**Functional genetic diversity and plant growth promoting potential of polyphosphate accumulating bacteria in soil**

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Running title: Diversity of phosphate accumulating bacteria in soil

Supplementary Table 1. Details of isolation site

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sequence\_ID | Country | Isolation\_source | Isolate | Lat\_Lon |
| Seq1 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_1 | 27.2928° N, 78.2531° E |
| Seq2 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_2 | 27.2928° N, 78.2531° E |
| Seq3 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_3 | 27.2928° N, 78.2531° E |
| Seq4 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_4 | 27.2928° N, 78.2531° E |
| Seq5 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_5 | 27.2928° N, 78.2531° E |
| Seq6 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_7 | 27.2928° N, 78.2531° E |
| Seq7 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_8 | 27.2928° N, 78.2531° E |
| Seq8 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_9 | 27.2928° N, 78.2531° E |
| Seq9 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_10 | 27.2928° N, 78.2531° E |
| Seq10 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_11 | 27.2928° N, 78.2531° E |
| Seq11 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_12 | 27.2928° N, 78.2531° E |
| Seq12 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_13 | 27.2928° N, 78.2531° E |
| Seq13 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_14 | 27.2928° N, 78.2531° E |
| Seq14 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_15 | 27.2928° N, 78.2531° E |
| Seq15 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_16 | 27.2928° N, 78.2531° E |
| Seq16 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_17 | 27.2928° N, 78.2531° E |
| Seq17 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_18 | 27.2928° N, 78.2531° E |
| Seq18 | Deokhera, India | Rhizospheric soil | SS\_NBRI\_19 | 27.2928° N, 78.2531° E |
| Seq19 | Gujarat, India | Rhizospheric soil | SS\_NBRI\_20 | 23.0248° N, 72.2899° E, |
| Seq20 | Gujarat, India | Rhizospheric soil | SS\_NBRI\_22 | 23.0248° N, 72.2899° E, |
| Seq21 | Punjab, India | Rhizospheric soil | SS\_NBRI\_23 | 30.4036° N, 74.0280° E |
| Seq22 | Punjab, India | Rhizospheric soil | SS\_NBRI\_24 | 30.4036° N, 74.0280° E |
| Seq23 | Punjab, India | Rhizospheric soil | SS\_NBRI\_25 | 30.4036° N, 74.0280° E |
| Seq24 | Punjab, India | Rhizospheric soil | SS\_NBRI\_26 | 30.4036° N, 74.0280° E |
| Seq25 | Punjab, India | Rhizospheric soil | SS\_NBRI\_27 | 30.4036° N, 74.0280° E |
| Seq26 | Punjab, India | Rhizospheric soil | SS\_NBRI\_29 | 30.4036° N, 74.0280° E |
| Seq27 | Punjab, India | Rhizospheric soil | SS\_NBRI\_32 | 30.4036° N, 74.0280° E |
| Seq28 | Punjab, India | Rhizospheric soil | SS\_NBRI\_33 | 30.4036° N, 74.0280° E |
| Seq29 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_34 | 28.4171° N, 77.8250° E |
| Seq30 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_35 | 28.4171° N, 77.8250° E |
| Seq31 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_36 | 28.4171° N, 77.8250° E |
| Seq32 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_37 | 28.4171° N, 77.8250° E |
| Seq33 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_38 | 28.4171° N, 77.8250° E |
| Seq34 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_39 | 28.4171° N, 77.8250° E |
| Seq35 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_40 | 28.4171° N, 77.8250° E |
| Seq36 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_41 | 28.4171° N, 77.8250° E |
| Seq37 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_42 | 28.4171° N, 77.8250° E |
| Seq38 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_43 | 28.4171° N, 77.8250° E |
| Seq39 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_45 | 28.4171° N, 77.8250° E |
| Seq40 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_47 | 28.4171° N, 77.8250° E |
| Seq41 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_48 | 28.4171° N, 77.8250° E |
| Seq42 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_49 | 28.4171° N, 77.8250° E |
| Seq43 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_50 | 28.4171° N, 77.8250° E |
| Seq44 | Bulandshahr, India | Rhizospheric soil | SS\_NBRI\_51 | 28.4171° N, 77.8250° E |
| Seq45 | Punjab, India | Rhizospheric soil | SS\_NBRI\_53 | 30.4036° N, 74.0280° E |
| Seq46 | Shillong, India | Rhizospheric soil | SS\_NBRI\_55 |  |
| Seq47 | India | Rhizospheric soil | NBRI-RA |  |

