Dataset for Sinking enhances the degradation of organic particles by marine bacteria

Video

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Publication date:
2021-08-23

Permanent link:
https://doi.org/https://doi.org/10.3929/ethz-b-000488179

Dataset for

Sinking enhances the degradation of organic particles by marine bacteria

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Dataset descriptions:

A. Dataset1 – Video microscopy movies from which data used to create Fig. 1, Fig. 2 and Extended Data Fig. 1a were obtained. Degradation of alginate particles under flow. All movies contain data from 70 h imaging in 20 min intervals at 10× magnification.

1. **File 1 – D1_Exp1.nd2**
   1 imaging positions × 2 imaging planes × 3 colours.
   Flow rate = 1.14 m/day, 2.18 m/day, 4.35 m/day and 0 m/day (plus bacteria).
2. **File 2 – D1_Exp2.nd2**
   12 imaging positions × 2 imaging planes × 3 colours.
   Flow rate = 7.98 m/day, 14.52 m/day, 21.77 m/day, 0 m/day (plus bacteria) and 0 m/day (no bacteria).
3. **File 3 – D1_Exp3.nd2**
   6 imaging positions × 2 imaging planes × 3 colours.
   Flow rate = 36.29 m/day and 4.35 m/day.
4. **File 4 – D1_Exp4.nd2**
   1 imaging position × 2 imaging planes × 3 colours.
   0 m/day (no bacteria).
5. **File 5 – D1_Exp5.nd2**
   3 imaging positions × 2 imaging planes × 3 colours.
   7.25 m/day (no bacteria).

Dataset 1 File number (D1_Exp#.nd2)	Position (from left to right)	Flow rate (m/day)	Imaging plane	Channels Grey – Phase microscopy 10× Green – GFP-*V.cyclitrophicus* ZF270 Red – Rhodamine-labelled alginate
1	1	2.18	Mid	Grey, Green and Red
1	2	2.18	Bottom	Grey, Green and Red
1	3	2.18	Mid	Grey, Green and Red
1	4	2.18	Bottom	Grey, Green and Red
1	5	1.14	Mid	Grey, Green and Red
1	6	1.14	Bottom	Grey, Green and Red
1	7	1.14	Mid	Grey, Green and Red
1	8	1.14	Bottom	Grey, Green and Red
1	9	1.14	Mid	Grey, Green and Red
1	10	1.14	Bottom	Grey, Green and Red
1	11	2.18	Mid	Grey, Green and Red
1	12	2.18	Bottom	Grey, Green and Red
1	13	4.35	Mid	Grey, Green and Red
1	14	4.35	Bottom	Grey, Green and Red
1	15	0	Mid	Grey, Green and Red
1	16	0	Bottom	Grey, Green and Red
1	17	4.35	Mid	Grey, Green and Red
1	18	4.35	Bottom	Grey, Green and Red
1	19	0	Mid	Grey, Green and Red
1	20	0	Bottom	Grey, Green and Red
1	21	4.35	Mid	Grey, Green and Red
1	22	4.35	Bottom	Grey, Green and Red
2	1	7.98	Mid	Grey, Green and Red
2	2	7.98	Bottom	Grey, Green and Red
2	3	7.98	Mid	Grey, Green and Red

