

Report on Microbial Ecology in Arid Regions Conference

Location: Abu Dhabi, UAE

Dates: February 11-13, 2020

During February 2020 I organized a conference around the topic of microbial ecology in arid regions, with a strong focus on the Middle East and the Persian Gulf. The conference explored the latest developments in the field of microbial ecology combined with an exploration of new technologies that enhance this exploration within the region. The conference was mainly funded by the NYU Abu Dhabi Institute, ISME and Department of Culture & Tourism of Abu Dhabi. The major goals of the conference were:

- 1- To bring together scientists from around the region to summarize and discuss their common and special research interests/findings in the field of microbial ecology.
- 2- To build up networks and promote collaborations between scientists in the region and with European/US/Australian scientists.
- 3- To discuss novel solutions of common environmental problems in the region and propose solutions that can be used by governments and decision-makers.
- 4- To establish new links between academia and industry, and open new horizons of bio-based industries.
- 5- To establish a "Middle-Eastern Society of Microbial Ecologists" that will work under the umbrella of the International Society of Microbial Ecologists (ISME) to coordinate future research activities and collaborations in the region in microbial ecology and to organize future meetings that rotates around the different countries.

The conference took place at the NYU Abu Dhabi campus and was attended by ~50 scientists and students. The agenda (enclosed) involved sessions on marine microbial ecology, microbial communities and symbiosis, extremophiles and their biotechnology applications, pollution and bioremediation. During refreshment breaks and lunches that took place adjacent to the oral talks hall researchers and students presented their research in a poster session that lasted throughout the whole conference. All participants also engaged in scientific discussions during dinners, which took place at different venues around the city.

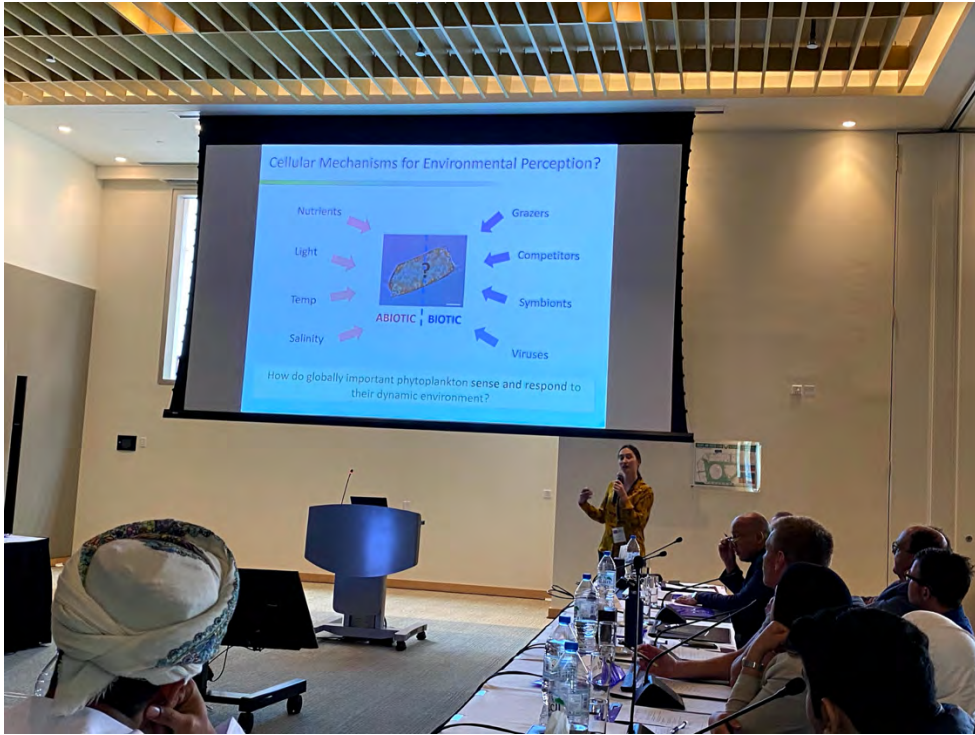
The funds received from ISME through the Ambassador Program were used to fund travel and accommodation of a graduate student (M.Sc. student) with the best abstract/oral talk (Shahad Abbas) from Kuwait University.

