

Supplementary Table S1. List of primers used for gene expression analysis.

| GENE | ACCESSION NO. | FORWARD PRIMER | REVERSE PRIMER | AMPLICON SIZE (BP) |
|--------------------|----------------------|------------------------------|------------------------------|---------------------------|
| <i>BnaNIP5;1</i> | KT899999.1 | 5'-CTCCTGGTGTCTCCCTTACTC-3' | 5'-GCTCCGTCGTATTTCTGGTTC-3' | 109 |
| <i>BnaNIP6;1</i> | XM_013794870.3 | 5'-TGGAGGTTTTGAAGGAAAGAGG-3' | 5'-CGCAAGAGACTGGAGGGA-3' | 134 |
| <i>BnaBOR1;1a</i> | GU827643 | 5'-AAAGAGCAGCGTGTAAAGCAA-3' | 5'-CAGAGGACAGAGGTTGGGA-3' | 98 |
| <i>BnaBOR1;1c</i> | GU827644 | 5'-CAAAGAGCAGCGTGTAAAGCAA-3' | 5'-GCGAAGTAGCCCCAAAGGA-3' | 111 |
| <i>BnaBOR1;2a</i> | GU827648 | 5'-CGGAACGGGAGAATCAGAAG-3' | 5'-AAGACCAAAGGGAGGAACCA-3' | 89 |
| <i>BnaBOR1;2c</i> | GU827647 | 5'-TAGACCTGAACTGGGACGAGA-3' | 5'-GCCATCACAAACAGCATCAAAG-3' | 84 |
| <i>BnaBOR1;3a</i> | GU827646 | 5'-AATGGTGGGAGGATGCGTTG-3' | 5'-CGACTTGGGGCTGTGAATAGA-3' | 150 |
| <i>BnaBOR1;3c</i> | GU827645 | 5'-CACTGCTTATTCTCGGC GTT-3' | 5'-AGTCCAAACACAAACCCATCC-3' | 131 |
| <i>BnaEf1alpha</i> | NM_001315606 | 5'-AGTCTCTTGTGGAGGCACTT-3' | 5'-CTGGGTCATCCTTGGGGTT-3' | 111 |
| <i>BnaACT7</i> | NM_001316079 | 5'-TGAGAGATTCCGTTGCCCT-3' | 5'-CACCCTGAGGACGATGTTTC-3' | 149 |
| <i>BnaTIP41</i> | XM_013842392 | 5'-GGCACGATTCTCACTTCTCTC-3' | 5'-CATTCTCGCAAAGACCATTTC-3' | 88 |
| <i>BnaPP2A</i> | XM_013856328 | 5'-TCCTTTTGTGGAGGGGTTG-3' | 5'-CTCTCTCACGCAGGTCTCTT-3' | 98 |

Supplementary Table S2 : Effect of Si application on rapeseed elemental composition under B deficiency. Plants were grown in hydroponic culture under either low (0.1 μM) or normal B (25 μM) as well as 1.8 mM of Si supply. Roots and shoots were harvested after 20 days of treatments. Data are expressed as mean \pm SD in mg g^{-1} dry weight for the concentration (A) or in mg per plant for the total uptake (B). Data expressed as mg per plant correspond to the concentration in root or shoot multiplied by the corresponding root or shoot dry weight. Different letters denote significant difference according to ANOVA followed by the SNK test ($p < 0.05$; $n = 6$).

(A)

