Table S1 Major topological properties of the co-occurrence network of microbiome in rhizosphere of cucumber.

Groups	Treatments	Nodes	Nodes connected with *Strep.*	Number of Links	ND (Network diameter)	MD (modularity)	CC (Clustering coefficient)	GD (Graph density)	AD (Average degree)	APL (Average path length)
Bacteria	Control	296	20	2342	4	0.484	0.318	0.054	15.824	2.641
	With *Strep.*	313	41	3536	4	0.441	0.350	0.066	15.525	2.525
Fungi	Control	62	1	405	5	0.218	0.526	0.214	13.065	2.26
	With *Strep.*	69	4	399	6	0.285	0.462	0.170	11.565	2.498

Table S2 Biomass of cucumber after the inoculation with *Streptomyces* Act12[1]

Inoculation	Concentration g kg^{-1} soil	Biomass in 20th d g plant[-1]		Biomass in 45th d g plant[-1]	
		Mean	⊿Ctrl%	Mean	⊿Ctrl%
CK		13.91±0.94ab	-	19.28±0.73ab	-
Act12[2]	1.0	16.87±2.62a	21.2	21.79±3.58a	13.0
	1.5	16.53±3.04a	18.8	22.47±1.67a	16.5
	2.0	15.24±1.93a	9.6	19.69±1.65ab	2.1
HK[3]		10.13±1.31c	-	19.90±1.19bc	-
Act12+HK	1.0	15.38±2.47b	51.9	19.77±0.67c	-0.6
	1.5	18.12±1.37ab	78.9	25.60±4.32a	28.6
	2.0	18.95±1.52a	87.0	23.71±0.66ab	19.2

[1] Three duplicates were set up in a pot experiment planting with cucumber, control was treated without *Streptomyces*. Values are means ± standard deviation (*n* = 3). Different letters indicate statistically significant difference between the control and *Streptomyces* treatments, at the level of $P < 0.05$.

[2] The *Streptomyces bio-agent* was $2.59×10^{11}$ CFU·g^{-1}.

[3] HK represents inoculated with pathogens *F. oxysporum* with concentration of 10^2 CFU·g^{-1} soil.

Table S3 Root weight and length of cucumber after the inoculation with *Streptomyces* Act12[1]

Inoculation	Concentration g kg⁻¹ soil	Root weight in 20th d g plant⁻¹		Root weight in 45th d g plant⁻¹		Root length in 45th d cm	
		Mean	⊿Ctrl%	Mean	⊿ Ctrl	Mean	⊿ Ctrl
CK		0.55±0.15b	-	1.70±0.17b	-	7.94±0.55b	-
Act12[2]	1.0	1.42±0.22a	157.7	2.09±0.33a	22.9	12.45±0.56a	56.8
	1.5	1.79±0.35a	225.0	1.95±0.09ab	14.4	12.49±0.99a	57.3
	2.0	0.91±0.07b	66.1	1.78±0.14ab	4.4	13.02±0.77a	63.9
HK[3]		0.79±0.28c	-	1.59±0.17a	-	6.90±0.97c	-
Act12+HK	1.0	1.34±0.37b	69.6	1.85±0.02a	16.6	12.04±1.93bc	74.6
	1.5	1.70±0.3ab	114.6	2.08±0.3a	30.6	18.12±0.29a	162.
	2.0	1.96±0.36a	147.5	1.73±0.43a	9.0	14.49±2.32b	110.

[1] Three duplicates were set up in a pot experiment planting with cucumber, control was treated without *Streptomyces*. Values are means ± standard deviation (n = 3). Different letters indicate statistically significant difference between the control and *Streptomyces* treatments, at the level of $P < 0.05$.

[2] The *Streptomyces bio-agent* was 2.59×10^{11} CFU·g⁻¹.

[3] HK represents inoculated with pathogens *F. oxysporum* with concentration of 10^2 CFU·g⁻¹ soil.

