Estimated and realized dispersal potentials in deep-sea chemosynthesis-based communities: the case of a Pacific galatheid crab

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Recognizing the distribution of animals provides a clue to reveal dynamics of marine ecosystems. In marine benthic animals the adult distribution is often the only distribution considered, despite their planktonic larval stages being key for their dispersal and therefore realized ranges. Population genetics, phylogeographic analyses, and physic-oceanographic modelling are powerful tools that help biologists estimate and understand the expected and realized larval dispersal potentials and connectivity among sites. The *Shinkaia crosnieri* galatheid crab is a widely distributed and iconic species in deep-sea chemosynthesis-based communities in the Indo-West Pacific, including hot vents and cold seeps. They harbor chemoautotrophic bacteria on their ventral surface which they feed on, and consequently they are specific to chemosynthesis-based ecosystems. Recent surveys on faunal distribution in such habitats has revealed some new distributions for the galatheid crab, revealing that its distributional pattern differs from other dominant species such as “*Bathymodiolus*” mussels. Here, we apply dispersal model estimation and phylogeographic analyses to the galatheid crab in order to compare its estimated and known realized larval dispersal ranges, and to discuss dynamics of plankton larvae from deep-sea vents and seeps. The results were mostly in agreement, but with some differences. Distribution patterns and the mechanisms underlying them are extremely important in making informed decisions on effectively managing upcoming deep-sea mining events and planning marine protected areas, and should be elucidated for the representative dominant species, at the very least.

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