Supplementary Table 2. Total fungal and bacterial population in soil samples

|  |  |  |
| --- | --- | --- |
|  | **Total population (cfu Log10/ml)** | |
|  | **Fungi** | **Bacteria** |
| **Bulandshahr** | 2.11 | 6.048701 |
| **Bulandshahr** | 1.98 | 5.732394 |
| **Bulandshahr** | 1.81 | 5.738781 |
| **Bulandshahr** | 2.00 | 5.634141 |
| **Bulandshahr** | 1.79 | 5.718225 |
| **Bulandshahr** | 1.75 | 5.658965 |
| **Bulandshahr** | 1.47 | 5.634141 |
| **Bulandshahr** | 2.20 | 5.818666 |
| **Raebareli** | 1.53 | 5.754348 |
| **Deokhera 1** | 1.46 | 5.84427 |
| **Deokhera 2** | 1.76 | 5.795185 |
| **Punjab 1** | 1.25 | 5.892836 |
| **Punjab 2** | 1.48 | 5.839268 |
| **Gujarat** | 1.78 | 5.707002 |
| **Shillong** | 1.10 | 5.841776 |



Supplementary Fig. 1. Quanlitative screening of phosphate accumulating bacteria



Supplementary Fig. 2. Range of accumulated phosphate estimated as Pi in different bacterial isolates.

Supplementary Table 3. GenBank accession number of phosphate accumulating bacteria

