**Consortium of plant growth – promoting rhizobacteria enhances oilseed rape (Brassica napus L.) growth under normal and saline conditions**

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**Table S1** Plant growth – promoting traits possessed by the selected PGPR

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Strains | IAA  (µg/ml) | ACC deaminase  (mmol α-ketobutyrate/mg protein/h) | P- solubilization  (in mm) | Siderophore  (dhalo/dcolony) | SA  (µg/ml) | Ammonia | HCN | Chitinase  (in mm) |
| B1 | 5.20±0.21 | 0.36±0.11 | - | - | - | + | + | - |
| B2 | 4.67±0.19 | 0.25±0.13 | - | 1.32 | 1.08±0.01 | + | - | - |
| B3 | 6.12±0.08 | 0.34±0.14 | - | 1.88 | 1.10±0.13 | + | - | - |
| B4 | 4.00±0.11 | - | - | 1.95 | - | + | - | - |
| B5 | 3.31±0.12 | - | 3 | 1.47 | 1.58±0.17 | - | - | - |
| B6 | 3.57±0.08 | - | 3 | 1.60 | - | - | - | - |
| B7 | 4.11±0.20 | - | 2 | 1.54 | 1.18±0.11 | - | - | - |
| B8 | 5.34±0.24 | - | 2 | 1.32 | - | - | - | - |
| B9 | 6.67±0.16 | - | 2 | 1.51 | 1.10±0.09 | - | - | - |
| B10 | 2.12±0.18 | - | - | - | 1.02±0.12 | + | - | - |
| B11 | 9.35±0.11 | 0.42±0.09 | 2 | - | 2.99±0.01 | + | - | 7 |
| B12 | 15.05±0.09 | 0.11±0.12 | 2 | - | 1.85±0.02 | + | - | 6 |
| B13 | 4.42±0.15 | - | - | - | - | - | - | - |
| B14 | 15.57±0.24 | 7.67±0.13 | - | 3.80 | 2.99±0.02 | - | - | 3 |
| B15 | 3.10±0.16 | - | - | - | - | - | - | - |
| B16 | 17.59±0.15 | 5.98±0.11 | - | 1.80 | 2.29.±0.16 | + | - | 15 |
| B17 | 9.64±0.19 | - | - | - | 1.86±0.01 | - | - | 3 |
| B18 | 3.22±0.23 | - | - | - | 1.32±0.14 | - | - | - |
| B19 | 16.29±0.35 | 6.84±0.15 | - | 2.57 | 1.99±0.10 | + | + | 2 |
| B20 | 6.21±0.28 | - | - | - | 1.36±0.15 | + | - | - |
| B21 | 4.20±0.15 | - | - | - | - | - | - | - |
| B22 | 5.37±0.12 | 0.33±0.18 | 2 | 1.20 | - | - | - | - |
| B23 | 6.47±0.11 | - | - | 1.73 | 1.02±0.12 | + | - | - |
| B24 | 2.38±0.23 | - | 1 | 1.11 | - | - | - | 2 |
| B25 | 2.18±0.21 | - | 1 | 2.02 | - | + | - | 3 |
| B26 | 4.93±0.13 | - | 2 | 1.96 | - | - | - | - |
| B27 | 7.06±0.19 | - | 2 | 1.62 | 1.09±0.09 | - | - | - |
| B28 | 9.00±0.09 | - | 1 | 1.43 | - | + | + | - |
| B29 | 8.50±0.05 | - | - | - | - | + | - | 2 |
| B30 | 4.51±0.23 | - | - | - | 1.00±0.02 | - | - | - |
| B31 | 3,10±0.28 | - | - | - | - | - | - | - |
| B32 | 2.06±0.19 | - | - | - | 1,10±0.07 | + | - | - |
| B33 | 7.20±0.17 | - | - | 1.49 | 0.51±0.10 | - | - | - |
| B34 | 9.83±0.12 | - | - | - | 0.33±0.06 | - | - | - |
| B35 | 6.07±0.09 | 0.12±0.09 | - | - | - | - | - | - |
| B36 | 3.34±0.20 | - | - | - | 0.22±0.10 | + | - | - |
| B37 | 2.82±0.14 | - | - | 1.90 | 1,05±0.19 | + | + | - |
| B38 | 1.89±0.12 | - | - | 0.99 | - | - | - | - |
| B39 | 7.31±0.08 | - | - | 1.84 | 0.23±0.05 | - | - | - |
| B40 | 6.68±0.27 | 0.12±0.08 | - | 1.23 | - | + | - | - |
| B41 | 1.26±0.35 | 0.36±0.12 | - | 1.49 | 0.24±0.02 | + | - | - |
| B42 | 4.09±0.17 | - | - | 1.52 | 1.05±0.05 | - | - | - |
| B43 | 5.45±0.11 | - | - | - | 2,04±0.11 | - | - | - |
| B44 | 1.24±0.16 | - | - | - | - | - | - | - |
| B45 | 5.82±0.23 | - | - | - | 0.67±0.16 | + | - | - |
| B46 | 5.70±0.11 | 0.23±0.12 | - | - | 0.92±0.07 | + | - | - |
| B47 | 4.53±0.10 | - | 1 | - | - | + | - | - |
| B48 | 1.08±0.27 | - | 1 | 1.68 | 0.93±0.12 | - | - | - |
| B49 | 7.60±0.12 | - | 2 | - | - | - | - | - |
| B50 | 3.09±0.11 | - | 1 | 1.71 | - | + | - | - |

