

1 **Supplemental Materials For:**

2 **Removal of soluble strontium into biogenic carbonate minerals from a highly saline**
3 **solution using halophilic bacterium, *Bacillus* sp. TK2d.**

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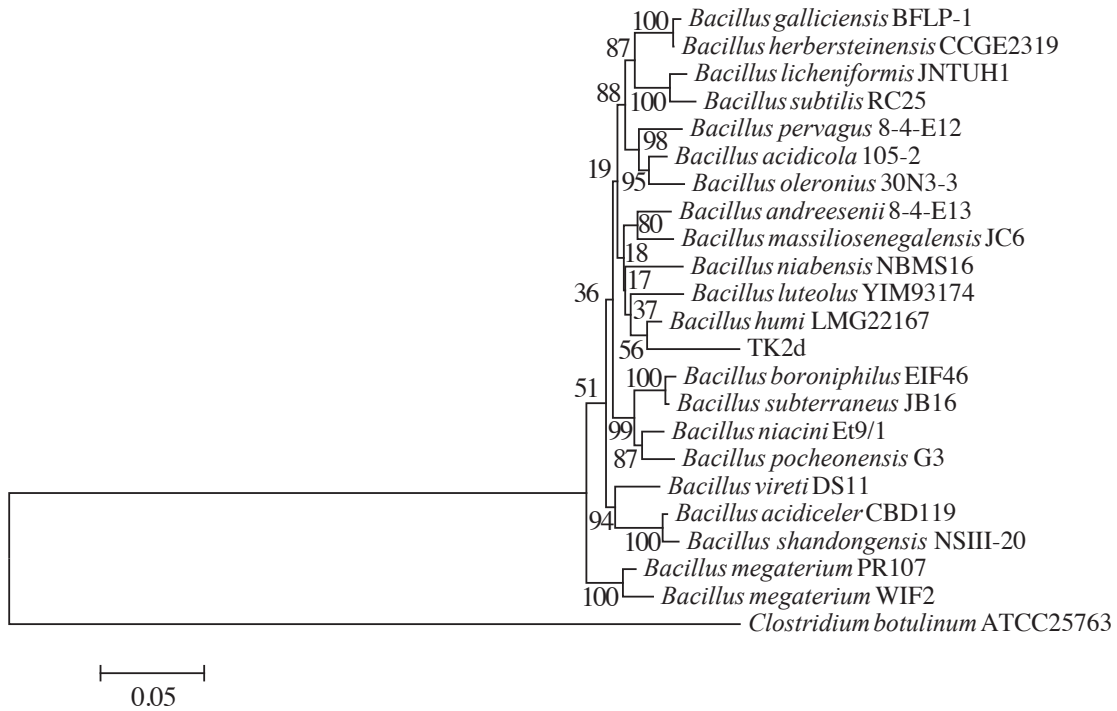
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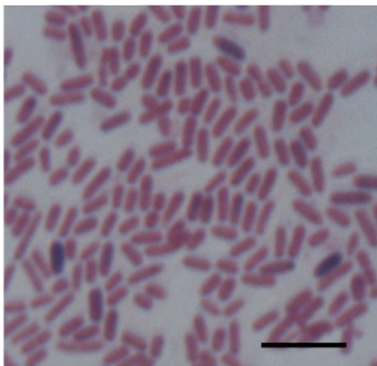
23 Supplemental figures and table



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25 Fig. S1. Phylogenetic tree inferred from the 16S rRNA gene sequences of *Bacillaceae*.

