# Supplementary Information

## Linkage and regional association analysis reveal two new tightly-linked major-QTLs for pod number and seed number per pod in rapeseed

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**Table S1 Summary statistics for primer-pairs screening for parents and marker genotyping in the BnaZNF$_2$ population.**

| Marker type | Prefix of primer-pairs | Screened primer-pairs | Polymorphic primer-pairs | Polymorphic markers | Source of primer-pairs |
|---|---|---|---|---|---|
| InDel | BnID | 76 | 33 | 34 | our unpublished data |
| SNP | IGF | 98 | 4 | 4 | http://brassica.nbi.ac.uk/IMSORB/ |
|  | ns | 294 | 108 | 110 | Huang et al. 2013 |
|  | snap | 2200 | 46 | 48 | Wang et al.2012 |
| SSR | BN | 24 | 2 | 2 | Kresovich et al. (1995); Szewc-McFadden AK et al.(1996) |
|  | BnEMS,BnGMS,BoGMS,BrGMS | 602 | 63 | 71 | Cheng et al (2009); Xu et al (2010); Li et al (2010) |
|  | BoSF, BrSF, BnSF | 4275 | 517 | 566 | Shi et al. 2014 |
|  | BRAS,CB | 373 | 35 | 37 | Piquemal et al. (2005); Radoev et al. 2008 |
|  | BRMS | 40 | 4 | 4 | Suwabe et al. 2002 |
|  | CNU | 191 | 43 | 49 | Kim et al. (2009) |
|  | ENA | 13 | 2 | 2 | Choi et al. (2007) |
|  | FITO | 255 | 6 | 6 | Iniguez-Luy et al. 2009 |
|  | HRI | 6 | 1 | 1 | Smith LB and King GJ (2000) |
|  | KS | 50 | 5 | 5 | http://www.brassica.info/resource/markers.php |
|  | MB | 5 | 0 | 0 | Lagercrantz et al. (1993) |
|  | MD | 2 | 1 | 1 | Uzanova and Ecke (1999) |
|  | MR | 8 | 6 | 6 | Uzanova and Ecke (1999) |
|  | Na,Ni,Ol,Ra | 398 | 24 | 27 | Lowe et al. 2004 |
|  | nga | 30 | 0 | 0 | Bell and Ecker (1994) |
|  | niab | 144 | 20 | 23 | Kim et al. (2009) |
|  | SA | 3 | 1 | 1 | Qiut et al. (2006) |
|  | sN,sO,sR,sS | 85 | 28 | 29 | AAFC Consortium |
| STS | AT, IFLP,TF | 179 | 12 | 12 | Sun et al. 2013 |
| **Total** |  | **9351** | **961** | **1038** |  |

**Table S2** List of 561 newly developed and mapped markers (499 SSR, 31 SNP and 31 InDel) on the BnaZNF2 linkage map.

| Marker_name | Marker_Typ | Forward_Primer (5'-3') | Reverse_Primer (5'-3') |
|---|---|---|---|
| BnID035a | InDel | GGAATAAGTTGCTTGGGTTGC | GCCAGCGAGGTTCTCAGC |
| BnID040 | InDel | TTTCATCCAAGGAGTAGCGG | CCGTTGACAAAAAGGGCTAC |
| BnID041 | InDel | GTTCCGTTCGGGTTCATCTA | GCTCTTCGAACACGTTCTCC |
| BnID042 | InDel | TTTCCAACTGGAACGCAAAT | GTGACCAGGCTCATCGAAAT |
| BnID043 | InDel | TTCGATACCACCACCAGACA | CATCCTCCTCCTCCATTTGA |
| BnID044 | InDel | CCCATGAGGACAAGGAAGAA | CAACCGTTTGTCAAAGACTGA |
| BnID045 | InDel | CCTGGTTGTGCATTTCCTTT | ATGGCTTTACACGGAGCAGT |
| BnID046 | InDel | CCAGCCATGAGAGTTAGGGA | TGGTGGAGTGTTGGTTTTTG |
| BnID047 | InDel | CCCTTTCAATATGAGAGAGAGGA | TTAATTTGGATATGCATGGGC |
| BnID052 | InDel | GAGGGAACAAAAGAGAGCCA | GGATCACCAGCTGAGGAAGA |
| BnID053 | InDel | GCTCATACCGATGAACATTCTTT | TGTTCGGATAAGCCTTCTTGA |
| BnID056 | InDel | TGGTGCACTACAAGAACATGG | ATGACCCCATGCAACCTTAC |
| BnID060 | InDel | CAAGCATCGAGTTCCACTCA | CATTATTGTTACGGCCCGAT |
| BnID061 | InDel | ACCCCATTGTCTTGGAATCA | CGGAATAACTGCACCGAAAC |
| BnID062 | InDel | GCGACACGTCTCTGGAGAAT | TGCAAGTGCATCCAAAGTTC |
| BnID063 | InDel | ACGCTTTTCCCCTTAGGAAC | GCACATTCTTCCCTTTTTGC |
| BnID075 | InDel | CGCCCTTCAAATACAAGCTC | CTTCCTGAAAGCGTCTACCG |
| BnID076 | InDel | AGCTAAGAGCTGAAGCACGG | AGATGCTGAAATTCGTCTGTGA |
| BnID078 | InDel | TTATGAGGAGGTGACTGGGTG | GCGCAGACACCTATGGAAAT |
| BnID079 | InDel | CAGTCCTGAGCTATTTGGTCC | AACTACGGAAGGGTCAAGCC |
| BnID081 | InDel | GGAGGGAGGGTGCAAGTATT | CACCAACCGTTTTTCATTCC |
| BnID082 | InDel | TACGACCCGCCAAATATCAT | GACGTTTTGGGTATCTGTTCG |
| BnID085 | InDel | CCCTTCCTTCTCCATTCTCC | GGCCCATTAAACTCTCACGA |
| BnID086 | InDel | TCTGTTCTCATGCTGTGGCT | TCCCCTTGGTGTTTTGTCTC |
| BnID087 | InDel | CTTCCCCGACCAAAATGAT | AAGCAAGAGGGGAAAAGAGC |
| BnID090 | InDel | CTCGACGTCTGGGAGATCA | ATCGGCATTCCGTGATAGAT |
| BnID094 | InDel | CACATGAAACCCACCACTGA | GGCCCGTACTATGATCCTCA |

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|---|---|---|---|
| BnID095 | InDel | GACAACGGCTAGGGTTTCAA | TGAGAGCTCTGTTGCGAAAA |
| BnID097 | InDel | TTGCTTTAGCGGAGCTTGTT | GCAAGCCGGTTATTGAATTT |
| BnID107 | InDel | AAGCACACGTGTCCCACTTT | TGCAGCCAAAAGAGAACCTT |
| BnID108 | InDel | AACTCTCGGCCCATGAACTA | CGGTATCGGAGGAATGAGAA |
| BnSF2342-39 | SSR | GGCGAACAAGAAACCGATTA | TTCCGAATTAAACCGCAAAC |
| BnSF287-186 | SSR | CAGATACATGTGAAAGTTTGAAACAA | ATGTAAACCTCCCCGGTTTT |
| BnSF400-253 | SSR | ATCACCAATGCCATCCTCAT | ATTCAAGACATTTGGCCTGC |
| BnSF400-28 | SSR | AAATTGCAACCCCATAACACA | TCCCACACTAGAGAGAGCGAA |
| BnSF400-29 | SSR | TTGAATCGAATCAGGAAGGG | CATTTAGCAACCTCCACCGT |
| BnSF400-54 | SSR | TGTCGTTTGATGGATGCCTA | GAGGACTCGGTCTGAACTCG |
| BoSF0016 | SSR | GGCGAGGAGGTTGTTGATTA | CTTCGACGGAGATTTTCGAG |
| BoSF0017 | SSR | GGGCATTTCTTTTCGTGGTA | CTCACGGACTTTGCTGACAA |
| BoSF0022a | SSR | TGCCATCAAAGGAGTGTTCA | TCATCTGCTCAACATGAGGC |
| BoSF0022b | SSR | TGCCATCAAAGGAGTGTTCA | TCATCTGCTCAACATGAGGC |
| BoSF0023 | SSR | CCCTATTTGCGTGCGTCTAT | GAAACCACCCATCAAGGAAA |
| BoSF0033a | SSR | GTTGTGGTCTGCCAAAAGGT | CGCAGGAAACTGTAAGAGCC |
| BoSF0040 | SSR | CCAAAATTTGCATGAAAGCC | CAGCTTGTGCTTGTCTTCTTG |
| BoSF0050a | SSR | TGTACGTGCACCACGTTTTT | CTTCGATTACTCGGTGGCAT |
| BoSF0050b | SSR | TGTACGTGCACCACGTTTTT | CTTCGATTACTCGGTGGCAT |
| BoSF0096 | SSR | CTTGGTCCGTTGCTCTTTTC | AACTGATCGAAAGCTCGCAT |
| BoSF0114 | SSR | TCTGCCAAATTGACCAGAGA | TGTAAATGGAACAAGCAAGCA |
| BoSF0130 | SSR | AAATCCAAACCCACAACCAA | CCCATCACAGAGGCAAGAGT |
| BoSF0132 | SSR | GGTCATCCACATTGGTTAGAAA | GAGGAGTGTCCAGGACCGTA |
| BoSF0133 | SSR | CGTTTCGAGTGTCTCACCAA | TCGAGGCTAGGTTTTGCAGT |
| BoSF0160 | SSR | GAAGGTCCTTACATGGTGAAGC | AAACACAGTGCTGATGCAGG |
| BoSF0176 | SSR | ATGAAAACCACAATCACGCA | TTTCGATGGCACAAAAATTG |
| BoSF0185 | SSR | ATGGACTGTGTTTTTGGTCG | ATGAAACCAAGGCAAAATGC |
| BoSF0197 | SSR | CGGATTCATCAACCTCGTCT | CTCACCGCTTCAAAATCCAT |
| BoSF0213 | SSR | GAAAATCCTGCAAACCCTGA | CTCTCCATATCTCCGGACCA |
| BoSF0215 | SSR | CAGGTCACTACAAGTGGGCA | TCCCTATCCATGAGACGAGC |

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|---|---|---|---|
| BoSF0216 | SSR | GAGCCTTTGCACACGAAAAC | GGCGTCTAATAGCATGTACAAGTG |
| BoSF0222 | SSR | CTCTTCCCACCGGTATTCCT | CGAGTTCACCGAGCACAATA |
| BoSF0223 | SSR | AGCTCACGAATCTGCTCCAT | CCGAAACCAAGATAGGTGGA |
| BoSF0224a | SSR | TTCACAAGGCTTCTCAGCAA | CTGATCTTGGAATGCCGTTT |
| BoSF0224b | SSR | TTCACAAGGCTTCTCAGCAA | CTGATCTTGGAATGCCGTTT |
| BoSF0230 | SSR | GGCAAAAGAAGAGACAGCGA | AGTGGGGGACCATAAACCTC |
| BoSF0231 | SSR | CTCGTGGTTCAGGACTCCAT | GTGGCGAGTTTTGATTTGGT |
| BoSF0232 | SSR | CAGACTCTTTGACCGCCATT | GCTCCGGTCAGATCCATAAA |
| BoSF0239 | SSR | TGTGTGGAACAGTGTTTGGAA | TCTCTGGCTCTCTTTCGCTC |
| BoSF0259 | SSR | GTGGTTGGAAATATCGACGC | TGAAGCTCACAAATCGCAAG |
| BoSF0270 | SSR | TGAACCGTGACAGAGAGTGC | CCTCACCCAAAAGCCAAGTA |
| BoSF0284 | SSR | TCTCTACTTTCTCGGGTGGG | GCGTGTTCTCCTCCCTCTAC |
| BoSF0302 | SSR | CATGCGGAAGCATTTGAGTA | CCGATCGAGCTCATGATAAA |
| BoSF0310 | SSR | TCCCTCAACATACCCATTGA | TGTCCATGACCATTGCTTGT |
| BoSF0318 | SSR | CAAACAGGCCCGTCTCTAAG | AGGTGGAGCTGCATTTGATT |
| BoSF0329 | SSR | AACCGTTACAGACACCGCTC | AGGAAGCTTTATCCCCCAGA |
| BoSF0333 | SSR | CGATCAGTACCAGCCGAAAT | TCTCTCAGCTCCTCAACCGT |
| BoSF0336a | SSR | CCGAATCTTCCATTTACCGA | CCATGTCCATCTTCGCTTTT |
| BoSF0336b | SSR | CCGAATCTTCCATTTACCGA | CCATGTCCATCTTCGCTTTT |
| BoSF0346 | SSR | AAAACATTGGGGCAAATCAA | GCGAGACGTATTGTTTGGGT |
| BoSF0349 | SSR | AAACCCACACATCATCTTCCA | AGCATCTTTGCTCTTGGCAT |
| BoSF0365 | SSR | GAGATTGGAAGAGCGCAAAC | ACCCCAAGCCTGGTTAGACT |
| BoSF0371 | SSR | TCAACAAACCAGTAACCACGTT | CAACACGAGCCAGAGATGAA |
| BoSF0393 | SSR | TCGAATGGTTGTTTGTTGTTG | GCGAGACGTATTGTTTGGGT |
| BoSF0402 | SSR | CCTTACGCAAGACCAGAAGC | GACTCGAAGCTGTGGTGACA |
| BoSF0415a | SSR | AGCAGAAACGAAACCTGCAT | TCGTTAAGGTGTGGAGTGATTG |
| BoSF0415b | SSR | AGCAGAAACGAAACCTGCAT | TCGTTAAGGTGTGGAGTGATTG |
| BoSF0421 | SSR | GGACAAAAGTGTGTCATGCG | AAGGTAAGCCGTTCGGTTCT |
| BoSF0442 | SSR | TCGTTGGTCTTGCCTTTCTT | CGTATTTCTTGAGTGCAAACG |
| BoSF0448 | SSR | CTTCTCCAAATCCTGGTGGA | AAGCATCCAAACCCATCAAC |

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|---|---|---|---|
| BoSF0455b | SSR | TCGAATGCCATATCACAGGA | ACCACCATAGCCAAAACCAA |
| BoSF0455c | SSR | TCGAATGCCATATCACAGGA | ACCACCATAGCCAAAACCAA |
| BoSF0466 | SSR | TAGCATGTTCGAACCGTCAG | AAATAACTGGACGCCCAAAA |
| BoSF0482 | SSR | GGTGATCAACCATTGCAACA | GACTCCACCGAAGGTACCAA |
| BoSF0483 | SSR | GCATCTGATCTTTCCGCTTC | GGTTTTGTTTTGATTGGGACA |
| BoSF0495 | SSR | TCTCCTTGCATCGGCTAAGT | TTTTGGGCTGTTTAGTTCCG |
| BoSF0503 | SSR | ACCATGGCCTCTTGTATTGC | CGGAGTGTTCCCAATCAACT |
| BoSF0513 | SSR | CCTTTTACAAAGGCAATTGAGA | AAAACCCTGAACACACCGAG |
| BoSF0521 | SSR | CTCACGAGCTATTGATCGCA | CACGAATGATGAGCCAAGAA |
| BoSF0525b | SSR | GGAGAATAGCAGGCAGCAAC | TTGACCCAAGCATGCAAATA |
| BoSF0546 | SSR | GCGTAGGTCGTTGACAGACA | GCTCCCATGGTAGTGTTGGT |
| BoSF0552 | SSR | GCCCTAAACATGGCATTGTC | GGGTTTCTTCAAACACCAGAA |
| BoSF0554 | SSR | TGCGTCACAACCCTTTCATA | TGCGCGGATCTTAAGCTAGT |
| BoSF0560 | SSR | GGATTGCAGAGGACGAGGTA | GCGCAATTGCTGTTAAAAAGA |
| BoSF0582 | SSR | CACACATGGTGGCTTTCTTG | GATTTCCCGACAAAGTTCCA |
| BoSF0586a | SSR | GAACAGACGAAACGACAGGC | AGCACCAAAAGCTATCCCAG |
| BoSF0592 | SSR | TTTGAAACGGAGGACATCAA | CCATGTGATCGCCATTGTTA |
| BoSF0598 | SSR | GTATGAAGGACAACGCGACA | TTAGCAGACTTTAGCGCCGT |
| BoSF0600 | SSR | GGGGCCCAACTTTTACCTTA | TATTTTGTTTGCAGCCGTTG |
| BoSF0601 | SSR | AAAACCCCACTTTTGACGTG | CCGTCGTTATCATCCTCGAT |
| BoSF0613 | SSR | TGGAATTGTCTCCCCAAATC | CGAACTGAACCCGAATGAGT |
| BoSF0643 | SSR | TAGCCCTACTGGCCCCTATT | CGCACTCCGGTTTCTCTAAA |
| BoSF0652 | SSR | TCTTCCTCCTCCCTCCATTT | ACGTAAACCTGAGGAGCGAA |
| BoSF0664 | SSR | TTCTCTGCGTTTTCAGGTGAT | CCTAAGAGCCGTGACATGGT |
| BoSF0665 | SSR | AAAATCGGGGGTTATCTTGC | TTGGCCAAAGTTTCTAGCGT |
| BoSF0670 | SSR | ATCTTCCTCCACGTTCATGC | TGAGGAGTGTGTGTGTGTGTG |
| BoSF0678a | SSR | AACTTTCTCTCCTCCACGCA | TTTCCGCCGATAAAAAGAGA |
| BoSF0693 | SSR | ATGCATCTTAGCTGGCACAT | TTTCTCGCCAGAATCGAACT |
| BoSF0707 | SSR | ACTTCCAATGGGGGTTCTTC | GGCGTTCTTTGCTATACCGT |
| BoSF0711a | SSR | GAGGCGATTCGTCGTTCTAA | ATTGGCCATTTCAGTGAGGT |

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|---|---|---|---|
| BoSF0711b | SSR | GAGGCGATTCGTCGTTCTAA | ATTGGCCATTTCAGTGAGGT |
| BoSF0718 | SSR | CAAAACGTGGCTAACAACCA | TTTCGTCGGTTTAGGTTTCG |
| BoSF0733 | SSR | CGTGGACATAACGGACAATG | CTTGAAGCTCTCCAGCAAGAA |
| BoSF0757 | SSR | CAAAAGTGGTTGTGCATTGG | GCTCTTGGAATGGCGTCTAC |
| BoSF0760 | SSR | CCAAACGGTCATTTCGTCTT | CAGGAGGAAGGAATCGATGA |
| BoSF0764 | SSR | CCCAAGTTCGCTTAATGGTT | GTTCTGGGGCAAATGACTGT |
| BoSF0778 | SSR | GAGTCCCACCGATCAAGAAA | GATGAGAGAGATCAGGGAAGGA |
| BoSF0783a | SSR | GCCTTGGATGAAGACAGAGG | GCGGTGAAGGGTGTAACTGT |
| BoSF0783b | SSR | GCCTTGGATGAAGACAGAGG | GCGGTGAAGGGTGTAACTGT |
| BoSF0784 | SSR | GCTTTCTCAGAGGTGCGTTC | CACTTCCGTAGGAGGTGCAT |
| BoSF0805 | SSR | GCCCCATCCATATACCATTG | ATATGGAGGCGTGGCATTAC |
| BoSF0840 | SSR | GCGAAGCTTCCTTTGTCATC | ATCTGAGACGGAGCGTGAGT |
| BoSF0841b | SSR | AGCGGTGGAAAGCTACTTCA | CAACACCGTCGATCCCTATC |
| BoSF0869 | SSR | AGCACCGCCGATGACTATAC | TGAAGCGAGAGGACGAATCT |
| BoSF0872b | SSR | TGGAAATAGGCATATTACATTGG | GAAGAGCAGGAAGTTTTGGC |
| BoSF0880 | SSR | ACGATTCCAATCACAAAGGC | GTCGTCGTTGCTCTCCTTCT |
| BoSF0883 | SSR | TGAATGTGTGTGTGTGGAGTG | GGCGCATCCAATACCTAACA |
| BoSF0898 | SSR | ATTCAGTACAAAGGCCGTGC | TGGAATGTGCTTCAGAGTCG |
| BoSF0911 | SSR | ATTCCCGGAGGATCAAAAAG | GATGACCAGTCAAAGAGCCC |
| BoSF0926a | SSR | TTCCAACAAACTCATGCCAG | AACAAAAGGGATGACGTTGC |
| BoSF0926b | SSR | TTCCAACAAACTCATGCCAG | AACAAAAGGGATGACGTTGC |
| BoSF0926c | SSR | TTCCAACAAACTCATGCCAG | AACAAAAGGGATGACGTTGC |
| BoSF0935 | SSR | TGGCGATCGAGTTATGTGAA | GTCCGGTTATGTCTGTGCCT |
| BoSF0943 | SSR | AGCCGCGTTAATTTGCTAAG | GGGGAGTGGGTTAGGGTTTA |
| BoSF0948 | SSR | GGCCAAGAGAAAAGGAAACC | CGTCCATAACCGTCTCATCC |
| BoSF0949 | SSR | TCAGATTAAGGGAGCAACCG | AAGCAGCCGAAAATGCTAAA |
| BoSF0952a | SSR | GGGTTCATATCAAAAATAAAAGCA | TGTTGCATAGAGTTCTCCATAGAT |
| BoSF0952b | SSR | GGGTTCATATCAAAAATAAAAGCA | TGTTGCATAGAGTTCTCCATAGAT |
| BoSF0955 | SSR | ATCACCAGCATCACCATGAA | TGCTCACATAATTGTCAATACAGC |
| BoSF0960 | SSR | CATTGTACATGACCGCCAAC | TGCGTGCTCTTTTGATATGC |

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|---|---|---|---|
| BoSF0980 | SSR | CTAGCACCATTGGATCGACA | CCCCGAATCAATCATCAAAC |
| BoSF0997 | SSR | TTCACATGATAACACCATTGAACA | CCAAACTCTTAAAAAGGGACCA |
| BoSF1005 | SSR | CAACCTCGGATTTTGATTCG | ATTCATTTGTGCAGCAGTGG |
| BoSF1009 | SSR | TCGCTGAAGAGGAGGAACAT | TTTCTCTCCTCGCTGGGTTA |
| BoSF1017 | SSR | GCCACAAGTGTTTCCTTTCC | CACAACTTTGCCGGTGTATG |
| BoSF1064 | SSR | ATGCCCGCAAGTATAAAGTAGT | AGTACCGTCACCTGGATTCG |
| BoSF1085 | SSR | GCCACACATCAGACACCAAC | TCTGTGGCCATGTTAGTGGA |
| BoSF1088 | SSR | TTCAAACTTTTGGCGATTCC | ACGAAAACAAAACAGGTCCG |
| BoSF1098 | SSR | TTCAGCGTTGACTCTTCCTG | ACTCCTTTGTTGTTCCGTGC |
| BoSF1121 | SSR | TGTGTACCTCGCCTAGCCTT | GGTGATGTTTGTTTTTGGGG |
| BoSF1125 | SSR | GCTGACCAGATGGAGAGCAT | TCCATGTACTGCCTTTCACAA |
| BoSF1126 | SSR | TCATGGGGAGGACAAAAGTC | GCTGCTCTTTTTGTTGTGTGG |
| BoSF1136 | SSR | ATGCAATCACACGGAATCAA | CTTCGTCTTCTTCGTCACCA |
| BoSF1144 | SSR | CCGCACCATCGAAAATAAAT | TGGTGGTTTTTGCATTTTTG |
| BoSF1161 | SSR | GACTTCATACAGCTGCCCGT | CGAATTTTCTCCCAAACATCA |
| BoSF1212a | SSR | TAAGGAAGCAATCCACCACC | CTTTCCCAATCCTTTCCCTC |
| BoSF1212b | SSR | TAAGGAAGCAATCCACCACC | CTTTCCCAATCCTTTCCCTC |
| BoSF1222 | SSR | CACTTGGACTACCGCTGTCA | TAGAAACAACTTGGGACGGC |
| BoSF1228 | SSR | TCTCTTTGAAAATGTGGCCC | TATGTGGACGATCTTTTGCG |
| BoSF1230 | SSR | GGAGAAAGTGGTGAGCTTCG | ATTCTTTACACGACCGCCCT |
| BoSF1254 | SSR | TGTGGGTGTAAGATATGCGTCT | ATCTTCCCATAAGGCACACG |
| BoSF1258 | SSR | AGGAGGAGGAAGAGCAGAGG | GTGTGGTCGTCAATTTGTGC |
| BoSF1264 | SSR | TTGTTATCTATATTTCCAAACAAACCT | TTGTTTGCAATGGTTGTTGTT |
| BoSF1270 | SSR | GCATTGATTGGATGATTCAAAA | ACTGATCTCCTCACCCGTTG |
| BoSF1271a | SSR | GGATGGCAGCTTTTTGTGTT | AATTCTGATACGCAGGCACC |
| BoSF1271b | SSR | GGATGGCAGCTTTTTGTGTT | AATTCTGATACGCAGGCACC |
| BoSF1276 | SSR | CCTTGCATCTCCTCTTCCTG | ATGCAGCCACCTTCATATCC |
| BoSF1319 | SSR | AGGAACGGTTGCTTACGAGA | ATCCCTCAGCTCACTCCTCA |
| BoSF1324 | SSR | CCAACACAGGTTACACCAACA | TTGGAAGCCATGAAGACGTT |
| BoSF1331a | SSR | ACTGGGCTGGCTGCTAAATA | AGAAATGCGCGTTTTTAAGG |

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|---|---|---|---|
| BoSF1336 | SSR | TTTCATTCGGGAAGATCAAAA | TCCGTAGCTATTTCCTTGATTTCT |
| BoSF1365 | SSR | CGCCTATAACATTAGTTGTCGC | GGTGACCAATGAAATTGGAA |
| BoSF1372 | SSR | CGCTGCCGGTAAAGTTTCTA | CTGCAGGATTGCATTTAGCA |
| BoSF1406 | SSR | TACCATGAGTGCAAAACCCA | GGAAGCTGCTGGTTCAGTTC |
| BoSF1414 | SSR | CCCCTATGCACATGGAAACT | CGGTAAAGAATCTTCAAGCCC |
| BoSF1425 | SSR | TTTTATGTTTCGGCACATGG | CCCTGCGAGCCTACAATAAG |
| BoSF1468 | SSR | TTGTTCTCCTTTGTTTCTGATCC | CTTTGTTTCTGGGTTGAAGTTG |
| BoSF1469 | SSR | AAAAACAAAAAGCAAGGGGC | GAGCCAAAACAGCAATCACA |
| BoSF1476 | SSR | GCATATCACAGACCAGTCGC | TTTCCGTACTCGGTAGGAGG |
| BoSF1481 | SSR | TTGCTATTGGCATAGCTTCTTG | GGGAGTTGTTGAAGAAGGAGG |
| BoSF1492 | SSR | CGTTGTGCTTTGTGAGCATT | CCTCCATTTCCAATCGAATC |
| BoSF1509 | SSR | GTGCGGTGGTCAAGTTTTCT | TGCGGCATTAGTTGTCAGTC |
| BoSF1510 | SSR | TGACATTGACGCCATTAGGT | GCCAGCTCAGTTTAATTCGG |
| BoSF1521 | SSR | CACTCCAGATGTGTCGTTGG | ATGAGATGGGAGGATGGTGA |
| BoSF1522 | SSR | AGTTGCCTCCTCTGCAAGAC | TCCCCAACTATCACGTCCTC |
| BoSF1539 | SSR | TCATACCCGGATGCAATTCT | TGAAGGATCCGTCTTTCCAC |
| BoSF1555 | SSR | TGCCATCAACTGAGACGAAG | GAGACGAGACTTCAACATTGTTTTT |
| BoSF1559 | SSR | GCCTGTTTATCTCACAAATACTTTCA | CTTGGGATTTTGACCAAAGG |
| BoSF1597 | SSR | TTGCCAGCTTCAGACCAAG | CGATTGGAAGATCTCAGAGGA |
| BoSF1642 | SSR | ACCAGCAAGTTGGGATGAAC | GGCTGTCTTCTCATTGATTCAG |
| BoSF1647 | SSR | TAACCAACAACCTCCAATGA | CAATCCGAGAACAAAGATAAA |
| BoSF1650 | SSR | CTATTCAGCTCCAAGCCCAG | TCATCATTCCCTCCAACCTC |
| BoSF1651 | SSR | TGGGATCCATTTTGTTAGCC | TCATTGGTTTATGATTTGTAGAGCA |
| BoSF1659 | SSR | CGGTTTGTTCCTTGACGAAT | CCATCAGCAACCTCTACTTGC |
| BoSF1663 | SSR | TCTGAGGAATCGAAATTGGG | GCGTACACTTGTCCGGTTGT |
| BoSF1665 | SSR | TTGCTTCCTCCATCCCTAAA | CAAAATCTTTTTAAATTCTTTGGATCT |
| BoSF1666 | SSR | CTGGCTCTGTCTCTTGAGGG | CCAACCACAAAGGAGGAAGA |
| BoSF1667 | SSR | TCACCCTATGCACCGTTAGA | AACTCAAGGCCGACAAAGAA |
| BoSF1678 | SSR | CTTTCTGTCTCTCCCTCATTC | CGCTGTTATCCGACTCCA |
| BoSF1692 | SSR | CAAGCTGCATCCATCCATTA | ATGTCATGGAGCCCTCGTAG |

