Supplemental Material

hours elapsed	TSS (mg/mL)	% PHB (mg PHB/mg TSS)	cells/mL	O_2 consumed (mmol)	CH_4 consumed (mmol)	NO_3^- (mg N/mL)	% N in TSS
0.00	0.034 ± 0.005	0.02	3.5E+07 ± 4.3E+05	0.00	0.00	1.4E-01 ± 4.1E-04	8.58
6.8	0.088 ± 0.020	0.05	6.6E+07 ± 1.1E+06	0.26 ± 0.04	-0.02 ± 0.14	1.4E-01 ± 6.1E-04	7.96
12.1	0.100 ± 0.005	0.05	1.2E+08 ± 2.6E+05	0.72 ± 0.04	0.38 ± 0.16	1.3E-01 ± 3.7E-04	10.29 ± 0.02
16.1	0.207 ± 0.036	0.12	1.9E+08 ± 4.2E+05	1.19 ± 0.02	0.67 ± 0.12	1.2E-01 ± 4.2E-04	10.185 ± 0.065
17.8			2.2E+08 ± 4.1E+05	1.49 ± 0.76	0.87 ± 0.55	1.2E-01±9.3E-04	9.8
19.2	0.269 ± 0.024	0.15	2.7E+08 ± 8.1E+05	2.08 ± 0.05	1.29 ± 0.19	1.2E-01 ± 9.2E-05	10.46 ± 0.04
20.8	0.307 ± 0.050	0.18	3.1E+08 ± 7.7E+06		0.0	1.1E-01±1.5E-03	10.075 ± 0.305
22.2	0.404 ± 0.022	0.21	3.6E+08 ± 2.5E+06	2.92 ± 0.03	1.88 ± 0.16	1.0E-01 ± 1.8E-04	10.15 ± 0.17
23.8	0.442 ± 0.070	0.26	4.3E+08 ± 2.7E+06	3.52 ± 0.05	2.21 ± 0.18	9.3E-02 ± 1.2E-03	8.62 ± 0.93
24.9	0.573 ± 0.027	0.30	4.9E+08 ± 1.1E+05	4.31 ± 0.04	2.79 ± 0.18	8.3E-02 ± 8.0E-04	10.22

TABLE 1. Data describes growth of *M. parvus* OBBP under balanced growth conditions.