2	4	7.98	Bottom	Grey, Green and Red
2	5	7.98	Mid	Grey, Green and Red
2	6	7.98	Bottom	Grey, Green and Red
2	7	14.52	Mid	Grey, Green and Red
2	8	14.52	Bottom	Grey, Green and Red
2	9	14.52	Mid	Grey, Green and Red
2	10	14.52	Bottom	Grey, Green and Red
2	11	14.52	Mid	Grey, Green and Red
2	12	14.52	Bottom	Grey, Green and Red
2	13	21.77	Mid	Grey, Green and Red
2	14	21.77	Bottom	Grey, Green and Red
2	15	21.77	Mid	Grey, Green and Red
2	16	21.77	Bottom	Grey, Green and Red
2	17	21.77	Mid	Grey, Green and Red
2	18	21.77	Bottom	Grey, Green and Red
2	19	0 (plus bacteria)	Mid	Grey, Green and Red
2	20	0 (plus bacteria)	Bottom	Grey, Green and Red
2	21	0 (no bacteria)	Mid	Grey, Green and Red
2	22	0 (no bacteria)	Bottom	Grey, Green and Red
2	23	0 (no bacteria)	Mid	Grey, Green and Red
2	24	0 (no bacteria)	Bottom	Grey, Green and Red
3	1	36.29	Mid	Grey, Green and Red
3	2	36.29	Bottom	Grey, Green and Red
3	3	36.29	Mid	Grey, Green and Red
3	4	36.29	Bottom	Grey, Green and Red
3	5	36.29	Mid	Grey, Green and Red
3	6	36.29	Bottom	Grey, Green and Red
3	7	4.35	Mid	Grey, Green and Red
3	8	4.35	Bottom	Grey, Green and Red
3	9	4.35	Mid	Grey, Green and Red
3	10	4.35	Bottom	Grey, Green and Red
3	11	4.35	Mid	Grey, Green and Red
3	12	4.35	Bottom	Grey, Green and Red
4	1	0 (plus bacteria)	Bottom	Grey, Green and Red
4	2	0 (plus bacteria)	Mid	Grey, Green and Red
5	1	7.27 (no bacteria)	Bottom	Grey, Green and Red
5	2	7.27 (no bacteria)	Mid	Grey, Green and Red
5	3	7.27 (no bacteria)	Bottom	Grey, Green and Red
5	4	7.27 (no bacteria)	Mid	Grey, Green and Red
5	5	7.27 (no bacteria)	Bottom	Grey, Green and Red
5	6	7.27 (no bacteria)	Mid	Grey, Green and Red

B. Dataset2 - Video microscopy movies from which data used to create Fig. 3 were obtained. Degradation of alginate particles under flow in the presence of oligo-alginate. All movies contain data from 70 h imaging in 20 min intervals at 10× magnification.

6. **File 1 – D2_Exp1.nd2**
   (6 imaging positions × 2 imaging planes × 3 colours)
   Flow rate = 7.25 m/day, oligo-alginate concentration = 0 plus 1% MB 2216, 0 mg/ml, 0.01 mg/ml, 0.04 mg/ml, 0.2 mg/ml, 0.6 mg/ml.
7. **File 2 – D2_Exp2.nd2**
   (6 imaging positions × 2 imaging planes × 3 colours)
   Flow rate = 7.25 m/day, oligo-alginate concentration = 0 plus 1% MB 2216, 0 mg/ml, 0.01 mg/ml, 0.04 mg/ml, 0.2 mg/ml, 0.6 mg/ml.

Dataset 2 File number (D2_Exp#.nd2)	Position (from left to right)	Oligo-alginate (mg/ml)	Imaging plane	Channels Grey – Phase microscopy 10× Green – GFP-*V. cyclitrophicus* ZF270 Red – Rhodamine-labelled alginate
1	1	2216 (1%)	Mid	Grey, Green and Red
1	2	2216 (1%)	Bottom	Grey, Green and Red
1	3	0	Mid	Grey, Green and Red
1	4	0	Bottom	Grey, Green and Red
1	5	0.01	Mid	Grey, Green and Red
1	6	0.01	Bottom	Grey, Green and Red
1	7	0.04	Mid	Grey, Green and Red
1	8	0.04	Bottom	Grey, Green and Red
1	9	0.2	Mid	Grey, Green and Red
1	10	0.2	Bottom	Grey, Green and Red
1	11	0.6	Mid	Grey, Green and Red
1	12	0.6	Bottom	Grey, Green and Red
2	1	2216 (1%)	Mid	Grey, Green and Red
2	2	2216 (1%)	Bottom	Grey, Green and Red
2	3	0	Mid	Grey, Green and Red
2	4	0	Bottom	Grey, Green and Red
2	5	0.01	Mid	Grey, Green and Red
2	6	0.01	Bottom	Grey, Green and Red
2	7	0.04	Mid	Grey, Green and Red
2	8	0.04	Bottom	Grey, Green and Red
2	9	0.2	Mid	Grey, Green and Red
2	10	0.2	Bottom	Grey, Green and Red
2	11	0.6	Mid	Grey, Green and Red
2	12	0.6	Bottom	Grey, Green and Red

C. Dataset3 - Video microscopy movies from which data used to create Fig. 3 were obtained. Degradation of alginate particles under flow in the absence of bacteria and in the presence of the enzyme alginate lyase and oligo-alginate. All movies contain data from 3 h imaging in 20 s intervals at 10× magnification.

