



## Marta Bolgan, Bsc, Mrs, Ph.D.

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[https://www.researchgate.net/profile/Marta\\_Bolgan](https://www.researchgate.net/profile/Marta_Bolgan)

Websites: Artemis Eyes Project

[www.artemiseyesproject.wordpress.com](http://www.artemiseyesproject.wordpress.com)

[www.youtube.com/channel/UCk-SxpESf6ybxLG-Y9\\_9gZQ](http://www.youtube.com/channel/UCk-SxpESf6ybxLG-Y9_9gZQ)

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### Research experience

October 2016 – **BeIPD-COFUND: Marie-Curie COFUND postdoctoral fellowship supervised by Prof Eric Parmentier**

University of Liège (Belgium)

Aims: (i) produce a complete list of the different fish calling species found in the Calvi Bay; (ii) investigate their calling periods and how different species share the same acoustic space; (iii) study the potential influence of abiotic factors (photoperiod, temperature, pH etc.) on fish sounds features.

October 2012 – **PhD project supervised by Dr Martin Gammell and co-supervised by Dr Joanne O'Brien.**  
October 2015

Marine and Freshwater Research Centre, Galway-Mayo Institute of Technology, Galway (Ireland).

Exploring the potential of Passive Acoustic Monitoring (PAM) for the management and conservation of the Arctic charr (*Salvelinus alpinus* L.) in Irish and British lakes.

March 2012 – **Researcher position: analysis of bioacoustic data, supervised by Dr Stefano Malavasi and co-supervised by Dr Marta Picciulin.**  
May 2012

Center for Estuarine and Coastal Marine Sciences, Department of Environmental Sciences, Informatics and Statistics, Ca' Foscari University, Venice (Italy).

Soundscape investigation and identification of brown meagre (*Sciaena umbra*; Sciaenidae) calls using PAM on artificial rocky habitats of the Venice lagoon (Italy).

April 2011 – **Researcher position: fish hearing sensitivity, with Dr M. Clara P. Amorim and Dr Paulo J. Fonseca**  
July 2011

Centre for Ecology, Evolution and Environmental Changes, Department of Animal Biology, Lisbon University, Lisbon (Portugal).

Neurophysiology study of the acoustic sensitivity of sand gobies species (*Pomatoschistus* spp; Gobiidae) using the Auditory Evoked Potentials (AEP) technique.

June 2010 – **Assistant researcher position supervised by Dr Donatella Del Piero**  
September 2010

Department of Life Sciences, Trieste University, Trieste (Italy).

Collaboration in the experimental survey for the evaluation of the population status of *Chamelea gallina* and *Callista chione* (Veneridae; Mollusca) in the Trieste Gulf (Italy).



December 2009 – July 2010     **Mres thesis data collection, supervised by Dr M. Clara P. Amorim and Dr Paulo J. Fonseca and co-supervised by Dr Marta Picciulin.**

Centre for Ecology, Evolution and Environmental Changes, Department of Animal Biology, Lisbon University, Lisbon (Portugal).

Comparative analysis of the reproductive behaviour of closely related sand gobies species (i.e. *Pomatoschistus pictus* and *Pomatoschistus microps*; Gobiidae) with particular reference to acoustic communication.

August 2009 – October 2009     **Assistant researcher position supervised by Dr Donatella Del Piero.**

Department of Life Sciences, Trieste University, Trieste (Italy).

Collaboration in the experimental survey for the evaluation of the population status of *Chamelea gallina* (Veneridae; Mollusca) in the Gulf of Trieste (Italy).

May 2008 – September 2008     **Bsc thesis data collection, supervised by Dr Enrico A. Ferrero and co-supervised by Maria Rodeano (Zoological garden Director).**

Department of Life Sciences, Trieste University, Trieste (Italy) and Zoological garden "Parco Zoo Punta Verde", Lignano (Italy).

Analysis of the behaviour of a captive meerkat colony (*Suricata suricatta*; Herpestidae; Mammalia), with particular reference to the use of space and time budget.