hours elapsed	TSS (mg/mL)	% PHB (mg PHB/mg TSS)	NO_3^- (mg N/mL)	cells/mL	fluorescence	dissolved O_2 (mg/mL)	dissolved CH_4 (mg/mL)
0.0	0.34 ± 0.06	44.7 ± 1.1	1.8E-01 ± 2.4E-02	5.9E+08 ± 5.5E+07	1.7E+04 ± 5.5E+02	18.0 ± 1.0	9.6 ± 0.9
1.3	0.40 ± 0.01	42.5 ± 1.3	1.5E-01 ± 4.1E-03	5.8E+08 ± 8.5E+05	1.8E+04 ± 5.4E+02	19.8 ± 1.3	9.5 ± 0.1
2.8	0.39 ± 0.01	41.3 ± 0.7	1.4E-01 ± 1.4E-03	5.6E+08 ± 9.6E+06	1.6E+04 ± 2.5E+02	18.1 ± 0.2	9.5 ± 0.1
4.3	0.43 ± 0.01	37.1 ± 1.5	1.4E-01 ± 4.9E-03	5.8E+08 ± 1.1E+07	1.4E+04 ± 5.2E+02	17.4 ± 0.0	9.5 ± 0.2
5.8	0.35 ± 0.00	34.5 ± 0.4	1.4E-01 ± 6.3E-03	7.0E+08 ± 8.3E+07	9.7E+03 ± 1.8E+02	17.0 ± 0.2	9.1 ± 0.2
7.5	0.36 ± 0.01	25.9 ± 1.4	1.4E-01 ± 4.2E-03	9.1E+08 ± 5.1E+07	6.9E+03 ± 9.9E+01	14.9 ± 1.0	8.6 ± 0.6
10.0	0.38 ± 0.02	13.0 ± 2.4	1.2E-01 ± 4.4E-03	1.2E+09 ± 8.6E+06	3.1E+03 ± 3.4E+01	15.7 ± 0.2	9.2 ± 0.0
13.2	0.53 ± 0.02	7.3 ± 0.4	1.1E-01 ± 1.6E-03	1.6E+09	2.1E+03 ± 5.6E+00	9.9 ± 0.3	7.0 ± 0.3
19.6	0.69 ± 0.03	2.4 ± 0.3	8.5E-02 ± 4.0E-03	1.7E+09*	1.4E+03 ± 2.2E+01	0.6 ± 0.8	3.3 ± 0.1
23.5	0.70 ± 0.02	2.1 ± 0.5	8.3E-02 ± 5.9E-03	2.3E+09 ± 1.2E+07*	1.4E+03 ± 6.6E+00	12.9 ± 0.5	3.2 ± 0.1
27.4	0.96 ± 0.01	1.3 ± 0.1	5.4E-02 ± 2.2E-03	2.3E+09 ± 1.0E+08*	1.2E+03 ± 2.0E+01	8.1 ± 6.5	3.5 ± 0.0
31.0	0.97 ± 0.05	1.0 ± 0.1	5.0E-02 ± 2.6E-03	3.6E+09 ± 2.4E+08	1.1E+03 ± 1.7E+01	0.3 ± 0.2	3.5 ± 0.5
35.5	1.22 ± 0.03	0.7 ± 0.1	1.6E-02 ± 2.3E-04	5.1E+09 ± 1.9E+08	9.9E+02 ± 1.5E+01	7.0± 6.7	3.3 ± 0.6

TABLE 2. Data describes growth from the second experiment where excess methane and nitrogen were provided to PHB-rich cells of *M. parvus* OBBP. The periods of growth and PHB utilization were divided into three phases: Phase 1(0-4.3 hrs), Phase 2 (4.3-19.6 hrs), and Phase 3 (19.6-35.5 hrs). The headspace of serum bottles was replenished with methane and oxygen at t = 7.5, 23.5, and 31 hours. A * indicates that we believe these data points are inaccurate due to loss of a sample and subsequent error in sample processing.

