



Massive impacts of the Lessepsian invasion on molluscan communities of the Israeli Mediterranean shelf

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The 'Lessepsian invasion' – the massive influx of Indo-Pacific taxa into the Mediterranean Sea via the Suez Canal – is the largest marine biological invasion and a major threat to native biodiversity. The lack of pre-invasion data on community composition and functioning, however, hampers our understanding of how Mediterranean shallow-water assemblages have been affected by the invasion over the past 150 years. Molluscan death assemblages (DAs) - accumulations of shells with decadal to millennial scale time-averaging encountered in surficial sediment layers - were collected along depth transects on the shallow (10-40 m depth) Israeli Mediterranean shelf and compared with living molluscan assemblages (LAs) from spring and autumn seasons to overcome this impediment. Radiocarbon dating of shells was used to quantify the scale of DA time-averaging at each station to better constrain the timing of the observed patterns. Lessepsian molluscs dominated autumn LAs in terms of species richness (up to 60 % species) and abundance (up to 90 % of individuals) at most sampling stations, while their abundances were considerably lower in spring. High live-dead (LD) dissimilarity in taxonomic composition (Jaccard-Chao index) and rank-order of relative abundances (Spearman's rho) in both seasons suggest a strong and recent community shift. The magnitude of LD-mismatch in feeding guild composition showed a complex site-specific pattern with pronounced seasonality at some stations, particularly off southern Israel. In contrast, functional mismatch was high and independent of season in very shallow water off northern Israel. Further species-specific functional traits are currently being analyzed to gain a more complete picture of potential changes in community functioning and habitat-specific differences. Our LD-comparison highlights the magnitude of the Lessepsian invasion and its potential to affect the functional properties of shallow water assemblages in the Levantine Basin.