

Correction to “Consistent fractionation of ¹³C in nature and in the laboratory: Growth-rate effects in some haptophyte algae” by R. R. Bidigare et al.

In the paper “Consistent fractionation of ¹³C in nature and in the laboratory: Growth-rate effects in some haptophyte algae” by Robert R. Bidigare, Arnim Fluegge, Katherine H. Freeman, Kristi L. Hanson, John M. Hayes, David Hollander, John P. Jasper, Linda L. King, Edward A. Laws, Jeffrey Milder, Frank J. Millero, Richard Pancost, Brian N. Popp, Paul A. Steinberg, and Stuart G. Wakeham (*Global Biogeochemical Cycles*, 11(2), 279-292, 1997), in which our colleagues recently reviewed the data used by

Bidigare et al. [1997], errors were found in Table 1 (ΣCO_2 and alkalinity) and Table 3 ($\delta_{37:2}$). The error in Table 1 was typographical and did not affect the calculation of C_e which appears in Table 3 and is used in Figure 2. The error in Table 3 resulted in changes in ϵ_p , μ , and b for six of the 48 points listed.

As shown in the revised Figure 2a, the recalculated values of b for the Santa Monica Basin fall above those observed for most other localities. This offset might be related to one or more of the

Table 1. Natural Populations and Pertinent Environmental Conditions

Sample	Field Designation	Date	d, m	T, °C	ΣCO_2 , $\mu\text{mol kg}^{-1}$	Alk, $\mu\text{eq kg}^{-1}$	Salinity	δ_{DIC} , ‰	PO_4 , μM	Si(OH)_4 , μM	NO_3+NO_2 , μM
<i>Bermuda Atlantic Time-series Study Site, 31°50'N 64°10'W</i>											
31	38	Nov. 12, 1991	5	23.4	2023	2389	36.58	1.53	0.0	0.58	0.0
32	39	Dec. 10, 1991	5	22.7	2035	2402	36.78	1.50	0.0	0.71	0.0
33	41	Feb. 12, 1992	5	19.3	2058	2394	36.68	1.41	0.0	0.82	0.5
34	42	March 10, 1992	5	19.8	2053	2394	36.66	1.40	0.1	0.68	0.0
35	43	April 21, 1992	5	20.1	2064	2401	36.77	1.40	0.0	0.64	0.0
36	45	June 17, 1992	5	23.3	2040	2378	36.46	1.45	0.0	0.57	0.0
37	46	July 14, 1992	5	26.6	2033	2374	36.37	1.49	0.0	0.73	0.0
38	47	Aug. 18, 1992	5	28.1	2024	2379	36.44	1.51	0.1	0.69	0.0
39	48	Sept. 15, 1992	5	26.8	2012	2369	36.28	1.56	0.0	0.72	0.0

Table 3. Isotopic Fractionation Imposed by Natural Populations of Alkenone-Producing Haptophytes and Calculated Growth Rates

N	δ_e , ‰	$\delta_{37:2}$, ‰	C_e , $\mu\text{mol kg}^{-1}$	ϵ_p , ^a ‰	t_p , ^b hour	μ , ^c d^{-1}	b , ^d ‰ $\mu\text{mol kg}^{-1}$
<i>Santa Monica Basin, 38 km Offshore Southern California</i>							
17	-8.23	-26.5	15.24	14.60	12.0	0.5	159
18	-7.85	-24.4	17.22	12.81	12.0	0.6	210
19	-7.44	-26.0	13.60	14.89	12.0	0.4	137
20	-8.14	-24.6	15.99	12.72	11.9	0.6	196
21	-7.49	-25.1	14.09	13.91	11.9	0.5	156
22	-7.41	-22.8	16.50	11.60	11.9	0.6	221

^aValues of ϵ_p for natural populations are based on $\delta_{37:2}$ and δ_e assuming a depletion in ¹³C relative to carbon biomass of 4‰.

^bDay length or photoperiod.

^cGrowth rate calculated using equations (1) and (2).

^d $b = (25 - \epsilon_p)C_e$; see text.

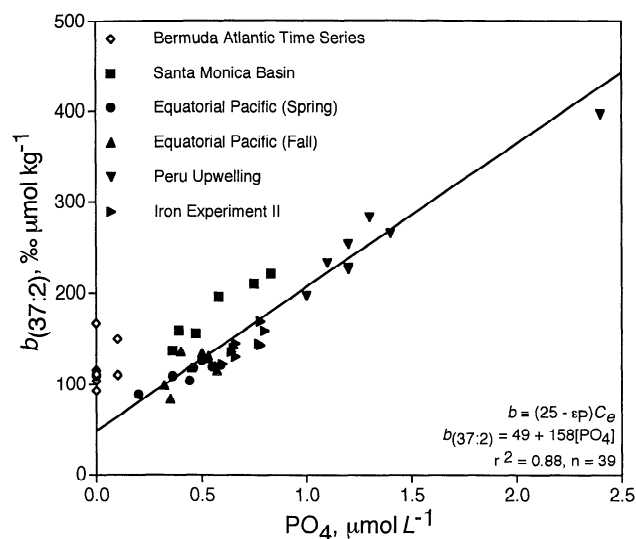


Figure 2a. Relationship between b and phosphate concentration. Data are summarized numerically in Tables 1 and 3. The line and equation represent the results of a geometric mean regression analysis (reduced major axis) and include only the data obtained for samples collected in the Pacific Ocean; that is, they do not include samples from the Bermuda Atlantic Time-series Study site.

micronutrient controls discussed in the closing paragraphs of *Bidigare et al.* [1997], but there is no explicit evidence for that, and recent work has shown that b varies in response to cellular geometry as well as rate of microalgal growth [Popp *et al.*, 1998]. Further information may allow dissection of these factors. For the moment, we note that (1) the slope and intercept defined by the new reduced major axis regression are not statistically different from those initially reported and (2) the basic interpretations and conclusion of the original paper are therefore unchanged.

References

- Bidigare R.R., A. Fluegge, K.H. Freeman, K.L. Hanson, J.M. Hayes, D. Hollander, J.P. Jasper, L.L. King, E.A. Laws, J. Milder, F.J. Millero, R. Pancost, B.N. Popp, P.A. Steinberg, and S.G. Wakeham, Consistent fractionation of ^{13}C in nature and in the laboratory: Growth-rate effects in some haptophyte algae, *Global Biogeochem. Cycles*, *11*, 279-292, 1997.
- Popp, B.N., E.A. Laws, R.R. Bidigare, J.E. Dore, K.L. Hanson, and S.G. Wakeham, Effect of phytoplankton cell geometry on carbon isotopic fractionation, *Geochim. Cosmochim. Acta*, *62*, 69-77, 1998.

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