

Supplemental Material

Bacterial chitinolytic communities respond to chitin and pH alteration in soil

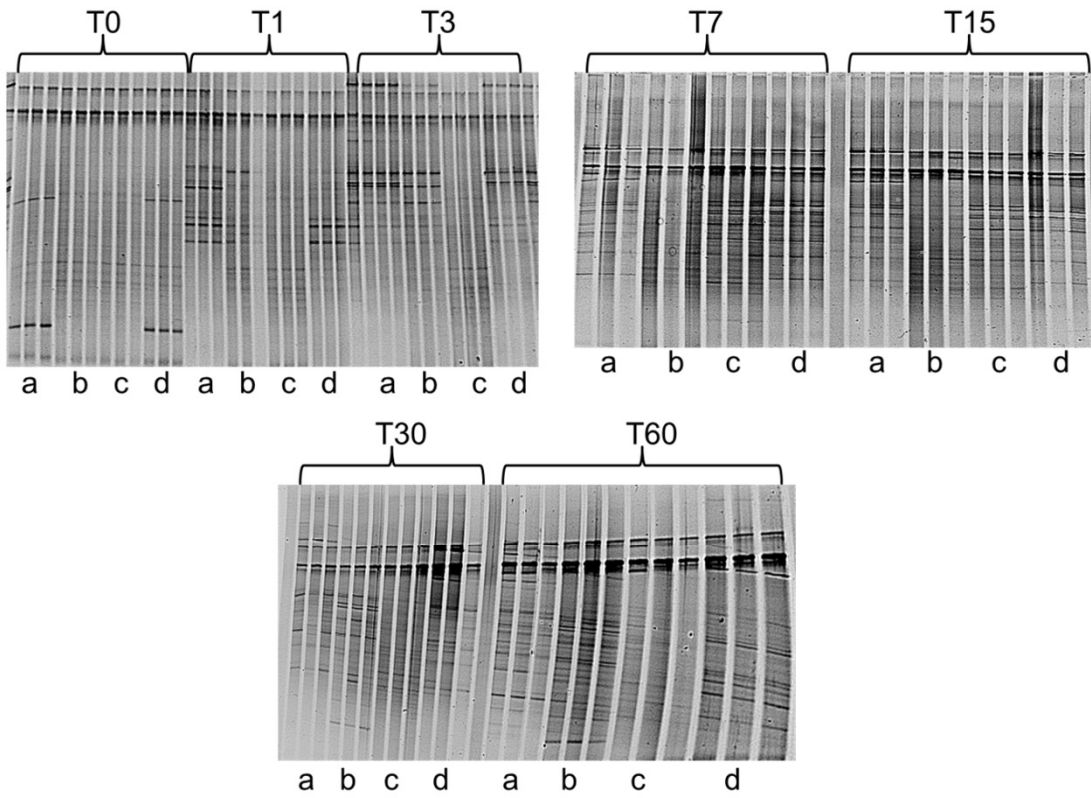