## Education

October 2012 – October 2015     **PhD project supervised by Dr Martin Gammell and by Dr Joanne O'Brien.**

Marine and Freshwater Research Centre, Galway-Mayo Institute of Technology at Galway (Ireland).

PhD thesis title: Exploring the potential of Passive Acoustic Monitoring (PAM) for the management and conservation of the Arctic charr (*Salvelinus alpinus* L.): investigations of visual and acoustic behaviour of fish in captivity and soundscape analysis of selected habitats in Ireland and Britain., 255 pp.

September 2008 – March 2011     **Master in Research (Mres) (2 years) in Marine Biology (*cum laude*).**

Department of Life Sciences, Trieste University, Trieste (Italy).

Thesis title: Bolgan, M. (2011) Comparative analysis of the reproductive behaviour of two closely related species, *Pomatoschistus pictus* and *Pomatoschistus microps* with particular reference to acoustic communication. Master thesis, University of Trieste, IT, 212 pp.

September 2005 – August 2008     **Honours Bachelor (3 years) in Biology.**

Department of Life Sciences, Trieste University, Trieste (Italy).

Thesis title: Bolgan, M. (2008) The effects of environmental and food enrichments on the behaviour of a meerkats (*Suricata suricatta*) colony in captivity. Bachelor thesis, University of Trieste, IT, 51 pp.



## Publications

### Papers in peer-reviewed international journals

Rountree R.A., Juanes F., **Bolgan M.** (in press) Air movement sound production by alewife, white sucker, and four salmonid fishes suggests the phenomenon is widespread among freshwater fishes. PLOS One.

Picciulin M., Kever L, Parmentier E., **Bolgan M.** (in press) Listening to the unseen: Passive Acoustic Monitoring reveals the presence of a cryptic fish species. Aquatic Conservation: Marine and Freshwater Ecosystems

**Bolgan M.**, Amorim M.C.P., Fonseca P.J., Di Iorio L. & Parmentier E. (2018). Acoustic Complexity of vocal fish communities: a field and controlled validation. Scientific reports, 8(1): 10559

**Bolgan M.**, Chorazyczewska E., Winfield I.J., Mc Cullough P., O'Brien J. & Gammell M. (2017) The soundscape of Arctic charr spawning grounds in lotic and lentic environments: can Passive Acoustic Monitoring be used to detect spawning activities? Bioacoustics (early view doi 10.1080/09524622.2017.1286262).

**Bolgan M.**, O'Brien J., Picciulin M., Manning L. & Gammell M. (2016) Behaviour of Arctic charr during an induced mating season in captivity: how male relative size influences male behavioural investment and female preference over time. Journal of Fish Biology (early view doi/10.1111/jfb.13244).

**Bolgan M.**, Chorazyczewska, E., Winfield I.J., Codarin, A., O'Brien J, & Gammell M. (2016) First observations of anthropogenic underwater noise in a large multi-use lake. Journal of Limnology 75(3):644-651.

**Bolgan M.**, O'Brien J, Rountree, R.. & Gammell M. (2016) Does the Arctic charr, *Salvelinus alpinus*, produce sounds in a captive setting? Journal of Fish Biology 89(3): 1857-1865.

Picciulin M., **Bolgan M.**, Coro' A.B., Calcagno G. & Malavasi S. (2016) Sound production in the shi drum *Umbrina cirrosa* and comparison with the brown meagre *Sciaena umbra*: a passive acoustic monitoring perspective. Journal of Fish Biology 88(4): 1655-1660

**Bolgan M.**, O'Brien J. & Gammell M. (2015) The behavioural repertoire of Arctic charr (*Salvelinus alpinus* (L.)) in captivity: a case study for testing ethogram completeness and reducing observer effects. Ecology of Freshwater Fish 25(2): 318-328.

Picciulin M., **Bolgan M.**, Codarin A., Fiorin R., Colla S & Malavasi S. (2013) Characterisation of the noise emitted by the passage of a passenger cruise liner in the Venice lagoon: concern about possible effects on the local fish community. Annales: Series Historia Naturalis 23 (2): 143-147.

