



Understanding the Red Sea nutrient cycle – a first look into nitrogen fixation in the Red Sea

Roslinda Mohamed (1), Jesus Arrieta (1), Intikhab Alam (2), and Carlos Duarte (1)

(1) Red Sea Research Centre, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia, (2) Computational Bioscience Research Centre, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia

The Red Sea is an elongated and semi-enclosed system bordered by Africa and Saudi Arabia. Positioned in an arid, tropical zone, the system receives high solar irradiance and heat flux, extensive evaporation, low rainfall and therefore high salinity. These harsh environmental conditions has set the Red Sea to be one of the fastest warming and saltiest ecosystem in the world. Although nutrients are known to be at very low concentrations, the ultimately limiting nutrient in the system is still undefined. Therefore, like most other oligotrophic systems, we regard the Red Sea as being nitrogen-limited and we foresee nitrogen fixation as the most probable bottleneck in the Red Sea nitrogen budget. On the basis of metagenomes from pelagic microbial communities along the Red Sea, we looked into the distribution of nitrogenase, an enzyme involved in nitrogen fixation, in this system and provide a first insight into the microbial community that is involved in the process. The implications of this study will not only help improve our understanding of the Red Sea nutrient regime, but may also hint on future ocean responses to rising climates.