

Supplementary Materials for

High functional diversity stimulates diversification in experimental microbial communities

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Supplementary material

table S1. Assembly of communities of *P. fluorescens* of different phylogenetic and functional diversity for studying the evolution of *P. fluorescens* F113 and its XerD⁻ isogenic mutant (focal species). Eight lineages of *P. fluorescens* were used for community assembly. Values indicate the relative abundance of each lineage. Each community was supplemented with 20% of the focal species. Focal species was included when computing functional diversity (see Methods).

Sample	MVP1-4	Q2-87	CHA0	F113	Phl1C2	Pf5	1M1-96	Q8r1-96	Richness
1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1
2	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1
3	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1
4	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1
5	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1
6	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1
7	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1
9	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1
10	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1
11	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1
12	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1
13	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1
14	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1
15	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1
17	0.50	0.00	0.50	0.00	0.00	0.00	0.00	0.00	2
18	0.00	0.50	0.00	0.00	0.50	0.00	0.00	0.00	2
19	0.00	0.00	0.50	0.50	0.00	0.00	0.00	0.00	2
20	0.50	0.00	0.00	0.00	0.00	0.50	0.00	0.00	2
21	0.00	0.00	0.00	0.00	0.50	0.00	0.50	0.00	2
22	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	2
23	0.00	0.00	0.00	0.00	0.00	0.50	0.50	0.00	2

24	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.50	2
25	0.50	0.00	0.00	0.00	0.50	0.00	0.00	0.00	2
26	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.50	2
27	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.50	2
28	0.00	0.00	0.50	0.00	0.00	0.50	0.00	0.00	2
29	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.50	2
30	0.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	2
31	0.00	0.00	0.00	0.00	0.50	0.00	0.50	0.00	2
32	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.00	2
33	0.00	0.50	0.00	0.00	0.00	0.50	0.00	0.00	2
34	0.00	0.00	0.00	0.00	0.00	0.50	0.50	0.00	2
35	0.33	0.00	0.00	0.33	0.33	0.00	0.00	0.00	3
36	0.00	0.33	0.33	0.00	0.33	0.00	0.00	0.00	3
37	0.00	0.00	0.00	0.33	0.00	0.33	0.33	0.00	3
38	0.00	0.33	0.00	0.00	0.00	0.00	0.33	0.33	3
39	0.33	0.00	0.33	0.00	0.00	0.00	0.33	0.00	3
40	0.00	0.33	0.00	0.00	0.33	0.00	0.00	0.33	3
41	0.00	0.00	0.33	0.00	0.00	0.33	0.33	0.00	3
42	0.33	0.33	0.00	0.33	0.00	0.00	0.00	0.00	3
43	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.33	3
44	0.33	0.00	0.33	0.00	0.00	0.33	0.00	0.00	3
45	0.33	0.00	0.00	0.00	0.00	0.33	0.00	0.33	3
46	0.00	0.33	0.33	0.00	0.00	0.00	0.33	0.00	3
47	0.00	0.00	0.00	0.33	0.33	0.33	0.00	0.00	3
48	0.00	0.33	0.00	0.00	0.00	0.00	0.33	0.33	3
49	0.33	0.00	0.33	0.00	0.00	0.33	0.00	0.00	3
50	0.25	0.00	0.00	0.00	0.00	0.25	0.25	0.25	4
51	0.00	0.25	0.25	0.00	0.25	0.00	0.25	0.00	4
52	0.25	0.00	0.00	0.25	0.00	0.25	0.00	0.25	4
53	0.00	0.25	0.00	0.25	0.25	0.00	0.25	0.00	4
54	0.25	0.00	0.25	0.00	0.00	0.25	0.00	0.25	4
55	0.00	0.25	0.00	0.25	0.25	0.00	0.00	0.25	4

56	0.00	0.25	0.25	0.00	0.25	0.00	0.25	0.00	4
57	0.25	0.25	0.25	0.25	0.00	0.00	0.00	0.00	4
58	0.00	0.25	0.25	0.25	0.00	0.00	0.25	0.00	4
59	0.00	0.00	0.00	0.00	0.25	0.25	0.25	0.25	4
60	0.25	0.00	0.25	0.00	0.25	0.25	0.00	0.00	4
61	0.00	0.25	0.00	0.25	0.25	0.00	0.00	0.25	4
62	0.25	0.00	0.25	0.00	0.00	0.25	0.25	0.00	4
63	0.00	0.00	0.00	0.25	0.25	0.25	0.00	0.25	4
64	0.25	0.25	0.00	0.00	0.00	0.00	0.25	0.25	4
65	0.20	0.00	0.20	0.20	0.00	0.00	0.20	0.20	5
66	0.00	0.20	0.00	0.20	0.20	0.00	0.20	0.20	5
67	0.20	0.00	0.20	0.00	0.20	0.20	0.00	0.20	5
68	0.00	0.20	0.00	0.20	0.20	0.20	0.20	0.00	5
69	0.20	0.20	0.20	0.20	0.00	0.20	0.00	0.00	5
70	0.00	0.20	0.00	0.20	0.00	0.20	0.20	0.20	5
71	0.20	0.20	0.20	0.00	0.20	0.00	0.00	0.20	5
72	0.20	0.00	0.00	0.20	0.20	0.20	0.20	0.00	5
73	0.00	0.20	0.20	0.00	0.20	0.20	0.00	0.20	5
74	0.20	0.00	0.20	0.20	0.00	0.20	0.20	0.00	5
75	0.00	0.20	0.20	0.20	0.20	0.00	0.00	0.20	5
76	0.20	0.20	0.20	0.00	0.20	0.00	0.20	0.00	5
77	0.17	0.00	0.17	0.17	0.17	0.17	0.17	0.00	6
78	0.17	0.00	0.17	0.17	0.17	0.00	0.17	0.17	6
79	0.17	0.17	0.17	0.17	0.00	0.17	0.17	0.00	6
80	0.17	0.17	0.17	0.00	0.17	0.17	0.00	0.17	6
81	0.17	0.17	0.00	0.17	0.00	0.17	0.17	0.17	6
82	0.17	0.17	0.00	0.17	0.17	0.00	0.17	0.17	6
83	0.00	0.17	0.17	0.17	0.17	0.17	0.00	0.17	6
84	0.00	0.17	0.17	0.00	0.17	0.17	0.17	0.17	6
85	0.14	0.00	0.14	0.14	0.14	0.14	0.14	0.14	7
86	0.14	0.14	0.14	0.14	0.14	0.14	0.00	0.14	7
87	0.14	0.14	0.14	0.00	0.14	0.14	0.14	0.14	7

