Pau Gimenez-Grau

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Date of birth: 17/01/86

Research interests: *biogeochemistry, ecological stoichiometry, microbial ecology, evolutionary ecology, limnology*

PROFILE

I obtained my PhD in Ecology by the University of Barcelona (2016) and I am currently researcher at Aarhus University. My predoctoral research focused on the effects of nutrient availability (i.e. nitrogen and phosphorus) on the stoichiometry, ecophysiology and growth of phytoplankton and periphyton. These studies were supported by field experiments in oligotrophic and ultraoligotrophic lakes and streams of the Pyrenees. I am now working on aquatic biogeochemistry and stream functioning (e.g. stream metabolism and nutrient uptake) in Denmark and in the Arctic (Greenland and Canada).

EDUCATION

2017 **MS in Teaching in Secondary Schools, Vocational Training and Language Centres.** Universitat Autònoma de Barcelona.

Dissertation title: Analysis of explanations of 1st ESO students on the role of microorganisms in everyday life situations

2016 **PhD in Ecology.** Supervisors: Dr J. Catalan and Dr M. Felip. Universitat de Barcelona.

Dissertation title: Nutrients and algal growth in the oligotrophy: A field experimental approach in mountain lakes. *(Excellent-Cum laude)*

2010 **MS in Ecology.** Universitat de Barcelona and Universitat de Girona.

Dissertation title: Determination of phosphatase bacterial activity: methodological study and application in two high-altitude mountain lakes.

2009 **BA in Biology, major in Organisms and Systems.** Universitat de Barcelona.

PROFESSIONAL HISTORY

2021 **Academic staff with research tasks** at Aarhus University.

2018-20 **Postdoctoral researcher** at Aarhus University.

2020 **Lecturer** of Limnology (Aalborg University). Four lectures (4h duration each one) about lake limnology.

2017 **Teacher** of the program "Joves i Ciència 2017" ("Youth and Science 2017"), a workshop on "Mountain aquatic ecosystems: how are they affected by human activities?". Funded by Fundació La Pedrera. MónNatura-Pirineus, Planes de Son.

2017 **Student of Master's Degree** in Teaching in Secondary Schools, Vocational Training and Language Centres.

2016 **Teacher** of the program "Joves i Ciència 2016" ("Youth and Science 2016"), a workshop on bioindicators of mountain ecosystems. Funded by Fundació La Pedrera. MónNatura-Pirineus, Planes de Son.

2010-16 **Predoctoral researcher and master student** at:

- Ecological and Forestry Applications Research Centre (CREAF) (2015-16)
- Blanes Centre for Advanced Studies (CEAB) – Spanish Research National Council (CSIC) (2010-2015)
- University of Barcelona, Department of Ecology (2010-2016)

2008 **Undergraduate research assistant** at the Blanes Centre for Advanced Studies (CEAB).

PARTICIPATION IN RESEARCH PROJECTS

2021 **Nitrogen sources for Arctic freshwaters (NitroFresh).** Principal investigator: A. Pastor. Role: *research assistant*.

2021 **Nitrogen in rocks: an overlooked nutrient source in Arctic aquatic ecosystems.** Principal investigator: A. Pastor. Role: *research assistant*.

2021 **Deciphering the Role of Rocks as Nitrogen Source for Biological Cycling in Arctic Freshwaters (RockNrole).** Principal investigator: T. Riis. Role: *research assistant*.

2018-19 **Streams providing clean water: How do we optimize natural water purification in streams?** Principal investigator: T. Riis. Role: *postdoctoral researcher*.

2019 **Effects of permafrost thaw on microbial organic matter utilization in Arctic streams. .** Funded by Danish Agency for Science and Higher Education. Principal investigator: A. Pastor. Role: *postdoctoral researcher*.

2010-13 **Study of the effects of nitrogen deposition increase on the lakes of the Pyrenees (NITROPIR)**. Funded by Spanish Ministry of Science and Innovation. Principal investigator: Jordi Catalan. Role: *predoctoral researcher*.

2010-13 **Livestock effects on the lakes of Aigüestortes and Sant Maurici Lake National Park: nitrogen inputs and eutrophication risk (EGALA).** Funded by Spanish Ministry of Rural and Marine Environment. Principal investigator: Marisol Felip. Role: *predoctoral researcher*.

