Summer 2022 cryptic N fix metadata

0\_data:

* contains folders for either climate experiment (ClimExp) or field measurements (actualNfix) raw data
* In each of those folders there are excel files containing the raw excel sheet used to record the sample name and 1.5s peak area on our labs GC – Shimadzu Gas Chromatograph with FID. There will also be data sheets contain the raw data for our sample dry masses (drymasses)
  + The peak area is then converted to ppm using equations from 4-point standard curves shown in the raw data files
* In the raw data folder there is also I flux calculation spreadsheets (flux\_calcs or some derivative). These spreadsheets are still considered raw as I just copied and pasted the raw values from the GC data sheets into the flux\_clalc spreadsheets, along with the dry mass raw data, to then calculate fluxes in excel. In some cases R was used to organize raw data and those “cleaned” or “tidy” files are also contained in the raw data folders. If not, the data was organized and cleaned in excel and is included in a separate “for R” sheet used to import to R for analysis.

For Climate experiment samples:

round: 1 = June climate experiment which included all five niches however methodology was slightly different. Samples were wet collected in late May and either dried down or wet up to achieve a moisture gradient. This experiment was deemed unsuccessful for the soil, litter and wood niches due to very little N fix activity detected and very high variability among active N fix rates.

2 = We decided to repeat the experiment with just the soil, litter and wood niches and increase or sample size to accommodate anticipate high degrees of variability. These samples were collected in august, at which point they were very dry, and thus we wet each sample up assuming their field collected moisture content was 0. This experiment was then conducted in August back in Missoula at UM’s ECOR facility. This is why the excel sheets are named “August\_clim\_experiment”.

niche: The sampled cryptic N fixing niches:

Wood (deadwood CWD class 4 and 5)

Soil (upper 2cm mineral soil)

Litter (Oi horizon, with occasional Oe mixed in – dependent on plot)

Moss (includes a variety of moss crust species collected from forest floor or downed wood) – Species is not included in first climate experiment for mosses

Lichen (includes a variety of lichen crust species collected from forest floor) – species not included in first climate experiment for lichen

temp: degrees C of incubation temperature –24hr pre-incubation at the same temp

moist\_level: The intended moisture level for that temperature level. \* Different from actual moisture content

sample\_no: that specific sample’s number. For June experiment, 6 samples (6th sample is a sample-only blank) per niche per treatment therefore 5 active samples. For August climate experiment, 10 samples (10th sample is a sample-only blank), therefore 9 active samples per niche per treatment.

dry\_mass: that sample’s dry mass in grams as determined by weighing after 48 hours of oven drying at 65 C or 105 C (mineral soil samples).

actual\_moist: actual moisture content in percent of sample determined after experiment by calculating ((wet mass- oven dry mass)/oven dry mass)\*100

ppm: parts per million of C2H4 produced during incubation period as measured by gas chromatograph

blank\_corr: ppm corrected for sample-only and C2H2-only blanks (raw ppm – average sample-only and C2H2 only blank for that niche and for that C2H2 bag letter – A, B, C etc…)

headspace vol = volume of headspace in **Liters** of incubation tube (incubation tubes are 50ml in volume). Used for ppm to C2H4 conversion using ideal gas law

pressure: constant atmospheric pressure for incubations (0.99)

vol analyte: the volume in liters of C2H4 analyzed by GC as calculated by dividing the blank corrected ppm by 1 million then multiplying by incubation tube headspace.

mols analyte: mols of C2H4 as calculated by PV = nRT using analyte volume, pressure, ideal gas constant of 0.0825 and standard temperature of 276.483 K

nanomoles analyte: mole of C2H4 converted to nanomols.

hrs of incubation: the duration of ARA incubation rounded to the nearest 0.25 hrs.

flux (nmol/g/hr): flux of C2H4 produced per gram dry mass per hour based on mols produced over entire incubation period divided by incubation duration and dry mass of sample.

flux (mol N/g/hr): using the value above and assuming a 3 C2H4: 1 N molar ratio, this column represents the molar production rate of N

flux (gram N/g/hr): represents the same value as above just converted to grams of N using N’s molar mass of 14.0067 g/mol.