

Table S1: Soil properties of collected sodic soil

| Parameters | Trichy | | | Chinna Salem | |
|------------------|--------|-------|-------|--------------|------|
| | L1 | L2 | L3 | L4 | L5 |
| pH | 8.78 | 8.61 | 8.54 | 9.2 | 8.7 |
| EC | 0.172 | 0.152 | 0.125 | 1.36 | 1.45 |
| ESP | 15.38 | 15.39 | 15.04 | 24.54 | 16 |
| HCO ₃ | 0.99 | 0.95 | 0.85 | 2.58 | 2.69 |
| CO ₃ | 0.00 | 0.00 | 0.01 | 0.02 | 0.02 |

L1, L2, L3,L4, L5- Soil sampling locations, EC- Electrical conductivity (dSm⁻¹), ESP- Exchangeable sodium percentage (%),CO₃²⁻ & HCO₃⁻ (g kg⁻¹).

Table S2: Bacteria isolated from the rhizosphere of rice under sodic soils

| Isolate details | Closest match | Homology (%) | Length of sequence (bp) | NCBI Genebank accession number |
|-----------------|--|--------------|-------------------------|--------------------------------|
| L3C9N | <i>Rhodococcus pyridinivorans</i> SB3094 | 99.58 | 1429 | OM392062 |
| L3C1L | <i>Priestia flexa</i> NE09 | 100 | 1458 | OM392063 |
| L4C1L | <i>Stenotrophomonas</i> sp. LSB20 | 89.20 | 1442 | OM584324 |
| L5C1L | <i>Bacillus cabrialesii</i> NOK82 | 99.58 | 1459 | OM392064 |
| L2C3L | <i>Bacillus velezensis</i> VMFR18 | 99.52 | 1458 | OM421749 |
| L5C2L | <i>Bacillus altitudinis</i> VMFR18 | 99.24 | 1452 | OM421787 |
| L3C2L | <i>Lysinibacillus</i> sp. NE12 | 92.49 | 1452 | OM604753 |
| L5C3L | <i>Lysinibacillus fusiformis</i> NE12 | 99.86 | 1457 | OM421788 |
| L5C4L | <i>Bacillus paramycoides</i> LU6 | 98.00 | 1455 | OM421789 |
| L2C5L | <i>Bacillus velezensis</i> T49 | 99.72 | 1455 | OM421790 |
| L1C4L | <i>Cytobacillus firmus</i> xmb003 | 99.59 | 1457 | OM421791 |
| L1C5L | <i>Bacillus paralicheniformis</i> KLV27 | 98.97 | 1459 | OM421792 |
| L4C3L | <i>Bacillus cabrialesii</i> TE3 | 99.58 | 1455 | OM422610 |
| L4C4L | <i>Bacillus paramycoides</i> LU6 | 98.00 | 1454 | OM422611 |
| L4C6L | <i>Ralstonia pickettii</i> B77 | 98.88 | 1440 | OM422612 |
| L5C8L | <i>Arthrobacter</i> sp. BT82 | 97.88 | 1429 | OM422613 |
| L5C11L | <i>Bacillus velezensis</i> LY9 | 99.45 | 1457 | OM422614 |
| L2C9L | <i>Niallia circulans</i> KB-9 | 99.65 | 1457 | OM422615 |
| L5C11L | <i>Achromobacter</i> sp. RABA7 | 84.70 | 1439 | OM614587 |
| L5C1T | <i>Bacillus paramycoides</i> LU6 | 99.03 | 1453 | OM422616 |
| L2C2T | <i>Staphylococcus</i> sp. Y41 | 95.50 | 1453 | OM422617 |
| L2C6T | <i>Burkholderia territorii</i> CR1 | 98.31 | 1437 | OM422618 |
| L2C7T | <i>Stenotrophomonas maltophilia</i> LH15 | 99.86 | 1450 | OM422619 |

