



**Study of Fiddler Crab Density in Relation to Soil Properties and Soil Carbon
Sequestration in Ban Modtanoi Mangrove Forest, Kantang District, Trang Province**

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Abstract

This study investigated the relationship between fiddler crab population density, soil properties, and carbon sequestration in the Ban Modtanoi mangrove forest, Trang Province, Thailand. Soil samples were collected from a depth of 30 centimeters at two locations: the community enterprise area and the pier area. Soil properties were analyzed following the GLOBE Soil Protocol, and soil organic carbon was estimated using the Loss-on-Ignition method. The results showed that the pier area had a significantly higher mean fiddler crab density than the community enterprise area, with 90.5 and 44.8 individuals per square meter, respectively. The higher crab density was associated with improved soil physical properties, including higher soil moisture, lower soil temperature, and a clay loam soil texture that retained more water and organic matter than the sandy clay loam soil in the community enterprise area. Both locations had a soil pH of 6 and very low levels of nitrogen, phosphorus, and potassium. However, the pier area contained higher organic matter (6.92%) and soil organic carbon (2.65%) than the community enterprise area (4.36% and 1.54%, respectively). These findings suggest that greater fiddler crab population density is associated with improved soil properties and increased carbon sequestration. Burrowing and bioturbation enhance soil porosity and structure, promoting the accumulation and burial of organic matter in deeper soil layers. Therefore, fiddler crabs play an important ecological role in increasing the blue carbon sequestration potential of mangrove forests, serving as a guideline for the sustainable conservation of coastal ecosystems.

Keywords: Mangrove Forest, Fiddler Crab, Soil Properties, Carbon Sequestration