

Distribution of Organic Matter in a Tidal Estuary of the Seto Inland Sea, Japan, and Its Relationship with the Macrozoobenthic Communities

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This work is part of a long-term and multidisciplinary project which aims at quantifying the cycling of biophilic elements (C, N, P, Si) in a tidal estuary of the Seto Inland Sea, Japan, and to assess the role of primary producers (microphytobenthos) and consumers (macrozoobenthos) in this cycling. As an initial phase of this project, we carried out a bi-weekly survey lasting 13 months to investigate the environmental factors affecting the development of microphytobenthic assemblages at two intertidal stations differing in distance from the shore-line, elevation and grain-size composition (Magni and Montani 1997). In parallel we assessed the short-term (24 h) and seasonal (2 year) variability of the water chemistry along the estuary to verify the sources of the different nutrients: from inland outside or within the estuary (Montani et al. 1998, Magni & Montani 2000). In parallel, we conducted monthly field surveys on the spatial and seasonal distribution of intertidal and subtidal communities of the macrozoobenthos (Magni 1998, Magni & Montani 1998). Subsequently as a link between primary producers and consumers, we quantified the magnitude and temporal variability of the contribution of macrozoobenthos on the upward flux of inorganic nutrients within the intertidal zone (Magni et al 2000). By extrapolating laboratory experiments on animal nutrient excretion to a field community situation, we found that the dominant bivalves *Ruditapes philippinarum* and *Musculista senhousia* play a major role in recycling the inorganic forms of nitrogen and phosphorus available to primary producers (Magni et al. 2000). Additional work is now in progress to examine the influence of major physical (i.e. grain size, water content) and chemical (i.e. Chlorophyll a, phaeo-pigments, total organic carbon and acid-volatile sulphide) parameters of the sediments on the spatial arrangement and the seasonal change of macrozoobenthos along the estuary. In this report, we will present major results on the relationship between organic matter and macrozoobenthos along the estuary (i.e. the intertidal and the subtidal zone), with emphasis on the role and ecological significance of total organic carbon (TOC) in the sediments.