Supporting Information

**S1 File. S1\_Supplmental\_Materials.docx** Contains Supplemental Figures (1-9) and Supplemental Tables (1-4).

**S2 File. SF2\_Internal\_Nomenclature.odt** – For use with QIIME2’s visualization files, this is a file contains the sample names used in the computational steps (in Portuguese) and their English counterparts in the text.

**S3 File. SF3\_Files\_Supplemental\_Feature\_table.qzv** – QIIME2 visualization file of Feature ID (aka OTU) within samples.

**S4 File. SF4\_Files\_Supplemental\_Taxa-bar-plots.qzv** – QIIME2 visualization file of taxa proportion per taxonomic level per site.

**S5 File. SF5\_Files\_Supplemental\_Taxonomy.qzv** – QIIME2 visualization of the assigned taxa for each Feature ID.

**S6 File. SF6\_File\_KO\_taxa\_specific\_enrichment.ods** Tab-separated value table representing the output of sigilo script using labelled metabolic\_KOs (from Supplemental File SF1). Columns are Kegg Object Metabolic pathway, taxonomic level, taxon, Kegg Object, KO specific function, fraction of total function (ie. taxon\_specific\_functional\_abundance / total\_taxon\_function\_abundance), p-value, taxon\_specific\_function\_abundance, total\_taxon\_function\_abundance).

**S7 File. SF7\_File\_Phylogenetic\_Metabolic\_Tree.pdf** Large format phylogenetic tree similar to Figure 7 but with the names shown for all taxa.

**S8 File. SF8\_Metabolism.zip** – Comma-separated file containing Carbon, Nitrogen, Phosphorus, and Sulfur metabolism associated Kegg Orthologs. These include Phosphorus (ko00030), Methane (ko00680), Nitrogen (ko00910), Sulfur (ko00920), Carbon (ko01200), as well as numerous subsets: (ko01220), (M00021, M00338, M00609), (M00174), (M00175), (M00176), (M00529), (M00530), (M00580), (M00595), (M00596), (M00631), (M00804).