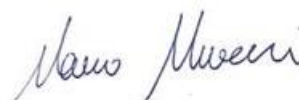


## Marco Munari's Curriculum vitae

### Personal data

**Name**

Munari Marco



**Home Address**

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35135, Padova - Italy

**Work address**

Stazione Zoologica Anton Dohrn,  
Department of Integrated Marine Ecology,  
Villa Dohrn - Benthic Ecology Center,  
Punta San Pietro, 80077, Ischia (Naples),  
Italy

**Nationality**

Italian

### Present position

**Full time researcher** at the Department of Integrated Marine Ecology of the Stazione Zoologica Anton Dohrn (Naples, Italy, 2017-ongoing).

**Coordinator** of the Benthic Ecology Center of the Stazione Zoologica Anton Dohrn based in Ischia (Naples, Italy, 2018-ongoing).

### Education and Employments

**Scientific lyceum diploma** (82/100 marks): Technical Institute for Social activities 'Pietro Scalerle', Biological-Chemical Curriculum, Padova, Italy, (1997-2002).

**Bachelor degree in Marine Biology** (99/110 marks): University of Padova, Italy (2002-2005).

**Thesis supervisor:** Professor Maria Gabriella Marin.

**Thesis project:** Effects of temperature and salinity on physiological responses in the bivalve *Tapes philippinarum*.

**Period:** 2 months, at the Ecophysiology and Ecotoxicology of Marine Invertebrates laboratory (Department of Biology, University of Padova, Padova, Italy).

**Master degree in Marine Biology** (110/110 marks): University of Pisa, Italy, (2005-2008).

**Thesis supervisor:** Professor Marco Nigro, Professor Giada Frenzilli, Doctor Brett Lyons.

**Thesis project:** Genotoxic effects of nanoparticles in a bioindicator (*Mytilus edulis*) and in fish cell-lines.

**Period:** 11 months, (from the 15<sup>th</sup> of July 2007 to the 15<sup>th</sup> of February 2008) at the laboratories of CEFAS (Weymouth, UK) and (from the 16<sup>th</sup> of February 2008 to the 10<sup>th</sup> of June 2008) at the Department of Human Morphology and Applied Biology (University of Pisa, Italy).

**Post-graduate fellowship** (European Circle-Med Project) at the Department of Biology, University of Padova, (2008-2010).

**Project coordinator:** Professor Luis Chicharo (University of Algarve, Faro, Portugal).

**Italian PI:** Professor Maria Gabriella Marin

**Project:** The integrated impacts of marine acidification, temperature and precipitation changes on bivalve coastal biodiversity and fisheries: how to adapt? (ACIDBIV).

**Period:** 24 months, (from the 3<sup>rd</sup> of December 2008 to the 3<sup>rd</sup> of December 2010) at the Ecophysiology and Ecotoxicology of Marine Invertebrates laboratory (Department of Biology, University of Padova, Padova, Italy) and at the Hydrobiological Station 'Umberto d' Ancona' (University of Padova, Chioggia, Italy).

**PhD in Evolutionary Biology** (PhD School of Bioscience and Biotechnology, Course of study in Evolutionary Biology) at the Department of Biology, University of Padova, Italy, (2011-2014).

**Project director:** Professor Maria Gabriella Marin.

**Project:** Combined effects of seawater acidification and emerging contaminants on marine bivalves.

**Period:** 38 months, (from the 2<sup>nd</sup> of January 2011 to the 7<sup>th</sup> of March 2014) at the Ecophysiology and Ecotoxicology of Marine Invertebrates laboratory (Department of Biology, University of Padova, Padova, Italy), at the Hydrobiological Station 'Umberto d' Ancona' (University of Padova, Chioggia, Italy) and at the St. Lawrence Centre (Environmental Canada, Montreal, Quebec, Canada).

**Post-Doc Grant** at the Department of Biology, University of Padova, Italy, (2014-2016).

**Project director:** Professor Maria Gabriella Marin.

**Project:** Combined effects of seawater acidification and environmental contaminants on the early life stages of marine invertebrates.

