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THE ROLE OF SYMBIONT BEARING BENTHIC FORAMINIFERAL BIOMINERALIZATION IN COASTAL ENVIRONMENTS UNDERGOING WARMING

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Benthic foraminifera are unicellular marine eukaryotes that produce an exoskeleton made from calcite, contributing to 4% of the total carbonate production in the modern oceans. Specifically, symbiont bearing Large Benthic foraminifera (LBF), which are very common in the shallow tropical-subtropical environments, are responsible for 80% of total production made by benthic foraminifera. Our research focuses on assessing the present and future role of LBFs from shallow Eastern Mediterranean shelf. This environment is at the forefront of ocean warming and also harbors highly diverse and abundant LBFs (100 specimens per 5cm^2). For this study, ecological samples were collected throughout a year to (i) establish the key LBF species in these environments, (ii) calculate average foraminifera density, (iii) determine seasonal assemblage composition, and (iv) understand the size fraction distribution of individual species within the foraminiferal assemblages. These parameters were used to establish model growth curves of dominant LBF species and combined with the seasonal population dynamics to compute the gross carbonate production potential for each species. Additionally, these species were grown under a temperature gradient in controlled laboratory conditions. The thermal sensitivities of the holobiont were determined through carbonate production (alkalinity anomaly method) and net photosynthetic activity (dissolved oxygen) to establish the responses of the LBF species and their algal symbionts, respectively. The carbonate production estimation combined with data on algal substrate preferences and holobiont thermal thresholds are used to gain insight into the future of the dominant players of the community and possible species turnover in these coastal environments.