

University Academic Curriculum Vitae

Personal information

Veronica Carnio

Italian driving license B

Education since leaving school

- 2012 Bachelor's degree in Biotechnology; University of Padua
- 2015 Master's degree in Biotechnology for food science; University of Padua
- 2025 PhD in Mountain Environment and Agriculture; Free University of Bozen/Bolzano; Title: New strategies for sustainable apple crop protection against *Cydia pomonella* and *Halyomorpha halys*

Present appointment

Not currently holding a research appointment

Professional experience

Chronological list of all previous employments (each with job title, starting and finishing dates, level, employer, responsibilities)

From / to	Job title	Name of academic Institution	Academic level	responsibilities
2026-ongoing	Guest Lecturer	Free University of Bozen/Bolzano	PhD in Mountain Environment and Agriculture	Delivered lectures and practical sessions on bee ecology, behavior, and applied apiculture
2025-2026	Research Assistant	Free University of Bozen/Bolzano	PhD in Mountain Environment and Agriculture	Research on sustainable pest management with smart sensor monitoring and low-impact management in fruit crops
2023 – ongoing	Teaching Assistant	Free University of Bozen/Bolzano	MSc in Biotechnology/ PhD in Mountain Environment and Agriculture	Delivered practical session on: • Insects as Novel Food • Entomology
2021 – 2021	Research Assistant	Laimburg Research Centre	MSc in Biotechnology	Research on parasitoids associated with major insect pests in fruit crops
2017 – ongoing	Tecnico/esperto apistico	Regione Veneto	MSc in Biotechnology	Technical support
2014 – 2021	Professional beekeeper	Ape Impertinente, Società semplice	MSc in Biotechnology	Co-founder

Publications

Carnio, V., Preti, M., Favaro, R., Lecini, O., Giannotta, G., Angeli, S. (2026). Design, training, and field validation of a YOLOv8-based automated trap for remote detection of codling moth, *Cydia pomonella*. *Entomologia experimentalis et applicata*, 1–13.

Leskey, T. C., Carnio, V., Nixon, L. J. (2025). Chemically mediated trophic interactions of invasive herbivorous insects and their applications for monitoring and Management. *Current Opinion in Insect Science*, 101364.

Carnio, V., Favaro, R., Preti, M., Angeli, S. (2024). Impact of aggregation pheromone traps on spatial distribution of *Halyomorpha halys* damage in Apple Orchards. *Insects*, 15(10), 791.

Falagiarda, M., Carnio, V., Chiesa, S. G., Pignalosa, A., Anfora, G., Angeli, G., Ioriatti, C., Mazzoni, V., Schmidt, S., Zapponi, L. (2023). Factors influencing short-term parasitoid establishment and efficacy for the biological control of *Halyomorpha halys* with the Samurai Wasp *Trissolcus japonicus*. *Pest Management Science*, 79(7), 2397–2414.

Further data

Carnio, V., Preti, M., Angeli, S., (2023). *Cydia pomonella* (Lepidoptera: Tortricidae) management through female removal in apple crop of Trentino-Alto Adige Region. Dgaee Entomology Congress (Dgaee 2023). Bolzano, Italy (20-23/02/23)

Carnio, V., Preti, M., Angeli, S. (2023). Optimization of the female removal technique for the *Cydia pomonella* (Lepidoptera: Tortricidae) management in apple orchards. Congresso Nazionale Italiano di Entomologia (XXVII CNIE 2023), Palermo, Italy (12–16/06/23)

Carnio, V., Preti, M., Angeli, S. (2023). Implementing the 'female removal' technique for apple orchard protection: recent results in the Trentino-Alto Adige region, Italy. XII European Congress of Entomology (ECE 2023), Heraklion, Crete, Greece (02–06/10/23)

Favaro, R., Cappellin, L., Preti, M., Carnio, V., Angeli, S. (2024). *Halyomorpha halys* fruit damage shifts but does not reduce when aggregation pheromone is used in apple orchards. 39th Annual Meeting of the International Society of Chemical Ecology (ISCE 2024), Prague, Czech Republic (14–18/07/24)

