Curriculum Vitae et Studiorum

Personal information

Name **Matteo Zarantoniello**

Current position

May 1, 2023 - Present

Università Politecnica delle Marche
Department of Life and Environmental Sciences
Reproductive and Developmental Biology Lab.

Post-doc position within the Horizon Europe project "*Bringing knowledge and consensus to prevent and reduce Food Loss at the primary production stage. Understanding, measuring, training and recommending – FOLOU*".

Multi-spectral cameras (VIS+NIR) used to estimate aquaculture food loos due to harvesting practice, particularly focused on hatchery system of salmonids. The automatic counting of fertilized and dead eggs will be based on deep learning models.

Education and career

January 1, 2022 – April 30, 2023

Università Politecnica delle Marche
Department of Life and Environmental Sciences
Reproductive and Developmental Biology Lab

Research fellowship within the INSHORE project funded by Regione Marche (PSR Marche 2014/2020) (Coordinator MJ ENERGY s.r.l).

The project is aimed to: (**i**) improve the nutritional value of *Hermetia illucens* prepupae meal in terms of polyunsaturated fatty acids and bioactive molecules (carotenoids and tocopherols) by adding *Arthrospira platensis* (Spirulina) to the insect growth substrate (15% w/w), (**ii**) formulate two experimental diets characterized by two different dietary levels of fish meal replacement (3 and 20 %) of "enriched" *Hermetia illucens* prepupae meal, (**iii**) investigate the physiological effects of the experimental diets in European seabass (*Dicentrarchus labrax*) and giant freshwater prawn (*Macrobrachium rosenbergii*) post larvae reared in aquaponic systems.

November 1, 2018 - December 31, 2021

Università Politecnica delle Marche
Department of Life and Environmental Sciences
Reproductive and Developmental Biology Lab

PhD (XXXIV cycle) in Life and Environmental Sciences - Marine Biology and Ecology.
Title of the thesis: "*Future feeds in aquaculture: insects as a new ingredient for fish culture*".
Tutor: Professor Ike Olivotto. Sector: BIO/06

The aim of the thesis was the investigation of the physiological effects of different dietary inclusion levels of *Hermetia illucens* prepupae meal: (**i**) firstly on an experimental model (zebrafish; *Danio rerio*) considering the whole life cycle and the possible impact across generations and (**ii**) on a freshwater (Siberian sturgeon, *Acipenser baerii*) and a marine (gilthead seabream, *Sparus aurata*) farmed fish species. Applying a multidisciplinary approach involving biometric, histological, molecular, gas chromatographic, and spectroscopic analyses, particular emphasis was given to fish growth, fillet fatty acids composition and liver/gut health.

The Commission rated the entire work as “Outstanding”.

April 1, 2017 - October 30, 2019

Università Politecnica delle Marche
Department of Life and Environmental Sciences
Reproductive and Developmental Biology Lab

Research fellowship within the project “*Sustainable fish feed innovative ingredients - SUSHIN”.*

The project is aimed to test innovative and sustainable aquafeed ingredients like *Hermetia illucens* prepupae meal, poultry by-products meal, microbial dried biomass, and red swamp crayfish meal (*Procambarus clarkii*) as innovative aquafeed ingredient in diets for rainbow trout (*Oncorhynchus mykiss*), gilthead seabream (*Sparus aurata*) and European seabass (*Dicentrarchus labrax*) totally deprived of fish meal and where the major protein fraction was composed by plant-derived ingredients.

September 2014 - October 2016

Università Politecnica delle Marche
Department of Life and Environmental Sciences

MSc in Marine Biology with final evaluation of 110/110 magna cum laude disputing an experimental thesis titled: ”*Autonomous Reef Monitoring Structures for the study of biodiversity in the Adriatic Sea*”.

October 1 - November 30, 2015

Oceanogràfic Aquarium, Valencia

Internship at Oceanogràfic Aquarium.

Research activity on (**i**) anatomy, pathology, and reproductive biology of fish, especially on elasmobranch species (*Mustelus mustelus*, *Scyliorhinus canicula*, *Raya clavata*), (**ii**) feeding strategies on juvenile stage of seahorses (*Hippocampus reidii* and *Phycodurus eques*) and hammerhead shark (*Sphyrna lewini*), (**iii**) maintenance of sea turtles (*Caretta caretta*, *Chelonia mydas*).
Daily maintenance of tanks and animals.

September 2010 - February 2014

Università degli Studi di Milano Bicocca

BSc in Biological Sciences with final evaluation of 96/110.

September 2005 - June 2010

ITCS Primo Levi, Bollate, Milano

Scientific Degree of Maturity with final evaluation of 90/100.