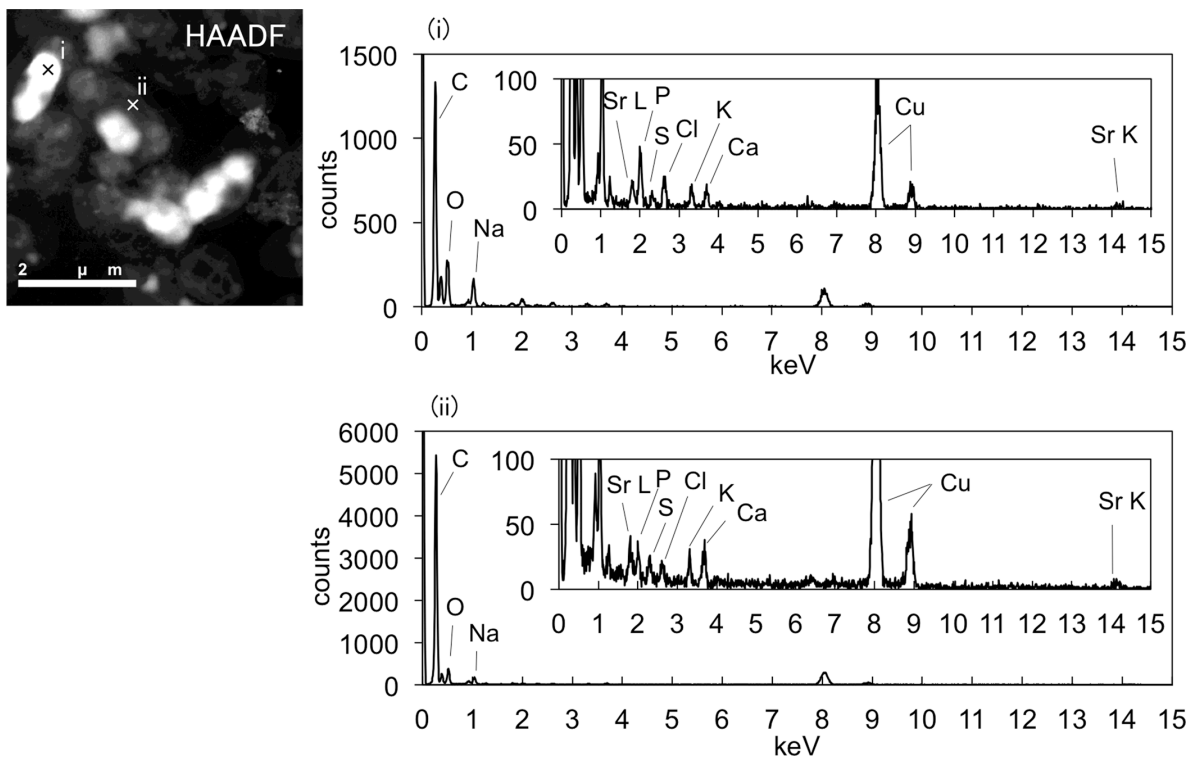
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28 Fig. S2. Gram-stained cells of the TK2d strain. Bar = 10 μ m.

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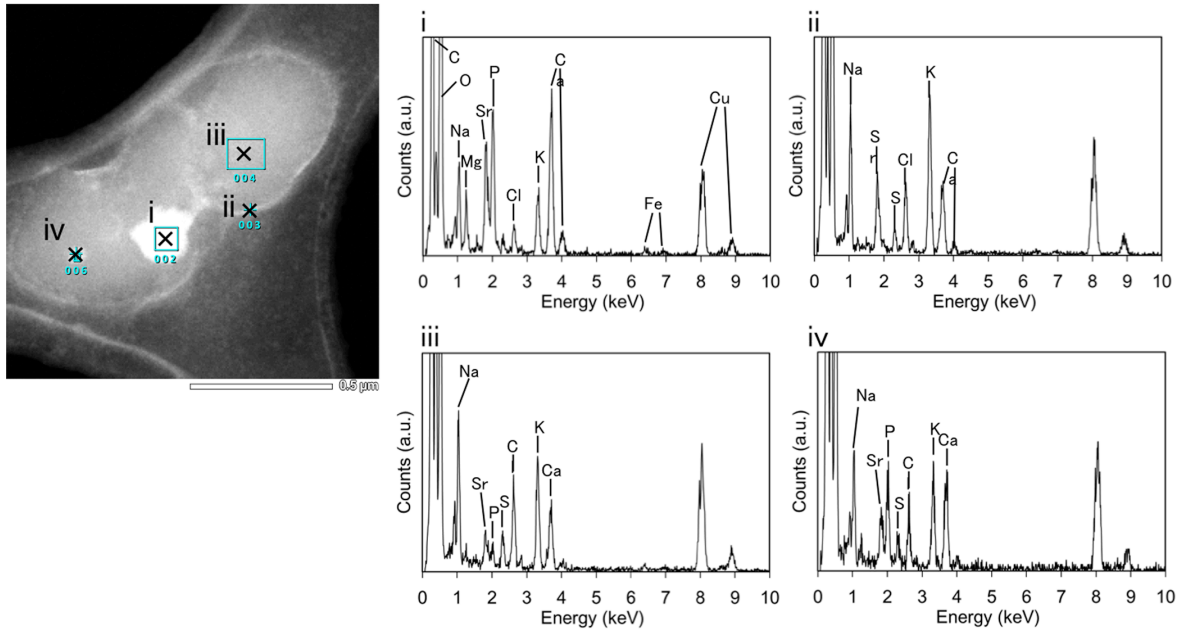


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31 Fig. S3. HAADF-STEM image of precipitates in culture of the TK2d strain after 1.3 d (32

32 h) cultivation. HAADF-STEM image, bar = 2.0 μm. EDS spectra at spots (i) and (ii).

