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Sedimentary composition and organic carbon sources in mangrove forests along the coast of northeast Vietnam

Nguyen Tai Tue^{1,2*}, Pham Thao Nguyen², Dang Minh Quan²,
Luu Viet Dung², Tran Dang Quy^{1,2}, Mai Trong Nhuan^{1,2}, Nguyen Dinh Thai¹

¹*Faculty of Geology, VNU University of Science*

²*VNU Key Laboratory of Geoenvironment and Climate change Response*

**Corresponding author: Nguyen Tai Tue*

Address: Faculty of Geology, VNU University of Science, 334 Nguyen Trai, Thanh Xuan District, Hanoi, Vietnam

Email: tuenguyentai@gmail.com; tuenguyentai@vnu.edu.vn

Cell phone: +84-164-873-8650

Phone: +84-43-557-3336

Fax: +84-43-557-3336

ABSTRACT

The objective of this research was to examine the patterns of sedimentation and sedimentary organic carbon content in mangrove forests along the coast of northeast Vietnam. Stable isotope ratios ($\delta^{13}\text{C}$), C/N ratios, and sediment texture (sediment grain size, sorting, skewness and sediment facies) were analyzed in three sediment cores from different mangrove forests. Results showed that sediments were mainly composed of fine sand, silt, and clay. Mud content decreased from estuarine islets through to the fringe, and to riverine mangrove forests. Total organic carbon (TOC) content, $\delta^{13}\text{C}$ values, and C/N ratios ranged from 0.3 to 6.8%, -30.1 to -24.9% , and 12 to 42, respectively. Results from bivariate analysis of sedimentary parameters clearly indicated that hydrological energy in the riverine mangrove forest was relatively lower than that observed from the fringe and estuarine islet mangrove forests. Co-variation between $\delta^{13}\text{C}$ and C/N ratios showed that sedimentary organic carbon in riverine mangrove forests mainly originated from mangrove organic matter, while fringe and estuarine islet mangrove forests tended to accumulate higher proportions of marine phytoplankton. Results underscored the significance of mangrove stands and geomorphological settings in influencing sedimentation and organic carbon burial processes in mangrove sediments.

Keywords: Stable isotopes; Sedimentation; Sediment texture; Mangroves; Vietnam.

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