



Foraminiferal Range Expansions: The Mediterranean Sea as a natural laboratory for climate induced invasions

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Climate change and biological invasions are key processes that modify biodiversity. One of the most severely affected areas of global change is the Mediterranean Sea, where global warming and the opening of the Suez Canal triggered a mass invasion of tropical Red Sea taxa into Mediterranean territories. Climate models prognosticate that the Mediterranean Sea will be one of the most affected ocean regions and may thus serve as a natural laboratory of future global changes. Among the key taxa that are rapidly expanding their latitudinal range in the Mediterranean Sea are symbiont-bearing foraminifera of the genus *Amphistegina*. Their range expansion strongly correlates with rising sea surface temperatures and mirrors processes of global change.

Amphisteginid foraminifera are among the most prolific foraminiferal species and contribute significantly to shallow-water carbonate sediments. Given their prominent environmental role, rapid biogeographic range expansion, and impact on native ecosystems, *amphisteginid* range expansion and invasion into new territory are likely to trigger changes in ecosystem functioning. Among the uncertainties, it is not known whether all parts of the Mediterranean will be affected equally and to what extent *amphisteginid* invasions will impact native biotas. We have initiated a new baseline study to explore the effects of invasive *amphisteginids* on native foraminiferal biotas and to monitor expansion rates and effects on ecosystem functioning along the current range expansion front. We will present new data on recent shift along the range expansion front and discuss cascading effects on community structures and species richness of native foraminiferal biotas. The magnitude and effects that climate change will have on the Mediterranean foraminiferal faunas may ultimately serve as an example of what would happen along expansion fronts in global oceans.