Electronic Supplementary Material (ESI) for Environmental Science: Processes & Impacts.

Supporting Information

Strontium-90 pollution can be bioremediated with the green microalga *Tetraselmis chui*

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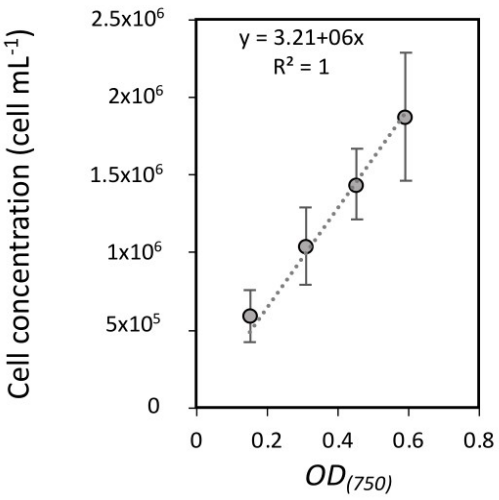


Figure S1: Correlation between the optical density measured in *T. chui* cultures at 750 nm (OD_{750}) and the cell density of the cultures. The dashed line corresponds to the estimated. The equation and associated R^2 value are shown. Error bars represent the standard deviations (n=4).

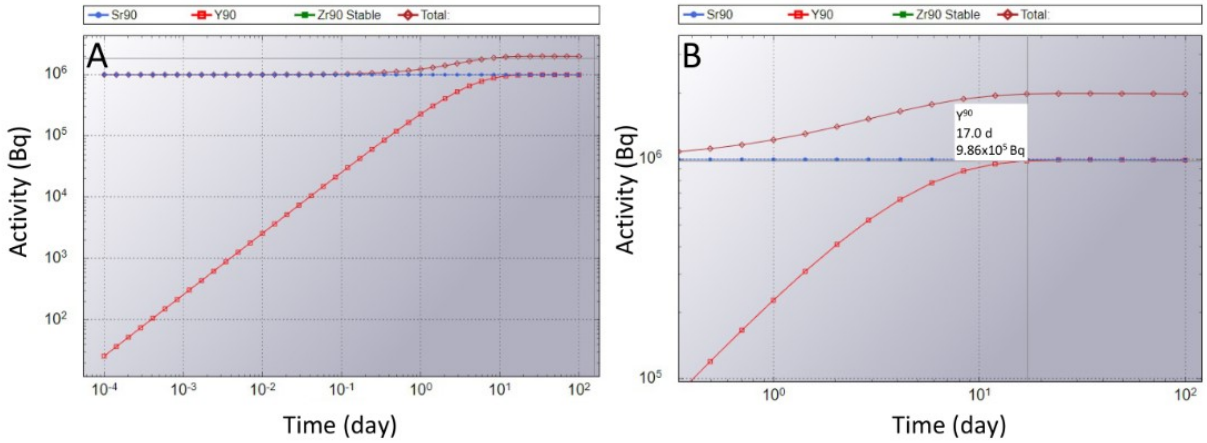


Figure S2: (A) Decay of 1MBq ^{90}Sr and production of ^{90}Y for 100 days. (B) Zoom in at the secular equilibrium region between the remaining activity of ^{90}Sr and the activity produced by ^{90}Y. As calculated using the NUCLEONICA decay engine, equilibrium is reached after 17 days.

