Alejandro A. Murillo May, 2024

Current Position
Assistant professor.
From March 2023 to date.
Director of the Coastal Research Center (CIC-UDA)
Vice-Rectorate Office for Research and Postgraduate Studies.
Atacama University.
Av. Copayapu 485, Copiapó, Atacama Region, Chile.

ORCID iD: https://orcid.org/0000-0003-3553-1330
Scopus Author ID: 7004490338
ResearcherID: I-4080-2016
https://cic.uda.cl/

Previous Positions
Science communication coordinator, Monitoring of Algae in Chile (MACH) project
From Jan. 2021 to March 2023
Harmful Algae Research Center (CREAN)
Fisheries Development Institute (IFOP)
Padre Harter 574, Puerto Montt 5480000, Chile.

Postdoctoral Fellow – FFEM project – TARA Ocean Consortium
From Feb. 2017 to Dec. 2020
Structural and Computational Biology Unit – Bork group
European Molecular Biology Laboratory (EMBL).
Heidelberg – Germany.

Postdoctoral Fellow in Microbial Oceanography
From Nov. 2014 to Jan. 2017
Millennium Institute of Oceanography
University of Concepción, P.O. Box 1313 Concepción 3, Concepción – Chile.
imo-chile.cl

Postdoctoral Fellow, Chilean National Commission for Scientific and Technological Research (CONICYT)
From Nov. 2011 to Nov. 2014
Microbial Oceanography Laboratory
University of Concepción, Department of Oceanography, Concepción – Chile.

Postdoctoral Fellow, 'Microbial Initiative in Low Oxygen areas off Concepción and Oregon' (MI_LOCO) project. Funded by the Gordon and Betty Moore Foundation (GBMF) #1661 (11/01/2008 to 11/01/2012).
From March 2010 to Oct. 2011
Microbial Oceanography Laboratory
University of Concepción, Department of Oceanography, Concepción – Chile.

Education

- Summer Workshop on "Marine Ecological & Environmental Genomics", Station Biologique Roscoff (France), May 31st – June 12th 2015.

- Summer course on "Advanced Flow Cytometry", Millennium Institute of Oceanography, University of Concepción. Austral Summer 2015.
- Ph.D. in Biological Sciences (Molecular Genetic and Microbiology) 2011, Pontificia Universidad Católica de Chile, Santiago, Chile.

- Summer course on Microbial Oceanography: Genomes to Biomes, School of Ocean and Earth Science and Technology/ Department of Oceanography, University of Hawaii at Manoa/USA. Summer 2008

- Ecology and Diversity of Marine Microorganisms (ECODIM V), Austral Summer Institute (ASI VIII), Department of Oceanography and Center of Oceanographic Research in the Eastern-South Pacific. Austral Summer 2008.

- Internship, at the Biosciences and Ecological Chemistry Division, Alfred-Wegener-Institut für Polar- und Meeresforschung, Bremerhaven, Germany 2007.

- M.Phil. in Biological Sciences 2007, Pontificia Universidad Católica de Chile, Santiago, Chile.

- B.A. in Biological Sciences 2004, Pontificia Universidad Católica de Chile, Santiago, Chile.

Membership of scientific societies

- Member of the Chile Society for Microbiology (SoMiCh)

- Member of the International Society for Microbial Ecology (ISME)

Journal Publications

- Rigonato, J., Budinich, M., **Murillo, A. A.**, Brandão, M. C., Pierella Karlusich, J. J., Soviadan, Y. D., et al. Ocean-wide comparisons of mesopelagic planktonic community structures. *ISME Commun.* 2023; 83. doi:10.1038/s43705-023-00279-9.

- Gajardo, G., Morón-López, J., Vergara, K., Ueki, S., Guzmán, L., Espinoza-González, O., et al. The holobiome of marine harmful algal blooms (HABs): a novel ecosystem-based approach for implementing predictive capabilities and managing decisions. *Environ. Sci. Policy.* 2023; 143, 44–54. doi:10.1016/j.envsci.2023.02.012.