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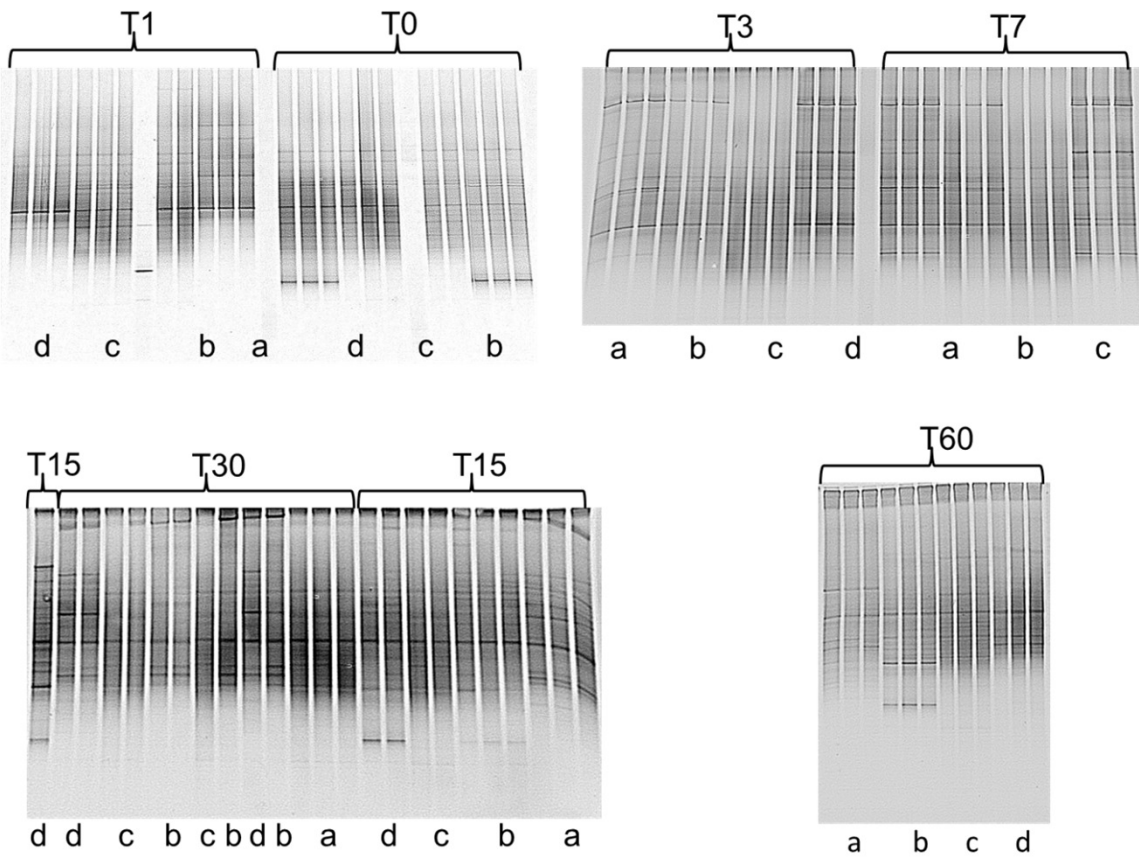
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A



