NACHO Data Report for bulk δ^{13}C and δ^{15}N

LABORATORY

UW Facility for Compound-Specific Isotope Analysis of Environmental Samples (known informally a NACHO)
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METHOD

Your solid samples were analyzed for bulk δ^{13}C and δ^{15}N on a ThermoFinnigan Delta V with a Carlo Erba elemental analyzer in continuous flow mode following the general method of Fry et al. 1992. Automated analysis system for coupled d13C and d15N measurements. Analytical Chemistry 64, 288-291.

ANALYSIS

Date of Analysis (YYYY-MM-DD): 2024-03-25
Processed data folder file path: /Users/gracehenry/Documents/GitHub/CSIA_lab_work/data/EA results/processed/03:25:2024/
Run type: bulk C and N
Run comments: NA

REFERENCE MATERIALS

All internationally recognized reference material accepted values can be found at the CIAAW. Typically we use IsoLab working standards GA1, GA2, and Bristol Bay Sockeye (salmon) on NACHO. You can find information about these standards on the IsoLab web page. Below are data specific to this run:

Table 1: Lab reference materials used in this run and their accepted values.

group	d13C_VPDB	d15N_air	mass.percent.C	mass.percent.N
GA1	-28.3	-4.6	40.8	9.5
GA2	-13.7	-5.7	40.8	9.5
SALMON	-21.3	11.3	45.7	11.8

Table 2: Mean measured d13C and d15N of working standards both raw and adjusted to international standards.

group	d13C_raw	d15N_raw	d13C_VPDB	d15N_air
GA1	-16.8	-4.3	-28.3	-4.6
GA2	-1.5	-5.4	-13.7	-5.7
SALMON	-9.4	11.7	-21.3	11.3

Table 3: Linear calibration curve coefficents used for this run (y=mx + b).

Value	Intercept	Slope
d13C	-12.2393	0.9569
d15N	-0.3080	0.9945
mass.percent C	0.2191	-0.0004
mass.percent N	0.0499	-0.0002

Table 4: Accuracy and precision of standards for this run.

Value	Precision	Accuracy
d13C_VPDB	0.28	0.03
d15N_air	0.04	-0.03
mass.percent.C	9.48	-3.18
mass.percent.N	1.62	-0.51

ZEROS & BLANKS

Blanks are empty tins while zeros are no tin or sample. The table below, if given, contains the data for blanks and zeros from this run. No table indicates blanks and zeros were not measurable. A blank correction has not been implemented in the script.

Table 5: Blank data.

	Analysis	Row	Identifier.1	Comment	Amount	unique.ID	Area.44	d.13C.12C	Area.28	d.15N.14N
46	47377	48	BLANK	BLANK	0	BLANK_47377	1.489	-21.139	NA	NA

MASS EFFECTS

Your data were analysed for effects of sample mass on peak area and isotopic ratios. Ideally, there should be a strong linear response of mass C (or N) in the standard on peak area 44 (or 28) and no effect of peak area on δ^{13}C or δ^{15}N.

Table 6: Linear model coefficients of mass effects.

Model	Intercept	Slope
d13C.vs.Area44	-1.1720	-0.0792
d15N.vs.Area28	-5.1732	0.0060
MassC.vs.Area44	0.2191	-0.0004
MassN.vs.Area28	0.0499	-0.0002

SAMPLE MASS CHECK

Any samples listed below are 30% below the target mass nitrogen and/or carbon. Samples at or below 30% of the target amount of nitrogen and/or carbon are highly suspect and should be reanalyzed.

