

Supplementary materials

Table S1: Pretreatment data

Content: Ammonium concentration data collected during the Pretreatment.

Pretreatment	Day	NH4
C	0	13.1
C	0	19.8
C	0	7.3
E	0	30.6
E	0	31.3
E	0	12.7
L	0	50
L	0	47.7
L	0	31.3
EL	0	48.8
EL	0	50
EL	0	50
C	5	64
C	5	83.6
C	5	80.6
E	5	82
E	5	58
E	5	84.8
L	5	72.4
L	5	48.4
L	5	74.6
EL	5	66.8
EL	5	74.4
EL	5	65.4
C	20	62.4
C	20	45.3
C	20	51
E	20	45
E	20	45.6
E	20	51.6
L	20	72.7
L	20	46.2
L	20	58.2
EL	20	46.5
EL	20	63.6
EL	20	62.7
C	41	42
C	41	45
C	41	34
E	41	200

E	41	196
E	41	221
L	41	72
L	41	56
L	41	58
EL	41	217
EL	41	212
EL	41	234

Table S2: Treatment data

Content: Ammonium concentration and CFU count data collected during the Treatment.

Treatment	Day	UFC	NH4
C	0	2.3	22
C	0	1.3	22
C	0	2.3	4
E	0	10	64
E	0	30	65
E	0	30	64
L	0	1.7	15
L	0	2.7	1
L	0	2	2
EL	0	10	45
EL	0	11	64
EL	0	10	44
CE	0	3.3	6
CE	0	2	1
CE	0	2.3	1
C	9	3.3	50
C	9	4.33	43
C	9	5	36
E	9	20	84
E	9	33	81
E	9	37	70
L	9	3	31
L	9	3.3	29
L	9	1.3	34
EL	9	30	71
EL	9	20	73
EL	9	33	80
CE	9	2	21
CE	9	1.66	20
CE	9	2.3	18
C	22	7.33	26
C	22	10	26

C	22	4.33	27
E	22	20	125
E	22	16.6	170
E	22	30	162
L	22	2.33	73
L	22	2	74
L	22	3.66	78
EL	22	13	79
EL	22	10	74
EL	22	10	72
CE	22	2.66	70
CE	22	3	76
CE	22	2.3	47
C	36	30	37
C	36	26.6	29
C	36	33	36
E	36	66.6	54
E	36	36.6	55
E	36	40	61
L	36	66.6	24
L	36	13.3	24
L	36	20	27
EL	36	23.3	53
EL	36	23.3	54
EL	36	26.6	47
CE	36	20	39
CE	36	10	32
CE	36	20	49
C	52	11	36
C	52	20	41
C	52	16.6	47
E	52	20	25
E	52	16.6	25
E	52	20	21
L	52	33	42
L	52	16.6	43
L	52	20	45
EL	52	16.6	20
EL	52	10	23
EL	52	30	20
CE	52	100	41
CE	52	200	31
CE	52	130	29

Annex S3: Ammonium concentration Pretreatment Statistical Analysis

Content: Statistical analysis results (Shapiro-wilk normality test + Kruskal-wallis test) for Ammonium concentration data collected during the Pretreatment.

day 0 Pretreatment Shapiro-wilk normality test

w = 0.85817, p-value = 0.04638

day 0 Pretreatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 8.7817, df = 3, p-value = 0.03234

day 5 Pretreatment Shapiro-wilk normality test

w = 0.94142, p-value = 0.5166

day 5 Pretreatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 1.6667, df = 3, p-value = 0.6444

day 20 Pretreatment Shapiro-wilk normality test

w = 0.86825, p-value = 0.06211

day 20 Pretreatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 3.6154, df = 3, p-value = 0.3061

day 41 Pretreatment Shapiro-wilk normality test

w = 0.77995, p-value = 0.005593

day 41 Pretreatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 9.6667, df = 3, p-value = 0.02162

Annex S4: Ammonium concentration Treatment Statistical Analysis

Content: Statistical analysis results (Shapiro-wilk normality test + Kruskal-wallis test) for Ammonium concentration data collected during the Treatment.

day 0 Treatment Shapiro-wilk normality test

w = 0.81907, p-value = 0.006527

day 0 Treatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 12.027, df = 4, p-value = 0.01715

day 9 Treatment Shapiro-wilk normality test

w = 0.88207, p-value = 0.05095

day 9 Treatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 12.9, df = 4, p-value = 0.01177

Day 22 Treatment Shapiro-wilk normality test

w = 0.84958, p-value = 0.01713

day 22 Treatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 11.466, df = 4, p-value = 0.0218

Day 36 Treatment Shapiro-wilk normality test

w = 0.91873, p-value = 0.1842

day 36 Treatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 12.587, df = 4, p-value = 0.01348

Day 52 Treatment Shapiro-wilk normality test

w = 0.8895, p-value = 0.06589

day 52 Treatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 12.174, df = 4, p-value = 0.01611

Annex S5: CFU Treatment Statistical Analysis

Content: Statistical analysis results (Shapiro-wilk normality test + Kruskal-wallis test) for CFU count data collected during the Pretreatment.

day 0 Treatment Shapiro-wilk normality test

w = 0.85854, p-value = 0.02299

day 0 Treatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 10.835, df = 4, p-value = 0.02848

day 9 Treatment Shapiro-wilk normality test

w = 0.85923, p-value = 0.02353

day 9 Treatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 12.174, df = 4, p-value = 0.01611

Day 22 Treatment Shapiro-wilk normality test

w = 0.92724, p-value = 0.2481

day 22 Treatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 12.657, df = 4, p-value = 0.01308

Day 36 Treatment Shapiro-wilk normality test

w = 0.95928, p-value = 0.6798

day 36 Treatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 8.6751, df = 4, p-value = 0.06975

Day 52 Treatment Shapiro-wilk normality test

w = 0.81079, p-value = 0.005073

day 52 Treatment Kruskal-wallis Test

Kruskal-wallis chi-squared = 8.0975, df = 4, p-value = 0.08807

Annex S6: Main blast results for amoAamb primers

Content: 100% alignment blast results for ammonia oxidizing beta proteobacteria amoA primer.

Uncultured ammonia-oxidizing beta proteobacterium various clones Ssedi# ammonia monooxygenase subunit A (amoA) gene, partial cds

Uncultured ammonia-oxidizing beta proteobacterium various clones S12m-# ammonia monooxygenase subunit A (amoA) gene, partial cds

Uncultured ammonia-oxidizing beta proteobacterium various clones Psedi-# ammonia monooxygenase subunit A (amoA) gene, partial cds

Uncultured ammonia-oxidizing beta proteobacterium various clones P7m-# ammonia monooxygenase subunit A (amoA) gene, partial cds

Annex S7: Main blast results for amoAput primers

Content: 100% alignment blast results for putative amoA primer

Lysinibacillus sphaericus strain 2362

Lysinibacillus sphaericus strain III(3)7

Lysinibacillus sphaericus strain OT4b.25

Lysinibacillus fusiformis strain RB-21

Lysinibacillus sphaericus strain C3-41

Figure S8: *Lysinibacillus sphaericus* culture from soil (left) and worm tissue (right) samples.

Content: Cell culture from soil sample (left) and worm tissue (right) suggesting *L. sphaericus* sporulation inside worm's gut.