Research activity

- Co-author of 29 scientific publications in peer-reviewed journals recorded in SCOPUS; first/last name in 13 ones; corresponding author in 1 publication. SCOPUS - *h*-index: 14, citations: 675 by 350 documents (for details on publications, see the dedicated section).
- Participation in 4 international scientific conferences with oral presentations and/or posters (for details, see the dedicated section).

Research issues

May 1, 2023 - present

Università Politecnica delle Marche
Department of Life and Environmental Sciences
Reproductive and Developmental Biology Lab

Development, testing and validation of multi-spectral cameras (VIS+NIR) technology tool for Food Loss estimation within the Horizon Europe project "Bringing knowledge and consensus to prevent and reduce Food Loss at the primary production stage. Understanding, measuring, training and recommending – FOLOU".

This project task aims to validate the potential of applying multi-spectral cameras to estimate aquaculture food loos due to poor harvesting practice, particularly focused on hatchery system of salmonids. The automatic system relies on multi-spectral cameras that will be used to identify and count dead eggs. In a preliminary stage the collected images will be labelled by domain experts and then used to train a deep learning model. In order to have a real evaluation of the dead eggs during the incubation period an optic system able to precociously recognize and move the dead whitish eggs will be developed. The system will be based on a robotic system that allows a gently movement of the eggs for an easier recognition by the image collecting and processing. Collected eggs will be then analysed by human experts to validate the developed system.

January 1, 2022 - present

Università Politecnica delle Marche
Department of Life and Environmental Sciences
Reproductive and Developmental Biology Lab

INSHORE project funded by Regione Marche (PSR Marche 2014/2020) (Coordinator MJ ENERGY s.r.l).

A multidisciplinary approach integrating biometric, histological, molecular (real-time PCR), gas chromatographic, microbiome and spectroscopic (Fourier Transform Infrared Spectroscopy, FTIR) analyses has been applied to: (**i**) improve the nutritional value of *Hermetia illucens* prepupae meal in terms of polyunsaturated fatty acids and bioactive molecules (carotenoids and tocopherols) by adding *Arthrospira platensis* (Spirulina) to the insect growth substrate (15% w/w), (**ii**) formulate two experimental diets characterized by two different dietary levels of fish meal replacement (3 and 20 %) of "enriched" *Hermetia illucens* prepupae meal, (**iii**) investigate the physiological effects of the experimental diets in European seabass (*Dicentrarchus labrax*) and giant freshwater prawn (*Macrobrachium rosenbergii*; *publication 1*) post larvae reared in aquaponic systems.
A side study (not part of the project), involving the same enriched procedure and dietary inclusion levels, has been performed on rainbow trout (*Oncorhynchus mykiss*) juveniles (*publication 2*).

November 2021 - Present

Università Politecnica delle Marche
Department of Life and Environmental Sciences
Reproductive and Developmental Biology Lab

Testing diets contaminated by microplastics on zebrafish (*Danio rerio*), rainbow trout (*Oncorhynchus mykiss*) post-larvae and European seabass (*Dicentrarchus labrax*) juveniles with emphasis on growth and welfare and possible strategies to mitigate their adverse effects.

Research activity is aimed to prepare diets starting from a basal formulation for both zebrafish and European seabass and then contaminate them with purchased fluorescent microplastic beads with different size ranges (40-47 µm and 1-5 µm) included at different concentrations (0.05 and 0.5 g/kg of feed). Biometric analyses, analyses with confocal microscopy, and histological and molecular approach have been applied to determine the effects of dietary microplastics on fish growth and welfare, including the potential bioaccumulation in target organs focusing on all the life-cycle stages of zebrafish (from larvae to adult) and on European seabass juveniles.

February 2021 - Present

Università Politecnica delle Marche
Department of Life and Environmental Sciences
Reproductive and Developmental Biology Lab

Investigation of the physiological responses of carpione (*Salmo carpio*) to innovative commercial diets as part of the Carpio project funded by Caritro Bando Ricerca e Sviluppo 2020 (N 2020.0410) (Coordinator Prof. I. Olivotto).

Research activity is aimed to formulate and test practical diets for carpione ensuring production rates, fish welfare, and quality of the product. Carpione (*Salmo carpio*) is a precious endemism of Lake Garda, particularly refined for its high-quality meat, which wild population has been drastically reduced leading to the insertion in the IUCN list of severely endangered fish species. A multidisciplinary approach including zootechnical performances and histological, biochemical, spectroscopic (Fourier Transform Infrared Spectroscopy, FTIR), and molecular analyses has been applied, for the first time, to determine liver and gut health status and quality of the fillet (*publication number 4*).

2018 - 2021

Università Politecnica delle Marche
Department of Life and Environmental Sciences
Reproductive and Developmental Biology Lab

Investigation of the physiological responses of fish to innovative insect-based diets as part of the NUTRIFISH project funded by Cariverona foundation (Coordinator Prof. I. Olivotto).

