



Supplement of

Fertilizer regimes reshape microbial interaction networks without altering sugarcane rhizosphere diversity

Leonardo Zamora-Leiva et al.

Correspondence to: Manuel Paneque (mpaneque@uchile.cl)

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Supplementary Tables

Table S1. Yield of culture sites of long-term fertilization trial at the Sugar Cane Research Institute in Santiago de Cuba.

Site code	Fertilization regime	Respiration	P2O5 (mg/100g)	K2O (mg/100g)	Ca + Mg (cmol(+)/kg)	Yield of site (Ton/ha)
Blank	Bulk soil (no rhizosphere)	1654.73 ± 3.68 ef	80.59 ± 2.46 de	32.76 ± 0.36 b	60.73 ± 0.21 f	N/A
Control	Rhizosphere (no fertilization)	1912.81 ± 1.34 bc	66.19 ± 4.37 e	32.28 ± 2.20 b	60.77 ± 0.25 f	76.2
N0	N ₀ P ₂₅ K ₅₀	1931.86 ± 1.39 bc	81.28 ± 10.71 de	33.42 ± 4.40 b	67.08 ± 0.32 d	95.9
N1	N ₅₀ P ₂₅ K ₅₀	1829.36 ± 140.48 cd	93.15 ± 5.54 cd	39.76 ± 3.94 b	69.89 ± 0.18 b	96.5
N2	N ₁₀₀ P ₂₅ K ₅₀	2076.03 ± 0.81 a	94.27 ± 6.66 cd	30.07 ± 6.59 b	66.96 ± 0.03 d	95.3
N3	N ₁₅₀ P ₂₅ K ₅₀	2098.90 ± 1.25 a	65.47 ± 2.88 e	31.08 ± 2.40 b	62.78 ± 0.19 e	82.5
N4	N ₂₀₀ P ₂₅ K ₅₀	1914.10 ± 0.52 bc	109.82 ± 2.42 abc	33.55 ± 4.06 b	63.11 ± 0.21 e	83.5
N5	N ₅₀ P ₀ K ₀	1991.04 ± 1.56 ab	83.64 ± 14.63 de	29.76 ± 1.62 b	63.21 ± 0.13 e	87.7
P1	N ₅₀ P ₇₅ K ₅₀	1892.36 ± 6.44 bc	85.81 ± 6.81 de	33.05 ± 5.19 b	72.17 ± 0.26 a	97.4
P2	N ₅₀ P ₁₀ K ₅₀	2096.60 ± 1.56 a	122.09 ± 9.66 ab	42.12 ± 2.05 b	60.76 ± 0.01 f	96.3
K1	N ₅₀ P ₂₅ K ₁₀₀	1563.49 ± 1.31 f	101.95 ± 7.16 bcd	41.88 ± 2.46 b	63.29 ± 0.31 e	98.2
K3	N ₅₀ P ₂₅ K ₂₀₀	1745.67 ± 2.26 de	132.85 ± 9.90 a	70.17 ± 19.72 a	72.26 ± 0.17 a	98.8
K4	N ₅₀ P ₂₅ K ₃₀₀	1443.13 ± 2.03 g	97.88 ± 10.48 cd	35.82 ± 3.43 b	68.69 ± 0.22 c	99.6

Values are presented as the mean ± standard deviation (n = 3). Different lowercase letters within the same column indicate statistically significant differences among treatments according to a one-way ANOVA followed by Tukey's HSD post-hoc test (p < 0.05). Means sharing the same letter are not significantly different.

