P2.06 Linking the edges of microbially-mediated nitrogen transformations in mangrove sediments

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Microbially-mediated ecosystem functions, such as N_2 fixation and denitrification, can be influenced by both the structure and activity of the residing microbial community, which might respond differently to anthropogenic disturbances. Due to the vertical stratification of the aerobic, microaerophilic and anaerobic zones, mangroves are important hot spots for microbial activity. However, the N_2 fixation and denitrification processes have been not extensively assessed in these ecosystems. Here, we present a survey based on mangrove sediments using samples taken in three different mangroves located at the coast of São Paulo State (Brazil), and varying according to their degree of disturbance: *i*) oil-contaminated mangrove at Bertioga, *ii*) mangrove under the pressure of anthropogenic activity at Bertioga, *iii*) non-disturbed mangrove at Cardoso Island - Cananéia. Functional microbial communities possibly involved in these transformations were assessed by denaturing gradient gel electrophoresis (DGGE) and quantitative PCR, using the *nif*H and *nos*Z genes as markers for nitrogen fixation and denitrification, respectively. DGGE analysis of *nif*H gene showed differences among the mangroves and also revealed clear differences among the sampling points across the transect sea-land. Despite the difference in community structure, the abundance of nitrogen fixers remained constant at all points within the mangrove and between the sediments of three mangroves (log values ranging from 6.0 to 7.9 copies per gram of sediment). Results based on *nosZ* showed higher abundance of denitrifiers was higher than of nitrogen fixers (log values ranging from 7.5 to 8.5 copies per gram of sediment), possibly related to the anaerobic conditions of the mangroves, favoring denitrification. Moreover, denitrifiers were present in higher abundance in the mangrove at Cananéia compared to Bertioga, indicating that disturbances have a great impact on the size of these communities. In summary, our findings revealed that denitrifiers and nitrogen fixers coexist in the mangrove sediment, although mangrove sediments sustain a higher abundance of the former. Moreover, the observed changes in community density and structure indicate that the preservation state of the mangroves is directly involved with the nitrogen transformations in these sediments.