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **Accession number** | | | |
| **S.N.** | **Strains** | **Identification** | ***16S rRNA*** | ***rpoB*** | ***ppk*** | ***ppx*** |
| 1 | SS NBRI 1 | *Pseudomonas* sp. | MT629836 | MT947903 | MT947952 | MT948001 |
| 2 | SS NBRI 2 | *Pseudomonas* sp. | MT629837 | MT947904 | MT947953 | MT948002 |
| 3 | SS NBRI 3 | *Pseudomonas koreensis* | MT629838 | MT947905 | MT947954 | MT948003 |
| 4 | SS NBRI 4 | *Pseudomonas koreensis* | MT629839 | MT947906 | MT947955 | MT948004 |
| 5 | SS NBRI 5 | *Pseudomonas* sp. | MT629840 | MT947907 | MT947956 | MT948005 |
| 6 | SS NBRI 6 | *Pseudomonas* sp. | MT629841 | MT947908 | MT947957 | MT948006 |
| 7 | SS NBRI 7 | *Pseudomonas* sp*.* | MT629842 | MT947909 | MT947958 | MT948007 |
| 8 | SS NBRI 8 | *Pseudomonas koreensis* | MT629843 | MT947910 | MT947959 | MT948008 |
| 9 | SS NBRI 9 | *Pseudomonas* sp. | MT629844 | MT947911 | MT947960 | MT948009 |
| 10 | SS NBRI 10 | *Pseudomonas* sp*.* | MT629845 | MT947912 | MT947961 | MT948010 |
| 11 | SS NBRI 11 | *Pseudomonas* sp. | MT629846 | MT947913 | MT947962 | MT948011 |
| 12 | SS NBRI 12 | *Pseudomonas koreensis* | MT629847 | MT947914 | MT947963 | MT948012 |
| 13 | SS NBRI 13 | *Pseudomonas* sp. | MT629848 | MT947915 | MT947964 | MT948013 |
| 14 | SS NBRI 14 | *Pseudomonas koreensis* | MT629849 | MT947916 | MT947965 | MT948014 |
| 15 | SS NBRI 15 | *Pseudomonas* sp. | MT629850 | MT947917 | MT947966 | MT948015 |
| 16 | SS NBRI 16 | *Pseudomonas koreensis* | MT629851 | MT947918 | MT947967 | MT948016 |
| 17 | SS NBRI 17 | *Pseudomonas koreensis* | MT629852 | MT947919 | MT947968 | MT948017 |
| 18 | SS NBRI 18 | *Pseudomonas* sp. | MT629853 | MT947920 | MT947969 | MT948018 |
| 19 | SS NBRI 19 | *Pseudomonas koreensis* | MT629854 | MT947921 | MT947970 | MT948019 |
| 20 | SS NBRI 20 | *Pseudomonas stutzeri* | MT629855 | MT947922 | MT947971 | MT948020 |
| 21 | SS NBRI 22 | *Pseudomonas stutzeri* | MT629856 | MT947923 | MT947972 | MT948021 |
| 22 | SS NBRI 23 | *Pseudomonas alcaliphila* | MT629857 | MT947924 | MT947973 | MT948022 |
| 23 | SS NBRI 24 | *Pseudomonas mendocina* | MT629858 | MT947925 | MT947974 | MT948023 |
| 24 | SS NBRI 25 | *Pseudomonas alcaliphila* | MT629859 | MT947926 | MT947975 | MT948024 |
| 25 | SS NBRI 26 | *Pseudomonas* sp. | MT629860 | MT947927 | MT947976 | MT948025 |
| 26 | SS NBRI 27 | *Pseudomonas stutzeri* | MT629861 | MT947928 | MT947977 | MT948026 |
| 27 | SS NBRI 29 | *Pseudomonas alcaliphila* | MT629862 | MT947929 | MT947978 | MT948027 |
| 28 | SS NBRI 32 | *Pseudomonas* sp. | MT629863 | MT947930 | MT947979 | MT948028 |
| 29 | SS NBRI 33 | *Pseudomonas alcaliphila* | MT629864 | MT947931 | MT947980 | MT948029 |
| 30 | SS NBRI 34 | *Pseudomonas mendocina* | MT629865 | MT947932 | MT947981 | MT948030 |
| 31 | SS NBRI 35 | *Pseudomonas alcaliphila* | MT629866 | MT947933 | MT947982 | MT948031 |
| 32 | SS NBRI 36 | *Pseudomonas alcaliphila* | MT629867 | MT947934 | MT947983 | MT948032 |
| 33 | SS NBRI 37 | *Pseudomonas mendocina* | MT629868 | MT947935 | MT947984 | MT948033 |
| 34 | SS NBRI 38 | *Pseudomonas alcaliphila* | MT629869 | MT947936 | MT947985 | MT948034 |
| 35 | SS NBRI 39 | *Pseudomonas mendocina* | MT629870 | MT947937 | MT947986 | MT948035 |
| 36 | SS NBRI 40 | *Pseudomonas alcaliphila* | MT629871 | MT947938 | MT947987 | MT948036 |
| 37 | SS NBRI 41 | *Pseudomonas alcaliphila* | MT629872 | MT947939 | MT947988 | MT948037 |
| 38 | SS NBRI 42 | *Pseudomonas alcaliphila* | MT629873 | MT947940 | MT947989 | MT948038 |
| 39 | SS NBRI 43 | *Pseudomonas alcaliphila* | MT629874 | MT947941 | MT947990 | MT948039 |
| 40 | SS NBRI 45 | *Pseudomonas alcaliphila* | MT629875 | MT947942 | MT947991 | MT948040 |
| 41 | SS NBRI 47 | *Pseudomonas mendocina* | MT629876 | MT947943 | MT947992 | MT948041 |
| 42 | SS NBRI 48 | *Pseudomonas mendocina* | MT629877 | MT947944 | MT947993 | MT948042 |
| 43 | SS NBRI 49 | *Pseudomonas* sp. | MT629878 | MT947945 | MT947994 | MT948043 |
| 44 | SS NBRI 50 | *Pseudomonas mendocina* | MT629879 | MT947946 | MT947995 | MT948044 |
| 45 | SS NBRI 51 | *Pseudomonas mendocina* | MT629880 | MT947947 | MT947996 | MT948045 |
| 46 | SS NBRI 52 | *Pseudomonas* sp. | MT629881 | MT947948 | MT947997 | MT948046 |
| 47 | SS NBRI 53 | *Pseudomonas alcaliphila* | MT629882 | MT947949 | MT947998 | MT948047 |
| 48 | SS NBRI 54 | *Pseudomonas* sp. | MT629883 | MT947950 | MT947999 | MT948048 |
| 49 | SS NBRI 55 | *Enterobacter cloacace* | MT629884 | MT947951 | MT948000 | MT948049 |
| 50 | NBRIRA | *Pseudomonas putida* | MTCC5279 | MT982439 | MT982437 | MT982438 |