- Ulloa O, Henríquez-Castillo C, Ramírez-Flandes S, Plominsky A, **Murillo AA**, Morgan-Lang C, Hallam SJ, Stepanauskas R. 'The cyanobacterium Prochlorococcus has divergent light-harvesting antennae and may have evolved in a low-oxygen ocean.' Proceedings of the National Academy of Sciences. 2021; 118 (11). doi: https://doi.org/10.1073/pnas.2025638118

- Henriquez-Castillo C, Franco-Cisterna B, **Murillo AA**, Ulloa O, Riquelme-Bugueño R. 'Flow cytometry with cell sorting and sequencing as a tool for the study of the Humboldt Current krill stomach microbiota.' The Journal of Crustacean Biology. 2021; 41 (1), ruab006. doi: https://doi.org/10.1093/jcbiol/ruab006

- **Murillo AA**, Molina V, Salcedo-Castro J, Harrod C. 'Marine microbiome and biogeochemical cycles in marine productive areas.' Frontier in Marine Science. 2019; 6, 657. doi:10.3389/fmars.2019.00657

- Léniz B, **Murillo AA**, Ramírez-Flandes S, Ulloa O. 'Diversity and transcriptional levels of RuBisCO form II of sulfur-oxidizing Gamma-proteobacteria in coastal-upwelling waters with seasonal anoxia.' Frontier in Marine Science. 2017; 4, 213. doi:10.3389/fmars.2017.00213

- Cornejo M, **Murillo AA**, Farías L. 'An unaccounted N_2O sink in the surface water of the eastern subtropical South Pacific: Physical versus biological mechanisms.' Progress in Oceanography. 2015; 137(A):12-23. doi: 10.1016/j.pocean.2014.12.016.

- **Murillo AA**, Ramírez-Flandes S, DeLong EF, Ulloa O. 'Enhanced metabolic versatility of planktonic sulfur-oxidizing γ-proteobacteria in an oxygen-deficient coastal ecosystem.' Frontiers in Marine Science. 2014; 1:18. doi: 10.3389/fmars.2014.00018

- Soto-Liebe K, **Murillo AA**, Krock B, Stucken K, Fuentes-Valdés JJ, Trefault N, Cembella A, Vásquez M. 'Reassessment of the toxin profile of Cylindrospermopsis raciborskii T3 and function of putative sulfotransferases in synthesis of sulfated and sulfonated PSP toxins.' Toxicon. 2010; 56(8):1350-1361.

- Stucken K, John U, Cembella A, **Murillo AA**, Soto-Liebe K, Fuentes-Valdés JJ, Friedel M, Plominsky AM, Vásquez M, Glöckner G. 'The Smallest Known Genomes of Multicellular and Toxic Cyanobacteria: Comparison, Minimal Gene Sets for Linked Traits and the Evolutionary Implications.' PLoS ONE. 2010; 5: e9235.

- Stucken K, **Murillo AA**, Soto-Liebe K, Fuentes-Valdés JJ, Méndez MA, Vásquez M. 'Toxicity phenotype does not correlate with phylogeny of Cylindrospermopsis raciborskii strains.' Systematic and Applied Microbiology. 2009; 32: 37-48.

- Bueno MS, Santiviago CA, **Murillo AA**, Fuentes JA, Trombert AN, Rodas PI, Youderian P, Mora GC. 'Precise Excision of the Large Pathogenicity Island, SPI7,

in Salmonella enterica Serovar Typhi.' Journal of Bacteriology. 2004; 186: 3202-3213.

Research and Project Participation

- "SALARES" Natural Laboratory Node: Collaborative network of transdisciplinary research on salt flats - Line 2: Natural Laboratory Node Research Development. National Agency of Research and Development (ANID). 2024-2025. Co-investigator: **Alejandro A. Murillo**

- Natural Laboratory Atacama Desert LANDATA "Natural Laboratory of adaptability, resilience, and a window to look at space, origin, and future." - Line 1: Strengthening of Natural Laboratory Nodes. National Agency of Research and Development (ANID). 2024-2025. Co-investigator: **Alejandro A. Murillo**

- Development of harmful algal bloom monitoring methods and forecast system for sustainable aquaculture and coastal fisheries in Chile (Monitoring of algae in Chile). Funded by the Science and Technology Research Partnership for Sustainable Development (SATREPS) Program, through the Japan International Cooperation Agency (JICA) and the Japan Science and Technology Agency (JST). Outreach coordinator. 2021-2023.

