

Processes regulating early post-settlement habitat use in a subtidal assemblage of brachyuran decapods

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Abstract

In highly mobile animals post-settlement dispersion of juveniles can strongly influence the observed patterns of abundance and distribution. To explore the relative importance of factors regulating the use of habitat by crabs we performed a multi-species manipulative experiment in a subtidal environment of the central Chilean coast. First, demographic patterns were established by performing a year-round crab survey in three discrete and well-known subtidal crab habitats: (1) algal turf, (2) cobbles and (3) shell hash. Second, habitat preferences were experimentally evaluated using concrete trays that were filled with different substrate types that simulate natural habitats. Settlement and recruitment rates were estimated from experimental trays that were left in the field and surveyed after 2 weeks (complete experiment was repeated 7 times throughout 1 year). Third, mortality, due to predation, was assessed by covering 50% of the trays with a 4-mm mesh-size screen that excluded large predators (i.e., fishes, shrimps). Fourth, habitat colonization rates were evaluated by quantifying the arrival, into open trays, of large juveniles (secondary dispersal). The most abundant species in this system (*Paraxanthus barbigier*, *Cancer setosus*, *Taliepus dentatus* and *Pilumnoides perlatus*) displayed clear habitat preferences at the time of settlement, evidenced by differences in density of recruits among habitats. Recruitment regulation by predation seemed to explain the observed patterns in only one case. For most species, however, evidence of ontogenetic change in the use of habitat, through active habitat redistribution by large juveniles, was detected. Thus, secondary dispersal among habitats seems to outweigh the influence of megalopae's habitat selection and post-settlement mortality as responsible for the observed demographic patterns.