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| BoSF1704 | SSR | CGATCACTTGGATTCGGTCT | CGCGATTTTACGGAGAAGAG |
| BoSF1709 | SSR | CGACACGGAGCTTTAAGGAG | CGCGTCATCTACGCAAACTA |
| BoSF1714 | SSR | AAATTGCCGAAACCCTAAGC | CGACGAAAACCCCTCTGTAA |
| BoSF1715 | SSR | GATACACTCCGGGTCTGGAA | GCAAAAGAGAGGCACGTTTC |
| BoSF1722 | SSR | CACAGGGATCGAACTCCATAA | CGGTTCCTTAAAATATGGGTGA |
| BoSF1743 | SSR | GCAGTGATGACCACTCTTTTCA | GTTCCATATCGCTGGCGTAG |
| BoSF1749 | SSR | AGCTTGAGAACCCTCCAACA | AGACTCGCTCGGTGATGATT |
| BoSF1752 | SSR | GAACTTGCAGCAGGACATGA | ACTCAAACAGAACCGAACCG |
| BoSF1779 | SSR | GGAGGGAGAGAGAGAGAGGG | TAAACCGGTATTGGGTCGGT |
| BoSF1788 | SSR | ACGGATGTGAGGAGATCAGG | TGATGCTGTCCAGGTACCAA |
| BoSF1799 | SSR | GTTCTCATTCGTCTTGGGGA | CGTGAGGTCATCTCCATCCT |
| BoSF1808 | SSR | CCTCTGTCCGCATATTTGGT | CTCTTGGACATATCTCCGGC |
| BoSF1810 | SSR | ACCCCTGTTAAAAGAACGCA | GTTCGCCGAAAAACACAAAT |
| BoSF1814 | SSR | TTGTGACTGTTACCTCGGCA | TATGCATATGGGTTGCTTCG |
| BoSF1817 | SSR | TGAAACAAACAAAGCCTGTGA | TTGTTTTCCAACTCTTGGGG |
| BoSF1825 | SSR | CGGTAATTGTTTTTGTGGCA | CCCTGCCATTAGTGGAAACA |
| BoSF1826 | SSR | TGAGATGGTCCCTGAGAACC | CCCTTTTCCCCTTCTATTGG |
| BoSF1830 | SSR | CCGACATCGGAAGATTAGGA | CCAACCTATTACTGGCGGAA |
| BoSF1843 | SSR | TCTCCACGTTGTCCATCAAA | TTTAATCAACGATGCTTGCG |
| BoSF1852 | SSR | TTGGGAGAGCGAGAGTGAAT | TGGCTGATTATTGACGAATTG |
| BoSF1872 | SSR | CACTCAGAGGAGGAGGTTGC | GCCACGTGTAGGCATGTAGA |
| BoSF1885 | SSR | CCCAATGGGGTCTGTTTTAG | GAACCATGTTGGGTCCTCTC |
| BoSF1886 | SSR | TAACCCTCGGGTCACAATTT | ATCTTGTCTTCATCGCACCC |
| BoSF1902 | SSR | GCCAAAAACATGAGAGCACA | GCGAAGAGCACAGATGATGA |
| BoSF1911 | SSR | ATCCTCGGACAATCAAATCG | CCCAACCAATTATAAAAACATGC |
| BoSF1918 | SSR | TACCCCTCTGCATCTTCCAG | GGGGCTTGGTATACATTGGA |
| BoSF1919 | SSR | AAACGCCCAAGGCTTCTTAC | CGGTGTTGTGAAATGGTGTC |
| BoSF1920a | SSR | CAGGCTCGAGACAATCCAAT | ATGTGAGGGGTGGTTGTGTT |
| BoSF1920b | SSR | CAGGCTCGAGACAATCCAAT | ATGTGAGGGGTGGTTGTGTT |
| BoSF1924 | SSR | ACCGTCAATCAGAAACGGTC | CTAATTAACCACGGAGCCGA |

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|---|---|---|---|
| BoSF1926 | SSR | TGGCTTGCATTCAGCTAAGA | CCTTCCTGTTTCAATCCTCG |
| BoSF1937 | SSR | TCAAACGTTTTGCTGTTTGC | AGATTGAAGCTATGCGGAGG |
| BoSF1939 | SSR | AATCGAGTTCTTTCTCGCCA | CGAGAGAGCAAACCAAGTCG |
| BoSF1944 | SSR | TGTGATTCAAGAACAGCCCA | CACACGCACACCTACGACTT |
| BoSF1951 | SSR | GAAAGTGCCTTCCTTGCACT | CCCTTTCACTATTTCCAGCA |
| BoSF1969 | SSR | TGCAGATTGATGGGTTGAAG | CCCTAAGGTCGTTTTCATGC |
| BoSF1970 | SSR | TGACCCAGCTATCGCACATA | GGTTCTTCTTGCCGTCGTAG |
| BoSF1972 | SSR | TTATCGACGCCGTCTTAACC | TTGCTTTCAATAGGGGATGG |
| BoSF1976 | SSR | TCGGGGAAAGCCTCTAACTT | CCCTGGTCCCAACCTTTAAT |
| BoSF1977 | SSR | ACATGTACATAGGCCCCCAA | ACGCCAACAAAGGAATCAAC |
| BoSF1990 | SSR | AGGGGAAGGGAAATGAGAAA | GCCTAGCGCTAAAGTGATCG |
| BoSF1995a | SSR | ACCCCAAACTATCCCCAAAG | ACTCAAAACATGGCGGTTTC |
| BoSF1998 | SSR | CCCCAGTACCAGTGATAGCG | TTTTAGGATTGGAGGAGGCA |
| BoSF2005 | SSR | GGAAACGTTGAGATGGGAAA | CTGATCATCTCAGGCCACAA |
| BoSF2006 | SSR | GGATTGGGGTGAGAAAGGTT | ATATGCCGCAACACCTGAAT |
| BoSF2018 | SSR | TTGCTCATTCAGCACGAATC | GAAAACGTCCCTCCCTCTTT |
| BoSF2019 | SSR | GCAACTCAACAGTTGGGAAAA | TAGGCGCCAATGTTAATGCT |
| BoSF2030 | SSR | GCTGCTTCAAGGAGGTTCAG | CCATTGGAACCTGGGAATTA |
| BoSF2040 | SSR | CCATCTTTTACGCCCTCTCA | CCCGAAAGAGACAGTTTCCA |
| BoSF2062 | SSR | CTCCTACCCCTCTAAACCGC | GCCAATTACCCACACTTGCT |
| BoSF2071 | SSR | GAAATGGAGTAAATATGTTACGGCTAA | TGCAGAGTGAAGTGGTGAGG |
| BoSF2073 | SSR | TGACCAATTTTTATTTCCCCC | CTTGGTCTAAGGCATCCGAA |
| BoSF2100 | SSR | TCCCCTTTTCTTTCTTGGCT | ATGCTGAAACTCTCCCCCTT |
| BoSF2104a | SSR | GACTTCCATCGAGCACCTTT | ACTGGAAACTCTTCAGCGGT |
| BoSF2106 | SSR | GAGTCATCGCAAGGCTCTTC | TCACCCACCCACCTATCCTA |
| BoSF2123 | SSR | TTCAAGATTCGGAGACCAGAA | CTCCGAGCTTCCATCATCTC |
| BoSF2131 | SSR | CCCAAAGCCTCCTTCTCTCT | GAAAACGAAGAGGTGTCTATAAGAA |
| BoSF2132 | SSR | ATGCCTGGGAGATTAACGTG | GGACAGCCTATCTGAGGCTTA |
| BoSF2141 | SSR | GGATCCCGTTTCTGAACTGA | TACATCGGCGGTTCACAGTA |
| BoSF2145 | SSR | TGGTAAATGTCTCGGCTTCC | CGCAGGCTTCTGTATGTGAA |

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|---|---|---|---|
| BoSF2163 | SSR | GGGTGGAACTTCAACTCCAG | ACATTTCCACGTCAACCCAT |
| BoSF2181 | SSR | CGACAGCTGCATGAGGATT | TCAGGAGATGGCTGTGAAGA |
| BoSF2182 | SSR | CTCATGATGACTTGGCGTTG | TGGAAAGGGAAGCATCAAAC |
| BoSF2214 | SSR | TCGATTTACGTCTCTCACGG | AGGAATGTGGTTGTGGCATT |
| BoSF2220 | SSR | ATCTGAACATGGGGGATTGA | TGACAACAAATCTTTTCAAGAGTCA |
| BoSF2224 | SSR | CCTACAGCAGTAACGGCTCC | AATGACAGGTCCCCTCCTCT |
| BoSF2233 | SSR | CGCAACCATGTGAAGAAGAA | TCTACACTGAACCCGAAGGAA |
| BoSF2242 | SSR | CGTTGTCTCAAATCAATGGC | TCATCCATTATCATCGGGGT |
| BoSF2253 | SSR | CGAAAGCAATAGCCTATATCCG | GCATGCATGGTTACATTTTCA |
| BoSF2257 | SSR | CGTGCGGAGTATTTCCATTT | CAGAGCTCGCTTCTGGACTT |
| BoSF2258 | SSR | TCGATTTGAACGGAATGGAT | GGCCTAATGGGCTTCACATA |
| BoSF2263 | SSR | TCCTATCCAACATGTTCCTCC | TCATCGATCTGCTTCTTTGTATG |
| BoSF2269 | SSR | GAGCATCATTAACGCGGTCT | CTTCATTTGCTGGGGATCAT |
| BoSF2273 | SSR | CACGTAGACAAGAAGCGCAG | TTTGTTCATTTACTCCCGGC |
| BoSF2274 | SSR | CTTCTTAGGTCGTTCCTGCG | AAACCCCACCATAGATTCCC |
| BoSF2277 | SSR | GAGAATCCAATCCGGACAGA | CACGTTCAGGTTCCCTGATT |
| BoSF2281 | SSR | CGATCTTCTCCTCTCTCTCCAA | TGTGACGATCAACCATTGCT |
| BoSF2284 | SSR | CGAGATCAATAGGTAGCGGC | ACGTGGTCTCAGATTTTGGG |
| BoSF2290 | SSR | GCCTCCGATCAACAAGAAAA | ACCAGCATGGTCAAGTCGTT |
| BoSF2294 | SSR | ATCTCGAATCGCATTGATCC | GCCCTCGTGTCAAATCCTTA |
| BoSF2314 | SSR | CAGCTTCTGGTGATGCGTAA | CCAAGAAAACAAACGGCTCT |
| BoSF2316 | SSR | TTTTGAGTTCACAAGGGTTGC | ACCTGAGCCTGAAGTCCAAA |
| BoSF2324 | SSR | AGCTTCACTGCGAAGGAAAA | TCTTTCCCATTTTCACAGCC |
| BoSF2344 | SSR | CCTGAAACGAATCGGTGAAT | AGCTCCGACCTTTCTCAACA |
| BoSF2346 | SSR | TTAAGCCAAGCTTCCCAAGA | GGCTGTTGCGTATTACCGTT |
| BoSF2347 | SSR | TGTTTGACGAGTGAGTTGGC | TACAGGAGTGGGGATTGCTC |
| BoSF2360 | SSR | GCAGGTGAGGATCGGAATAA | ATTCCCGAGGAGAACTGTCA |
| BoSF2378 | SSR | GAGGAAATGAGATCCATAGGTCA | GGAATGGAAATATTCTGAAACTCC |
| BoSF2392a | SSR | TGACCAATCCCTTATTGTGGA | TGTTTTGATTAGCTTGTCGATTG |
| BoSF2392b | SSR | TGACCAATCCCTTATTGTGGA | TGTTTTGATTAGCTTGTCGATTG |

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| BoSF2393 | SSR | CTGGCCCCTATCATATCGAA | GCCATGTCAAGGCAATTTCT |
| BoSF2395 | SSR | GGTTTAATCTTTTAAGCCATAGCC | CAAGCAAAAGATGTGTCTGGA |
| BoSF2398 | SSR | CTTTCACGCCTCGAGAGTTC | GGACATGAAGCTCTGATCGAA |
| BoSF2406 | SSR | AAGGAGGATCACGAGGAGGT | CATGGTAGCATCGAAAGCCT |
| BoSF2407 | SSR | CTAACAAGCAATCAACCGCA | AGCTCTTCGACGGATTCAAA |
| BoSF2475 | SSR | TTCCAAAATCAGCCAGCTTC | AGATGGGCAACCAATCAATC |
| BoSF2482 | SSR | GGTTTCTTGAGAATGCTCGG | TTGGCAAATAGATGCTTTGAA |
| BoSF2489 | SSR | GAGCAGCAGAACCAAAGGAC | ATCATGACGATGACAAGCCA |
| BoSF2499 | SSR | GAGGCTGGCTTTGTATGGAG | TCAAAACGATCCCTCAGGTC |
| BoSF2506 | SSR | AATCTTTGGCCCTTCCCTAA | TGCAAGACTTGGCTCAACAC |
| BoSF2507 | SSR | GGGCGTATCAGGAAGAGTGA | ATGTGTGCCTGGGAGAAAAT |
| BoSF2508 | SSR | CGGTACGGCGAATAGAAAAA | GTCCCCGATGAAACAGTGAT |
| BoSF2509 | SSR | TCGTCGTCATTTCTCTGTCG | CTGTAACGAAAGGCGGGTAA |
| BoSF2510 | SSR | TGGCATTTGAGTAGTGGCCT | AGTGGCCCACACTTCCATAG |
| BoSF2513 | SSR | CATCGTGAACGTGCTCATCT | AGGAAGTTCAGACCAAGCGA |
| BoSF2538 | SSR | GTCCCTGTCAAAACGACAAA | GGAGCTAGGGCTTCGTTTTT |
| BoSF2549 | SSR | ACGCTAGGCAAAGAGCAGAG | ATGCTTAGGCTTGTTGGGTG |
| BoSF2552 | SSR | GGTGCACACCAATGACTACG | CATGAAATGCTGAGAGAAAAGG |
| BoSF2575 | SSR | CTGCAACCGATTTGGAGTTT | CGATCTGATTGATGTGTGGC |
| BoSF2578 | SSR | ACAATGGTGGGAGTGGAGAA | GAACAAGTCGCATTGTTTATTGA |
| BoSF2583 | SSR | CTTCTTGCTTTGGCCTTTTG | GTGTTTGCGTGTTGGACATC |
| BoSF2591 | SSR | CCAAAGGTGTCACGCATGTA | TAATTCGGCCTCTGTGTTCC |
| BoSF2604 | SSR | CGAGAATCTCATCTGGCTCC | TGCATGACTAATGCTTCGGA |
| BoSF2607 | SSR | TTTTCGTGAAGCTGATGCTG | CCAGCTTTCTTTAAAATCCCAA |
| BoSF2609 | SSR | CTTCTCCAACAAAAGCTCGG | AGAGGACTGGTCCCCAAAGT |
| BoSF2616 | SSR | GCACTGTCCATCTGCAACAT | CCAGTCTTGGACATGCGTTA |
| BoSF2624 | SSR | AAAAGCGAAATGAACCAACG | TCTTCGAGAGGAGAATAAGAGTTGA |
| BoSF2646 | SSR | GCAACATACCATTTTTGGGG | ATCTCCTTTCCAGCGAGTCA |
| BoSF2653 | SSR | ATATGGCCCTGCAAACAGAG | CAGCTTATGGAATGCCCCT |
| BoSF2657 | SSR | CAAAAGGCAAAGACCGAGAG | CCACTGACCTTGGATGTGTG |

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|---|---|---|---|
| BoSF2666 | SSR | CCTCGATGAGACGCAATTTT | CATTCAAGGTTCAGCTCCTG |
| BoSF2669 | SSR | CGAGTTGGAGCCTACTTTGG | ACAAGCAGTGCTGCAAACAA |
| BoSF2670 | SSR | AACGCAGAATCAGGCAAAAC | TTAGGAGTGAGCTCGGGAAG |
| BoSF2672 | SSR | GGTCCGAGTTCCAACACAGT | CAAGGGGGTTTTGATTCCTT |
| BoSF2676 | SSR | TGGGAGAAACATGGGAAGAG | CGCAGCTTGTTCTCTCAAAA |
| BoSF2702 | SSR | CTTTGGCAGAATGTGGGAAT | GGTCTTAGCGCAGAGGACAA |
| BoSF2703 | SSR | GGATCTAGGACACAAGCAGCA | TGAATCCTCCTACACCGTCC |
| BoSF2709 | SSR | TCGTCTGGAGGAAACAACAA | AAGCGTACGTGGACCATTTC |
| BoSF2710 | SSR | TAGAACGCAAACCAGTTCCC | CAGAGGCATTGGATGTGTTG |
| BoSF2723a | SSR | CGCACTAGTGACCTCGATGA | AGCTTCAAGTTCAACGGTTTG |
| BoSF2723b | SSR | CGCACTAGTGACCTCGATGA | AGCTTCAAGTTCAACGGTTTG |
| BoSF2740 | SSR | GTTTGCGCCCAATAGTGTTT | TTTGCGAATCTGTACTTGTCG |
| BoSF2744 | SSR | TCACAAGCAACGAGAACTGC | CTGGCTTGCTTCACTTTCCT |
| BoSF2746 | SSR | GGCGAGAGAAAGAGAGAGATCA | AACGCAACTCAAAAGATGGG |
| BoSF2748 | SSR | TGTTCACCGCATGAATGAAA | ACAATCAGATGGAAACCCCA |
| BoSF2751 | SSR | TCCATGACTCTCGTGCTGTC | TGTGTGACGAATTCACTGGG |
| BoSF2754 | SSR | GGCAAAATCACTTCGCAAAT | CAGACCTCGAAAAAGGCTTG |
| BoSF2769 | SSR | CGGCCTAGACACCTCTTCTG | GAAAACGGCGATTAGTTTCA |
| BoSF2770 | SSR | TCACCCTGTGAAAAATGCAA | GGAAACAGCCACTTCACCAT |
| BoSF2771 | SSR | TTCAATCGCCATTGTTCAAA | TTGGGAGGATAAGAACGACG |
| BoSF2774 | SSR | GTGATGAGAAGCTAAGGGCG | TTTTGGGAAGTTCCTCTGGA |
| BoSF2788 | SSR | TCCAGAGCAGCGTATAGCAA | CCAAAAACACGGAGAAAGGA |
| BoSF2791 | SSR | GGAACTCAACGAGGAAAACG | AGAAGCTTTGCTTTGCTTGC |
| BoSF2807 | SSR | TCGGTAAACCAATCCCAAAA | GAAGGAGCTGAGCAAGGAGA |
| BoSF2820 | SSR | GTTGCGATACGGAAGGAAAA | CAGAGTCCGTTCCCCTATGA |
| BoSF2821 | SSR | AGTGCGTTCTCCTCGTTGTT | CGCCAATTCGTTAGGGAGTA |
| BoSF2828 | SSR | GGCGTTGATGTTGCTCAGTA | TACACACCATTCCCTCCCAT |
| BoSF2838 | SSR | GGGACGCAAAATTTACGCTA | CTTGCCGTGACCCAATAAGT |
| BoSF2852 | SSR | TGCCTCATAGTTCAGGTCCC | CAGGAAACCTCACGGATGAT |
| BoSF2861 | SSR | GCTCGTTGTTCAGCTCCTTC | CCATGATGCGTCTGGAGTAA |

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| BoSF2872 | SSR | GAACCCAAGGAAACATGCAC | TCAGAGTGTCCTCTGCCTCA |
| BoSF2884 | SSR | CACTCCTACCACCTCGCTTC | GATTCCTCCTGCAAGTTTGG |
| BoSF2915 | SSR | GTTGCAGCTTCAGCCATTTT | GAGCGCAATTCTCTGAAACC |
| BrSF0006 | SSR | CATCGCTAATCAGAAAATTAGTGAAA | CGTTGGTAAGATGGGCTAACA |
| BrSF0009 | SSR | AACCATATCAAAAGCATGGC | GAGTAGAATGAAATACTTTGTCGGC |
| BrSF0010 | SSR | AAACGGGAAATTTAAGCGGA | GCTTCCCGGAAAGTCTTCTT |
| BrSF0016 | SSR | CGCAACGAACTCTGTCTTCA | ACACTGCCTCAAGCGAATCT |
| BrSF0019 | SSR | GACTTTTGTCCCTTTCCCAA | TAAGCACAAACCACACCCAA |
| BrSF0029 | SSR | TAGGGTTTAAGGTTGTGGCG | CCAAACTAACCGAAACCGAA |
| BrSF0031 | SSR | GCTGGCAATTTATAATTATCTTGAA | TTCCGAAATTATCGCAATGAG |
| BrSF0032 | SSR | TGGGGCTTCCAATTTTCTAA | TGGATGTCGTCCAAGATGAA |
| BrSF0040 | SSR | CAAGTTGGTCGAACGTGTGT | GTGATCGAACCGGTGGTTAT |
| BrSF0045 | SSR | TCGTATGGCTAAACCAAAATGT | TTTTTCTCTTTTTAGCATTATCCCA |
| BrSF0049 | SSR | CGTTGCAATGTTTTTCTTTTAAT | GCTGCGTTCACGTACCCTTA |
| BrSF0051 | SSR | CATTGATGAAACTTGGGACTAGAA | CAATCAACATAAATAATACTCCATTTG |
| BrSF0052 | SSR | GTGAAGTGAGGTTTTGGGGA | AGTGGCATACCATAGACGGG |
| BrSF0053 | SSR | TGACTCAATCTAACATCATGGAA | TCATCATGCAGGTATGTGGG |
| BrSF0056 | SSR | TTTGATTCATCCTATTTGCTTGTAA | AACAAAAATGGAACAAGGATAACA |
| BrSF0062 | SSR | ACGGCTCACAGTTTGCTCTT | TCACCTTGGTTTACAGAGTCCA |
| BrSF0065a | SSR | ACGGATTTATGCAATTCGGA | CCAAACAATATAAATTTTGAACACC |
| BrSF0065b | SSR | ACGGATTTATGCAATTCGGA | CCAAACAATATAAATTTTGAACACC |
| BrSF0078 | SSR | TTTCACATGTTTTCTTGGTCATC | CAGCGAAGAACGGAGAAGAG |
| BrSF0087a | SSR | TGTTTTTCCAGTAAATTGCCC | AGTTGAAGGGAAAGAGGGGA |
| BrSF0089 | SSR | CAACATTATTTTGACCCCCA | CCTAGCTTTAACTCGGCTTCA |
| BrSF0090 | SSR | AAAAACCAGCACAACGGAAC | AGGGAGGGATCAAGAGGATG |
| BrSF0091 | SSR | TTCAGCCAGAAACCTCCATC | CCAAGGCCAAGCTGATAAAG |
| BrSF0092 | SSR | TTTCCAGGGTGAAAGAAACC | ATATGCTCTCCGTCCGTTTG |
| BrSF0102 | SSR | TAAATCTCCATGTGGTGGCA | CTTTCTTTGGTCGGGGTTTT |
| BrSF0112 | SSR | TTCCACCCCTTGATCAACAT | CCTCAAAGGAAGAATGGGGT |
| BrSF0114 | SSR | CACCACGAGATACAAGCAAA | TTGTTACAACAAGATGCAAATAATCA |

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| BrSF0120 | SSR | CAACTTCGGGGAAATTTGAA | CATTGTCCAAATGAAAGAAAACA |
| BrSF0144 | SSR | CAATGAATGTGATGTTATCCGA | AAGATGTGAGGGTAAGTTTGTGG |
| BrSF0149 | SSR | AGAGAGTGGGATCGATGGTG | TTTCTGGATCCGCAAACTAA |
| BrSF0153 | SSR | GATGTTCATTCCGTGCAAGA | GTGGATTAATAGCCCGACCA |
| BrSF0154 | SSR | CGGGTGGACCTAAATAGCAT | AACTGCTTTGAAAGTTAATATTTGGA |
| BrSF0162 | SSR | AACCATGTAGTTCAGAAAGCACA | GTTAGAAATGCGCCGTCAAT |
| BrSF0166 | SSR | GATGGAAAGTAGCTCCTGCG | AAGCAGAATTTGGGCCTTTT |
| BrSF0171 | SSR | AATCACCGGCGTTGTTTTT | GCGGATCTCGTTGATGTTCT |
| BrSF0185 | SSR | ATTGCACGCATCCACATAAA | TTCAAAGGATAAGGGCATCG |
| BrSF0193 | SSR | TTGAAATTGTCCAAAACACTTGA | TGGATTTGAATAATACATGCCAA |
| BrSF0210 | SSR | TCAAGCTTCAGCCCTTAAAAA | TGCCTTCATAAACACGCAAA |
| BrSF0214 | SSR | CGTATAATTTTCATAGGCGACG | AGCATGCTTATGACTCTGGGA |
| BrSF0229 | SSR | AAAAACATAAAGACAACTTTGATGAC | GAGATTTTGACAAACGACTTGAAA |
| BrSF0250 | SSR | ATTTGCAACGGTCAAAACAA | CCATGTGAGAAAACCATCTCC |
| BrSF0251 | SSR | GACCGCCACCAGATCTTAAA | TCAACTTGACATGTTCACTAATAGTTT |
| BrSF0255 | SSR | CAAGTTTTTCGTGGAATGGAA | CAAAGATACAAATGACAATAAAACCA |
| BrSF0261 | SSR | TGATGGGTCTGAATTGGGTT | TCCTCGTCGATATGGTGACA |
| BrSF0279 | SSR | AAATTCAATGGTTAAAGTCAATGTT | CATATGCGGGCTTAATCGTT |
| BrSF0283 | SSR | CTTGTCTCTTGTAACTTGCCCA | TGAGAACATCTGACCCACCA |
| BrSF0287 | SSR | TGACAAACTTGTAGATAATTTCCAGTG | GAGATTATAACTTTTCCAATGTGTGC |
| BrSF0295 | SSR | TCGTGATGACTACGGAACCA | CCAAAGTACAACATGATTTTAAGGA |
| BrSF0299 | SSR | AAGACAATGTGGGCAGAGAA | TCTTGAGGAGTGTGTGTGTGTG |
| BrSF0300 | SSR | CCTTCTGCGTTGCTTCTTCT | ACTTTCGTTTCTGGGGTCCT |
| BrSF0313 | SSR | TGAGTCAAATTGGGTGACGA | TCTGGTCAAAGAGATTGCAACTAA |
| BrSF0331 | SSR | TCTTCTCCGATTGGTTTTGC | TTTAGAGGCAATTCCGTTGG |
| BrSF0350 | SSR | TCAAAGTATTGATTTAGTTTGATTGAA | ACGGAGGACGTTGACAAATC |
| BrSF0353 | SSR | TTGACATTGGAGAATTGGCA | ACAAGTACGTCGGCTCAAGG |
| BrSF0356 | SSR | ATGGCGAAGATAACGTTTGG | TAGGGATGGTGGGGAACATA |
| BrSF0369 | SSR | TGAGGAAGATGATTGAGGGG | ACCCAAGTATACCAACGCCA |
| BrSF0383 | SSR | ACCAAACCAAACCAAACCAA | CGATCTTTTGGTGGAAGGAA |

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| BrSF0385 | SSR | ACCAGAAGACGATTCCAAGC | GCGAAGACTGACACGACTTG |
| BrSF0389a | SSR | AGGGACTCAGTGCTTCCTCA | AACGATCTCGGTGGTGGTAG |
| BrSF0403 | SSR | TTCCCCATATATCACGCCAT | TAGATCAACGGCCATGATGA |
| BrSF0415 | SSR | TTTTCTTTCCATTCACAGCAGA | GAGAAAATCACGGAAGAAAATCC |
| BrSF0422 | SSR | GGATCTAGAAACCCCTTCACAA | TGATCGAGATCGAGACCCTT |
| BrSF0425a | SSR | CTGACCCCACTACTTTCCCA | CAGAGATGAGAGACCGCACA |
| BrSF0425b | SSR | CTGACCCCACTACTTTCCCA | CAGAGATGAGAGACCGCACA |
| BrSF0427 | SSR | TGCGTGGAATTGATCTGAAA | ACAGCCTGACCGTAACAACC |
| BrSF0436a | SSR | TTGTTTGAAGTGAGAAAGAAATCAA | TGCTAAGCTAAGAGTGAGCATGA |
| BrSF0436b | SSR | TTGTTTGAAGTGAGAAAGAAATCAA | TGCTAAGCTAAGAGTGAGCATGA |
| BrSF0446 | SSR | CCGGGTATAGATCGGGTTTT | GAGAAGAGAAGTGATGCGGC |
| BrSF0472 | SSR | AGGCCCTCTCTGTCCATTCT | CCTCCGGTGTCCATAACAAC |
| BrSF0480 | SSR | TTCTGTCCAGCTGCAATCAC | AGCATCACTAGCTTCGCCAT |
| BrSF0491 | SSR | GCAACCACAAAATATCGAAAA | TCATGGCTCTCACGTTTCAG |
| BrSF0497 | SSR | CCGCCGACAGTTTCATATTT | AGTTCTAAACCATGCCCCCT |
| BrSF0503 | SSR | GATTCGAGTCCCCATGTCAC | CACTTGGAGTGTGCAGCTTT |
| BrSF0519 | SSR | ATATGAGCCACACGTCAGCA | TGTTGATGTACACTTACAGCTAATTTT |
| BrSF0520 | SSR | GCTGCATCATAAACCACATGA | GAAAATTGAATGCAAATTCCAGA |
| BrSF0549a | SSR | GCTACTCATCTCCGGCTCAC | GTCCACCTCGTCACTACCGT |
| BrSF0550 | SSR | TGGCAATCTTCTGCTCTTGA | AATGGCTCATTTTCCTGTGG |
| BrSF0552 | SSR | ACCCAACTCTAACGTGTGGC | AAAGCAGCAACCAAGCAAAT |
| BrSF0560 | SSR | GCCAAAAGAGAAAGCGAATG | GAAGATCTGGTGCGGAAGAG |
| BrSF0564 | SSR | CGGCAGCTTGTTAAGGCTAC | GCCTTGTTCCATCCTCCATA |
| BrSF0570 | SSR | TTGACGGTTTACCGGATTTC | GAGCACCATTGCCAATTTTT |
| BrSF0606 | SSR | TCGGGCAACTAAAAGGCTTA | TGGGGAGCTATCATCTTTGT |
| BrSF0615b | SSR | GAAGAGCAGGAAGTTTTGGC | TCTTTTTCGACAGCATATTGAGA |
| BrSF0618 | SSR | TTGCGTATAAAACGTGCCTG | CCGTGCTGATCAATCAAAGA |
| BrSF0620 | SSR | AAATCCCGCATTTTTACACG | TTGTATTCGTTTCAACTTTTAAGCA |
| BrSF0642a | SSR | ACGTGGACTGGGAAAAGATG | CACCTGTTCCCCAAAAGAGA |
| BrSF0643 | SSR | ATGCTTTGTGTTGCCTGTTG | AATGCGAATGTCATATGGTGA |

