



University of Genova

**Department of Earth, Environmental
and Life Sciences**

**Doctorate Course in Earth and
Environmental Science and
Technology**



Curriculum in biology applied to agriculture and the environment

Research Theme n. 4

Titolo: Studio sulle specie invasive di Ditteri nel territorio Italiano
Title: Evaluation of the invasive dipteran species in Italy
Tutor: Prof. Stefano Vanin
Co-tutor: Prof. S. Scarfi
Program description including the formation program abroad Invasive species are considered one of the causes of biodiversity decline and at the same time they are considered one of the most important issues for human and animal health and economical damages. In particular, Diptera with mosquitos and flies are responsible of the transmission of several diseases. In fact, mosquitos act as vector of Dengue, Toscana Virus, Malaria, Usutu virus, West Nile virus and they are monitored by the national and regional “Piano per il contrasto delle arbovirosi”. On the other hand, flies act as mechanical vector of several bacteria and viruses and their capacity of infecting human and livestock depends on their synanthropic level. Global warming and globalization have been reported as the main causes of species introduction. <i>Chrysomya megacephala</i> (Diptera, Calliphoridae) and <i>Synthesiomya nudiseta</i> (Diptera, Muscidae) are among the fly species of medical, veterinary and forensic interest reported in the last years in Italy, and also in Liguria. <i>Aedes albopictus</i>, <i>Aedes koreicus</i> and <i>Aedes japonicus</i> (Diptera, Culicidae) are the mosquitos species of medical and veterinary interest reported in the last years in Italy, and also in Liguria. The aims of the project is the monitoring of Diptera of medical, veterinary and forensic interest introduced in Italy by using interception traps, traps baited with specific odors mimicking the human sweat and CO₂, traps baited with decomposing flesh. The work will be performed in Liguria following the “Piano regionale per Il monitoraggio e contrasto delle arbovirosi”, in Campania, Veneto, Friuli Venetia Giulia, Sicily and Puglia placing the traps in the ports in collaboration with the University of Naples “Federico II” (Dipartimento di Veterinaria), University of Bari (Dipartimento di Scienze agrarie), University of Trieste, University of Messina and University of Palermo. In addition, a sampling in Marseille (France) will be performed that will allow the PhD candidate to spend at least 3 months abroad. After the sampling, specimens will be morphologically and molecularly identified. The PhD candidate will also put attention on the designing of a Diptera specific protocol for the identification of the origin of the invasive species. COII gene has been already investigated, showing a population specificity in <i>Chrysomya albiceps</i> from Africa (around 2% of variability between population).

