## Abstract

The present study was aimed to understand the ecology of *Clibanarius rhabdodactylus* in terms of population structure, intertidal distribution and shell utilisation pattern on the rocky intertidal zone of Saurashtra coast of Gujarat state, India. Catch per unit effort method was employed to study population structure and shell utilisation pattern while transect method was used to study intertidal distribution pattern. Along with *C. rhabdodactylus*, another hermit crab species, *C. ransoni* was also found abundantly. Hence the shell utilization of both the hermit crab was studied. A clear sexual dimorphism was observed, with males being significantly larger than females. Overall sex ratio was female biased. The size frequency distribution was bimodal in male while unimodal in females. Ovigerous females occurred year-round, showing a continuous reproductive pattern of the species. The total number of eggs, size of eggs, and total weight of egg mass showed a positive correlation with the shield length and body weight of the ovigerous females. The abundance of *C. rhabdodactylus* varied significantly between seasons with maximum values recorded in winter followed by summer and monsoon. In case of microhabitat, upper intertidal zone was maximally composed of tide pools while middle and lower intertidal zone was maximally composed of open area. Tide pool water and ambient temperature varied significantly between seasons. The species mostly preferred upper intertidal region possibly because of greater coverage of tide pools in the upper intertidal zone. *Clibanarius rhabdodactylus* and *C. ransoni* were occupying almost similar number of gastropod species with > 75% occupied shells comprised of *Cerithium caeruleum, Lunella coronata*, *Turbo bruneus*, *Tenguella granulate* and *Pollia undosa*. *Cerithium caeruleum* was most abundant in the study area which may also influence the shell utilization of hermit crab species. Males and non-ovigerous females utilized almost all shell species, while ovigerous females used only a few shell species. Significant relationship was observed between different morphological parameters of the occupant hermit crab species and their shells. Shell partitioning was evident between hermit crab sexes as well as reproductive stages based on occupied shells of different species, shapes, and sizes. The present study revealed shell occupation pattern of *C. rhabdodactylus* and *C. ransoni* is highly influenced by the diversity, morphology and availability of gastropod shells in the study area.