The following appendices accompany the article

Alphaproteobacterial dominance in a large mesotrophic lake (Lake Biwa, Japan)

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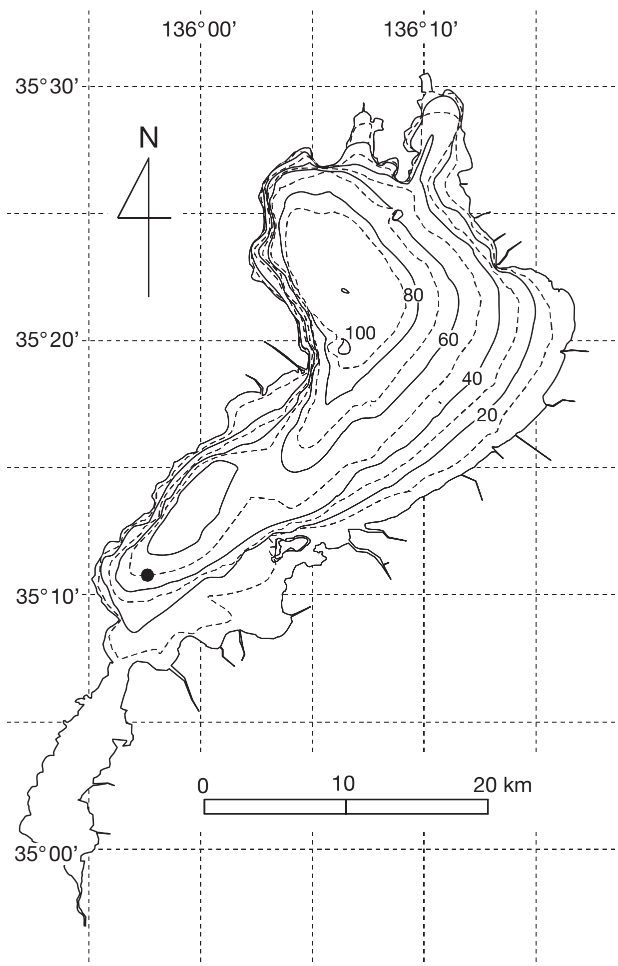
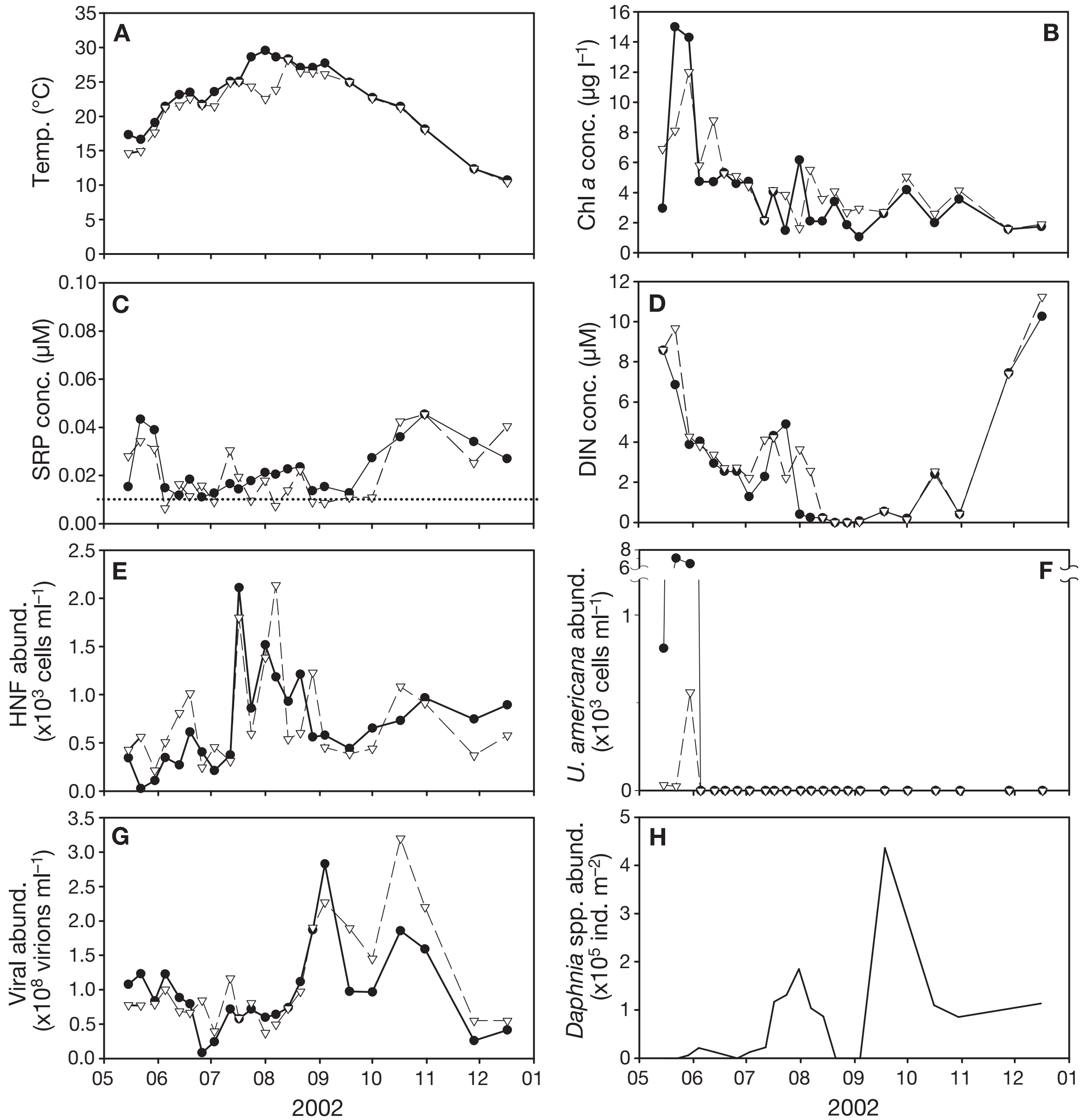
Appendix 1. Lake Biwa and the sampling station (●)