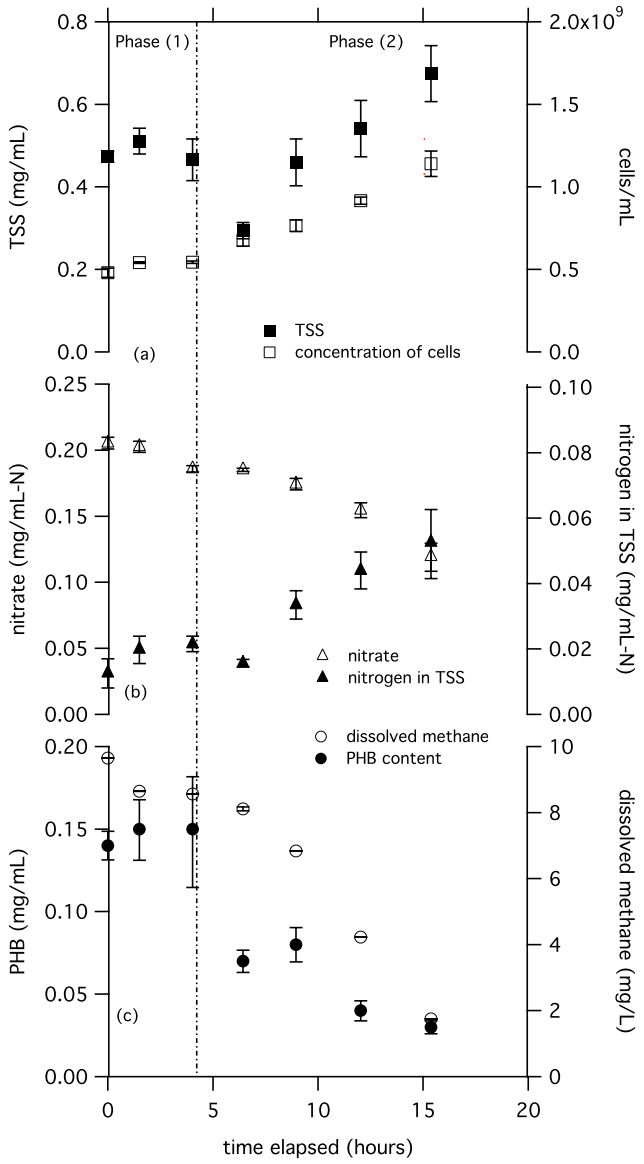

FIGURE 1. Data from the first experiment testing the effects of methane and nitrogen on PHB consumption and production is shown. The first two phases of metabolism in PHB-rich cells of *M. parvus* OBBP exposed to methane and nitrogen are depicted. Panel (a) compares TSS (black squares) and concentration of cells (open squares), panel (b) compares the concentration of dissolved nitrate as N (open trianlges) with the N-TSS (black triangles), and panel (c) compares the PHB content of the cells (black circles) with the concentration of dissolved methane (open circles). All error bars represent the range of values for replicate samples (cell concentration, N-biomass, methane concentration, PHB content) or the range of values of duplicate measurements taken for replicate samples.

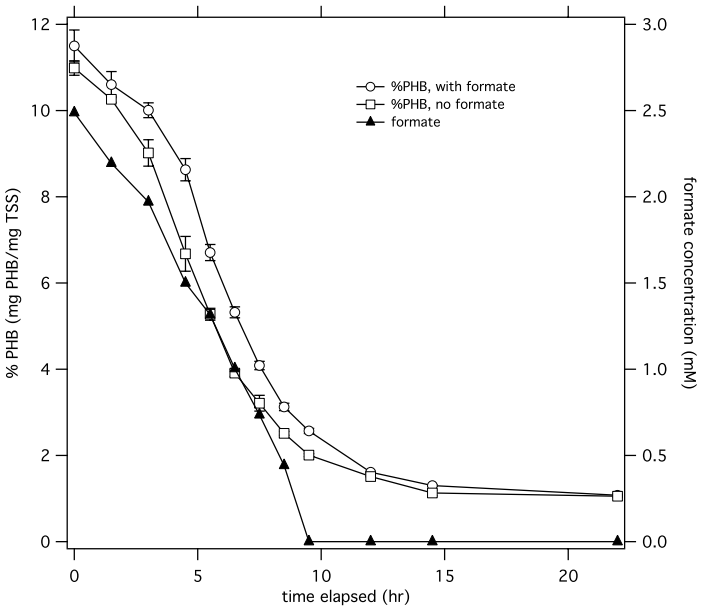

FIGURE 2. The depletion of PHB in cultures of *M. parvus* OBBP exposed to methane and nitrogen with (open circles) and without formate (open squares) and the depletion of formate (black triangles) are depicted. Error bars represent the standard deviation of triplicate measurements. Each concentration of formate represents a single data point.