Picciulin M., **Bolgan M.**, Codarin A., Fiorin R., Zucchetta M. & Malavasi S. (2013) Passive acoustic monitoring of *Sciaena umbra* on rocky habitats in the Venetian littoral zone. Fisheries Research 145: 76-81.

**Bolgan M.**, Pedroso S.S., Picciulin M., Fonseca P.J & Amorim M.C.P (2013) Differential investment in acoustic communication during social interactions in two closely-related sand goby species. Behaviour 150: 133-152.

Amorim M.C.P, Pedroso S.S., **Bolgan M.**, Jordão J.M, Caiano M. & Fonseca P.J. (2012) Painted gobies sing their quality out loud: acoustic rather than visual signals advertise male quality and contribute to mating success. Functional Ecology 27(2): 289-298.

**Bolgan M.**, Rodeano, M., Manna, D., Ferrero, E.A. (2009) Animal welfare and scientific research: the meerkat group at Parco Zoo Punta Verde. International Zoo News 374 (56/5): 281-288.

**Bolgan M.**, Rodeano, M., Manna, D., Ferrero, E.A. (2008) What enrichment motivates meerkats? Shape of Enrichment 17 (4): 11-13.

### Papers in conference proceedings

Rountree R.A., Juanes F., **Bolgan M.** (2017) Fish sound production in freshwater habitats of New England: Widespread occurrence of air movements sounds. In: The Journal of the Acoustical Society of America 141(5)- in press-

**Bolgan M.**, O'Brien J., Winfield I.J. Gammell M. (2016) An investigation of Irish and British inland water soundscapes: which sonic sources influence acoustic levels? In: Proceedings of Meetings on Acoustics (POMA), Acoustical Society of America (ASA).

Picciulin M., Colla S., Fiorin R., **Bolgan M.**, Pranovi F., Malavasi S. (2016) The soundscape of a mussel farm: biophony and man-made noise levels. In: Proceedings of Meetings on Acoustics (POMA), Acoustical Society of America (ASA).

**Bolgan M.**, Picciulin M., Codarin A., Fiorin R., Zucchetta M. & Malavasi S. (2015) Is the Venice lagoon noisy? First passive listening monitoring of the Venice lagoon: possible effects on the typical fish community. In: Popper, A.N. and Hawkins, A. (ed.) The Effects of Noise on Aquatic Life II. Springer Science+Business Media, LLC, New York.

**Bolgan M.**, Pedroso S.S., Vasconcelos R.O, Jordão J.M, Amorim M.C.P. & Fonseca P.J. (2012) Hearing sensitivity of the painted goby, *Pomatoschistus pictus*. In: Popper, A.N. and Hawkins, A. (ed.) The Effects of Noise on Aquatic Life I. Springer Science+Business Media, LLC, New York, pp. 109-111.



Pedroso S.S., **Bolgan M.**, Jordão J.M., Fonseca P.J. & Amorim M.C.P. (2012) Acoustic communication in *Pomatoschistus* spp.: a comparison between closely related species. In: Popper, A.N. and Hawkins, A. (ed.) The Effects of Noise on Aquatic Life I. Springer Science+Business Media, LLC, New York, pp. 113-115.

## Conferences

**Bolgan M.**, Di Iorio I, Lejeune P., Parmentier E. (2018) Abundance et diversité acoustique des populations de poissons dans la baie de Calvi (Invited by Dr. M. Leduc, STARESO), Workshop STARECAPMED, STARESO, April 2018. Oral presentation.

**Bolgan M.**, Amorim M.C.P., Fonseca P.J., Di Iorio L. & Parmentier E. (2017) Acoustic Complexity of fish vocal community: a field and controlled validation (Invited by Dr. Di Iorio, CHORUS), Séminaire 'Ecologie & Acoustique sous-marine', 13 November 2017 (Grenoble, France). Oral presentation.

**Bolgan M.**, O'Brien J., Winfield I.J. Gammell M. (2016) An investigation of Irish and British inland water soundscapes: which sonic sources influence acoustic levels? In: Proceedings of Meetings on Acoustics (POMA), Acoustical Society of America (ASA). Oral presentation.