B



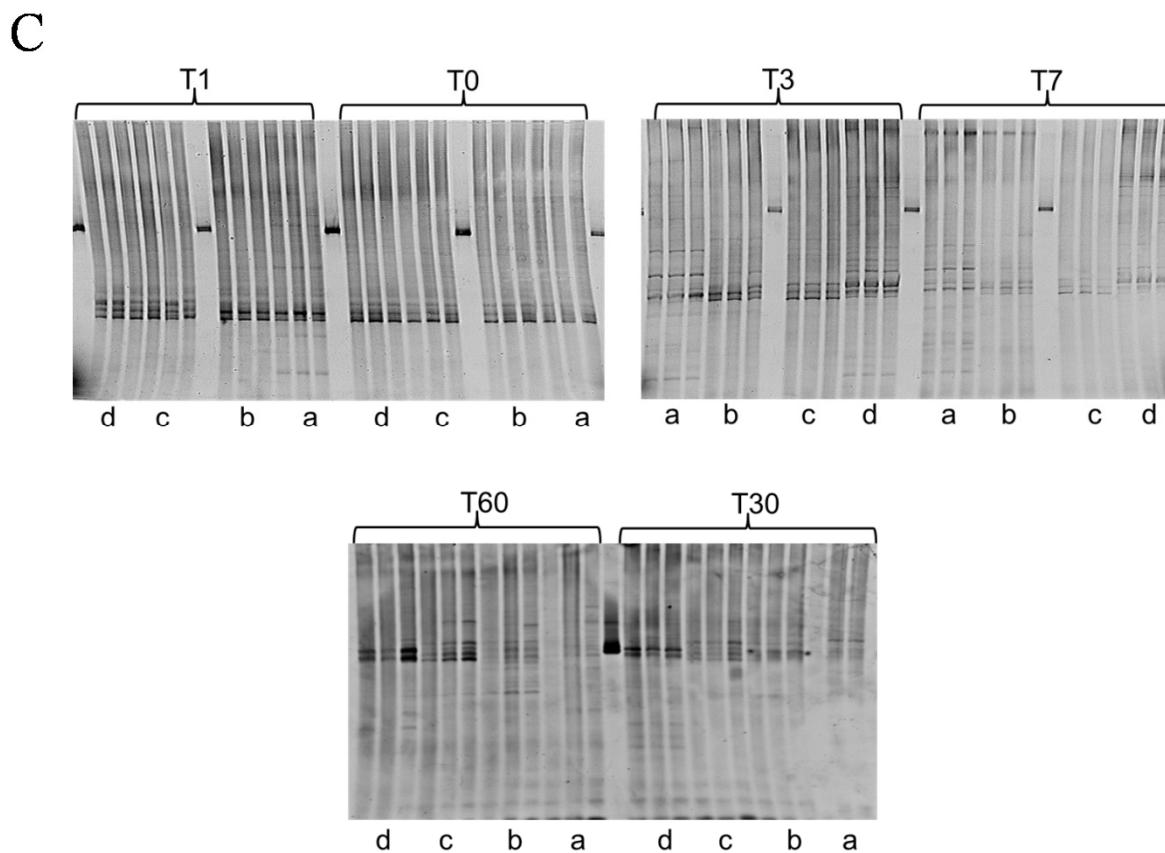


Figure S1. (A) 16S rRNA (B) actinobacterial 16S rRNA (C) *chiA* gene-based denaturing gradient gel electrophoresis profiles. Replicates are indicated by the same letter: a – soil pH 8.7 with chitin, b- soil pH 8.7 without chitin, c- soil pH 5.7 without chitin, d- soil pH 5.7 with chitin. Day of sampling in indicated above photos.