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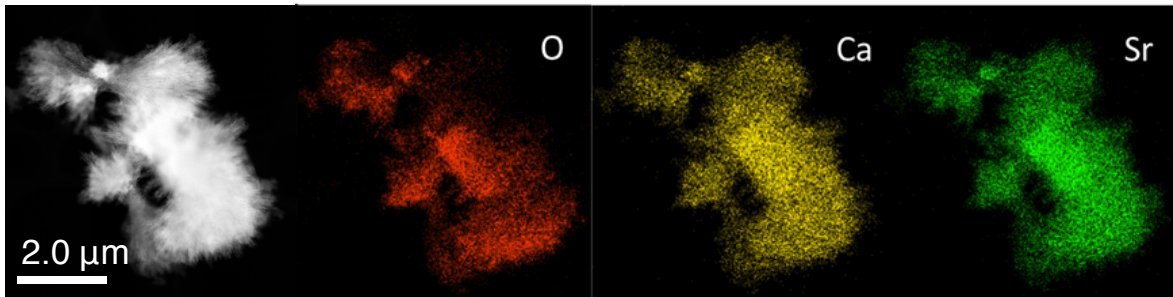


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35 Fig. S4. HAADF-STEM image of precipitates in culture of the TK2d strain after 2 d

36 cultivation. HAADF-STEM image, bar = 0.5 μm. EDS spectra at spots i, ii, iii, and iv.

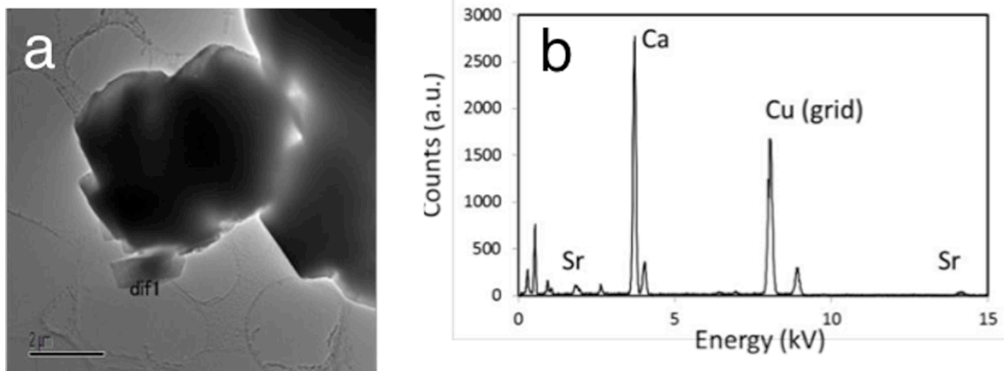
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39 Fig. S5. HAADF-STEM images (same as Fig. 4f) and elemental mappings (O, Sr and Ca)

40 of precipitates in culture of the TK2d strain after and 8 d cultivation.