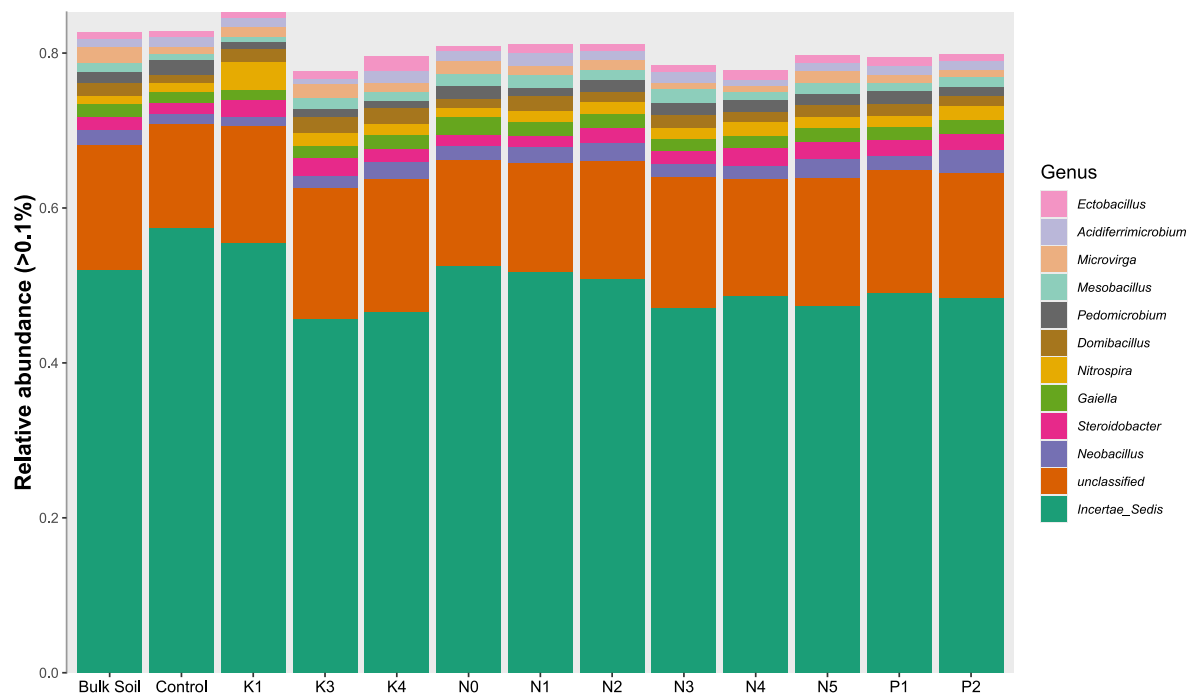


Figure 1S. Bacterial relative relative abundance at the genus level of all genera with relative abundance > 0.1% considering all unclassified and incertae sedis ASVs. Sample abbreviations: K1, medium potassium application; K3, high potassium application; K4, very high potassium application; N0, no-nitrogen application; N1, low nitrogen application; N2, medium nitrogen application; N3, high nitrogen application; N4, very high nitrogen application; N5, only nitrogen application; P1, medium phosphorus application; P2, high phosphorus application.

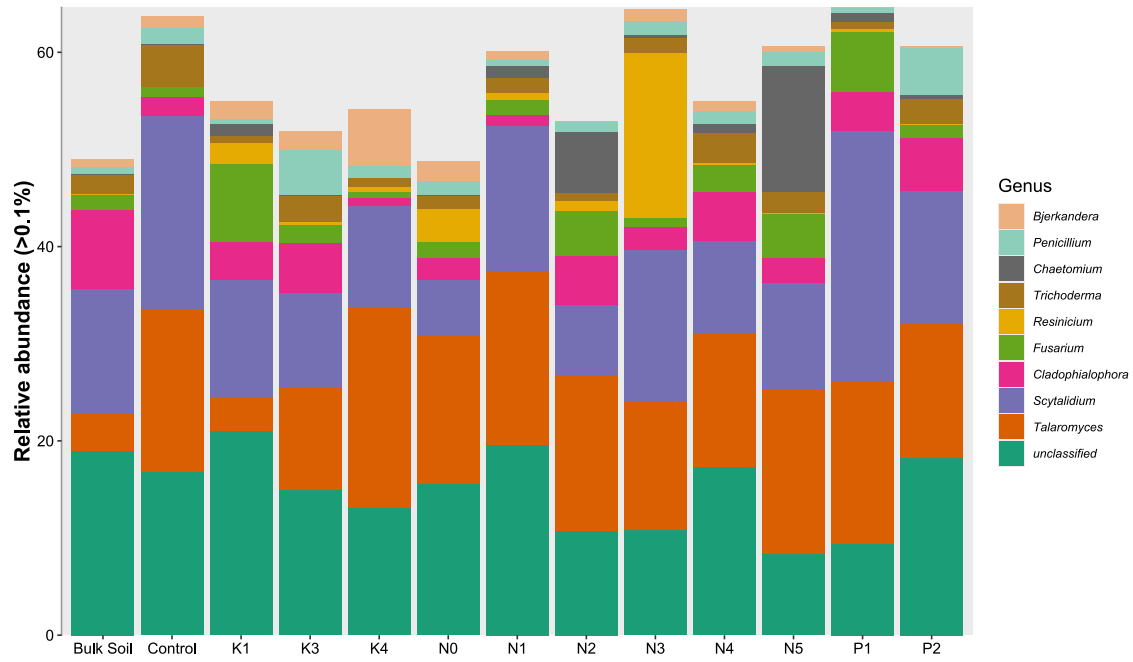


Figure 2S. Fungal relative relative abundance at the genus level of all genera with relative abundance > 0.1% considering all unclassified and incertae sedis ASVs. Sample abbreviations: K1, medium potassium application; K3, high potassium application; K4, very high potassium application; N0, non-nitrogen application; N1, low nitrogen application; N2, medium nitrogen application; N3, high nitrogen application; N4, very high nitrogen application; N5, only nitrogen application; P1, medium phosphorus application; P2, high phosphorus application.