Table S4 Root activity after the inoculation with *Streptomyces* Act12[1]

Inoculation	Concentration g kg⁻¹ soil	Root activity in 20th d g·g⁻¹·h⁻¹		Root activity in 45th d g·g⁻¹·h⁻¹	
		Mean	⊿Ctrl%	Mean	⊿Ctrl%
CK		0.12±0.03d	-	0.07±0.03a	-
Act12[2]	1.0	1.01±0.13a	741.6	0.08±0.03a	17.1
	1.5	0.70±0.02b	482.0	0.07±0.03a	-5.9
	2.0	0.26±0.01c	114.3	0.05±0.02a	-23.1
HK[3]		0.15±0.06d	-	0.07±0.02b	-
Act12+HK	1.0	0.69±0.00ab	362.0	0.18±0.01a	161.0
	1.5	0.80±0.04a	433.4	0.09±0.03b	32.3
	2.0	0.50±0.00bc	232.8	0.07±0.01b	0.5

[1] Three duplicates were set up in a pot experiment planting with cucumber, control was treated without *Streptomyces*. Values are means ± standard deviation (n = 3). Different letters indicate statistically significant difference between the control and *Streptomyces* treatments, at the level of $P < 0.05$.

[2] The *Streptomyces bio-agent* was $2.59×10^{11}$ CFU·g⁻¹.

[3] HK represents inoculated with pathogens *F. oxysporum* with concentration of 10^2 CFU·g⁻¹ soil.

Table S5 Leaf area and SPAD after the inoculation with *Streptomyces* Act12[1] in the 45th day.

Inoculation	Concentration g kg⁻¹ soil	Leaf area cm²		SPAD	
		Mean	⊿Ctrl%	Mean	⊿Ctrl%
CK		53.08±9.15b	-	39.74±1.96a	-
Act12[2]	1.0	77.33±7.97a	45.7	43.38±5.02a	9.2
	1.5	77.13±12.34a	45.3	41.58±4.11a	4.6
	2.0	62.18±4.10b	17.1	41.01±2.54a	3.2
HK[3]		54.97±4.15c	-	38.37±3.85a	-
Act12+HK	1.0	64.54±5.29bc	17.4	40.34±2.51a	5.1
	1.5	82.45±16.29a	50.0	41.34±2.28a	7.7
	2.0	73.67±3.09ab	34.0	40.96±2.17a	6.8

[1] Three duplicates were set up in a pot experiment planting with cucumber, control was treated without *Streptomyces*. Values are means ± standard deviation (n = 3). Different letters indicate statistically significant difference between the control and *Streptomyces* treatments, at the level of $P < 0.05$.

[2] The *Streptomyces bio-agent* was 2.59×10^{11} CFU·g⁻¹.

[3] HK represents inoculated with pathogens *F. oxysporum* with concentration of 10^2 CFU·g⁻¹ soil.
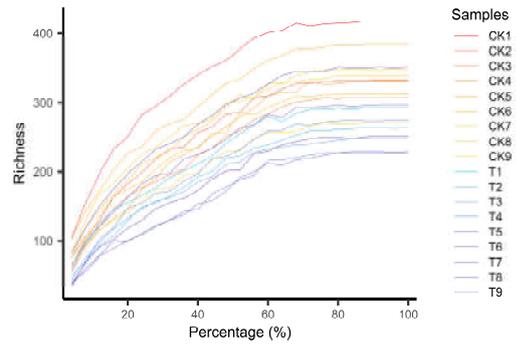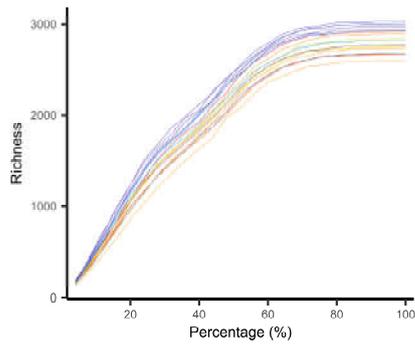
Figure S1. The rarefaction curve by each samples of the rhizosphere microbiome associated with cucumber plants in *Streptomyces*-inoculated soil (T) and uninoculated control soil (CK) *Streptomyces*. (a) The rarefaction curves of bacteria; (b) the rarefaction curves of fungi.