TITLE: SUNKEN ORGANIC AND SYNTHETIC SUBSTRATES IN THE DEEP SOUTHWESTERN ATLANTIC HARBOR DISTINCT BACTERIAL COMMUNITIES

AUTHORS: PERES, F. V.[1]; FRANCO, D. C.[2]; SIGNORI, C. N.[2]; SUMIDA, P. Y. G.[2]; NAKAYAMA, C. R.[3]; PELLIZARI, V. H.[2]

INSTITUTION: [1]Instituto de Ciências Biomédicas, Universidade de São Paulo (Avenida Lineu Prestes, 1374, São Paulo, SP); [2]Instituto Oceanográfico, Universidade de São Paulo (Praça do Oceanográfico, 191, São Paulo, SP); [3]Instituto de Ciências Ambientais, Químicas e Farmacêuticas (Rua São Nicolau, Jardim Pitangueiras, 210, Diadema, SP).

ABSTRACT: Wood substrate and whale carcasses that reach the ocean floor are remarkable reservoirs of energy and carbon, constituting habitats with potential to harbor high microbial diversity. The aim of this study was to assess the bacterial diversity and community structure associated to synthetic and organic substrates (wood and whale vertebra). These substrates were submerged by a lander in a period of 22 months in the Southwestern Atlantic along the 3300-m isobath, comparing three different sampling areas (off Espírito Santo, Rio de Janeiro and São Paulo states). We sequenced the V4 hypervariable region of the 16S ribosomal RNA gene of 27 samples, and characterized a total of 1704604 tags representing 1735 operational taxonomic units (OTUs, 97% similarity). The classes *Alphaproteobacteria* and *Flavobacteriia* were dominant in the synthetic (59.8% and 16.5%, respectively) and wood substrates (40.8% and 29.4%, respectively), whereas the classes *Delta* and *Epsilonproteobacteria* were dominant in the whale vertebra (31.1% and 24.4%, respectively). Beta-diversity analyses showed significant differences ($p < 0.05$) between the studied substrates and within the geographical sites, being only 3 OTUs (*Alphaproteobacteria-Rhodobacteraceae_unclassified*; *Epsilonproteobacteria-Sulfurovum* and *Alphaproteobacteria-Sedimentitalea*) shared among all the samples. Genera related to chemosynthesis, such as *Sulfurovum*, *Desulforhopalus*, *Desulfuromusa*, *Sulfurospirillum*, *Desulfobacter*, *Desulfotalea* and *Sulfurimonas*, were found in the synthetic, wood and vertebra substrates, representing 0.8%, 12.1% and 54.8% respectively. In the vertebra substrate, the organic matter is already available for consumption, while wood, composed mainly of cellulose, requires longer periods for the installation of chemosynthetic communities. This study showed new insights about how substrate and geographic location could influence bacterial communities structure in deep southwest Atlantic.

Keywords: chemosynthesis; whale fall; wood fall; deep-sea

Financial support: CAPES; FAPESP

Institutional support: Instituto Oceanográfico (IO-USP)