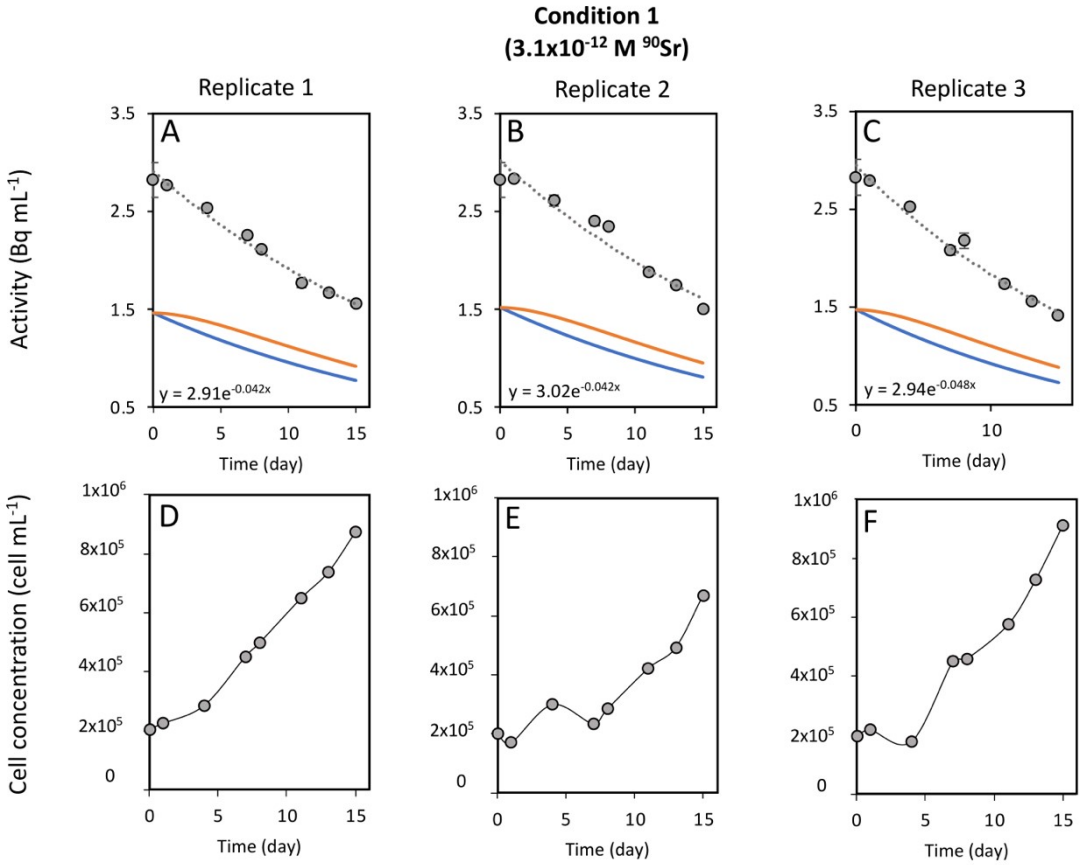


Figure S3: (A-C) Time evolution of the activity measured in the growth medium of three replicates of *T. chui* cultures amended with 3.1x10^{-12}M ^{90}Sr: (A) replicate 1, (B) replicate 2, and (C) replicate 3. Grey circles correspond to the total activity of the culture medium. The dashed line represents the calculated exponential reduction fit of the total activity. The equation is shown in the bottom left area of each graph. The orange line corresponds to the estimated ^{90}Y activity and the blue line to the estimated ^{90}Sr activity. Error bars correspond to the standard deviations (n=3). (D-E) Time evolution of the cell concentration of the three replicates of *T. chui* cultures amended with 3.1x10^{-12} M ^{90}Sr: (D) replicate 1, (E) replicate 2, and (F) replicate 3.

