

淡水紅樹林沼澤有機質沉積特性研究

報告者：Ya-Chi Su

指導教授：Louis L. Tsai

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摘要

紅樹林為重要的潮間帶濕地生態系統，具有較高的初級生產力，豐富的碎屑及有機碳。為了解濕地有機質保存埋藏的機制過程，本研究針對現生淺層沉積物進行採樣分析，評估其礦物相、總有機碳(TOC%)、Rock-Eval 熱裂分析、現地水質資料，並透過 Biomarker 分析樣品中有機物的材料來源。本研究採樣點位於台灣西北部淡水紅樹林，針對近岸及濱海分別採集四種不同深度的樣品(表層、5-15cm、15-30cm、30-40cm)。研究的樣品顯示 TOC 介於 0.17% - 0.8%；Tmax 為 364-443°C；S1、S2 的範圍分別為 0.08-0.19 mg HC/g rock 及 0.07-0.47 mg HC/g rock，樣品的生煙成熟度皆為未成熟階段。沉積物以第 III 型油母質為主，表示有機物質的來源主要是陸生植物。水質資料顯示兩個採樣點皆受海水影響，且濱海地區有較高的溶氧量及導電度。所有樣品中均含有石英及長石，伊萊石為濱海地區主要的黏土礦物成分，而近岸地區則為伊萊石及高嶺石。根據生物指標 Biomarker 分析結果，顯示研究區域為富氧沉機環境。本研究將根據不同位置及深度所造成的樣品特性差異，探討紅樹林沼澤有機質之沉積特性。

Depositional Characteristics of Organic Materials in Mangrove Swamp in Tamsui, NW Taiwan

Presenter : Ya-Chi Su

Advisor : Prof. Louis L. Tsai

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Abstract

Mangrove swamp is an important intertidal wetland ecosystem with high primary productivity, abundant detritus, and also rich in organic carbon. In order to understand the process and mechanism of organic material during burial and preservation processes in a mangrove swamp, we evaluated the mineralogy, total organic carbon (TOC %), Rock-Eval pyrolysis, water quality, as well as biomarker to evaluate the depositional source. Study area was the mangrove swamp at Tamsui, NW Taiwan. In this area, we chose two sampling sites, MF (closer to the sea) and MM (closer to the land). Samples were collected from different depths (0-5cm, 5-15cm, 15-30cm, 30-40cm). We found that TOC varied between 0.17% and 0.8%, Tmax values were 364 to 443°C ; S1 and S2 were ranging from 0.08 to 0.19 mg HC/g rock and 0.07 to 0.47 mg HC/g rock respectively. Hydrocarbon potential was immature for all samples. In addition, organic matter types analyzed are dominated in Type III, showed that the source of organic materials were from land plants. Furthermore, water quality data showed that both sampling sites were influenced by sea water. MF area exhibited higher dissolved oxygen and electricity conductivity. XRD indicated that all of the soils were characterized by quartz and feldspar. The major clay mineral in MF samples is Illite. Besides, Illite and Kaolinite are major clay minerals in MM samples. Finally, biomarker analysis indicate an oxic environment for all samples. Based on the analyses of characterizing different localities and depths, the deposition characteristics of organic materials of mangrove swamps can thus be evaluated, for the purpose of furthering understanding organic depositional mechanism in the study area.