

Supplementary Materials: Effects of Compost Amendment on Glycophyte and Halophyte Crops Grown on Saline Soils: Isolation and Characterization of Rhizobacteria with Plant Growth Promoting Features and High Salt Resistance

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Table S1. Physicochemical parameters of soil (mean value \pm standard deviation 3 replicates).

SOIL PARAMETER	
pH	7.33 \pm 0.26
Organic C (g kg ⁻¹)	15.97 \pm 0.53
C (%)	3 \pm 0.1
N (%)	0.14 \pm 0.01
C/N	21.4
CSC (meq/100g)	0.395 \pm 0.001
Organic matter content (g kg ⁻¹)	27.54 \pm 0.90

Table S2. Physical-chemical properties of compost.

Parameter	U.M.	Result	Method
Dry residue at 105 °C	% w/w	66.8	UNI 10780:1998 App. C
Humidity	% w/w	33.2	UNI 10780:1998 App. C
pH	--	8.33	ANPA Man.3:2001. 8
Germination index	%	78.1	UNI 10780:1998 App. K
Organic carbon	% ss	24.3	UNI 10780:1998 App. E
Humic and fulvic carbon	% ss	11.6	ANPA Man.3:2001. 11
Total Nitrogen	% ss	1.8	UNI 10780:1998 App. J.1
Organic nitrogen	%	92.2	ANPA Man.3:2001. 14
Ammonia nitrogen	%	4.4	UNI 10780:1998 App. J.3
NO ₂	% ss	0.11	CNR IRSA 8a Q64 1985
NO ₃	% ss	< 0.01	D.M. 23/03/2000 G.U. n°87 13/04/00
Rate C/N	--	13.5	ANPA Man.3:2001
Pb	mg/kg ss	24	UNI 10780:1998 App. B.3 + EPA 6010 C 2007
Cd	mg/kg ss	< 0.5	UNI 10780:1998 App. B.3 + EPA 6010 C 2007
Ni	mg/kg ss	9	UNI 10780:1998 App. B.3 + EPA 6010 C 2007
Zn	mg/kg ss	91	UNI 10780:1998 App. B.3 + EPA 6010 C 2007
Cu	mg/kg ss	97	UNI 10780:1998 App. B.3 + EPA 6010 C 2007
Hg	mg/kg ss	< 0.1	UNI 10780:1998 App. B.3 + EPA 6010 C 2007
Cr VI	mg/kg ss	< 0.1	UNI 10780:1998 App. B. 4.7

Note S1. CAS agar plates.

Chrome Azurol Sulfate (CAS) agar was prepared from four solutions sterilized separately before mixing. Initially, 60.5 mg CAS was dissolved in 50 mL water and mixed with 10 mL iron (III) solution (1.0 mM FeCl₃·6H₂O, 10 mM HCl). The resulting mixture was added slowly and under constant stirring to 72.9 mg Hexadecyltrimethylammonium bromide (HDTMA) dissolved in 40 mL ultrapure water (solution 1). The solution 2 was prepared by dissolving 30.24 g of piperazine-N,N'-bis(2-ethanesulfonic acid) (PIPES), 0.3 g KH₂PO₄, 0.5 g NaCl, 1 g NH₄Cl and 15 g agar in 750 mL ultrapure water. The pH was adjusted to 6.8 with KOH 12 M solution. Solution 3 was prepared mixing in 70 mL of ultrapure water 2.0 g glucose, 493 mg MgSO₄·7H₂O, 11.0 mg CaCl₂, 1.17 mg MnSO₄, 1.40 mg H₃BO₃. These solutions were sterilized for 20 min at 121 °C. The solution 4 was prepared dissolving 10% casamino acids in 30 mL ultrapure water and filter-sterilized. Finally, all four solutions were mixed and 30 mL per plate were poured in Petri dishes.

Note S2.