Picciulin M., Colla S., Fiorin R., **Bolgan M.**, Pranovi F., Malavasi S. (2016) The soundscape of a mussel farm: biophony and man-made noise levels. The Effects of Noise on Aquatic Life. 4th international conference. Dublin, Ireland. Poster presentation.

**Bolgan M.**, O'Brien J. & Gammell M. (2013) Does the Arctic char (*Salvelinus alpinus*) rely on sound to communicate? 48<sup>th</sup> European Marine Biology Symposium. Galway, Ireland. Poster presentation.

**Bolgan M.**, Picciulin M., Codarin A., Fiorin R., Zucchetta M. & Malavasi S. (2013) Is the Venice lagoon noisy? First passive listening monitoring of the Venice lagoon: possible effects on the typical fish community. The Effects of Noise on Aquatic Life. 3<sup>rd</sup> international conference. Budapest, Hungary. Oral presentation.

Amorim M.C.P., Pedroso S. S., **Bolgan M.**, Jordão J.M., Fonseca P.J. (2011) Courtship sounds indicate male quality in the painted gobies (*Pomatoschistus pictus*). Behaviour 2011. International conference. Bloomington, Indiana. Oral presentation.

**Bolgan M.**, Pedroso S.S., Picciulin M., Jordão J.M., Fonseca P.J. & Amorim M.C.P. (2011) Are painted goby drums efficient at keeping intruders at bay? A comparison of agonistic communication between two closely related species (Gobiidae, Teleostei). The XXIII meeting of the International Bioacoustics Council (IBAC). La Rochelle, France. Poster presentation.

Pedroso S. S., **Bolgan M.**, Fonseca P.J. & Amorim M.C.P. (2011) Do painted gobies sing their quality out loud? Symposium on Acoustic Communication by Animals. 3rd International conference. Ithaca, NY. Oral presentation.

Pedroso S.S., **Bolgan M.**, Pereira A., Almada V.C., Lugli M., Malavasi S., Fonseca P.J. & Amorim, M.C.P. (2011) Geographical variation in courtship acoustic signals in sand gobies (Gobiidae, Teleostei). The XXIII meeting of the International Bioacoustics Council (IBAC). La Rochelle, France. Poster presentation.

**Bolgan M.**, Pedroso S.S., Vasconcelos R.O., Jordão J.M., Amorim M.C.P. & Fonseca, P.J. (2010) Hearing sensitivity of the painted goby, *Pomatoschistus pictus*. The Effects of Noise on Aquatic Life. 2<sup>nd</sup> international conference, Cork, Ireland. Poster presentation.

Pedroso S.S., **Bolgan M.**, Jordão J.M., Fonseca P.J. & Amorim M.C.P. (2010) Acoustic communication in *Pomatoschistus* spp.: a comparison between closely related species. The Effects of Noise on Aquatic Life. 2<sup>nd</sup> international conference. Cork, Ireland. Poster presentation.

Del Piero D., **Bolgan M.**, Burca M., Calcagno G., D'Antoni S., Coglievina C., De Flego P., De Munari M. & Diviacco P. (2010) Three years after: What about *Callista chione* restoration plans. ICSR 13<sup>th</sup> International Conference on Shellfish Restoration. Charleston, SC, USA. Oral presentation.

## Scientific illustrations in peer-reviewed international journals

**Figure 10.1 in:** Lusher A. (2015). Microplastics in the marine environment: distribution, interactions and effects. In: Marine anthropogenic litter. Springer International Publishing, pp. 245-307.

**Figure 1 in:** Vasconcelos R.O., Carriço R., Ramos A., Modesto T., Fonseca P.J. & Amorim, M.C.P. (2012). Vocal behavior predicts reproductive success in a teleost fish. Behavioral Ecology 23(2): 375-383.



## Scientific illustration in popular science

Illustrations for the informative materials of the project "Deaf as a fish", run by Dr Marta Picciulin, Dr Linda Sebastianutto and Dr Antonio Codarin (Department of Life Science, University of Trieste, Italy), in collaboration with the WWF Marine Protected Area of Miramare and funded by Fondazione Cassa di Risparmio della Provincia di Gorizia (Italy).