Appendix 2. Seasonal changes in (A) temperature, (B) chl *a* concentration, (C) soluble reactive phosphorus (SRP) concentration, (D) dissolved inorganic nitrogen (DIN) concentration, (E) abundance (abund.) of heterotrophic nanoflagellates (HNF), (F) abundance of *Uroglena americana*, (G) abundance of viruses, and (H) abundance of *Daphnia* spp. Data were collected at a depth of 1 m (●) and in subsurface layers (∇). For *Daphnia* spp., total abundance in the epilimnetic water column is shown. (C) Dotted line shows the detection limit. (A) Water temperature varied in the range of 10.4 to 29.6°C, with the maximum on 26 August. (B) Chl *a* concentrations were high in May (max. 15.0 µg l^{-1}) and low in other months (1.1 to 8.8 µg l^{-1}). (C,D) Average concentrations of SRP and DIN were 0.021 ± 0.011 µM (range, 0.006 to 0.045 µM) and 3.10 ± 3.08 µM (range, 0 to 11.24 µM), respectively. (D) The high DIN to SRP ratio (average, 158) indicates general deficiencies in P (Nishimura et al. 2005, Kim et al. 2006), although DIN concentrations were low (< 1 µM) during the late stratification period (August and September). (E) Abundance of HNF varied in the range of 0.02×10^3 and 2.1×10^3 cells ml^{-1}, with 2 peaks on 17 July and 7 August. (F) *U. americana*, a mixotrophic colonial (colony diameter, around 300 µm) chrysophyte (Kimura & Ishida 1985), were abundant in May ($8.1 \times 10^2 – 7.0 \times 10^3$ cells ml^{-1}), especially in the surface layer relative to the subsurface layer; the abundances in both layers were low (< 4.8 cells ml^{-1}) in other months. (G) Abundances of viruses varied in the range of 8.4×10^6 to 3.2×10^8 virions ml^{-1}. (H) *Daphnia* spp. showed 2 peaks on 1 August (1.9×10^5 ind. m^{-2}) and 18 September (4.4×10^5 ind m^{-2}). Phytoplankton community was generally dominated by *Chlorophyceae* (mean contribution, 74.2 ± 21.5%); other major taxa included *Chrysophyceae* (max. 59.1% on 22 May), *Cyanobacteria* (max. 54.5% on 4 September) and *Bacillariophyceae* (max. 57.0% on 18 September) (data not shown)



Appendix 3. Relative abundance of the major phylogenetic groups of bacteria in freshwater lakes, ponds and reservoirs. Phylogenetic groups include *Alpha*- (α), *Beta*- (β), and *Gamma*- (γ) subdivisions of *Proteobacteria*, the *Cytophaga-Flavobacteria* cluster (CF), and *Actinobacteria* (Actino). Relative abundances of EUB-probe positives are also shown. Values are averages and ranges (in parentheses) of the abundances relative to total prokaryotes. All data were obtained by FISH using oligonucleotide probes targeted to rRNA. –: group was not determined