The major outcomes of the conference were (1) a collaboration between several PIs from other regional universities and I to propose a *Frontiers in Marine Science* topic revolving around microbial ecology in the Persian Gulf. This topic has just been accepted by *Frontiers* and is now online (<https://www.frontiersin.org/research-topics/14686/microbial-ecology-of-the-arabianpersian-gulf>). (2) Designate a second version of the conference to take place at Kuwait University (likely now in late 2021). (3) The establishment of a microbial ecology society in the Middle East. Several colleagues from Oman, Kuwait, Bahrain, Egypt and myself are in the planning stage for the society and we are working on including more peers to widen our reach.

Below are selected photos from the event and the Agenda.









International Conference on Microbial Ecology in Arid Regions

AGENDA

NYU ABU DHABI

Institute Conference Center, Room # 001

11 - 13 FEBRUARY 2020

February 11, 2020 | DAY 1

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| 7:00 – 8:30 AM | Breakfast Flavors Restaurant, Sheraton Corniche <i>For Hotel Guests Only</i> |
| 8:30 AM | Bus Departure for NYUAD Campus Outside Hotel Lobby |
| 9:00 AM | Registration & Coffee Institute Conference Center |
| 9:30 – 9:45 AM | Welcoming Remarks & Introduction Program Organizers Shady Amin , NYU Abu Dhabi Raeid Abed , Sultan Qaboos University |
| 9:45 – 10:00 AM | Opening Address Marta Losada , Dean of Science |
| 10:00 – 10:45 AM | Participants' Slide Introductions |
| 10:45 AM – 3:45 PM | Topic I: Microbial Ecology of the Oceans Moderator: Shady Amin , NYU Abu Dhabi |
| 10:45 – 11:30 AM | <i>Genomic traits and biogeographic patterns of the Atlantic Ocean microbiome reflect adaptation to greatly varying availability of energy and nutrients</i> Meinhard Simon , University of Oldenburg |
| 11:30 AM – 12:00 PM | Break, Refreshments & Poster Session Meeting Room Foyer |

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| 12:00 – 12:30 PM | <i>The Gulf: 50 years of research in marine microbial ecology, achievements and challenges</i> Huda Mahmoud , Kuwait University |
| 12:30 – 1:00 PM | <i>Stirring, mixing, growing: Disregarding patchiness leads to biases in phytoplankton models</i> Francesco Paparella , NYU Abu Dhabi |
| 1:00 – 2:15 PM | Lunch Torch Club, 1 st Floor D2 |
| 2:15 – 2:45 PM | <i>The stratified microbial network in the anaerobic deep-sea brine pools of the Red Sea</i> Daniele Daffonchio , KAUST |
| 2:45 – 3:15 PM | <i>A novel Ca²⁺ signaling pathway coordinates environmental phosphorus sensing in marine diatoms</i> Katherine Helliwell , University of Exeter |
| 3:15 – 3:45 PM | <i>Swimming in the sea: The impact of bacterial motility and chemotaxis on ocean ecology and biogeochemistry</i> Justin Seymour , University of Technology Sydney |
| 3:45 – 4:15 PM | Break, Refreshments & Poster Session Meeting Room Foyer |
| 4:15 – 6:00 PM | Topic II: Microbial Communities & Symbiosis Moderator: Justin Seymour , University of Technology Sydney |
| 4:15 – 5:00 AM | <i>The role of microbes in coral holobiont function and adaptation</i> Christian Voolstra , University of Konstanz |
| 5:00 – 5:30 PM | <i>Phytoplankton modulation of microbial consortia using unique secondary metabolites</i> Ahmed Shibl , NYU Abu Dhabi |
| 5:30 – 6:00 PM | <i>Human microbiome in health and disease</i> Ahmed Moustafa , American University in Cairo |
| 6:15 PM | Bus Departure to Hotel Pick up from A6 Street-side entrance |
| 7:00 PM | Dinner TBD (Possibly Al Mayass) |