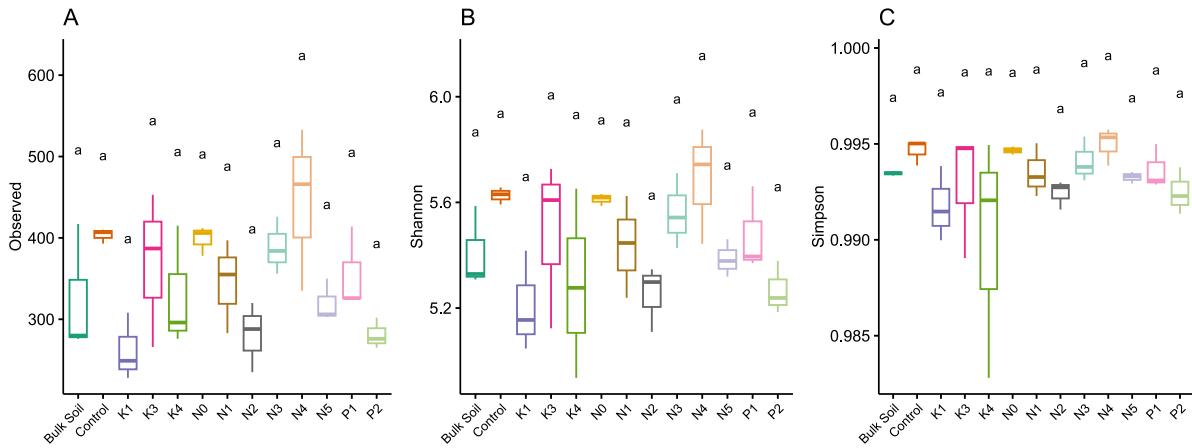


Figure 3S. Bacterial alpha diversity for rhizosphere and soil samples based on four indices (Observed, A; Shannon, B; and Simpson, C). Kruskal–Wallis test, non-significant. Sample abbreviations: K1, medium potassium application; K3, high potassium application; K4, very high potassium application; N0, non-nitrogen application; N1, low nitrogen application; N2, medium nitrogen application; N3, high nitrogen application; N4, very high N application; N5, only nitrogen application; P1, medium phosphorus application; P2, high phosphorus application.

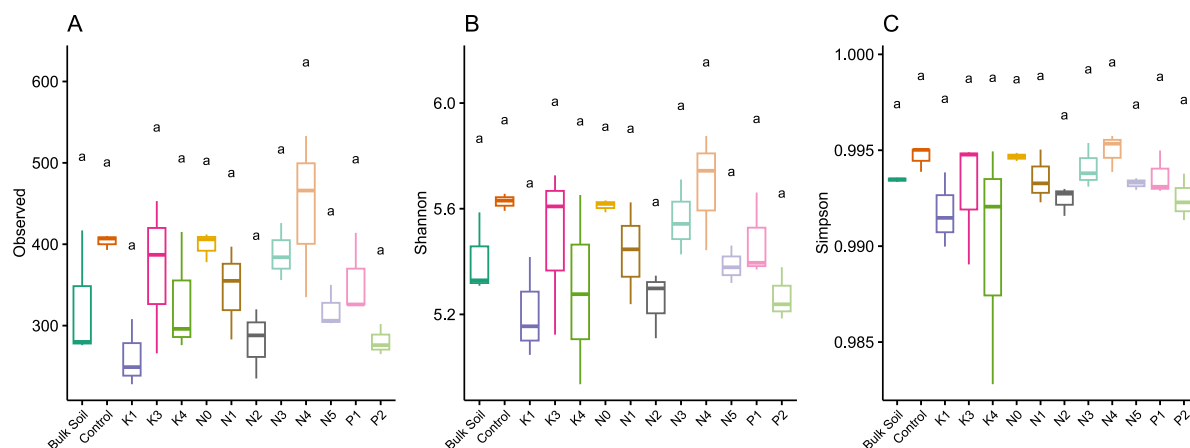


Figure 4S. Fungal alpha diversity for rhizosphere and soil samples based on four indices (Observed, A; Shannon, B; and Simpson, C). Kruskal–Wallis test, non-significant. Sample abbreviations: K1, medium potassium application; K3, high potassium application; K4, very high potassium application; N0, non-nitrogen application; N1, low nitrogen application; N2, medium nitrogen application; N3, high nitrogen application; N4, very high N application; N5, only nitrogen application; P1, medium phosphorus application; P2, high phosphorus application.



