

A Seasonal Comparison of Decomposition Rates Across 5 Semi-Urban Mangrove Sites Spanning a Range of Soil Types and Tidal Regimes

Rachel Collin, Estefania Espinosa, Arnaldo Diaz, Carlos Jimenez, Fleur Cartwright, and Milton Sandoval

Smithsonian Tropical Research Institute, Panama City, Panama

Decomposition rates of organic material vary with temperature, salinity, and oxygen availability, resulting in latitudinal and seasonal variation across sites. Although well-studied in terrestrial systems and in temperate wetlands, data on decomposition rates in tropical wetlands are sparse. The objective of this study was to determine how decomposition rates vary across semi-urban tropical mangroves using a suite of standardized substrate assays. Following protocols from the literature we deployed gel-filled ROMA plates, tea bags, and wood lamina to test the hypotheses that decomposition rates of these different substrates would co-vary across sites and across seasons. We selected 5 semi-urban mangrove sites in Panama that included carbonate and terrigenous soils, and macro-tidal and micro-tidal systems and replicated the assays across the wet and dry season. Rates of gel loss from the ROMA plates and weight loss from the teabags were generally similar across the sites but showed significant effects of and interactions between site and season as well as treatment (red vs. green tea or covered or open ROMA plate wells). Surprisingly the site with the highest loss of gel from the ROMA plates was different from the highest loss of weight from the teabags. Seasonal differences were associated with the variation of hydrological conditions across the sites.