

Resource partitioning between intertidal predatory crabs: interference and refuge utilization

Sergio A. Navarrete & Juan C. Castilla

Abstract

Acanthocyclus gayi Milne-Edwards et Lucas and *A. hassleri* Rathbun are two intertidal predatory crabs that coexist along the rocky coast of Chile. The two species are morphologically similar and remain hidden inside refuges during diurnal low tide periods. Their microhabitat distributions and diets were studied at two sites in central Chile. Juveniles of each species were found coexisting in three microhabitats (mussel beds, rock crevices and kelp holdfasts), although most lived amongst mid intertidal mussels. Most recruits were observed in mussel beds. In contrast to juveniles, adults were segregated by microhabitat. Most adults of *A. hassleri* were in galleries built through mussel beds, while adults of *A. gayi* were found only in rock crevices and holdfasts of the kelp *Lessonia nigrescens* Bory. Diets of both species were similar, even between adults. Because of the large dietary overlap observed between juveniles and adults of the two species, and the apparent abundance of food in the field, segregation between adult crabs did not seem to result from competition for food. Because thickness of the mussel bed was positively correlated with the density and size of crabs, there may be a paucity of suitable living spaces for adult crabs. In contrast to juvenile crabs, which shared refuges during low tides, adults aggressively defended refuges, both intra- and interspecifically. Laboratory and field experiments showed strong asymmetry in interspecific contests. Adults of *A. hassleri*, which have a proportionally larger master chela, were able to aggressively exclude adults of *A. gayi* from refuges provided in the laboratory, and from galleries in mussel beds in the field. Segregation between adult crabs seems to be the outcome of interference competition for refuges. Refuges are readily available for small crabs and hence they coexist in the same microhabitats. Refuges are hypothesized to provide protection for *Acanthocyclus* crabs from visual predators, such as the kelp gull *Larus dominicanus*. Analysis of relative predation pressure on crabs by gulls indicates that galleries in mussel beds constitute an effective refuge against this kind of predator.