Figure 5S. Taxa roles on co-occurrence network of combined bacterial and fungal datasets. Upper panel, Among-module connectivity; lower panel, Within-module connectivity. Bigger figures represent higher relative abundance; shape represents taxa roles: $Z_i \geq 2.5$, module hubs; $P_i \geq 0.62$, connectors; Z_i and $P_i \geq 2.5$, network hubs. Otherwise, they were classified as Peripheral nodes.



Figure 6S. Circular plot of connections between taxa at phylum level.

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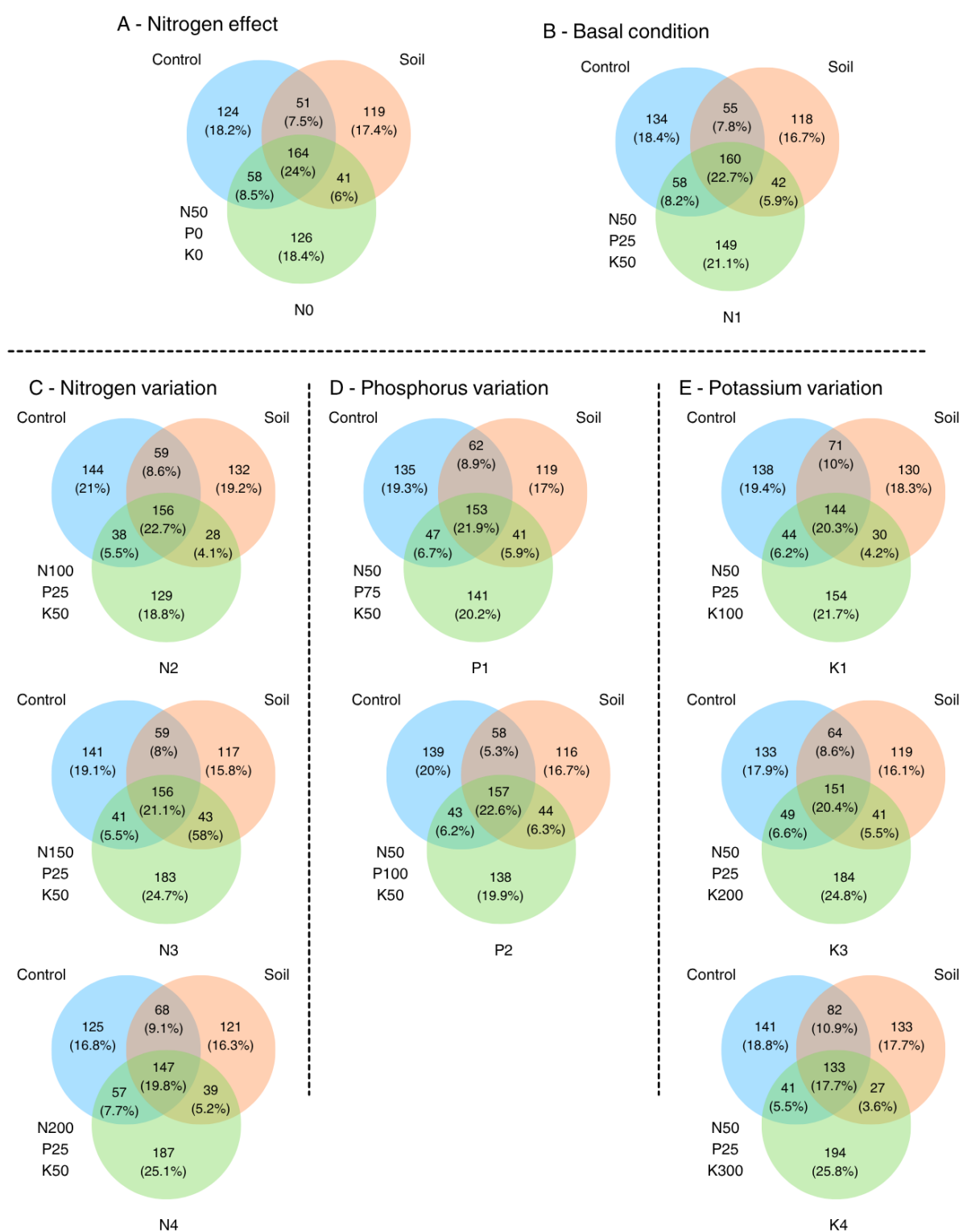


Figure 7S. Venn diagram of shared nodes on ASVs networks of different fertilization regimes vs non-fertilization conditions (Soil and Control Rhizosphere). A) Nitrogen-only effect (N50P0K0); B) Basal condition, N50P25K50 (kg/ha); C) Nitrogen variation (100–200 kg/ha) with phosphorus and potassium identical to basal condition; D) Phosphorus variation (75–100 kg/ha) with nitrogen and potassium identical to basal condition; E) Potassium variation (100–300 kg/ha) with nitrogen and phosphorus identical to basal condition. The number of nodes is represented as a number inside the circle.