

Hatching Rhythm, Larval Release of the Rocky Intertidal Crab *Leptodius exaratus* (Brachyura: Xanthidae) in Kuwait, Arabian Gulf

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Abstract : The hatching rhythm and larval release patterns of the rocky shore crab *Leptodius exaratus* was investigated in relation to the tidal cycle, the time of the day, and lunar cycle. Ovigerous females were collected from rocky shores at six sites along the Kuwait coastline between April and July of 2014. The females were kept separated in aquaria under a natural photoperiod cycle and the pattern of larval release was monitored in relation to local tidal and dial cycles. Larval release occurred mostly during the night time, and was highly synchronized with neap tides that followed full moon; at the end of the hatching period, significant larval release occurred also during spring tides. Time series analysis showed a highly significant autocorrelation and the periodicity at a peak of 14-15 days. The cross-correlation analysis between hatching and the daily low tide level suggests that larvae are released about a day before neap tide. Hatching during neap tides occurred early in the night at times of the expected ebb tide. During spring tide period (late in the season), larval release occurred later during night at tides of the ebb tide. The results of this study indicated a strong relationship between the tidal cycle, time of the day and the hatching rhythm of *L. exaratus*. In addition, the results suggest that water level in the intertidal zone is also playing a very important role in determining the time of the hatching. Hatching and larval release synchronize with the preferred larval environmental conditions to prevent exposing larvae to physiological or environmental stress during their early larval stages. It is also an important factor in determining the larval dispersal.

Keywords : brachyura, hatching rhythm, larvae, Kuwait

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