February 12, 2020 | DAY 2

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| 7:00 – 8:30 AM | Breakfast Flavors Restaurant, Sheraton Corniche <i>For Hotel Guests Only</i> |
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| 8:30 AM | Bus Departure for NYUAD Campus Outside Hotel Lobby |
| 9:00 AM – 2:45 PM | Topic III: Extremophiles & Their Biotechnology Moderator: Ahmed Shibl , NYU Abu Dhabi |
| <i>9:00 – 9:45 AM</i> | <i>Using soil microbiomes for ecological restoration of arid lands</i> Ferran Garcia-Pichel , Arizona State University |
| <i>9:45 – 10:15 AM</i> | <i>How salt crust at halite saturation conditions affects the diversity and physiology of microbial mats?</i> Raeid Abed , Sultan Qaboos University |
| <i>10:15 – 10:45 AM</i> | Break, Refreshments & Poster Session (& Group Photo) Meeting Room Foyer |
| <i>10:45 – 11:15 AM</i> | <i>Microbes: Indispensable tools for the manufacturing of innovative products in biotechnology</i> Harald Hundsberger , IMC University of Applied Sciences Krems |
| <i>11:15 – 11:45 AM</i> | <i>Biological soil crust as a hot-spot of enzyme activities and microbial abundance in arid soil</i> Hojeong Kang , Yonsei University |
| <i>11:45 AM – 12:15 PM</i> | <i>Life in the unlivable: The quest for novel drugs in extreme environments in the West Indies/ Caribbean</i> Rania Siam , American University in Cairo |
| 12:15 – 1:15 PM | Lunch Torch Club, 1 st Floor D2 |
| <i>1:15 – 1:45 PM</i> | <i>Genomic signatures of subtropical microalgae</i> Kourosh Salehi-Ashtiani , NYU Abu Dhabi |
| <i>1:45 – 2:15 PM</i> | <i>Bioenergetic modelling to predict pathway feasibility, microbial community function and growth yields</i> Jorge Rodriguez , Khalifa University of Science and Technology |
| <i>2:15 – 2:45 PM</i> | <i>Sponge-associated bacteria and their potential biotechnological applications</i> Shahad Abbas , Kuwait University |
| 2:45 – 3:15 PM | Break, Refreshments & Poster Session Meeting Room Foyer |
| 3:15 – 4:15 PM | NYU Abu Dhabi's Core Facility Tour |
| 4:30 PM | Bus Departure for Abu Dhabi Tour Pick up from A6 Street-side entrance |
| 5:30 – 7:00 PM | Tour of the Sheikh Zayed Grand Mosque |
| 7:30 PM | Gala Dinner TBA |

10:00 PM **Bus Return to Hotel**

February 13, 2020 | DAY 3

7:00 – 8:30 AM **Breakfast**
Flavors Restaurant, Sheraton Corniche
For Hotel Guests Only

8:30 AM **Bus Departure for NYUAD Campus**
Outside Hotel Lobby

9:00 – 10:45 AM **Topic IV: Pollution & Bioremediation**
Moderator: **Raeid Abed**, Sultan Qaboos University

9:00 – 9:45 AM *The succession of microorganisms fouling plastic and bioplastic in a semi-arid lagoon*
Jeffrey Turner, Texas A&M Corpus Christi

9:45 – 10:15 AM *Plastic-associated marine biofouling communities and their spatio-temporal effects on the degradability of plastic in the Arabian Gulf*
Thirmahal Muthukrishnan, Sultan Qaboos University

10:15 – 10:45 AM *Microbial biodesulfurization of diesel with mixed cultures: Opportunities and challenges*
Wael El Moslimany, Arabian Gulf University

10:45 – 11:15 AM **Break, Refreshments & Poster Session**
Meeting Room Foyer

11:15 AM – 12:15 PM ***Panel discussion: Microbial ecology in the Middle East***
Moderator: **Raeid Abed**, Sultan Qaboos University
Moderator: **Shady Amin**, NYU Abu Dhabi

12:15 – 12:30 PM **Concluding Remarks**

12:30 – 2:00 PM **Lunch**
Torch Club, 1st Floor
D2

2:15 PM **Bus Return to Hotel**
Pick up from A6 Street-side entrance