Effects of Algal Extracellular Polymeric Substances on the Formation of Filamentous Manganese Oxide Particles in the near-Bottom Layer of Lake Biwa

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Table S1. Composition of CT medium [27]

|  |  |
| --- | --- |
|  | Concentration (L-1) |
| Ca(NO3)2⋅4H2O | 15 mg |
| KNO3 | 10 mg |
| MgSO4⋅7H2O | 4 mg |
| Disodium β-glycerophosphate | 5 mg |
| Thiamin hydrochloride | 1 μg |
| Cyanocobalamin | 0.01 μg |
| Biotin | 0.01 μg |
| TAPS | 10 mg |
| PIV metal salts soln.\* | 0.3 mL |
| \*This solution contained (per liter) 19.6 mg of FeCl3⋅6H2O, 3.6 mg of MnCl2⋅4H2O, 2.2 mg of ZnCl2⋅7H2O, 0.4 mg of CoCl2⋅6H2O, 0.25 mg of Na2MoO4⋅2H2O, and 100 mg of Na2EDTA⋅2H2O (pH 8.2). | |



Figure S1. Mn(II) oxidation by *Bosea* sp. BIWAKO-01 in agar-containing cultures. Mn(II) ions were added at a concentration of 0.1 mM at the time indicated by the arrow. Data from triplicate cultures are represented as means ± SD.



Figure S2. TEM image of filamentous Mn oxide particle collected at a depth of 90 m at the study site of Lake Biwa. The high magnification image shows that the filaments consist of sheet-type structure. Bar: 500 nm. Inset, SAED pattern obtained for the sheet-type structure with *d* values of 0.253 and 0.148 nm.

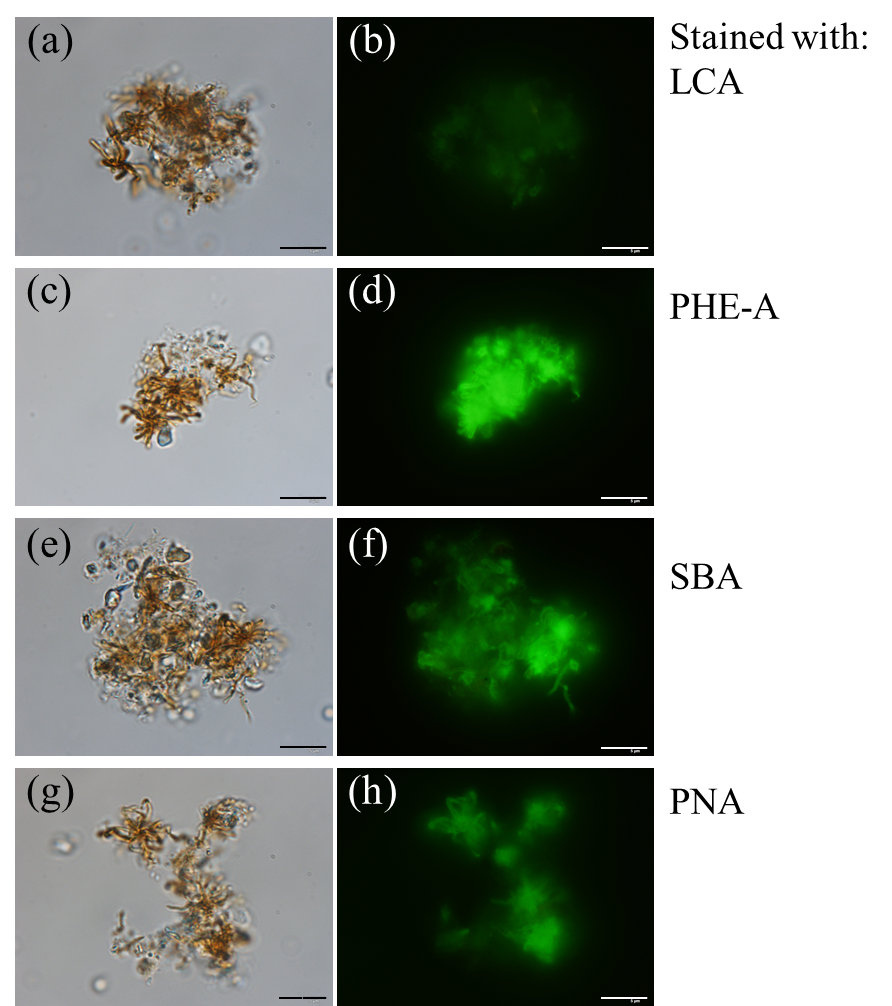


Figure S3. Differential interference contrast and epifluorescence images of aggregates collected at a depth of 90 m at the study site of Lake Biwa. The aggregates were stained with fluorescein-conjugated LCA (a, b), PHA-E (c, d), SBA (e, f), and PNA (g, h). Bar: 10 μm.