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|---|---|---|---|
| BrSF0645 | SSR | TGGGTTAGTCAAAAAGGGGC | CATCCTTCCCAAGTCCTAACA |
| BrSF0646 | SSR | ATAACCAGCGGTGCCAATAC | GGAGAAAGAATGGCATCGAG |
| BrSF0661 | SSR | CCCCTGCAATTTGTAACCAC | CCCTTTTGAACAAGGTACGC |
| BrSF0663 | SSR | ACCGAAACATGTGGCTCCTA | CGAGAAACATCATCCAATTCA |
| BrSF0665 | SSR | CGCCATGACTTGCTGTTAGA | CCATAAATAGAGGGACGCGA |
| BrSF0679 | SSR | ATCCAACGGCTACCCTTCTT | ATCTCTCCGGCCAAATCTTC |
| BrSF0680 | SSR | TTTTACAACCGTGCACACAAA | AAATCCGATCCCCAACATCT |
| BrSF0682 | SSR | TGCTAATGCTCCCGTATTCA | CGGTTTTCCTCTCTTCTCGTC |
| BrSF0689 | SSR | TTGCCATTTTGAACATTAGGAA | TGAGCCTCTCTGAGTCTCGAA |
| BrSF0695 | SSR | CATCATGTGCCTTGTCGAAC | ATTAAACCCCCACCCAAAGA |
| BrSF0696 | SSR | GAATGATTTTCAATTTTTAGGTTTCA | TGATTGACCGACTGATTCAAA |
| BrSF0702 | SSR | TGCCTTGTGCTCCATAAACA | ACGCAAGCCAAAAAGAAGAA |
| BrSF0703 | SSR | TGCACCACACATAGCAAACA | TGAGTTGTGGGAATGCAAAA |
| BrSF0705 | SSR | TGAAAACACTGCGATTGAGC | TGTCAAATCAGACAGCCTGG |
| BrSF0706 | SSR | CGAGGGAAATACCCATACCA | GAGAAGATGTTCCCGAGGTG |
| BrSF0708 | SSR | GATTTCTCAGAGCCGAGCTG | CTCTAACGTCTAGGGGCACG |
| BrSF0712 | SSR | CCCACTGAGAAAATGAAGGAA | CGTTTCCAAAGCCAAATGTT |
| BrSF0719 | SSR | CGCCGTGGATACTTCATTTT | CTTCCACGCACTGTAAAGCA |
| BrSF0726 | SSR | AATCGTCAATGATCATCGGTT | ATGCACACGCATTATCCAAA |
| BrSF0741 | SSR | CGTCTCGAAGAAGCAAAAGG | AGATTCCTCCGGTGATGTTG |
| BrSF0743 | SSR | TCACGTCATCTCCATCATCAA | TGGCATGATTACCAATGACTG |
| BrSF0750 | SSR | GGGAGAAGGAAGAGCAAAAGA | TCGTCGCTAAAATGAAATTGA |
| BrSF0754 | SSR | GCAAATCAAGCAAGGTTGAAG | TCAACTTTTTATGAATCCTTCTTTG |
| BrSF0755 | SSR | CTTCAAGAAACGATATCGGGA | GGTTTCAATTCGTCGGAAAT |
| BrSF0784 | SSR | TTGGGGACTTGTCACATCAG | GGACCCGTGGATAAAAGGAT |
| BrSF0789 | SSR | TGGTTATTTCATGGTGGCCT | AACCTCCAAAGTCAAACCTTTTT |
| BrSF0811 | SSR | AAAAGGAAGGGCAAAGTGGT | TTTTGCCATTCGTGTCGTAA |
| BrSF0819 | SSR | CGAAATTAAATCGTACATGCATAA | TTTGTGAAACAAAACGAGCG |
| BrSF0820 | SSR | TGGGTTTGTGAAAATATGGTGA | TGTAAAGTTGTGCAAGGATTGTG |
| BrSF0821 | SSR | GATGCGCTCACAATTCTTCA | CCTATTGACCCCACACCACT |

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|---|---|---|---|
| BrSF0822 | SSR | GGGCAGGCTAACCCCTAGTA | GAAGACGACGACATCGGTTTA |
| BrSF0836 | SSR | AATCGTCGAGTTTCACCGTC | CTTCCCTGAGACAAGCGAAC |
| BrSF0845a | SSR | CACCAGAGAGAACGCAATCA | TGCTCCTGATGCATTAACCA |
| BrSF0845b | SSR | CACCAGAGAGAACGCAATCA | TGCTCCTGATGCATTAACCA |
| BrSF0849 | SSR | TTGCTCTTTGAGGGTTTTGG | CGCCTCTTTGCCCTAAAGTA |
| BrSF0858a | SSR | CGAAGTTCTCCGGTAACCAA | CTTCGAACTCGACCAGAAGG |
| BrSF0858b | SSR | CGAAGTTCTCCGGTAACCAA | CTTCGAACTCGACCAGAAGG |
| BrSF0860 | SSR | GATGCCAGTACATGACGACG | ATTCCCCACATTTTCCATCA |
| BrSF0869 | SSR | TTCACTGCTCGTGTAATCGC | TTTGGTGGTGTTGCTTGTGT |
| BrSF0898a | SSR | CCAACAACGTTCGTGTTCAA | TTTACCGTACCGGAATCCAA |
| BrSF0916a | SSR | CGGGTCCATGGTCTATAACTTC | CCCACACACAGAGTCCCCTA |
| BrSF0918 | SSR | GGGTGAATCTCAGTCAGGGA | CCCTCGTTCACGACTTCTCT |
| BrSF0942 | SSR | TGACATTCGCATCAGATTTGT | TTCCTCCATCGTCTTTGTCC |
| BrSF0949 | SSR | GCATCAAACGCACACCAATA | TCTGCCCCTGTCTCTCTGTT |
| BrSF0952 | SSR | TTGGTTCAAATTATTTTAATGGAAG | AAACCCCAGATTTTCATCATTTT |
| BrSF0958 | SSR | TGCGCAACTAGATAGAGCATGT | CACCATGACCCTCCTGATTT |
| BrSF0969 | SSR | CAGAAAAACACGTTTTGGCA | AATTTGGGATCGGTTTAGGG |
| BrSF0972 | SSR | AATGGCGACGATTCTGTTTC | TCATTATTTTGGATAATTTAGACCCTT |
| BrSF0973 | SSR | ACGCAGCTTACAGTCGTGTG | TCCAAGCAGTTTCTTTGCAT |
| BrSF0975a | SSR | TGGTTTTCTCTTTTCATTTCTTTCTAT | TTTGAAAATGTTGAAAAAGAAGTTG |
| BrSF0982 | SSR | GAGACCGTGTGTCCTCTCGT | GGTGGAAACAATAAAGGCCA |
| BrSF0998 | SSR | GTGATTGGTTGGCACATGAC | GTGATGGTACGGCTTAGGCT |
| BrSF1002 | SSR | TTTTCAATGTGAGATTTCTTTCAA | AAGATGCAAATGATCATAAAATCG |
| BrSF1008 | SSR | TCCCGTCAGATAGTGTTCTTTT | TTGGTTTATATCTTTTTGGCTTATGA |
| BrSF1031b | SSR | AGAAGACTCGAAGGGGAAGG | CAAACTCCAACCACGAACCT |
| BrSF1032 | SSR | CCGCGTTTCTGAACCTAAAA | GCAAAATATGCCGGACTCAC |
| BrSF1044 | SSR | TCAAACGATTACCAATCTAAAAACA | TCAAATTAATATGTTGGATGGCA |
| BrSF1049 | SSR | AACTCAGTAAACCCCAAAAATAAA | TTTCCTATGCTCATGCAAAGA |
| BrSF46-167 | SSR | TCGGCTAGAATGGCTACAAGA | TGCCCATTCGTGTATGTTTG |
| BrSF46-176a | SSR | ATCACCATTGTGTTATTTCTTCAG | GGATCAAATGGATTTAGCGG |

| | | | |
|---|---|---|---|
| BrSF46-176b | SSR | ATCACCATTGTGTTATTTCTTCAG | GGATCAAATGGATTTAGCGG |
| BrSF46-177 | SSR | AGCTGGTACATGATTGCGTG | CAACTCTGCCATTCACATGC |
| BrSF46-186 | SSR | GCCAAAGTGCATCCCATCTA | CCTTTGGAAAGTCGAGAGACC |
| BrSF46-22 | SSR | TCGTGTAAGTGAGAGGAGAGTAAAGA | AGCTGGTGCAGTATGTCAGC |
| BrSF46-238 | SSR | TTGCGAGATTATTTTTAGATATGTGC | GAAAGCGTGAATCAAAAACG |
| BrSF46-291 | SSR | CCACGTCTGAGGTGAGGTTT | CTTTTCTTCAATGCCACCGT |
| BrSF46-306 | SSR | ATGATCATGTGGACCGTTGA | TGATTGTTATTCCCAACTTTTTAGG |
| BrSF47-10 | SSR | ATCAATTTTTCCGAGACCCC | AAGCTGGTGAACTCGTTTCG |
| BrSF47-234 | SSR | CGGTTCATGTTTTGATTTGG | TATGGGATGTCCGAAGGTGT |
| BrSF47-277 | SSR | TGATGACACGTGACTACACTCAA | ATCCAGGCGAAACATCGTAT |
| BrSF47-382a | SSR | GACTGTTGTTCTTCCTCGGG | TCCACAGCGAGAGATACACG |
| BrSF47-389 | SSR | AAGAGGAGCATCATGGGTGT | CACGGTTGATAATAACGCGA |
| BrSF47-54 | SSR | GAGTTGAAACCCCAAGCAAG | GCGAAACAGAGGCAATAAGG |
| BrSF53-712 | SSR | ACCCCATTGGGTCACAATTA | ACCATGAGGAGGCAGAGAGA |
| BrSF54-590 | SSR | ACGGACGTCTTCTCCTCTGA | AACGGGATGGAATGTTATGG |
| BrSF6-104 | SSR | AAGATCTCTCAAATGTACGCCA | TCTCAAACCGAAGACAAAACAA |
| BrSF6-2245 | SSR | GAGGAAAGAGTTGCCGTTTG | CTGCTCTCAAACCACTGCAC |
| BrSF6-2380 | SSR | TCACCAGCTCAACTGTTTGG | AACGTTCAAGCGGAATTGTC |
| BrSF6-2389 | SSR | TCAACTTGACATGTTCACTAATAGTTT | CAATAGACACGGAAATGGGC |
| BrSF6-2413 | SSR | TTTGCTTGGAATCAAAATTCTTT | AGCTTCAAATCAGCGGAGAA |
| BrSF6-2562 | SSR | TGTTTCCCCTATATATTTATTTGTGGT | TCAAAATAACAACCCATTCCA |
| BrSF77-118 | SSR | CACTCTCCCGCTGTAGGAAG | GAAACCAAAGCAATCCATCAA |
| BrSF82-562 | SSR | GCGAGATCCAACCAAAAACA | GTGGCCCAGGTTTAAAATCA |
| ns027b | SNP | CTTGCTGTGAGTTTGTGGGTCCGA | CGCCGCTGCTCCAACGCTAG |
| ns033 | SNP | CGCTGCATCACCCCGCATCA | TGACCCTGCTCCAGCCTAGTCTCAAA |
| ns059 | SNP | CACGGAAAGGCAGACGCGGAG | AGAGATTCTTACCACAGATGTGACAGGTACGC |
| ns067 | SNP | ACACGTGCAAAACGAGTTACTATAATAGTTTTATG | ACAGTTTTTGGATTGGAAGAAAGAAGATAAAATGG |
| ns085 | SNP | GGTGTTTGAACAGTCTGCATTTTCAGGAG | CGGTTTAAAATTTTGGTTAATTCGGTTAGTTCAGTT |
| ns104 | SNP | TCCTGCTTCCTTACAGCCTCAGTGTTACC | ATGGAAATCAGAGCAAAAACAGAAACTTTGGT |
| ns120 | SNP | CTTCAGTCATTGCAGCTTATTTCTCTGATATGTTC | TGAAGAACAGGTTATAGCCTTAGCGATAGGAGTTT |

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|---|---|---|---|
| ns123 | SNP | ATCAAAATCCCAAATTAAACCAAAATATTCTCCAGA | AAACCGGTTTAGGCCTTTTCCCTCC |
| ns126 | SNP | CAGATTCAGGCAATATGGATTATGGCATC | GTGTGTAGAGTCCGACCCGGTTCAAA |
| ns155 | SNP | CTCTAAACCGTTCAGAATAGCGTCGAGATATCTT | ACGATGGGGAACGTCGACAACG |
| ns156 | SNP | ACTAAGCTTCACTAGGTAAATCTAATCTATGTGGGT | GAATCACGCGAGTGAAGAAGCTGCTAAG |
| ns158 | SNP | AAAGCACGAACGTCAAAGCCGTTCTT | TGGTGCTAGAAAGCAACCGTCTTTCG |
| ns160 | SNP | CACTTCTTTTTGTGGGTTGTTAAATTGCTTCC | AAACACCATTTTACCTTCTCCTCCCTTGTTTAAG |
| ns161 | SNP | CCACCCTTTCATCAGTGACATGACCG | AGTTTCCATCGGTAACCCTAATGGTTTGTTC |
| ns162 | SNP | GCATTCGTTGAACTTGCTTTGAGATGTATTAGC | GCTGCGACATCATTTTTAAGAGATCCTCTGT |
| ns163 | SNP | CCGGAAGGCTCGCAAATGCTC | GCCACCGTTCCCGATCCCAT |
| ns164 | SNP | CAAATCCTTAACAGAAAACCAAACCGGAGTTT | TAACGGCGACGACGGTTGACG |
| ns165 | SNP | CATGAGAGAGAATAACTGAGAAACTGCAACCAT | TTCCCCTTGGATCCACAGATGGC |
| ns166 | SNP | TGCAACTAACTCATCAGCACTTAAGACTGGC | TTCCCCTTGGATCCACAGATGGC |
| ns167 | SNP | CATCAGCACTTAAGACTAGCGACTGCTGATAAC | AACTTGACGAGGACGGGTGAGATAATGAG |
| ns168 | SNP | CACACTAATGCACAATCATGTAACGCAGGAT | TTGAATTATTTGGGAGCGCTGGATGA |
| ns211 | SNP | GCAAAGGCCTCTTCTGCAACTGTTACT | GGTTGGGTGAGTTGATATTGTTTTATCTGATCTGT |
| ns213 | SNP | GCTGCACCATGGAGGTCTGATGTAGATAGT | GCTCCAACAAGTCCAGACAGGGTCC |
| ns218 | SNP | TCTTCACTTGGGACCAAACAAATGGAAT | GAAACTTACCGCTACTGTTGCGTGAGGA |
| ns231 | SNP | CCAAAGTTAATCAAATCATGCCTTGTGTATTTAACT | AAATTGAACGCTTTGAGGATTTGGTTACCTACTAG |
| ns258 | SNP | AACCTTAGCCTAGCAAGCACAATAGAGATGAAAT | GCTTCAGTATGGGTAGATTCAATCGATATCTTTGTT |
| ns262 | SNP | CAGTGTTTTAACAAGCGAAAGGACGCAAATT | TTACCATACCAGCCTTCACCATTCCTGA |
| ns314 | SNP | ATCGATCAAACTACAAGGAGTTGCTAATTCCAGT | AACATATGGGCTTACACAGAGCATGGTTAATATACA |
| ns326 | SNP | GAGTCCAGCCCGAATGTTTCAGAACT | CAACAGCTTCACCTGACGCAGAACC |
| ns337 | SNP | TGCATTACAGTTGCTCATCTGCGCTTAAT | TGACTAAAGCTCTCTATGGTCTTAAACAGGCTCC |
| ns347 | SNP | CCATATCACGTGCCGTTGAAGCAAAT | CTTGGCTTGCTCAGTTACAGGTGTGTGTT |

**Table S3** CHISQ test for segregation of 803 markers on the 19 linkage groups of BnaZN$F_2$ genetic map.

| Linkage group | Marker_name | Position | A | B | H | C | D | - | $Px^2$ | Toward |
|---|---|---|---|---|---|---|---|---|---|---|
| A01 | BrGMS0081b | 0.0 | 0 | 119 | 0 | 0 | 52 | 8 | 2.E-41 | No.73290 |
| A01 | niab097a | 6.1 | 0 | 98 | 0 | 0 | 77 | 4 | 3.E-21 | No.73290 |
| A01 | BoSF2770 | 8.8 | 0 | 121 | 0 | 0 | 55 | 3 | 6.E-41 | No.73290 |
| A01 | BnEMS0886 | 13.3 | 13 | 60 | 14 | 0 | 0 | 92 | 2.E-20 | No.73290 |
| A01 | niab106 | 27.2 | 41 | 0 | 0 | 126 | 0 | 12 | 9.E-01 | |
| A01 | niab071 | 37.5 | 48 | 0 | 0 | 131 | 0 | 0 | 6.E-01 | |
| A01 | CNU139a | 39.2 | 42 | 0 | 0 | 133 | 0 | 4 | 8.E-01 | |
| A01 | CNU142c | 41.5 | 44 | 0 | 0 | 135 | 0 | 0 | 9.E-01 | |
| A01 | BrSF0019 | 43.4 | 43 | 45 | 89 | 0 | 0 | 2 | 1.E+00 | |
| A01 | BoSF0224b | 44.3 | 41 | 0 | 0 | 137 | 0 | 1 | 5.E-01 | |
| A01 | BoSF0302 | 44.8 | 0 | 42 | 0 | 0 | 135 | 2 | 7.E-01 | |
| A01 | BoSF1331a | 46.8 | 43 | 0 | 0 | 131 | 0 | 5 | 9.E-01 | |
| A01 | CB10081 | 50.4 | 41 | 42 | 93 | 0 | 0 | 3 | 7.E-01 | |
| A01 | BRMS037 | 50.4 | 39 | 0 | 0 | 133 | 0 | 7 | 5.E-01 | |
| A01 | niab113a | 52.0 | 41 | 0 | 0 | 138 | 0 | 0 | 5.E-01 | |
| A01 | BrSF0403 | 56.5 | 42 | 41 | 89 | 0 | 0 | 7 | 9.E-01 | |
| A01 | BoSF2131 | 59.4 | 50 | 42 | 86 | 0 | 0 | 1 | 6.E-01 | |
| A01 | CB10099a | 69.1 | 44 | 0 | 0 | 120 | 0 | 15 | 6.E-01 | |
| A01 | BrSF0016 | 72.2 | 0 | 37 | 0 | 0 | 141 | 1 | 2.E-01 | |
| A01 | BrSF0446 | 82.7 | 49 | 37 | 92 | 0 | 0 | 1 | 4.E-01 | |
| A01 | CB10189 | 83.5 | 49 | 40 | 87 | 0 | 0 | 3 | 6.E-01 | |
| A01 | BoSF0764 | 87.5 | 0 | 39 | 0 | 0 | 137 | 3 | 4.E-01 | |
| A01 | CNU132b | 89.8 | 28 | 20 | 41 | 0 | 0 | 90 | 4.E-01 | |
| A01 | BoSF0503 | 89.8 | 42 | 37 | 98 | 0 | 0 | 2 | 3.E-01 | |
| A01 | Ra2G05 | 90.7 | 40 | 36 | 95 | 0 | 0 | 8 | 3.E-01 | |
| A01 | BoSF1659 | 91.4 | 42 | 0 | 0 | 136 | 0 | 1 | 7.E-01 | |
| A01 | BrSF0702 | 93.3 | 39 | 36 | 102 | 0 | 0 | 2 | 1.E-01 | |
| A01 | SA63 | 93.8 | 37 | 37 | 105 | 0 | 0 | 0 | 7.E-02 | |
| A01 | BrSF0703 | 94.1 | 36 | 37 | 106 | 0 | 0 | 0 | 5.E-02 | |
| A01 | BrSF0706 | 95.0 | 0 | 37 | 0 | 0 | 140 | 2 | 2.E-01 | |
| A01 | CNU068 | 98.1 | 37 | 0 | 0 | 142 | 0 | 0 | 2.E-01 | |
| A01 | BrSF0010 | 98.1 | 38 | 71 | 69 | 0 | 0 | 1 | 2.E-05 | No.73290 |
| A01 | BrSF0009 | 98.5 | 36 | 0 | 0 | 143 | 0 | 0 | 1.E-01 | |
| A01 | BoSF0050a | 99.6 | 40 | 0 | 0 | 136 | 0 | 3 | 5.E-01 | |
| A01 | BrSF0006 | 102.1 | 36 | 0 | 0 | 140 | 0 | 3 | 2.E-01 | |
| A01 | CNU397 | 103.2 | 42 | 0 | 0 | 137 | 0 | 0 | 6.E-01 | |
| A01 | BrSF1002 | 104.7 | 0 | 47 | 0 | 0 | 130 | 2 | 6.E-01 | |
| A01 | TFZIP23 | 105.8 | 0 | 45 | 0 | 0 | 134 | 0 | 1.E+00 | |
| A01 | sN3523 | 106.9 | 41 | 45 | 91 | 0 | 0 | 2 | 9.E-01 | |
| A01 | BrSF0982 | 113.9 | 42 | 0 | 0 | 128 | 0 | 9 | 9.E-01 | |
| A01 | BoSF0911 | 119.1 | 0 | 48 | 0 | 0 | 130 | 1 | 5.E-01 | |
| A01 | CNU474 | 122.1 | 42 | 0 | 0 | 137 | 0 | 0 | 6.E-01 | |
| A01 | CNU388 | 123.5 | 0 | 41 | 0 | 0 | 137 | 1 | 5.E-01 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| A01 | BoSF1939 | 124.1 | 0 | 33 | 0 | 0 | 129 | 17 | 2.E-01 | |
| A01 | BoSF2123 | 124.4 | 39 | 0 | 0 | 140 | 0 | 0 | 3.E-01 | |
| A01 | BoSF0197 | 125.0 | 38 | 0 | 0 | 139 | 0 | 2 | 3.E-01 | |
| A01 | BrSF0973 | 125.5 | 0 | 38 | 0 | 0 | 134 | 7 | 4.E-01 | |
| A01 | Na14F11b | 126.5 | 45 | 0 | 0 | 124 | 0 | 10 | 6.E-01 | |
| A01 | BrSF0949 | 128.8 | 30 | 32 | 104 | 0 | 0 | 13 | 5.E-03 | |
| A02 | niab025 | 0.0 | 53 | 0 | 0 | 122 | 0 | 4 | 1.E-01 | |
| A02 | BoSF2549 | 5.7 | 44 | 0 | 0 | 130 | 0 | 5 | 9.E-01 | |
| A02 | sR94102 | 6.1 | 0 | 20 | 0 | 0 | 66 | 93 | 7.E-01 | |
| A02 | BrSF0051 | 9.4 | 55 | 36 | 87 | 0 | 0 | 1 | 1.E-01 | |
| A02 | BrGMS0511 | 11.1 | 42 | 0 | 0 | 117 | 0 | 20 | 7.E-01 | |
| A02 | BrSF0065a | 11.5 | 0 | 37 | 0 | 0 | 140 | 2 | 2.E-01 | |
| A02 | BoSF0239 | 12.8 | 48 | 38 | 92 | 0 | 0 | 1 | 5.E-01 | |
| A02 | BRAS083 | 18.4 | 0 | 38 | 0 | 0 | 140 | 1 | 3.E-01 | |
| A02 | BrSF0665 | 19.1 | 50 | 0 | 0 | 127 | 0 | 2 | 3.E-01 | |
| A02 | MR052 | 20.3 | 49 | 0 | 0 | 128 | 0 | 2 | 4.E-01 | |
| A02 | BRAS037 | 22.4 | 48 | 44 | 83 | 0 | 0 | 4 | 7.E-01 | |
| A02 | BrSF0062 | 23.6 | 50 | 0 | 0 | 129 | 0 | 0 | 4.E-01 | |
| A02 | BrSF0661 | 24.9 | 45 | 45 | 85 | 0 | 0 | 4 | 9.E-01 | |
| A02 | sN3761 | 26.2 | 46 | 0 | 0 | 123 | 0 | 10 | 5.E-01 | |
| A02 | BoSF2224 | 27.2 | 48 | 42 | 85 | 0 | 0 | 4 | 8.E-01 | |
| A02 | BrSF0663 | 28.0 | 45 | 0 | 0 | 131 | 0 | 3 | 9.E-01 | |
| A02 | sR6293 | 29.9 | 49 | 47 | 83 | 0 | 0 | 0 | 6.E-01 | |
| A02 | BrSF0045 | 30.5 | 50 | 44 | 75 | 0 | 0 | 10 | 3.E-01 | |
| A02 | BoSF0329 | 31.6 | 46 | 0 | 0 | 133 | 0 | 0 | 8.E-01 | |
| A02 | BrSF0750 | 33.5 | 46 | 42 | 91 | 0 | 0 | 0 | 9.E-01 | |
| A02 | BrSF0053 | 34.0 | 46 | 42 | 90 | 0 | 0 | 1 | 9.E-01 | |
| A02 | BrSF0052 | 34.2 | 48 | 0 | 0 | 129 | 0 | 2 | 5.E-01 | |
| A02 | BrSF0754 | 34.6 | 48 | 41 | 90 | 0 | 0 | 0 | 8.E-01 | |
| A02 | BrSF0755 | 36.2 | 50 | 43 | 86 | 0 | 0 | 0 | 7.E-01 | |
| A02 | BrSF0049 | 38.2 | 52 | 0 | 0 | 126 | 0 | 1 | 2.E-01 | |
| A02 | CNU046 | 41.9 | 53 | 42 | 82 | 0 | 0 | 2 | 3.E-01 | |
| A02 | BrSF0031 | 43.1 | 51 | 41 | 85 | 0 | 0 | 2 | 5.E-01 | |
| A02 | BoSF1714 | 43.6 | 39 | 0 | 0 | 96 | 0 | 44 | 3.E-01 | |
| A02 | BoSF2100 | 45.9 | 46 | 0 | 0 | 128 | 0 | 5 | 7.E-01 | |
| A02 | BrSF0570 | 47.2 | 48 | 0 | 0 | 128 | 0 | 3 | 4.E-01 | |
| A02 | BrSF0056 | 47.8 | 49 | 42 | 87 | 0 | 0 | 1 | 7.E-01 | |
| A02 | BrSF0679 | 48.5 | 0 | 36 | 0 | 0 | 140 | 3 | 2.E-01 | |
| A02 | IFLP018 | 51.2 | 0 | 47 | 0 | 0 | 132 | 0 | 7.E-01 | |
| A02 | BrSF0682 | 52.1 | 47 | 0 | 0 | 128 | 0 | 4 | 6.E-01 | |
| A02 | BoSF0216 | 53.6 | 0 | 40 | 0 | 0 | 136 | 3 | 5.E-01 | |
| A02 | FITO255 | 55.2 | 51 | 0 | 0 | 121 | 0 | 7 | 2.E-01 | |
| A02 | BoSF0926c | 56.2 | 52 | 39 | 87 | 0 | 0 | 1 | 4.E-01 | |
| A02 | BrSF0680 | 58.1 | 0 | 19 | 0 | 0 | 70 | 90 | 4.E-01 | |
| A02 | BoSF1924 | 58.5 | 52 | 36 | 90 | 0 | 0 | 1 | 2.E-01 | |
| A02 | BrSF1044 | 60.6 | 54 | 0 | 0 | 125 | 0 | 0 | 1.E-01 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| A02 | BoSF2657 | 60.7 | 51 | 36 | 84 | 0 | 0 | 8 | 3.E-01 | |
| A02 | BrSF0696 | 60.9 | 0 | 35 | 0 | 0 | 144 | 0 | 9.E-02 | |
| A02 | BrSF0695 | 61.1 | 52 | 36 | 91 | 0 | 0 | 0 | 2.E-01 | |
| A02 | BrSF0032 | 61.3 | 53 | 0 | 0 | 125 | 0 | 1 | 1.E-01 | |
| A02 | BrSF0472 | 61.3 | 53 | 36 | 90 | 0 | 0 | 0 | 2.E-01 | |
| A02 | BrSF0836 | 61.4 | 54 | 36 | 89 | 0 | 0 | 0 | 2.E-01 | |
| A02 | CB10628 | 61.7 | 52 | 36 | 87 | 0 | 0 | 4 | 2.E-01 | |
| A02 | BrSF0520 | 61.8 | 52 | 36 | 89 | 0 | 0 | 2 | 2.E-01 | |
| A02 | BrSF0519 | 62.2 | 51 | 37 | 90 | 0 | 0 | 1 | 3.E-01 | |
| A02 | BoSF2324 | 63.2 | 52 | 33 | 82 | 0 | 0 | 12 | 1.E-01 | |
| A02 | BnEMS0401 | 65.5 | 0 | 37 | 0 | 0 | 141 | 1 | 2.E-01 | |
| A02 | BrSF0689 | 67.3 | 58 | 39 | 82 | 0 | 0 | 0 | 7.E-02 | |
| A02 | BoSF2214 | 79.6 | 52 | 33 | 93 | 0 | 0 | 1 | 1.E-01 | |
| A02 | Na14B05 | 82.9 | 51 | 0 | 0 | 127 | 0 | 1 | 3.E-01 | |
| A03 | niab115a | 0.0 | 60 | 31 | 87 | 0 | 0 | 1 | 8.E-03 | |
| A03 | BoSF1704 | 6.2 | 49 | 30 | 95 | 0 | 0 | 5 | 6.E-02 | |
| A03 | BrGMS0642 | 12.1 | 44 | 0 | 0 | 104 | 0 | 31 | 2.E-01 | |
| A03 | BrSF0422 | 12.8 | 50 | 35 | 94 | 0 | 0 | 0 | 2.E-01 | |
| A03 | BrSF0427 | 15.6 | 44 | 36 | 78 | 0 | 0 | 21 | 7.E-01 | |
| A03 | BrSF0350 | 16.1 | 52 | 35 | 91 | 0 | 0 | 1 | 2.E-01 | |
| A03 | CB10036 | 16.5 | 52 | 34 | 88 | 0 | 0 | 5 | 2.E-01 | |
| A03 | BoSF2852 | 17.1 | 52 | 31 | 94 | 0 | 0 | 2 | 6.E-02 | |
| A03 | BrSF0029 | 18.6 | 28 | 22 | 38 | 0 | 0 | 91 | 3.E-01 | |
| A03 | BoSF2392a | 20.6 | 0 | 40 | 0 | 0 | 137 | 2 | 5.E-01 | |
| A03 | TFZIP19 | 21.1 | 0 | 41 | 0 | 0 | 135 | 3 | 6.E-01 | |
| A03 | BrSF0090 | 21.8 | 49 | 47 | 80 | 0 | 0 | 3 | 5.E-01 | |
| A03 | KS50980 | 21.8 | 56 | 40 | 82 | 0 | 0 | 1 | 1.E-01 | |
| A03 | sR6688a | 23.3 | 49 | 38 | 76 | 0 | 0 | 16 | 3.E-01 | |
| A03 | BrSF0089 | 24.2 | 54 | 40 | 84 | 0 | 0 | 1 | 3.E-01 | |
| A03 | BrSF0091 | 25.4 | 0 | 40 | 0 | 0 | 139 | 0 | 4.E-01 | |
| A03 | BrSF0845a | 25.7 | 54 | 0 | 0 | 123 | 0 | 2 | 9.E-02 | |
| A03 | BrSF0087a | 26.3 | 53 | 0 | 0 | 125 | 0 | 1 | 1.E-01 | |
| A03 | BoSF2807 | 26.8 | 55 | 42 | 80 | 0 | 0 | 2 | 2.E-01 | |
| A03 | BoSF0546 | 28.8 | 0 | 42 | 0 | 0 | 135 | 2 | 7.E-01 | |
| A03 | BoSF0560 | 30.9 | 0 | 44 | 0 | 0 | 134 | 1 | 9.E-01 | |
| A03 | BnEMS0894 | 32.2 | 55 | 40 | 80 | 0 | 0 | 4 | 1.E-01 | |
| A03 | IGF2134f2 | 33.5 | 52 | 0 | 0 | 124 | 0 | 3 | 2.E-01 | |
| A03 | BrSF0092 | 35.0 | 49 | 45 | 83 | 0 | 0 | 2 | 6.E-01 | |
| A03 | CNU253 | 37.0 | 0 | 47 | 0 | 0 | 132 | 0 | 7.E-01 | |
| A03 | Na12E02a | 38.7 | 46 | 43 | 88 | 0 | 0 | 2 | 9.E-01 | |
| A03 | Ol11B05 | 38.7 | 47 | 43 | 88 | 0 | 0 | 1 | 9.E-01 | |
| A03 | BrSF0300 | 39.3 | 48 | 43 | 84 | 0 | 0 | 4 | 8.E-01 | |
| A03 | BoSF0415b | 40.2 | 0 | 42 | 0 | 0 | 130 | 7 | 9.E-01 | |
| A03 | BoSF2277 | 40.5 | 47 | 0 | 0 | 128 | 0 | 4 | 6.E-01 | |
| A03 | CNU288 | 44.1 | 50 | 43 | 86 | 0 | 0 | 0 | 7.E-01 | |
| A03 | BrSF0114 | 44.9 | 48 | 0 | 0 | 130 | 0 | 1 | 5.E-01 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| A03 | BoSF0664 | 45.2 | 0 | 45 | 0 | 0 | 133 | 1 | 9.E-01 |  |
| A03 | BoSF2744 | 48.1 | 41 | 48 | 87 | 0 | 0 | 3 | 7.E-01 |  |
| A03 | CNU466 | 48.9 | 0 | 42 | 0 | 0 | 122 | 15 | 9.E-01 |  |
| A03 | BrSF0078 | 49.8 | 0 | 47 | 0 | 0 | 131 | 1 | 7.E-01 |  |
| A03 | BoSF1709 | 50.8 | 45 | 47 | 84 | 0 | 0 | 3 | 8.E-01 |  |
| A03 | BoSF2220 | 51.3 | 50 | 0 | 0 | 121 | 0 | 8 | 2.E-01 |  |
| A03 | BoSF2915 | 52.8 | 43 | 48 | 87 | 0 | 0 | 1 | 8.E-01 |  |
| A03 | CB10329 | 55.4 | 45 | 48 | 83 | 0 | 0 | 3 | 7.E-01 |  |
| A03 | BoSF1715 | 55.4 | 0 | 49 | 0 | 0 | 126 | 4 | 4.E-01 |  |
| A03 | BrSF0295 | 55.9 | 0 | 50 | 0 | 0 | 125 | 4 | 3.E-01 |  |
| A03 | BoSF1886 | 57.5 | 45 | 54 | 78 | 0 | 0 | 2 | 2.E-01 |  |
| A03 | CNU098 | 62.1 | 39 | 0 | 0 | 140 | 0 | 0 | 3.E-01 |  |
| A03 | BoSF1678 | 62.1 | 39 | 0 | 0 | 139 | 0 | 1 | 3.E-01 |  |
| A03 | CNU259 | 64.0 | 0 | 54 | 0 | 0 | 124 | 1 | 1.E-01 |  |
| A03 | FITO285 | 66.5 | 38 | 43 | 96 | 0 | 0 | 2 | 5.E-01 |  |
| A03 | BoSF1651 | 67.0 | 39 | 45 | 93 | 0 | 0 | 2 | 6.E-01 |  |
| A03 | BrSF0102 | 68.4 | 37 | 46 | 95 | 0 | 0 | 1 | 4.E-01 |  |
| A03 | CNU422 | 69.8 | 32 | 45 | 94 | 0 | 0 | 8 | 2.E-01 |  |
| A03 | Na14G10 | 70.6 | 35 | 46 | 95 | 0 | 0 | 3 | 3.E-01 |  |
| A03 | Ol11G11 | 70.6 | 31 | 49 | 88 | 0 | 0 | 11 | 1.E-01 |  |
| A03 | sN11722 | 73.6 | 34 | 49 | 94 | 0 | 0 | 2 | 3.E-01 |  |
| A03 | CB10114 | 73.6 | 39 | 0 | 0 | 140 | 0 | 0 | 3.E-01 |  |
| A03 | BoSF0598 | 73.7 | 35 | 0 | 0 | 141 | 0 | 3 | 1.E-01 |  |
| A03 | BoSF2828 | 76.1 | 38 | 0 | 0 | 131 | 0 | 10 | 5.E-01 |  |
| A03 | BoSF1085 | 98.9 | 0 | 46 | 0 | 0 | 133 | 0 | 8.E-01 |  |
| A03 | CNU371 | 100.4 | 0 | 43 | 0 | 0 | 129 | 7 | 1.E+00 |  |
| A03 | CNU223 | 101.4 | 36 | 45 | 98 | 0 | 0 | 0 | 3.E-01 |  |
| A03 | BoSF2145 | 104.1 | 39 | 0 | 0 | 140 | 0 | 0 | 3.E-01 |  |
| A03 | sR11644 | 105.8 | 35 | 53 | 84 | 0 | 0 | 7 | 1.E-01 |  |
| A03 | BoSF0346 | 105.9 | 0 | 48 | 0 | 0 | 131 | 0 | 6.E-01 |  |
| A03 | BoSF0393 | 105.9 | 39 | 0 | 0 | 140 | 0 | 0 | 3.E-01 |  |
| A03 | MR181 | 109.8 | 0 | 47 | 0 | 0 | 130 | 2 | 6.E-01 |  |
| A03 | BoGMS1071 | 110.6 | 0 | 45 | 0 | 0 | 125 | 9 | 7.E-01 |  |
| A03 | KS40432 | 111.8 | 36 | 45 | 96 | 0 | 0 | 2 | 3.E-01 |  |
| A03 | BnGMS0616 | 114.4 | 38 | 46 | 87 | 0 | 0 | 8 | 7.E-01 |  |
| A03 | BoSF1919 | 116.0 | 40 | 0 | 0 | 126 | 0 | 13 | 8.E-01 |  |
| A03 | BrSF0708 | 118.3 | 39 | 0 | 0 | 136 | 0 | 4 | 4.E-01 |  |
| A03 | BoSF1779 | 122.0 | 36 | 0 | 0 | 127 | 0 | 16 | 4.E-01 |  |
| A03 | CB10425 | 126.4 | 38 | 50 | 85 | 0 | 0 | 6 | 4.E-01 |  |
| A03 | BrSF0918 | 129.1 | 43 | 0 | 0 | 132 | 0 | 4 | 9.E-01 |  |
| A04 | BrSF0564 | 0.0 | 36 | 39 | 83 | 0 | 0 | 21 | 8.E-01 |  |
| A04 | BoSF2609 | 1.8 | 0 | 45 | 0 | 0 | 134 | 0 | 1.E+00 |  |
| A04 | BrSF0560 | 5.4 | 46 | 42 | 84 | 0 | 0 | 7 | 9.E-01 |  |
| A04 | BrSF0112 | 6.6 | 48 | 45 | 86 | 0 | 0 | 0 | 8.E-01 |  |
| A04 | BoSF0336a | 11.2 | 0 | 49 | 0 | 0 | 130 | 0 | 5.E-01 |  |
| A04 | IFLP014 | 13.4 | 45 | 44 | 90 | 0 | 0 | 0 | 1.E+00 |  |

