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Carbon lability study from Gabon's mangrove in front of climate change

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The climate change and demographic expansion have brought disastrous consequences on the environment, such as damage to water and sediment quality of rivers and estuaries, and warming oceans, which directly affecting the mangroves. Mangroves contain the highest densities of organic carbon (Corg) compared to any ecosystem, representing up to 283 ± 193 $tC.ha^{-1}$ up to 1 m depth[1]. The carbon lability is sensitive to environmental changes and consequently, it can influence the natural organic matter (NOM) stabilization and its oxidation drives the CO_2 flux as a by-product in the ecosystem. So, any disturbances and alterations can make a significant contribution to the carbon (C) balance in world. Based on, this study aims to evaluate the Corg lability of the sediment from mangroves in Gabon (Africa). Different analytical techniques, UV-Vis spectroscopy and fluorescence spectroscopy (EEM-CP/PARAFAC) were used in order to evaluate the molecular characteristics of NOM from sediment of African mangrove. The study area was in mangrove of Port Gentil (Gabon). For Corg lability study, an experiment was developed in a microcosm scale using different masses of sediment from mangrove known (1.0 and 5.0g), in which the Corg was estimated by the consumption of CO_2 released. The reaction kinetics which was indirectly measured by the biochemical oxygen demand (BOD) using the Oxitop. Extracts of these microcosms were collected at time zero and 10 days after incubation, and subsequently characterized using the techniques mentioned above. Preliminary results showed that BOD can be an indirect measure of C consumption in the system, which showed at least 13.2% of the Corg contained in the sediment is labile (Figure 1) in which it's estimated by respiration equation. Furthermore, the extracts collected from the microcosms showed that with 10 days of incubation, the NOM was degraded and transformed into humic-type compounds, demonstrating their mineralization. Thus, the preliminary results are unique and will allow determining the entry of C labile in mangrove and besides understanding of the NOM dynamics and their role in the face of climate change. Financial: Institut de Recherche pour le Développement - Action SUD. [1]Jakovac et al. (2020), *Ecological Economics*, 176, 106758.

Figure 1: Determination of biochemical oxygen demand (BOD) on sediments from Gabon were employing OxiTop® manometers.