| | Roots (mg g^{-1} DW) | | | | Leaves (mg g^{-1} DW) | | | |
|-----------|--------------------------------|------------------------------|------------------------------|-------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|
| | Control | | Low B | | Control | | Low B | |
| | -Si | +Si | -Si | +Si | -Si | +Si | -Si | +Si |
| Al | 0.11 \pm 0.02 ^a | 0.04 \pm 0.01 ^c | 0.07 \pm 0.01 ^b | 0.06 \pm 0.02 ^{bc} | 0.04 \pm 0.00 | 0.04 \pm 0.00 | 0.04 \pm 0.00 | 0.04 \pm 0.01 |
| Ca | 8.94 \pm 2.10 ^a | 6.96 \pm 0.53 ^b | 7.12 \pm 0.70 ^b | 7.14 \pm 0.49 ^b | 24.30 \pm 3.33 ^b | 27.91 \pm 2.02 ^{ab} | 32.12 \pm 2.94 ^a | 32.00 \pm 2.54 ^a |
| Cu | 0.04 \pm 0.01 ^a | 0.02 \pm 0.00 ^b | 0.02 \pm 0.00 ^b | 0.02 \pm 0.00 ^b | 0.01 \pm 0.00 | 0.01 \pm 0.00 | 0.01 \pm 0.00 | 0.01 \pm 0.00 |
| Fe | 3.48 \pm 0.67 ^a | 1.45 \pm 0.33 ^b | 3.87 \pm 0.62 ^a | 1.85 \pm 0.02 ^b | 0.10 \pm 0.01 | 0.09 \pm 0.01 | 0.09 \pm 0.01 | 0.09 \pm 0.02 |
| K | 72.06 \pm 2.46 | 69.04 \pm 8.95 | 64.66 \pm 1.24 | 62.75 \pm 4.59 | 48.42 \pm 4.04 ^b | 55.27 \pm 3.91 ^a | 47.55 \pm 2.56 ^b | 49.82 \pm 4.00 ^b |
| Mg | 3.16 \pm 0.79 ^a | 2.90 \pm 0.50 ^a | 2.08 \pm 0.14 ^b | 2.23 \pm 0.17 ^b | 3.01 \pm 0.29 | 3.18 \pm 0.21 | 2.99 \pm 0.26 | 3.33 \pm 0.16 |
| Mn | 1.12 \pm 0.13 | 1.15 \pm 0.14 | 1.15 \pm 0.42 | 1.31 \pm 0.11 | 0.22 \pm 0.03 | 0.23 \pm 0.02 | 0.20 \pm 0.04 | 0.23 \pm 0.02 |
| Mo | 0.01 \pm 0.00 | 0.01 \pm 0.00 | 0.01 \pm 0.00 | 0.01 \pm 0.00 | 0.01 \pm 0.00 | 0.01 \pm 0.00 | 0.01 \pm 0.00 | 0.01 \pm 0.00 |
| Na | 0.71 \pm 0.13 | 0.61 \pm 0.05 | 0.73 \pm 0.16 | 0.63 \pm 0.05 | 0.20 \pm 0.03 | 0.21 \pm 0.02 | 0.24 \pm 0.05 | 0.23 \pm 0.03 |
| P | 8.31 \pm 0.61 ^a | 7.28 \pm 0.50 ^b | 8.38 \pm 0.26 ^a | 7.00 \pm 0.37 ^b | 5.66 \pm 0.30 | 5.32 \pm 0.40 | 5.37 \pm 0.94 | 5.40 \pm 0.30 |
| S | 10.94 \pm 0.79 | 11.08 \pm 0.64 | 10.01 \pm 1.00 | 10.70 \pm 0.44 | 12.97 \pm 1.79 | 12.49 \pm 0.36 | 11.79 \pm 1.13 | 12.51 \pm 1.48 |
| Zn | 0.06 \pm 0.02 ^{ab} | 0.04 \pm 0.00 ^c | 0.07 \pm 0.00 ^a | 0.05 \pm 0.01 ^{bc} | 0.032 \pm 0.005 ^a | 0.024 \pm 0.002 ^b | 0.028 \pm 0.005 ^b | 0.024 \pm 0.002 ^b |

(B)