2009 **Phosphorus as a factor of interdependence between biogeochemistry and population dynamics in alpine lakes at different time scales (ECOFOS).** Funded by Spanish Ministry of Education and Science. Principal investigator: Jordi Catalan. Role: *specialized technician*.

2008 **Nitrogen stable isotopes in fluvial ecosystems, the role of biotic compartments as indicators of nitrogen sources and processes (ISONEF).** Funded by Spanish Ministry of Education and Science. Role: *undergraduate research assistant*; supervised by Eugènia Martí.

2008 **Coupling biofilm diversity and ecosystem functioning: the role of communication and mixing in microbial landscapes (COMIX).** Role: *undergraduate research assistant*; supervised by Tom Battin.

RESEARCH STAGES

University of Alberta, Edmonton (Canada). Dates: July 2019 (2 weeks). Funded by: North2north. Visiting: S. Tank.

Canadian High Arctic Research station (CHARS). Cambridge Bay (Canada). Dates: June-July 2019 (3 weeks).

Zackenberg Research station (Greenland). Dates: August 2018 (2 weeks) and July 2021 (2 weeks).

Centre for High Mountain Research (CRAM) (University of Barcelona). Limnological Observatory of the Pyrenees (LOOP). Catalonia (Spain). Dates: November 2011; June 2012-November 2012; July 2013-August 2013.

WasserKluster Lunz, Biologische Station GmbH . Lunz (Austria). Dates: July-August 2008. Visiting: T. Battin.

PUBLICATIONS

Pastor, A., Manolaki, P., Freixa, A., **Giménez-Grau, P.**, Romaní, A., Riis, T. (2021). *Temperature sensitivity of microbial extracellular enzymes in Arctic streams (Disko Island, Greenland).* Polar Biology (in press). DOI: https://doi.org/10.1007/s00300-021-02955-9

Zufiaurre, A., Felip, M., **Giménez-Grau, P.**, Pla-Rabés, S., Camarero, L., Catalán, J. (2021). *Episodic nutrient enrichments stabilize protist coexistence in planktonic oligotrophic conditions.* Journal of Ecology, 109, 4, 1717-1729.

Fosforfølsomme vandområder: vandløb. (2020). Baattrup-Pedersen, A., Riis, T., Johnsen, T. J., **Gimenez Grau, P.** In: Fosforkortlægning af dyrkningsjord og vandområder i Danmark. Ed.: Andersen, H. E., Heckrath, G. Videnskabelig rapport fra DCE - Nationalt Center for Miljø og Energi: 397, 123-142.

Giménez-Grau, P., Felip, M., Zufiaurre, A., Pla-Rabés, S., Camarero, L., Catalán, J. (2020). *Homeostasis and non-linear shift in the stoichiometry of P-limited planktonic communities.* Ecosphere, 11(9):e03249. 10.1002/ecs2.3249

Pastor, A. and collaborators. (2020). *Early-Career Coordinated Distributed Experiments: Empowerment Through Collaboration.* Frontiers in Education, Vol. 5, 13.

Catalán, N. and collaborators. (2018). *Behind the Scenes: Mechanisms Regulating Climatic Patterns of Dissolved Organic Carbon Uptake in Headwater Streams*. Global Biogeochemical Cycles, 32, 10, 1528-1541.

Pastor, A. and collaborators. (2017). *Local and regional drivers of headwater stream metabolism: insights from the first AIL collaborative project*. Limnetica. 36, 1, 67-85 (DOI: 10.23818/limn.36.06)

PRESENTATIONS IN CONFERENCES

Pastor, A., Pereda, O., Sandvej-Larsen, E. E. L., **Giménez-Grau, P.**, Skovsholt, L. J., Manolaki, P., Elosegui, A., Riis, T. (2019). *The role of macrophytes as sources of dissolved organic matter in lowland streams*. 8th International Symposium on Wetland Pollutant Dynamics and Control, WETPOL 2019, Aarhus, Denmark (oral).