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|---|---|---|---|---|---|---|---|---|---|---|
| A04 | BnGMS0115 | 14.9 | 45 | 44 | 88 | 0 | 0 | 2 | 1.E+00 | |
| A04 | BrSF1049 | 17.3 | 45 | 0 | 0 | 134 | 0 | 0 | 1.E+00 | |
| A04 | BrSF1032 | 18.0 | 0 | 39 | 0 | 0 | 140 | 0 | 3.E-01 | |
| A04 | niab143 | 19.1 | 20 | 0 | 0 | 70 | 0 | 89 | 5.E-01 | |
| A04 | BoSF1125 | 20.4 | 0 | 44 | 0 | 0 | 135 | 0 | 9.E-01 | |
| A04 | sN2025 | 24.6 | 0 | 41 | 0 | 0 | 126 | 12 | 9.E-01 | |
| A04 | CNU246 | 33.3 | 44 | 44 | 86 | 0 | 0 | 5 | 1.E+00 | |
| A04 | BoSF1161 | 35.1 | 43 | 50 | 86 | 0 | 0 | 0 | 7.E-01 | |
| A04 | CNU039 | 36.1 | 44 | 0 | 0 | 129 | 0 | 6 | 9.E-01 | |
| A04 | BrSF0726 | 47.0 | 44 | 51 | 84 | 0 | 0 | 0 | 5.E-01 | |
| A04 | BoSF0415a | 48.4 | 40 | 49 | 86 | 0 | 0 | 4 | 6.E-01 | |
| A04 | BoSF0482 | 50.1 | 40 | 0 | 0 | 139 | 0 | 0 | 4.E-01 | |
| A04 | BrSF0719 | 50.6 | 0 | 58 | 0 | 0 | 118 | 3 | 1.E-02 | |
| A04 | BoSF1476 | 52.1 | 0 | 56 | 0 | 0 | 123 | 0 | 5.E-02 | |
| A04 | BrSF0646 | 54.8 | 35 | 54 | 88 | 0 | 0 | 2 | 1.E-01 | |
| A04 | BrSF0120 | 56.3 | 0 | 54 | 0 | 0 | 123 | 2 | 9.E-02 | |
| A04 | BoSF0231 | 56.8 | 37 | 56 | 86 | 0 | 0 | 0 | 1.E-01 | |
| A04 | BrSF0645 | 57.7 | 33 | 49 | 75 | 0 | 0 | 22 | 2.E-01 | |
| A04 | IFLP036 | 59.7 | 34 | 0 | 0 | 143 | 0 | 2 | 8.E-02 | |
| A04 | BoSF1555 | 60.1 | 0 | 56 | 0 | 0 | 122 | 1 | 5.E-02 | |
| A04 | BoSF1642 | 62.5 | 0 | 54 | 0 | 0 | 122 | 3 | 8.E-02 | |
| A04 | BrSF0643 | 63.2 | 37 | 0 | 0 | 124 | 0 | 18 | 6.E-01 | |
| A04 | BrSF0642a | 64.4 | 25 | 25 | 33 | 0 | 0 | 96 | 2.E-01 | |
| A04 | BoSF0841b | 68.3 | 34 | 0 | 0 | 143 | 0 | 2 | 8.E-02 | |
| A04 | BoSF2769 | 70.6 | 0 | 49 | 0 | 0 | 125 | 5 | 3.E-01 | |
| A04 | BrSF0969 | 79.4 | 25 | 0 | 0 | 152 | 0 | 2 | 8.E-04 | No.73290 |
| A04 | BrSF0972 | 87.1 | 23 | 86 | 52 | 0 | 0 | 18 | 8.E-16 | No.73290 |
| A05 | BoSF1666 | 0.0 | 39 | 46 | 90 | 0 | 0 | 4 | 7.E-01 | |
| A05 | Na14G02 | 3.7 | 41 | 29 | 102 | 0 | 0 | 7 | 2.E-02 | |
| A05 | BrSF0712 | 4.8 | 42 | 29 | 102 | 0 | 0 | 6 | 2.E-02 | |
| A05 | ns213 | 11.3 | 46 | 0 | 0 | 133 | 0 | 0 | 8.E-01 | |
| A05 | ns218 | 12.1 | 47 | 0 | 0 | 132 | 0 | 0 | 7.E-01 | |
| A05 | ns231 | 12.3 | 0 | 35 | 0 | 0 | 127 | 17 | 3.E-01 | |
| A05 | BoSF2141 | 14.4 | 44 | 0 | 0 | 134 | 0 | 1 | 9.E-01 | |
| A05 | BrSF0975a | 20.7 | 43 | 37 | 97 | 0 | 0 | 2 | 4.E-01 | |
| A05 | BrSF0942 | 20.8 | 42 | 0 | 0 | 129 | 0 | 8 | 9.E-01 | |
| A05 | CNU398 | 20.8 | 59 | 0 | 0 | 119 | 0 | 1 | 1.E-02 | |
| A05 | BoSF1098 | 21.2 | 43 | 0 | 0 | 136 | 0 | 0 | 8.E-01 | |
| A05 | Na12E01a | 22.8 | 40 | 40 | 95 | 0 | 0 | 4 | 5.E-01 | |
| A05 | BrSF0620 | 23.8 | 32 | 43 | 101 | 0 | 0 | 3 | 7.E-02 | |
| A05 | BnGMS0293 | 24.5 | 43 | 44 | 89 | 0 | 0 | 3 | 1.E+00 | |
| A05 | BrSF0952 | 24.5 | 44 | 41 | 92 | 0 | 0 | 2 | 8.E-01 | |
| A05 | CNU029 | 24.7 | 44 | 44 | 87 | 0 | 0 | 4 | 1.E+00 | |
| A05 | BrSF0550 | 25.1 | 44 | 45 | 89 | 0 | 0 | 1 | 1.E+00 | |
| A05 | BrSF1031b | 26.5 | 0 | 40 | 0 | 0 | 134 | 5 | 5.E-01 | |
| A05 | BrSF0849 | 26.6 | 42 | 42 | 87 | 0 | 0 | 8 | 1.E+00 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| A05 | ns211 | 28.1 | 49 | 0 | 0 | 130 | 0 | 0 | 5.E-01 | |
| A05 | BrSF0618 | 29.9 | 42 | 41 | 96 | 0 | 0 | 0 | 6.E-01 | |
| A05 | BrGMS0293 | 34.2 | 43 | 42 | 91 | 0 | 0 | 3 | 9.E-01 | |
| A05 | BoSF1230 | 37.7 | 23 | 19 | 47 | 0 | 0 | 90 | 7.E-01 | |
| A05 | IFLP039 | 42.3 | 49 | 39 | 87 | 0 | 0 | 4 | 6.E-01 | |
| A05 | BrSF0497 | 45.7 | 43 | 38 | 94 | 0 | 0 | 4 | 5.E-01 | |
| A05 | BoSF0582 | 46.0 | 47 | 36 | 95 | 0 | 0 | 1 | 3.E-01 | |
| A05 | BoSF0259 | 46.1 | 48 | 0 | 0 | 131 | 0 | 0 | 6.E-01 | |
| A05 | BoSF1749 | 46.6 | 45 | 0 | 0 | 130 | 0 | 4 | 8.E-01 | |
| A05 | CNU268 | 49.2 | 0 | 34 | 0 | 0 | 144 | 1 | 7.E-02 | |
| A05 | BoSF2746 | 50.6 | 0 | 36 | 0 | 0 | 139 | 4 | 2.E-01 | |
| A05 | BoSF2030 | 51.3 | 0 | 34 | 0 | 0 | 136 | 9 | 1.E-01 | |
| A05 | BrSF0491 | 52.5 | 48 | 35 | 92 | 0 | 0 | 4 | 3.E-01 | |
| A05 | snap1047a | 55.6 | 51 | 0 | 0 | 125 | 0 | 3 | 2.E-01 | |
| A06 | BoSF0784 | 0.0 | 59 | 32 | 87 | 0 | 0 | 1 | 2.E-02 | |
| A06 | BrSF0149 | 1.1 | 56 | 33 | 90 | 0 | 0 | 0 | 5.E-02 | |
| A06 | BoSF2253 | 2.0 | 58 | 32 | 84 | 0 | 0 | 5 | 2.E-02 | |
| A06 | BoSF0869 | 4.8 | 60 | 33 | 84 | 0 | 0 | 2 | 1.E-02 | |
| A06 | BoSF0455c | 5.7 | 0 | 33 | 0 | 0 | 143 | 3 | 6.E-02 | |
| A06 | BrSF0860 | 7.4 | 52 | 0 | 0 | 109 | 0 | 18 | 3.E-02 | |
| A06 | CB10143 | 9.3 | 55 | 35 | 84 | 0 | 0 | 5 | 9.E-02 | |
| A06 | IFLP001 | 12.1 | 56 | 36 | 86 | 0 | 0 | 1 | 1.E-01 | |
| A06 | BoSF1212b | 13.5 | 0 | 19 | 0 | 0 | 70 | 90 | 4.E-01 | |
| A06 | BrSF0741 | 17.7 | 0 | 39 | 0 | 0 | 140 | 0 | 3.E-01 | |
| A06 | BoSF1521 | 19.7 | 51 | 37 | 91 | 0 | 0 | 0 | 3.E-01 | |
| A06 | BrSF0743 | 21.4 | 52 | 37 | 88 | 0 | 0 | 2 | 3.E-01 | |
| A06 | BoSF2583 | 25.7 | 44 | 41 | 91 | 0 | 0 | 3 | 9.E-01 | |
| A06 | BoSF2360 | 29.5 | 48 | 41 | 85 | 0 | 0 | 5 | 7.E-01 | |
| A06 | BoSF0022a | 30.2 | 45 | 45 | 88 | 0 | 0 | 1 | 1.E+00 | |
| A06 | BRAS052 | 34.2 | 48 | 56 | 72 | 0 | 0 | 3 | 4.E-02 | |
| A06 | BrSF0171 | 39.3 | 47 | 0 | 0 | 131 | 0 | 1 | 7.E-01 | |
| A06 | BoSF1990 | 41.4 | 45 | 45 | 86 | 0 | 0 | 3 | 1.E+00 | |
| A06 | BoSF1752 | 42.8 | 41 | 0 | 0 | 133 | 0 | 5 | 7.E-01 | |
| A06 | BnGMS0480 | 46.5 | 39 | 44 | 95 | 0 | 0 | 1 | 6.E-01 | |
| A06 | CNU050 | 47.1 | 40 | 0 | 0 | 135 | 0 | 4 | 5.E-01 | |
| A06 | IGF1653c | 47.3 | 23 | 22 | 41 | 0 | 0 | 93 | 9.E-01 | |
| A06 | CNU149 | 47.6 | 41 | 46 | 92 | 0 | 0 | 0 | 8.E-01 | |
| A06 | CB10006 | 48.1 | 42 | 0 | 0 | 137 | 0 | 0 | 6.E-01 | |
| A06 | BrSF0858b | 48.8 | 0 | 47 | 0 | 0 | 121 | 11 | 4.E-01 | |
| A06 | BrSF0789 | 52.5 | 42 | 52 | 84 | 0 | 0 | 1 | 4.E-01 | |
| A06 | ENA23 | 54.9 | 0 | 50 | 0 | 0 | 123 | 6 | 2.E-01 | |
| A06 | BoSF2407 | 55.5 | 0 | 52 | 0 | 0 | 122 | 5 | 1.E-01 | |
| A06 | BoSF1509 | 56.3 | 0 | 50 | 0 | 0 | 129 | 0 | 4.E-01 | |
| A06 | BrSF0154 | 57.5 | 42 | 56 | 79 | 0 | 0 | 2 | 1.E-01 | |
| A06 | BrSF0153 | 59.3 | 44 | 50 | 85 | 0 | 0 | 0 | 7.E-01 | |
| A06 | BoSF1414 | 60.6 | 47 | 0 | 0 | 132 | 0 | 0 | 7.E-01 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| A06 | BoGMS0314 | 63.7 | 45 | 48 | 67 | 0 | 0 | 19 | 1.E-01 | |
| A06 | BoSF1522 | 65.3 | 49 | 0 | 0 | 130 | 0 | 0 | 5.E-01 | |
| A06 | IGF5707b | 65.9 | 0 | 25 | 0 | 0 | 65 | 89 | 5.E-01 | |
| A06 | sS1949 | 66.1 | 47 | 0 | 0 | 126 | 0 | 6 | 5.E-01 | |
| A06 | BoSF0213 | 66.7 | 0 | 52 | 0 | 0 | 127 | 0 | 2.E-01 | |
| A06 | BrSF47-382a | 76.7 | 38 | 56 | 83 | 0 | 0 | 2 | 1.E-01 | |
| A06 | BrSF47-389 | 78.9 | 40 | 58 | 75 | 0 | 0 | 6 | 3.E-02 | |
| A06 | BrSF0162 | 79.7 | 44 | 53 | 71 | 0 | 0 | 11 | 8.E-02 | |
| A06 | CNU400 | 80.0 | 44 | 57 | 78 | 0 | 0 | 0 | 9.E-02 | |
| A06 | BrSF47-277 | 81.9 | 36 | 56 | 71 | 0 | 0 | 16 | 2.E-02 | |
| A06 | BrSF47-234 | 82.8 | 33 | 57 | 72 | 0 | 0 | 17 | 1.E-02 | |
| A06 | BoSF1088 | 83.5 | 38 | 0 | 0 | 141 | 0 | 0 | 2.E-01 | |
| A06 | BoSF2406 | 83.8 | 42 | 60 | 72 | 0 | 0 | 5 | 1.E-02 | |
| A06 | BrSF0820 | 84.3 | 0 | 60 | 0 | 0 | 115 | 4 | 5.E-03 | |
| A06 | BrSF46-22 | 84.3 | 0 | 61 | 0 | 0 | 109 | 9 | 1.E-03 | |
| A06 | BrSF47-10 | 84.3 | 37 | 58 | 71 | 0 | 0 | 13 | 1.E-02 | |
| A06 | BrSF47-54 | 84.5 | 39 | 61 | 75 | 0 | 0 | 4 | 1.E-02 | |
| A06 | BrSF0821 | 84.7 | 39 | 0 | 0 | 140 | 0 | 0 | 3.E-01 | |
| A06 | BoSF0783a | 84.7 | 39 | 0 | 0 | 136 | 0 | 4 | 4.E-01 | |
| A06 | BrSF0819 | 85.0 | 39 | 61 | 78 | 0 | 0 | 1 | 2.E-02 | |
| A06 | BrSF46-186 | 85.3 | 34 | 60 | 68 | 0 | 0 | 17 | 2.E-03 | |
| A06 | BrSF46-177 | 85.4 | 37 | 57 | 69 | 0 | 0 | 16 | 1.E-02 | |
| A06 | BrSF46-176a | 85.7 | 35 | 53 | 64 | 0 | 0 | 27 | 2.E-02 | |
| A06 | BrSF46-167 | 86.4 | 38 | 60 | 70 | 0 | 0 | 11 | 5.E-03 | |
| A06 | BrSF46-306 | 87.4 | 36 | 58 | 73 | 0 | 0 | 12 | 1.E-02 | |
| A06 | BrSF46-291 | 87.8 | 33 | 53 | 64 | 0 | 0 | 29 | 1.E-02 | |
| A06 | BrSF46-238 | 88.2 | 39 | 60 | 69 | 0 | 0 | 11 | 5.E-03 | |
| A06 | BrSF0822 | 88.9 | 0 | 60 | 0 | 0 | 119 | 0 | 8.E-03 | |
| A06 | BrSF0166 | 93.8 | 0 | 60 | 0 | 0 | 119 | 0 | 8.E-03 | |
| A06 | BnID108 | 97.0 | 38 | 55 | 78 | 0 | 0 | 8 | 1.E-01 | |
| A06 | BrSF0144 | 97.7 | 41 | 56 | 82 | 0 | 0 | 0 | 2.E-01 | |
| A06 | BoSF2702 | 98.3 | 41 | 56 | 82 | 0 | 0 | 0 | 2.E-01 | |
| A06 | BnID107 | 99.1 | 37 | 57 | 80 | 0 | 0 | 5 | 6.E-02 | |
| A06 | BoSF2788 | 99.7 | 98 | 0 | 0 | 79 | 0 | 2 | 1.E-20 | Zhongshuang11 |
| A06 | BoSF0215 | 113.3 | 42 | 48 | 85 | 0 | 0 | 4 | 8.E-01 | |
| A07 | sR4047 | 0.0 | 34 | 44 | 80 | 0 | 0 | 21 | 5.E-01 | |
| A07 | sR282 | 0.9 | 33 | 0 | 0 | 140 | 0 | 6 | 7.E-02 | |
| A07 | BoSF2344 | 3.7 | 39 | 53 | 87 | 0 | 0 | 0 | 3.E-01 | |
| A07 | BoSF0665 | 6.9 | 40 | 0 | 0 | 139 | 0 | 0 | 4.E-01 | |
| A07 | BRAS023 | 13.2 | 40 | 53 | 85 | 0 | 0 | 1 | 3.E-01 | |
| A07 | AT1G27050 | 16.3 | 39 | 52 | 87 | 0 | 0 | 1 | 4.E-01 | |
| A07 | BoSF2653 | 17.8 | 42 | 0 | 0 | 136 | 0 | 1 | 7.E-01 | |
| A07 | BrSF0331 | 20.1 | 42 | 51 | 85 | 0 | 0 | 1 | 5.E-01 | |
| A07 | CNU273 | 35.2 | 37 | 54 | 88 | 0 | 0 | 0 | 2.E-01 | |
| A07 | BrSF0185 | 35.2 | 22 | 25 | 42 | 0 | 0 | 90 | 8.E-01 | |
| A07 | sR7223 | 37.8 | 40 | 48 | 86 | 0 | 0 | 5 | 7.E-01 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| A07 | niab043 | 46.9 | 37 | 54 | 85 | 0 | 0 | 3 | 2.E-01 | |
| A07 | BRMS036 | 53.7 | 25 | 50 | 90 | 0 | 0 | 14 | 1.E-02 | |
| A07 | BoSF0898 | 60.5 | 0 | 49 | 0 | 0 | 130 | 0 | 5.E-01 | |
| A07 | CNU339 | 61.2 | 33 | 49 | 94 | 0 | 0 | 3 | 2.E-01 | |
| A07 | CNU037 | 62.7 | 35 | 47 | 96 | 0 | 0 | 1 | 3.E-01 | |
| A07 | BoGMS2110 | 69.6 | 0 | 57 | 0 | 0 | 121 | 1 | 3.E-02 | |
| A07 | CNU331b | 71.1 | 41 | 0 | 0 | 135 | 0 | 3 | 6.E-01 | |
| A07 | CNU043 | 73.8 | 40 | 52 | 79 | 0 | 0 | 8 | 3.E-01 | |
| A07 | CNU053 | 80.4 | 0 | 47 | 0 | 0 | 130 | 2 | 6.E-01 | |
| A07 | CNU052 | 81.1 | 38 | 51 | 87 | 0 | 0 | 3 | 4.E-01 | |
| A07 | BoSF2257 | 82.1 | 36 | 0 | 0 | 138 | 0 | 5 | 2.E-01 | |
| A07 | BrSF0480 | 84.9 | 39 | 56 | 78 | 0 | 0 | 6 | 8.E-02 | |
| A07 | BoSF2703 | 87.9 | 41 | 53 | 82 | 0 | 0 | 3 | 3.E-01 | |
| A07 | BoSF0707 | 91.5 | 0 | 50 | 0 | 0 | 126 | 3 | 3.E-01 | |
| A07 | BoSF1972 | 92.5 | 0 | 48 | 0 | 0 | 127 | 4 | 5.E-01 | |
| A07 | CNU308 | 96.8 | 0 | 48 | 0 | 0 | 126 | 5 | 4.E-01 | |
| A08 | BoSF0711a | 0.0 | 0 | 45 | 0 | 0 | 125 | 9 | 7.E-01 | |
| A08 | BnEMS1142 | 1.2 | 34 | 46 | 95 | 0 | 0 | 4 | 2.E-01 | |
| A08 | BrGMS0339a | 4.3 | 26 | 46 | 92 | 0 | 0 | 15 | 3.E-02 | |
| A08 | BrSF0210 | 6.8 | 35 | 45 | 98 | 0 | 0 | 1 | 2.E-01 | |
| A08 | snap0675 | 13.4 | 0 | 57 | 0 | 0 | 122 | 0 | 3.E-02 | |
| A08 | BoSF2672 | 14.1 | 38 | 0 | 0 | 135 | 0 | 6 | 4.E-01 | |
| A08 | BnEMS0412 | 16.1 | 0 | 51 | 0 | 0 | 117 | 11 | 1.E-01 | |
| A08 | BrSF0606 | 19.0 | 39 | 54 | 82 | 0 | 0 | 4 | 2.E-01 | |
| A08 | BoSF1830 | 19.5 | 37 | 0 | 0 | 139 | 0 | 3 | 2.E-01 | |
| A08 | BoSF0693 | 23.3 | 42 | 54 | 82 | 0 | 0 | 1 | 3.E-01 | |
| A08 | BnEMS0236 | 23.3 | 21 | 27 | 38 | 0 | 0 | 93 | 4.E-01 | |
| A08 | sN12352 | 25.4 | 0 | 52 | 0 | 0 | 116 | 11 | 7.E-02 | |
| A08 | BrGMS0825 | 27.4 | 37 | 50 | 83 | 0 | 0 | 9 | 4.E-01 | |
| A08 | BoSF2499 | 32.6 | 41 | 53 | 79 | 0 | 0 | 6 | 2.E-01 | |
| A09 | KS51170 | 0.0 | 157 | 7 | 15 | 0 | 0 | 0 | 3.E-82 | Zhongshuang11 |
| A09 | BrSF0916a | 1.6 | 151 | 7 | 19 | 0 | 0 | 2 | 3.E-75 | Zhongshuang11 |
| A09 | BnID044 | 3.7 | 0 | 38 | 0 | 0 | 139 | 2 | 3.E-01 | |
| A09 | BrSF0255 | 7.0 | 0 | 43 | 0 | 0 | 136 | 0 | 8.E-01 | |
| A09 | BnID043 | 8.3 | 40 | 31 | 97 | 0 | 0 | 11 | 8.E-02 | |
| A09 | BnID045 | 9.1 | 38 | 36 | 70 | 0 | 0 | 35 | 9.E-01 | |
| A09 | BnID047 | 9.5 | 43 | 38 | 86 | 0 | 0 | 12 | 8.E-01 | |
| A09 | BnID046 | 10.3 | 44 | 32 | 90 | 0 | 0 | 13 | 2.E-01 | |
| A09 | CNU157 | 11.4 | 46 | 39 | 94 | 0 | 0 | 0 | 6.E-01 | |
| A09 | BnID042 | 12.2 | 42 | 33 | 89 | 0 | 0 | 15 | 3.E-01 | |
| A09 | CNU004 | 12.9 | 40 | 0 | 0 | 128 | 0 | 11 | 7.E-01 | |
| A09 | BnID040 | 14.0 | 41 | 33 | 92 | 0 | 0 | 13 | 3.E-01 | |
| A09 | BnID041 | 14.5 | 0 | 29 | 0 | 0 | 134 | 16 | 3.E-02 | |
| A09 | BoSF0270 | 15.4 | 42 | 38 | 98 | 0 | 0 | 1 | 4.E-01 | |
| A09 | BoSF2624 | 34.3 | 55 | 40 | 83 | 0 | 0 | 1 | 2.E-01 | |
| A09 | BnID052 | 36.8 | 55 | 38 | 74 | 0 | 0 | 12 | 6.E-02 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| A09 | BnID053 | 37.1 | 59 | 36 | 76 | 0 | 0 | 8 | 2.E-02 | |
| A09 | ns156 | 40.9 | 0 | 49 | 0 | 0 | 130 | 0 | 5.E-01 | |
| A09 | BoSF2489 | 44.0 | 57 | 54 | 67 | 0 | 0 | 1 | 4.E-03 | |
| A09 | BrSF0998 | 45.8 | 56 | 44 | 76 | 0 | 0 | 3 | 9.E-02 | |
| A09 | CNU402 | 47.2 | 55 | 51 | 73 | 0 | 0 | 0 | 4.E-02 | |
| A09 | BnID056 | 49.0 | 29 | 24 | 39 | 0 | 0 | 87 | 3.E-01 | |
| A09 | ns155 | 49.5 | 0 | 54 | 0 | 0 | 125 | 0 | 1.E-01 | |
| A09 | BrSF6-104 | 50.1 | 57 | 49 | 65 | 0 | 0 | 8 | 5.E-03 | |
| A09 | ns162 | 53.1 | 0 | 56 | 0 | 0 | 122 | 1 | 5.E-02 | |
| A09 | ns160 | 55.1 | 0 | 55 | 0 | 0 | 119 | 5 | 4.E-02 | |
| A09 | ns158 | 56.4 | 62 | 0 | 0 | 117 | 0 | 0 | 3.E-03 | |
| A09 | ns161 | 56.8 | 0 | 52 | 0 | 0 | 121 | 6 | 1.E-01 | |
| A09 | BoSF0232 | 58.9 | 0 | 45 | 0 | 0 | 134 | 0 | 1.E+00 | |
| A09 | ns164 | 60.5 | 0 | 38 | 0 | 0 | 127 | 14 | 6.E-01 | |
| A09 | ns163 | 60.5 | 0 | 50 | 0 | 0 | 127 | 2 | 3.E-01 | |
| A09 | BnSF2342-39 | 68.9 | 56 | 45 | 72 | 0 | 0 | 6 | 4.E-02 | |
| A09 | ns165 | 70.7 | 55 | 0 | 0 | 109 | 0 | 15 | 1.E-02 | |
| A09 | ns166 | 70.7 | 0 | 56 | 0 | 0 | 120 | 3 | 4.E-02 | |
| A09 | ns168 | 70.7 | 0 | 50 | 0 | 0 | 129 | 0 | 4.E-01 | |
| A09 | ns167 | 70.7 | 0 | 34 | 0 | 0 | 127 | 18 | 3.E-01 | |
| A09 | BnID076 | 71.4 | 54 | 37 | 82 | 0 | 0 | 6 | 1.E-01 | |
| A09 | BnID075 | 72.1 | 51 | 40 | 83 | 0 | 0 | 5 | 4.E-01 | |
| A09 | BrSF6-2245 | 74.2 | 46 | 36 | 58 | 0 | 0 | 39 | 6.E-02 | |
| A09 | BrSF6-2562 | **76.4** | 57 | 36 | 73 | 0 | 0 | 13 | 2.E-02 | |
| A09 | BnSF400-253 | 76.8 | 0 | 37 | 0 | 0 | 129 | 13 | 4.E-01 | |
| A09 | BnID060 | 77.1 | 58 | 38 | 73 | 0 | 0 | 10 | 2.E-02 | |
| A09 | BrSF0385 | 78.0 | 51 | 34 | 81 | 0 | 0 | 13 | 2.E-01 | |
| A09 | BnID081 | 79.1 | 57 | 36 | 79 | 0 | 0 | 7 | 4.E-02 | |
| A09 | BoSF0333 | 79.6 | 56 | 0 | 0 | 119 | 0 | 4 | 3.E-02 | |
| A09 | BoSF2710 | 81.5 | 55 | 0 | 0 | 123 | 0 | 1 | 7.E-02 | |
| A09 | BoSF2709 | 81.8 | 55 | 38 | 86 | 0 | 0 | 0 | 2.E-01 | |
| A09 | ENA27 | 82.0 | 55 | 0 | 0 | 123 | 0 | 1 | 7.E-02 | |
| A09 | BnID082 | 82.9 | 0 | 49 | 0 | 0 | 118 | 12 | 2.E-01 | |
| A09 | BnSF400-28 | 95.9 | 34 | 0 | 0 | 134 | 0 | 11 | 2.E-01 | |
| A09 | BrSF6-2380 | 96.8 | 35 | 0 | 0 | 139 | 0 | 5 | 1.E-01 | |
| A09 | BrSF0383 | 100.2 | 37 | 85 | 45 | 0 | 0 | 12 | 2.E-14 | No.73290 |
| A09 | CNU264 | 100.2 | 36 | 91 | 46 | 0 | 0 | 6 | 1.E-16 | No.73290 |
| A09 | BrSF0251 | 102.0 | 38 | 100 | 40 | 0 | 0 | 1 | 8.E-22 | No.73290 |
| A09 | BrSF6-2389 | 102.0 | 38 | 95 | 43 | 0 | 0 | 3 | 1.E-18 | No.73290 |
| A09 | BnSF400-29 | 102.5 | 36 | 94 | 35 | 0 | 0 | 14 | 2.E-21 | No.73290 |
| A09 | BrSF0353 | 103.2 | 36 | 97 | 44 | 0 | 0 | 2 | 1.E-19 | No.73290 |
| A09 | BnSF400-54 | 103.6 | 0 | 89 | 0 | 0 | 72 | 18 | 7.E-19 | No.73290 |
| A09 | BrSF0389a | 103.8 | 0 | 88 | 0 | 0 | 79 | 12 | 1.E-16 | No.73290 |
| A09 | BoSF0223 | 104.8 | 0 | 91 | 0 | 0 | 88 | 0 | 1.E-15 | No.73290 |
| A09 | BoSF1814 | 105.3 | 0 | 96 | 0 | 0 | 81 | 2 | 3.E-19 | No.73290 |
| A09 | BrSF0250 | 105.3 | 39 | 92 | 48 | 0 | 0 | 0 | 7.E-16 | No.73290 |