**Supplemenatry Table 4.** Plant growth promotary traits in phosphate accumulating bacterial isolates

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Auxin production**  **(µg/ml)** | **Phosphate solubilisation**  **(µg/ml)** | **Siderophore**  **Production**  **(zone in cm)** | **Alkaline Phosphatase**  **(µM of pNP produced)** | **Acidic Phosphatase**  **(µM of pNP produced)** | **Biofilm production** |
| NBRI RA | 55.68±0.10 | 41.50±3.34 | 0±0.00 | 5.53±0.42 | 10.53±1.27 | 1.30±0.10 |
| SS NBRI 1 | 39.55±1.11 | 22.00±0.09 | 0.4±0.002 | 4.30±0.47 | 7.71±0.26 | 0.94±0.06 |
| SS NBRI 2 | 47.74±0.14 | 15.89±0.55 | 1.1±0.004 | 7.76±0.31 | 17.07±3.88 | 2.30±0.28 |
| SS NBRI 3 | 50.33±0.14 | 11.53±0.42 | 0.5±0.01 | 1.91±0.42 | 8.77±0.37 | 1.95±0.08 |
| SS NBRI 4 | 44.34±0.45 | 26.42±3.08 | 0±0.00 | 4.84±2.07 | 15.10±0.46 | 2.35±0.17 |
| SS NBRI 5 | 49.56±0.14 | 17.77±0.03 | 0.7±0.002 | 1.06±0.42 | 6.86±.26 | 2.37±0.10 |
| SS NBRI 7 | 43.43±0.66 | 15.21±1.04 | 0.7±0.002 | 25.69±3.14 | 5.16±0.15 | 2.05±0.12 |
| SS NBRI 8 | 56.52±0.45 | 15.99±0.00 | 0.8±0.006 | 6.65±3.56 | 15.53±1.50 | 1.64±0.21 |
| SS NBRI 9 | 48.19±0.03 | 10.36±0.09 | 1±0.00 | 9.25±3.93 | 6.75±1.75 | 1.53±0.62 |
| SS NBRI 10 | 45.04±0.52 | 11.79±0.16 | 1±0.00 | 3.13±0.05 | 7.34±0.10 | 3.23±0.18 |
| SS NBRI 11 | 46.69±0.91 | 13.42±0.87 | 0.6±0.001 | 2.23±0.10 | 7.44±0.00 | 1.22±0.06 |
| SS NBRI 12 | 49.56±0.14 | 17.06±0.29 | 0.8±0.005 | 7.66±1.27 | 26.28±4.36 | 1.12±0.12 |
| SS NBRI 13 | 52.92±0.35 | 17.58±4.97 | 0.7±0.003 | 0.15±0.05 | 6.43±0.37 | 0.85±0.09 |
| SS NBRI 14 | 57.15±0.59 | 16.34±0.74 | 1±0.00 | 1.43±0.26 | 6.06±0.10 | 2.05±0.06 |
| SS NBRI 15 | 45.81±0.45 | 2.27±0.19 | 0.7±0.003 | 4.46±0 | 5.69±0.69 | 2.20±0.18 |
| SS NBRI 16 | 51.34±0.17 | 15.86±0.78 | 0.8±0.005 | 3.45±0.69 | 4.68±0.10 | 2.14±0.17 |
| SS NBRI 17 | 51.38±0.14 | 12.64±0.09 | 0.9±0.001 | 1.91±0.63 | 19.57±2.02 | 1.26±0.09 |
| SS NBRI 18 | 41.54±0.73 | 3.47±0.22 | 0.7±0.007 | 4.41±0.05 | 13.77±1.01 | 2.75±0.05 |
| SS NBRI 19 | 59.92±0.98 | 17.42±0.39 | 0.5±0.003 | 8.45±0.37 | 46.70±1.17 | 1.63±0.19 |
| SS NBRI 20 | 33.53±0.35 | 42.86±0.09 | 0.3±0.004 | 3.67±0.05 | 3.51±0.63 | 0.98±0.22 |
| SS NBRI 22 | 30.87±0.21 | 4.06±0.03 | 0.3±0.004 | 3.08±0.10 | 4.46±0.10 | 1.10±0.21 |