Means ± SE are presented; (+): positive result; (−): negative result

**Table S2** General features and characteristics of B14, B16 and B19 genomes used for comparative genomics analysis

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Strain | BioSample | Bioproject | Assembly | Level | Size Mb | GC% | WGS | Scaffolds | Gene | Protein |
| B14 | SAMN14435791 | PRJNA614621 | |  | | --- | |  |   GCA\_012030485.1 | Contig | 6.73 | 60.30 | JAAUVM | 74 | 6211 | 5978 |
| B16 | SAMN14450831 | PRJNA614621 | GCA\_012030425.1 | Contig | 6.02 | 36.30 | JAAUVN01 | 34 | 5064 | 4916 |
| B19 | SAMN14450832 | PRJNA614621 | GCA\_012030385.1 | Contig | 4.06 | 68.60 | JAAUVO01 | 50 | 3937 | 3839 |

**Table S3** Genome assembly statistics

|  |  |  |  |
| --- | --- | --- | --- |
|  | B14  *Pseudomonas grimontii* | B16  *Sphingobacterium kitahiroshimense* | B19  *Microbacterium oxydans* |
| # of reads | 1676437 | 1008784 | 612023 |
| # contigs | 56 | 13 | 45 |
| # contigs (>= 0 bp) | 87 | 42 | 50 |
| # contigs (>= 1000 bp) | 52 | 13 | 42 |
| Largest contig | 757014 | 2376480 | 351061 |
| Total length | 6726416 | 6013966 | 4060543 |
| Total length (>= 0 bp) | 6733150 | 6020996 | 4062177 |
| Total length (>= 1000 bp) | 6722939 | 6013966 | 4058808 |
| N50 | 261782 | 1099225 | 195006 |
| N75 | 129498 | 517166 | 104958 |
| L50 | 9 | 2 | 9 |
| L75 | 18 | 4 | 16 |

**Table S4** Effect of bacterial inoculation on rape growth.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Parametr | Control | B14 | B16 | B19 | Consortium  (B14, B19, B16) | Significant level p |
| Number of live leaves | 3.33 ± 0.29a | 4.06 ± 0.31a | 3.87 ± 0.40a | 2.87 ± 0.19a | 5.05 ± 0.29b | \* |
| Number of death leaves | 1.13 ± 0.24 | 0.56 ± 0.20 | 0.53 ± 0.13 | 0.33 ± 0.13 | 0.50 ± 0.15 | ns |
| Lenght of shoots (mm) | 12.7 ± 1.3a | 9.81 ± 0.77b | 13.6 ± 1.4a | 9.13 ± 0.47b | 16.9 ± 1.5a | \* |
| Lenght of roots (mm) | 133.1 ± 11.7 | 149.5 ± 10.7 | 147.1 ± 13.4 | 115.1 ± 11.4 | 145.4 ± 8.57 | ns |
| Lenght of epicotyls (mm) | 27.3 ± 3.08 | 25.6 ± 1.59 | 25.4 ± 2.27 | 21.3 ± 1.96 | 20.5 ± 1.67 | ns |
| Dry weight of leaves (g) | 0.148 ± 0.034 | 0.234 ± 0.055 | 0.220 ± 0.054 | 0.101 ± 0.015 | 0.282 ± 0.067 | ns |
| Dry weight of petioles (g) | 0.048 ± 0.011 | 0.067 ± 0.019 | 0.081 ± 0.022 | 0.025 ± 0.006 | 0.088 ± 0.020 | ns |
| Dry weight of roots (g) | 0.032 ± 0.006 | 0.053 ± 0.011 | 0.068 ± 0.015 | 0.036 ± 0.005 | 0.057 ± 0.012 | ns |
| Dry weight of epicotyls (g) | 0.019 ± 0.003 | 0.023 ± 0.003 | 0.023 ± 0.004 | 0.016 ± 0.002 | 0.019 ± 0.003 | ns |
| Dry weight of shoots (g) | 0.020 ± 0.004 | 0.029 ± 0.006 | 0.033 ± 0.007 | 0.018 ± 0.003 | 0.038 ± 0.006 | ns |
| Specific leaf area SLA (cm2/g) | 342.6 ± 29.6 | 324.0 ± 28.4 | 312.2 ± 19.9 | 251.9 ± 24.0 | 371.8 ± 26.9 | ns |
| Leaf weight ratio LWR (g/g) | 0.52 ± 0.02 | 0.55 ± 0.02 | 0.48 ± 0.03 | 0.51 ± 0.02 | 0.54 ± 0.02 | ns |
| Chlorophyll Content Index | 41.5 ± 2.15a | 24.4 ± 1.30b | 39.9 ± 3.74a | 28.9 ± 2.83b | 41.8 ± 1.87a | \* |

Significance levels (p) symbols: ns – not significant differences, \* p < 0.05 (value obtained by permutation Monte Carlo test with Bonferroni correction in CCA. If there are statistically significant differences, the letters (a,b) indicate groups that differ from each other.