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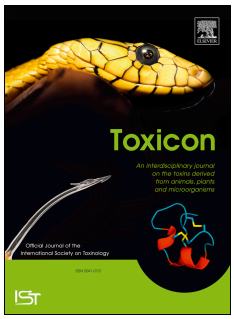

Potential impacts of blooms of the toxic dinoflagellate *Karenia brevis* on the growth, survival and juvenile recruitment of the non-native green mussel *Perna viridis* in southeastern United States

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Potential impacts of blooms of the toxic dinoflagellate *Karenia brevis* on the growth, survival and juvenile recruitment of the non-native green mussel *Perna viridis* in southeastern United States

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Abstract

Red tide blooms formed by *Karenia brevis* are frequent along the Gulf coast of Florida and it is unclear what tolerance the green mussel *Perna viridis*, a recently introduced species to coastal waters, has toward these events. Established populations of *P. viridis* were monitored along the coastal waters of Estero Bay, Florida before, during and following two consecutive red tide blooms to assess the potential effects on growth, survival and juvenile recruitment. Upon onset of the bloom, growth rates fell from 6 – 10 mm month^{-1} (March 2011 – November 2011) to less than 3 mm month^{-1}. In the succeeding years, *K. brevis* blooms were present, and average growth of individually tagged mussels remained below 3 mm month^{-1}. During growth monitoring the use of calcein as an internal marker was tested with positive staining results and no observed effect on growth or survival. In March 2012, following the first red tide bloom, a population-wide mortality event was observed. Following this event, increased mortality rates were observed with peaks during onset of the bloom in the fall of 2012 and 2013. Juvenile recruitment was also limited during years in which blooms persisted into the spring spawning period suggesting gamete and / or larval sensitivity to *K. brevis*. Although it cannot be conclusively determined that the cause of reduced growth and survival is due to red tide events,