on the human society (landscape management, disease spread, etc).

The PhD candidate will present his/her results to the ICFAE (International Conference of Funerary Archaeoentomology) biannual meeting and to other National and International Entomology and Archaeology conferences (eg. CNIE, AIAZ, EAA, etc) and will have the opportunity to collaborate with the world leaders of the discipline.

Techniques: Archaeological excavation, Insect identification, Microscopy, Electron Microscopy, statistical analysis, GIS simulation.

Financial support:

Tutor's publications:

Tuccia, F., Giordani, G., Vanin, S. 2022 State of the art of the funerary archaeoentomological investigations in Italy. *Archaeological and Anthropological Sciences* 14, 70.

Vanin, S., Azzoni, M., Giordani, G., Belcastro, M.G. 2021 Bias and potential misinterpretations in the analysis of insects collected from human remains of archaeological interest *Archaeological and Anthropological Sciences*, 13 (11), 201

Giordani G., Erauw C., Eeckhout P. A., Owens L. S., Vanin S. 2020 Patterns of camelid sacrifice at the site of Pachacamac, Peruvian Central Coast, during the Late Intermediate Period (AD1000–1470): Perspectives from funerary archaeoentomology *Journal of Archaeological Science*, 114: 105065