A multidisciplinary approach integrating biometric, histological, molecular (real-time PCR), gas chromatographic, microbiome and spectroscopic (FTIR) analyses has been applied to: (**i**) improve the nutritional value and safety of *Hermetia illucens* prepupae rearing them on a growing substrate composed of coffee silverskin and enriched with 10% *Schizochytrium* sp. (v/v) as a source of polyunsaturated fatty acids (*publications 7,14,15,23*); (**ii**) investigate the physiological responses of zebrafish (*Danio rerio*) at different life cycle stages (larvae, juveniles and adult and F1 generation) to increasing dietary percentages of BSF prepupae meal (0, 25, 50, 75 and 100 % respect to fish meal) (*publications 6,8,11,12,21,22,24*); (**iii**) test the best BSF-based diet from zebrafish laboratory feeding trial in terms of diet sustainability and fish growth and welfare in a farmed fish species (*Acipenser baerii*, Siberian sturgeon) in an aquaponic system (*publications 3, 16*).

2017 - 2021

Università Politecnica delle Marche
Department of Life and Environmental Sciences
Reproductive and Developmental Biology Lab

Investigation of the physiological responses of rainbow trout, gilthead seabream, and European seabass to innovative aquafeed ingredients included in diets totally deprived of fish meal as part of the SUSHIN project funded by Ager foundation (Coordinator Prof. E. Tibaldi, Department of Agri-Food, Environmental and Animal Sciences, University of Udine).

A multidisciplinary approach including biometric, histological, molecular (real-time PCR) and spectroscopic (FTIR) analyses was used to assess the effects of innovative and sustainable ingredients (*Hermetia illucens* prepupae meal, poultry by-product meal, microbial dried biomass, red swamp crayfish meal) included, singly or in combination, in diets totally deprived of fish meal (where the major protein fraction was composed by plant-derived ingredients) intended for rainbow trout (*publications 5,10,18,27*), gilthead seabream (*publication 13*), and European seabass.

2017 - 2020

Università Politecnica delle Marche
Department of Life and Environmental Sciences
Reproductive and Developmental Biology Lab

Investigation of the physiological effects of different dietary inclusions (25, 50, and 100 % respect to fish meal) of full-fat *Hermetia illucens* prepupae meal on zebrafish.

The physiological effects of the experimental diets were assessed during zebrafish larval development (*publications 28,29*), the whole life cycle (*publication 26*), and on the reproductive performances of female specimens (*publication 19*) through biometric, histological, molecular (real-time PCR), gas-chromatographic and spectroscopic (FTIR) analyses.

Scientific publications

[*] equal contribution / [CA] Corresponding author

1. **Zarantoniello, M. [CA]**, Chemello, G., Ratti, S., Pulido-Rodriguez, L.F., Daniso, E., Freddi, L., Salinetti, P., Nartea, A., Bruni, L., Parisi, G., Riolo, P., Olivotto, I. Growth and welfare status of giant freshwater prawn (*Macrobrachium rosenbergii*) post larvae fed diets including enriched black soldier fly (*Hermetia illucens*) prepupae meal. *Animals* **2023**, 13, 715. 10.3390/ani13040715.

2. Ratti, S.[*], **Zarantoniello, M.[*]**, Chemello, G., Giammarino, M., Palermo, F.A., Cocci, P., Mosconi, G., Tignani, M.V., Pascon, G., Cardinaletti, G., Pacetti, D., Nartea, A., Parisi, G., Riolo, P., Belloni, A., Olivotto, I. Spirulina-enriched substrate to rear black soldier fly (*Hermetia illucens*) prepupae as alternative aquafeed ingredient for rainbow trout (*Oncorhynchus mykiss*) diets: possible effects on zootechnical performances, gut and liver health status, and fillet quality. *Animals* **2023**, 13(1), 173. doi: 10.3390/ani13010173.

3. Milanović, V., Cardinali, F., Aquilanti, L., Maoloni, A., Garofalo, C., **Zarantoniello, M.**, Olivotto, I., Riolo, P., Ruschioni, S., Isidoro, N., Corsi, L., Cardinaletti, G., Osimani, I. Quantification of antibiotic resistance genes in Siberian sturgeons (*Acipenser baerii*) fed *Hermetia illucens*-based diet. *Aquaculture* **2022**, 560, 738485. doi:10.1016/j.aquaculture.2022.738485.

4. Randazzo, B.[*], **Zarantoniello, M.[*]**, Secci, G., Faccenda, F., Fava, F., Marzorati, G., Belloni, A., Maradonna, F., Orazi, V., Cerri, R., Povinelli, M., Parisi, G., Olivotto, I. Towards the identification of a suitable commercial diet for carpione (*Salmo carpio*, Linnaeus 1758): a multidisciplinary study on fish performances, animal welfare and quality traits. *Animals* **2022**, 12, 1918. doi:10.3390/ani12151918.