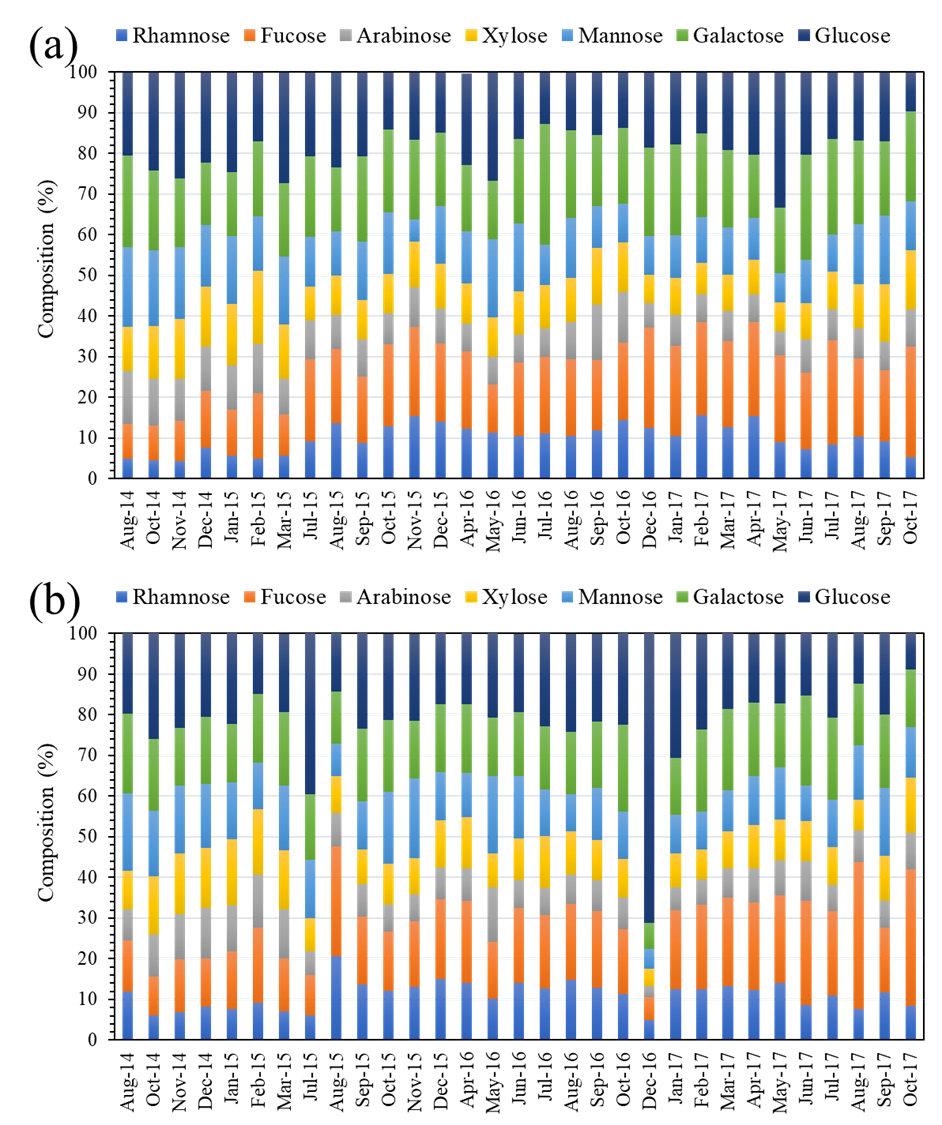


Figure S4. Neutral monosaccharides detected in the total polysaccharides collected from the lake waters at 0.5 m (a) and 90 m (b) during 2014-2017.