

oral presentation to the Coastal Estuarine Research Federation Conference, November 3-7, 2013, San Diego, CA

When gourmet is not enough: organic matter sources supporting the high production of *Corbicula fluminea* in an invaded estuary

Ester Dias, Pedro Morais, Carlos Antunes, Joel C. Hoffman

#### Abstract

The Asian clam *Corbicula fluminea* is one of the most pervasive species in freshwater ecosystems. Our objective was to characterize the food sources fuelling *C. fluminea* in the Minho river estuary (NW-Iberian Peninsula, Europe), an estuarine ecosystem in which *C. fluminea* presently dominates the benthic macrofauna biomass. We identified and quantified the contribution of different organic matter (OM) sources to *C. fluminea*'s biomass along the estuarine mixing zone, using C and N stable isotope analysis.

A pronounced shift in the quality of OM available for *C. fluminea* occurred along the salinity gradient. Particulate OM was largely comprised of terrestrial derived OM in freshwater stations (TFW) and was increasingly comprised of phytoplankton, a more palatable food source, towards the polyhaline estuary. A similar shift in isotopic composition along the estuarine mixing zone was observed in *C. fluminea*, suggesting a shift in the food sources used in response to the change in food quality. Although the majority of the food sources identified during this study were being filtered from the water column (70-90%), reliance on sediment OM and microphytobenthos provided evidence for deposit feeding by *C. fluminea*.

Thus, data interpretation suggests that *C. fluminea* has the ability to adapt to environments with low food quality, which can be a competitive adaptation in systems with perennial low food quality such as the Minho River estuary. Moreover, its ability to couple the terrestrial ecosystem with the estuarine environments, constitutes a new process by which *C. fluminea* may alter food web flows in aquatic ecosystems. As an invader, the implication of this adaptive and flexible feeding behavior is that it likely facilitates its widespread success at establishing in new aquatic environments.