88	0.14	0.14	0.14	0.14	0.00	0.14	0.14	0.14	7
89	0.14	0.14	0.14	0.14	0.14	0.00	0.14	0.14	7
90	0.00	0.14	0.14	0.14	0.14	0.14	0.14	0.14	7
91	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	8
92	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	8
93	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	8
94	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	8
95	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	8

table S2. Summary of the communities set up. Number of distinct communities set up at each richness level, the number of replicates and the number of each genotype at each diversity level. Differences between number of distinct communities and replicates were due to drawing the same community by chance more than once, and to communities replicated with the same composition of genotypes (monocultures and 8-strain mixtures).

Genotypic richness levels	Number of distinct communities (and replicates)
1	8(16) (all eight monocultures replicated twice)
2	15(18) (randomly assembled; every genotype maximally four times present)
3	14(16) (randomly assembled; every genotype maximally six times present)
4	12(14) (randomly assembled; every genotype maximally eight times present)
5	12(12) (randomly assembled; every genotype maximally eight times present)
6	7(7) (randomly assembled; every genotype six times present)
7	6(7) (randomly assembled; every genotype maximally six times present)
8	1(5) (all eight genotypes, five replicates)

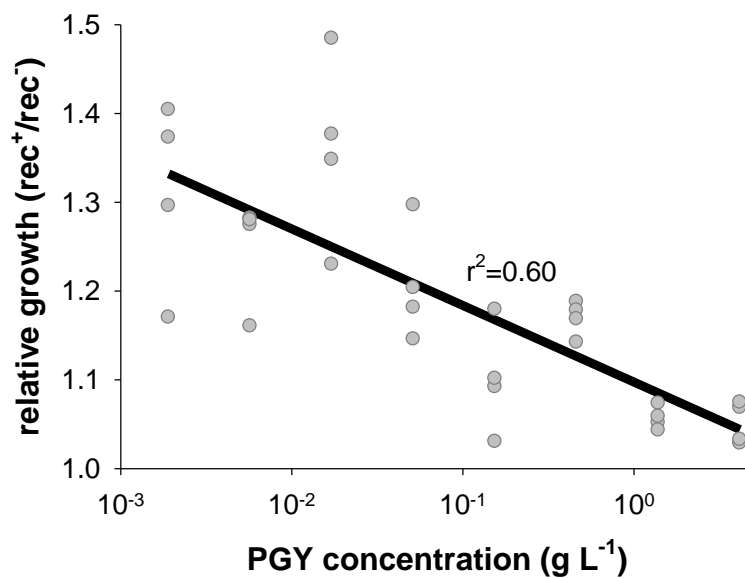


fig. S1. Effect of resource concentration (dilution series of PGY medium) on the relative growth of *P. fluorescens* F113 (rec⁺) over its *xerD* isogenic mutant (rec⁻). Each strain was grown in isolation, relative growth was defined as the ratio of the population density between the two strains after 48h in different dilutions of PGY medium. A relative growth of 1 indicates an equivalent growth of the two strains, a relative growth over 1 a better growth of the rec⁺ strain.

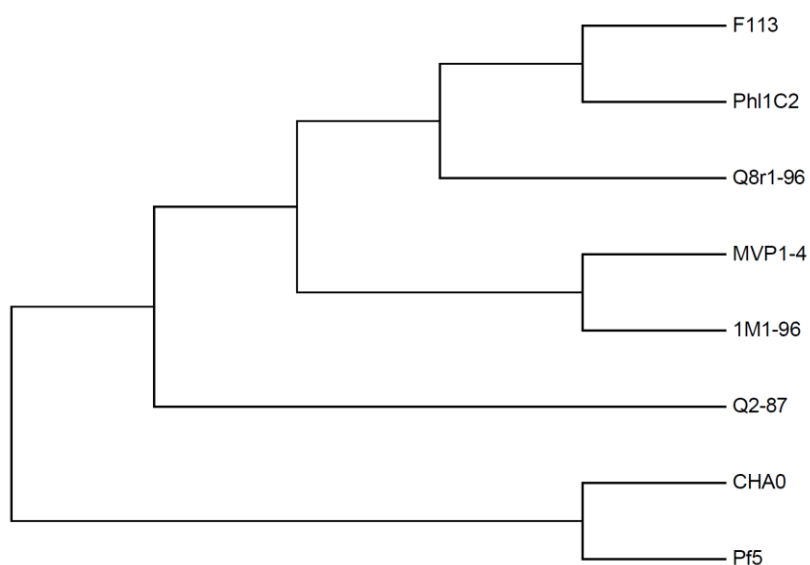


fig. S2. Maximum likelihood tree based on *phlD* sequences depicting the phylogenetic relationships between the eight studied *Pseudomonas* lineages.