| SS NBRI 23 | 43.54±0.14 | 10.40±0.32 | 0±0.00 | 9.46±0.53 | 41.81±0.63 | 2.13±0.26 |
| SS NBRI 24 | 52.18±0.38 | 3.41±0.290. | 0±0.00 | 7.92±0.05 | 38.83±0.00 | 1.98±0.13 |
| SS NBRI 25 | 38.88±0.38 | 2.66±0.39 | 0±0.00 | 4.52±0.05 | 21.12±0.15 | 1.38±0.11 |
| SS NBRI 26 | 33.88±0.98 | 3.64±0.06 | 0±0.00 | 7.71±0.05 | 22.66±0.53 | 2.34±0.17 |
| SS NBRI 27 | 43.54±0.14 | 4.68±0.19 | 0±0.00 | 6.96±0.26 | 20.16±0.79 | 1.99±0.29 |
| SS NBRI 29 | 47.32±0.00 | 3.31±0.19 | 0.5±0.00 | 4.57±0.21 | 13.72±0.10 | 1.47±0.38 |
| SS NBRI 32 | 33.46±0.28 | 27.235±0.19 | 0.5±0.00 | 1.06±0.00 | 7.34±0.00 | 1.37±0.068 |
| SS NBRI 33 | 29.96±0.14 | 18.85±0.06 | 0±0.00 | 31.70±0.63 | 38.78±0.58 | 1.13±0.056 |
| SS NBRI 34 | 21.21±0.14 | 11.765±0.65 | 1±0.00 | 39.84±0.37 | 40.32±2.12 | 1.05±0.089 |
| SS NBRI 35 | 21±0.28 | 3.86±0.55 | 0±0.00 | 15.21±0.31 | 91.82±3.61 | 1.26±0.17 |
| SS NBRI 36 | 31.36±0.07 | 21.61±0.22 | 0.4±0.00 | 37.45±1.70 | 273.07±3.03 | 2.08±0.12 |
| SS NBRI 37 | 20.23±0.14 | 18.26±0.97 | 0.6±0.00 | 10.69±0.05 | 58.41±3.08 | 1.53±0.13 |
| SS NBRI 38 | 31.99±1.05 | 17.25±0.29 | 0.4±0.00 | 46.55±3.99 | 69.90±0.74 | 1.64±0.086 |
| SS NBRI 39 | 21.21±0.14 | 17.84±0.35 | 1±0.006 | 38.78±.05 | 38.67±0.58 | 1.017±0.17 |
| SS NBRI 40 | 26.74±0.21 | 6.63±3.9 | 0.1±0.00 | 7.71±0.26 | 27.82±3.67 | 2.29±0.18 |
| SS NBRI 41 | 27.825±0.38 | 4.12±0.61 | 0±0.00 | 9.15±0.63 | 57.61±1.11 | 0.81±0.05 |
| SS NBRI 42 | 31.92±1.54 | 4.35±0.39 | 0±0.00 | 9.20±0.47 | 62.08±0.58 | 2.87±0.19 |
| SS NBRI 43 | 28.805±0.24 | 3.70±0.06 | 0.2±0.00 | 15.21±0.31 | 50.00±1.48 | 1.57±0.05 |
| SS NBRI 45 | 36.89±4.27 | 3.99±0.13 | 0.3±0.001 | 8.88±0.15 | 27.23±1.80 | 2.17±0.04 |
| SS NBRI 47 | 21.245±0.24 | 3.18±0.06 | 0±0.00 | 17.76±0.10 | 43.51±4.25 | 1.49±0.07 |
| SS NBRI 48 | 19.005±0.59 | 2.47±0.35 | 0.8±0.004 | 27.66±1.48 | 65.91±1.22 | 1.26±0.11 |
| SS NBRI 49 | 35.385±0.10 | 3.47±0.29 | 0.5±0.00 | 18.62±0.10 | 45.75±1.48 | 1.18±0.23 |
| SS NBRI 50 | 27.23±0.49 | 5.88±0.0 | 0.8±0.003 | 14.09±1.33 | 65.38±2.07 | 1.31±0.05 |
| SS NBRI 51 | 26.14±0.73 | 0.71±0.74 | 0±0.00 | 4.68±.042 | 40.21±2.13 | 0.73±0.04 |
| SS NBRI 53 | 56.73±0.03 | 3.80±0.91 | 0.2±0.00 | 16.91±0.10 | 29.20±3.88 | 1.15±0.006 |
| SS NBRI 55 | 40.04±0.00 | 30.48±0.34 | 0±0.00 | 5.21±0.53 | 17.60±1.86 | 0.31±0.041 |