5. **Zarantoniello, M.[*]**, Pulido Rodriguez, L.F.[*], Randazzo, B., Cardinaletti, G., Giorgini, E., Belloni, A., Secci, G., Faccenda, F., Pulcini, D., Parisi, G., Capoccioni, F., Tibaldi, E., Olivotto, I. Conventional feed additives or red claw crayfish meal and dried microbial biomass as feed supplement in fish meal-free diets for rainbow trout (*Oncorhynchus mykiss*): Possible ameliorative effects on growth and gut health status. *Aquaculture* **2022**, 554, 738137. doi:10.1016/j.aquaculture.2022.738137.

6. Chemello, G., **Zarantoniello, M.**, Randazzo, B., Gioacchini, G., Truzzi, C., Cardinaletti, G., Riolo, P., Olivotto, I. Effects of black soldier fly (*Hermetia illucens*) enriched with *Schizochytrium* sp. on zebrafish (*Danio rerio*) reproductive performances. *Aquaculture* **2022**, 550, 737853. doi:10.1016/j.aquaculture.2021.737853.

7. Truzzi, C., Girolametti, F., Giovannini, L., Olivotto, I., **Zarantoniello, M.**, Scarponi, G., Annibaldi, A., Illuminati, S. New eco-sustainable feed in aquaculture: influence of insect-based diets on the content of potentially toxic elements in the experimental model zebrafish (*Danio rerio*). *Molecules* **2022**, 27(3), 818. doi:10.3390/molecules27030818.

8. Milanović, V., Cardinali, F., Aquilanti, L., Maoloni, A., Garofalo, C.,

Zarantoniello, M., Olivotto, I., Riolo, P., Ruschioni, S., Isidoro, N., Cattalani, M., Cardinaletti, G., Clementi, F., Osimani, A. Quantitative assessment of transferable antibiotic resistance genes in zebrafish (*Danio rerio*) fed *Hermetia illucens*-based feed. *Animal Feed Science and Technology* **2021**, 277, 114978. doi: 10.1016/j.anifeedsci.2021.114978.

9. Planas, M., Olivotto, I., González, M.J., Laurà, R., Angeletti, C., Amici, A., **Zarantoniello, M**. Pre-breeding diets in the seahorse *Hippocampus reidi*: how do they affect fatty acid profiles, energetic status and histological features in newborn? *Frontiers in Marine Science* **2021**, 8, 688058. doi:10.3389/fmars.2021.688058.

10. Randazzo, B., **Zarantoniello, M.**, Gioacchini, G., Cardinaletti, G., Belloni, A., Giorgini, E., Faccenda, F., Cerri, R., Tibaldi, E., Olivotto, I. Physiological response of rainbow trout (*Oncorhynchus mykiss*) to graded levels of *Hermetia illucens* or poultry by-product meals as single or combined substitute ingredients to dietary plant proteins. *Aquaculture* **2021**, 538, 736550. doi:10.1016/j.aquaculture.2021.736550.

11. **Zarantoniello, M.**, Randazzo, B., Secci, G., Notarstefano, V., Giorgini, E., Lock, E.J., Parisi, G., Olivotto, I. Application of laboratory methods for understanding fish responses to black soldier fly (*Hermetia illucens*) based diets. *Journal of Insects as Food and Feed* **2021**, 8(11), 1173-1195. doi:10.3920/JIFF2020.0135.

12. **Zarantoniello, M.**, Randazzo, B., Cardinaletti, G., Truzzi, C., Chemello, G., Riolo, P., Olivotto, I. Possible dietary effects of insect-based diets across zebrafish (*Danio rerio*) generations: a multidisciplinary study on the larval phase. *Animals* **2021**, 11(3), 751. doi: 10.3390/ani11030751.

13. Randazzo, B., **Zarantoniello, M.**, Cardinaletti, G., Cerri, R., Giorgini, E., Belloni, A., Contò, M., Tibaldi, E., Olivotto, I. *Hermetia illucens* and poultry by-product meals as alternatives to plant protein sources in gilthead seabream (*Sparus aurata*) diet: a multidisciplinary study on fish gut status. *Animals* **2021**, 11(3), 677. doi:10.3390/ani11030677.

14. Milanović, V., Roncolini, A., Cardinali, F., Garofalo, C., Aquilanti, L., Riolo, P., Ruschioni, S., Corsi, L., Isidoro, N., **Zarantoniello, M.**, Olivotto, I., Ceccobelli, S., Tavoletti, S., Clementi, F., Osimani, A. Occurrence of antibiotic resistance genes in *Hermetia illucens* larvae fed coffee silverskin enriched with *Schizochytrium limacinum* or *Isochrysis galbana* microalgae. *Genes* **2021**, 12, 213. doi:10.3390/genes12020213.

