

# CURRICULUM VITAE

**Carlo Croci**

**Birth date:** 09/08/1997

**Birthplace:** Varese

**Nationality:** Italian

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## PROFILE

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**Main topics of my work are entomology, molecular biology, microbiology, evolution and ecology, elements that I always try to link together.**

I have always been passionate about ecology and molecular biology and I have tried to deepen and link them as much as possible in my studies. I think it is important to understand the mechanisms behind ecosystems that often depend on the smallest forms of life. For this reason, I find the study of insects and the relationships they have with the environment and with other organisms very stimulating. What fascinates me most is their incredible versatility that often depends on articulated and complex symbiotic relationships with microorganisms. I am also very interested in studying the evolution of these relationships and how they have developed over time reaching very complex levels.

Part of my research interests are also nature conservation and management, both terrestrial and freshwater ecosystems and species. I believe that the protection and preservation of endangered species is crucial, as well as the management of alien species and the problems that can affect habitats. Often much environmental damage results from ignorance. For this reason, I am part of a small group of friends involved in science divulgation.

## EXPERIENCES

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**PhD candidate in Genetics, Molecular and Cellular Biology** | October 2023 - ongoing  
Lab of Parasitology, Symbiosis and Genomic evolution (Univ. Pavia)

Project title: Evolutionary analyses of arthropods and their associated microorganisms  
Supervisor: Dr. Michele Castelli

The project aims to study the microbial community of different groups of arthropods trying to reveal deep evolutionary significant interactions.

**MSCA-RISE-2020 NGTax Secondee** | June – August 2023  
Palustrine Design Ltd – Helsinki (Finland)

Project title: Description of ciliate biodiversity in different aquatic ecosystems  
Supervisor: Dr. Michele Castelli and Dr. Outi Wahlroos

The aim of the project was to conduct biodiversity surveys by collecting water samples in various ecosystems, including peatlands, marshes, bogs, forests, coastal areas, dunes, and islands. The aquatic microscopic community, ciliates and other protists in particular, was analysed under the microscope trying to reveal ecological dynamics in wetland ecosystems.

**Research fellow** | May – September 2023

Lab of Parasitology, Symbiosis and Genomic evolution (Univ. Pavia)

Project title: Molecular and phylogenetic analyses of ticks and associated microorganisms

Supervisor: Dott. Michele Castelli and prof. Davide Sasseria

The aim of the project was to characterise the population genetics of the tick *Ixodes ricinus* in Europe and compare the symbionts of this species with its sister species *Ixodes persulcatus*. Part of the project (3 months, June - August) will be carried out in Helsinki (Finland) in collaboration with Palustrine Design Ltd and the patronage of the European project Next Generation Taxonomy Horizon 2020.

**Master's Degree Thesis Internship** | April - November 2022

Max Planck Institute for Terrestrial Microbiology - Marburg (Germany)

Thesis title: "Flagellates of *Kaloterme italicus* and the diversity of symbiotic UBA3830 bacteria in termite guts"

Supervisors: Dott. Michele Castelli (Univ. Pavia) and Prof. Andreas Brune (MPI)

The thesis was dealt both with laboratory and bioinformatics analysis. The research project focused on the investigation of the eukaryotic and prokaryotic microbiota in the newly discovered termite species *Kaloterme italicus* using molecular biology and microscopy techniques. In addition, bioinformatics tools were applied for phylogenetic analysis.

**Master's Degree Internship** | May - November 2021

CNR Istituto di ricerca sulle acque (Verbania, Italy)

Project title: Management of invasive alien species in lake environments

Supervisor: Dott. Angela Boggero

The project focused on the monitoring and catching (manually and using traps) of alien crayfish along the shores of Lake Orta to determine their distribution and population structure. The main focus of the project was the highly invasive species *Procambarus clarkii*, but during sampling we also reported *Faxonius limosus* for the first time in this lake.

**Master's Degree Curricular Laboratory** | March - April 2021

Lab of genomics and biotechnology of insects of agricultural and medical importance (Univ. Pavia)

Supervisor: Prof. Mariangela Bonizzoni

The laboratory experience involved conducting molecular analyses in mosquitoes (*Aedes albopictus*) focusing on the identification of viral fragments integrated into the host genome. Furthermore, it was learnt how to handle the insectarium.

