



# VALERIA SOUZA

MEXICO

Microbial evolutionary ecologist. Her research focuses on understanding the evolution of microbes and the huge diversity of their communities.

In freshwater science, she is known for her works studying microbial mats and complex communities at Cuatro Ciénegas in Mexico.

Senior researcher in the Department of Evolutionary Ecology of the Institute of Ecology of the Universidad Nacional Autónoma de México.

She collaborated in the Global Ocean Sampling Expedition, and was the president of the Mexican Scientific Society of Ecology (2016-2018).

## HERSTORY

Her work has received several recognitions, including the Honorary Foreign Member of the American Academy of Arts and Science (2019) and the Environmental Stewardship Award of the Society for Freshwater Science (2020).

# CUATRO CIENAGAS BASIN, A PREKANBRIC PARK

Rare wetland oasis in the Chihuahuan desert that contains biological endemism similar to that of the Galapagos Islands.

It is characterized by the magnetism of the mountains that rise the deep sea waters to the surface.

Valeria found that these water movements provoke microbes and minerals of the ancient seas move towards the surface, leading to a highly diverse and unique microbial community composed by some the oldest organisms in the world.



Cuatro Cienagas Basin (google maps)

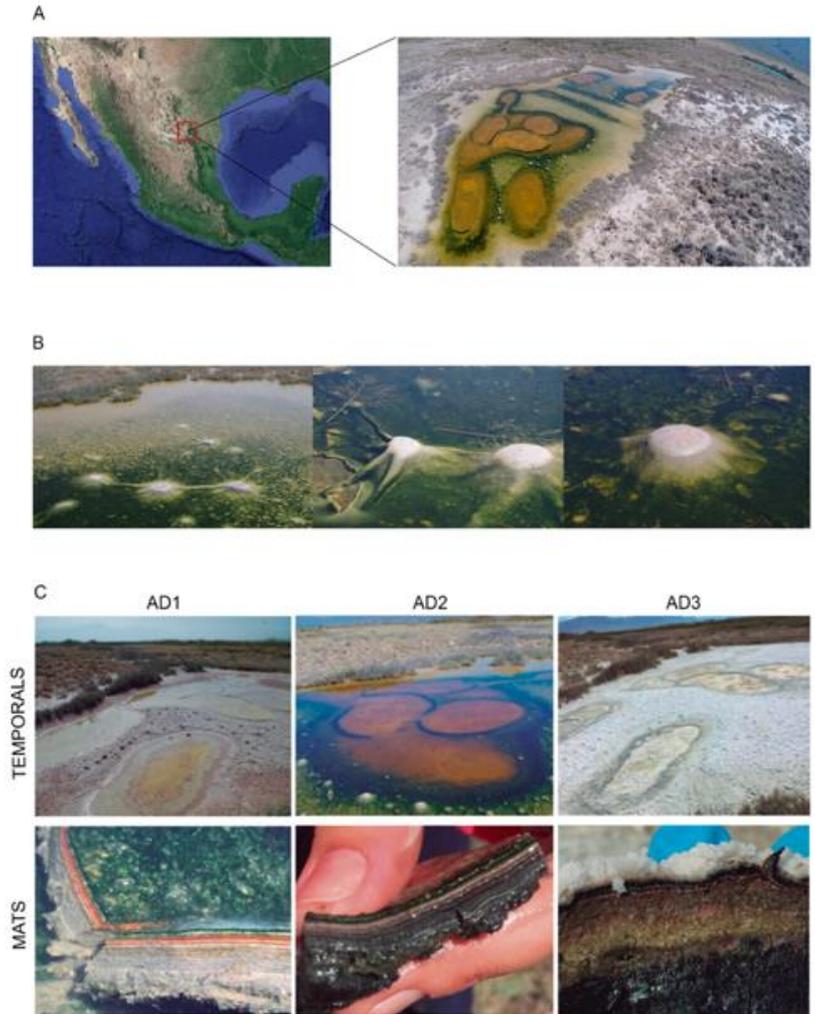
# HIGHLY DIVERSE ARCHAEOAL COMMUNITIES, A WINDOW TO THE LOST WORLD

Cuatro Ciénegas Basin contained one of the most diverse Archaeal communities of the world.

Archaea are known to be within the ancient organisms in the world, date back to the Archaean Eon.

Valeria found high abundances of halophitic and methenogenic Archaea with marine and magmatic affinities that might be related to the ancient ocean.

This community could be a model of the “*lost world*”, which opens a new window to better understand ancient marine communities and the extreme conditions that favored their survival.



Nahui Olin Medina-Chávez et al. (2019). bioRxiv.

# A WAR FOR THE WATER IN THE DESERT

Valeria is also involved in environmental education projects for the young people in the Cuatro Cienagas Basin.

The project, which started in 2004, aims to promoting the awareness of the natural resources and the water use in this desert valley, where during the last decades, most of the water from the aquifer has been divert for agricultural use.

Together with other researchers and the young people in the area, Valeria has described the enormous diversity of the oasis. Thanks to all their actions, there are efforts on restoring the wetland and recovering the soil fertility in Cuatro Cienagas Basin.



Picture provided by Valeria Souza

# RELEVANT CONTRIBUTIONS

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Souza, V., Siefert, J. L., Escalante, A. E., Elser, J. J., & Eguiarte, L. E. (2012). The cuatro ciénegas basin in Coahuila, Mexico: an astrobiological precambrian park. Astrobiology, 12, 641-647.

Souza, V., Moreno-Letelier, A., Travisano, M., Alcaraz, L. D., Olmedo, G., Eguiarte, L. E. (2018). The lost world of Cuatro Ciénegas Basin, a relictual bacterial niche in a desert oasis. Elife, 7, e38278.

Medina-Chávez, N. O., Viladomat-Jasso, M., Olmedo-Álvarez, G., Eguiarte, L. E., Souza, V., de la Torre-Zavala, S. (2019). Diversity of Archaea Domain in Cuatro Ciénegas Basin: Archaeal Domes. bioRxiv, 766709.

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FOR MORE?

**You can find more information about her story and research at:**

<http://web2.ecologia.unam.mx/perfiles/perfil.php?ID=1237852985093>

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