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|---|---|---|---|---|---|---|---|---|---|---|
| A09 | BrSF6-2413 | 105.3 | 0 | 84 | 0 | 0 | 85 | 10 | 1.E-13 | No.73290 |
| A09 | BnID079 | 107.2 | 44 | 86 | 44 | 0 | 0 | 5 | 2.E-14 | No.73290 |
| A09 | BnID078 | 108.2 | 37 | 99 | 36 | 0 | 0 | 7 | 5.E-23 | No.73290 |
| A09 | BnID086 | 110.3 | 43 | 81 | 48 | 0 | 0 | 7 | 1.E-11 | No.73290 |
| A09 | BnID087 | 111.1 | 43 | 87 | 45 | 0 | 0 | 4 | 2.E-14 | No.73290 |
| A09 | BnID061 | 112.4 | 44 | 76 | 47 | 0 | 0 | 12 | 3.E-10 | No.73290 |
| A09 | BnID090 | 112.5 | 28 | 0 | 0 | 144 | 0 | 7 | 8.E-03 | |
| A09 | BoSF1920a | 112.6 | 0 | 87 | 0 | 0 | 90 | 2 | 1.E-13 | No.73290 |
| A09 | BnID063 | 113.4 | 41 | 83 | 39 | 0 | 0 | 16 | 5.E-15 | No.73290 |
| A09 | BnID094 | 114.4 | 43 | 80 | 48 | 0 | 0 | 8 | 2.E-11 | No.73290 |
| A09 | BnID062 | 114.6 | 41 | 82 | 47 | 0 | 0 | 9 | 2.E-12 | No.73290 |
| A09 | BnID085 | 116.4 | 50 | 78 | 47 | 0 | 0 | 4 | 8.E-11 | No.73290 |
| A09 | BnID095 | 117.0 | 51 | 39 | 84 | 0 | 0 | 5 | 4.E-01 | |
| A09 | BrSF0615b | 117.0 | 0 | 129 | 0 | 0 | 48 | 2 | 5.E-49 | No.73290 |
| A09 | BoSF0872b | 117.0 | 0 | 114 | 0 | 0 | 47 | 18 | 4.E-41 | No.73290 |
| A09 | BrSF0229 | 118.0 | 0 | 66 | 0 | 0 | 112 | 1 | 2.E-04 | No.73290 |
| A09 | BoSF1885 | 120.7 | 27 | 0 | 0 | 142 | 0 | 10 | 7.E-03 | |
| A09 | BoSF2104a | 120.9 | 0 | 102 | 0 | 0 | 75 | 2 | 1.E-23 | No.73290 |
| A09 | BnEMS0337 | 121.7 | 45 | 36 | 94 | 0 | 0 | 4 | 4.E-01 | |
| A09 | BoSF2791 | 122.4 | 0 | 131 | 0 | 0 | 46 | 2 | 3.E-51 | No.73290 |
| A09 | BrSF77-118 | 123.3 | 0 | 26 | 0 | 0 | 55 | 98 | 1.E-01 | |
| A09 | BnID097 | 124.7 | 51 | 39 | 85 | 0 | 0 | 4 | 4.E-01 | |
| A09 | BrSF82-562 | 125.1 | 20 | 0 | 0 | 67 | 0 | 92 | 7.E-01 | |
| A09 | BoSF1902 | 125.8 | 34 | 50 | 92 | 0 | 0 | 3 | 2.E-01 | |
| A09 | BrSF0261 | 125.9 | 0 | 144 | 0 | 0 | 33 | 2 | 4.E-67 | No.73290 |
| A10 | BrSF0898a | 0.0 | 44 | 0 | 0 | 134 | 0 | 1 | 9.E-01 | |
| A10 | BrSF0958 | 4.9 | 47 | 50 | 82 | 0 | 0 | 0 | 5.E-01 | |
| A10 | Na10E08 | 10.6 | 38 | 42 | 62 | 0 | 0 | 37 | 3.E-01 | |
| A10 | BrSF0436b | 10.6 | 0 | 19 | 0 | 0 | 70 | 90 | 4.E-01 | |
| A10 | sS2066 | 25.4 | 49 | 53 | 76 | 0 | 0 | 1 | 1.E-01 | |
| A10 | BoSF0652 | 26.2 | 49 | 0 | 0 | 127 | 0 | 3 | 4.E-01 | |
| A10 | BrSF0287 | 26.8 | 0 | 54 | 0 | 0 | 125 | 0 | 1.E-01 | |
| A10 | niab140 | 26.8 | 0 | 52 | 0 | 0 | 124 | 3 | 2.E-01 | |
| A10 | sR12384 | 30.3 | 0 | 52 | 0 | 0 | 126 | 1 | 2.E-01 | |
| A10 | BrSF0425a | 30.5 | 41 | 39 | 50 | 0 | 0 | 49 | 3.E-02 | |
| A10 | BrSF0283 | 33.6 | 51 | 0 | 0 | 127 | 0 | 1 | 3.E-01 | |
| A10 | niab122 | 36.0 | 51 | 55 | 73 | 0 | 0 | 0 | 4.E-02 | |
| A10 | BoSF0601 | 36.7 | 0 | 54 | 0 | 0 | 122 | 3 | 8.E-02 | |
| A10 | BrSF0415 | 37.3 | 0 | 56 | 0 | 0 | 123 | 0 | 5.E-02 | |
| A10 | niab103 | 44.1 | 48 | 47 | 83 | 0 | 0 | 1 | 7.E-01 | |
| A10 | BrGMS0536 | 44.9 | 40 | 42 | 74 | 0 | 0 | 23 | 8.E-01 | |
| A10 | sN8502 | 47.2 | 23 | 23 | 42 | 0 | 0 | 91 | 9.E-01 | |
| A10 | BoSF1808 | 48.5 | 46 | 48 | 75 | 0 | 0 | 10 | 3.E-01 | |
| C01 | BrSF0279 | 0.0 | 0 | 46 | 0 | 0 | 133 | 0 | 8.E-01 | |
| C01 | BoSF2670 | 4.6 | 43 | 40 | 95 | 0 | 0 | 1 | 6.E-01 | |
| C01 | BoSF0224a | 7.3 | 44 | 46 | 88 | 0 | 0 | 1 | 1.E+00 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| C01 | CB10587 | 11.1 | 43 | 44 | 84 | 0 | 0 | 8 | 1.E+00 | |
| C01 | CNU139c | 15.1 | 44 | 0 | 0 | 133 | 0 | 2 | 1.E+00 | |
| C01 | BoSF1469 | 18.2 | 45 | 57 | 77 | 0 | 0 | 0 | 8.E-02 | |
| C01 | BnEMS1012 | 25.9 | 0 | 46 | 0 | 0 | 127 | 6 | 6.E-01 | |
| C01 | niab068 | 29.2 | 0 | 42 | 0 | 0 | 136 | 1 | 7.E-01 | |
| C01 | IGF2026c | 31.8 | 41 | 49 | 89 | 0 | 0 | 0 | 7.E-01 | |
| C01 | BoSF0678a | 32.0 | 40 | 49 | 90 | 0 | 0 | 0 | 6.E-01 | |
| C01 | CB10369b | 34.1 | 39 | 0 | 0 | 137 | 0 | 3 | 4.E-01 | |
| C01 | BoSF0442 | 34.4 | 42 | 45 | 89 | 0 | 0 | 3 | 9.E-01 | |
| C01 | BoSF1667 | 35.5 | 42 | 47 | 89 | 0 | 0 | 1 | 9.E-01 | |
| C01 | BoSF1998 | 35.7 | 39 | 0 | 0 | 138 | 0 | 2 | 4.E-01 | |
| C01 | BoGMS1565a | 41.4 | 37 | 42 | 94 | 0 | 0 | 6 | 5.E-01 | |
| C01 | BoSF2182 | 41.4 | 35 | 47 | 94 | 0 | 0 | 3 | 3.E-01 | |
| C01 | BoSF0130 | 48.1 | 31 | 44 | 102 | 0 | 0 | 2 | 5.E-02 | |
| C01 | BoSF0133 | 50.8 | 35 | 42 | 99 | 0 | 0 | 3 | 2.E-01 | |
| C01 | BoSF0114 | 59.7 | 0 | 25 | 0 | 0 | 154 | 0 | 7.E-04 | Zhongshuang11 |
| C01 | BrSF0811 | 65.1 | 0 | 45 | 0 | 0 | 133 | 1 | 9.E-01 | |
| C01 | BoSF2314 | 68.8 | 40 | 44 | 88 | 0 | 0 | 7 | 9.E-01 | |
| C01 | BrSF0705 | 70.8 | 42 | 0 | 0 | 133 | 0 | 4 | 8.E-01 | |
| C01 | BoSF2346 | 70.9 | 0 | 43 | 0 | 0 | 133 | 3 | 9.E-01 | |
| C01 | BoSF2538 | 73.3 | 39 | 0 | 0 | 128 | 0 | 12 | 6.E-01 | |
| C01 | BoSF0050b | 75.8 | 0 | 40 | 0 | 0 | 117 | 22 | 9.E-01 | |
| C01 | BoSF1372 | 76.8 | 41 | 44 | 93 | 0 | 0 | 1 | 8.E-01 | |
| C01 | BoSF2575 | 78.7 | 43 | 45 | 90 | 0 | 0 | 1 | 1.E+00 | |
| C01 | BoSF1270 | 85.0 | 35 | 39 | 105 | 0 | 0 | 0 | 6.E-02 | |
| C01 | ns258 | 91.3 | 58 | 0 | 0 | 121 | 0 | 0 | 2.E-02 | |
| C01 | ns059 | 94.1 | 0 | 52 | 0 | 0 | 127 | 0 | 2.E-01 | |
| C01 | ns262 | 94.5 | 48 | 0 | 0 | 131 | 0 | 0 | 6.E-01 | |
| C01 | BoSF1597 | 99.1 | 30 | 0 | 0 | 148 | 0 | 1 | 1.E-02 | |
| C01 | FITO283 | 99.5 | 30 | 0 | 0 | 147 | 0 | 2 | 1.E-02 | |
| C01 | BoSF2820 | 102.4 | 31 | 0 | 0 | 146 | 0 | 2 | 2.E-02 | |
| C02 | BoSF2071 | 0.0 | 0 | 58 | 0 | 0 | 120 | 1 | 2.E-02 | |
| C02 | BoSF1799 | 1.9 | 0 | 53 | 0 | 0 | 126 | 0 | 2.E-01 | |
| C02 | BoSF1425 | 2.4 | 0 | 53 | 0 | 0 | 125 | 1 | 1.E-01 | |
| C02 | BnGMS0081 | 2.8 | 0 | 46 | 0 | 0 | 121 | 12 | 4.E-01 | |
| C02 | BoSF1539 | 3.2 | 0 | 53 | 0 | 0 | 126 | 0 | 2.E-01 | |
| C02 | BoGMS0665 | 3.8 | 30 | 43 | 75 | 0 | 0 | 31 | 3.E-01 | |
| C02 | BoSF1017 | 4.5 | 0 | 52 | 0 | 0 | 127 | 0 | 2.E-01 | |
| C02 | BoSF0132 | 5.1 | 34 | 53 | 89 | 0 | 0 | 3 | 1.E-01 | |
| C02 | BoSF2604 | 5.5 | 35 | 53 | 83 | 0 | 0 | 8 | 1.E-01 | |
| C02 | BoSF1825 | 5.8 | 0 | 48 | 0 | 0 | 113 | 18 | 2.E-01 | |
| C02 | Ol11H09 | 5.9 | 40 | 54 | 82 | 0 | 0 | 3 | 2.E-01 | |
| C02 | BoSF1826 | 5.9 | 0 | 55 | 0 | 0 | 117 | 7 | 3.E-02 | |
| C02 | CNU461 | 19.4 | 39 | 43 | 96 | 0 | 0 | 1 | 5.E-01 | |
| C02 | BoSF1264 | 28.3 | 0 | 40 | 0 | 0 | 138 | 1 | 4.E-01 | |
| C02 | BrSF0065b | 30.1 | 44 | 42 | 91 | 0 | 0 | 2 | 9.E-01 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| C02 | niab124 | 31.2 | 0 | 40 | 0 | 0 | 139 | 0 | 4.E-01 | |
| C02 | BoSF2242 | 34.3 | 0 | 40 | 0 | 0 | 139 | 0 | 4.E-01 | |
| C02 | snap0674 | 36.2 | 0 | 40 | 0 | 0 | 138 | 1 | 4.E-01 | |
| C02 | snap0673 | 39.1 | 0 | 48 | 0 | 0 | 131 | 0 | 6.E-01 | |
| C02 | BoSF0033a | 41.4 | 44 | 30 | 98 | 0 | 0 | 7 | 6.E-02 | |
| C02 | BoSF2475 | 52.1 | 0 | 42 | 0 | 0 | 137 | 0 | 6.E-01 | |
| C02 | BoSF0880 | 57.4 | 45 | 0 | 0 | 134 | 0 | 0 | 1.E+00 | |
| C02 | BnEMS0959 | 57.9 | 43 | 35 | 98 | 0 | 0 | 3 | 2.E-01 | |
| C02 | CB10026 | 61.5 | 48 | 37 | 88 | 0 | 0 | 6 | 5.E-01 | |
| C02 | BoSF0096 | 64.6 | 51 | 37 | 88 | 0 | 0 | 3 | 3.E-01 | |
| C02 | BoSF0757 | 66.2 | 52 | 34 | 91 | 0 | 0 | 2 | 1.E-01 | |
| C02 | BoSF0525b | 66.6 | 54 | 0 | 0 | 125 | 0 | 0 | 1.E-01 | |
| C02 | BoSF1743 | 67.0 | 53 | 38 | 86 | 0 | 0 | 2 | 3.E-01 | |
| C02 | BoSF0284 | 74.9 | 48 | 34 | 95 | 0 | 0 | 2 | 2.E-01 | |
| C02 | BoSF1995a | 84.4 | 22 | 21 | 45 | 0 | 0 | 91 | 1.E+00 | |
| C02 | ns314 | 90.6 | 0 | 56 | 0 | 0 | 123 | 0 | 5.E-02 | |
| C02 | ns085 | 96.9 | 0 | 38 | 0 | 0 | 141 | 0 | 2.E-01 | |
| C02 | MD038 | 100.8 | 65 | 0 | 0 | 114 | 0 | 0 | 5.E-04 | Zhongshuang11 |
| C02 | BrSF0503 | 107.6 | 61 | 38 | 79 | 0 | 0 | 1 | 2.E-02 | |
| C02 | BoSF0310 | 110.0 | 57 | 0 | 0 | 120 | 0 | 2 | 3.E-02 | |
| C02 | BoGMS2128 | 111.2 | 46 | 28 | 73 | 0 | 0 | 32 | 1.E-01 | |
| C02 | BoSF1258 | 112.2 | 58 | 37 | 84 | 0 | 0 | 0 | 6.E-02 | |
| C02 | BoSF2269 | 113.7 | 56 | 32 | 82 | 0 | 0 | 9 | 3.E-02 | |
| C03 | BoSF2181 | 0.0 | 52 | 47 | 77 | 0 | 0 | 3 | 2.E-01 | |
| C03 | sR12137 | 4.5 | 54 | 42 | 83 | 0 | 0 | 0 | 3.E-01 | |
| C03 | BoSF1005 | 6.5 | 0 | 43 | 0 | 0 | 134 | 2 | 8.E-01 | |
| C03 | BoSF1977 | 7.5 | 0 | 48 | 0 | 0 | 130 | 1 | 5.E-01 | |
| C03 | BoGMS0707 | 8.5 | 50 | 38 | 73 | 0 | 0 | 18 | 2.E-01 | |
| C03 | BRMS006 | 8.9 | 0 | 41 | 0 | 0 | 131 | 7 | 7.E-01 | |
| C03 | BoSF1944 | 9.5 | 0 | 42 | 0 | 0 | 133 | 4 | 8.E-01 | |
| C03 | BoSF0421 | 9.7 | 0 | 42 | 0 | 0 | 131 | 6 | 8.E-01 | |
| C03 | niab077 | 9.9 | 0 | 46 | 0 | 0 | 132 | 1 | 8.E-01 | |
| C03 | BoSF2263 | 10.4 | 49 | 44 | 79 | 0 | 0 | 7 | 5.E-01 | |
| C03 | niab115b | 10.8 | 48 | 0 | 0 | 130 | 0 | 1 | 5.E-01 | |
| C03 | BoSF2861 | 12.4 | 52 | 0 | 0 | 126 | 0 | 1 | 2.E-01 | |
| C03 | BoSF1510 | 13.0 | 52 | 0 | 0 | 127 | 0 | 0 | 2.E-01 | |
| C03 | BoGMS0407 | 17.3 | 47 | 45 | 81 | 0 | 0 | 6 | 7.E-01 | |
| C03 | BoSF0371 | 18.8 | 0 | 46 | 0 | 0 | 131 | 2 | 8.E-01 | |
| C03 | BoSF1970 | 25.5 | 58 | 41 | 76 | 0 | 0 | 4 | 4.E-02 | |
| C03 | BoSF2392b | 30.5 | 0 | 53 | 0 | 0 | 123 | 3 | 1.E-01 | |
| C03 | BoSF2006 | 32.0 | 46 | 49 | 79 | 0 | 0 | 5 | 5.E-01 | |
| C03 | BoSF2005 | 32.2 | 0 | 48 | 0 | 0 | 128 | 3 | 5.E-01 | |
| C03 | BoGMS0678 | 34.8 | 49 | 50 | 77 | 0 | 0 | 3 | 3.E-01 | |
| C03 | BnID035a | 35.8 | 47 | 0 | 0 | 127 | 0 | 5 | 5.E-01 | |
| C03 | FITO218 | 38.8 | 0 | 45 | 0 | 0 | 133 | 1 | 9.E-01 | |
| C03 | BoSF0466 | 39.3 | 45 | 45 | 86 | 0 | 0 | 3 | 1.E+00 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| C03 | BrBAC087b | 42.2 | 49 | 47 | 82 | 0 | 0 | 1 | 6.E-01 | |
| C03 | BoSF2132 | 42.8 | 47 | 45 | 86 | 0 | 0 | 1 | 9.E-01 | |
| C03 | BrSF0845b | 43.3 | 49 | 0 | 0 | 128 | 0 | 2 | 4.E-01 | |
| C03 | BN12A | 43.3 | 0 | 45 | 0 | 0 | 130 | 4 | 8.E-01 | |
| C03 | CB10569 | 43.7 | 46 | 0 | 0 | 131 | 0 | 2 | 8.E-01 | |
| C03 | BoSF0805 | 44.7 | 44 | 45 | 87 | 0 | 0 | 3 | 1.E+00 | |
| C03 | CB10235 | 48.4 | 42 | 41 | 83 | 0 | 0 | 13 | 1.E+00 | |
| C03 | BoSF2258 | 49.5 | 44 | 0 | 0 | 131 | 0 | 4 | 1.E+00 | |
| C03 | BoSF2284 | 51.2 | 40 | 47 | 90 | 0 | 0 | 2 | 7.E-01 | |
| C03 | BrSF0299 | 54.7 | 47 | 0 | 0 | 121 | 0 | 11 | 4.E-01 | |
| C03 | ns027b | 56.1 | 41 | 47 | 85 | 0 | 0 | 6 | 8.E-01 | |
| C03 | Na12E02b | 56.6 | 0 | 51 | 0 | 0 | 126 | 2 | 2.E-01 | |
| C03 | BoSF0670 | 58.1 | 39 | 48 | 86 | 0 | 0 | 6 | 6.E-01 | |
| C03 | Ol10E05 | 59.7 | 37 | 50 | 80 | 0 | 0 | 12 | 3.E-01 | |
| C03 | BoSF1271b | 61.4 | 38 | 57 | 84 | 0 | 0 | 0 | 9.E-02 | |
| C03 | BoSF1276 | 63.8 | 36 | 58 | 82 | 0 | 0 | 3 | 4.E-02 | |
| C03 | BoSF0840 | 66.1 | 36 | 56 | 78 | 0 | 0 | 9 | 5.E-02 | |
| C03 | snap0622 | 67.0 | 40 | 0 | 0 | 139 | 0 | 0 | 4.E-01 | |
| C03 | BoSF0160 | 73.2 | 36 | 49 | 93 | 0 | 0 | 1 | 3.E-01 | |
| C03 | BoSF0402 | 74.1 | 0 | 50 | 0 | 0 | 128 | 1 | 3.E-01 | |
| C03 | BoSF1911 | 74.8 | 34 | 0 | 0 | 145 | 0 | 0 | 6.E-02 | |
| C03 | BoSF2669 | 75.6 | 34 | 45 | 92 | 0 | 0 | 8 | 3.E-01 | |
| C03 | BoSF0883 | 76.8 | 36 | 50 | 92 | 0 | 0 | 1 | 3.E-01 | |
| C03 | Na12G05 | 78.0 | 0 | 61 | 0 | 0 | 115 | 3 | 3.E-03 | |
| C03 | BrGMS2766 | 79.3 | 35 | 40 | 77 | 0 | 0 | 27 | 8.E-01 | |
| C03 | CB10057 | 81.3 | 34 | 39 | 90 | 0 | 0 | 16 | 4.E-01 | |
| C03 | BoGMS0369 | 82.6 | 0 | 43 | 0 | 0 | 119 | 17 | 7.E-01 | |
| C03 | snap0260 | 84.8 | 0 | 60 | 0 | 0 | 119 | 0 | 8.E-03 | |
| C03 | BoSF2281 | 92.1 | 0 | 46 | 0 | 0 | 129 | 4 | 7.E-01 | |
| C03 | Na10E02 | 93.4 | 0 | 47 | 0 | 0 | 127 | 5 | 5.E-01 | |
| C03 | BoSF2723a | 97.1 | 47 | 41 | 82 | 0 | 0 | 9 | 7.E-01 | |
| C03 | BoSF0711b | 104.8 | 41 | 40 | 90 | 0 | 0 | 8 | 8.E-01 | |
| C03 | BoSF2510 | 107.2 | 44 | 41 | 92 | 0 | 0 | 2 | 8.E-01 | |
| C03 | BoSF2509 | 108.7 | 42 | 0 | 0 | 135 | 0 | 2 | 7.E-01 | |
| C03 | BoSF2754 | 109.4 | 43 | 41 | 95 | 0 | 0 | 0 | 7.E-01 | |
| C03 | CALSSR | 109.4 | 40 | 0 | 0 | 131 | 0 | 8 | 6.E-01 | |
| C03 | BoSF2233 | 109.4 | 43 | 40 | 95 | 0 | 0 | 1 | 6.E-01 | |
| C03 | BoSF2821 | 109.6 | 44 | 40 | 94 | 0 | 0 | 1 | 7.E-01 | |
| C03 | BoSF0176 | 110.5 | 0 | 40 | 0 | 0 | 137 | 2 | 5.E-01 | |
| C03 | BoGMS0819 | 112.1 | 41 | 40 | 86 | 0 | 0 | 12 | 9.E-01 | |
| C03 | BoSF0926a | 113.7 | 45 | 0 | 0 | 133 | 0 | 1 | 9.E-01 | |
| C03 | BrSF0193 | 116.3 | 41 | 0 | 0 | 137 | 0 | 1 | 5.E-01 | |
| C03 | BRAS068 | 120.9 | 43 | 42 | 92 | 0 | 0 | 2 | 9.E-01 | |
| C03 | Ol13C12 | 121.8 | 38 | 43 | 89 | 0 | 0 | 9 | 7.E-01 | |
| C03 | MR049 | 123.3 | 43 | 43 | 92 | 0 | 0 | 1 | 9.E-01 | |
| C03 | BoSF0960 | 130.2 | 0 | 38 | 0 | 0 | 138 | 3 | 3.E-01 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| C03 | snap0833 | 134.0 | 0 | 40 | 0 | 0 | 135 | 4 | 5.E-01 |  |
| C03 | BoSF2513 | 135.7 | 0 | 14 | 0 | 0 | 76 | 89 | 4.E-02 |  |
| C03 | BrSF0869 | 138.8 | 0 | 34 | 0 | 0 | 138 | 7 | 1.E-01 |  |
| C03 | BoSF1650 | 140.4 | 0 | 39 | 0 | 0 | 140 | 0 | 3.E-01 |  |
| C03 | BoSF1136 | 144.4 | 0 | 42 | 0 | 0 | 137 | 0 | 6.E-01 |  |
| C03 | BrSF0214 | 148.7 | 37 | 0 | 0 | 142 | 0 | 0 | 2.E-01 |  |
| C04 | snap1060 | 0.0 | 59 | 0 | 0 | 120 | 0 | 0 | 1.E-02 |  |
| C04 | BoSF1319 | 6.0 | 46 | 47 | 85 | 0 | 0 | 1 | 8.E-01 |  |
| C04 | BrSF0313 | 9.8 | 40 | 0 | 0 | 132 | 0 | 7 | 6.E-01 |  |
| C04 | BoSF2273 | 15.3 | 45 | 48 | 84 | 0 | 0 | 2 | 8.E-01 |  |
| C04 | BoSF0349 | 17.2 | 49 | 48 | 81 | 0 | 0 | 1 | 5.E-01 |  |
| C04 | BoSF1492 | 17.6 | 47 | 48 | 80 | 0 | 0 | 4 | 5.E-01 |  |
| C04 | CNU286 | 20.7 | 43 | 0 | 0 | 135 | 0 | 1 | 8.E-01 |  |
| C04 | BoSF0643 | 20.7 | 42 | 0 | 0 | 133 | 0 | 4 | 8.E-01 |  |
| C04 | FITO366 | 21.3 | 42 | 0 | 0 | 137 | 0 | 0 | 6.E-01 |  |
| C04 | BoSF0016 | 21.9 | 41 | 45 | 91 | 0 | 0 | 2 | 9.E-01 |  |
| C04 | BoGMS1219 | 23.4 | 41 | 39 | 91 | 0 | 0 | 8 | 7.E-01 |  |
| C04 | BoSF1271a | 24.6 | 38 | 48 | 90 | 0 | 0 | 3 | 5.E-01 |  |
| C04 | BoSF0318 | 25.6 | 36 | 48 | 94 | 0 | 0 | 1 | 3.E-01 |  |
| C04 | BnEMS0038 | 28.3 | 32 | 41 | 75 | 0 | 0 | 31 | 6.E-01 |  |
| C04 | BoSF1722 | 29.6 | 40 | 0 | 0 | 138 | 0 | 1 | 4.E-01 |  |
| C04 | niab002 | 30.3 | 38 | 0 | 0 | 141 | 0 | 0 | 2.E-01 |  |
| C04 | snap0205 | 40.5 | 0 | 53 | 0 | 0 | 126 | 0 | 2.E-01 |  |
| C04 | snap1299 | 42.5 | 50 | 0 | 0 | 127 | 0 | 2 | 3.E-01 |  |
| C04 | snap1891 | 45.0 | 33 | 0 | 0 | 146 | 0 | 0 | 4.E-02 |  |
| C04 | BoSF2018 | 45.8 | 38 | 56 | 82 | 0 | 0 | 3 | 1.E-01 |  |
| C04 | MR119 | 47.5 | 38 | 53 | 85 | 0 | 0 | 3 | 3.E-01 |  |
| C04 | BoSF2723b | 47.9 | 0 | 52 | 0 | 0 | 123 | 4 | 1.E-01 |  |
| C04 | BoSF2106 | 52.3 | 37 | 42 | 99 | 0 | 0 | 1 | 3.E-01 |  |
| C04 | BoSF2884 | 53.6 | 38 | 0 | 0 | 139 | 0 | 2 | 3.E-01 |  |
| C04 | BoSF0952a | 53.8 | 41 | 0 | 0 | 138 | 0 | 0 | 5.E-01 |  |
| C04 | BoSF1336 | 54.1 | 0 | 40 | 0 | 0 | 137 | 2 | 5.E-01 |  |
| C04 | BoSF0997 | 54.8 | 37 | 44 | 91 | 0 | 0 | 7 | 6.E-01 |  |
| C04 | CB10428 | 54.9 | 0 | 45 | 0 | 0 | 134 | 0 | 1.E+00 |  |
| C04 | BoSF0552 | 55.4 | 39 | 0 | 0 | 138 | 0 | 2 | 4.E-01 |  |
| C04 | BoSF2040 | 55.6 | 38 | 43 | 98 | 0 | 0 | 0 | 4.E-01 |  |
| C04 | BoSF1852 | 55.8 | 0 | 40 | 0 | 0 | 139 | 0 | 4.E-01 |  |
| C04 | BoSF2062 | 56.0 | 0 | 39 | 0 | 0 | 133 | 7 | 5.E-01 |  |
| C04 | IFLP013 | 56.1 | 0 | 16 | 0 | 0 | 74 | 89 | 1.E-01 |  |
| C04 | BoSF0718 | 56.2 | 39 | 42 | 94 | 0 | 0 | 4 | 6.E-01 |  |
| C04 | BoSF0600 | 56.2 | 0 | 42 | 0 | 0 | 134 | 3 | 7.E-01 |  |
| C04 | BoSF1843 | 56.2 | 0 | 42 | 0 | 0 | 135 | 2 | 7.E-01 |  |
| C04 | BoSF0592 | 56.3 | 37 | 42 | 96 | 0 | 0 | 4 | 4.E-01 |  |
| C04 | BrSF0552 | 56.7 | 0 | 36 | 0 | 0 | 136 | 7 | 2.E-01 |  |
| C04 | BoSF0949 | 56.7 | 38 | 0 | 0 | 141 | 0 | 0 | 2.E-01 |  |
| C04 | BoSF1121 | 56.9 | 39 | 40 | 97 | 0 | 0 | 3 | 4.E-01 |  |