**Period:** 24 months, (from the 1<sup>st</sup> of April 2014 to the 31<sup>st</sup> of March 2016) at the Ecophysiology and Ecotoxicology of Marine Invertebrates laboratory (Department of Biology, University of Padova, Padova, Italy) and at the Hydrobiological Station 'Umberto d' Ancona' (University of Padova, Chioggia, Italy).

**Expert marine biologist** for the Cooperative BLUSCIENZA (2016), at the Adriatic Zoology Museum 'Giuseppe Olivi' of the University of Padua based in Chioggia (Venice, Italy).

**Duties:**

- control of the state and maintenance of the historical adriatic collection of marine organisms,

- organization and preparation of educational activities, tours and public events.

**Period:** from the 1<sup>st</sup> of April 2016 to the 31<sup>st</sup> of December 2016.

**Responsible** of the General Botany laboratory practical activities of the General Botany course within the First cycle degree in Natural Science, University of Padova, Italy (2016).

**Course responsible:** Doctor Francesca Dalla Vecchia.

**Period:** October-November 2016 for a total amount of 48 hours.

**Post-Doc Grant** at the Benthic Ecology Center in Ischia, Department of Integrated Marine Ecology, Stazione Zoologica Anton Dohrn, Naples, Italy, (2017).

**Project director:** Doctor Maria Cristina Gambi.

**Project:** High-CO<sub>2</sub> Seas: Assessing the impacts of ocean acidification on marine biodiversity and species adaptation.

**Period:** from the 1<sup>st</sup> of January 2017 to the 30<sup>th</sup> of September 2017.

**Full time researcher** at the Benthic Ecology Center in Ischia, Department of Integrated Marine Ecology, Stazione Zoologica Anton Dohrn, Naples, Italy.

**Period:** from the 2<sup>nd</sup> of October 2017 - ongoing.

**Coordinator** the Benthic Ecology Center in Ischia.

**Period:** from March 2018 – ongoing.

### Languages

- Mother language: Italian.
- Speaking: Italian and English.
- Writing: Italian and English.

### International and national course participations

2012 - PhD Course at the University of Gothenburg, Sweden: Ecotoxicogenomics & Mechanisms of Toxicity.

2012 - PhD Course at the University of Gothenburg, Sweden: Marine evolution under Climate Change.

### Scientific societies

- Italian Association of Developmental and Comparative Immunology (IADCI).
- Society of Environmental Toxicology and Chemistry (SETAC).

### Research collaborations

- St. Lawrence Centre, Environmental Canada, Montreal Quebec, Canada.
- Centre for Environment, Fisheries & Aquaculture Science<sup>(CEFAS)</sup>, Weymouth, UK.
- Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS), Trieste, Italy.
- Department of Human Morphology and Applied Biology, University of Pisa, Pisa, Italy.
- Department of Biology, University of Padova, Padova, Italy.

### Supervisor of master students

**Benettello Giuditta:** Master Thesis in Marine Biology, University of Padova, Italy (2012).

‘Combined effects of seawater acidification and diclofenac in *Mytilus galloprovincialis*’.

**Chemello Giulia:** Master Thesis in Marine Biology, University of Padova, Italy (2013).

‘Combined effects of seawater acidification and diclofenac in *Ruditapes philippinarum*’.

**Dalle Palle Giulia:** Master Thesis in Natural Science, University of Padova, Italy (2016).

‘Combined effects of seawater acidification and environmental contaminants on the early life stages of the sea urchin *Paracentrotus lividus*’.

**Palombo Cristina:** Master Thesis in Ecobiology, University of Rome 'La Sapienza', Italy (2017). 'Evaluation of paternal and maternal effects in response to marine acidification in two sea urchin species, *Paracentrotus lividus* and *Arbacia lixula*'.

