

**A comprehensive insights into Functional profiles of free-living microbial community responses to a toxic *Akashiwo sanguinea* bloom**

Caiyun Yang<sup>1,2†</sup>, Yi Li<sup>2,3†</sup>, Yanyan Zhou<sup>2</sup>, Xueqian Lei<sup>2</sup>, Wei Zheng<sup>2</sup>, Yun Tian<sup>2</sup>, Joy D. Van Nostrand<sup>4</sup>, Liyou Wu<sup>4</sup>, Zhili He<sup>4</sup>, Jizhong Zhou<sup>4,5,6\*</sup>, Tianling Zheng<sup>2\*</sup>

**Table S1** (Yang *et al.*, 2015) Properties of samples during the *Akashiwo sanguinea* bloom in 2011 (Only the samples for comparison (bloom vs. control) are shown)

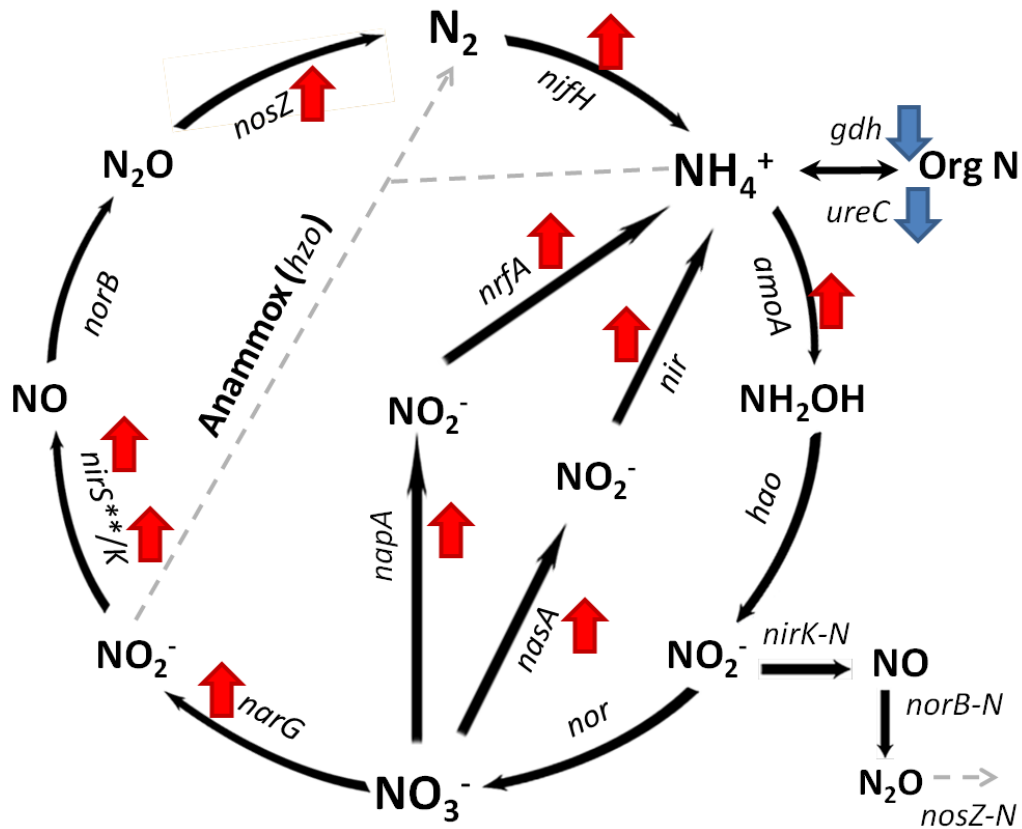
Samples	T	Sal	pH	SP	DO	NO <sub>2</sub> <sup>-</sup>	NO <sub>3</sub> <sup>-</sup>	NH <sub>4</sub> <sup>+</sup>	DIN	DIP	N/P	SiO <sub>4</sub> <sup>-</sup>	COD	CHLa	EI	BACT	<i>A. sa</i>	TALG
A1-1	31	24	7.99	2.8	5.25	0.032	0.186	0.009	0.227	0.021	11	0.87	4.66	67.91	4.84	4.60×10 <sup>11</sup>	1.08×10 <sup>5</sup>	1.32×10 <sup>5</sup>
A1-2	31	26	7.97	19.0	4.66	0.029	0.194	0.009	0.232	0.032	7.33	0.84	2.04	51.9	3.32	4.11×10 <sup>11</sup>	2.05×10 <sup>5</sup>	2.36×10 <sup>5</sup>
A1-3	30.8	28	7.89	15.5	4.57	0.030	0.355	--	--	0.026	--	0.95	2.95	23.32	--	9.96×10 <sup>11</sup>	1.55×10 <sup>5</sup>	1.84×10 <sup>5</sup>
A1-4	30	29	7.87	14.2	4.46	0.030	0.296	0.028	0.354	0.020	18.03	0.90	2.01	33.09	3.09	3.11×10 <sup>11</sup>	0.81×10 <sup>5</sup>	0.99×10 <sup>5</sup>
A1-5	30.5	25	7.84	13.8	3.9	0.013	0.117	0.018	0.147	0.010	15.38	0.57	1.89	52.97	0.59	2.86×10 <sup>11</sup>	1.70×10 <sup>5</sup>	1.89×10 <sup>5</sup>
A1-8	31	30	7.82	10.1	3.51	0.026	0.255	0.078	0.359	0.027	13.20	1.02	1.38	21.3	3.00	--	0.10×10 <sup>5</sup>	0.37×10 <sup>5</sup>
H1-1	31	24	7.89	13.6	6.17	0.043	0.183	0.002	0.228	0.012	18.96	0.79	1.45	38.65	0.88	1.77×10 <sup>11</sup>	0.18×10 <sup>5</sup>	0.41×10 <sup>5</sup>
