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Supplemental Material

Manuscript title: Exploring *Tetraselmis chui* microbiomes - functional metagenomics for novel catalases and superoxide dismutases

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Table S1: Profile hidden Markov model (HMM) search for SODs (PF00081 and PF02777) and CATs (PF00199 and PF06628) against the *Tetraselmis chui* metagenome. Taxonomic affiliation was inferred from the best BLASTp hit in NCBI's nr-database.

No.	IMG Query ID (Ga0499797_)	HMM	HMM e-value	HMM score	BlastP subject	BlastP Identity	Species assignment (BlastP subject)
A)							
1	000026_192	Sod_Fe_N	5.8E-24	88.5	WP_159642379.1	100	<i>Sphingorhabdus</i> sp. 109
TcJM_SOD2	000027_110175_110774_1	Sod_Fe_N	3.8E-28	84.1	WP_149780105.1	100	<i>Roseovarius</i> <i>litoreus</i>
3	000027_113	Sod_Fe_N	1.3E-22	84.1	WP_149780105.1	100	<i>Roseovarius</i> <i>litoreus</i>
4	000031_37	Sod_Fe_N	2.4E-25	92.9	WP_109767327.1	98	<i>Oceaniradius</i> <i>stylonematis</i>
TcIK_SOD3	000031_37060_37662_1	Sod_Fe_N	7E-31	92.9	WP_109767327.1	98	<i>Oceaniradius</i> <i>stylonematis</i>
6	000036_74	Sod_Fe_N	2.5E-22	83.2	WP_089419839.1	99.5	Roseobacteraceae bacterium
7	000038_26	Sod_Fe_N	1.2E-30	109.9	TVR83868.1	81.7	Saprospirales bacterium
8	000083_66	Sod_Fe_N	4.5E-25	92	WP_260277506.1	100	<i>Paracoccus</i> <i>maritimus</i>
9	056429_1	Sod_Fe_C	1.8E-10	44.9	KAK3246025.1	90.3	<i>Cymbomonas</i> <i>tetramitiformis</i>
B)							
1	000001_642	Catalase	1.6E-179	601.1	WP_159643319.1	100	<i>Sphingorhabdus</i> sp. 109

2	000030_55	Catalase	1.7E-173	581.3	WP_089419967.1	99.6	Roseobacteraceae bacterium
TcJM_CAT2	000030_56127_57647_1	Catalase	4.9E-179	581.3	WP_089419967.1	99.6	Roseobacteraceae bacterium
4	000173_13	Catalase	6.5E-183	612.3	WP_084354968.1	94.2	<i>Primorskyibacter flagellatus</i>
TcIK_CAT3	000173_13486_14940_1	Catalase	1.9E-188	612.3	WP_084354968.1	94.2	<i>Primorskyibacter flagellatus</i>
6	000217_8	Catalase	1.4E-180	604.6	PHQ68604.1	98.4	<i>Paracoccus</i> sp.
7	167948_1	Catalase	1.8E-78	268.5	WP_292606672.1	99.4	<i>Nocardioides</i> sp. REDSEA-S30_B4

Table S2: Statistical F-test comparison of linear models for the toxological effects on *Galleria mellonella* larvae of the tested antioxidant enzymes to a control.

Enzyme	Concentration (ng/ml)	Estimate	Std.error	Statistic	p.value
TcJM_SOD2	300	0.104	0.342	0.304	0.773
TcJM_SOD2	3,000	-0.063	0.353	-0.177	0.866
TcJM_SOD2	30,000	0.187	0.375	0.499	0.638
TcIK_SOD3	300	-0.229	0.381	-0.601	0.573
TcIK_SOD3	3,000	-0.312	0.328	-0.954	0.384
TcIK_SOD3	30,000	-0.645	0.329	-1.964	0.107
TcJM_CAT2	60	0.063	0.353	0.177	0.866
TcJM_CAT2	600	-0.77	0.486	-1.587	0.173
TcJM_CAT2	6,000	0.479	0.364	1.317	0.245
TcIK_CAT3	60	0.396	0.419	0.944	0.388
TcIK_CAT3	600	0.312	0.393	0.795	0.463
TcIK_CAT3	6,000	0.229	0.431	0.532	0.618

Movie S1: Structure comparison of predicted TcJM_SOD2 and predicted TcIK_SOD3. Yellow: TcJM_SOD2 structure prediction by AlphaFold2. Purple: TcIK_SOD3 structure prediction by AlphaFold2.

Movie S2: Structure comparison of predicted TcJM_CAT2 and predicted TcIK_CAT3. Blue: TcJM_SOD2 structure prediction by AlphaFold2. Orange: TcIK_SOD3 structure prediction by AlphaFold2.