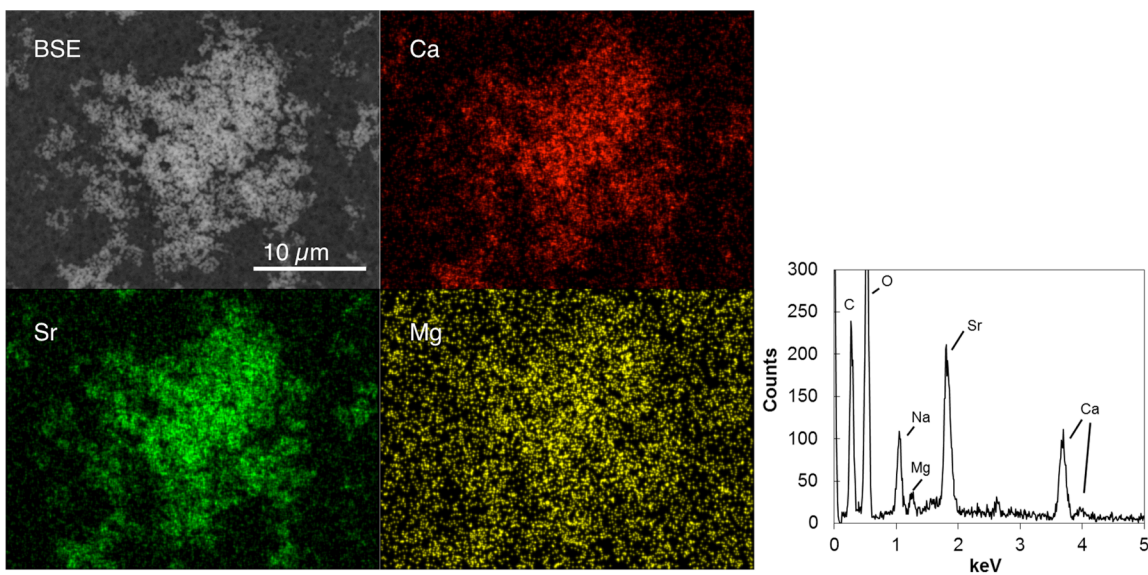


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42 Fig. S6. BFTEM images of (a) abiotic Sr containing Ca-carbonate and (b) the associated

43 EDS spectrum. Bar = 2.0 μm.

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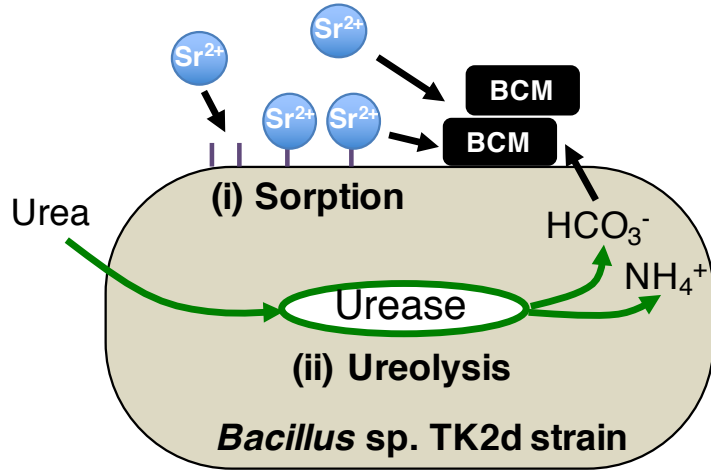
46 Fig. S7. SEM-EDX analysis of abiotic Sr containing Ca-carbonate from MB.

47 Back-scattered electron image (BSE), elemental mappings (Sr, Ca and Mg) and EDS

48 spectrum. Bar = 10 μm.

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52 Fig. S8. The conceptual mechanism of Sr removal by the TK2d strain.

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54 Table S1. Key characteristics that differentiate the TK2d strain from strains of closely
 55 related bacterial species¹⁻³.

Characteristics	Strain TK2d	<i>B. humi</i> strain DSM16317	<i>B. luteolus</i> strain YIM 93174	<i>B. andreesenii</i> strain DSM23947
Cell shape	rod	rod	rod	rod
Cell size (µm)	0.9–1.0×1.5–2.5	0.7–0.9×4.0–7.0	0.7–0.9×2.0–5.0	0.5–0.9×1.5–3.6
Spore	+	+	+	+
Spore shape	Ellipsoidal	Ellipsoidal	Spherical	Ellipsoidal
Spore position	(Sub) Terminal	(Sub) Terminal	Terminal	Terminal
Gram stain	+	+	+	+
Motility	+	+	+	+
Catalase	+	+	+	+
Oxidase	+	+	-	-
Nitrate reduction	-	+	-	+
Anaerobic growth	+w	-	-	-
Growth in:				
0% (w/v) NaCl	+	ND	+	-
3% (w/v) NaCl	+	+	+	+
5% (w/v) NaCl	+	+	+	+
10% (w/v) NaCl	+	-	+	+
Growth at:				
30 °C	+	+	+	+
37 °C	+	ND	+	+
45 °C	-	-	+	+
Hydrolysis of:				
Aesculin	-	+	-	+w
Gelatin	-	-	-	-
Tween 80	+	ND	-	-
Urea	+	-	+	-
Growth on:				
D-Galactose	-	-	-	+
Cellobiose	-	-	-	+
D-Mannose	-	-	-	-
Sucrose	+	-	+	-
Maltose	+	-	-	+
Acid production from:				
Lactose	+	+w	ND	-
D-Mannitol	+	-	-	-
D-Xylose	+	-	+	-
Trehalose	+	-	-	+
L-Arabinose	+	-	-	-
Glycerol	-	-	+w	+

+: positive, +w: weakly positive, -: negative, ND: no data available

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58 **References in supplemental materials**

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