- i. *Bacillus licheniformis* is a bacterium commonly found in the soil. It is a Gram-positive, mesophilic bacterium. Its optimal growth temperature is around 50 °C and the optimal temperature for enzyme secretion is 37 °C. High capacity of secretion of the alkaline serine protease has made *B. licheniformis* is one of the most important bacteria in industrial enzyme production.
- ii. *Bacillus halotolerans* belongs to the genus *Brevibacterium*, is a Gram-positive soil bacteria, established in 1953 by Breed with *Bacillus linens* as the type species; it is short, unbranching, rod-shaped bacterial species formerly classified in the genus *Bacterium*.
- iii. *Staphylococcus succinus* subsp. *succinus* is a Gram-positive coccoid bacterium belonging to the genus *Staphylococcus*. The bacillus was isolated from a fragment of Dominican amber dating back about 25 million years. Its growth occurs between 25–40 °C with the optimal temperature at 28 °C. Cells are spherical with diameter 0.6–1.9 µm.
- iv. *Brevibacterium* sp. is a genus of bacteria of the order Actinomycetales. They are Gram-positive soil organisms. It is the sole genus in the family Brevibacteriaceae.
- v. *Halomonas* is a genus of halophilic (salt-tolerating) proteobacteria. It grows over the range of 5 to 25% NaCl. Members of *Halomonas* are Gram-negative, rod-shaped bacteria, generally 0.6–0.8 µm by 1.6–1.9 µm. They move by using flagella. They grow in the presence of oxygen, although some have been reported to be able to grow without oxygen.
- vi. *Bacillus mojavensis*, a recently erected species within one of the *B. subtilis* subgroups, which includes *Bacillus amyloliquefaciens*, *B. atrophaeus*, *B. licheniformis*, *Brevibacterium halotolerans*, *Paenibacillus lentimorbus*, and *P. popilliae*. As the name suggests, it was isolated from the Mojave Desert of US. It is wide between 0.5–1.0 mm, long between 2 and 4 mm, and occurs singly or in short chains. It is motile, Gram positive, its optimum growth temperature ranges from 28 to 30 °C, with the maximum growth temperature ranging from 50 to 55 °C,
- vii. *Bacillus stratosphericus* is Gram-positive bacterium and a motile rod-shaped. It is a facultative anaerobe. *B. stratosphericus* persistence in adverse circumstances includes resistance to UV radiation (3,5) and being considerably halotolerant in which up to 17.5% NaCl is nondestructive to the cell. It can grow at temperatures between 8°C and 37°C, and at pH between 6–10.
- viii. *Photobacterium halotolerans* is Gram-negative bacterium, facultative anaerobic, mesophilic, isolated from saline lake water. It can grow at temperatures between 4°C and 37°C, and at pH between 5.0–8.5. It grows in the presence of NaCl concentrations up to 8% (w/v) and optimally in the presence of 1–5 % (w/v) NaCl at 28 °C.
- ix. *Bacillus paralicheniformis* is a Gram- positive, facultatively anaerobic, motile, rod-shaped, endospore-forming bacterium. Generally, some strains were found to grow at a temperature between 15–60 °C and to tolerate up to 10% NaCl. Optimal growth is at pH 7.0–8.0 but it can grow between pH 6.0–11.
- x. *Halomonas titanicae* was discovered on rusticles recovered from the wreck of the RMS Titanic. It is a Gram-negative, heterotrophic, aerobic, non-endospore-forming, peritrichously flagellated and motile bacterial strain. The strain, designated BH1, grew optimally between 30–37 °C, pH 7.0–7.5 and in the presence of 2–8% (w/v) NaCl.
- xi. *Halomonas alkaliantarctica* was isolated from salt of the saline lake “Cape Russell”. The name is related to the ability to grow at alkaline pH and isolated from Antarctica. Cells are rod (1.35 µm). They are Gram-negative, aerobic and lack endospores. It is mesophilic exhibiting optimum growth temperature of 30 °C, but can grow between 10 and 37 °C. It presents an optimum pH at 9.0, the pH ranges between 7.4–9.6 and it tolerates up to 22.2% NaCl.