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*Supplement of*

## **Physiology regulates the relationship between coccosphere geometry and growth phase in coccolithophores**

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**Table S1.** Growth phase experiment days (D), mean exponential growth rates ( $\mu$ ) and summary statistics for species-specific coccosphere geometry data for exponential-phase days of growth (Exp) and non-exponential-phase days of growth (Non-exp). Minimum, mean and maximum PIC (particulate inorganic carbon) calculated for selected exponential- and non-exponential-phase days from the 22 °C experiment are shown, which were used for the calculations reported in Sect. 4.4 and displayed in Fig. 5. The full dataset of experimental conditions, daily growth rates and coccosphere geometry measurements from each individual coccosphere is available as Sheward et al. (2016) at <https://doi.pangaea.de/doi:10.1594/PANGAEA.865403>.

Parameter	<i>Helicosphaera carteri</i>		<i>Calcidiscus leptoporus</i>		<i>Calcidiscus quadriperforatus</i>		<i>Coccolithus braarudii</i>		
	Exp	Non-exp	Exp	Non-exp	Exp	Non-exp	Exp	Non-exp	
Number of values	780	210	870	150	690	150	250	50	
Experiment days, D	22 °C	≤ D11	D12-14	≤ D15	D16-23	≤ D11	D12-15	-	-
	20 °C	≤ D7	D8	≤ D11	D12-13	≤ D11	D12-13	-	-
	18 °C	≤ D15	D16-17	≤ D17	D18-19	≤ D15	D16-17	-	-
	16 °C	≤ D13	D14-17	≤ D18	-	≤ D16	D17-18	-	-
	15 °C	-	-	-	-	-	-	≤ D10	D11-15
Mean growth rates, $\mu$ d <sup>-1</sup>	22 °C	0.35	-	0.34	-	0.44	-	-	-
	20 °C	0.45	-	0.44	-	0.43	-	-	-
	18 °C	0.28	-	0.32	-	0.33	-	-	-
	16 °C	0.28	-	0.36	-	0.30	-	-	-
	15 °C	-	-	-	-	-	-	0.68	-
Coccosphere diameter, $\emptyset$ $\mu$ m	Min	9.35	11.64	10.02	10.79	13.84	15.28	15.18	16.13
	Mean	14.88	15.52	13.15	14.02	18.44	19.09	20.80	22.14
	Max	20.90	19.50	19.72	17.28	24.39	22.99	29.14	29.42
Cell diameter, $\emptyset$ $\mu$ m	Min	6.53	9.26	6.39	7.09	8.64	10.42	11.24	12.48
	Mean	10.18	10.56	9.78	10.44	13.54	14.55	16.51	17.99
	Max	17.99	16.68	16.54	13.96	18.81	18.77	24.10	22.44
Coccolith length, $C_L$ $\mu$ m	Min	6.70	7.05	5.02	5.39	5.67	7.40	8.13	7.92
	Mean	8.05	8.17	6.70	6.80	9.08	9.18	11.73	11.43
	Max	11.22	10.89	8.76	8.61	11.67	10.87	15.33	13.84
Coccoliths per cell, $C_N$ $\mu$ m	Min	6	8	10	11	8	12	5	8
	Mean	15	17	19	21	18	20	10	13
	Max	30	25	45	35	29	28	20	20
22 °C experiment days incl.	D6, 7, 8	D11-14	D7, 9, 11	D19, 20, 21	D3, 5, 7	D13, 15	≤ D11	D12-15	
PIC pmol C cell <sup>-1</sup>	Min	7.79	13.44	3.27	4.06	15.06	17.16	6.97	7.25
	Mean	25.79	28.68	10.91	15.76	29.31	31.91	27.90	33.80
	Max	49.38	50.52	25.34	29.54	57.88	54.34	70.09	85.82
Reference	This study		This study		This study		Gibbs et al. (2013); Sheward et al. (2014)		