15. Osimani, A., Ferrocino, I., Corvaglia, M.R., Roncolini, A., Milanović, V., Garofalo, C., Aquilanti, L., Riolo, P., Ruschioni, S., Jamshidi, E., Isidoro, N., **Zarantoniello, M.**, Cocolin, L., Olivotto, I., Clementi, F. Microbial dynamics in rearing trials of *Hermetia illucens* larvae fed coffee silverskin and microalgae. *Food Research International* **2021**, 140, 110028. doi:10.1016/j.foodres.2020.110028.

16. **Zarantoniello, M.**, Randazzo, B., Nozzi, V., Truzzi, C., Giorgini, E., Cardinaletti, G., Freddi, L., Ratti, S., Girolametti, F., Osimani, A., Notarstefano, V., Milanović, V., Riolo, P., Isidoro, N., Tulli, F., Gioacchini, G., Olivotto, I. Physiological responses of Siberian sturgeon (*Acipenser baerii*) juveniles fed on full-fat insect-based diet in an aquaponic system. *Scientific Reports* **2021**, 11, 1057. doi:10.1038/s41598-020-80379-x.

17. **Zarantoniello, M.**, Bortoletti, M., Olivotto, I., Ratti, S., Poltronieri, C., Negrato, E., Caberlotto, S., Radaelli, G., Bertotto, D. Salinity, temperature and ammonia acute stress response in seabream (*Sparus aurata*) juveniles: a multidisciplinary study. *Animals* **2021**, 11, 97. doi:10.3390/ani11010097.

18. Bruni, L., Randazzo, B., Cardinaletti, G., **Zarantoniello, M.**, Mina, F., Secci, G., Tulli, F., Olivotto, I., Parisi, G. Dietary inclusion of full-fat *Hermetia illucens* prepupae meal in practical diets for rainbow trout (*Oncorhynchus mykiss*): lipid metabolism and fillet quality investigations. *Aquaculture* **2020**, 529, 735678. doi:10.1016/j.aquaculture.2020.735678.

19. Randazzo, B., **Zarantoniello, M.**, Gioacchini, G., Giorgini, E., Truzzi, C., Notarstefano, V., Cardinaletti, G., Huyen, K.T., Carnevali, O., Olivotto, I. Can insect-based diets affect zebrafish (*Danio rerio*) reproduction? A multidisciplinary study. *Zebrafish* **2020**, 17(5), 287-304. doi:10.1089/zeb.2020.1891.

20. Planas, M., Olivotto, I., Jesús González, M., Laurà, R., **Zarantoniello, M**. A multidisciplinary experimental study on the effects of breeders diet on newborn seahorses (*Hippocampus guttulatus*). *Frontiers in Marine Sciences* **2020**, 7, 638. doi:10.3389/fmars.2020.00638.

21. **Zarantoniello, M.**, Randazzo, B., Gioacchini, G., Truzzi, C., Giorgini, E., Riolo, P., Gioia, G., Bertolucci, C., Osimani, A., Cardinaletti, G., Lucon-Xiccato, T., Milanović, V., Annibaldi, A., Tulli, F., Notarstefano, V., Ruschioni, S., Clementi, F., Olivotto, I. Zebrafish (*Danio rerio*) physiological and behavioural responses to insect-based diets: a multidisciplinary approach. *Scientific Reports* **2020**, 10, 10648. doi:10.1038/s41598-020-67740-w.

22. **Zarantoniello, M.**, Zimbelli, A., Randazzo, B., Delli Compagni, M., Truzzi, C., Antonucci, M., Riolo, P., Loreto, N., Osimani, A., Milanović, V., Giorgini, E., Cardinaletti, G., Tulli, F., Cipriani, R., Gioacchini, G., Olivotto, I. Black Soldier Fly (*Hermetia illucens*) reared on roasted coffee by-product and *Schizochytrium* sp. as a sustainable terrestrial ingredient for aquafeeds production. *Aquaculture* **2020**, 518, 734659. doi:10.1016/j.aquaculture.2019.734659.

23. Truzzi, C., Giorgini, E., Annibaldi, A., Antonucci, M., Illuminati, S., Scarponi, G., Riolo, P., Isidoro, N., Conti, C., **Zarantoniello, M.**, Cipriani, R., Olivotto, I. Fatty acids profile of black soldier fly (*Hermetia illucens*): influence of feeding substrate based on coffee-waste silverskin enriched with microalgae. *Animal Feed Science and Technology* **2020**, 259, 114309. doi:10.1016/j.anifeedsci.2019.114309.