Lake/Pond/ Reservoir	Country	Dominant	Abundance relative to total prokaryotes (%) EUB	α	β	γ	CF	Actino	Source
Biwa	Japan	α	59.1 (34.5–73)	41.7 (20.1–66.9)	11.8 (5.4–36.7)	2.2 (0–6.8)	5.8 (1.6–18.1)	14.3 (2.7–38.4)	This study
Baikal	Russia	β	58.7	1	16.2	1.2	8.2	–	Glöckner et al. (1999)
Baikal	Russia	β	72.5	–	15	–	14	9.5	Glöckner et al. (2000)
Tibetan lakes[a]	PR China	β or Actino	60 (51.9–66.5)	1.5 (0.3–4.5)	21.8 (14.3–26.6)	1.0 (0–4.6)	8.7 (1.6–20.6)	17.7 (5.2–35.1)	Wu et al. (2006)
Lago di Cadagno	Switzerland	β	51 (46–61)	1 (0–2)	19.3 (17–21)	2.3 (0–5)	7.7 (3–12)	–	Glöckner et al. (1999)
Lago di Cadagno[b]	Switzerland	γ	(53–66)	(0–1)	(1–2)	(29–36)	–	–	Bosshard et al. (2000)
Grosser Ostersee	Germany	β	52.2 (46–61)	2 (1–3)	9.8 (3–16)	<1 (0–1)	3.6 (1–7)	–	Glöckner et al. (1999)
Constance	Germany	β	37.5	4.1	12	2.2	5.4	–	Zwisler et al. (2003)
Fuchskuhle	Germany	Actino	68.5	–	18.5	–	2	22	Glöckner et al. (2000)
Zwischenahner Meer	Germany	β or Actino	43.2	1.3	11.25	0.45	2.9	16.7	Bruns et al. (2003)
Farm pond	Germany	β	77	0	23	0	6	–	Jürgens et al. (1999)
Gossenköllesee	Austria	β	63.8 (63–65)	10.5 (10–11)	19 (12–26)	(<1)	5.5 (5–6)	–	Alfreider et al. (1996)
Gossenköllesee	Austria	β	21 (7–45)	11 (4–23)	24 (5–41)	(<2)	3.5 (<10)	–	Pernthaler et al. (1998)
Gossenköllesee	Austria	β	51	10	18	1	16	–	Glöckner et al. (1999)
Gossenköllesee	Austria	β or Actino	79.5 (47–96)	12.5 (5–22)	23.5 (11–40)	3.9 (2–10)	–	35.8 (15–60)	Glöckner et al. (2000)
High mountain lakes	Austria	β or Actino	–	–	(7–38)	–	–	(3–68)	Warnecke et al. (2005)
Rimov Reservoir	Czech Rep.	β	77.3	<1	22	2.5	7	–	Šimek et al. (2001)
Rimov Reservoir	Czech Rep.	β	50	<2	23	5	20	–	Šimek et al. (2003)
Rimov Reservoir	Czech Rep.	β	62.1 (40–83)	–	22.6 (8–52)	–	27.2 (8–50)	–	Masin et al. (2003)
Rimov Reservoir	Czech Rep.	β	58	–	18	8	15	18	Šimek et al. (2005)
Orlik Reservoir	Czech Rep.	β or CF	48.2 (30–62)	7.2 (<12)	12.4 (7–18)	5.2 (<18)	15.1 (5–25)	–	Masin et al. (2003)
Sep Reservoir	France	β	(26.2–62.8)	5.9	14.2	–	4.1	–	Jardillier et al. (2004)
Sau Reservoir	Spain	CF	43.4	2.6	10.5	0.7	10.7	–	Gasol et al. (2002)
Tiete Reservoirs	Brazil	α	(34.5–53.4)	14.8 (11.8–19.2)	10.8 (7.8–13.3)	(1.1–3.5)	(4.5–12.8)	–	Abe et al. (2003)
Moss	Antarctica	β	55.1 (49.6–84)	4.3 (2.3–10.6)	24.3 (26.4–71.5)	2.7 (0–29.6)	5.3 (1.8–13.5)	–	Pearce (2003)
Range of means (Lake Biwa not included)				0–15	10–24	0–5	2–27	10–36	
Range of means (Lake Biwa included)				0–42	10–24	0–5	2–27	10–36	

[a]Data for freshwater lakes (<1.0 g l^{-1} salinity) only

[b]High abundance of *Gammaproteobacteria* was detected in the anoxic chemocline. This value is not included in the 'range of means' and range presented in Fig. 4

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