Financial support: Piano arbovirosi 2025 (Regione Liguria)	
Tutor's publications of the last 3 years	
1.	Larentis O., Gorini I., Campus M., Lorenzetti M., Mansueto G., Bortolotto S., Zappa E., Gregorini A., Rampazzi L., Vanin S. , Carta G., Carli A., Simonaitis L., De Luca L., Tonina E. 2025 Integrated multidisciplinary analysis of mobile digital radiographic acquisitions of the mummies of the Hermits from the Sanctuary of Madonna della Corona (Trentino-Alto Adige, Italy -17 th to 19 th Century CE). <i>Front. Med. Sec. Pathology</i> 11:1492328 doi: 10.3389/fmed.2024.1492328
2.	Vanin S. , Tuccia F., Pradelli J., Carta G., Giordani G. 2024 Identification of Diptera Puparia in Forensic and Archeo-Funerary Contexts. <i>Insects.</i> ; 15(8): 599. doi: 10.3390/insects15080599
3.	Traverso F., Aicardi S., Bozzo M., Zinni M., Amaroli A., Galli L., Candiani S., Vanin S. , Ferrando S. 2024 New Insights into Geometric Morphometry Applied to Fish Scales for Species Identification. <i>Animals (Basel)</i> 14(7):1090. doi: 10.3390/ani14071090.
4.	Pascali J. P., Giorgetti A., Mohamed S., Pozzebon M., Vanin S., Pirani F., Pelletti G., Fais P. 2024 Assessment of Per- and Polyfluoroalkyl Substances (PFAS) in Traditional, Organic and Protein Flours. <i>Exposure And Health</i> , 664, 50-57 hdoi: 10.1007/s12403-024-00664-2.
5.	Baldino G, Vanin S, Burrascano G, Forzese E, Asmundo A, Ventura Spagnolo E. 2024 A case report of complex suicide in physician: attempt drugs poisoning and adhesive tape asphyxia. <i>Forensic Sci Med Pathol</i> . doi: 10.1007/s12024-024-00836-1.
6.	Danna C., Malaspina P., Cornara L., Smeriglio A., Trombetta D., De Feo V., Vanin S. 2024 <i>Eucalyptus</i> essential oils in pest control: a review of chemical composition and applications against insects and mites. <i>Crop protection</i> 176: 106319 doi. 10.1016/j.cropro.2023.106319
7.	Cutroneo L., Ahmed H., Azzola A., Fontana H., Geneselli I., Mancini I., Montefalcone M., Oprandi A., Pancrazi I., Vanin S. , Capello M. 2023 First Chemical–Physical Measurements by Multi-Parameter Probe in the Blue Hole of Faanu Madugau (Ari Atoll, the Maldives). <i>Environments</i> 10(10):180. doi: 10.3390/environments10100180
8.	Lunardini A., Carta C., Costantini L., Minozzi S., Giuffra V., Giordani G, Vanin S. 2023 Entomological analysis for archaeological reconstruction and conservation strategies design: the mummies of Cerreto di Spoleto (Central Italy). <i>Archaeological and Anthropological Sciences</i> 15: 149 doi: 10.1007/s12520-023-01851-z
9.	Giordani G., Whitmore D., Vanin S. 2023 A New, Non-Invasive Methodology for the Molecular Identification of Adult Sarcophagidae from Collections. <i>Insects.</i> 14;14(7):635. doi: 10.3390/insects14070635
10.	Marchetti C., Mastrogioiuseppe L., Vanin S. , Cecchi R., Gherardi M. 2023 On-site inspection form in veterinary cases: the Parma veterinary form. <i>Animals</i> 13(13): 2064; https://doi.org/10.3390/ani13132064
11.	Giordani G., Vanin S. 2023 Morphological characterization of puparia and molecular analysis of <i>Heleomyza serrata</i> (Linnaeus, 1758) (Diptera: Heleomyzidae): a species of potential forensic interest. <i>European Journal of Zoology</i> 90(2): 604-613, doi: 10.1080/24750263.2023.2231485
12.	Vanin S. , Giordani G., Carta G. 2023 From the field to the microscope: funerary archaeoentomology workflow. <i>Journal of Bioarchaeological Research</i> 1(2):e2023017.
13.	Dutto M., Zavattero C., Vinai E., Lauria G., Vanin S. (2023) Atypical diagnosis of myiasis. <i>MTSI</i> , 3(2). doi: 10.48327/mtsi.v3i2.2023.370.
14.	Baldino G., Mondello C., Sapienza D., Stassi C., Asmundo A., Gualniera P., Vanin S. , Ventura Spagnolo E. 2023 Multidisciplinary forensic approach in “complex” bodies: systematic review and procedural proposal. <i>Diagnostics</i> , 13(2): 310; doi: 10.3390/diagnostics13020310
15.	Giordani G., Tuccia F., Martín-Vega D., Angell C.S., Pradelli J., Vanin S. 2023 Morphological and molecular characterization of puparia of Piophilidae species of forensic relevance. <i>Medical and Veterinary Entomology</i> , doi: 10.1111/mve.12635.
16.	Vanin S. 2023 When Entomological studies meet Archaeology: archaeo- entomology an old, new discipline for investigation of the Past. <i>Journal of Bioarchaeological Research</i> , 1: e2023007
17.	Giordani G., Vanin S. 2023 Indagine sugli insetti trovati nella teca delle reliquie del santo. In Giannella G (a cura di) <i>San Mercuriale il vagabondo di Dio: ecco il suo volto 1800 anni dopo</i> . Diari, Gegraf Editore, Bertinoro (FC)
18.	Vanin S. 2023 Insetti simbolismo nel passato e nel presente. <i>Atti e Memorie dell'Ateneo di Treviso</i> , 38: 87-91.

I thereby confirm that as supervisor I will provide the PhD candidate with a desk, a personal computer and the economical support for completing the present project. Financial support will derive from the “piano regionale per le arboirosi – regione Liguria”.

Prof. Stefano Vanin