### Key Skills and Abilities

**Field Skills:** Underwater soundscapes recordings (sampling design, equipment wire up and field calibration, equipment displacement and retrieval, data collection); visual data collection using optical equipment (SLR digital cameras, digital video cameras and spotting telescopes); collection of benthonic samples (biological and sediments); diving (up to -40 m).

**Laboratory Skills:** Analysis and interpretation of underwater soundscapes, with specific competences in the analysis and recognition of fish vocalization; stimuli creation for physiological experiments of fish auditory system; use of the Auditory Evoked Potential Technique on fish (set-up, data collection, results interpretation); freshwater and marine fish husbandry (including care and breeding induction); fish anesthesia and euthanasia; measurements of biometric parameters in shellfish (including planning the sampling effort and using several indices of organic matter to analyse the results).

**Software:** *Acoustic Data:* Raven, Adobe Audition, MATLAB, SPECTRA, Wavesurfer.

*Visual data:* Etholog 2.2., J Watcher.

*Statistical Analysis:* SPSS, STATISTICA, MS Excel, EstimateS. Gridding: Surfer.

*Reference Manager:* Mendeley.

*Design:* Adobe Photoshop, Adobe Premiere, GIMP, iSkysoft, MS Powerpoint.

*Cloud Storage:* Dropbox, OneDrive.

*Social Media:* Facebook, Twitter, Wordpress, LinkedIn, ResearchGate.

### Languages:

*Italian:* mother tongue;

*English:* proficient understanding C2 (listening and reading), speaking and writing;

*French:* B1;

*Portuguese:* basic user A1;

*Spanish:* basic user A1.

### Fellowships and scholarships

- BelPD-COFUND: postdoctoral fellowship (University of Liège, Belgium), Call 2016
- MITACS ELEVATE Postdoctoral Fellowship (Victoria University, Canada); fellowship awarded but refused in order to accept the BelPD-COFUND, Call 2016.
- Research travel grant: Marine Institute under the Marine Research Sub-programme funded by the Irish Government (NT/14/32), November 2014.
- PhD award grant: Irish Research Council Grant GOIPG/213/679, October 2013.
- Research scholarship, analysis of bioacoustic data, Ca' Foscari University, Venice (Italy), March 2012.
- Erasmus Student Research Grant, Trieste University, November 2009.

### Honors

- Seal of excellence of the European Commission; awarded with the project DEFPAM (796972) submitted under the Horizon 2020's Marie Skłodowska-Curie actions call H2020-MSCA-IF-2017 of 14 September 2017 by Marta Bolgan and University of Liege (project not funded)
- MSC in Marine Biology; maximum grade "*cum laude*"

### Teaching & Science Communication Experience

#### Co-supervision (University of Liège, Belgium)

- Justine Soulard, Msc student. MSc thesis title: Etude de la production des sons chez les poissons Scorpaena spp. ULiège 2017- 2018, supervisor Prof. Parmentier
- Aurora Crucianielli, Msc student. MSc thesis title: Sound production in Sciaenidae spp: relationship between acoustic activity and spawning in an aquaculture perspective. ULiège 2017- 2018, supervisor Prof. Parmentier.





### Lecturing assistance

#### **University of Liège (Belgium)**

In April 2018, I have assisted Prof. Parmentier during summer schools activities (Concours Corsica; <https://events.uliege.be/corsica/>) carried out at STARESO research station (Corsica, France). This project, funded under the H2020 scheme, use marine mammals for making science education and science careers attractive for young people.

#### **Galway-Mayo Institute of Technology (Galway, Ireland).**

During my PhD I have assisted:

- 3<sup>rd</sup> year Bachelor students fieldworks of the module in Ecology of Aquatic Ecosystems (lecturer Dr Edel Hanningan), first semester, 2012 (GA770).
- 3<sup>rd</sup> Years Bachelor students fieldworks of the module in Aquatic Animal Behaviour (lecturer Dr Martin Gammell), first semester, 2012 (GA770).
- 3<sup>rd</sup> Years Bachelor students fieldworks of the module in Limnology & Oceanography (lecturer Dr Edel Hanningan), second semester, 2012 (GA770).
- 2<sup>nd</sup> year Bachelor students practical classes of the module in Biology of Aquatic Organism, Seaweed and Water Plants (lecturer Dr Martin Gammell), second semester, 2012 (GA770).

