PrelIminary Measurements On Diel CH_4 and N_2O Fluxes on Brachiaria Pasture

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Brazil has extensive pasture areas for beef cattle grazing. An experiment was carried out in summer in a Brachiaria pasture in Southeastern Brazil, characterized by hot and humid climate in summer and dry in winter, with the objective of measuring hourly fluxes of methane and nitrous oxide from soil and identifying a possible relationship with environmental parameters, including air temperature, soil temperature, solar radiation, photosynthetically active radiation (PAR), and soil moisture. Temperature and radiation data were obtained from a climatological station on February 13 and 14, 2020, starting at 9:00 am and ending at the same hour of the next day. Soil moisture data were recorded by humidity sensors. The gas collection method used was the static closed chamber. Five chambers were used at the same time. Methane and nitrous oxide concentrations were sampled every 2 hours, in intervals of 0, 10, 20, 30, and 40 minutes. The gas samples were extracted by BD 60 mL syringes with a three-way luer lock valve and then transferred to 12 mL vacuum vials of the Labco Exetainer brand. A Thermo Scientific chromatograph model, Trace 1310, was used to determine the concentrations of gases. The statistical analysis was performed using the PROC CORR procedure of the SAS program. Preliminary results showed that N_2O fluxes peaked at 3 p.m. with around 10 µg N-N_2O m^{-2} h^{-1} and a minimum value of -2 µg N-N2O m^{-2} h^{-1} at 1 a.m. N_2O fluxes were positively correlated with air temperature (0.70939 /0.0066) and with PAR (0.59037/0.0337), while they were negatively correlated with relative humidity (-.69266/0.0087). Methane correlated negatively with soil temperature (-0.88646/<0.001), although the concentrations were very low throughout the day. Other diel measurements are going to be carried out and the experiment will be repeated in the summer season.

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