- Ocean Plankton, Climate and Development Project. Funded by the French Facility for Global Environment (FFEM). Postdoctoral fellowship. 2017-2019.

- Nitrite loop in aquatic ecosystems, an example of environmental microbiome cooperation on the nitrogen cycle. FONDECYT Program, grant #1171324. 2017-2020. Principal Investigator: Verónica Molina Trincado; Co-investigator: **Alejandro A. Murillo**

- Identity and functional diversity of inorganic carbon-fixing bacterial community in coastal waters with low oxygen: a probing with stable isotopes and metagenomics. Postdoctoral FONDECYT #3120047. 2012-2014.

- Microbial diversity and activity in the seasonal hypoxic coastal waters off Central Chile and Oregon: A comparative study. Gordon and Betty Moore Foundation. 2010-2011.

- Biosynthesis of saxitoxin and cylindrospermopsin in the cyanobacterium *Cylindrospermopsis raciborskii*: Identification of the genes involved in its regulation. FONDECYT 1080075. 2008-2010.

- The cyanobacterium *Cylindrospermopsis raciborskii* as a model for study the biosynthetic pathway of saxitoxin and its analogues. FONDECYT 1050433. 2006-2008.

- Microbial ecology, Microbiology and Environmental biotechnology. MIDEPLAN. 2006

- Functional Genomic in *Salmonella typhi*: Evaluation of the role of serovar-specific

genomic regions in Pathogenicity and Host-specificity. 2002

Editor and reviewer roles

Editor records

- Microbial communities in coastal glaciers and tidewater tongues of Svalbard Archipelago, Norway. https://doi.org/10.3389/fmars.2018.00512.
  Decision date: 2018-12-21 for Frontiers in Marine Science

- The influence of river discharge on nutrient export and phytoplankton biomass off the Central Chile coast (33º-37ºS). Seasonal cycle and interannual variability. https://doi.org/10.3389/fmars.2018.00423.
  Decision date: 2018-09-23 for Frontiers in Marine Science

- Metagenomics of coral reefs under phase shift and high hydrodynamics. https://doi.org/10.3389/fmicb.2018.02203.
  Decision date: 2018-08-29 for Frontiers in Microbiology

- Streptomyces nigra sp.nov is a novel actinobacterium isolated from mangrove soiland exerts a potent antitumor activity in vitro. https://doi.org/10.3389/fmicb.2018.01587.
  Decision date: 2018-07-18 for Frontiers in Microbiology

- First record of microbiomes of sponges collected from the Persian Gulf, using tag pyrosequencing. https://doi.org/10.3389/fmicb.2018.01500.
  Decision date: 2018-07-06 for Frontiers in Microbiology

- Temporal variability in net primary production in an upwelling area off central Chile (36° S). https://doi.org/10.3389/fmars.2018.00179.
  Decision date: 2018-05-29 for Frontiers in Marine Science

Review records

- Bicarbonate uptake rates and diversity of RuBisCO genes in saline lake sediments.
  Published on: 2021-02-25 in FEMS Microbiology Ecology

- Cyanobacterial soil surface consortia mediate N cycle processes in agroecosystems. https://doi.org/10.3389/fenvs.2018.00156.
  Published on: 2019-01-04 in Frontiers in Environmental Science

- Coupled carbon, sulfur, and nitrogen cycles mediated by microorganisms in the water column of a shallow-water hydrothermal ecosystem. https://doi.org/10.3389/fmicb.2018.02718.
  Published on: 2018-11-13 in Frontiers in Microbiology

- Community Metagenomic Assembly Reveals Microbes That Contribute to the Vertical Stratification of Carbon and Nitrogen Cycling in an Aquaculture Pond.

Rejected on: 2018-03-28 Frontiers in Microbiology

- New insights into the biosynthesis pathway of polyketide alkaloid argimycins P in Streptomyces argillaceus. https://doi.org/10.3389/fmicb.2018.00252.
  Published on: 2018-02-16 in Frontiers in Microbiology