Supplementary Table 5. Growth of phosphate accumulating bacteria in 1M salt

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| S.No. | Strains | 1 Day | 2 Day | 3 Day | 5 Day | 7 Day | 10 Day |
| 1 | SSNBRI 1 | +++ | +++ | +++ | +++ | +++ | +++ |
| 2 | SSNBRI 2 | +++ | +++ | +++ | +++ | +++ | +++ |
| 3 | SSNBRI 3 | +++ | +++ | +++ | +++ | +++ | +++ |
| 4 | SSNBRI 4 | +++ | +++ | +++ | +++ | +++ | +++ |
| 5 | SSNBRI 5 | +++ | +++ | +++ | +++ | +++ | +++ |
| 6 | SSNBRI 6 | +++ | +++ | +++ | +++ | +++ | +++ |
| 7 | SSNBRI 7 | +++ | +++ | +++ | +++ | +++ | +++ |
| 8 | SSNBRI 8 | +++ | +++ | +++ | +++ | +++ | +++ |
| 9 | SSNBRI 9 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 10 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 11 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 12 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 13 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 14 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 15 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 16 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 17 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 18 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 19 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 20 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 22 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 23 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 24 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 25 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 26 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 27 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 29 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 32 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 33 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 34 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 35 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 36 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 37 | +++ | +++ | +++ | +++ | +++ | ++ |
|  | SSNBRI 38 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 39 | +++ | +++ | +++ | +++ | +++ | ++ |
|  | SSNBRI 40 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 42 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 43 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 45 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 47 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 48 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 49 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 50 | +++ | +++ | +++ | +++ | ++ | +++ |
|  | SSNBRI 51 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 53 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 55 | +++ | +++ | +++ | +++ | +++ | +++ |

+++: Excellent growth; ++: Good growth; +: Fair growth

Supplementary Table 6. Growth of phosphate accumulating bacteria at 45 °C temperature

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| S.No. | Strains | 1 Day | 2 Day | 3 Day | 5 Day | 7 Day | 10 Day |
| 1 | SSNBRI 1 | +++ | +++ | +++ | +++ | +++ | +++ |
| 2 | SSNBRI 2 | +++ | +++ | +++ | +++ | +++ | +++ |
| 3 | SSNBRI 3 | +++ | +++ | +++ | +++ | +++ | +++ |
| 4 | SSNBRI 4 | +++ | +++ | +++ | +++ | +++ | +++ |
| 5 | SSNBRI 5 | +++ | +++ | +++ | +++ | +++ | +++ |
| 6 | SSNBRI 6 | +++ | +++ | +++ | +++ | +++ | +++ |
| 7 | SSNBRI 7 | +++ | +++ | +++ | +++ | +++ | +++ |
| 8 | SSNBRI 8 | +++ | +++ | +++ | +++ | +++ | +++ |
| 9 | SSNBRI 9 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 10 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 11 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 12 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 13 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 14 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 15 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 16 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 17 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 18 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 19 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 20 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 22 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 23 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 24 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 25 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 26 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 27 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 29 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 32 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 33 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 34 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 35 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 36 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 37 | +++ | +++ | +++ | +++ | +++ | ++ |
|  | SSNBRI 38 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 39 | +++ | +++ | +++ | +++ | +++ | ++ |
|  | SSNBRI 40 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 42 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 43 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 45 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 47 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 48 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 49 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 50 | +++ | +++ | +++ | +++ | ++ | +++ |
|  | SSNBRI 51 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 53 | +++ | +++ | +++ | +++ | +++ | +++ |
|  | SSNBRI 55 | +++ | +++ | +++ | +++ | +++ | +++ |