24. Osimani, A., Milanović, V., Roncolini, A., Riolo, P., Ruschioni, S., Isidoro, N., Loreto, N., Franciosi, E., Tuohy, K., Olivotto, I., **Zarantoniello, M.**, Cardinali, F., Garofalo, C., Aquilanti, L., Clementi, F. *Hermetia illucens* in diets for zebrafish (*Danio rerio*): a study of bacterial diversity by using PCR-DGGE and metagenomic sequencing. *PLoS ONE* **2019**, 14(12), e0225956. doi:10.1371/journal.pone.0225956.

25. Chemello, G., Randazzo, B., **Zarantoniello, M.**, Fifi, A.P., Aversa, S., Ballarin, C., Radaelli, G., Magro, M., Olivotto, I. Safety assessment of antibiotic administration by magnetic nanoparticles in in vitro zebrafish liver and intestine cultures. *Comparative Biochemistry and Physiology Part- C: Toxicology and Pharmacology* **2019**, 224, 108559. doi:10.1016/j.cbpc.2019.108559.

26. **Zarantoniello, M.***, Randazzo, B.*, Truzzi, C., Giorgini, E., Marcellucci, C., Vargas-Abúndez, J.A., Zimbelli, A., Annibaldi, A., Parisi, G., Tulli, F., Riolo, P., Olivotto, I. A six-months study on Black Soldier Fly (*Hermetia illucens*) based diets in zebrafish. *Scientific Reports* **2019**, 9, 8598. doi:10.1038/s41598-019-45172-5.

27. Cardinaletti, G., Randazzo, B., Messina, M., **Zarantoniello, M.**, Giorgini, E., Zimbelli, A., Bruni, L., Parisi, G., Olivotto, I., Tulli, F. Effects of graded dietary inclusion level of full-fat *Hermetia illucens* prepupae meal in practical diets for rainbow trout (*Oncorhynchus mykiss*). *Animals* **2019**, 9(5), 251. doi:10.3390/ani9050251.

28. Vargas, A., Randazzo, B., Riolo, P., Truzzi, C., Gioacchini, G., Giorgini, E., Loreto, N., Ruschioni, S., **Zarantoniello, M.**, Antonucci, M., Polverini, S., Cardinaletti, G., Sabbatini, S., Tulli, F., Olivotto, I. Rearing zebrafish on black soldier fly (*Hermetia illucens*): biometric, histological, spectroscopic, biochemical and molecular implications. *Zebrafish* **2018**, 15(4), 404-419. doi: 10.1089/zeb.2017.1559.

29. **Zarantoniello, M.**, Bruni, L., Randazzo, B., Vargas, A., Gioacchini, G., Truzzi, C., Annibaldi, A., Riolo, P., Parisi, G., Cardinaletti, G., Tulli, F., Olivotto, I. Partial dietary inclusion of *Hermetia illucens* (Black Soldier Fly) full-fat prepupae in zebrafish feed: biometric, histological, biochemical, and molecular implications. *Zebrafish* **2018**, 15(5), 519-532. doi:10.1089/zeb.2018.1596.

Contribution to scientific congresses

Oral communications

1. Zarantoniello, M. *et al*. Assessing fish physiological responses to dietary inclusion levels of black soldier fly (*Hermetia illucens*) prepupae meal: a focus on traditional and innovative laboratory approaches and look towards future approaches. *IEEE International workshop on Measurements and Applications in Veterinary and Animal Sciences*, April 26-28, 2023, Naples, Italy.

2. Zarantoniello, M. *et al*. Growth, blood metabolic parameters and gut health status in rainbow trout (*Oncorhynchus mykiss*) fed fish meal-free diets supplemented with conventional feed additives or dried microbial biomass and red swamp crayfish meal as feed supplement. *Aquaculture Europe 2022*, September 27-30, 2022, Rimini, Italy.

3. Zarantoniello, M. *et al*. Physiological effects of insect-based diets during *Danio rerio* larval development. *Aquaculture America 2020 - International Conference and Exposition*, February 9-12, 2020, Honolulu, Hawaii.

4. Zarantoniello, M. *et al*. Effects of new and sustainable aquafeed ingredients on zebrfish reproduction. *65° Convegno GEI-SIBSC Gruppo Embriologico Italiano, Società italiana di Biologia dello Sviluppo e della Cellula 2019*, June 24-27, 2019, Ancona, Italy.

Posters

1. Zarantoniello, M. *et al*. Searching for a suitable commercial diet for carpione, *Salmo carpio*, to sustain a proper growth, welfare, and fillet quality. *Aquaculture Europe 2022*, September 27-30, Rimini, Italy.

2. Olivotto, I. *et al*. Effects of different full-fat *Hermetia illucens* prepupae meal dietary inclusions on reproductive performances of adult female zebrafish. *Aquaculture Europe 2022*, September 27-30, Rimini, Italy.

