Title: ARCHEA DIVERISTY IN SOIL UNDER NO-TILL TREATMENT IN COMPARISON WITH SEMIDECIDUOUS FOREST

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Abstract:

Agriculture sustainability relies on soil management practices whose objective is to reduce overall degradation. The no-till practice is a technique applied with this objective, and consists in sowing directly in the last culture residues. This practice impact the micro-organisms diversity in the soil, and these microorganisms play a key role in the cycling of the soil nutrients. To analyze this impact on the Archaeal ecology of the soils under those management practices, we applied the metagenomic technique. In our work, two soils were sampled from the region of Dourados/MS. The first soil (NT) has a 20 year history of no-tillage management, and the latter (DF) was sampled from a nearby native semi-deciduous forest. DNA was extracted and sequenced using Illumina under the WGS technique, which amplifies the entire DNA sample. We utilized the PrinSeq software for sequence trimming. The *de novo* Assembly was done through the IDBA-UD software. The ORFs were identified with the FragGeneScan software, and the data were annotated in the MG-RAST server, which also provided a profile for obtaining the Archaea sequence proportion. This profile was imported on STAMP for the calculus of the proportion. Sequences with a p-value>5% were not considered. The NT soil presented an increased amount of about 10% in Archaea of the Euryarchaeotas phylum in comparison to S2, of which mostly belonging to the family Halobacteriaceae, also called halophiles, which are commonly found on soils with high salt saturation. The DF soil, in turn, presented a large amount of Archaea from the Thaumarchaeota phylum, whose members are known for their ammonia-oxidizing properties, which reinforce the evidence of their key role on the biogeochemical cycle of the nitrogen, through nitrification. Of the organisms found, the one which showed the biggest difference in proportion was *Nitrosopumilus maritimus*. This Archaea was the first AOA (*ammonia-oxidizing archaea*) isolated, and it's able to grow chemoautotrophically in ammonia-enriched media. These results allow the conclusion that soil management practices do possess some impact on the micro-organisms ecology, and the impact may be associated with nutrient maintenance in the soil.

Keywords: Bioinfomatics, Diversity, Metagenomics, NGS, WGS

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