### **Supervisor of PhD students**

**Asnicar Davide:** PhD school of Bioscience, Curriculum in *Evolution, Ecology and Conservation*, University of Padova, Italy (2017). 'Within- and trans-generational effects of ocean acidification and other environmental stressors in sea urchins'

### **Scientific activity**

Over my study path my main interests have always been biodiversity and how and when changes in the marine environment, directly or indirectly related to human activities, can affect marine organism's responses. This is why I focused my studies and research in fields such as marine ecology and ecotoxicology using different marine invertebrates as model species and using different scientific approaches and laboratory techniques. What I learned it is the importance of combining evolutionary approaches with classic ecotoxicological ones in order to better predict and anticipate threats to biodiversity. Actually, the knowledge about what kind of long term, transgenerational effects climate changes and pollution might have on natural populations is still scarce. In the last years I have focused my attention on the study on the combined effects of ocean acidification and emerging contaminants on different life stages of marine invertebrates such as bivalves and echinoderms from the cellular to the organism' levels, paying also attention whenever parental effects can buffer the detrimental effects due to ocean acidification or the exposure to pollutants. I am now working as full time researcher at the Villa Dohrn-Benthic Ecology Centre in Ischia, where I will continue to study the possible adaptations of marine organisms to future climate changes scenarios by using the natural laboratories represented by various volcanic CO<sub>2</sub> vents present along the coast of Ischia (Italy).

### **Social skills and competences**

During my research experiences I had the chance to acquire a significant team spirit and the capability to live and work in a multicultural environment where communication and coordination are essential.

In addition, I am active in public and educational activities by co-founding the Marine Biology association *Bluscienza* in 2013, with the aim of promoting environmental awareness among the general public throughout the development of educational programs in schools and other public environments.

### **Technical skills and competences**

- Microscope techniques.
- Spectrophotometric techniques.

- Measurement of physiological rates, enzymatic activities, immune system related parameters, gene expression and DNA damages in marine invertebrates.
- Histological analyses of gonadal development in marine invertebrates.
- Rearing of marine invertebrates (bivalves and echinoids) both at the larval and adult stages under laboratory conditions.
- Manipulation of marine invertebrate gametes (from bivalves and echinoids) to carry out fertilization assays.
- Measurement of sea water physical, chemical and biological characteristics (pH, temperature, oxygen concentration, salinity, dissolved organic matter, chlorophyll content and microbial components).

### **Computer skills and competences**

- Microsoft office package.
- Comet Assay Software.
- Statistical programs: R, Statistica, Primer6.
- Video Editing: Pinnacle Studio, GoPro Studio.
- Digital image processing program: ImageJ, ImaQ.
- Computer Assisted Sperm Analysis (CASA).

### **Other skills**

- European drive licence (B).
- Motor boat licence (within 12 nautical miles).
- FIPSAS/CMAS dive master with night diving, drift diving, deep diving and underwater navigation specializations.

### **Scientific articles**

1. **Munari M**, Matozzo V, Marin MG, 2010. Vitellogenin induction in the clam, *Ruditapes philippinarum*, and the crab, *Carcinus aestuarii*, from the Lagoon of Venice: a comparative study. *Fresenius Environmental Bulletin* 19 (10a), 2312-2317.
2. **Munari M**, Matozzo V, Marin MG, 2011. Combined effects of temperature and salinity on functional responses of haemocytes and survival in air of the clam *Ruditapes philippinarum*. *Fish and Shellfish Immunology* 30, 1024-1030.
3. Matozzo V, Chinellato A, **Munari M**, Finos L, Bressan M, Marin MG, 2012. First evidence of immunomodulation in bivalves under seawater acidification and increased temperature. *PLoS One* 7(3) e33820.
4. Matozzo V, Chinellato A, **Munari M**, Bressan M, Marin MG, 2013. Can the combination of decreased pH and increased temperature values induce oxidative stress in the clam *Chamelea gallina* and the mussel *Mytilus galloprovincialis*? *Marine Pollution Bulletin* 72, 34-40.
5. **Munari M**, Marin MG, Matozzo V, 2014. Effects of the antidepressant fluoxetine on the immune parameters and acetylcholinesterase activity of the clam *Venerupis philippinarum*. *Marine Environmental Research* 94, 32-37.