3. Conti. F. *et al*. Behavioural responses to different feed additives in zebrafish (*Danio rerio*) larvae: a preliminary study. *Aquaculture Europe 2022*, September 27-30, Rimini, Italy.

4. Ratti, S. *et al*. Rearing giant freshwater prawns (*Macrobrachium rosenbergii*) in aquaponic systems using sustainable aquafeeds. *Aquaculture Europe 2022*, September 27-30, Rimini, Italy.

5. Randazzo, B. *et al*. Towards the identification of a suitable commercial diet for carpione, *Salmo carpio* L.: a multidisciplinary study on fish performances, quality traits, and animal welfare. *XX International Symposium on Fish Nutrition and Feeding (ISFNF) – 2022*, June 5-9, Sorrento, Italy.

6. Girolametti, F. *et al*. Fatty acid profile and quantification in *Danio rerio* reared on new eco-sustainable insect-based diets. *9th MS day - I giovani e la spettrometria di*

massa - 2021, June 24, online edition.

7. Osimani, A. *et al*. Occurrence of antibiotic resistance genes in *Hermetia illucens*-based diets for aquaculture. *European Federation of Animal Science (EAAP) Annual Meeting 2020,* August 31 - September 4, Porto, Portugal.

8. Planas, M. *et al*. An experimental study on the effects of breeder diets on newborn seahorses *(Hippocampus guttulatus)*. *Congresso Iberico de Ictiologia, Iberian Society of Ichthyology (SIBIC) 2020*, June 15-19, Santiago de Compostela, Spain.

9. Olivotto, I. *et al*. Effects of graded dietary *Hermetia illucens* inclusion levels on juvenile and adult zebrafish growth and welfare. *Aquaculture America - International Conference and Exposition, World Aquaculture Society 2020* February 9-12, Honolulu, Hawaii.

10. Olivotto, I. *et al*. Insect meal and poultry by-product meal based diets during rainbow trout (*Onchorynchus mykiss*) culture. FTIR imaging and histological correlative study to investigate intestine and liver welfare. *Aquaculture America - International Conference and Exposition, World Aquaculture Society 2020* February 9-12, Honolulu, Hawaii.

11. Truzzi, C. *et al*. Omega-3 enriched *Hermetia illucens* as novel ingredient for insect-based food for the future: influence of growth substrate based on coffee-roasting by-product and microalgae. *6th MS-Food-day 2019*, September 25-27, Camerino, Italy.

12. Zimbelli, A. *et al*. 100 MHz electromagnetic field radiation effects on zebrafish *Danio rerio* embryonic development: a multidisciplinary approach. *65° Convegno GEI-SIBSC Gruppo Embriologico Italiano, Società italiana di Biologia dello Sviluppo e della Cellula 2019*, June 24-27, Ancona, Italy.

13. Randazzo, B. *et al*. Exposure of zebrafish larvae to low concentrations of cadmium and zinc and evaluation of the hair cell regeneration by a visual and molecular approach. *65° Convegno GEI-SIBSC Gruppo Embriologico Italiano, Società italiana di Biologia dello Sviluppo e della Cellula 2019*, June 24-27, Ancona, Italy.

14. Randazzo, B. *et al*. Sviluppo di un sistema fotocatalitico per la depurazione dell'acqua nell'allevamento dei pesci. *AquaFarm 2018*, February 15-16, Pordenone, Italy.

15. Randazzo, B. *et al*. Un approccio multidisciplinare per valutare le risposte biologiche dei teleostei alimentati con farine di insetti. *AquaFarm 2018*, February 15-16, Pordenone, Italy.

Abstract for oral presentations

1. Cattaneo, N. *et al*. The fate of dietary microplastics: a multidisciplinary laboratory approach to evaluate localization and physiological responses of zebrafish (*Danio rerio*) larvae. *Aquaculture Europe 2022*, September 27-30, Rimini, Italy.

2. Ratti, S. *et al*. Physiological responses of rainbow trout (*Oncorhynchus mykiss*) fed diets including *Hermetia illucens* prepupae meal enriched with spirulina (*Arthrospira platensis*). *Aquaculture Europe 2022*, September 27-30, Rimini, Italy.

3. Randazzo, B. *et al*. Effects of supplementing a plant protein-rich diet with insect, crayfish or microalgae meals on gilthead seabream (*S. aurata*) and European seabass (*D. labrax*) growth, welfare, gut health and microbiota. *XX International Symposium on Fish Nutrition and Feeding (ISFNF) – 2022*, June 5-9, Sorrento, Italy.

4. Roncolini, A. *et al*. Edible insects in aquaculture: microbial dynamics in the exploitation of *Hermetia illucens* as fish meal replacement. *3rd International Conference on Microbes and Beneficial Microbes 2019*, September 27-28, Toronto, Canada.