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|---|---|---|---|---|---|---|---|---|---|---|
| C04 | BoSF0943 | 57.3 | 38 | 0 | 0 | 139 | 0 | 2 | 3.E-01 | |
| C04 | BoGMS2091 | 58.2 | 37 | 39 | 93 | 0 | 0 | 10 | 4.E-01 | |
| C04 | BRAS061 | 59.0 | 0 | 41 | 0 | 0 | 137 | 1 | 5.E-01 | |
| C04 | BoSF1692 | 62.2 | 36 | 42 | 99 | 0 | 0 | 2 | 2.E-01 | |
| C04 | BoSF2872 | 69.5 | 36 | 50 | 91 | 0 | 0 | 2 | 3.E-01 | |
| C04 | BoSF0495 | 69.8 | 0 | 49 | 0 | 0 | 128 | 2 | 4.E-01 | |
| C04 | BoSF0935 | 70.2 | 0 | 49 | 0 | 0 | 128 | 2 | 4.E-01 | |
| C04 | sN464 | 70.5 | 0 | 48 | 0 | 0 | 131 | 0 | 6.E-01 | |
| C04 | BoGMS1031 | 71.0 | 34 | 42 | 84 | 0 | 0 | 19 | 5.E-01 | |
| C04 | BoSF0613 | 71.7 | 0 | 53 | 0 | 0 | 125 | 1 | 1.E-01 | |
| C04 | ns104 | 73.8 | 0 | 52 | 0 | 0 | 125 | 2 | 2.E-01 | |
| C04 | BoGMS0282 | 76.8 | 35 | 44 | 80 | 0 | 0 | 20 | 6.E-01 | |
| C04 | snap0299 | 80.2 | 0 | 63 | 0 | 0 | 115 | 1 | 1.E-03 | |
| C04 | BoSF2508 | 81.9 | 31 | 53 | 92 | 0 | 0 | 3 | 5.E-02 | |
| C04 | BoSF2294 | 84.4 | 0 | 47 | 0 | 0 | 128 | 4 | 6.E-01 | |
| C04 | BoSF0955 | 84.7 | 37 | 0 | 0 | 142 | 0 | 0 | 2.E-01 | |
| C04 | BoSF2666 | 86.3 | 32 | 52 | 92 | 0 | 0 | 3 | 9.E-02 | |
| C04 | ns123 | 89.8 | 0 | 55 | 0 | 0 | 124 | 0 | 8.E-02 | |
| C04 | ns120 | 91.9 | 0 | 58 | 0 | 0 | 120 | 1 | 2.E-02 | |
| C04 | ns126 | 94.8 | 0 | 54 | 0 | 0 | 125 | 0 | 1.E-01 | |
| C04 | BnGMS0160b | 105.1 | 0 | 47 | 0 | 0 | 113 | 19 | 2.E-01 | |
| C04 | snap1360 | 110.4 | 0 | 53 | 0 | 0 | 122 | 4 | 1.E-01 | |
| C04 | BoSF2838 | 110.6 | 32 | 48 | 94 | 0 | 0 | 5 | 1.E-01 | |
| C04 | Ol11H02 | 113.0 | 30 | 50 | 94 | 0 | 0 | 5 | 6.E-02 | |
| C04 | MR155 | 116.7 | 31 | 53 | 92 | 0 | 0 | 3 | 5.E-02 | |
| C04 | BoSF1009 | 118.9 | 36 | 51 | 90 | 0 | 0 | 2 | 3.E-01 | |
| C04 | BoSF1937 | 123.4 | 0 | 59 | 0 | 0 | 120 | 0 | 1.E-02 | |
| C05 | BnEMS1131 | 0.0 | 44 | 43 | 90 | 0 | 0 | 2 | 1.E+00 | |
| C05 | sORH13 | 5.4 | 46 | 43 | 87 | 0 | 0 | 3 | 9.E-01 | |
| C05 | BoSF2552 | 8.6 | 42 | 0 | 0 | 134 | 0 | 3 | 7.E-01 | |
| C05 | BoSF0017 | 10.3 | 45 | 40 | 89 | 0 | 0 | 5 | 8.E-01 | |
| C05 | BoSF2607 | 11.8 | 40 | 0 | 0 | 118 | 0 | 21 | 9.E-01 | |
| C05 | BoSF1212a | 13.1 | 28 | 25 | 36 | 0 | 0 | 90 | 2.E-01 | |
| C05 | BoSF2676 | 24.2 | 46 | 40 | 89 | 0 | 0 | 4 | 8.E-01 | |
| C05 | BoGMS2688 | 26.7 | 42 | 32 | 85 | 0 | 0 | 20 | 4.E-01 | |
| C05 | BoSF1663 | 30.7 | 43 | 0 | 0 | 132 | 0 | 4 | 9.E-01 | |
| C05 | BoSF0022b | 32.0 | 43 | 39 | 96 | 0 | 0 | 1 | 5.E-01 | |
| C05 | CB10374 | 39.3 | 46 | 0 | 0 | 128 | 0 | 5 | 7.E-01 | |
| C05 | BoSF0230 | 43.7 | 0 | 35 | 0 | 0 | 144 | 0 | 9.E-02 | |
| C05 | Na12C01 | 50.4 | 53 | 33 | 87 | 0 | 0 | 6 | 1.E-01 | |
| C05 | BrSF0858a | 50.8 | 51 | 0 | 0 | 118 | 0 | 10 | 1.E-01 | |
| C05 | BoSF1969 | 52.0 | 54 | 33 | 91 | 0 | 0 | 1 | 8.E-02 | |
| C05 | BoSF2019 | 52.5 | 54 | 33 | 88 | 0 | 0 | 4 | 8.E-02 | |
| C05 | ns033 | 57.3 | 0 | 37 | 0 | 0 | 142 | 0 | 2.E-01 | |
| C05 | BoSF1918 | 58.3 | 51 | 0 | 0 | 128 | 0 | 0 | 3.E-01 | |
| C05 | BoSF0222 | 58.5 | 0 | 36 | 0 | 0 | 140 | 3 | 2.E-01 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| C05 | sS2129 | 59.2 | 52 | 37 | 87 | 0 | 0 | 3 | 3.E-01 | |
| C05 | Na10D11 | 59.7 | 49 | 33 | 82 | 0 | 0 | 15 | 2.E-01 | |
| C05 | sS2131 | 60.0 | 54 | 38 | 86 | 0 | 0 | 1 | 2.E-01 | |
| C05 | CB10170 | 61.0 | 54 | 37 | 87 | 0 | 0 | 1 | 2.E-01 | |
| C05 | BrSF0040 | 65.6 | 52 | 35 | 90 | 0 | 0 | 2 | 2.E-01 | |
| C05 | BoSF0926b | 66.6 | 0 | 35 | 0 | 0 | 143 | 1 | 1.E-01 | |
| C05 | BRAS040 | 67.3 | 51 | 36 | 87 | 0 | 0 | 5 | 3.E-01 | |
| C06 | ns337 | 0.0 | 42 | 0 | 0 | 137 | 0 | 0 | 6.E-01 | |
| C06 | ns326 | 7.0 | 42 | 0 | 0 | 137 | 0 | 0 | 6.E-01 | |
| C06 | BoSF0455b | 16.0 | 42 | 0 | 0 | 133 | 0 | 4 | 8.E-01 | |
| C06 | BoSF0733 | 16.0 | 0 | 45 | 0 | 0 | 132 | 2 | 9.E-01 | |
| C06 | BoSF1665 | 16.5 | 13 | 27 | 46 | 0 | 0 | 93 | 8.E-02 | |
| C06 | BoSF2316 | 17.7 | 44 | 0 | 0 | 135 | 0 | 0 | 9.E-01 | |
| C06 | snap0695b | 30.3 | 47 | 0 | 0 | 124 | 0 | 8 | 5.E-01 | |
| C06 | BoSF0513 | 35.1 | 45 | 0 | 0 | 133 | 0 | 1 | 9.E-01 | |
| C06 | BoSF2395 | 35.6 | 44 | 0 | 0 | 135 | 0 | 0 | 9.E-01 | |
| C06 | BoSF1365 | 38.1 | 43 | 0 | 0 | 135 | 0 | 1 | 8.E-01 | |
| C06 | snap1395 | 41.8 | 46 | 0 | 0 | 128 | 0 | 5 | 7.E-01 | |
| C06 | Na12E01b | 42.8 | 0 | 30 | 0 | 0 | 145 | 4 | 2.E-02 | |
| C06 | snap1392 | 45.6 | 42 | 0 | 0 | 136 | 0 | 1 | 7.E-01 | |
| C06 | BoSF0952b | 48.7 | 56 | 0 | 0 | 114 | 0 | 9 | 2.E-02 | |
| C06 | MR133.1 | 50.2 | 0 | 31 | 0 | 0 | 143 | 5 | 3.E-02 | |
| C06 | BrSF0784 | 51.5 | 0 | 32 | 0 | 0 | 146 | 1 | 3.E-02 | |
| C06 | BoSF2507 | 52.6 | 45 | 32 | 94 | 0 | 0 | 8 | 2.E-01 | |
| C06 | BoSF1254 | 53.2 | 44 | 0 | 0 | 135 | 0 | 0 | 9.E-01 | |
| C06 | BoSF2506 | 54.5 | 44 | 39 | 91 | 0 | 0 | 5 | 7.E-01 | |
| C06 | BoSF0760 | 55.8 | 43 | 0 | 0 | 133 | 0 | 3 | 9.E-01 | |
| C06 | BoSF1126 | 60.0 | 0 | 36 | 0 | 0 | 142 | 1 | 1.E-01 | |
| C06 | BoSF2591 | 62.1 | 48 | 0 | 0 | 130 | 0 | 1 | 5.E-01 | |
| C06 | sR12387 | 76.0 | 37 | 0 | 0 | 134 | 0 | 8 | 3.E-01 | |
| C06 | BoSF1406 | 76.3 | 18 | 0 | 0 | 71 | 0 | 90 | 3.E-01 | |
| C06 | BoSF1144 | 76.9 | 39 | 46 | 94 | 0 | 0 | 0 | 6.E-01 | |
| C06 | BoSF1468 | 77.7 | 38 | 48 | 93 | 0 | 0 | 0 | 5.E-01 | |
| C06 | BoSF1951 | 82.6 | 0 | 46 | 0 | 0 | 132 | 1 | 8.E-01 | |
| C06 | BnEMS0350 | 85.1 | 0 | 49 | 0 | 0 | 124 | 6 | 3.E-01 | |
| C06 | CNU331a | 93.7 | 40 | 0 | 0 | 128 | 0 | 11 | 7.E-01 | |
| C06 | Na10C06 | 99.6 | 48 | 0 | 0 | 131 | 0 | 0 | 6.E-01 | |
| C06 | ns347 | 109.7 | 0 | 56 | 0 | 0 | 123 | 0 | 5.E-02 | |
| C07 | CB10534 | 0.0 | 42 | 44 | 93 | 0 | 0 | 0 | 9.E-01 | |
| C07 | BoSF0778 | 8.2 | 40 | 37 | 101 | 0 | 0 | 1 | 2.E-01 | |
| C07 | BoSF2740 | 10.5 | 37 | 39 | 102 | 0 | 0 | 1 | 1.E-01 | |
| C07 | BoSF2771 | 11.9 | 36 | 37 | 103 | 0 | 0 | 3 | 8.E-02 | |
| C07 | BoSF1559 | 14.6 | 0 | 39 | 0 | 0 | 140 | 0 | 3.E-01 | |
| C07 | BoSF1324 | 18.4 | 0 | 44 | 0 | 0 | 135 | 0 | 9.E-01 | |
| C07 | BoSF0783b | 20.3 | 22 | 17 | 50 | 0 | 0 | 90 | 4.E-01 | |
| C07 | BrSF46-176b | 32.1 | 0 | 37 | 0 | 0 | 125 | 17 | 5.E-01 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| C08 | ns067 | 0.0 | 0 | 60 | 0 | 0 | 117 | 2 | 6.E-03 | |
| C08 | BoGMS1419 | 10.8 | 38 | 48 | 86 | 0 | 0 | 7 | 6.E-01 | |
| C08 | BoSF0521 | 13.6 | 35 | 40 | 101 | 0 | 0 | 3 | 1.E-01 | |
| C08 | BoSF0586a | 16.9 | 34 | 51 | 93 | 0 | 0 | 1 | 2.E-01 | |
| C08 | BoGMS0456 | 17.5 | 34 | 44 | 81 | 0 | 0 | 20 | 5.E-01 | |
| C08 | BoSF2274 | 18.8 | 34 | 50 | 94 | 0 | 0 | 1 | 2.E-01 | |
| C08 | BoSF2646 | 19.4 | 33 | 49 | 93 | 0 | 0 | 4 | 2.E-01 | |
| C08 | CB10053 | 19.9 | 35 | 49 | 95 | 0 | 0 | 0 | 2.E-01 | |
| C08 | BoSF1481 | 20.4 | 0 | 46 | 0 | 0 | 130 | 3 | 7.E-01 | |
| C08 | BoSF0554 | 21.8 | 0 | 47 | 0 | 0 | 127 | 5 | 5.E-01 | |
| C08 | BoSF2163 | 26.7 | 0 | 51 | 0 | 0 | 128 | 0 | 3.E-01 | |
| C08 | BoSF2482 | 31.5 | 0 | 50 | 0 | 0 | 129 | 0 | 4.E-01 | |
| C08 | BnGMS0509 | 32.8 | 30 | 53 | 86 | 0 | 0 | 10 | 4.E-02 | |
| C08 | snap1382 | 36.2 | 0 | 62 | 0 | 0 | 117 | 0 | 3.E-03 | |
| C08 | BoSF2378 | 37.2 | 0 | 47 | 0 | 0 | 130 | 2 | 6.E-01 | |
| C08 | BoSF0023 | 38.5 | 33 | 48 | 97 | 0 | 0 | 1 | 1.E-01 | |
| C08 | BoSF2290 | 43.5 | 29 | 47 | 97 | 0 | 0 | 6 | 4.E-02 | |
| C08 | BnEMS0020 | 53.4 | 36 | 37 | 90 | 0 | 0 | 16 | 4.E-01 | |
| C08 | BoSF1926 | 56.8 | 32 | 44 | 102 | 0 | 0 | 1 | 7.E-02 | |
| C08 | BoSF2347 | 66.2 | 33 | 48 | 93 | 0 | 0 | 5 | 2.E-01 | |
| C08 | BoSF2751 | 67.9 | 34 | 42 | 96 | 0 | 0 | 7 | 2.E-01 | |
| C08 | BoSF2616 | 73.4 | 40 | 47 | 92 | 0 | 0 | 0 | 7.E-01 | |
| C08 | BoSF1222 | 74.8 | 41 | 46 | 92 | 0 | 0 | 0 | 8.E-01 | |
| C08 | BnSF287-186 | 80.6 | 34 | 55 | 80 | 0 | 0 | 10 | 6.E-02 | |
| C08 | niab129 | 81.5 | 37 | 51 | 86 | 0 | 0 | 5 | 3.E-01 | |
| C08 | BrSF0356 | 82.7 | 39 | 50 | 90 | 0 | 0 | 0 | 5.E-01 | |
| C08 | BrGMS0447 | 82.7 | 36 | 45 | 95 | 0 | 0 | 3 | 4.E-01 | |
| C08 | CB10179 | 85.3 | 41 | 50 | 84 | 0 | 0 | 4 | 5.E-01 | |
| C08 | IFLP021 | 92.1 | 32 | 52 | 95 | 0 | 0 | 0 | 8.E-02 | |
| C08 | BoSF0365 | 93.8 | 36 | 49 | 92 | 0 | 0 | 2 | 3.E-01 | |
| C08 | BnEMS1070 | 95.3 | 29 | 49 | 91 | 0 | 0 | 10 | 6.E-02 | |
| C08 | BoSF1064 | 98.2 | 31 | 47 | 98 | 0 | 0 | 3 | 7.E-02 | |
| C08 | BoSF0448 | 98.5 | 0 | 48 | 0 | 0 | 130 | 1 | 5.E-01 | |
| C08 | BoSF2073 | 101.0 | 33 | 44 | 101 | 0 | 0 | 1 | 1.E-01 | |
| C08 | BnEMS0606 | 103.8 | 29 | 45 | 92 | 0 | 0 | 13 | 8.E-02 | |
| C08 | sR5795 | 105.8 | 31 | 51 | 96 | 0 | 0 | 1 | 6.E-02 | |
| C08 | BoSF1920b | 107.2 | 0 | 55 | 0 | 0 | 123 | 1 | 7.E-02 | |
| C08 | BN26A | 107.2 | 33 | 0 | 0 | 144 | 0 | 2 | 5.E-02 | |
| C08 | BrSF0549a | 108.0 | 0 | 51 | 0 | 0 | 127 | 1 | 3.E-01 | |
| C08 | CB10092 | 111.9 | 28 | 53 | 97 | 0 | 0 | 1 | 1.E-02 | |
| C08 | CB10028 | 112.2 | 25 | 52 | 99 | 0 | 0 | 3 | 4.E-03 | |
| C08 | BrSF53-712 | 115.6 | 0 | 52 | 0 | 0 | 121 | 6 | 1.E-01 | |
| C09 | BoSF0980 | 0.0 | 52 | 48 | 72 | 0 | 0 | 7 | 9.E-02 | |
| C09 | BoSF0336b | 3.4 | 46 | 43 | 68 | 0 | 0 | 22 | 2.E-01 | |
| C09 | BrSF54-590 | 4.6 | 50 | 0 | 0 | 97 | 0 | 32 | 1.E-02 | |
| C09 | BoSF2578 | 5.8 | 0 | 48 | 0 | 0 | 131 | 0 | 6.E-01 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| C09 | BoSF0948 | 8.8 | 0 | 51 | 0 | 0 | 125 | 3 | 2.E-01 |  |
| C09 | BnGMS0213 | 9.8 | 54 | 47 | 78 | 0 | 0 | 0 | 2.E-01 |  |
| C09 | BoSF2398 | 11.2 | 56 | 45 | 69 | 0 | 0 | 9 | 2.E-02 |  |
| C09 | BoSF1228 | 12.5 | 51 | 47 | 80 | 0 | 0 | 1 | 4.E-01 |  |
| C09 | BoSF1976 | 12.9 | 53 | 49 | 77 | 0 | 0 | 0 | 2.E-01 |  |
| C09 | BoSF2748 | 13.6 | 0 | 45 | 0 | 0 | 122 | 12 | 6.E-01 |  |
| C09 | BoSF1872 | 14.0 | 51 | 49 | 77 | 0 | 0 | 2 | 2.E-01 |  |
| C09 | BoSF1810 | 15.9 | 52 | 47 | 79 | 0 | 0 | 1 | 3.E-01 |  |
| C09 | BrSF1008 | 16.8 | 49 | 0 | 0 | 130 | 0 | 0 | 5.E-01 |  |
| C09 | BoGMS1561 | 17.1 | 0 | 48 | 0 | 0 | 119 | 12 | 3.E-01 |  |
| C09 | BoSF1788 | 17.1 | 0 | 50 | 0 | 0 | 127 | 2 | 3.E-01 |  |
| C09 | BoSF1817 | 18.1 | 41 | 49 | 81 | 0 | 0 | 8 | 5.E-01 |  |
| C09 | BoGMS1453 | 20.5 | 40 | 44 | 75 | 0 | 0 | 20 | 7.E-01 |  |
| C09 | BoSF0040 | 20.5 | 43 | 50 | 85 | 0 | 0 | 1 | 6.E-01 |  |
| C09 | BoSF1647 | 22.4 | 0 | 45 | 0 | 0 | 131 | 3 | 9.E-01 |  |
| C09 | BoSF2393 | 22.8 | 39 | 45 | 80 | 0 | 0 | 15 | 8.E-01 |  |
| C09 | BoSF2774 | 23.6 | 46 | 0 | 0 | 127 | 0 | 6 | 6.E-01 |  |
| C09 | BrSF0436a | 24.1 | 45 | 49 | 85 | 0 | 0 | 0 | 7.E-01 |  |
| C09 | Ol12A04 | 38.4 | 0 | 42 | 0 | 0 | 115 | 22 | 6.E-01 |  |
| C09 | BoSF0185 | 39.7 | 48 | 48 | 71 | 0 | 0 | 12 | 2.E-01 |  |
| C09 | BrSF0425b | 41.2 | 42 | 45 | 82 | 0 | 0 | 10 | 9.E-01 |  |
| C09 | BoSF0483 | 44.2 | 43 | 48 | 88 | 0 | 0 | 0 | 8.E-01 |  |
| C09 | BrSF0369 | 45.7 | 41 | 0 | 0 | 137 | 0 | 1 | 5.E-01 |  |
| C09 | BoGMS1473 | 49.7 | 47 | 0 | 0 | 119 | 0 | 13 | 3.E-01 |  |

**Table S4** Identification of genomic arrangements between the pseudochromosomes of *B. napus* and *B. rapa* /*B. oleracea* through comparative mapping.

| Linkage_group | Marker_name | Genetic position (cM) | Physical position_*B.napus* (Mb) | Physical position_*B.rapa* /*B.oleracea* (Mb | Genomic rearrangement |
|---|---|---|---|---|---|
| A01 | niab097a | 6.137 | 0.638 | 1.041 | |
| A01 | BrGMS0081b | 0.000 | 0.798 | 1.201 | |
| A01 | BoSF2770 | 8.826 | 0.885 | 1.282 | |
| A01 | BnEMS0886 | 13.258 | 1.026 | 1.428 | |
| A01 | niab106 | 27.155 | 1.062 | 1.466 | |
| A01 | niab071 | 37.502 | 1.324 | 1.787 | |
| A01 | BrSF0019 | 43.442 | 1.360 | 1.824 | |
| A01 | CNU142c | 41.508 | 1.447 | 1.926 | |
| A01 | BoSF0224b | 44.260 | 1.537 | 2.037 | |
| A01 | CNU139a | 39.177 | 1.623 | 2.133 | |
| A01 | BoSF1331a | 46.816 | 2.452 | 0.083 | Translocation |
| A01 | BoSF0302 | 44.813 | 2.567 | 0.183 | Translocation |
| A01 | CB10081 | 50.398 | 2.700 | 0.324 | Translocation |
| A01 | BRMS037 | 50.398 | 2.700 | 0.324 | Translocation |
| A01 | niab113a | 51.996 | 2.743 | 0.367 | Translocation |
| A01 | BrSF0403 | 56.532 | | 2.952 | |
| A01 | BoSF2131 | 59.369 | 2.828 | 3.125 | |
| A01 | CB10099a | 69.142 | 3.903 | 4.226 | |
| A01 | BrSF0016 | 72.156 | 5.670 | 6.187 | |
| A01 | BrSF0446 | 82.652 | 8.537 | 9.917 | |
| A01 | CB10189 | 83.543 | 8.891 | 10.266 | |
| A01 | BoSF1659 | 91.434 | 9.995 | 11.205 | |
| A01 | BoSF0503 | 89.807 | 10.354 | 11.639 | |
| A01 | CNU132b | 89.807 | 10.354 | 11.639 | |
| A01 | Ra2G05 | 90.667 | 10.428 | 11.565 | |
| A01 | BoSF0764 | 87.526 | 14.715 | 16.385 | |
| A01 | BrSF0702 | 93.336 | 14.863 | 16.498 | |

| | | | | | |
|---|---|---|---|---|---|
| A01 | BrSF0703 | 94.070 | 15.559 | 16.658 | |
| A01 | SA63 | 93.813 | 15.648 | 16.747 | |
| A01 | BrSF0706 | 94.994 | | 17.373 | |
| A01 | BrSF0010 | 98.066 | 15.713 | 17.715 | |
| A01 | CNU068 | 98.066 | 15.713 | 17.715 | |
| A01 | BrSF0009 | 98.469 | 15.761 | 17.748 | |
| A01 | BoSF0050a | 99.589 | 16.498 | 19.182 | |
| A01 | BrSF0006 | 102.109 | 17.654 | 20.337 | |
| A01 | CNU397 | 103.201 | 17.654 | 20.338 | |
| A01 | BrSF1002 | 104.651 | 16.378 | 21.166 | |
| A01 | TFZIP23 | 105.810 | 18.273 | 22.862 | |
| A01 | sN3523 | 106.942 | 18.773 | 21.647 | |
| A01 | BrSF0982 | 113.857 | | 22.574 | |
| A01 | BoSF0911 | 119.126 | 21.557 | 26.906 | |
| A01 | BoSF2123 | 124.408 | | | |
| A01 | BrSF0973 | 125.451 | | | |
| A01 | Na14F11b | 126.504 | | 27.720 | |
| A01 | CNU388 | 123.510 | 22.720 | 27.924 | |
| A01 | CNU474 | 122.062 | 22.733 | 27.937 | |
| A01 | BrSF0949 | 128.788 | 22.744 | 27.946 | |
| A01 | BoSF0197 | 124.959 | 23.248 | 25.047 | |
| A01 | BoSF1939 | 124.130 | 23.811 | 25.609 | |
| A02 | niab025 | 0.000 | 0.124 | 1.257 | |
| A02 | sR94102 | 6.091 | 0.622 | 3.137 | |
| A02 | BoSF0239 | 12.750 | 1.390 | 3.994 | |
| A02 | BrGMS0511 | 11.109 | 1.567 | 4.171 | |
| A02 | BrSF0065a | 11.495 | 1.564 | 4.188 | |
| A02 | BoSF2549 | 5.653 | 1.661 | 4.285 | |
| A02 | BrSF0051 | 9.366 | 1.687 | 4.311 | |
| A02 | MR052 | 20.344 | 1.958 | 4.583 | |