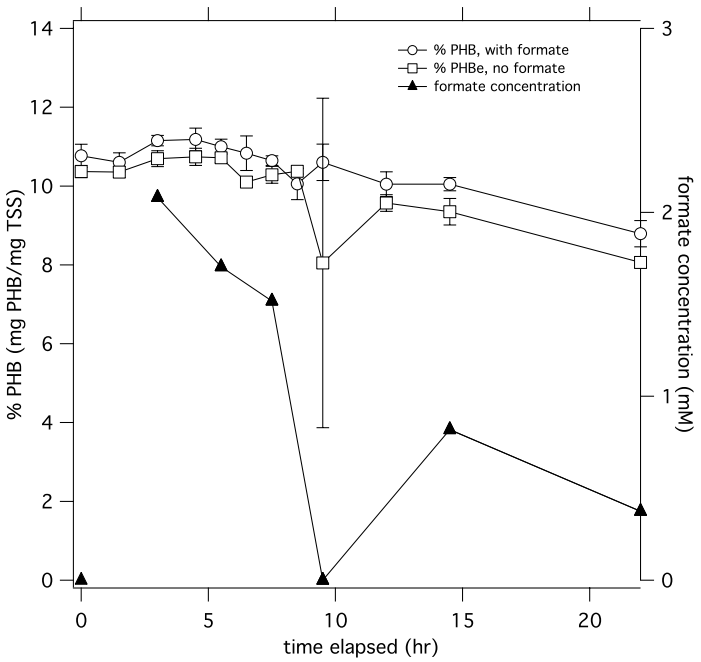

FIGURE 3. The depletion of PHB in cultures of *M. parvus* OBBP exposed to nitrogen in the absence of methane with (open circles) and without formate (open squares) and the depletion of formate (black triangles) are depicted. Error bars represent the standard deviation of triplicate measurements. Each concentration of formate represents a single data point.

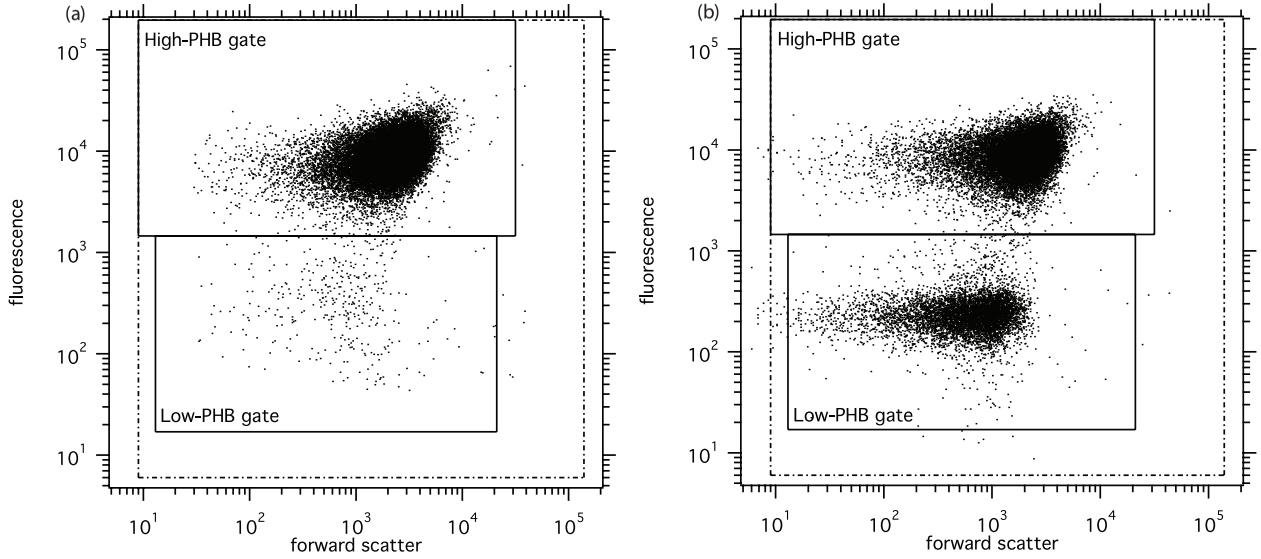

FIGURE 4. A scatterplot of forward scatter versus Nile red fluorescence is shown for PHB-rich cultures exposed to nitrogen, formate, and glyoxylate in the absence of methane after (a) 0 hrs and (b) 23 hrs. Dotted lines illustrate gates applied across all replicates to exclude cell debris and electronic noise. Solid lines indicate gates applied to differentiate high- and low-PHB subpopulations.