H1-2	31	24	7.87	10.6	--	0.027	0.213	0.026	0.266	0.013	20.87	0.56	0.97	28.13	0.74	1.00×10 <sup>11</sup>	0.08×10 <sup>5</sup>	0.18×10 <sup>5</sup>
H1-3	31	25	7.84	10.4	3.65	0.023	0.186	0.031	0.2393	0.024	10.06	0.68	1.26	31.31	1.59	0.75×10 <sup>11</sup>	0.22×10 <sup>5</sup>	0.35×10 <sup>5</sup>
H1-4	30.5	29	7.78	14.6	3.76	0.015	0.194	0.030	0.2385	0.012	20.24	0.79	1.36	21.58	0.85	1.23×10 <sup>11</sup>	0.63×10 <sup>5</sup>	0.76×10 <sup>5</sup>
H1-5	30.5	29	7.75	15.0	3.73	0.023	0.230	0.040	0.2927	0.009	34.02	0.94	1.04	23.14	0.58	2.38×10 <sup>11</sup>	0.08×10 <sup>5</sup>	0.14×10 <sup>5</sup>
H1-8	31.8	26	7.61	13.0	6.13	0.039	0.375	0.122	0.535	0.050	10.61	1.51	1.14	20.81	6.87	--	0.33×10 <sup>5</sup>	0.36×10 <sup>5</sup>

The sample numbers indicate time (days), 1: 31 July; 2-5: 1-4 August; 8: 7 August. T: temperature, °C; Sal: salinity,‰; SP: suspended particles, mg/L; DO: dissolved

oxygen, mg/L; NO<sub>2</sub><sup>-</sup>: nitrite nitrogen, mg/L; NO<sub>3</sub><sup>-</sup>: nitrate nitrogen, mg/L; NH<sub>4</sub><sup>+</sup>: ammonia nitrogen, mg/L; DIN: dissolved inorganic nitrogen, mg/L; DIP: dissolved

inorganic phosphorus, mg/L; N/P: ratio of dissolved inorganic nitrogen and DIP; SiO<sub>4</sub><sup>-</sup>: silicate mg/L; COD: chemical oxygen demand, mg/L; CHLa: chlorophyll *a*, ug/L; EI:

Eutrophication index; BACT: bacterial density, cells/mL; *A. sa*: *Akashiwo sanguinea* density; TALG: total algal density; --: not available.



**Figure S1** A simplified N cycle diagram with gene signal intensity changes ( $P < 0.05$ ) in the bloom compared to the control site. The red arrows indicates a signal intensity increase while blue arrows indicate a signal intensity decrease.