6. **Munari M**, Sturve J, Frenzilli G, Sanders MB, Christian P, Nigro M, Lyons BP, 2014. Genotoxic effects of Ag<sub>2</sub>S and CdS nanoparticles in blue mussel (*Mytilus edulis*) haemocytes. *Chemistry and Ecology*, doi.org/10.1080/02757540.2014.894989.
7. **Munari M**, Sturve J, Frenzilli G, Sanders MB, Brunelli A, Marcomini A, Nigro M, Lyons BP, 2014. Genotoxic effects of CdS quantum dots and Ag<sub>2</sub>S nanoparticles in fish cell lines (RTG-2). *Mutation research* 775–776, 89–93.
8. Bressan M, Chinellato A, **Munari M**, Matozzo V, Mancini A, Marceta T, Finos L, Moro I, Pastore P, Badocco D, Marin MG, 2014. Does seawater acidification affect survival, growth and shell integrity in bivalve juveniles? *Marine Environmental Research* 99, 136-148.
9. Range P, M. A. Chìcharo MA, Ben-Hamadou R, Pilò D, Fernandez-Reiriz MJ, Labarta U, Marin MG, Bressan M, Matozzo V, Chinellato A, **Munari M**, El Menif NT, Dellali M, Chìcharo L, 2014. Impacts of CO<sub>2</sub>-induced seawater acidification on coastal Mediterranean bivalves and interactions with other climatic stressors. *Regional Environmental Change* 14 (Suppl 1), 19-30.
10. Marisa I, Matozzo V, **Munari M**, Binelli A, Parolini M, Martucci A, Franceschinis E, Braine N, Marin MG, 2016. In vivo exposure of the marine clam *Ruditapes philippinarum* to zinc oxide nanoparticles: responses in gills, digestive gland and haemolymph. *Environmental Science and Pollution Research*, DOI 10.1007/s11356-016-6690-5.
11. **Munari M**, Chemello G, Finos L, Ingrosso G, Giani M, Marin MG, 2016. Coping with seawater acidification and the emerging contaminant diclofenac at the larval stage: A tale from the clam *Ruditapes philippinarum*. *Chemosphere*, 160, 293-302.
12. **Munari M**, Matozzo V, Gagné F, Chemello G, Riedl V, Finos L, Pastore P, Badocco D, Marin MG, 2018. Do seawater acidification and diclofenac induce oxidative stress in marine bivalves? A comparison study with the mussel *Mytilus galloprovincialis* and the clam *Ruditapes philippinarum*. *Environmental Pollution* 240, 925-937.
13. Matozzo V, Zampieri C, **Munari M**, Marina MG, 2019. Glyphosate affects haemocyte parameters in the clam *Ruditapes philippinarum*. *Marine Environmental Research*, 146, 66-70.
14. **Munari M**, Matozzo V, Chemello G, Riedl V, Pastore P, Badocco D, Marin MG, 2019. Seawater acidification and emerging contaminants: A dangerous marriage for haemocytes of marine bivalves. *Environmental research*, 175, 11-21.
15. Matozzo V, **Munari M**, Masiero L, Finos L, Marin MG, 2019. Ecotoxicological hazard of a mixture of glyphosate and aminomethylphosphonic acid to the mussel *Mytilus galloprovincialis* (Lamarck 1819). *Scientific reports* 9 (1), 1-9.
16. Ruocco N, Bertocci I, **Munari M**, Musco L, Caramiello D, Danovaro R, Zupo V, Costantini M, 2020. Morphological and molecular responses of the sea urchin *Paracentrotus lividus* to highly contaminated marine sediments: The case study of Bagnoli-Coroglio brownfield (Mediterranean Sea). *Marine Environmental Research* 154, 104865.