| | Roots (mg per plant) | | | | Leaves (mg per plant) | | | |
|----|---------------------------|----------------------------|---------------------------|---------------------------|----------------------------|---------------------------|---------------------------|----------------------------|
| | Control | | Low B | | Control | | Low B | |
| | -Si | +Si | -Si | +Si | -Si | +Si | -Si | +Si |
| Al | 0.17 ± 0.05 ^a | 0.06 ± 0.01 ^b | 0.05 ± 0.01 ^b | 0.06 ± 0.03 ^b | 0.31 ± 0.08 | 0.26 ± 0.02 | 0.24 ± 0.07 | 0.29 ± 0.06 |
| Ca | 14.01 ± 5.93 ^a | 10.07 ± 1.73 ^{ab} | 5.26 ± 1.65 ^b | 7.84 ± 1.65 ^b | 179.99 ± 57.28 | 203.09 ± 31.92 | 181.36 ± 42.9 | 237.44 ± 46.14 |
| Cu | 0.06 ± 0.03 ^a | 0.02 ± 0.004 ^b | 0.02 ± 0.002 ^b | 0.02 ± 0.005 ^b | 0.04 ± 0.01 ^a | 0.04 ± 0.01 ^{ab} | 0.03 ± 0.01 ^b | 0.04 ± 0.01 ^{ab} |
| Fe | 5.22 ± 0.65 ^a | 2.08 ± 0.31 ^b | 2.89 ± 1.06 ^b | 2.03 ± 0.39 ^b | 0.72 ± 0.11 ^a | 0.64 ± 0.1 ^{ab} | 0.49 ± 0.07 ^b | 0.68 ± 0.16 ^{ab} |
| K | 110.1 ± 19.6 ^a | 97.67 ± 21.27 ^a | 52.81 ± 5.74 ^b | 68.84 ± 14.7 ^b | 355.4 ± 85.3 ^{ab} | 402.7 ± 64.6 ^a | 268.8 ± 58.7 ^b | 364.8 ± 37.8 ^{ab} |
| Mg | 4.99 ± 2.22 ^a | 4.12 ± 1.08 ^a | 1.54 ± 0.49 ^b | 2.45 ± 0.57 ^b | 22.13 ± 5.62 | 23.11 ± 3.55 | 16.88 ± 3.75 | 24.74 ± 4.58 |
| Mn | 1.7 ± 0.27 ^a | 1.62 ± 0.32 ^a | 0.88 ± 0.51 ^b | 1.52 ± 0.25 ^a | 1.62 ± 0.44 ^{ab} | 1.63 ± 0.13 ^{ab} | 1.12 ± 0.33 ^b | 1.72 ± 0.36 ^a |
| Mo | 0.02 ± 0.01 ^a | 0.02 ± 0 ^a | 0.01 ± 0 ^b | 0.01 ± 0 ^{ab} | 0.09 ± 0.03 | 0.09 ± 0.01 | 0.06 ± 0.01 | 0.09 ± 0.03 |
| Na | 1.09 ± 0.36 ^a | 0.85 ± 0.17 ^{ab} | 0.51 ± 0.09 ^b | 0.69 ± 0.15 ^b | 1.44 ± 0.33 | 1.57 ± 0.12 | 1.3 ± 0.25 | 1.66 ± 0.3 |
| P | 12.76 ± 3.01 ^a | 10.23 ± 1.25 ^b | 6.17 ± 1.76 ^c | 7.66 ± 1.43 ^c | 41.04 ± 6.09 | 38.55 ± 4.74 | 30.16 ± 6.8 | 39.86 ± 6.5 |
| S | 16.9 ± 4.41 ^a | 15.62 ± 2.43 ^{ab} | 7.37 ± 2.32 ^c | 11.74 ± 2.3 ^b | 95.33 ± 25.07 | 90.69 ± 10.96 | 66.62 ± 15.18 | 93.38 ± 21.58 |
| Zn | 0.09 ± 0.01 ^a | 0.06 ± 0.01 ^b | 0.06 ± 0.01 ^b | 0.06 ± 0.01 ^b | 0.23 ± 0.04 ^a | 0.18 ± 0.01 ^b | 0.15 ± 0.02 ^b | 0.18 ± 0.03 ^b |

Figure S1: Effect of Si application on the expression level of B transporters in rapeseed roots under short-term B deficiency; (A) Relative expression of *BnaBOR1;1a* in roots, (B) Relative expression of *BnaBOR1;1c* in roots, (C) Relative expression of *BnaBOR1;2a* in roots, (D) Relative expression of *BnaBOR1;3a* in roots, (E) Relative expression of *BnaBOR1;3c* in roots and (F) Relative expression of *BnaNIP6;1* in roots. Plants were grown in hydroponic culture under control B condition for one week (using 25 μM ^{11}B) and then for two weeks under either low or control B condition (using 0.1 μM or 25 μM ^{10}B , respectively) as well as 1.8 mM of Si supply. Roots and shoots were harvested after 0, 2, 4, 7, 10 and 15 days of treatments. The two first leaves are considered as old leaves and the other leaves developing from 7 days of B deficiency are considered as young leaves. Bars indicate mean \pm SEM. Asterisks denote a significant difference according to t-test between low B and low B+Si ($p < 0.05$; $n = 5$).

