Supplementary Material

Table S1. Maximum cellular domoic acid (DA), mean cellular DA during the exponential and stationary phases, mean extracellular DA; for *P. multiseries* CCL70 and *P. australis* PNC1 grown on nitrate, ammonium, urea, arginine, glutamine, glutamate and taurine (the latter for *P. australis* only); nd = not detectable; $n = 2 \pm$ SE. ** We did not detect DA in the *P. multiseries* culture medium, in any of our treatments. It cannot be excluded that a methodological failure occurred during preservation of the vials containing dissolved DA, because extracellular DA has been reported in all previous studies on toxigenic *P. multiseries*.

	***P. multiseries* CCL70**			
	Maximum DA ($pg \cdot Cell^{-1}$)	**Mean DA Exponential Phase ($pg \cdot Cell^{-1}$)**	**Mean DA Stationary Phase ($pg \cdot Cell^{-1}$)**	**Mean DA Extracellular ****
Nitrate	2.03 ± 0.64	0.07 ± 0.04	1.39 ± 0.55	nd
Urea	2.53 ± 0.25	$0.03 \pm 3 \times 10^{-5}$	2.18 ± 0.09	nd
Ammonium	0.30 ± 0.04	0.24 ± 0.03	0.14 ± 0.01	nd
Arginine	0.87 ± 0.12	0.006 ± 0.01	0.49 ± 0.01	nd
Glutamine	0.60 ± 0.01	0.003 ± 0.005	0.22 ± 0.02	nd
Glutamate	nd	nd	nd	nd
	***P. australis* PNC1**			
	Maximum DA ($fg \cdot Cell^{-1}$)	**Mean DA Exponential Phase ($fg \cdot Cell^{-1}$)**	**Mean DA Stationary Phase ($fg \cdot Cell^{-1}$)**	**Mean DA Extracellular $ng \cdot mL^{-1}$**
Nitrate	37.1 ± 12.7	2.4 ± 0.1	12.3 ± 3.3	6.7 ± 2.7
Urea	24.8 ± 5.9	2.3 ± 0.1	7.9 ± 0.2	15.5 ± 0.7
Ammonium	43.9 ± 2.3	13.4 ± 0.6	19.5 ± 1.9	15.4 ± 0.6
Arginine	nd	nd	nd	nd
Glutamine	nd	nd	nd	nd
Glutamate	79.0 ± 6.4	12.4 ± 0.2	22.6 ± 3.8	20.1
Taurine	nd	nd	nd	nd

Table S2. Specific growth rate, biomass in stationary phase and domoic acid (DA) content of *P. multiseries* and *P. australis* growing in batch culture with different nitrogen sources; GLN = glutamine; GLU = glutamate; na = not determined; nd = not detected.

Species	Strain (Origin)	N Source (µM-N)		Irradiance (µmol Photons $m^{-2} \cdot s^{-1}$)	Specific Growth Rate (d^{-1})	Biomass in Stationary Phase (10^3 Cells mL^{-1})	DA Content ($Cell^{-1}$)	Reference
P. multiseries	NPARL (Canada)	NO_3	880 [a]	40		129	0.2–10 pg	Bates *et al.* (1989) [1]
			880 [a]	100		30–205	0.04–21 pg	
			880 [a]	140		36	0.2–0.9 pg	
			880 [a]	165		129	1.3–18 pg	
		NO_3	50	100		90	0.4 pg	Bates *et al.* (1991) [2]
			1000	100		256	9.6 pg	
		NO_3	55	100		100 [b]	0.30 pg [b]	Bates *et al.* (1993) [3]
			110	100		160 [b]	1 pg [b]	
			220	100		240 [b]	1.4 pg [b]	
			440	100		180 [b]	1.7 pg [b]	
			440	100		300 [c]	0.6–4.2 pg [c]	
		NH_4	55	100		100 [b]	0.3 pg [b]	
			110	100		160 [b]	1 pg [b]	
			220	100		180 [b]	3.7 pg [b]	
			440	100		130 [b]	5 pg [b]	
			440	100		30 [c]	0.6–8.5 pg [c]	
	TKA-2 (USA)	NO_3	880 [a]	100	0.65	150 [d]	2 pg [e]	Douglas & Bates (1992) [4]
		NO_3	220	100		166		Bates *et al.* (1993) [3]
			440	100		203		
			880	100		195		
		NH_4	220	100		123		
			440	100		30		
			880	100		1		
	MD-1 (USA)	NO_3	220	100		246		Bates *et al.* (1993) [3]
			440	100		261		
			880	100		265		
		NH_4	220	100		178		
			440	100		82		
			880	100		1		

