

Competition and niche segregation following the arrival of *Hemigrapsus takanoi* in the formerly *Carcinus maenas* dominated Dutch delta

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In a combined study including a 20 year monitoring programme of the benthic communities of four Dutch delta waters and a snapshot survey conducted in the Oosterschelde tidal bay in 2011, the populations of the native portunid European shore crab *Carcinus maenas* and the introduced varunid crabs *Hemigrapsus takanoi* and *Hemigrapsus sanguineus* were investigated. Whereas *C. maenas* was the most common shore crab in these waters, its numbers have declined on the soft sediment substrates during the last 20 years. As the two exotic crab species were first recorded in the Dutch delta in 1999, they could not have initiated the decline of the native *C. maenas*. However, within a few years *H. takanoi* completely dominated the intertidal hard substrate environments; the same environments on which juvenile *C. maenas* depend. On soft sediment substrate the native and exotic shore crab species are presently more or less equally abundant. *H. takanoi* might initially have taken advantage of the fact that *C. maenas* numbers were declining. Additionally *H. takanoi* are thriving in expanding oyster reefs of *Crassostrea gigas* (Pacific oyster) in the Dutch delta waters, which provide new habitat. Nowadays *H. takanoi* appears to be a fierce interference competitor or predator for small *C. maenas* specimens by expelling them from their shelters. These interactions have led to increased mortality of juvenile *C. maenas*. At present the *C. maenas* populations seem to be maintained by crabs that survive and reproduce on available soft sediment habitats where *H. takanoi* densities are low.

References

Van den Brink A.M., Wijnhoven, S., McLay, C.L. 2012. Competition and niche segregation following the arrival of *Hemigrapsus takanoi* in the formerly *Carcinus maenas* dominated Dutch delta. *Journal of Sea Research* 73:126–136.