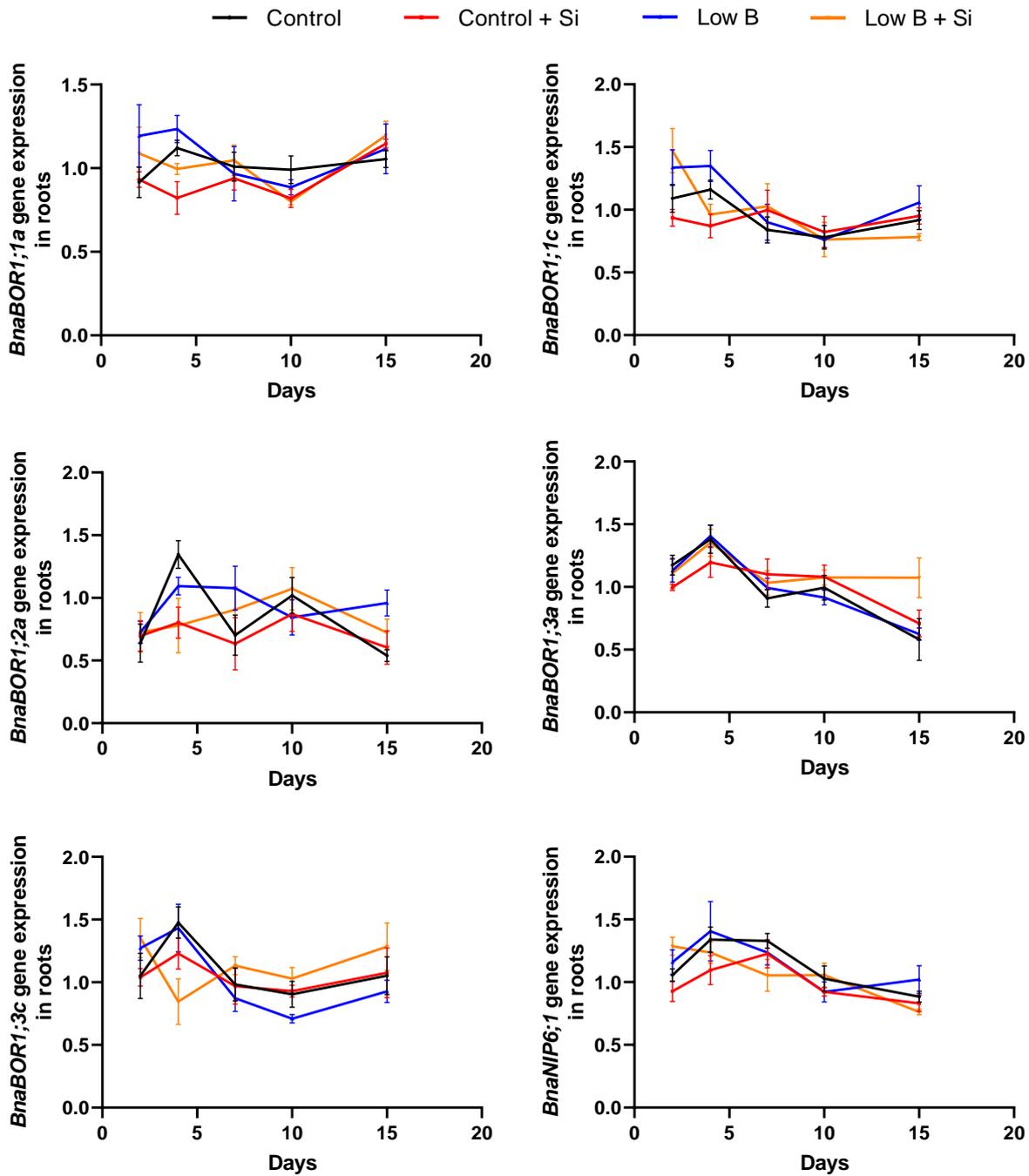


Figure S2: Effect of Si application on the expression level of B transporters in rapeseed old leaves under short-term B deficiency; (A) Relative expression of *BnaBOR1;1a* in old leaves, (B) Relative expression of *BnaBOR1;1c* in old leaves, (C) Relative expression of *BnaBOR1;2a* in old leaves, (D) Relative expression of *BnaBOR1;3a* in old leaves, (E) Relative expression of *BnaBOR1;3c* in old leaves and (F) Relative expression of *BnaNIP6;1* in old leaves. Plants were grown in hydroponic culture under control B condition for one week (using 25 μ M 11B) and then for two weeks under either low or control B condition (using 0.1 μ M or 25 μ M 10B, respectively) as well as 1.8 mM of Si supply. Roots and shoots were harvested after 0, 2, 4, 7, 10 and 15 days of treatments. The two first leaves are considered as old leaves and the other leaves developing from 7 days of B deficiency are considered as young leaves. Bars indicate mean \pm SEM. Asterisks denote a significant difference according to t-test between low B and low B+Si ($p < 0.05$; $n = 5$).