| | | | | |
|---------|--------------------------------------|-------|------|----------|
| L4C4T | <i>Bacillus paramycoides</i> LU6 | 98.63 | 1455 | OM422620 |
| L2C12T | <i>Bacillus altitudinis</i> SH91 | 99.59 | 1457 | OM422621 |
| L3C2T | <i>Bacillus stercoris</i> YBB10 | 99.72 | 1455 | OM422622 |
| L3C3T | <i>Bacillus</i> sp. MBG31 | 83.31 | 1464 | OM422623 |
| L1C5T | <i>Bacillus cabrialesii</i> NOK82 | 99.52 | 1459 | OM422624 |
| L5C13T | <i>Bacillus safensis</i> NS-5 | 99.52 | 1455 | OM422625 |
| L5C14T | <i>Pseudomonas</i> sp. FX03 | 93.48 | 1464 | OM486948 |
| L4C7T | <i>Burkholderia</i> sp. JCM5506 | 94.56 | 1455 | OM422626 |
| L1C7T | <i>Bacillus rugosus</i> SPB70 | 99.72 | 1457 | OM422627 |
| L3C6T | <i>Bacillus tequilensis</i> AQ10 | 99.59 | 1457 | OM422628 |
| L2C2R | <i>Kocuria</i> sp. NA31 | 92.97 | 1442 | OM615903 |
| L3C1L2 | <i>Bacillus</i> sp. P241 | 84.20 | 1474 | OM616571 |
| L2C1L2 | <i>Franconibacter helveticus</i> L20 | 99.23 | 1446 | OM422629 |
| L3C2L2 | <i>Planococcus</i> sp. CW1 | 92.93 | 1469 | OM614598 |
| L4C1L2 | <i>Bacillus paramycoides</i> LU6 | 98.83 | 1458 | OM422630 |
| L2C2L2 | <i>Bacillus zanthoxyli</i> Q231 | 99.73 | 1458 | OM422631 |
| L3C4L2 | <i>Bacillus paramycoides</i> LU6 | 99.16 | 1455 | OM422632 |
| L5C6L2 | <i>Acinetobacter</i> sp. S9 | 97.27 | 1441 | OM422633 |
| L4C1R2 | <i>Stenotrophomonas</i> sp. LSB20 | 94.88 | 1478 | OM422634 |
| L1C1T2 | <i>Bacillus coreaensis</i> GC317 | 97.99 | 1450 | OM422635 |
| L5C2T2 | <i>Bacillus velezensis</i> T49 | 99.72 | 1455 | OM422636 |
| L1C9T2 | <i>Achromobacter</i> sp. S15 | 86.64 | 1439 | OM615901 |
| L3C3T2 | <i>Bacillus altitudinis</i> CE27 | 99.65 | 1454 | OM422637 |
| L3C7T2 | <i>Bacillus</i> sp. LU6 | 97.66 | 1456 | OM422638 |
| L1C10T2 | <i>Burkholderia</i> sp. KBB5 | 96.95 | 1445 | OM422639 |
| L5C3T2 | <i>Stenotrophomonas</i> sp. LSB20 | 94.88 | 1464 | OM422640 |
| L4C5T | <i>Burkholderia</i> sp. KBB5 | 80.28 | 1447 | OM640465 |

Table S3: Selection of Sodium sources

| (pH) Before Autoclave | (Na ₂ CO ₃ -NaHCO ₃) (pH) After Autoclave | (Na ₂ CO ₃) (pH) After Autoclave | (NaOH) (pH) After Autoclave |
|-----------------------|---|---|-----------------------------|
| 7.50 | 7.97 | 7.50 | 7.39 |
| 8.00 | 8.70 | 8.23 | 7.86 |
| 8.50 | 9.58 | 8.87 | 8.17 |
| 9.00 | 9.50 | 9.30 | 8.56 |
| 9.50 | 9.85 | 9.65 | 8.92 |

