

## 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 ( $^{13}\text{C}$ ) and nitrogen-15 ( $^{15}\text{N}$ ) 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.

## Table of Content

Declaration	i
Abstract	ii
Acknowledgements	iii
Contents	iv
List of Figures	vii
List of Plates	ix
Chapter 1 Introduction	P. 1
1.1 Introduction	P. 1
1.2 Literature Review	P. 3
1.2.1 Terminology	P. 3
1.2.2 Past Studies of Organic Matter and Organic Carbon	P. 6
1.3 Interpretation of Organic Matter Data	P. 13
1.3.1 Organic Matter Preservation and Degradation	P. 13
1.3.2 C/N Ratios	P. 14
1.3.3 Carbon and Nitrogen Isotopes	P. 14
1.4 Organic Matter Sources in Hong Kong	P. 18
1.4.1 Overview	P. 18
1.4.2 Modern Organic Matter in Hong Kong	P. 21
Chapter 2 Methodology	P. 29
2.1 Objectives	P. 29
2.2 Field Work	P. 29
2.3 Laboratory Work	P. 33
Chapter 3 Organic Matter Sedimentation in Deep Bay	P. 42
3.1 Introduction	P. 42
3.2 Organic Matter Signatures in Deep Bay	P. 43
3.2.1 Zonation of Composite Core DB1	P. 45
3.2.2 Zonation of Composite Core DB2	P. 47
3.3 General Trends and Environment Implications for Composite Cores DB1 and DB2	P. 49
3.3.1 Mean Grain Size	P. 50

3.3.2	Organic Carbon Percentage	P. 51
3.3.3	C/N Ratios	P. 52
3.3.4	Calcium Carbonate	P. 53
3.3.5	The $\delta^{13}\text{C}$ Isotope Data	P. 54
3.3.6	The $\delta^{15}\text{N}$ Isotope Data	P. 56
3.3.7	Palaeoenvironmental Summary	P. 58
<b>Chapter 4</b>	<b>Organic Matter Deposition in Offshore Areas Near Tai O</b>	<b>P. 61</b>
4.1	Introduction	P. 61
4.2	Organic Matter Signatures in the Tai O Cores	P. 62
4.2.1	Zonation of Core TO1	P. 63
4.2.2	Zonation of Composite Core TO2	P. 65
4.2.3	Correlations between Core TO1 & Composite Core TO2	P. 67
4.3	General Trends and Environment Implications for Core TO1 and Composite Core TO2	P. 69
4.3.1	Mean Grain Size	P. 69
4.3.2	Organic Carbon and C/N Ratios	P. 70
4.3.3	Calcium Carbonate	P. 72
4.3.4	The $\delta^{13}\text{C}$ Stratigraphy	P. 73
4.3.5	The $\delta^{15}\text{N}$ Stratigraphy	P. 74
4.3.6	Palaeoenvironmental Summary	P. 75
<b>Chapter 5</b>	<b>Tolo Channel (Tolo Harbour, Plover Cove and Three Fathoms Cove)</b>	<b>P. 78</b>
5.1	Introduction	P. 78
5.2	Organic Matter Signatures and Environmental Implications in Tolo Channel (Tolo Harbour, Plover Cove and Three Fathoms Cove)	P. 79
5.2.1	Zonation of Core TP1	P. 80
5.2.2	Environmental Implications for TP1	P. 83
5.2.3	Zonation of Core YC1	P. 84
5.2.4	Environmental Implications for Core YC1	P. 87
5.2.5	Zonation of Core SC1	P. 89
5.2.6	Environmental Implications for Core SC1	P. 91

5.2.7	Comparisons and Contrasts between the Tolo Cores and Potential Environmental Controls	P. 93
Chapter 6	Organic Matter and Sedimentological Variability – Estuarine Verses Oceanic Regions in Hong Kong & Potential Human Controlling Factors on Organic Matter Deposition	P. 98
6.1	Introduction	P. 98
6.2	Spatial Variability in Sediment Sorting Stratigraphies between the Western (Estuarine) and Eastern (Fully marine) Cores	P. 99
6.3	Spatial Contrasts in Organic Matter between the Western and Eastern Cores Samples	P. 102
6.4	Spatial Contrasts in Organic Carbon Percentages and C/N Ratios between Western and Eastern Cores	P. 105
6.5	Carbon and Nitrogen Isotopic Variability between Regions	P. 106
6.6	Potential Human Controlling Factors on Organic Matter Deposition	P. 109
Chapter 7	Conclusion	P. 113
	Bibliography	P. 117
	Curriculum Vitae	P. 125