Analysis	Unique.ID
C	GLU_9_47337, GLU_10_47338, PHE_1_47339, PHE_2_47340, PHE_3_47341, PHE_4_47342, PHE_5_47343, PHE_6_47344, PHE_7_47345, PHE_8_47349, PHE_9_47350, PHE_10_47351, VAL_1_47352, VAL_2_47353, VAL_3_47354, VAL_4_47355, VAL_5_47356, VAL_6_47357, VAL_7_47358, VAL_8_47363, VAL_9_47364, VAL_10_47365, 22_W_03_a_47366, 22_W_03_b_47367, 22_W_03_c_47368, 22_W_03_d_47369, 22_W_03_e_47370
N	GLU_9_47337, GLU_10_47338, PHE_1_47339, PHE_2_47340, PHE_3_47341, PHE_4_47342, PHE_5_47343, PHE_6_47344, PHE_7_47345, PHE_8_47349, PHE_9_47350, PHE_10_47351, VAL_1_47352, VAL_2_47353, VAL_3_47354, VAL_4_47355, VAL_5_47356, VAL_6_47357, VAL_7_47358, VAL_8_47363, VAL_9_47364, VAL_10_47365, 22_W_03_a_47366, 22_W_03_b_47367, 22_W_03_c_47368, 22_W_03_d_47369, 22_W_03_e_47370

Any samples listed below are 50% below the target mass for nitrogen. δ^{15}N is suspect. Consider reanalyzing the sample.

unique.ID

Any samples listed below are 300% above the target mass for carbon. $\delta^{13}C$ is suspect. Consider reanalyzing the sample.

unique.ID
GLU_9_47337
GLU_10_47338
PHE_1_47339
PHE_2_47340
PHE_3_47341
PHE_4_47342
PHE_5_47343
PHE_6_47344
PHE_7_47345
PHE_8_47349
PHE_9_47350
PHE_10_47351
VAL_1_47352
VAL_2_47353
VAL_3_47354
VAL_4_47355
VAL_5_47356
VAL_6_47357
VAL_7_47358
VAL_8_47363
VAL_9_47364
VAL_10_47365
22_W_03_a_47366
22_W_03_b_47367
22_W_03_c_47368
22_W_03_d_47369
22_W_03_e_47370

SAMPLE DATA

Below is a short summary of your sample data. A more complete data set has been saved as a .csv file in your chosen processed data folder.

Table 10: Sample Data

Identifier.1	d.13C.12C.VPDB	d.15N.14N.air	mass.percent.C	mass.percent.N
GLU_9	-29.22	-2.87	37.48	8.74
GLU_10	-28.95	-2.99	39.49	9.20
PHE_1	-12.72	2.40	33.76	9.29
PHE_2	-12.59	2.38	33.76	9.24
PHE_3	-12.49	2.73	32.63	9.00
PHE_4	-12.74	2.67	32.78	9.04
PHE_5	-12.75	2.65	34.61	9.46

Identifier.1	d.13C.12C.VPDB	d.15N.14N.air	mass.percent.C	mass.percent.N
PHE_6	-12.68	2.78	34.82	9.51
PHE_7	-11.46	2.55	34.92	9.57
PHE_8	-9.34	2.62	33.94	9.31
PHE_9	-13.37	2.68	34.00	9.37
PHE_10	-12.37	2.75	34.65	9.49
VAL_1	-12.81	0.48	35.94	8.46
VAL_2	-13.93	0.40	36.12	8.56
VAL_3	-12.58	0.64	36.92	8.67
VAL_4	-12.83	0.61	36.66	8.63
VAL_5	-12.84	0.47	36.59	8.62
VAL_6	-11.84	0.46	38.64	9.09
VAL_7	-13.70	0.46	39.83	9.29
VAL_8	-12.80	0.48	38.40	9.03
VAL_9	-12.59	0.69	38.34	9.02
VAL_10	-12.90	0.62	37.94	8.91
22_W_03_a	-17.50	11.55	27.46	5.71
22_W_03_b	-11.75	11.30	30.68	6.51
22_W_03_c	-17.28	10.21	56.68	12.55
22_W_03_d	-16.67	11.88	33.06	7.04
22_W_03_e	-17.50	11.43	27.47	5.66

DATA REDUCTION DETAILS

```
##
##
## |                       |            |
## |:----------------------|:-----------|
## |File rendered on:      |10 Apr 2024 |
## |R version:             |4.3.2       |
## |HEEL package version: |1.0.0       |
```