Pereda, O., Pastor, A., **Giménez-Grau, P.**, Sandvej-Larsen, E. E. L., Skovsholt, L. J., Manolaki, P., Baattrup-Pedersen, A., Elosegui, A., Riis, T. (2019). *The effects of weed-cutting practices on nutrient retention and metabolism in lowland agricultural streams*. 8th International Symposium on Wetland Pollutant Dynamics and Control, WETPOL 2019, Aarhus, Denmark (oral).

Zufiaurre, A., Felip, M., **Giménez-Grau, P.**, Camarero, L., Pla-Rabés, S., Catalán, J. (2016). *Plankton community response to P enrichment and N imbalance*. XVIII Congress of the Iberian Association of Limnoloy. Tortosa, Spain (oral).

Zufiaurre, A., Felip, M., **Giménez-Grau, P**., Camarero, L., Pla-Rabés, S., Catalán, J. Catalan (2016) *Plankton community response to P-enrichment and N-imbalance: a mesocosm experiment in a P-limited lake*. XXXIII Congress of the International Society of Limnology. Torino, Italy (oral)

Giménez-Grau, P., Felip, M. Pla-Rabés, S., Camarero, L., Catalan, J. (2015). *Prokaryote phylogenetic major groups response to P and N experimental enrichments in an ultraoligotrophic lake*. Aquatic Sciences: Global and Regional Perspectives — North Meets South, Aquatic Sciences Meeting ASLO, Granada Spain (oral)

Catalán, C. and collaborators. (2015). *The potential of collaborative experiments among young scientists: the DOMIPEX project***.** Symposium of European Freshwater Sciences, Geneva, Switzerland (poster).

Pastor A. and collaborators. (2015). *Carbon uptake in headwater streams: insights from a collaborative experiment*. Symposium of European Freshwater Sciences, Geneva, Switzerland (oral).

SKILLS AND TECHNIQUES

Languages

Catalan and Spanish *native proficiency*

English *advanced*

Danish *basic*

Limnology and Microbial Ecology techniques

Field experimental methods: nutrient-diffusing substrata, nutrient additions and mesocosms

Field observational methods: ISCO autosampler and YSI multiprobe

^{14}C incubations, primary production and microautoradiography

Identification of algal pigments analysed by HPLC

Preparation of samples for ^{15}N and ^{13}C analysis

FISH and CARD-FISH (Catalysed Reported Deposition – Fluorescence *In Situ* Hibridization)

Determination of phosphatase activity of phytoplankton and bacterioplankton: MUP and ELF

Epifluorescence microscopy and cell counting (DAPI counts)

Automated processes and high-throughput analysis of microscope images

DNA extraction, amplification and quantification

Denaturing Gradient Gel Electrophoresis (DGGE)

Analysis of 16S sequences using ARB-Silva

Digestion of diatom frustules and chrysophyceans cysts

Advanced notions of water chemistry analysis

Basic notions of diatoms taxonomy and identification at the microscope

Basic notions of algal cultivation

Modelling and Statistical techniques

Advanced usage of R program and graphical display with *ggplot*

Fit mixed and generalized linear models using frequentist and Bayesian approaches

Estimation of reach-scale stream metabolism with inverse modelling (e.g. *StreamMetabolizer*)

Multivariant analysis

COURSES AND SEMINARS

The Data Scientist's Toolbox (2021). Online non-credit course authorized by Johns Hopkins University and offered through Coursera.

Bioinformatics (2014). 20h-course included in the staff training program of the Spanish National Research Council (CSIC). Organized by the Blanes Centre for Advanced Studies (CEAB).

Introduction to statistical analysis with R: ecological applications (2013). 20h-course included in the staff training program of the Spanish National Research Council (CSIC). Organized by the Blanes Centre for Advanced Studies (CEAB).

Meteorology of mountain areas (2012). Course of two days organized by the Aigüestortes and Sant Maurici lake National Park.

Symposia for European Freshwater Sciences (SEFS), Girona (2011).

R: a basic course (2011). 20h-course organized by the Department of Ecology of the University of Barcelona.

Symposia on Advances in Ecology (assistance on the VIII, IX and X editions) organized by the Catalan Society of Biology.

Assistance to more than 30 seminars organized by the Department of Ecology of the University of Barcelona and the section of Aquatic Biology of the Aarhus University.