



Ben-Gurion University of the Negev
Jacob Blaustein Institutes for Desert Research
The Swiss Institute for Dryland Environmental and Energy Research
Mitrani Department of Desert Ecology

Seminar

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Calcarina hispida, benthic foraminifera, Photo by Ivan Voltski.

Tuesday, December 13, 2016, 12:00

Seminar Room, Old Administration Building

Participants are invited to meet the seminar speaker at the MDDE meeting room immediately after the seminar (~ 13:00). Please bring your lunch; snacks will be provided.

Benthic foraminifera as marine bioindicators

Marine biomonitoring is been in practice for few decades, yet has become an urgent matter during the past few years due to increase awareness of possible impact of anthropogenic stressors on marine communities. Foraminifera are considered as one of the most powerful tools for marine biomonitoring. They are diverse and relatively large single cell eukaryotes, which produce a calcareous shell with conspicuous morphology and are responsible for a large portion of the marine carbonate production.

Foraminifera-specific DNA extraction and amplification techniques were developed in the mid 1990's, providing new opportunities to resolve phylogenetic relationships and examining the level of genetic similarity between species from different oceanic provinces. These techniques are now used in my laboratory to investigate the large-scaled Lessepsian invasion of large benthic foraminifera from the Red Sea to the Eastern Mediterranean. We were able to identify the invading genotypes of key species and to characterize their physiological constrains using laboratory culturing, field observations and geochemical analyses of their shells.

In another study we used the thermally polluted site near Hadera as a field laboratory that provides a unique opportunity to evaluate the temperature limitation of foraminiferal physiology including thresholds for calcification, an issue that will become more relevant as sea warming proceeds. Our ecological monitoring shows that the majority of the Lessepsian are almost absent in the warmest station indicating that future excess warming will likely impede their survival in the Eastern Mediterranean. In contrast, few species exhibit an unusual tolerance to extreme warm temperatures. Single-chamber Mg/Ca element ratios of these heat tolerant species were obtained using laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) and were converted to calcification temperatures based on laboratory culturing calibration. Our results provide the first direct evidence that some foraminiferal species are not only able to survive but also to calcify under extreme warm temperatures