### **Participation in conferences (oral or poster presentations)**

#### **International**

1. **Munari M**, Sturve J, Frenzilli G, Nigro M, Lyons B, 2009. Genotoxic effects of nanoparticles evaluated in sentinel species (*Mytilus edulis*) and in fish cell lines (RTG-2). SETAC, Göteborg, Sweden, POSTER.
2. **Munari M**, Matozzo V, Marin MG, 2009. Vitellogenin induction in the clam, *Ruditapes philippinarum*, and the crab, *Carcinus aestuarii*, from the lagoon of Venice: a comparison study. MESAEP 2009, Bari, Italy, POSTER.
3. **Munari M**, Chinellato A, Matozzo V, Bressan M, Marin MG, 2010. Effects of pH, temperature and salinity variations on haemocyte responses of *Mytilus galloprovincialis*. SETAC, Seville, Spain, POSTER CORNER (poster with oral presentation).
4. **Munari M**, Chinellato A, Matozzo V, Bressan M, Marin MG, 2010. Combined effects of temperature, salinity and pH on immune parameters in the clam *Chamelea gallina*. ESCPB 2010, Alessandria, Italy, POSTER.
5. Chinellato A, **Munari M**, Matozzo V, Bressan M, Marin MG, 2010. First attempts in evaluating acidification effects on physiological responses in *Mytilus galloprovincialis*. ESCPB 2010, Alessandria, Italy, POSTER.
6. **Munari M**, Riedl V, Benettello G, Matozzo V, Marin MG, 2012. Combined effects of acidification and emerging contaminants on immune parameters of the mussel *Mytilus galloprovincialis*. SETAC, Berlin, Germany, POSTER CORNER (poster with oral presentation).
7. **Munari M**, Ballarin L, Marin MG, Matozzo V, 2012. Effects of the antidepressant fluoxetine on the immune parameters of the clam *Venerupis philippinarum*. 1<sup>st</sup> international conference of Fish & Shellfish Immunology, Vigo, Spain, POSTER. Abstracts / Fish & Shellfish Immunology 34 (2013) 1692–1752.
8. **Munari M**, Matozzo V, Chemello G, Marin MG, 2012. Combined effects of seawater acidification and diclofenac on immune parameters of the clam *Ruditapes philippinarum*. ESCPB, Bilbao, Spain, ORAL PRESENTATION / Comparative Biochemistry and Physiology A-Molecular & Integrative Physiology 163 (2012) S5-S5.
9. Chinellato A, **Munari M**, Matozzo V, Bressan M, Marin MG, 2012. Effects of pH and temperature on physiological responses of the bivalves *Mimachlamys varia* and *Callista chione*. PHYSIOMAR, Santiago de Compostela, Spain, POSTER.
11. **Munari M**, Matozzo V, Chemello G, Marin MG, 2014. Can ocean acidification affect the susceptibility to emerging contaminants in marine bivalve early-life stages? SETAC, Basel, Swiss, POSTER.
12. **Munari M**, Matozzo V, Gagnè F, Marin MG, 2014. Oxidative stress-related parameters in adults and larvae of the clam *Ruditapes philippinarum* under different combinations of pH values and diclofenac concentrations. BIMAT, Palermo, Italy, ORAL PRESENTATION.
13. **Munari M**, Matozzo V, Gagnè F, Chemello G, Riedl V, Finos L, Marin MG, 2015. Challenging plasticity: can acidified conditions alter susceptibility to emerging contaminants in marine bivalves at different life-stages? SETAC, Barcelona, Spain, POSTER.
14. **Munari M**, Devigili A, Dalle Valle G, Nicolussi G, Marin MG, 2016. Early-life stages of the sea urchin *Paracentrotus lividus* coping with seawater acidification and environmental contaminants. ESCPB, Barcelona, Spain, ORAL PRESENTATION.

## National

1. **Munari M**, Chinellato A, Matozzo V, Bressan M, Marin MG, 2011. Combined effects of temperature, salinity and pH on immune parameters of bivalve molluscs. SIICS, Monteortone, Teolo, PD, Italy, ORAL PRESENTATION. Abstract / Invertebrate Survival Journal 8 (2011), 42.
2. **Munari M**, Marin MG, Matozzo V, 2012. Effects of fluoxetine on immune parameters of the clam *Ruditapes philippinarum*. SIICS 2012, San Benedetto del Tronto, AP, Italy, oral PRESENTATION. Abstract / Invertebrate Survival Journal 9 (2012), 40.
3. **Munari M**, Matozzo V, Gagnè F, Marin MG, 2014. Oxidative stress-related responses in the mussel *Mytilus galloprovincialis* and the clam *Venerupis philippinarum* under different combinations of pH values and diclofenac concentrations. SiTE, Ferrara, Italy, ORAL PRESENTATION.

## Invited reviewer:

- African Journal of Biotechnology
- Aquatic living resources
- Biological Trace Element Research
- Bulletin of Environmental Contamination and Toxicology
- Chemistry and Ecology
- Ecotoxicology
- Environmental Science: Processes & Impacts
- Environmental Science and Pollution Research
- Hidrobiologia
- Journal of Nanomaterials
- Pakistan Journal of Scientific and Industrial Research (PJSIR)
- Peer J
- Scientific Reports

## References

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