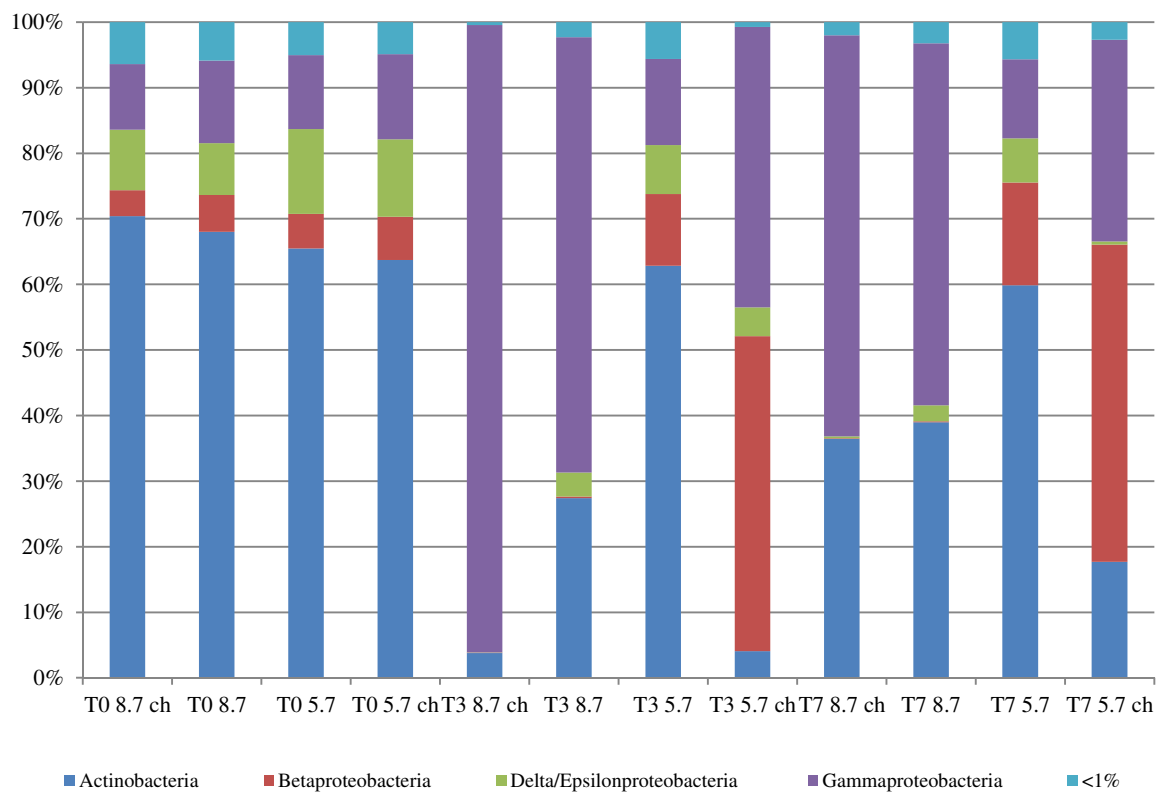


Figure S2. Comparison of *chiA* gene diversity between the different sampling points. Stacked column graph represents the relative distribution of the *chiA* genes affiliated with different bacterial phyla based on BLASTP analysis. All calculations were performed on normalized data. Relative abundance was calculated as a ration between sequence type aundance and total number of sequences in the group.

Table S1. Chitinases identified in as the best blastp hit in de dataset. Species affiliation, chitinase accession number, number of OTUs having certain chitinase as the best hit, The range of the identity of OUT representing sequence. All calculations were performed on normalized data. Relative abundance was calculated as a ration between sequence type aundance and total number of sequences in the group.

Best hit	Accession number	OUTs Nr	Highest score	Lowest score
<i>Janthinobacterium lividum</i>	AAA83223	48	99	59
<i>Stenotrophomonas maltophilia</i>	AAB70917	285	100	64
<i>Doohwaniella chitinasigens</i>	AAF21468	6	65	56
<i>Streptomyces fradiae</i>	AAQ94055	16	83	71
<i>Streptomyces griseobrunneus</i>	AAT67213	28	96	64
<i>Lysobacter enzymogenes</i>	AAT77163	25	85	64
<i>Lysobacter enzymogenes</i>	ABI63600	80	89	63
