DATASET 8 (DS8) - MICROBIAL FUEL CELLS (MFCS)

Task involved	Task7.1 (Microbial fuel cells (MFCs) for topsoil energy harvesting)
Creator/Curator	Bioo
Partners involved	-
General description of the activities	Task 7.1 aims to develop autonomous MFCs that can provide energy to the robot and, in addition, do not require continuous monitoring of the cell conditions. Bioo's objectives are: i) to have a cell that is easy to install, ii) that does not require of a continuous maintenance and iii) that is adaptable to non-wet lands. In order to achieve the objective described, different configurations for the MFC will be tested and adapted regarding to predominant plant species, soil pH, temperature, average humidity, organic matter and mineral salt composition. New electrode materials (combinations of polymers, metals, carbon) and surface treatments (i.e. doping with catalysts, new 2D materials, and functionalization with bacteria for on-demand activation) will be developed to improve their performance. Energy harvesting and storage will be established by considering low power harvesting technologies like tunnel FET and supercapacitors. **DS8 aims at collecting all the experimental data gathered during these activities.**
References	[1] Uria, N.; Costa, R.D.; Nunziata, C.; Santiago, S.; Guirado, G.; Muñoz-Berbel, X.; Kowalski, L. Self-contained and integral microbial fuel cells as portable and sustainable energy sources for low-power field devices. 2021. Submitted to Environmental Technology and Innovation (Under Review) [2] Paper in preparation

DS8's contents	o [Phragmites_australis]-Aerenchyma_formation_after_PMFC (jpg format) – Demonstration of aerenchyma formation marked with (*) in *Phragmites australis* roots after PMFC experiment.
	o [Sporobolus_indicus]-Aerenchyma_formation_after_PMFC (jpg format) – Demonstration of aerenchyma formation marked with (*) in *Sporobolus indicus* roots after PMFC experiment.
	o [PMFC_experiment]-ANOVA (xlsx format) – Statistic analysis of *Sporobolus indicus* (SI) and *Phragmites australis* (PA) data from PMFC experiment.
	o [PMFC_experiment]-Linear_Sweep_Voltammetry (xlsx format) – Measurements of the Linear Sweep Voltammetry (LSV) values on *Sporobolus indicus* (SI) and *Phragmites australis* (PA) during PMFC experiment.
	o [PMFC_experiment]-Voltage (xlsx format) – Measurements of voltage values on *Sporobolus indicus* (SI) and *Phragmites australis* (PA) during PMFC experiment.
	(PMFC: PlantMicrobialFuelCell)
	
	• **Energy Production (zip file)**
	    o [Linear Sweep Voltammetry_Arduino]-Measurements_October2020_device1 (xlsx format) – Continuous measurements of the Linear Sweep Voltammetry values on sample #1 bioreactor device through Arduino.
	    o [Linear Sweep Voltammetry_Arduino]-Measurements_October2020_device2 (xlsx format) – Continuous measurements of the Linear Sweep Voltammetry values on sample #2 bioreactor device through Arduino.
	    o [Linear Sweep Voltammetry_Arduino]-Measurements_October2020_device3 (xlsx format) – Continuous measurements of the Linear Sweep Voltammetry values on sample #3 bioreactor device through Arduino.
	    o [Linear Sweep Voltammetry_Arduino]-Comparison_October2020 (xlsx format) – Comparison and value adjustement on Linear Sweep Voltammetry previous measurements.

	o [Linear Sweep Voltammetry_DropSens]-Measurements_October2020_alldevices (xlsx format) – Weekly study of the Linear Sweep Voltammetry estabilized values through DropSens potentiostat. o [Linear Sweep Voltammetry_Arduino]-Measurements_January2021_device1 (xlsx format) – Continuous measurements of the Linear Sweep Voltammetry values on sample #1 bioreactor device through Arduino. o [Linear Sweep Voltammetry_Arduino]-Measurements_January2021_device2 (xlsx format) – Continuous measurements of the Linear Sweep Voltammetry values on sample #2 bioreactor device through Arduino. o [Linear Sweep Voltammetry_Arduino]-Measurements_January2021_device3 (xlsx format) – Continuous measurements of the Linear Sweep Voltammetry values on sample #3 bioreactor device through Arduino. o [Linear Sweep Voltammetry_Arduino]-Comparison_January2021 (xlsx format) – Comparison and value adjustement on Linear Sweep Voltammetry previous measurements. o [Linear Sweep Voltammetry_DropSens]-Measurements_January2021_device1 (xlsx format) – Weekly study of the Linear Sweep Voltammetry estabilized values on sample #1 bioreactor through DropSens potentiostat. o [Linear Sweep Voltammetry_DropSens]-Measurements_January2021_device2 (xlsx format) – Weekly study of the Linear Sweep Voltammetry estabilized values on sample #2 bioreactor through DropSens potentiostat. o [Linear Sweep Voltammetry_DropSens]-Measurements_January2021_device3 (xlsx format) – Weekly study of the Linear Sweep Voltammetry estabilized values on sample #3 bioreactor through DropSens potentiostat.