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|---|---|---|---|---|---|
| A02 | BrSF0665 | 19.076 | 2.154 | 5.039 | |
| A02 | BRAS083 | 18.449 | 3.140 | 5.945 | |
| A02 | BrSF0062 | 23.627 | 3.258 | 6.062 | |
| A02 | BRAS037 | 22.352 | 3.512 | 6.335 | |
| A02 | BrSF0661 | 24.901 | 3.709 | 6.493 | |
| A02 | BoSF2224 | 27.243 | 3.773 | 6.555 | |
| A02 | sN3761 | 26.170 | 3.973 | 6.755 | |
| A02 | BrSF0663 | 27.955 | 3.976 | 6.757 | |
| A02 | sR6293 | 29.867 | 4.211 | 7.173 | |
| A02 | BrSF0045 | 30.517 | 4.294 | 7.256 | |
| A02 | BoSF0329 | 31.636 | 4.414 | 7.392 | |
| A02 | BrSF0049 | 38.209 | 4.815 | 7.834 | |
| A02 | BrSF0750 | 33.482 | 4.996 | 8.014 | |
| A02 | BrSF0053 | 33.958 | 5.187 | 8.205 | |
| A02 | BrSF0052 | 34.232 | 5.223 | 8.241 | |
| A02 | BrSF0754 | 34.611 | 5.576 | 8.626 | |
| A02 | BrSF0755 | 36.160 | 5.996 | 9.046 | |
| A02 | BrSF0031 | 43.056 | 7.043 | 10.197 | |
| A02 | BoSF1714 | 43.632 | 7.050 | 10.206 | |
| A02 | CNU046 | 41.949 | 7.105 | 10.253 | |
| A02 | BoSF2100 | 45.934 | 8.340 | 11.335 | |
| A02 | BrSF0056 | 47.796 | 8.621 | 11.912 | |
| A02 | BrSF0570 | 47.181 | 8.945 | 12.234 | |
| A02 | IFLP018 | 51.207 | 9.507 | | |
| A02 | BoSF0216 | 53.595 | 10.518 | 12.319 | |
| A02 | FITO255 | 55.186 | 10.709 | 12.511 | |
| A02 | BoSF0926c | 56.204 | 11.268 | 14.490 | |
| A02 | BrSF0680 | 58.123 | 11.097 | 14.653 | |
| A02 | BrSF0679 | 48.538 | 11.058 | 14.693 | |
| A02 | BrSF0682 | 52.142 | 12.574 | 16.347 | |

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|---|---|---|---|---|---|
| A02 | BoSF2657 | 60.739 | 14.049 | 16.838 |  |
| A02 | BrSF0032 | 61.277 | 14.270 | 17.090 |  |
| A02 | BrSF1044 | 60.560 | 14.523 | 17.142 |  |
| A02 | BrSF0695 | 61.096 | 14.661 | 17.233 |  |
| A02 | BrSF0696 | 60.908 | 14.799 | 17.372 |  |
| A02 | BrSF0836 | 61.383 | 16.482 |  |  |
| A02 | BrSF0472 | 61.298 | 17.422 | 18.321 |  |
| A02 | BoSF1924 | 58.519 | 17.659 | 18.558 |  |
| A02 | BnEMS0401 | 65.481 | 17.732 | 18.632 |  |
| A02 | CB10628 | 61.673 | 18.212 | 19.174 |  |
| A02 | BrSF0520 | 61.821 | 18.310 | 19.267 |  |
| A02 | BrSF0519 | 62.212 | 18.346 | 19.393 |  |
| A02 | BoSF2324 | 63.208 | 18.402 | 19.444 |  |
| A02 | BrSF0689 | 67.263 | 13.178 | 21.952 | Translocation |
| A02 | BoSF2214 | 79.579 | 22.380 | 24.248 |  |
| A02 | Na14B05 | 82.883 | 22.654 | 24.522 |  |
| A03 | niab115a | 0.000 | 0.882 | 1.050 |  |
| A03 | BrSF0427 | 15.601 | 1.430 | 1.597 |  |
| A03 | BoSF1704 | 6.235 | 1.487 | 1.880 |  |
| A03 | BrSF0029 | 18.587 | 2.218 | 2.665 |  |
| A03 | BrSF0422 | 12.803 | 3.052 | 3.500 |  |
| A03 | CB10036 | 16.469 | 3.618 | 4.065 |  |
| A03 | BoSF2852 | 17.061 | 3.665 | 4.140 |  |
| A03 | BrSF0350 | 16.072 | 3.703 | 4.165 |  |
| A03 | BrGMS0642 | 12.057 | 3.824 | 4.295 |  |
| A03 | BoSF2392a | 20.613 | 4.090 | 4.569 |  |
| A03 | TFZIP19 | 21.126 | 4.132 | 4.630 |  |
| A03 | BrSF0090 | 21.803 | 4.458 | 5.026 |  |
| A03 | KS50980 | 21.803 | 4.458 | 5.026 |  |
| A03 | BrSF0091 | 25.358 | 4.529 | 5.095 |  |

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|---|---|---|---|---|---|
| A03 | BrSF0089 | 24.215 | 4.550 | 5.119 | |
| A03 | sR6688a | 23.346 | 4.554 | 5.130 | |
| A03 | BoSF2807 | 26.810 | 5.379 | 5.966 | |
| A03 | BrSF0845a | 25.748 | 5.414 | 6.000 | |
| A03 | BoSF0546 | 28.826 | 5.453 | 6.036 | |
| A03 | BrSF0087a | 26.284 | 5.463 | 6.047 | |
| A03 | BoSF0560 | 30.901 | 5.881 | 6.465 | |
| A03 | IGF2134f2 | 33.461 | 6.342 | 7.056 | |
| A03 | BnEMS0894 | 32.160 | 6.496 | 7.221 | |
| A03 | BrSF0092 | 35.003 | 6.734 | 7.442 | |
| A03 | BoSF2277 | 40.535 | 7.084 | 7.791 | |
| A03 | BrSF0300 | 39.258 | 7.216 | 7.931 | |
| A03 | Na12E02a | 38.657 | 7.237 | 7.954 | |
| A03 | Ol11B05 | 38.724 | 7.304 | 8.020 | |
| A03 | BoSF0415b | 40.190 | 7.330 | 8.041 | |
| A03 | CNU253 | 36.982 | 7.367 | 8.074 | |
| A03 | CNU288 | 44.098 | 8.774 | 9.504 | |
| A03 | BoSF0664 | 45.234 | 8.994 | 9.763 | |
| A03 | BrSF0114 | 44.940 | | | |
| A03 | BoSF2744 | 48.097 | 9.708 | 10.529 | |
| A03 | BoSF2220 | 51.321 | 10.039 | 10.860 | |
| A03 | BoSF1709 | 50.759 | 10.175 | 11.057 | |
| A03 | BrSF0078 | 49.846 | 10.189 | 11.062 | |
| A03 | CNU466 | 48.903 | 10.435 | 11.321 | |
| A03 | BoSF2915 | 52.768 | 10.825 | 11.698 | |
| A03 | BoSF1715 | 55.365 | 11.303 | 12.186 | |
| A03 | CB10329 | 55.365 | 11.303 | 12.186 | |
| A03 | BrSF0295 | 55.903 | 11.411 | 12.336 | |
| A03 | BoSF1886 | 57.487 | 11.787 | 12.656 | |
| A03 | CNU098 | 62.056 | 13.536 | 14.358 | |

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|---|---|---|---|---|---|
| A03 | BoSF1678 | 62.056 | 13.536 | 14.358 | |
| A03 | CNU259 | 63.987 | 13.786 | 14.616 | |
| A03 | FITO285 | 66.467 | 14.178 | 15.062 | |
| A03 | BoSF1651 | 66.975 | 14.299 | 15.242 | |
| A03 | BrSF0102 | 68.405 | 14.556 | 15.495 | |
| A03 | Na14G10 | 70.646 | 14.776 | 15.716 | |
| A03 | Ol11G11 | 70.646 | 14.776 | 15.716 | |
| A03 | CNU422 | 69.766 | 14.828 | 15.756 | |
| A03 | sN11722 | 73.614 | 15.085 | 16.001 | |
| A03 | CB10114 | 73.614 | 15.085 | 16.001 | |
| A03 | BoSF0598 | 73.745 | 15.125 | 16.042 | |
| A03 | BoSF2828 | 76.066 | 15.430 | 16.303 | |
| A03 | BoSF1085 | 98.859 | 20.728 | 21.933 | |
| A03 | CNU371 | 100.367 | 20.765 | 21.965 | |
| A03 | CNU223 | 101.388 | 20.873 | 22.058 | |
| A03 | sR11644 | 105.768 | 21.157 | 22.380 | |
| A03 | BoSF2145 | 104.130 | 21.184 | 22.406 | |
| A03 | BoSF0346 | 105.853 | 21.190 | 22.412 | |
| A03 | BoSF0393 | 105.853 | 21.191 | 22.412 | |
| A03 | MR181 | 109.775 | | | |
| A03 | KS40432 | 111.819 | 22.713 | 24.118 | |
| A03 | BoGMS1071 | 110.630 | 24.483 | 24.036 | |
| A03 | BrSF0708 | 118.254 | 23.229 | 24.850 | |
| A03 | BnGMS0616 | 114.400 | 23.462 | 25.083 | |
| A03 | BoSF1919 | 115.995 | 23.622 | 25.243 | |
| A03 | BoSF1779 | 121.972 | 23.997 | 25.618 | |
| A03 | BrSF0918 | 129.106 | 24.797 | 26.405 | |
| A03 | CB10425 | 126.413 | 25.015 | 26.638 | |
| A04 | BrSF0564 | 0.000 | 0.895 | 1.152 | |
| A04 | BrSF0560 | 5.422 | 1.585 | 1.857 | |

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|---|---|---|---|---|---|
| A04 | BrSF0112 | 6.644 | 2.321 | 2.616 | |
| A04 | BoSF2609 | 1.806 | 2.855 | 3.150 | |
| A04 | BoSF0336a | 11.158 | 7.258 | 5.472 | |
| A04 | IFLP014 | 13.370 | 7.593 | 5.807 | |
| A04 | BnGMS0115 | 14.865 | 8.598 | 6.724 | |
| A04 | BrSF1049 | 17.256 | 9.183 | 7.055 | |
| A04 | BrSF1032 | 18.017 | 9.530 | 7.403 | |
| A04 | niab143 | 19.104 | 10.508 | 8.811 | |
| A04 | BoSF1125 | 20.424 | 10.608 | 8.911 | |
| A04 | sN2025 | 24.625 | 11.525 | 9.809 | |
| A04 | CNU246 | 33.342 | 13.166 | 11.604 | |
| A04 | BoSF1161 | 35.118 | 13.312 | 11.753 | |
| A04 | CNU039 | 36.054 | 13.913 | 12.572 | |
| A04 | BrSF0726 | 47.004 | 15.297 | 14.271 | |
| A04 | BoSF0415a | 48.352 | 15.580 | 14.583 | |
| A04 | BoSF0482 | 50.058 | 15.620 | | |
| A04 | BrSF0719 | 50.566 | 15.781 | 14.745 | |
| A04 | BoSF1476 | 52.094 | | | |
| A04 | BoSF1555 | 60.071 | 16.202 | 15.433 | |
| A04 | BrSF0645 | 57.732 | 16.326 | 15.557 | |
| A04 | BrSF0646 | 54.765 | 16.467 | 15.698 | |
| A04 | BoSF0231 | 56.838 | 16.505 | 15.749 | |
| A04 | BrSF0120 | 56.303 | 16.614 | 15.858 | |
| A04 | IFLP036 | 59.688 | 17.067 | 16.311 | |
| A04 | BrSF0642a | 64.418 | 17.721 | 17.036 | |
| A04 | BrSF0643 | 63.206 | 17.895 | 17.216 | |
| A04 | BoSF1642 | 62.457 | 18.015 | 17.341 | |
| A04 | BoSF0841b | 68.278 | 18.259 | 17.601 | |
| A04 | BoSF2769 | 70.580 | 18.524 | 17.862 | |
| A04 | BrSF0969 | 79.398 | 19.073 | | |

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|---|---|---|---|---|---|
| A04 | BrSF0972 | 87.075 | 18.963 | 18.342 | |
| A05 | BoSF1666 | 0.000 | 1.932 | 1.810 | |
| A05 | Na14G02 | 3.685 | | | |
| A05 | BrSF0712 | 4.773 | | | |
| A05 | BoSF2141 | 14.432 | 7.955 | 9.762 | |
| A05 | BrSF0975a | 20.703 | 8.626 | 10.433 | |
| A05 | ns231 | 12.303 | 9.363 | 10.623 | |
| A05 | ns218 | 12.089 | 9.824 | 11.084 | |
| A05 | ns213 | 11.287 | 10.128 | 11.595 | |
| A05 | Na12E01a | 22.757 | | | |
| A05 | BrSF0952 | 24.498 | 10.921 | 14.302 | reshuffling |
| A05 | BoSF1098 | 21.205 | 11.957 | 11.998 | reshuffling |
| A05 | BrSF0942 | 20.763 | 11.962 | 15.492 | reshuffling |
| A05 | CNU398 | 20.763 | 11.962 | 15.492 | reshuffling |
| A05 | BrSF0550 | 25.121 | 12.489 | 12.492 | reshuffling |
| A05 | CNU029 | 24.725 | 12.504 | 12.508 | reshuffling |
| A05 | BnGMS0293 | 24.487 | 13.874 | 14.130 | reshuffling |
| A05 | BrSF1031b | 26.496 | | 15.654 | |
| A05 | BrSF0849 | 26.550 | | 16.452 | |
| A05 | BrSF0620 | 23.775 | 15.937 | 17.746 | |
| A05 | BrSF0618 | 29.904 | 16.298 | 18.002 | |
| A05 | BrGMS0293 | 34.224 | 17.371 | 19.141 | |
| A05 | ns211 | 28.085 | 18.227 | 20.013 | |
| A05 | BoSF1230 | 37.693 | 18.323 | 20.109 | |
| A05 | IFLP039 | 42.296 | 18.623 | 20.410 | |
| A05 | BoSF1749 | 46.577 | 18.743 | 20.543 | |
| A05 | BoSF0582 | 45.996 | 18.827 | 20.620 | |
| A05 | BrSF0497 | 45.653 | 18.872 | 20.664 | |
| A05 | BoSF0259 | 46.101 | 18.996 | 20.788 | |
| A05 | BrSF0491 | 52.510 | 19.946 | 21.770 | |

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|---|---|---|---|---|---|
| A05 | CNU268 | 49.231 | 20.118 | 21.979 | |
| A05 | snap1047a | 55.602 | 20.194 | 22.070 | |
| A05 | BoSF2746 | 50.565 | 20.219 | 22.101 | |
| A05 | BoSF2030 | 51.322 | 20.281 | 22.163 | |
| A06 | BoSF0784 | 0.000 | 0.936 | 0.896 | |
| A06 | BrSF0149 | 1.122 | 1.109 | 1.069 | |
| A06 | BoSF2253 | 2.036 | | | |
| A06 | BoSF0869 | 4.756 | 1.839 | 1.873 | |
| A06 | BoSF0455c | 5.725 | 1.849 | 1.895 | |
| A06 | CB10143 | 9.301 | 2.251 | 2.242 | |
| A06 | BrSF0860 | 7.427 | 2.259 | 2.255 | |
| A06 | BoSF1212b | 13.533 | 2.549 | 2.588 | |
| A06 | IFLP001 | 12.059 | 2.617 | 2.670 | |
| A06 | BrSF0741 | 17.742 | 3.194 | 3.377 | |
| A06 | BoSF1521 | 19.652 | 3.266 | 3.448 | |
| A06 | BrSF0743 | 21.424 | 3.422 | 3.653 | |
| A06 | BoSF2583 | 25.721 | 4.053 | 4.263 | |
| A06 | BoSF0022a | 30.223 | 4.374 | 4.555 | |
| A06 | BRAS052 | 34.204 | 4.394 | 4.583 | |
| A06 | BoSF2360 | 29.500 | 4.432 | 4.621 | |
| A06 | BrSF0171 | 39.307 | 5.818 | 6.379 | |
| A06 | BoSF1990 | 41.412 | 5.916 | 6.477 | |
| A06 | BoSF1752 | 42.769 | 6.138 | 6.751 | |
| A06 | BnGMS0480 | 46.507 | 7.247 | 7.606 | |
| A06 | IGF1653c | 47.255 | 7.300 | 7.664 | |
| A06 | CNU050 | 47.136 | 7.418 | 7.784 | |
| A06 | CB10006 | 48.109 | 8.010 | 8.466 | |
| A06 | CNU149 | 47.603 | 8.051 | 8.532 | |
| A06 | BrSF0858b | 48.764 | 8.538 | 9.070 | |
| A06 | BrSF0789 | 52.464 | 16.332 | 14.852 | |

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|---|---|---|---|---|---|
| A06 | BoSF1414 | 60.554 | 17.936 | 16.424 |  |
| A06 | BrSF0154 | 57.530 | 18.451 | 17.034 |  |
| A06 | BoSF2407 | 55.461 | 18.470 | 17.054 |  |
| A06 | BoSF1509 | 56.327 | 18.771 | 17.378 |  |
| A06 | ENA23 | 54.901 | 18.941 | 17.545 |  |
| A06 | BrSF0153 | 59.325 | 19.147 | 17.751 |  |
| A06 | sS1949 | 66.073 | 19.329 | 17.910 |  |
| A06 | BoSF1522 | 65.324 | 19.391 | 17.972 |  |
| A06 | BoGMS0314 | 63.709 | 19.447 | 18.069 |  |
| A06 | BoSF0213 | 66.688 | 19.838 | 18.443 |  |
| A06 | IGF5707b | 65.937 | 19.880 | 18.506 |  |
| A06 | BrSF47-389 | 78.872 | 21.656 | 22.617 |  |
| A06 | BrSF47-382a | 76.704 | 21.664 | 22.625 |  |
| A06 | CNU400 | 80.039 | 21.700 | 22.668 |  |
| A06 | BrSF0162 | 79.727 | 21.700 | 22.669 |  |
| A06 | BrSF47-277 | 81.929 | 21.870 | 22.845 |  |
| A06 | BrSF47-234 | 82.832 | 21.965 | 22.915 |  |
| A06 | BoSF1088 | 83.466 | 21.977 | 22.927 |  |
| A06 | BrSF47-54 | 84.485 | 22.315 | 23.268 |  |
| A06 | BoSF0783a | 84.726 | 22.402 | 23.355 |  |
| A06 | BrSF47-10 | 84.307 | 22.404 | 23.357 |  |
| A06 | BoSF2406 | 83.843 |  | 23.371 |  |
| A06 | BrSF0820 | 84.304 | 22.405 | 23.427 |  |
| A06 | BrSF46-22 | 84.304 | 22.405 | 23.427 |  |
| A06 | BrSF0821 | 84.681 | 22.424 | 23.448 |  |
| A06 | BrSF0819 | 84.961 | 22.590 | 23.614 |  |
| A06 | BrSF46-167 | 86.399 | 22.671 | 23.686 |  |
| A06 | BrSF46-176a | 85.709 | 22.683 | 23.699 |  |
| A06 | BrSF46-177 | 85.365 | 22.686 | 23.699 |  |
| A06 | BrSF46-186 | 85.269 | 22.695 | 23.707 |  |

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|---|---|---|---|---|---|
| A06 | BrSF46-238 | 88.186 | 22.787 | 23.806 |  |
| A06 | BrSF0822 | 88.918 | 22.837 | 23.850 |  |
| A06 | BrSF46-291 | 87.775 | 22.893 | 23.906 |  |
| A06 | BrSF46-306 | 87.383 | 22.927 | 23.940 |  |
| A06 | BrSF0166 | 93.842 | 23.131 | 24.232 |  |
| A06 | BnID107 | 99.121 | 23.515 | 24.615 |  |
| A06 | BnID108 | 96.956 | 23.566 | 24.667 |  |
| A06 | BoSF2788 | 99.684 | 23.603 | 24.704 |  |
| A06 | BoSF2702 | 98.257 | 23.628 | 24.725 |  |
| A06 | BrSF0144 | 97.692 | 23.736 | 24.829 |  |
| A06 | BoSF0215 | 113.265 | 25.150 | 26.244 |  |
| A07 | sR4047 | 0.000 | 0.756 | 0.829 |  |
| A07 | sR282 | 0.886 | 1.641 | 1.564 |  |
| A07 | BoSF2344 | 3.692 | 5.038 | 3.080 |  |
| A07 | BoSF0665 | 6.885 | 6.877 | 5.018 |  |
| A07 | AT1G27050 | 16.259 | 9.070 | 7.722 |  |
| A07 | BoSF2653 | 17.782 | 10.078 | 8.654 |  |
| A07 | BRAS023 | 13.176 | 10.114 | 8.683 |  |
| A07 | BrSF0331 | 20.103 | 10.195 | 8.750 |  |
| A07 | CNU273 | 35.174 | 14.472 | 12.545 |  |
| A07 | BrSF0185 | 35.174 | 14.472 | 12.545 |  |
| A07 | sR7223 | 37.794 | 14.441 | 12.315 |  |
| A07 | niab043 | 46.866 | 15.886 | 13.959 |  |
| A07 | BRMS036 | 53.675 | 18.575 | 16.648 |  |
| A07 | BoSF0898 | 60.479 | 20.077 | 18.185 |  |
| A07 | CNU037 | 62.737 | 20.117 | 18.224 |  |
| A07 | CNU339 | 61.221 | 20.118 | 18.226 |  |
| A07 | BoGMS2110 | 69.554 | 20.736 | 18.917 |  |
| A07 | CNU043 | 73.766 | 21.730 | 19.911 |  |
| A07 | CNU331b | 71.117 | 21.929 | 20.167 |  |

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|---|---|---|---|---|---|
| A07 | BoSF2257 | 82.081 | 22.564 | 21.015 |  |
| A07 | CNU053 | 80.449 | 22.962 | 21.412 |  |
| A07 | CNU052 | 81.096 | 23.017 | 21.479 |  |
| A07 | BrSF0480 | 84.890 | 23.162 | 21.619 |  |
| A07 | BoSF2703 | 87.874 | 23.163 | 21.620 |  |
| A07 | BoSF0707 | 91.481 | 23.823 | 22.280 |  |
| A07 | BoSF1972 | 92.450 | 23.871 | 22.460 |  |
| A07 | CNU308 | 96.838 | 23.623 | 22.224 |  |
| A08 | BrGMS0339a | 4.326 | 13.905 | 16.432 |  |
| A08 | BrSF0210 | 6.837 | 14.092 | 16.637 |  |
| A08 | BnEMS1142 | 1.210 | 14.229 | 16.757 |  |
| A08 | BoSF0711a | 0.000 | 14.574 | 17.100 |  |
| A08 | BoSF2672 | 14.103 | 14.848 | 17.391 |  |
| A08 | snap0675 | 13.367 | 15.365 | 17.926 |  |
| A08 | BnEMS0412 | 16.054 | 15.479 | 18.027 |  |
| A08 | BrSF0606 | 18.997 | 15.748 | 18.295 |  |
| A08 | BoSF1830 | 19.520 | 15.771 | 18.319 |  |
| A08 | BnEMS0236 | 23.297 | 16.105 | 18.653 |  |
| A08 | BoSF0693 | 23.297 | 16.105 | 18.653 |  |
| A08 | sN12352 | 25.407 | 16.241 | 18.889 |  |
| A08 | BrGMS0825 | 27.440 | 16.267 | 18.915 |  |
| A08 | BoSF2499 | 32.550 | 16.515 | 19.177 |  |
| A09 | KS51170 | 0.000 | 3.888 | 4.115 |  |
| A09 | BrSF0916a | 1.585 | 4.806 | 4.899 |  |
| A09 | BnID040 | 13.982 | 4.863 | 5.191 |  |
| A09 | BoSF0270 | 15.427 | 4.933 | 5.258 |  |
| A09 | BnID041 | 14.524 | 5.029 | 5.354 |  |
| A09 | BnID042 | 12.161 | 5.072 | 5.523 |  |
| A09 | CNU157 | 11.414 | 5.221 | 5.671 |  |
| A09 | BnID043 | 8.277 | 5.257 | 5.698 |  |

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|---|---|---|---|---|---|
| A09 | BnID044 | 3.719 | 5.362 | 5.803 | |
| A09 | BnID045 | 9.123 | 5.369 | 5.810 | |
| A09 | CNU004 | 12.892 | 5.397 | 5.852 | |
| A09 | BnID046 | 10.253 | 5.454 | 5.905 | |
| A09 | BrSF0255 | 6.978 | 5.729 | 7.240 | |
| A09 | BnID047 | 9.543 | 5.739 | 7.250 | |
| A09 | BoSF2624 | 34.291 | 17.581 | 20.650 | |
| A09 | BnID052 | 36.781 | 19.764 | 22.347 | |
| A09 | BnID053 | 37.051 | 19.792 | 22.381 | |
| A09 | BrSF0998 | 45.764 | 22.810 | 24.788 | |
| A09 | CNU402 | 47.167 | 23.197 | 25.175 | |
| A09 | BnID056 | 48.993 | 23.268 | 25.245 | |
| A09 | BoSF2489 | 43.963 | 23.604 | 25.458 | |
| A09 | ns155 | 49.486 | 24.006 | 25.921 | |
| A09 | ns156 | 40.901 | 24.018 | 25.934 | |
| A09 | ns158 | 56.370 | 24.143 | 26.068 | |
| A09 | BrSF6-104 | 50.096 | 24.217 | 26.148 | |
| A09 | ns160 | 55.118 | 26.700 | 28.759 | |
| A09 | ns161 | 56.753 | 26.700 | 28.759 | |
| A09 | ns162 | 53.123 | 26.705 | 28.765 | |
| A09 | BoSF0232 | 58.919 | 26.729 | 28.797 | |
| A09 | ns163 | 60.472 | 26.748 | 28.817 | |
| A09 | ns164 | 60.472 | 26.748 | 28.817 | |
| A09 | BnSF2342-39 | 68.871 | 28.125 | 30.342 | |
| A09 | ns165 | 70.699 | 28.129 | 30.346 | |
| A09 | ns166 | 70.699 | 28.129 | 30.346 | |
| A09 | ns167 | 70.699 | 28.129 | 30.346 | |
| A09 | ns168 | 70.699 | 28.129 | 30.346 | |
| A09 | BnID075 | 72.104 | 28.244 | 30.449 | |
| A09 | BnID076 | 71.371 | 28.258 | 30.463 | |

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|---|---|---|---|---|---|
| A09 | BoSF1814 | 105.283 | 28.319 | 30.526 |  |
| A09 | BrSF6-2245 | 74.181 | 28.349 | 30.600 |  |
| A09 | BrSF0389a | 103.808 | 28.427 | 30.678 |  |
| A09 | BrSF0353 | 103.205 | 28.431 | 30.682 |  |
| A09 | BnSF400-28 | 95.854 | 28.525 | 30.767 |  |
| A09 | BnSF400-29 | 102.491 | 28.526 | 30.768 |  |
| A09 | BnSF400-54 | 103.619 | 28.553 | 30.801 |  |
| A09 | BrSF6-2380 | 96.817 | 28.563 | 30.811 |  |
| A09 | BnID078 | 108.166 | 28.565 | 30.816 |  |
| A09 | BrSF6-2389 | 102.032 | 28.572 | 30.823 |  |
| A09 | BrSF0251 | 102.032 | 28.572 | 30.823 |  |
| A09 | CNU264 | 100.245 | 28.591 | 30.842 |  |
| A09 | BrSF0383 | 100.245 | 28.591 | 30.842 |  |
| A09 | BoSF0223 | 104.757 | 28.595 | 30.849 |  |
| A09 | BrSF0250 | 105.283 | 28.599 | 30.851 |  |
| A09 | BrSF6-2413 | 105.283 | 28.599 | 30.851 |  |
| A09 | BnID079 | 107.200 | 28.604 | 30.856 |  |
| A09 | BnID060 | 77.113 | 28.838 | 31.151 |  |
| A09 | BrSF6-2562 | 76.400 | 28.872 | 31.190 |  |
| A09 | BnSF400-253 | 76.762 | 28.889 | 31.207 |  |
| A09 | BrSF0385 | 77.975 | 28.955 | 31.280 |  |
| A09 | BnID081 | 79.084 | 29.012 | 31.319 |  |
| A09 | ENA27 | 81.982 | 29.072 | 31.376 |  |
| A09 | BnID082 | 82.907 | 29.117 | 31.416 |  |
| A09 | BoSF0333 | 79.578 | 29.240 | 31.546 |  |
| A09 | BoSF2709 | 81.756 | 29.270 | 31.580 |  |
| A09 | BoSF2710 | 81.489 | 29.272 | 31.581 |  |
| A09 | BrSF0229 | 117.952 | 29.898 | 32.003 |  |
| A09 | BnID085 | 116.408 | 30.019 | 32.156 |  |
| A09 | BnID061 | 112.358 | 30.171 | 32.308 |  |

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|---|---|---|---|---|---|
| A09 | BnID086 | 110.293 | 30.293 | 32.475 |  |
| A09 | BnID087 | 111.058 | 30.311 | 32.493 |  |
| A09 | BnID090 | 112.490 | 30.917 | 33.217 |  |
| A09 | BnID062 | 114.603 |  | 33.611 |  |
| A09 | BnID094 | 114.379 |  | 33.658 |  |
| A09 | BnID063 | 113.425 | 31.076 | 33.837 |  |
| A09 | BoSF1920a | 112.630 | 31.209 | 33.970 |  |
| A09 | BrSF0615b | 116.971 | 31.249 | 34.010 |  |
| A09 | BoSF0872b | 116.971 | 31.249 | 34.010 |  |
| A09 | BnID095 | 116.956 | 31.255 | 34.018 |  |
| A09 | BnID097 | 124.713 | 31.582 | 34.337 |  |
| A09 | BoSF2791 | 122.361 | 31.697 | 34.464 |  |
| A09 | BoSF1885 | 120.657 | 31.931 | 34.645 |  |
| A09 | BoSF2104a | 120.869 | 32.190 | 34.980 |  |
| A09 | BnEMS0337 | 121.670 | 32.700 | 35.490 |  |
| A09 | BrSF77-118 | 123.262 | 32.867 | 35.719 |  |
| A09 | BrSF0261 | 125.864 | 33.699 | 36.739 |  |
| A09 | BoSF1902 | 125.794 | 33.992 | 37.032 |  |
| A09 | BrSF82-562 | 125.127 | 34.017 | 37.058 |  |
| A10 | BrSF0898a | 0.000 |  |  |  |
| A10 | BrSF0958 | 4.862 | 7.634 | 4.604 |  |
| A10 | Na10E08 | 10.623 | 8.511 | 5.482 |  |
| A10 | BrSF0436b | 10.623 | 8.511 | 5.482 |  |
| A10 | BoSF0652 | 26.195 | 11.468 | 10.030 |  |
| A10 | sS2066 | 25.380 | 11.706 | 10.326 |  |
| A10 | BrSF0287 | 26.843 | 11.853 | 10.480 |  |
| A10 | niab140 | 26.843 | 11.853 | 10.480 |  |
| A10 | BrSF0425a | 30.494 | 12.330 | 10.939 |  |
| A10 | sR12384 | 30.314 | 12.366 | 10.977 |  |
| A10 | BrSF0283 | 33.626 | 12.721 | 11.405 |  |