#### **Venice University (Italy)**

- Guest lecturer: Module of Animal Behaviour, seminar about fish acoustic communication. 3<sup>rd</sup> year Bachelor Student in Environmental Sciences (lecturer Dr Stefano Malavasi), 2010.
- Guest lecturer: Module of Animal Behaviour, seminar about underwater anthropogenic pollution. 3<sup>rd</sup> year Bachelor Student in Environmental Sciences (lecturer Dr Stefano Malavasi), 2011.

#### **Trieste University (Italy)**

- Guest lecturer: Module of Animal Behaviour, seminar about the welfare of captive animals. 3<sup>rd</sup> year Bachelor Student in Biology (lecturer Dr Enrico A. Ferrero), 2009.

### Invited speaker

#### **Workshop STARECAPMED (STARESO research station (Calvi, France))**

Invited speaker: Abondance et diversité acoustique des populations de poissons dans la baie de Calvi (Invited by Dr. M. Leduc, STARESO), Workshop STARECAPMED, STARESO, April 2018.

#### **Séminaire 'Ecologie & Acoustique sous-marine'**

Invited speaker: Acoustic Complexity of fish vocal community: a field and controlled validation (Invited by Dr. Di Iorio, CHORUS), Séminaire 'Ecologie & Acoustique sous-marine', 13 November 2017 (Grenoble, France)

#### **STARESO research station (Calvi, France)**

Invited speaker: "Aquatic habitats: a silent world? An introduction to soundscape ecology with special reference to fish acoustic communication" (invited by Sebastien Leon, Blue Addiction), August 2017.

#### **Hellenic Centre of Marine Research (Crete, Greece)**

Invited lecturer: seminar "Aquatic habitats: a silent world? An introduction to soundscape ecology with special reference to fish acoustic communication" (invited by Dr Thanos Dailianis), July 2017.

### Science communication experience

#### **International Conference "The Effect of Noise on Aquatic Life" (Dublin, Ireland)**

In 2016, I was invited to be part of the Media Panel (4<sup>th</sup> conference edition). I'll be a member of the Media Panel also for the 5<sup>th</sup> edition (2019, 7-12 July, Den Haag, Netherlands). Main roles: Social media dissemination: Facebook and Twitter pages

- Organisation of a public lecture and video night on the effect of noise on aquatic life
- Organisation of a short video competition on the effect of noise on aquatic life
- Production of short promotional videos (see youtube channel Aquatic Noise Series)

#### **WWF Marine Protected Area of Miramare (Trieste, Italy)**

- Snorkelling guide for children and adults: sea-watching activities orientated to the observation of the marine environment (June 2009 – September 2009).
- Natural operator: Scientific advisor- guide in citizen engagement activities for the conservation of the marine environment and of wetlands areas (Marine Protected Area of Miramare and Natural Reserve of Valle Cavanata) for adults and children (February 2009 – January 2011)



## Certificates and Trainings

### Certificates

- LAST (Laboratory Animal Science and Training) course, based on the EU guidelines (article 23 and 24 of the directive 2010/63 EU), Galway, Ireland, March 2014.
- Personal Survival Techniques STCW-95 Certificate, achieved in November 2012 (Ireland).
- SSI advanced open water diver certificate, achieved in August 2009 (Italy)

### Trainings

- Science Communication (25 hours). Organization providing training: ULiège January-April 2017
- Science @Sea: Multidisciplinary research vessel-based course. Course topics; operation of equipment and instrumentation, survey design and planning, sample collection and processing, marine data acquisition and safety at sea. Organization providing training: Strategic Marine Alliance for Research and Training (SMART), Ireland. November 2012.
- Naturalistic designer (250 hours). Course topics included; dichotomies keys' implementation using Indian ink and watercolour techniques. Organization providing training: Natural History Museum of Trieste, Italy. October 2007-May 2008.