Analysis of Dissolved Organic Matter Percolated from Periphyton in Everglades and Interaction with Mercury

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Goals

- Characterization of DOM percolated from periphyton in the Everglades
- Comparison of DOM from Everglades surface water and periphyton
- Analysis of Hg speciation in the presence of periphyton DOM

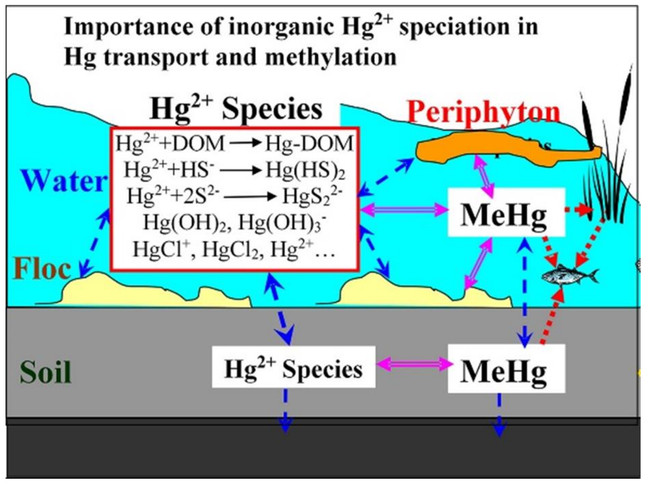


Figure 1: Mercury speciation in Florida Everglades; DOM plays a crucial role in controlling Hg speciation and transformation.

Research Methodology

- Collection of different types of periphyton and water samples from the Everglades
- Periphyton incubation and DOM leaching experiment
- Elemental Analysis by measuring total and dissolved C, N, P content
- Qualitative analysis: 3-D EEMs Fluorescence and UV-Visible Spectroscopy
- Analysis of Hg-DOM complexation

Figure 2a: Epiphyton

Figure 2b: Floating mat and Benthic

Figure 2: Different types of Periphyton samples in the Water Conservation Area 3b at the North part of the Florida Everglades

Figure 3a: Before incubation

Figure 3c: After incubation

Figure 3: Periphyton Incubation and DOM leaching experiment

Results

- Surface Water and Periphyton Overlying Water have same types of DOM: mostly fulvic-like; some humic-like (microbial origin)
- DOM in Periphyton Pore Water: mostly fulvic-like; Tyrosine-like (refractory); humic-like (ubiquitous)
- Leached DOM from periphyton incubation: mostly Tyrosine-like (refractory); fulvic-like; overlap of humic-like from microbial and ubiquitous origin

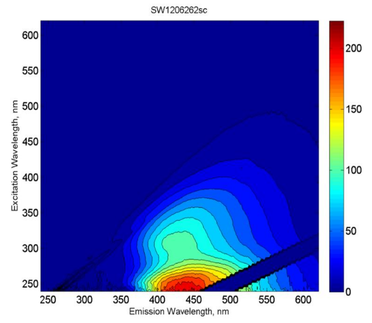


Figure 4a: Surface Water DOM

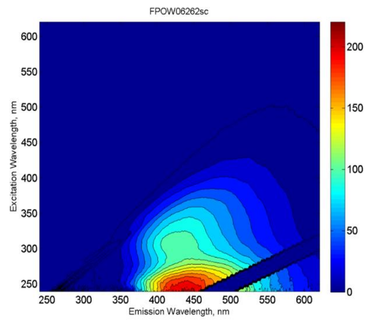


Figure 4b: Periphyton Overlying Water DOM

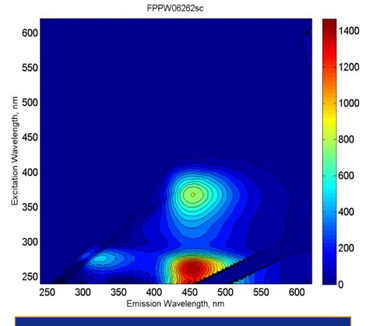


Figure 4c: Periphyton Pore Water DOM

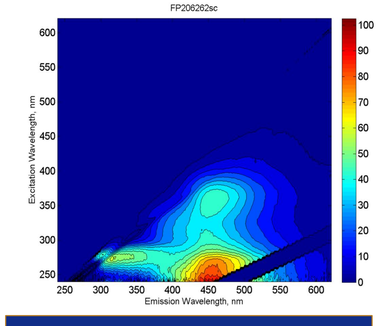
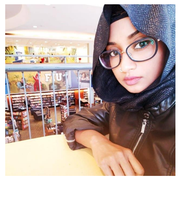


Figure 4d: DOM leached from floating mat after incubation

Figure 4: 3D EEMs Fluorescence Spectroscopy for DOM analysis



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