

Nanometer-scale visualization and structural analysis of the inorganic/organic hybrid structure of *Gallionella ferruginea* twisted stalks

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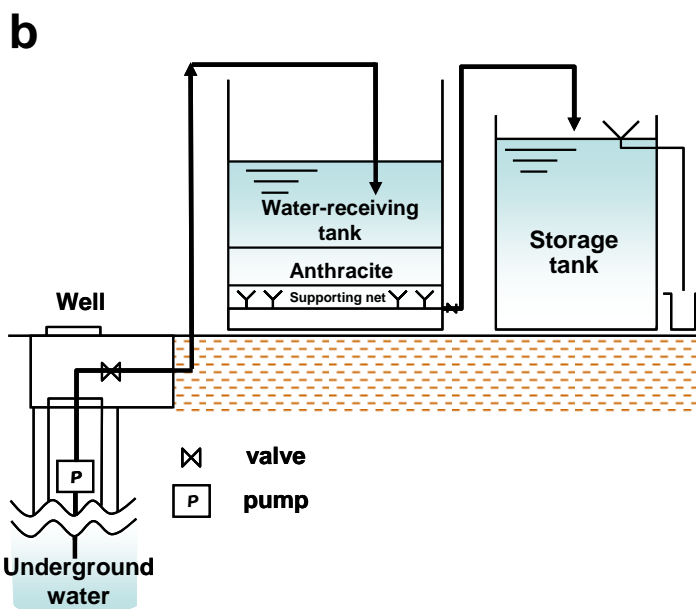
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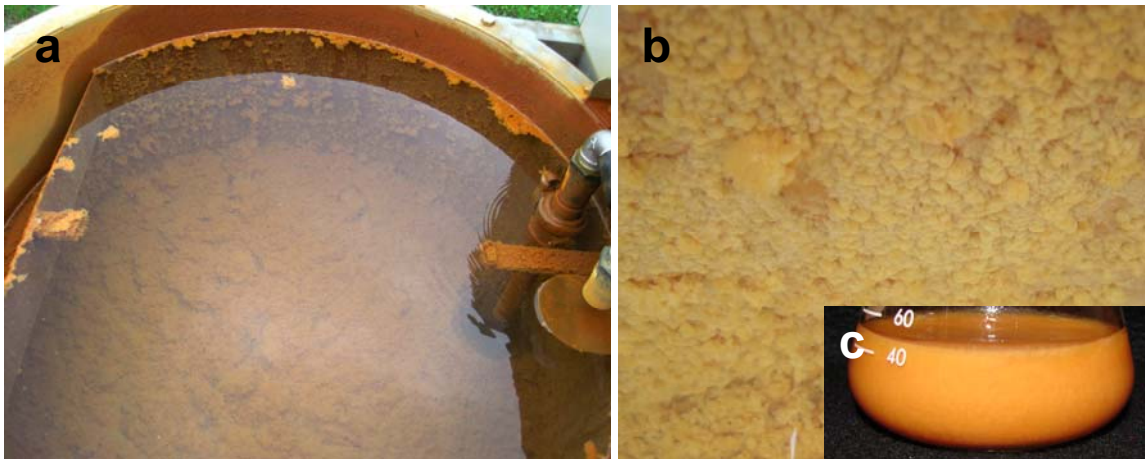
Supplementary Materials

Contents:

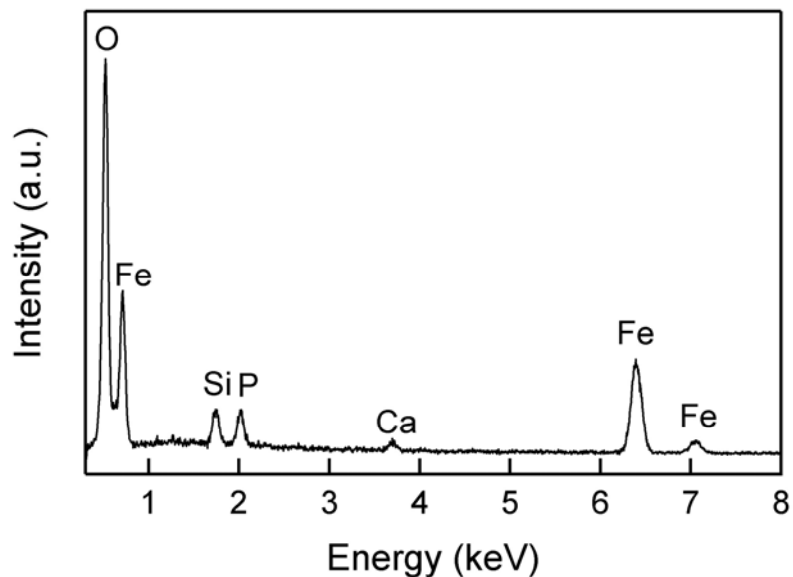
Supplementary Figure 1	2
Supplementary Figure 2	3
Supplementary Figure 3	4
Supplementary Table 1	5



Supplementary FIG. S1. (a) The experimental water purification system from which the ocherous flocs were collected at the Okayama University farm. (b) Schematic diagram of the system. Underground water was pumped up to the water-receiving stainless steel tank paved with anthracite at the bottom. The flow rate of the underground water was 4.6 l/min. The excess water was routed to a plastic storage tank. The water-receiving tank was always closed with a lid to prevent the entry of rainwater.



Supplementary FIG. S2. (a) Ocherous flocs covering the inner wall of the water-receiving tank. (b) An enlarged image of the surface of the inner wall of the water-receiving tank. (c) Suspension of the ocherous flocs collected from the inner wall by pipetting. The flocs loosely covered the wall surface and thus were readily removed by gentle pipetting. The flocs required only a few days to fully cover the surface of the wall after the tank had been completely washed out. In the water-receiving tank, *G. ferruginea* was the most prevalent species, although contamination with a few other microbial species was occasionally observed.



Supplementary FIG. S3. The EDX spectrum showing the constitutive elements identified in dried and chemically unfixed stalk material. Note the peaks of major elements (Fe-L, -K α , -K β [in this order from left to right] and O-K α) and those of minor elements (Si-K α , P-K α , and Ca-K α).

TABLE S1: Quantitative analysis of elements in the underground water and receiving tank water (See **Supplementary Fig. S1**)

Elements Samples	Concentration of elements (μg/ml)						
	Na	Mg	K	Ca	Mn	Fe	Si
Underground water	18.9	14.4	11.0	33.0	1.5	11.7	15.7
Receiving tank water	18.6	14.1	10.7	32.1	1.3	0.0	14.7

Analysis was performed using an inductivity coupled plasma optical emission spectrometer (ICPS-7500, Shimadzu, Japan).

Note that the Fe concentration decreased to undetectable levels in the water-receiving tank. This indicates the action of biological oxidation and deposition of Fe ions in the tank by the prevalent species, *Gallionella ferruginea*.