**Bachelor's degree thesis internship** | April – June 2020

Laboratory of plant developmental biology (Univ. Parma)

Thesis title: "The relationship between sulfur metabolism and tolerance of hexavalent chromium in the unicellular green alga *Scenedesmus acutus* (Spheropleales): study of Sulfite Reductase"

Supervisor: Prof. Anna Torelli

The thesis was dealt with a bioinformatics perspective. The research project focused on the investigation of the mechanisms of the sulfate assimilation pathway in response to oxidative stress from heavy metals (hexavalent chromium) in *Scenedesmus acutus*, a haploid unicellular freshwater green alga. In particular, I investigated the molecular structure and function of the enzyme Sulfite reductase (SIR).

## **EDUCATION**

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**University of Pavia** | October 2021 - December 2022

**Master's Degree in Experimental and Applied Biology** - curriculum Environmental Biology and Biodiversity (LM-6), graduated with honours (110/110 cum laude).

**University of Parma** | October 2017 - July 2020

**Bachelor's degree in Biological Sciences (L-13)**, graduated with honours (110/110 cum laude).

### **Complementary education: courses and workshops**

- **PADI Patent - Open Water Diver** (CSP - Pavia diving club) | May 2023
- **Mosquitoes, phlebotomine sand flies and ticks monitoring (IZSVe)** | Feb 2023
- **Intensive English language course** - Level C1 (CLA Univ. Pavia) | Nov 2022 – Gen 2023
- **Python for Data Analysis** (Univ. Pavia) | Dec 2021

## **EXPERTISE**

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### Laboratory techniques

- Basic techniques in algal research: Setting up algal cultures under sterile conditions, colony counting;
- Molecular biology techniques: DNA extraction and purification, PCR, electrophoretic gels, vector cloning and construction of clone libraries, fluorescence *in situ* hybridization microscopy (FISH);
- Microbiology techniques: medium and Petri plates preparation, isolation of bacteria from environmental samples, use of stereomicroscope, phase contrast microscope, fluorescence microscope.

### In silico techniques

- Bioinformatics searches in databases: NCBI, BLAST, WolfPsort, TargetP, Prosite, Protparam, WebLogo, PhyreII, SwissModel, PredAlgo, String;
- Use of bioinformatics programs for sequence alignment, comparison and phylogeny: ClustalX, GeneDoc, FigTree, Arb Silva;
- Chromatogram reading, trimming and assembling: BioEdit, Chromas, Finch TV, DNA star;
- Programming basics in Python;
- Microsoft Office and Google pack.

### Fieldwork

- Samplings: setting up sampling, characterisation of a site, active and passive monitoring and catching in fresh water and marine ecology, sample analysis;
- Water resource and alien species management;
- Taxonomic identification: morphological identification of invasive crayfish;
- Animal care: care of hospitalised animals (sea turtles and birds), feeding, insectary management (termites and mosquitoes).

### Languages

- Italian (mother tongue)
- English (C1)
- German (A1)

### Soft skills

Problem solving; interdisciplinarity; rapid learning; creativity; critical thinking; teamwork; punctuality and time organisation; adaptability; attention to detail; easy traveller.

## **PUBLICATIONS**

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Angela Boggero, **Carlo Croci**, Asia Zanaboni, Silvia Zaupa, Daniele Paganelli, Laura Garzoli, Theo Bras, Alessandra Busiello and Lyudmila Kamburska (2023). New records of the spiny-cheek crayfish *Faxonius limosus* (Rafinesque, 1817): expansion in subalpine lakes in North-western Italy. *BioInvasions Records*, 12(2), 445-456.

## **VOLUNTEERING AND OTHER ACTIVITIES**

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**Parabites project** | March 2021 - ongoing

Digital creator on Instagram as science divulgator on biology and nature conservation (@para\_bites).

**Allevamento Sacro Monte** | 2013 - ongoing

Basic concepts of aviary maintenance and hygiene, treatment of avian diseases, management of insects as food.

**Marburg botanical garden** | May 2022 - November 2022

Taking care of the botanical garden flower beds.

**Lampedusa turtle rescue** | July 2019

Taking care of hospitalized animals, guided tours of the center.

**Bachelor student representative** | 2018-2020

Interaction, communication and mediation with professors and students

## **ASSOCIATIONS**

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**APS Al Picchio Verde, Cunardo** | 2022 – 2023

**Italian Alpine Club** - CAI youth section Luino | 2020-2023

**German alpine club** - DAV youth section Marburg | 2022

Le dichiarazioni rese nel presente curriculum sono da ritenersi rilasciate ai sensi degli artt. 46 e 47 del D.P.R. 445/2000

Pavia, 28/02/2024