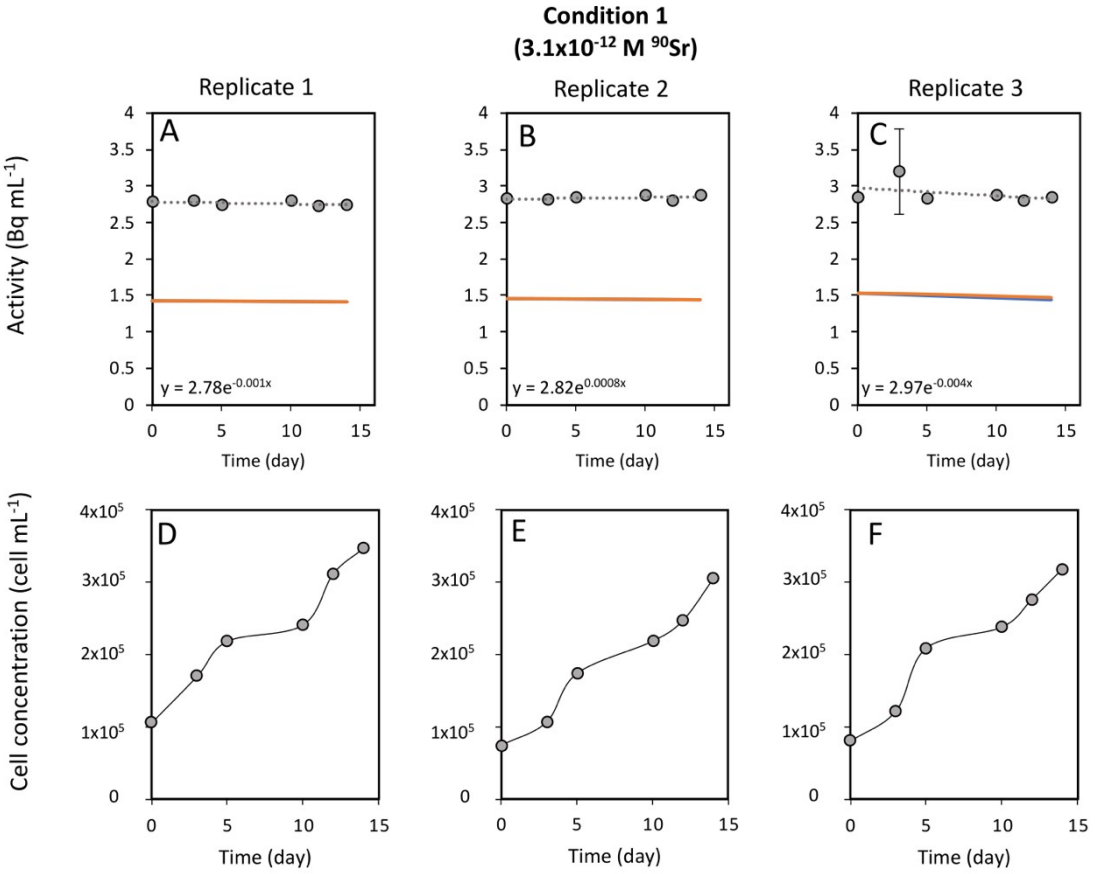


Figure S4: (A-C) Time evolution of the activity measured in the growth medium of three replicates of *T. marina* cultures amended with 3.1x10^{-12}M ^{90}Sr: (A) replicate 1, (B) replicate 2, and (C) replicate 3. Grey circles correspond to the total activity of the culture medium. The dashed line represents the calculated exponential reduction fit of the total activity. The equation is shown in the bottom left area of each graph. The orange line corresponds to the estimated ^{90}Y activity and the blue line to the estimated ^{90}Sr activity. In the three cases, both lines are superposed. Error bars correspond to the standard deviations (n=3). (D-E) Time evolution of the cell concentration of the three replicates of *T. marina* cultures amended with 3.1x10^{-12} M ^{90}Sr: (D) replicate 1, (E) replicate 2, and (F) replicate 3.