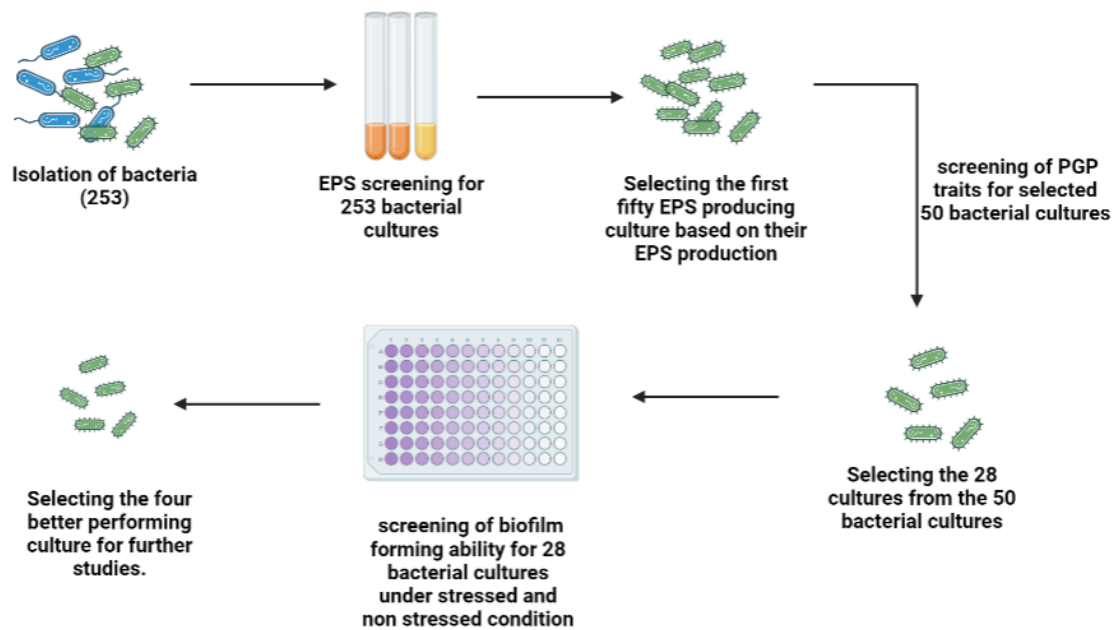
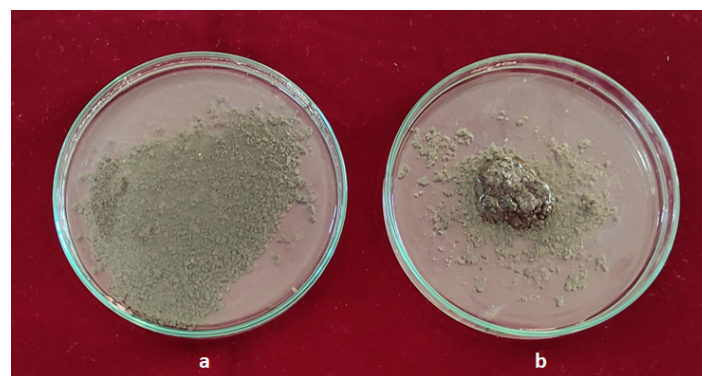


Figure S1: Screening process for selecting the EPS producing sodic tolerant PGPR



a- Control, b- Treatment (cell-free supernatant added)