5. Bruni, L. *et al*. Lipid metabolism and fillet quality of rainbow trout fed diets including *Hermetia illucens* full-fat larvae. *23rd Congress of the Animal Science and Production Association (ASPA) 2019*, June 11-14, Sorrento, Italy.

6. Zarantoniello, M. *et al*. Physiological effects of insect-based diets during *Danio rerio* larval development. *65° Convegno GEI-SIBSC Gruppo Embriologico Italiano, Società italiana di Biologia dello Sviluppo e della Cellula 2019, June 24-27, Ancona, Italy.*

Editorial activity

- Guest editor for the Special Issue (*Animals*, MDPI):
  "*Innovations in aquaculture sustainability and endangered aquatic species conservation: advances in reproduction, new aquafeed formulations, sustainable farming systems, emerging contaminants, and waste treatment and revalorization*" in the section "Aquatic Animals"

- Reviewer for 6 peer-reviewed journals:
  - *Aquaculture* (Elsevier, ISSN: 0044-8486)
  - *Frontiers in Physiology* (Frontiers, ISSN: 1664-042X)
  - *Animals* (MDPI, ISSN: 2076-2615)
  - *Aquaculture Research* (Wiley Online Library, ISSN: 1365-2109)
  - *Journal of Animal Physiology and Animal Nutrition* (Wiley Online Library, ISSN: 1439-0396)
  - *Fermentation* (MDPI, ISSN: 2311-5637)
  - *Fishes* (MDPI, ISSN: 2410-3888)

TEACHING ACTIVITY AND STUDENT SUPERVISION

Academic Year 2022/2023

Università Politecnica delle Marche
Department of Life and Environmental Sciences

Auxiliary teaching for the laboratory activities for the course of Cytology and Histology (BIO/06) included in the BSc in Biological Sciences

Academic Year 2022/2023

Università Politecnica delle Marche
Department of Life and Environmental Sciences

Teaching position for the "*Laboratory of teleost larvae rearing techniques*" module of the II level University Master Course "*Acquacoltura del futuro: innovazione tecnologica e gestionale a favore di sostenibilità e redditività*"

Academic Year 2020/2021 - present

Università Politecnica delle Marche
Department of Life and Environmental Sciences

Co-supervisor of 4 MSc thesis in Marine Biology

Academic Year 2018/2019 - present

Università Politecnica delle Marche
Department of Life and Environmental Sciences

Teaching of "*Blood and haematopoiesis*" and "*Muscular tissue*" modules of the course of Cytology and Histology (BIO/06) included in the BSc in Biological Sciences.

Academic Year 2018/2019 - present

Università Politecnica delle Marche
Department of Life and Environmental Sciences

Teaching of "*Types of aquaculture techniques*" module of the course of Biotechnology and Blue Growth (BIO/06) included in the MSc in Marine Biology.

Academic Years from 2018/2019 to 2021-2022

Università Politecnica delle Marche
Department of Life and Environmental Sciences

Tutor position for the laboratory activities for the course of Cytology and Histology (BIO/06) included in the BSc in Biological Sciences.

Academic Years from 2018/2019 – 2020/2021

Università Politecnica delle Marche
Department of Life and Environmental Sciences

Tutor of 9 students for their MSc thesis in Marine Biology.

Academic Year 2018/2019 - present

Università Politecnica delle Marche
Department of Life and Environmental Sciences

Tutor of 2 students for their internship thesis included in the BSc in Biological Sciences.

Academic Year 2017/2018 - present

Università Politecnica delle Marche
Department of Life and Environmental Sciences

Part of the Reproductive and Developmental Biology Lab staff during the annual events "SHARPER - La notte dei ricercatori", "Mini SHARPER", "Micro Genius", e "Tipicità in blu".

Academic awards

July 2021

Università Politecnica delle Marche
Department of Life and Environmental Sciences

"SUSHIN Award" winner for the best innovative research project (sector AGR/20)
"*Zero-waste production of alternative aquafeed ingredients for farmed fish culture*" proposed within the SUSHIN project funded by Ager foundation (Coordinator Prof. E. Tibaldi, Department of Agri-Food, Environmental and Animal Sciences, University of Udine)

LANGUAGES

MOTHER TONGUE **ITALIAN**

OTHER LANGUAGES

ENGLISH

• Reading	EXCELLENT
• Writing	EXCELLENT
• Speaking	EXCELLENT

SPANISH

• Reading	FLUENT
• Writing	FLUENT
• Speaking	FLUENT

ADDITIONAL INFORMATION

In reference to the law 196/2003, I assent to the entire treatment of the inserted personal and professional data.

In reference to the D.P.R. 445/2000, I declare the accuracy of the contents reported.