<i>Stenotrophomonas maltophilia R551-3</i>	ACF50247	89	100	67
<i>Streptosporangium roseum DSM 43021</i>	ACZ89829	162	100	65
<i>Kribbella flavida DSM 17836</i>	ADB30382	19	88	58
<i>Kribbella flavida DSM 17836</i>	ADB33963	78	91	64
<i>Isoptericola jiangsuensis</i>	ADD17351	63	81	61
<i>Thermobispora bispora DSM 43833</i>	ADG89561	23	96	68
<i>Streptomyces bingchenggensis BCW-1</i>	ADI05425	68	92	65
<i>Amycolatopsis mediterranei U32</i>	ADJ42100	125	95	65
<i>Amycolatopsis mediterranei U32</i>	ADJ44263	136	94	66
<i>Micromonospora aurantiaca ATCC 27029</i>	ADL48027	102	93	65
<i>Stigmatella aurantiaca DW4/3-1</i>	ADO72547	56	90	67
<i>Micromonospora sp. L5</i>	ADU09300	68	86	65
<i>Cellulomonas fimi ATCC 484</i>	AEE47275	41	86	61
<i>Streptomyces sp. AJ9463</i>	BAE47186	30	88	67

<i>Saccharopolyspora erythraea</i> NRRL 2338	CAM05726	4	62	58
<i>Stenotrophomonas maltophilia</i> K279a	CAQ44264	118	100	66
<i>Streptomyces scabiei</i> 87.22	CBG69972	64	92	67
<i>Streptomyces avermitilis</i> MA-4680	NP_824054	190	95	64
<i>Streptomyces avermitilis</i> MA-4680	NP_828094	71	96	68
<i>Myxococcus fulvus</i> HW-1	AEI66376	9	84	65
<i>Streptosporangium roseum</i> DSM 43021	ACZ85265	31	100	61
<i>Cellulomonas</i> sp. GM13	AAF00931	52	66	52

Table S2. Mean (standard deviation) *chiA*-types abundance in microcosm experiment.