+++: Excellent growth; ++: Good growth; +: Fair growth

Supplementary Table 7. Growth of phosphate accumulating bacteria under 45% PEG simulated drought stress

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| S.No. | Strains | 1 Day | 2 Day | 3 Day | 5 Day | 7 Day | 10 Day |
| 1 | SSNBRI 1 | + | + | - | - | - | - |
| 2 | SSNBRI 2 | + | - | - | - | - | - |
| 3 | SSNBRI 3 | - | - | - | - | - | - |
| 4 | SSNBRI 4 | - | - | - | - | - | - |
| 5 | SSNBRI 5 | +++ | +++ | +++ | +++ | ++ | ++ |
| 6 | SSNBRI 6 | + | - | - | - | - | - |
| 7 | SSNBRI 7 | - | - | - | - | - | - |
| 8 | SSNBRI 8 | - | - | - | - | - | - |
| 9 | SSNBRI 9 | + | - | - | - | - | - |
|  | SSNBRI 10 | - | - | - | - | - | - |
|  | SSNBRI 11 | +++ | +++ | +++ | +++ | ++ | +++ |
|  | SSNBRI 12 | - | - | - | - | - | - |
|  | SSNBRI 13 | +++ | +++ | +++ | ++ | ++ | ++ |
|  | SSNBRI 14 | - | - | - | - | - | - |
|  | SSNBRI 15 | - | - | - | - | - | - |
|  | SSNBRI 16 | - | - | - | - | - | - |
|  | SSNBRI 17 | - | - | - | - | - | - |
|  | SSNBRI 18 | - | - | - | - | - | - |
|  | SSNBRI 19 | - | - | - | - | - | - |
|  | SSNBRI 20 | - | - | - | - | - | - |
|  | SSNBRI 22 | - | - | - | - | - | - |
|  | SSNBRI 23 | +++ | +++ | +++ | ++ | ++ | ++ |
|  | SSNBRI 24 | + | - | - | - | - | - |
|  | SSNBRI 25 | + | - | - | - | - | - |
|  | SSNBRI 26 | + | - | - | - | - | - |
|  | SSNBRI 27 | + | - | - | - | - | - |
|  | SSNBRI 29 | - | - | - | - | - | - |
|  | SSNBRI 32 | - | - | - | - | - | - |
|  | SSNBRI 33 | +++ | +++ | +++ | +++ | ++ | ++ |
|  | SSNBRI 34 | - | - | - | - | - | - |
|  | SSNBRI 35 | - | - | - | - | - | - |
|  | SSNBRI 36 | - | - | - | - | - | - |
|  | SSNBRI 37 | - | - | - | - | - | - |
|  | SSNBRI 38 | - | - | - | - | - | - |
|  | SSNBRI 39 | - | - | - | - | - | - |
|  | SSNBRI 40 | - | - | - | - | - | - |
|  | SSNBRI 42 | - | - | - | - | - | - |
|  | SSNBRI 43 | - | - | - | - | - | - |
|  | SSNBRI 45 | - | - | - | - | - | - |
|  | SSNBRI 47 | - | - | - | - | - | - |
|  | SSNBRI 48 | - | - | - | - | - | - |
|  | SSNBRI 49 | - | - | - | - | - | - |
|  | SSNBRI 50 | - | - | - | - | - | - |
|  | SSNBRI 51 | - | - | - | - | - | - |
|  | SSNBRI 53 | - | - | - | - | - | - |
|  | SSNBRI 55 | - | - | - | - | - | - |
|  | NBRI RAR |  |  |  |  |  |  |

+++: Excellent growth; ++: Good growth; +: Fair growth; -: no growth



Supplementary Fig. 3. Growth of *A. thaliana* in presence of phosphate accumulating bacteria



Supplementary Fig. 4. Effect of phosphate accumulating bacteria inoculation on phosphate status of *A. thaliana*

C:\Users\Sonal\Desktop\Diversity\Diversity MS file\ISME\Fig. 6.tif

Supplementary Fig. 5. Growth of phosphate accumulating bacteria under abiotic stress conditions of temperature (40 °C), salinity (0.5 M NaCl) and drought (45% PEG).



Supplementary Fig. 6. Plant growth promotary traits in phosphate accumulating bacteria under saline stress condition