Carnio, V., Favaro, R., Preti, M., Nixon, L., Leskey, T., Angeli, S. (2025). Advancing trapping strategies for *Halyomorpha halys*: evaluating aggregation pheromone-baited 'minisailboat' traps and blue light for pest management in apple orchards. Congresso nazionale di entomologia (XXVIII CNIE 2025), Siena, Italy (16-20/06/25)

Carnio, V., La Forgia, D., Preti, M., Angeli, S. (2025). UV light trap for *Cydia pomonella* monitoring: integrating light trap data to improve kairomone-baited trap insights. Congresso nazionale di entomologia (XXVIII CNIE 2025), Siena, Italy (16-20/06/25)

Carnio, V., Preti, M., Hiltbold, I., Angeli, S., La Forgia, D. (2025). Signals in the dark: enhancing *Cydia pomonella* monitoring with kairomones and UV light traps. IOBC-WPRS BENEfruit, Wageningen, The Netherlands (14-18/09/25)

Carnio, V., Preti, M., Angeli, S. (2025). Valutazione delle trappole a feromoni di aggregazione 'mini-sailboat' e della luce blu per migliorare la gestione di *Halyomorpha halys* nei meleti. INTGR.HALYS – CIMICE ASIATICA: sfide e prospettive, Bologna, Italy (19/12/25)

Language competence

Italian: Native speaker; English: B2/C1; German: A1.

Technical skills

Agricultural entomology

- Expertise in the design and development of insect trap for monitoring and mass trapping, integrating chemical and visual ecology. Proven experience in the experimental evaluation of semiochemical (kairomones, pheromones) and semiophysical (light-based) attractants, with emphasis on insect behavioral responses and system optimization.
- Development and validation of fully automated trap systems for remote monitoring, including image-based (AI-driven) and optoelectronic sensing approaches, within a framework integrating sensor-based systems, multi-source data acquisition, and data analysis. Activities span the entire process, from conceptual design to pre-commercial stage, with focus on field transferability and the collections of monitoring data.
- Expertise in the implementation of low-input integrated pest management strategies, combining behavioral manipulation (e.g. mating disruption, attract-and-kill, female removal, push–pull) and biological control for key fruit pests such as *C. pomonella* and *H. halys*.
- Expertise in artificial intelligence applied to sensor-based pest monitoring, including the development, training, and validation of deep learning models for both image-based (e.g. YOLO) and optoelectronic data, as well as dataset preparation and annotation for robust performance under field conditions.
- Expertise in designing and implementing protocols for pest population and insect biodiversity monitoring (trapping, beat sampling, egg and immature stage sampling, parasitization assessment, damage evaluation), with spatial and temporal approaches. Expertise in species identification of major fruit crop pests, with training in Apoidea and Lepidoptera taxonomy and ecology.

- Knowledge of chemical ecology approaches, including electroantennography (EAG/GC-EAD), volatile organic compound sampling, and behavioral assays for evaluating semiochemicals and their application in trapping systems.
- Experience in laboratory and semi-field rearing systems for key species (*Drosophila suzukii*, *Trissolcus japonicus*, *Halyomorpha halys*), supporting experimental validation of monitoring and control strategies.

Data Analysis

- Experience in data analysis and processing, including statistical modeling (GLM/GLMM), data cleaning, and visualization in R, with application to pest population dynamics and monitoring datasets.
- Basic knowledge of Python, applied to data analysis, automation, and environmental and phenological modelling.
- Expertise in geospatial data analysis using QGIS for interpretation of pest distribution and damage patterns.
- Expertise in artificial intelligence applied to computer vision, including development and validation of deep learning models for insect detection, classification, and segmentation.
- Knowledge of chemical data analysis (VOC identification and quantification) using ChemStation and related tools.

General IT Skills

- Proficient in Windows, macOS, and Linux environments.
- Advanced user of Microsoft Office (Word, Excel, PowerPoint).
- Proficient in image editing using GIMP or Photoshop

Date 22/03/2026