Table S2. *Cont.*

	KP 84 (Canada)	NO_3	200	230	0.42–0.55	na	na	Hillebrand & Sommer (1996) [5]
			200	25	0.42–0.66		na	
		Urea	200	25	0.38–0.60		na	
		NH_4	300	230	nd		na	
			300	25	0.33–0.36		na	
		GLN	200	25	0.65–0.83		na	
	NPBIO (Canada)	NO_3	1,760 [f]	410	0.20–0.25	140–150	144–432 fg	Pan *et al*. (1996) [6]
	CLN-1 (Canada)	GLU	28.10^3	100		733	0.067 pg	Lyons (2002) [7]
	Mu411P (USA)	NO_3	880 [a]	100			0.1–15 pg	Kudela (2003) [8]
P. multiseries	CL-195 (Canada)	NO_3	880 [g]	100			0.7 pg [e]	Lundholm *et al.* (2004) [9]
	OKPm013-2 (Japan)	NO_3	880 [g]	100			1.15 pg [e]	Lundholm *et al.* (2004) [9]
		NO_3	880 [a]	200			1.9–140 pg	Trimborn *et al.* (2007) [10]
	CCL70 (UK)	NO_3	440		0.56		3.16 pg [e]	Calu *et al.* (2009) [11]
		Urea	440		0.67		5.17 pg [e]	
	CLN-47 (Canada)	NO_3	88	150/200	0.65		362 fg	Thessen *et al.* (2009) [12]
		NH_4	88	150/200	0.61		48 fg	
		Urea	88	150/200	0.68		24 fg	
	Pn-1 (USA)	NO_3	88	150/200	0.76		1250 fg	Thessen *et al.* (2009) [12]
		NH_4	88	150/200	0.76		406 fg	
		Urea	88	150/200	0.30		1807 fg	

Table S2. *Cont.*

	DOMA-1 (USA)	NO_3	54	22	0.8	20	12 pg [e]	Garrison *et al.* (1992) [13]
	DOMA-2 (USA)	NO_3	54	32	0.82	20	37 pg [e]	Garrison *et al.* (1992) [13]
	WW4 (Ireland)	NO_3	880 [a]	115	0.73–0.94	73–97	0.24–26 pg	Cuzak (2002) [14]
	PLY1St.19A (UK)	NO_3	880 [a]	100		172	0.15 pg	Fehling *et al.* (2004) [15]
	PLY1St.54B (UK)	NO_3	880 [a]	100		129	1.68 pg	Fehling *et al.* (2004) [15]
P. australis	AU221-a (USA)	NO_3	50	100	0.89		0.48 fg	Howard *et al* (2007) [16]
		NH_4	50	100	0.93		0.26 fg	
		Urea	50	100	0.52		1.37 fg	
	PA2 (Chile)	NO_3	880 [a]	100–140			0.04 pg	Àlvarez *et al.* (2009) [17]
	PA3 (Chile)	NO_3	880 [a]	100–140			0.05 pg	Àlvarez *et al.* (2009) [17]
	PA4 (Chile)	NO_3	880 [a]	100–140			1.74 pg	Àlvarez *et al.* (2009) [17]
	BTS-1 (Mexico)	NO_3	880 [g]	200			0.11–3 pg	Santiago *et al.* (2011) [18]
	PNaus45 (France)	NO_3	440 [h]	35–400	0.47–0.83		0.5–0.7 pg	Thorel *et al.* (2014) [19] [i]

[a] = F/2 medium; [b,c] = recalculated values from Figures 2 and 3, respectively (Bates *et al*., 1993) [3]; [d] = recalculated value from Figure 1A (Douglas and Bates, 1992) [4]; [e] = maximum value; [f] = F medium; [g] = L1 medium; [h] = K/2 medium; [i] = data from semi-continuous culture.

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