Row Labels	T0 pH5.7 chitin	T0 pH8.7 chitin	T0 pH8.7	T0 pH5.7	T3 pH5.7 chitin	T3 pH8.7 chitin	T3 pH8.7	T3 pH5.7	T7 pH5.7 chitin	T7 pH8.7 chitin	T7 pH8.7	T7 pH5.7
<i>Janthinoba</i> <i>cterium</i> <i>lividum</i> AAA83223	0.44 (0.06)	0.5 (0.56)	0.92 (1.15)	0.32 (0.09)	47.88 (3.22)	0.01 (0.01)	0.08 (0.09)	0.91 (0.42)	50.59 (6.21)	0.05 (0.02)	0.07 (0.06)	1.7 (1.29)
<i>Stenotropho</i> <i>monas</i> <i>maltophilia</i> AAB70917	1.62 (0.5)	1.3 (0.32)	2.05 (1.03)	1.5 (0.15)	5.99 (1.52)	43.53 (9.91)	38.44 (5.3)	1.58 (0.55)	4.65 (0.89)	38.17 (7.19)	35.71 (11.75)	1.43 (0.17)
<i>Cellulomon</i> <i>as</i> sp. GM13	2.56 (0.19)	3.38 (0.87)	3.41 (0.47)	2.48 (0.42)	0.18 (0.08)	0.21 (0.04)	2.83 (2.77)	2.04 (0.39)	0.18 (0.01)	0.44 (0.02)	2.29 (0.74)	2.06 (0.48)
AAF00931 <i>Doohwaniel</i> <i>la</i> <i>chitinasi</i> <i>gen</i> <i>s</i> AAF21468	6.07 (1.23)	3.41 (1.27)	4.63 (1.62)	5.06 (0.86)	0.33 (0.14)	0.01 (0.01)	0.13 (0.08)	10.13 (2.27)	0.17 (0.09)	0.01 (0.01)	0.11 (0.06)	13.9 (3.02)
<i>Streptomyce</i> <i>s</i> <i>fradiae</i> AAQ94055	1.54 (2.42)	0.22 (0.13)	0.27 (0.26)	0.18 (0.16)	0.03 (0.01)	0.01 (0)	0.06 (0.06)	0.09 (0.07)	0.1 (0.04)	0.15 (0.2)	0.11 (0.09)	0.09 (0.05)
<i>Streptomyce</i> <i>s</i> <i>griseobrunn</i> <i>eus</i> AAT67213	0.02 (0.04)	0.23 (0.09)	0.15 (0.15)	0.17 (0.03)	0.01 (0.01)	0.14 (0.11)	0.11 (0.04)	0.07 (0.04)	0.37 (0.25)	1.14 (0.44)	0.1 (0.03)	0.2 (0.17)
<i>Lysobacter</i> <i>enzymogene</i> <i>s</i> AAT77163	2.47 (0.4)	1.59 (0.38)	2.11 (0.23)	2.03 (0.26)	0.81 (0.3)	1.23 (0.63)	7.62 (3.33)	2.13 (0.15)	1.59 (0.27)	2.43 (1.15)	10 (6.32)	1.86 (0.15)
<i>Lysobacter</i> <i>enzymogene</i> <i>s</i> ABI63600	8.65 (1.05)	5.95 (0.96)	7.56 (1.59)	7.48 (1.01)	0.54 (0.12)	0.07 (0.02)	4.34 (4.72)	9.01 (0.69)	0.86 (0.21)	0.13 (0.03)	1.07 (0.27)	8.58 (1.11)
<i>Stenotropho</i> <i>monas</i> <i>maltophilia</i> R551-3	0.05 (0.02)	0.31 (0.44)	0.18 (0.12)	0.05 (0.02)	4.82 (0.86)	6.6 (1.41)	2.05 (0.84)	0.06 (0.03)	3.3 (1.66)	3.19 (1.09)	1.12 (0.08)	0.06 (0.06)
ACF50247 <i>Streptospor</i> <i>angium</i> <i>roseum</i> DSM 43021	1.47 (0.78)	0.84 (0.3)	0.87 (0.24)	1.14 (0.17)	0.05 (0.03)	0.02 (0.02)	0.82 (0.21)	1.83 (0.34)	0.04 (0.02)	0.14 (0.02)	1.36 (0.47)	2.11 (0.28)
ACZ85265 <i>Streptospor</i> <i>angium</i> <i>roseum</i> DSM 43021	3.88 (0.33)	5.32 (1.49)	4.11 (0.34)	4.53 (0.62)	0.37 (0.12)	0.18 (0.07)	1.56 (0.66)	3.55 (0.25)	2.84 (0.08)	0.24 (0.08)	1.86 (0.28)	3.39 (0.52)
ACZ89829 <i>Kribbella</i> <i>flavida</i> DSM 17836	3.36 (0.94)	2.82 (1.7)	2.34 (0.08)	2.41 (0.99)	0.17 (0.03)	0.05 (0.03)	1.14 (0.67)	2.49 (0.31)	0.48 (0.26)	0.13 (0.1)	1.47 (0.66)	2.22 (0.55)
ADB30382 <i>Kribbella</i> <i>flavida</i> DSM 17836	5.89 (0.86)	8.14 (0.76)	5.67 (1)	6.07 (0.67)	0.27 (0.11)	0.28 (0.29)	3.08 (0.09)	5.66 (0.88)	0.15 (0.08)	0.36 (0.1)	4.07 (0.68)	5.69 (1.11)
ADB33963 <i>Isoptericola</i> <i>jiangsuensis</i> ADD17351	0.06 (0.06)	0.22 (0.11)	0.24 (0.14)	0.09 (0.07)	1.04 (0.51)	0.86 (0.06)	0.16 (0.06)	0.09 (0.01)	7.77 (1.19)	29.66 (1.47)	0.27 (0.11)	0.1 (0.03)