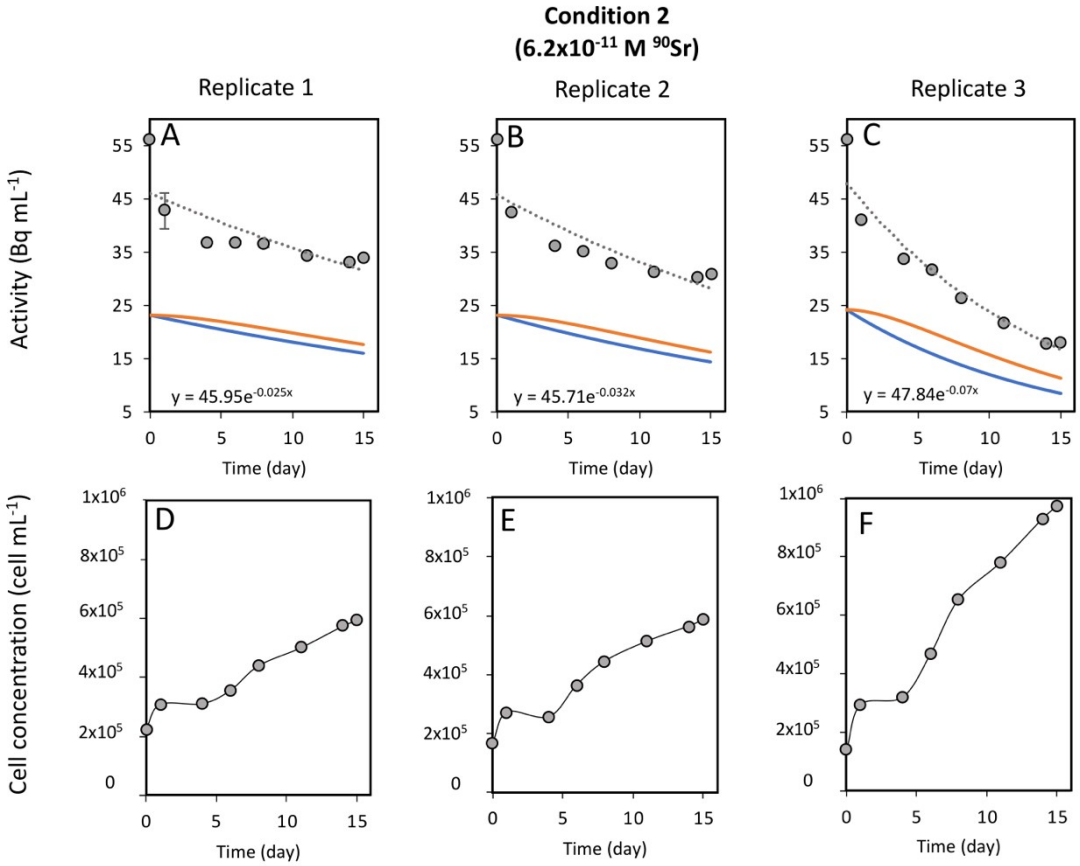


Figure S5: (A-C) Time evolution of the activity measured in the growth medium of three replicates of *T. chui* cultures amended with 6.2x10^{-11}M ^{90}Sr: (A) replicate 1, (B) replicate 2, and (C) replicate 3. Grey circles correspond to the total activity of the culture medium. The dashed line represents the calculated exponential reduction fit of the total activity. Its associated equation is expressed on the bottom left area of each graph. The orange line corresponds to the estimated ^{90}Y activity and the blue line to the estimated ^{90}Sr activity. Error bars correspond to the standard deviations (n=3). (D-E) Time evolution of the cell concentration of the three replicates of *T. chui* cultures amended with 6.2x10^{-11} M ^{90}Sr: (D) replicate 1, (E) replicate 2, and (F) replicate 3.

