

MASTER'S THESIS

Sedimentary organic matter: implications for palaeoenvironments and human impacts on sedimentation in Hong Kong

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Sedimentary Organic Matter:
Implications for Palaeoenvironments and
Human Impacts on Sedimentation in Hong Kong

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Abstract

The study of sedimentary organic matter, in particular the sources and characteristics of organic matter, provides useful information that can be used to interpret palaeoenvironments. The sources of sedimentary organic matter, which are mainly plants of different types, may yield clues to the past environment in which they lived and environmental change. Information can also be derived with regard to depositional regime, and also the impacts of human activities. Seven piston cores collected from two contrasting depositional regimes were studied, and their major sedimentary organic matter characteristics were determined. Parameters examined included: carbon-13 (^{13}C) and nitrogen-15 (^{15}N) stable isotopes, C/N atomic ratios, carbonate and organic carbon content, as well as mean particle size and sorting. The results showed distinct differences between two major depositional regimes in the Pearl River Estuary and in Tolo Harbour. Sediments tended to be finer and better sorted in the Pearl River Estuary than in the Tolo Harbour region. The core data show significant variability in terms of particle size, with pulses of coarser sediments at discrete horizons occurring toward the top of cores from the Pearl Estuary. Organic carbon generally increases. C/N ratios suggest mixed terrestrial and phytoplankton contributions and increased instability in organic matter supply. Carbon and nitrogen also show a general increase in instability towards core tops. Within individual cores, these changes generally start at about the same time during the early sixteenth century. These changes may have been caused by farmer immigrants and their agricultural activities, and their role in deforestation. In the last few decades erosion rates and organic matter signatures suggest the possibility that urbanization is accelerating change in the marine environment.

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