Figure S2: Aggregate formation in dispersed soil

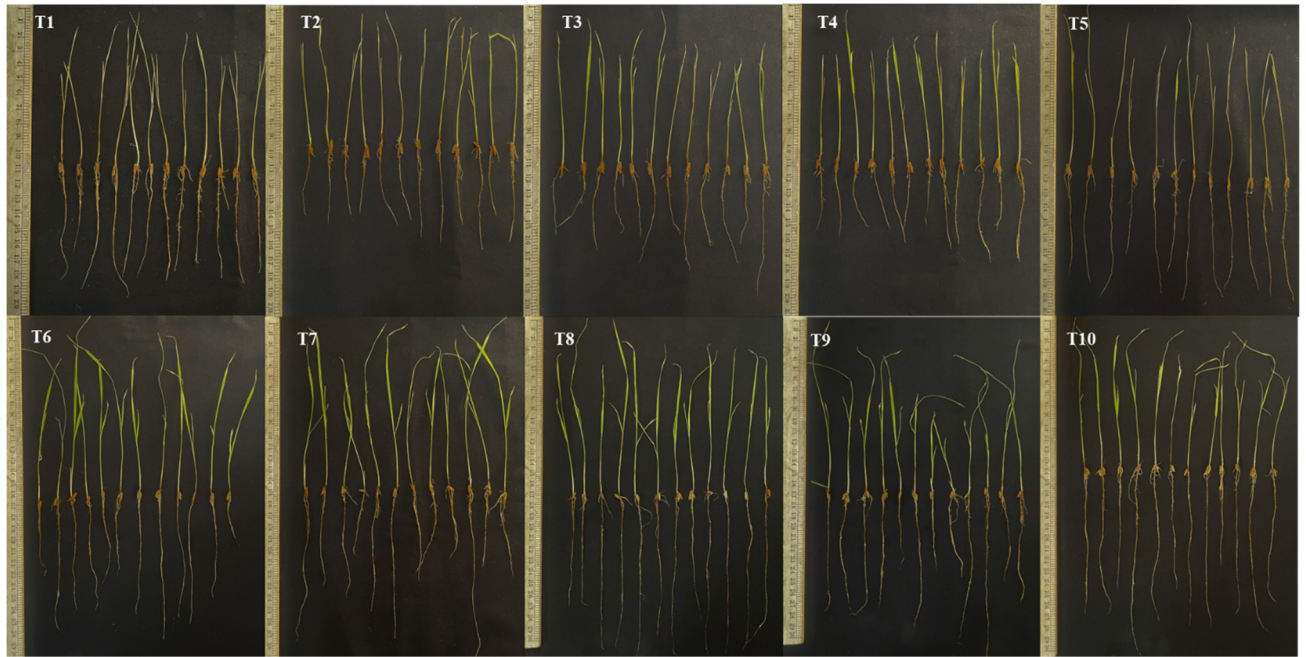


Figure S3: Impact of bacterial inoculation on plant growth under sodic stress and unstress condition. T1- Absolute control @70 SAR, T2- *Bacillus rugosus* L1C7T @70 SAR, T3- *Bacillus paralicheniformis* L1C5L @70 SAR, T4- *Pseudomonas* sp. L5C14T @70 SAR, T5- *Franconibacter helveticus* L2C1T2@70 SAR, T6 - Absolute control (unstressed), T7- *Bacillus rugosus* L1C7T, T8 - *Bacillus paralicheniformis* L1C5L, T9- *Pseudomonas* sp. L5C14T, and T10- *Franconibacter helveticus* L2C1T2.

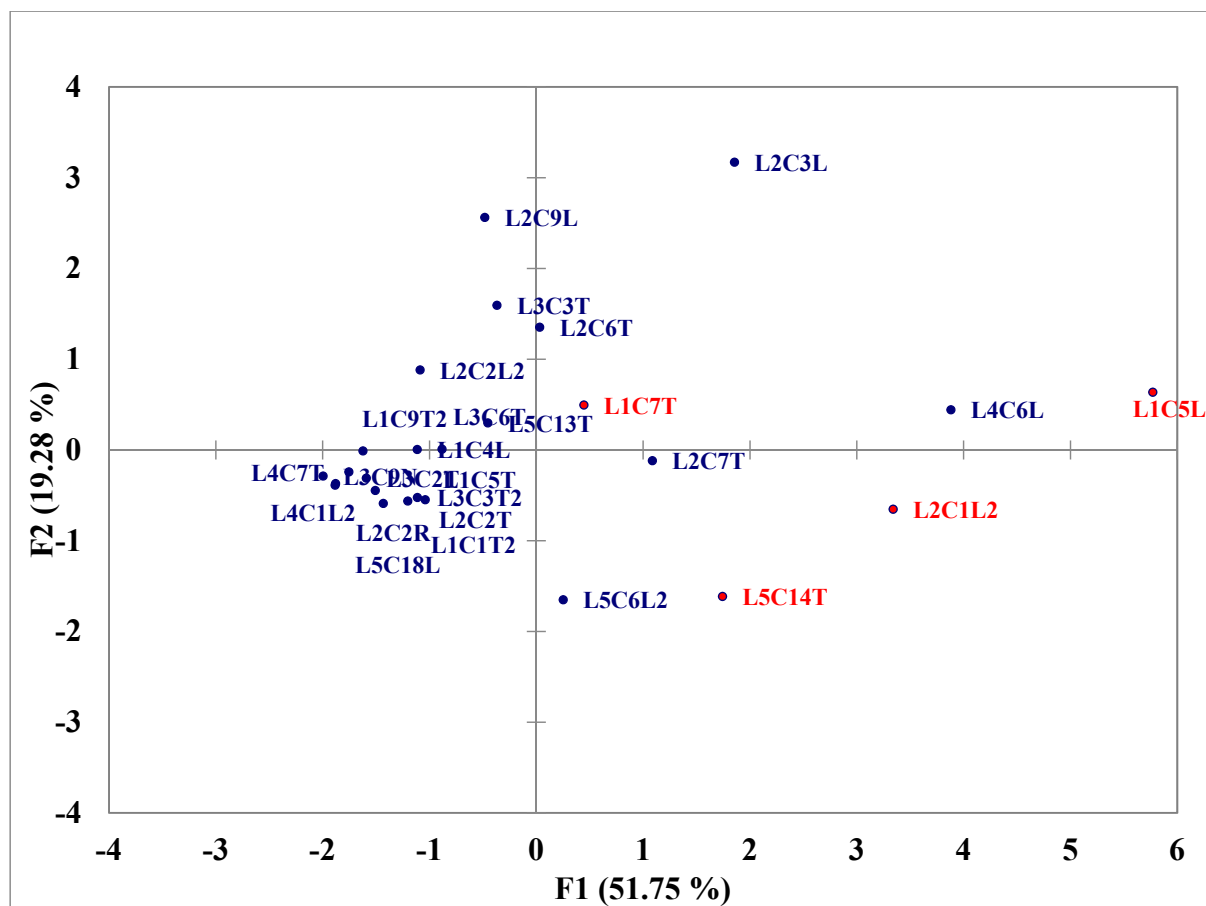


Figure S4: Principal component analysis plots relating Biofilm forming ability, and EPS-sodic tolerance-bacterial isolates.