

Supplementary Table S1. Genes related to nitrogen and phosphorus assimilation examined in this study.

Gene	ProPortal v4.0 COG	Product	Role	Reference
<i>Nitrogen Genes</i>				
<i>amtB/amt1</i>	1478	ammonium transporter protein	ammonium transport	García-Fernández et al., 2004
<i>cynA</i>	25277	cyanate ABC type transporter substrate binding protein	cyanate transport	Kamennaya et al., 2008
<i>cynB</i>	17453	cyanate ABC type transporter permease protein	cyanate transport	Kamennaya et al., 2008
<i>cynS</i>	16887	cyanate lyase	hydrolysis of cyanate to ammonium and carbon dioxide	Kamennaya et al., 2008
<i>focA</i>	10584	nitrite transporter from formate/nitrite family	nitrite transport	Rocap et al., 2003
<i>moaA</i>	8269	molybdenum cofactor biosynthesis protein A	molybdopterin biosynthesis	Martiny et al., 2009
<i>moaB</i>	9123	molybdenum cofactor biosynthesis protein B	molybdopterin biosynthesis	Martiny et al., 2009
<i>moaC</i>	12914	molybdenum cofactor biosynthesis protein C	molybdopterin biosynthesis	Martiny et al., 2009
<i>moaD</i>	7626	molybdenum cofactor biosynthesis protein D	molybdopterin biosynthesis	Martiny et al., 2009
<i>moaE</i>	20838	molybdenum cofactor biosynthesis protein E	molybdopterin biosynthesis	Martiny et al., 2009
<i>mobA</i>	7553	molybdopterin-guanine dinucleotide biosynthesis protein MobA	molybdopterin biosynthesis	Martiny et al., 2009
<i>moeA</i>	6195	molybdopterin biosynthesis protein MoeA	molybdopterin biosynthesis	Martiny et al., 2009
<i>nadB</i>	253	L-aspartate oxidase	deamination of amino acids	Tedeschi et al., 1996
<i>napA/nrtP</i>	5121	nitrate/nitrite transporter	nitrate/nitrite transport	Martiny et al., 2009b; Wang et al., 2000; Bird & Wyman, 2003
<i>narB</i>	3405	assimilatory nitrate reductase	nitrate reduction to nitrite	Martiny et al., 2009
<i>narX1</i>	12460	conserved hypothetical protein	unknown function	Martiny et al., 2009
<i>narX2</i>	30465, 26956, 33277	conserved hypothetical protein	unknown function	Martiny et al., 2009
<i>nirA</i>	5136	ferredoxin nitrite reductase	nitrite reduction to ammonium	Martiny et al., 2009
<i>nirX</i>	27176, 11823	conserved hypothetical protein	unknown function	Martiny et al., 2009
<i>thiO</i>	772	glycine oxidase	deamination of amino acids	Nishiya & Imanaka, 1998
<i>ureA</i>	1864	urease subunit alpha	hydrolysis of urea to ammonium and carbon dioxide	Palinska et al., 2000

Gene	ProPortal v4.0 COG	Product	Role	Reference
<i>Phosphorus Genes</i>				
PMM0707	30300, 31904	hypothetical protein	expressed in MED4 during phosphorus starvation	Martiny et al., 2006
PMM0715	26328	hypothetical protein	expressed in MED4 during phosphorus starvation	Martiny et al., 2006
PMM0717	32234	hypothetical protein	expressed in MED4 during phosphorus starvation	Martiny et al., 2006
PMM0719	3650	hypothetical protein	expressed in MED4 during phosphorus starvation	Martiny et al., 2006
PMM0720	28615	hypothetical protein	expressed in MED4 during phosphorus starvation	Martiny et al., 2006
PMM0721	28631	hypothetical protein	expressed in MED4 during phosphorus starvation	Martiny et al., 2006
PMM0722	2536	hypothetical protein	expressed in MED4 during phosphorus starvation	Martiny et al., 2006
<i>arsA</i>	22394	arsenite efflux pump subunit	arsenate resistance	Martiny et al., 2006
<i>arsR</i>	1361	arsenate reductase	arsenate resistance	Martiny et al., 2006
<i>carA</i>	20	carbamoyl phosphate synthetase small subunit	carbamoyl phosphate synthesis	Martiny et al., 2006
<i>carB</i>	346	carbamoyl phosphate synthetase large subunit	carbamoyl phosphate synthesis	Martiny et al., 2006
<i>chrA</i>	13381	response regulator	chromate resistance	Martiny et al., 2006
<i>gapI</i>	99	glyceraldehyde-3-phosphate dehydrogenase	expressed in MED4 during phosphorus starvation	Martiny et al., 2006
<i>mfs</i>	817	major facilitator superfamily transporter	expressed in MED4 during phosphorus starvation	Martiny et al., 2006
<i>prpB</i>	6142	phosphoenolpyruvate mutase	phosphonate biosynthesis	Yu et al., 2013
<i>phnC</i>	506	phosphonate ABC type transporter ATP binding protein	phosphonate transport	Feingersch et al., 2012; Martinez et al., 2010
<i>phnD</i>	4518	phosphonate ABC type transporter substrate binding protein	phosphonate transport	Feingersch et al., 2012; Martinez et al., 2010
<i>phoA</i>	15427, 26745	alkaline phosphatase	dephosphorylation	Martiny et al., 2006
<i>phoB</i>	204	phosphate regulon response regulator	phosphate two component regulatory system	Martiny et al., 2006
<i>phoR</i>	13582	phosphate regulon sensor histidine kinase	phosphate two component regulatory system	Martiny et al., 2006
<i>phoX</i>	26697	alkaline phosphatase	dephosphorylation	Martiny et al., 2006
<i>pstA</i>	3725	phosphate ABC type transporter permease protein	phosphate transport	Martiny et al., 2006
<i>pstB</i>	88	phosphate ABC type transporter ATP binding protein	phosphate transport	Martiny et al., 2006
<i>pstC</i>	4183, 30634	phosphate ABC type transporter permease protein	phosphate transport	Martiny et al., 2006
<i>pstS</i>	1827	phosphate ABC type transporter substrate binding protein	phosphate transport	Martiny et al., 2006
<i>ptrA</i>	37989, 6860, 11384	transcriptional regulator	stress response to phosphorus starvation	Ostrowski et al., 2010
<i>sphX</i>	25109	phosphate binding protein	phosphate transport	Mann & Scanlan, 1994

References for Supplementary Table S1:

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