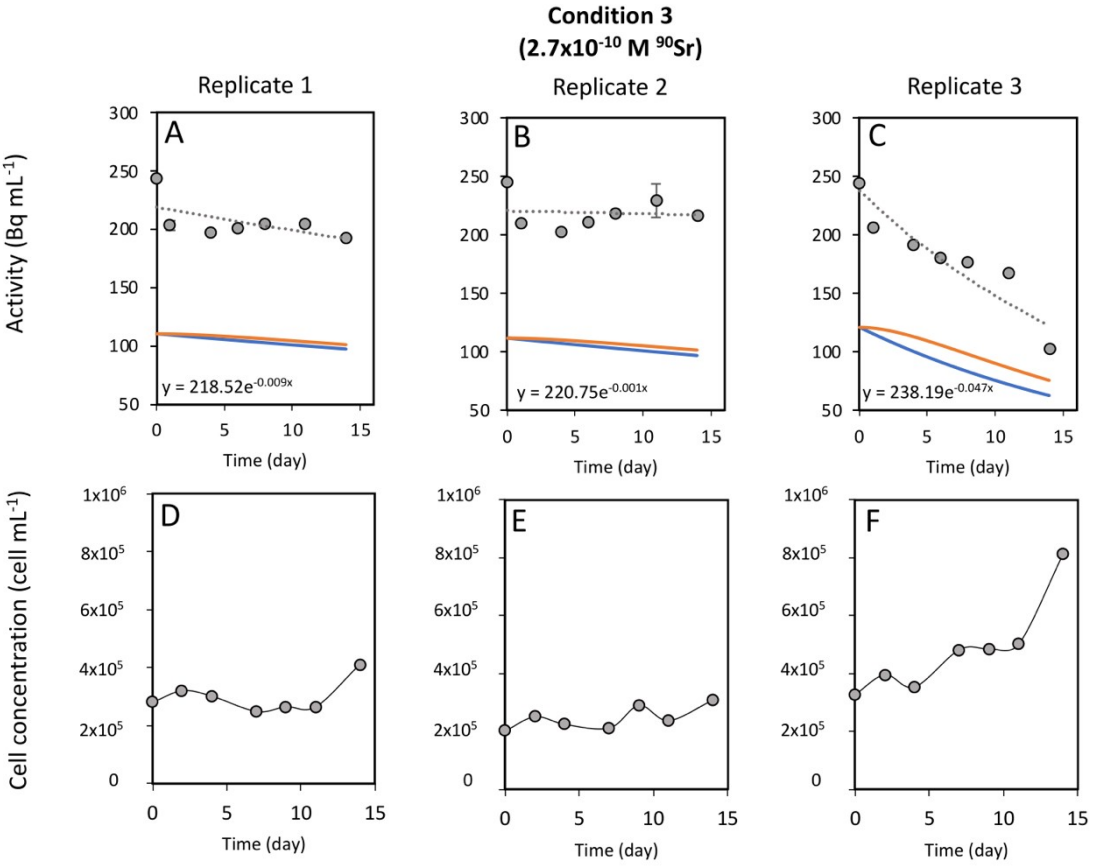


Figure S6: (A-C) Time evolution of the activity measured in the growth medium of three replicates of *T. chui* cultures amended with 2.7x10^{-10}M ^{90}Sr: (A) replicate 1, (B) replicate 2, and (C) replicate 3. Grey circles correspond to the total activity of the culture medium. The dashed line represents the calculated exponential reduction fit of the total activity. Its associated equation is expressed on the bottom left area of each graph. The orange line corresponds to the estimated ^{90}Y activity, and the blue line to the estimated ^{90}Sr activity. Error bars correspond to the standard deviations (n=3). (D-E) Time evolution of the cell concentration of the three replicates of *T. chui* cultures amended with 2.7x10^{-10} M ^{90}Sr: (D) replicate 1, (E) replicate 2, and (F) replicate 3.