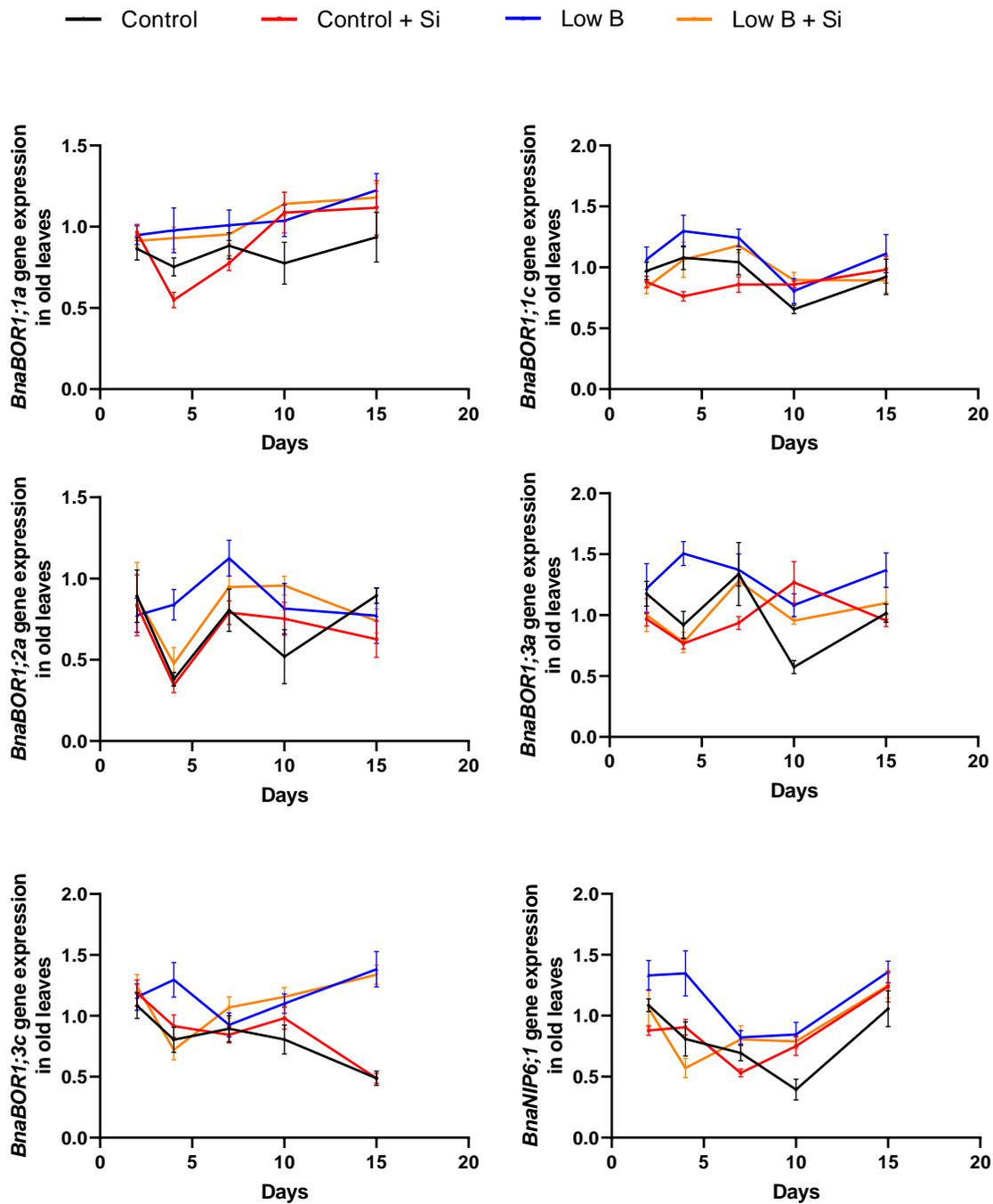


Figure S3: Effect of Si application on the expression level of B transporters in rapeseed young leaves under short-term B deficiency; (A) Relative expression of *BnaBOR1;1a* in young leaves, (B) Relative expression of *BnaBOR1;1c* in young leaves, (C) Relative expression of *BnaBOR1;2a* in young leaves, (D) Relative expression of *BnaBOR1;3a* in young leaves, (E) Relative expression of *BnaBOR1;3c* in young leaves and (F) Relative expression of *BnaNIP6;1* in young leaves. Plants were grown in hydroponic culture under control B condition for one week (using 25 μM ^{11}B) and then for two weeks under either low or control B condition (using 0.1 μM or 25 μM ^{10}B , respectively) as well as 1.8 mM of Si supply. Roots and shoots were harvested after 0, 2, 4, 7, 10 and 15 days of treatments. The two first leaves are considered as old leaves and the other leaves developing from 7 days of B deficiency are considered as young leaves. Bars indicate mean \pm SEM. Asterisks denote a significant difference according to t-test between low B and low B+Si ($p < 0.05$; $n = 5$).

