

Agronomy Supporting Information

Article title: Endophytic biostimulants for smart agriculture: *Burkholderia seminalis* 869T2 benefits heading leafy vegetables in-field management in Taiwan

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Figure S1. Endophytic biostimulants-treated lettuce phenotypes in the field.

Phenotypes of harvested heads: (a) fresh weight (FW), (b) total soluble sugar (TSS) and (c) starch contents per sample dry weight (DW), (d) hardness, and (e) circumference length (HPD, polar diameter; HED, equatorial diameter); lengths are shown as the mean \pm SEM. $n=3-4$. Different letters indicate statistically significant differences, $p<0.05$.

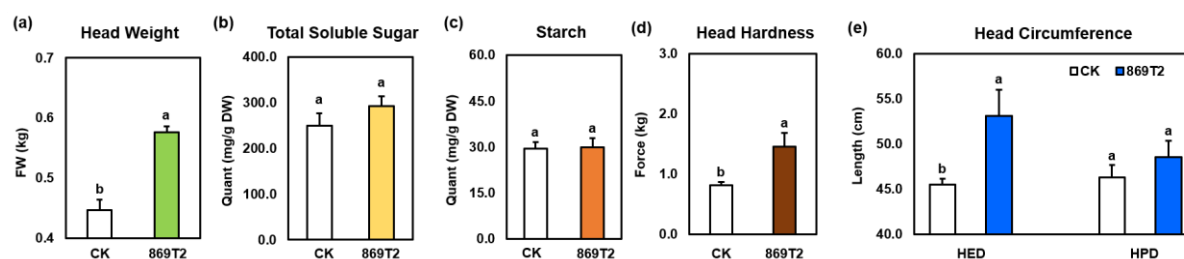


Table S1. The primer pairs used for artificial symbiosis availability checks in this work.

Gene product	Primer pairs	Sequence (5' to 3')	Reference
16S rRNA	E8F	AGAGTTTGATCATGGCTCAG	Baker <i>et al.</i> , 2003
	U1510R	CGGTTACCTTGTTACGACTT	
Pyrrolnitrin	BSPYT_F	TCGATCCGGAAGGCGGGCGGCCTCC	This work
	BSPYT_R	CGGTCGACCCAGCCGCGGTAGAAC	
Pyrroloquinoline quinone (PQQ)	BSPQBCD_F	ATGAAGATCAAGATACTCGGC	This work
	BSPQBCD_R	TCAGTCGAGCCAGCC	

Table S2. Different testing conditions for the best fermentation medium (BFM) evaluation.

Nutrient recipes					
PYGn	Content	Unit	MRSn	Content	Unit
NaHCO ₃	0.4	g/L	Tween 80	1	g/L
NaCl	0.08	g/L	Ammonium citrate	2	g/L
KH ₂ PO ₄	0.04	g/L	CH ₃ COONa	5	g/L
K ₂ HPO ₄	0.04	g/L	K ₂ HPO ₄	2	g/L
MgSO ₄ ·7(H ₂ O)	0.0192	g/L	MgSO ₄ ·7(H ₂ O)	0.1	g/L
CaCl ₂	0.008	g/L	MnSO ₄ ·H ₂ O	0.05	g/L
FeSO ₄ ·7(H ₂ O)	1.1	mg/L			

Carbon and nitrogen sources					
Carbon	Content	Unit	Nitrogen	Content	Unit
Molasses M1	40	g/L	Fish protein F1	20	g/L
Molasses M2	60	g/L	Fish protein F2	40	g/L

Gas conditions			
Aerobic	Ratio	Anaerobic	Ratio
O ₂	same to air	O ₂	0%
CO ₂	same to air	CO ₂	100%

Table S3. Testing combinations for the best fermentation medium (BFM).

Conditions	+ Nutrient	C & N	Gas	- Nutrient	C & N	Gas
	PYGn	M1	Aerobic	--	M1	Aerobic
	MRSn	M2	Anaerobic	--	M2	Anaerobic
		F1			F1	
		F2			F2	
Number of	2	4	2	--	4	2
Combinations			16			8
Total testing combinations = 24						

Table S4. Nutrient element analysis of in-field lettuce treated with a semilarge volume of fermenting endophytic biostimulants.

Targeted Nutrient Elements	Detected Content (%)	
	CK	869T2
Total Nitrogen (N)	2.5±0.05	2.37±0.28
Total Phosphorus (P)	0.589±0.009	0.549±0.041
Total Potassium (K)	4.39±0.21	4.62±0.12
Total Calcium (Ca)	0.361±0.016	0.385±0.003
Total Magnesium (Mg)	0.157±0.005	0.151±0.007
Total Iron (Fe)	0.0054±0.0011	0.0047±0.0032
Each data point is based on two biological replicates and is shown as the mean±SEM.		

Table S5. Nutrient element analysis of in-field lettuce treated with a large volume of fermenting endophytic biostimulants.

Targeted Nutrient Elements	Detected Content (%)			
	CK	250X	500X	1000X
Total Nitrogen (N)	2.6	2.3	2.4	2.1
Total Phosphorus (P)	0.5	0.4	0.5	0.4
Total Potassium (K)	4.7	4.6	4.9	4.2
Total Calcium (Ca)	0.4	0.4	0.4	0.4
Total Magnesium (Mg)	0.2	0.2	0.2	0.2
Total Iron (Fe) [†]	65.2	57.3	90.9	44.5
Total Nitrate (NO ₃ ⁻)	1.23	0.529	0.635	0.657
Total Sulphate (SO ₄ ²⁻)	0.459	0.175	0.220	0.233
[†] The total iron (Fe) content is shown in mg/kg. Each data point is based on triplicate samples.				