<i>Thermobispora bispora</i> DSM 43833 ADG89561	0.35 (0.19)	0.6 (0.36)	0.31 (0.15)	0.36 (0.03)	0 (0)	0 (0)	0.16 (0.04)	0.22 (0.06)	0 (0.01)	0.02 (0.01)	0.27 (0.11)	0.38 (0.09)
<i>Streptomyces bingchenggensis</i> BCW-1 ADI05425	2.07 (0.31)	1.9 (0.23)	2.21 (0.72)	2.15 (0.7)	0.13 (0.02)	0.13 (0.09)	0.87 (0.27)	3.65 (2.69)	0.18 (0.07)	0.16 (0.05)	1.21 (0.13)	2.28 (0.84)
<i>Amycolatopsis mediterranea</i> U32 ADJ42100	6.64 (0.96)	7.01 (0.5)	8.09 (0.79)	8.25 (2.38)	0.23 (0.02)	0.23 (0.07)	2.47 (0.78)	6.92 (0.71)	0.4 (0.23)	0.48 (0.03)	3.61 (0.39)	6.97 (1.11)
<i>Amycolatopsis mediterranea</i> U32 ADJ44263	5.34 (0.75)	8.93 (1.12)	7.84 (1)	6.37 (2.2)	0.11 (0.05)	0.2 (0.09)	2.34 (0.29)	4.93 (0.25)	0.29 (0.22)	0.38 (0.09)	3.56 (0.43)	4.41 (0.8)
<i>Streptomyces avermitilis</i> MA-4680 NP_824054	12.19 (2.31)	10.12 (1.94)	12.47 (0.81)	11.33 (0.8)	0.53 (0.14)	0.41 (0.22)	4.25 (0.24)	12.78 (1.33)	0.83 (0.19)	0.78 (0.08)	7 (0.48)	12.63 (1.42)
<i>Streptomyces avermitilis</i> MA-4680 NP_828094	5.29 (0.7)	4.58 (1.14)	5.32 (0.83)	5.81 (0.75)	0.09 (0.02)	0.16 (0.07)	1.78 (0.77)	4.51 (0.63)	0.11 (0.04)	0.19 (0.1)	2.7 (0.52)	3.91 (0.28)
<i>Saccharopolyspora erythraea</i> NRRL 2338 CAM05726	1.61 (0.69)	2.11 (0.64)	1.61 (0.24)	1.17 (0.24)	0.02 (0.02)	0.02 (0.01)	0.57 (0.06)	1.23 (0.49)	0.06 (0.02)	0.09 (0.06)	1.07 (0.32)	1.36 (0.29)
<i>Stenotrophomonas maltophilia</i> K279a CAQ44264	0.25 (0.14)	0.54 (0.15)	0.65 (0.44)	0.24 (0.24)	30.71 (6.48)	44.42 (9.06)	13.91 (5.55)	0.34 (0.26)	19.28 (3.93)	17.9 (5.18)	6.92 (0.94)	0.2 (0.11)
<i>Streptomyces scabiei</i> 87.22 CBG69972	2.32 (0.17)	2.13 (0.41)	2.64 (0.1)	2.23 (0.69)	0.18 (0.03)	0.34 (0.13)	0.92 (0.06)	3.18 (0.54)	1 (0.41)	0.56 (0.12)	1.7 (0.38)	2.48 (0.43)
<i>Micromonospora aurantiaca</i> ATCC 27029 ADL48027	3.1 (0.36)	4.36 (0.95)	3.47 (1.04)	2.33 (0.87)	0.11 (0.04)	0.1 (0.07)	1.27 (0.16)	2.53 (0.33)	0.28 (0.13)	0.33 (0.08)	2.21 (0.44)	2.76 (0.61)
<i>Stigmatella aurantiaca</i> DW4/3-1 ADO72547	11 (6.98)	7.41 (2.2)	7.31 (1.18)	12.07 (5.06)	3.94 (2.74)	0.05 (0.02)	3.48 (2.65)	7.13 (5.22)	0.4 (0.15)	0.38 (0.26)	1.93 (0.45)	6.08 (4.95)
<i>Micromonospora</i> sp. L5 ADU09300	3.01 (1.17)	4.89 (0.68)	4.43 (0.43)	3.92 (1.38)	0.11 (0.05)	0.08 (0.07)	1.55 (0.59)	3.46 (0.39)	0.2 (0.04)	0.27 (0.07)	2.44 (0.77)	3.87 (0.9)
<i>Cellulomonas fimi</i> ATCC 484 AEE47275	1.62 (0.71)	1.45 (0.43)	1.63 (0.29)	2.82 (2)	0.05 (0.04)	0.05 (0.03)	1.1 (0.37)	1.96 (0.52)	0.04 (0.02)	0.06 (0.06)	1.24 (0.04)	2.14 (1.47)
<i>Myxococcus fulvus</i> HW-1 AEI66376	0.58 (0.6)	0.61 (0.26)	0.65 (0.37)	1.54 (1.41)	0.17 (0.1)	0 (0)	0.19 (0.07)	0.21 (0.27)	0.01 (0.01)	0.04 (0.04)	0.5 (0.26)	0.34 (0.16)
<i>Streptomyces</i> sp. AJ9463 BAE47186	1.67 (0.73)	1.02 (0.8)	1 (0.26)	0.87 (0.32)	0.39 (0.15)	0.18 (0.04)	0.4 (0.18)	1.61 (0.44)	1.36 (0.66)	0.27 (0.18)	0.75 (0.29)	1.16 (0.21)