8. **File 1 – D3_Exp1.nd2**
   (6 imaging positions × 1 imaging plane × 3 colours)
   Flow rate = 7.25 m/day, oligo-alginate concentration = 1 mg/ml, alginate lyase concentration = 10 µg/ml).
9. **File 2 – D3_Exp2.nd2**
   (2 imaging positions × 1 imaging plane × 3 colours)
   Flow rate = 7.25 m/day, oligo-alginate concentration = 1 mg/ml, alginate lyase concentration = 0 µg/ml).

Dataset 3 File number (D3_Exp#.nd2)	Position (from left to right)	Enzyme (µg/ml), Oligo-alginate (mg/ml)	Imaging plane	Channels Grey – Phase microscopy 10× Green – FITC Red – Rhodamine-labelled alginate
1	1	Enz 10, OA 1	Mid	Grey, Green and Red
1	2	Enz 10, OA 1	Mid	Grey, Green and Red
1	3	Enz 10, OA 0	Mid	Grey, Green and Red
1	4	Enz 10, OA 0	Mid	Grey, Green and Red
2	1	Enz 0, OA 1	Mid	Grey, Green and Red
2	2	Enz 0, OA 1	Mid	Grey, Green and Red

D. Dataset4 - Video microscopy movies from which data used to create Extended Data Fig. 10 were obtained. Degradation of chitin/chitosan particles under flow in the presence of *Vibrio splendidus* 1A01 and *Psychromonas* 6C06. All movies contain data from up to 200 h imaging in 20 min intervals at 10× magnification.

10. **File 1 – D4_Exp1.nd2**
    (1 imaging position × 2 imaging planes × 1 colour)
    Flow rate = 7.25 m/day, chitin.
11. **File 2 – D4_Exp2.nd2**
    (3 imaging positions × 2 imaging planes × 1 colour)
    Flow rate = 7.25 m/day, chitin.
12. **File 3 – D4_Exp3.nd2**
    (3 imaging positions × 2 imaging planes × 1 colour)
    Flow rate = 0 m/day, chitin.
13. **File 4 – D4_Exp4.nd2**
    (6 imaging positions × 2 imaging planes × 3 colour)
    Flow rate = 0 m/day and 7.25 m/day, chitosan (short chain)

Dataset 4 File number (D4_Exp#.nd2)	Position (from left to right)	Flow (m/day)	Imaging plane	Channels Grey – Phase microscopy 10× Green – *Vibrio* sp. 1A01 Red - Empty
1	1	7.25	Mid	Grey
1	2	7.25	Bottom	Grey
2	1	7.25	Mid	Grey
2	2	7.25	Bottom	Grey
2	3	7.25	Mid	Grey
2	4	7.25	Bottom	Grey
2	5	7.25	Mid	Grey
2	6	7.25	Bottom	Grey
2	7	7.25	Mid	Grey
2	8	7.25	Bottom	Grey
2	9	7.25	Mid	Grey
2	10	7.25	Bottom	Grey
2	11	7.25	Mid	Grey
2	12	7.25	Bottom	Grey
3	1	0	Mid	Grey
3	2	0	Bottom	Grey
3	3	0	Mid	Grey
3	4	0	Bottom	Grey
3	5	0	Mid	Grey
3	6	0	Bottom	Grey
3	7	0	Mid	Grey
3	8	0	Bottom	Grey
3	9	0	Mid	Grey
3	10	0	Bottom	Grey
3	11	0	Mid	Grey
3	12	0	Bottom	Grey
4	1	0	Mid	Grey, Green and Red
4	2	0	Bottom	Grey, Green and Red
4	3	0	Mid	Grey, Green and Red
4	4	0	Bottom	Grey, Green and Red
4	5	0	Mid	Grey, Green and Red
4	6	0	Bottom	Grey, Green and Red
4	7	7.25	Mid	Grey, Green and Red
4	8	7.25	Bottom	Grey, Green and Red
4	9	7.25	Mid	Grey, Green and Red
4	10	7.25	Bottom	Grey, Green and Red
4	11	7.25	Mid	Grey, Green and Red
4	12	7.25	Bottom	Grey, Green and Red