

Lessepsian invaders reshape soft substrate assemblages on the Israeli Mediterranean shelf

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The ‘Lessepsian invasion’ – the massive influx of Indo-Pacific biota into the Mediterranean Sea via the Suez Canal – is the largest marine biological invasion. The lack of data on pre-invasion community composition, however, severely impairs our understanding to which degree the taxonomic and functional composition of shallow-water assemblages has been modified by the invasion. Shelly death assemblages (DAs) encountered in surficial sediments represent a unique archive of past community states that enable overcoming this impediment. This is because they change more slowly (10-10,000 years) than the corresponding living assemblages (LAs; yearly scales of turnover). Strong and rapid directional changes such as those due to human activities are therefore not immediately captured by DAs, leading to a greater live-dead (LD) mismatch than under natural processes alone. We compared molluscan LAs and DAs collected along a depth transect down to 40 m on the Mediterranean shelf of Israel. High dissimilarity in taxonomic composition (Jaccard-Chao index), rank-order agreement of species relative abundances (Spearman’s rho), and differences in trophic guild composition suggest a major ecosystem shift in recent times. Our findings reveal that Lessepsian species have not only replaced native taxa, but also altered the functional properties of local molluscan assemblages.