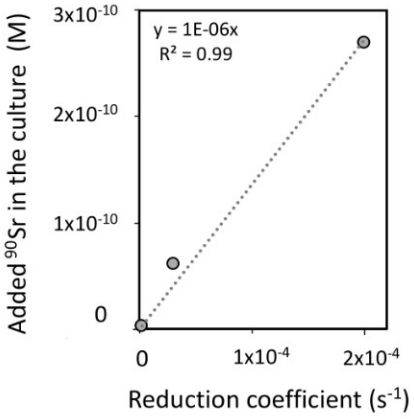
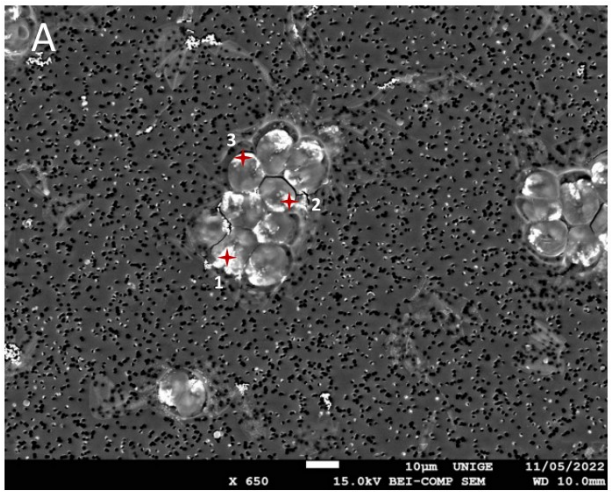
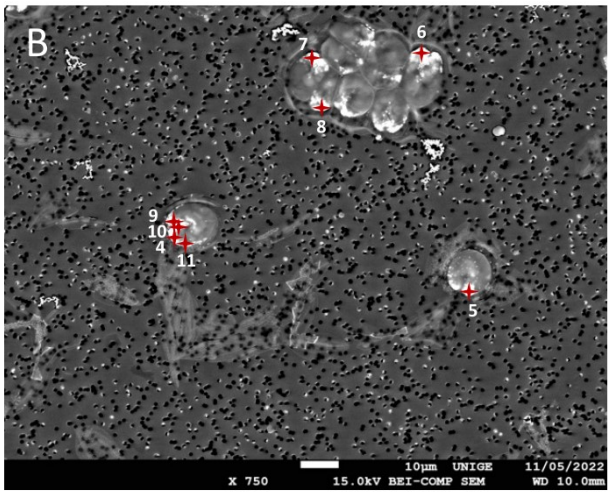
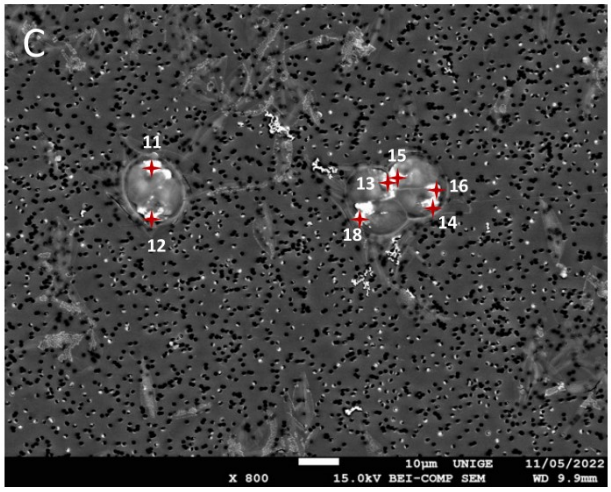


Figure S7: Correlation between the ^{90}Sr concentration added to the culture (Y axis) and the total activity reduction coefficient calculated as a function of *T. chui* cell density (X axis). The dashed line corresponds to the estimated linear fit. The equation and associated R^2 value are shown in the upper left area of the graph.







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Analysis point	Sr (mol%)	Ca (mol%)	Sr/Ca (mol%)
1	17.58	82.42	0.21
2	21.82	78.18	0.28
3	21.75	78.25	0.28
4	25.40	74.60	0.34
5	17.56	82.44	0.21
6	16.69	83.31	0.20
7	34.61	65.39	0.53
8	27.22	72.78	0.37
9	23.21	76.79	0.30
10	23.38	76.62	0.31
11	29.46	70.54	0.42
12	28.75	71.25	0.40
13	16.62	83.38	0.20
14	24.95	75.05	0.33
15	24.96	75.04	0.33
16	25.86	74.14	0.35
17	25.14	74.86	0.34
18	30.02	69.98	0.43
Mean			0.32
Standard deviation			0.09

Figure S8: (A-C) SEM images of *T. chui* cells grown for four days in a culture medium amended with 3.1×10^{-12} M ^{90}Sr. The red marks correspond to EDXS analysis points. (D) EDXS results of the analyzed points.