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|---|---|---|---|---|---|
| A10 | niab122 | 36.032 | 12.984 | 12.936 | |
| A10 | BrSF0415 | 37.266 | 13.110 | 13.068 | |
| A10 | BoSF0601 | 36.732 | 13.155 | 13.121 | |
| A10 | niab103 | 44.075 | 13.713 | 13.673 | |
| A10 | BrGMS0536 | 44.921 | 13.797 | 13.761 | |
| A10 | BoSF1808 | 48.493 | 13.832 | 13.796 | |
| A10 | sN8502 | 47.179 | 13.930 | 13.895 | |
| C01 | BrSF0279 | 0.000 | | | |
| C01 | BoSF2670 | 4.551 | 1.902 | 2.160 | |
| C01 | CB10587 | 11.112 | 2.273 | 2.531 | |
| C01 | BoSF0224a | 7.295 | 2.337 | 2.595 | |
| C01 | CNU139c | 15.069 | 2.467 | 2.713 | |
| C01 | BoSF1469 | 18.174 | 3.122 | 3.256 | |
| C01 | BnEMS1012 | 25.893 | 5.805 | 5.715 | |
| C01 | niab068 | 29.242 | 5.878 | 5.793 | |
| C01 | IGF2026c | 31.768 | 5.910 | 5.827 | |
| C01 | BoSF0678a | 32.028 | 5.955 | 5.882 | |
| C01 | CB10369b | 34.099 | 6.282 | 6.209 | |
| C01 | BoSF0442 | 34.425 | 6.301 | 6.228 | |
| C01 | BoSF1667 | 35.483 | 6.430 | 6.357 | |
| C01 | BoSF1998 | 35.730 | | | |
| C01 | BoGMS1565a | 41.390 | 8.212 | 7.994 | |
| C01 | BoSF2182 | 41.390 | 8.212 | 7.994 | |
| C01 | BoSF0130 | 48.079 | 11.032 | 10.809 | |
| C01 | BoSF0133 | 50.843 | 11.296 | 11.072 | |
| C01 | BoSF0114 | 59.748 | 14.780 | 14.556 | |
| C01 | BrSF0811 | 65.108 | 34.475 | 17.941 | Translocation |
| C01 | BrSF0705 | 70.767 | 28.235 | 23.234 | |
| C01 | BoSF2314 | 68.799 | 28.302 | 23.293 | |
| C01 | BoSF2538 | 73.258 | 28.875 | 26.281 | |

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|---|---|---|---|---|---|
| C01 | BoSF2346 | 70.906 | 29.505 | 26.911 | |
| C01 | BoSF0050b | 75.799 | 29.818 | 27.224 | |
| C01 | BoSF1372 | 76.790 | | 28.263 | |
| C01 | BoSF2575 | 78.684 | 31.345 | 29.274 | |
| C01 | ns258 | 91.292 | | 31.652 | |
| C01 | ns059 | 94.081 | 34.106 | 32.358 | |
| C01 | ns262 | 94.526 | 34.744 | 32.996 | |
| C01 | BoSF1270 | 84.975 | 35.169 | 33.230 | |
| C01 | FITO283 | 99.531 | 38.103 | 37.881 | |
| C01 | BoSF2820 | 102.385 | 38.358 | 37.626 | |
| C01 | BoSF1597 | 99.082 | 38.740 | 38.517 | |
| C02 | BoSF1425 | 2.383 | 0.672 | 2.217 | Inversion |
| C02 | BoSF1799 | 1.926 | 0.754 | 2.123 | Inversion |
| C02 | BoSF2071 | 0.000 | 0.823 | 2.061 | Inversion |
| C02 | BnGMS0081 | 2.848 | 1.135 | 1.496 | Inversion |
| C02 | BoSF1539 | 3.200 | 1.305 | 1.465 | Inversion |
| C02 | BoSF2604 | 5.461 | 1.547 | 0.438 | Inversion |
| C02 | BoSF1017 | 4.453 | 1.727 | 0.258 | Inversion |
| C02 | BoSF1825 | 5.750 | 1.864 | 0.120 | Inversion |
| C02 | BoSF1826 | 5.875 | 1.870 | 0.115 | Inversion |
| C02 | Ol11H09 | 5.875 | 1.870 | 0.115 | Inversion |
| C02 | BoSF0132 | 5.078 | 1.912 | 0.073 | Inversion |
| C02 | BoGMS0665 | 3.780 | 1.973 | 0.012 | Inversion |
| C02 | CNU461 | 19.422 | 2.235 | 2.573 | |
| C02 | BoSF1264 | 28.264 | 3.755 | 4.093 | |
| C02 | BrSF0065b | 30.135 | 3.822 | 4.160 | |
| C02 | niab124 | 31.164 | 4.298 | 4.612 | |
| C02 | BoSF2242 | 34.257 | 8.266 | 6.147 | |
| C02 | snap0673 | 39.120 | 8.569 | 7.209 | |
| C02 | snap0674 | 36.162 | 8.569 | 7.209 | |

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|---|---|---|---|---|---|
| C02 | BoSF0033a | 41.434 | 8.886 | 7.527 | |
| C02 | BoSF2475 | 52.109 | 14.032 | 12.673 | |
| C02 | BoSF0880 | 57.365 | 15.596 | 13.657 | |
| C02 | BnEMS0959 | 57.945 | 15.469 | 13.535 | |
| C02 | CB10026 | 61.496 | 16.325 | 14.391 | |
| C02 | BoSF0096 | 64.580 | 20.317 | 18.623 | |
| C02 | BoSF0757 | 66.240 | | 19.800 | |
| C02 | BoSF1743 | 67.005 | | 19.983 | |
| C02 | BoSF0525b | 66.560 | | 20.025 | |
| C02 | BoSF0284 | 74.930 | 36.101 | 34.048 | |
| C02 | ns314 | 90.565 | 36.166 | 34.122 | |
| C02 | ns085 | 96.901 | 38.749 | 37.524 | |
| C02 | BoSF1995a | 84.397 | 39.286 | 37.965 | |
| C02 | BrSF0503 | 107.579 | 45.882 | 41.790 | |
| C02 | BoSF0310 | 110.008 | 46.086 | 41.995 | |
| C02 | BoGMS2128 | 111.156 | 46.361 | 42.269 | |
| C02 | BoSF1258 | 112.187 | | | |
| C02 | MD038 | 100.832 | | | |
| C02 | BoSF2269 | 113.694 | | | |
| C03 | BRMS006 | 8.932 | | | |
| C03 | BoSF0421 | 9.729 | 0.012 | | |
| C03 | BoSF1944 | 9.472 | 0.282 | 0.037 | |
| C03 | BoSF2181 | 0.000 | 0.385 | 0.129 | |
| C03 | BoSF1005 | 6.468 | 0.473 | 0.220 | |
| C03 | BoSF1977 | 7.535 | 0.592 | 0.338 | |
| C03 | niab077 | 9.853 | 0.658 | 0.419 | |
| C03 | niab115b | 10.755 | 1.174 | 1.025 | |
| C03 | BoSF2263 | 10.442 | 1.450 | 1.320 | |
| C03 | BoGMS0707 | 8.526 | 1.691 | 1.581 | |
| C03 | sR12137 | 4.549 | 1.924 | 1.811 | |

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|---|---|---|---|---|---|
| C03 | BoSF2861 | 12.364 | 2.082 | 1.973 | |
| C03 | BoSF1510 | 13.000 | 2.085 | 1.976 | |
| C03 | BoGMS0407 | 17.301 | 2.840 | 2.210 | |
| C03 | BoSF0371 | 18.824 | 3.723 | 3.170 | |
| C03 | BoSF1970 | 25.467 | 4.128 | 3.589 | |
| C03 | BoSF2006 | 32.044 | 5.465 | 4.995 | |
| C03 | BoSF2005 | 32.172 | 5.475 | 5.000 | |
| C03 | BoSF2392b | 30.528 | 5.525 | 5.059 | |
| C03 | BnID035a | 35.832 | 5.896 | 5.621 | |
| C03 | BoGMS0678 | 34.789 | 5.923 | 5.647 | |
| C03 | BoSF0466 | 39.293 | 6.290 | 5.961 | |
| C03 | FITO218 | 38.778 | 6.650 | 6.321 | |
| C03 | BrSF0845b | 43.310 | 7.126 | 6.798 | |
| C03 | BrBAC087b | 42.175 | 7.152 | 6.877 | |
| C03 | BoSF2132 | 42.802 | 7.194 | 6.919 | |
| C03 | BN12A | 43.312 | 7.481 | 7.162 | |
| C03 | CB10569 | 43.688 | 7.509 | 7.190 | |
| C03 | BoSF0805 | 44.656 | 7.603 | 7.335 | |
| C03 | CB10235 | 48.435 | 8.160 | 7.978 | |
| C03 | BoSF2258 | 49.504 | 8.909 | 8.422 | |
| C03 | BoSF2284 | 51.154 | 9.141 | 8.653 | |
| C03 | Na12E02b | 56.596 | 9.667 | 9.180 | |
| C03 | ns027b | 56.117 | 10.222 | 9.734 | |
| C03 | Ol10E05 | 59.661 | 11.161 | 9.848 | |
| C03 | BrSF0299 | 54.737 | 11.175 | 9.862 | |
| C03 | BoSF0670 | 58.050 | 11.175 | 9.862 | |
| C03 | BoSF1271b | 61.416 | | 10.386 | |
| C03 | snap0622 | 67.039 | 12.656 | 11.694 | |
| C03 | BoSF1276 | 63.809 | 12.705 | 11.746 | |
| C03 | BoSF0840 | 66.133 | 13.900 | 12.482 | |

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|---|---|---|---|---|---|
| C03 | CB10057 | 81.272 | 15.395 | 14.250 | |
| C03 | BoGMS0369 | 82.632 | 15.561 | 14.407 | |
| C03 | BoSF0402 | 74.117 | 15.561 | 14.407 | |
| C03 | BoSF0160 | 73.187 | 16.193 | 15.076 | |
| C03 | BoSF2669 | 75.601 | 17.551 | 16.540 | |
| C03 | BoSF0883 | 76.845 | 17.836 | 17.209 | |
| C03 | BrGMS2766 | 79.345 | 18.806 | 18.179 | |
| C03 | BoSF1911 | 74.833 | 18.840 | 18.213 | |
| C03 | Na10E02 | 93.369 | 28.723 | 21.435 | |
| C03 | Na12G05 | 78.000 | 29.730 | 24.330 | |
| C03 | BoSF2281 | 92.053 | 31.058 | 28.247 | |
| C03 | snap0260 | 84.782 | 33.055 | 29.280 | |
| C03 | BoSF2723a | 97.115 | 40.387 | 32.624 | |
| C03 | BoSF0176 | 110.499 | 46.516 | 39.908 | |
| C03 | BoSF2821 | 109.640 | 46.820 | 40.211 | |
| C03 | BoSF2233 | 109.441 | 46.859 | 40.251 | |
| C03 | BoSF2754 | 109.353 | 46.892 | 40.284 | |
| C03 | CALSSR | 109.433 | 45.929 | 40.355 | |
| C03 | BoGMS0819 | 112.089 | 46.073 | 40.499 | |
| C03 | BoSF2509 | 108.722 | 47.486 | 43.713 | |
| C03 | BoSF2510 | 107.179 | 47.494 | 43.721 | |
| C03 | BoSF0711b | 104.750 | 47.536 | 43.777 | |
| C03 | BoSF0926a | 113.718 | 47.672 | 45.402 | |
| C03 | BrSF0193 | 116.309 | 47.683 | 45.413 | |
| C03 | BRAS068 | 120.910 | 50.536 | 47.708 | |
| C03 | MR049 | 123.296 | 50.720 | 47.523 | |
| C03 | Ol13C12 | 121.768 | 50.801 | 48.412 | |
| C03 | BoSF0960 | 130.195 | 55.354 | 50.621 | |
| C03 | snap0833 | 134.048 | 55.800 | 51.444 | |
| C03 | BoSF2513 | 135.654 | 57.463 | 54.442 | |

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|---|---|---|---|---|---|
| C03 | BoSF1650 | 140.367 | 57.685 | 54.773 | |
| C03 | BrSF0214 | 148.684 | 57.689 | 54.776 | |
| C03 | BrSF0869 | 138.768 | 57.724 | 54.806 | |
| C03 | BoSF1136 | 144.371 | 57.761 | 54.844 | |
| C04 | BoSF1319 | 6.001 | 1.090 | 0.122 | |
| C04 | snap1060 | 0.000 | 1.662 | 0.722 | |
| C04 | BrSF0313 | 9.826 | 1.797 | 0.857 | |
| C04 | BoSF0349 | 17.181 | 2.326 | 1.774 | |
| C04 | BoSF1492 | 17.648 | 2.415 | 1.865 | |
| C04 | BoSF2273 | 15.282 | 3.586 | 2.380 | |
| C04 | CNU286 | 20.731 | 3.158 | 2.894 | |
| C04 | BoSF0643 | 20.731 | 3.158 | 2.894 | |
| C04 | FITO366 | 21.311 | 3.228 | 2.966 | |
| C04 | BoSF0016 | 21.936 | 3.246 | 2.982 | |
| C04 | BoGMS1219 | 23.443 | 3.324 | 3.040 | |
| C04 | BoSF1271a | 24.631 | 3.750 | 3.465 | |
| C04 | BoSF0318 | 25.599 | 3.863 | 3.579 | |
| C04 | BnEMS0038 | 28.314 | 3.903 | 7.304 | |
| C04 | snap0205 | 40.458 | 4.541 | 6.649 | |
| C04 | BoSF1722 | 29.574 | 4.674 | 6.492 | |
| C04 | niab002 | 30.278 | 4.687 | 6.478 | |
| C04 | snap1299 | 42.534 | | 7.959 | |
| C04 | BoSF2018 | 45.771 | 8.912 | 19.592 | |
| C04 | MR119 | 47.488 | 8.986 | 19.666 | |
| C04 | BoSF2723b | 47.914 | | | |
| C04 | BoSF2884 | 53.611 | | | |
| C04 | BoSF0952a | 53.827 | | | |
| C04 | BoSF1336 | 54.086 | 14.375 | | |
| C04 | BoSF0552 | 55.436 | 14.566 | | |
| C04 | CB10428 | 54.911 | 14.748 | | |

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|---|---|---|---|---|---|
| C04 | BoSF2040 | 55.617 | 14.932 | | |
| C04 | BoSF0997 | 54.813 | 16.282 | 12.198 | reshuffling |
| C04 | BoSF0592 | 56.299 | 17.709 | 26.429 | reshuffling |
| C04 | BoSF2106 | 52.269 | 18.344 | 25.248 | reshuffling |
| C04 | IFLP013 | 56.108 | 18.541 | 25.052 | reshuffling |
| C04 | BoSF0718 | 56.168 | 18.942 | 24.651 | reshuffling |
| C04 | BoSF2062 | 56.037 | | | reshuffling |
| C04 | BoSF0600 | 56.175 | 18.884 | | reshuffling |
| C04 | BoSF1121 | 56.937 | 18.941 | | reshuffling |
| C04 | BoSF0949 | 56.707 | 19.490 | 24.163 | reshuffling |
| C04 | snap1891 | 45.005 | 19.967 | | reshuffling |
| C04 | BoSF1852 | 55.809 | 19.980 | | reshuffling |
| C04 | BoSF1843 | 56.177 | 20.324 | | reshuffling |
| C04 | BoSF0943 | 57.346 | | 11.694 | reshuffling |
| C04 | BrSF0552 | 56.694 | 21.693 | 15.257 | reshuffling |
| C04 | BoGMS2091 | 58.214 | 22.111 | 14.839 | reshuffling |
| C04 | BRAS061 | 58.960 | 22.255 | 14.611 | reshuffling |
| C04 | BoSF1692 | 62.175 | 23.382 | | reshuffling |
| C04 | snap0299 | 80.189 | 30.412 | 28.276 | reshuffling |
| C04 | BoSF0935 | 70.221 | 30.447 | 27.785 | reshuffling |
| C04 | sN464 | 70.522 | 30.516 | 27.716 | reshuffling |
| C04 | ns104 | 73.778 | 30.956 | 27.276 | reshuffling |
| C04 | BoGMS1031 | 71.015 | 31.086 | 27.146 | reshuffling |
| C04 | BoSF2872 | 69.537 | 31.088 | 27.144 | reshuffling |
| C04 | BoSF0495 | 69.848 | 31.124 | 27.112 | reshuffling |
| C04 | BoGMS0282 | 76.843 | 34.290 | 28.536 | |
| C04 | BoSF2508 | 81.875 | 35.151 | 29.397 | |
| C04 | BoSF2294 | 84.360 | 36.174 | 30.420 | |
| C04 | ns126 | 94.751 | 36.517 | 30.763 | |
| C04 | ns123 | 89.755 | 36.591 | 30.837 | |

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|---|---|---|---|---|---|
| C04 | BoSF2666 | 86.275 | 36.852 | 31.098 | |
| C04 | ns120 | 91.878 | 36.898 | 31.143 | |
| C04 | BoSF0613 | 71.737 | 40.860 | 31.744 | |
| C04 | BoSF0955 | 84.665 | 42.817 | 33.661 | |
| C04 | BnGMS0160b | 105.115 | 45.654 | 38.055 | |
| C04 | BoSF2838 | 110.630 | 47.462 | 39.909 | |
| C04 | BoSF1937 | 123.433 | 48.115 | 40.444 | |
| C04 | MR155 | 116.650 | 48.403 | 40.511 | |
| C04 | Ol11H02 | 113.012 | 48.327 | 40.657 | |
| C04 | BoSF1009 | 118.907 | 48.636 | 40.966 | |
| C04 | snap1360 | 110.352 | 48.735 | 41.065 | |
| C05 | BnEMS1131 | 0.000 | 1.694 | 1.718 | |
| C05 | sORH13 | 5.448 | 2.248 | 2.031 | |
| C05 | BoSF2552 | 8.620 | 2.441 | 2.480 | |
| C05 | BoSF0017 | 10.293 | 2.529 | 2.567 | |
| C05 | BoSF2607 | 11.844 | 2.589 | 2.656 | |
| C05 | BoSF1212a | 13.112 | 2.676 | 2.696 | |
| C05 | BoSF2676 | 24.230 | 4.226 | 25.541 | Translocation |
| C05 | BoGMS2688 | 26.693 | 4.328 | 25.457 | Translocation |
| C05 | BoSF1663 | 30.692 | 4.874 | 3.350 | |
| C05 | BoSF0022b | 31.957 | 5.088 | 3.564 | |
| C05 | CB10374 | 39.347 | 6.949 | 6.064 | |
| C05 | BoSF0230 | 43.716 | 7.443 | 6.663 | |
| C05 | Na12C01 | 50.373 | 10.659 | 16.976 | |
| C05 | BrSF0858a | 50.763 | 10.780 | 17.096 | |
| C05 | BoSF1969 | 52.018 | 12.576 | 17.714 | |
| C05 | BoSF2019 | 52.523 | 12.673 | 17.811 | |
| C05 | ns033 | 57.307 | | | |
| C05 | BoSF1918 | 58.273 | 16.685 | 11.982 | Translocation |
| C05 | BoSF0222 | 58.530 | | | |

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|---|---|---|---|---|---|
| C05 | sS2129 | 59.222 | 24.453 | 7.208 | Translocation |
| C05 | Na10D11 | 59.685 | 24.453 | 7.208 | Translocation |
| C05 | sS2131 | 60.020 | 25.701 | 8.855 | Translocation |
| C05 | BrSF0040 | 65.605 | | | |
| C05 | CB10170 | 60.990 | 30.174 | 20.318 | |
| C05 | BRAS040 | 67.332 | 30.992 | 21.135 | |
| C05 | BoSF0926b | 66.617 | 31.097 | 21.241 | |
| C06 | BoSF1665 | 16.453 | 1.430 | 2.715 | Inversion |
| C06 | BoSF0733 | 16.041 | 1.826 | 1.177 | Inversion |
| C06 | BoSF2316 | 17.657 | 2.958 | 0.045 | Inversion |
| C06 | ns337 | 0.000 | 3.219 | 14.644 | |
| C06 | ns326 | 6.954 | 3.220 | 14.644 | |
| C06 | BoSF0455b | 16.005 | 3.439 | 15.253 | |
| C06 | snap0695b | 30.252 | 12.456 | 30.949 | Translocation |
| C06 | BoSF0513 | 35.133 | 12.521 | 22.354 | |
| C06 | BoSF2395 | 35.624 | 12.714 | 22.161 | |
| C06 | BoSF1365 | 38.134 | 14.166 | | |
| C06 | Na12E01b | 42.790 | | | |
| C06 | snap1392 | 45.562 | 17.705 | | |
| C06 | snap1395 | 41.822 | 17.754 | | |
| C06 | BoSF1254 | 53.196 | 17.762 | | |
| C06 | BoSF0952b | 48.734 | 17.951 | 12.635 | Translocation |
| C06 | BrSF0784 | 51.508 | 17.991 | 12.676 | Translocation |
| C06 | BoSF0760 | 55.751 | 17.893 | 10.807 | Translocation |
| C06 | MR133.1 | 50.171 | 18.102 | 11.057 | Translocation |
| C06 | BoSF2506 | 54.529 | 18.766 | | |
| C06 | BoSF2507 | 52.558 | 18.782 | | |
| C06 | BoSF1126 | 59.954 | 20.394 | 24.496 | |
| C06 | BoSF2591 | 62.084 | 20.438 | 24.540 | |
| C06 | BoSF1406 | 76.301 | 29.433 | | |

| | | | | | |
|---|---|---|---|---|---|
| C06 | sR12387 | 75.964 | 29.486 | | |
| C06 | BoSF1144 | 76.919 | 29.502 | | |
| C06 | BoSF1951 | 82.591 | 30.587 | 32.127 | |
| C06 | BoSF1468 | 77.696 | 31.158 | 32.698 | |
| C06 | BnEMS0350 | 85.058 | 31.726 | 33.266 | |
| C06 | CNU331a | 93.683 | 34.190 | 37.415 | |
| C06 | Na10C06 | 99.642 | 34.268 | 37.425 | |
| C06 | ns347 | 109.710 | 34.497 | 37.645 | |
| C07 | CB10534 | 0.000 | 19.301 | | |
| C07 | BoSF0778 | 8.179 | | | |
| C07 | BoSF2740 | 10.544 | 26.053 | 28.351 | |
| C07 | BoSF2771 | 11.880 | 26.105 | 28.435 | |
| C07 | BoSF1559 | 14.550 | 26.895 | 29.290 | |
| C07 | BoSF1324 | 18.413 | 27.954 | 30.200 | |
| C07 | BrSF46-176b | 32.105 | 28.130 | 30.261 | |
| C07 | BoSF0783b | 20.299 | 28.889 | 31.005 | |
| C08 | ns067 | 0.000 | 4.950 | 7.683 | |
| C08 | BoSF0521 | 13.627 | 5.460 | 8.193 | |
| C08 | BoGMS1419 | 10.797 | 5.715 | 8.448 | |
| C08 | BoGMS0456 | 17.543 | 14.103 | 11.950 | |
| C08 | BoSF0586a | 16.909 | 14.437 | 12.284 | |
| C08 | BoSF2163 | 26.736 | 15.226 | 13.087 | |
| C08 | BoSF2274 | 18.771 | 15.779 | 13.721 | |
| C08 | BoSF2646 | 19.384 | 15.887 | 14.067 | |
| C08 | CB10053 | 19.920 | 15.990 | 14.170 | |
| C08 | BoSF1481 | 20.392 | 15.996 | 14.185 | |
| C08 | BoSF0554 | 21.849 | | | |
| C08 | BoSF2482 | 31.472 | 19.127 | 18.004 | |
| C08 | BnGMS0509 | 32.841 | 19.214 | 18.092 | |
| C08 | snap1382 | 36.239 | 19.654 | 18.249 | |

| | | | | | |
|---|---|---|---|---|---|
| C08 | BoSF2378 | 37.229 | 19.844 | 18.439 | |
| C08 | BoSF0023 | 38.467 | 19.959 | 18.543 | |
| C08 | BoSF2290 | 43.519 | 20.577 | 19.598 | |
| C08 | BoSF1926 | 56.797 | 25.513 | 27.397 | |
| C08 | BnEMS0020 | 53.391 | 25.537 | 27.421 | |
| C08 | BoSF2751 | 67.868 | 28.387 | 30.261 | |
| C08 | BoSF2347 | 66.166 | 28.805 | 30.671 | |
| C08 | BoSF2616 | 73.432 | 29.723 | 31.590 | |
| C08 | BoSF1222 | 74.824 | 29.991 | 31.839 | |
| C08 | BnSF287-186 | 80.555 | 31.123 | 33.033 | |
| C08 | niab129 | 81.512 | 31.176 | 33.096 | |
| C08 | BrSF0356 | 82.689 | 31.222 | 33.141 | |
| C08 | BrGMS0447 | 82.689 | 31.222 | 33.141 | |
| C08 | CB10179 | 85.290 | 31.401 | 33.365 | |
| C08 | IFLP021 | 92.111 | 33.288 | 35.630 | |
| C08 | BoSF0365 | 93.779 | 33.449 | 35.791 | |
| C08 | BnEMS1070 | 95.337 | 33.673 | 36.056 | |
| C08 | BoSF0448 | 98.532 | 33.921 | 36.345 | |
| C08 | BoSF1064 | 98.195 | 34.053 | 36.477 | |
| C08 | BoSF2073 | 100.968 | 34.348 | 36.862 | |
| C08 | BnEMS0606 | 103.818 | 34.941 | 37.507 | |
| C08 | sR5795 | 105.811 | 35.121 | 37.731 | |
| C08 | BN26A | 107.213 | 35.293 | 37.900 | |
| C08 | BoSF1920b | 107.181 | 35.299 | 37.907 | |
| C08 | BrSF0549a | 107.955 | 35.354 | 37.962 | |
| C08 | CB10092 | 111.915 | 36.037 | 38.689 | |
| C08 | BrSF53-712 | 115.583 | 36.106 | 38.751 | |
| C08 | CB10028 | 112.222 | 36.352 | 39.012 | |
| C09 | BoSF0980 | 0.000 | 7.970 | | |
| C09 | BoSF0336b | 3.403 | | | |

| | | | | | |
|---|---|---|---|---|---|
| C09 | BrSF54-590 | 4.620 | 13.856 | 5.104 | |
| C09 | BoSF2578 | 5.757 | 13.859 | 5.107 | |
| C09 | BoSF0948 | 8.847 | 14.614 | 5.862 | |
| C09 | BnGMS0213 | 9.795 | 14.254 | 6.222 | |
| C09 | BoSF1228 | 12.542 | 14.788 | 6.756 | |
| C09 | BoSF2748 | 13.646 | 15.359 | 7.435 | |
| C09 | BoSF1976 | 12.860 | 15.415 | 7.490 | |
| C09 | BoSF2398 | 11.199 | 15.549 | 7.624 | |
| C09 | BoSF1872 | 14.037 | 16.505 | 8.400 | |
| C09 | BoSF1810 | 15.929 | 17.958 | 9.738 | |
| C09 | BoGMS1561 | 17.108 | 18.047 | 9.827 | |
| C09 | BoSF1788 | 17.108 | 18.047 | 9.827 | |
| C09 | BrSF1008 | 16.810 | 18.115 | 9.895 | |
| C09 | BoSF1817 | 18.121 | 18.368 | 10.149 | |
| C09 | BoGMS1453 | 20.538 | 18.868 | 11.104 | |
| C09 | BoSF0040 | 20.538 | 18.868 | 11.104 | |
| C09 | BoSF2393 | 22.837 | 32.027 | 19.941 | |
| C09 | BoSF2774 | 23.578 | 32.123 | 20.037 | |
| C09 | BrSF0436a | 24.124 | 32.262 | 20.176 | |
| C09 | BoSF1647 | 22.397 | 32.391 | 20.452 | |
| C09 | BrSF0425b | 41.175 | 41.614 | 31.085 | |
| C09 | BoSF0185 | 39.731 | 41.667 | 31.156 | |
| C09 | BrSF0369 | 45.689 | 41.868 | 31.405 | |
| C09 | Ol12A04 | 38.407 | 41.998 | 31.535 | |
| C09 | BoGMS1473 | 49.680 | 42.762 | 31.542 | |
| C09 | BoSF0483 | 44.177 | 43.110 | 32.435 | |

**Table S5** ANOVA analysis of pod number and seed number per pod in five experiments.

| **Trait** | **Source** | **DF** | **SS** | **MS** | **F value** | **P value** | ***ϭ*** $^{2}$ | $h^{2}$ |
|---|---|---|---|---|---|---|---|---|
| PNb | Genotype | 183 | 1352503 | 7391 | 2.0 | 3.7E-11 | 277.9 | 0.45 |
| | Environment | 3 | 2257494 | 752498 | 269.1 | 1.9E-118 | 1355.9 | |
| | Genotype×Environment | 469 | 1902498 | 4056 | 1.5 | 3.0E-06 | 420.2 | |
| | Error | 748 | 2091418 | 2796 | | | 2796.0 | |
| PNm | Genotype | 183 | 88726 | 485 | 4.9 | 7.9E-55 | 20.9 | 0.65 |
| | Environment | 4 | 246328 | 61582 | 816.2 | 1.2E-271 | 111.3 | |
| | Genotype×Environment | 646 | 110737 | 171 | 2.3 | 2.3E-27 | 32.0 | |
| | Error | 751 | 56666 | 75 | | | 75.5 | |
| PNw | Genotype | 183 | 1788677 | 9774 | 2.0 | 9.1E-11 | 400.4 | 0.49 |
| | Environment | 3 | 1588670 | 529557 | 152.5 | 4.0E-77 | 950.3 | |
| | Genotype×Environment | 469 | 2330885 | 4970 | 1.4 | 6.5E-06 | 499.3 | |
| | Error | 748 | 2597027 | 3472 | | | 3472.0 | |
| SNPPb | Genotype | 183 | 4388 | 24 | 9.6 | 6.4E-113 | 1.6 | 0.82 |
| | Environment | 3 | 1741 | 580 | 235.8 | 2.1E-107 | 1.0 | |
| | Genotype×Environment | 469 | 1978 | 4 | 1.7 | 2.7E-11 | 0.6 | |
| | Error | 741 | 1823 | 2 | | | 2.5 | |
| SNPPm | Genotype | 183 | 6243 | 34 | 13.2 | 2.4E-148 | 1.9 | 0.83 |
| | Environment | 4 | 10539 | 2635 | 1038.2 | 4.3E-303 | 4.8 | |
| | Genotype×Environment | 652 | 3819 | 6 | 2.3 | 2.6E-28 | 1.1 | |
| | Error | 746 | 1893 | 3 | | | 2.5 | |
| SNPPw | Genotype | 183 | 4522 | 25 | 11.7 | 6.4E-134 | 1.7 | 0.83 |
| | Environment | 3 | 2031 | 677 | 324.9 | 1.0E-134 | 1.2 | |
| | Genotype×Environment | 470 | 1940 | 4 | 2.0 | 3.7E-17 | 0.7 | |
| | Error | 743 | 1548 | 2 | | | 2.1 | |

**Table S6A** List of all detected QTLs at both significant and suggestive level for pod number and seed number per pod.

| Trait_name | Experiments | Linkage_groups | Position | Interval | Additive_effect | Dominant effect | LOD_value | *R* ^2 | Level |
|---|---|---|---|---|---|---|---|---|---|
| Pod number | W10F2:3m | A01 | 104.1 | 94.3-104.5 | -4.31 | 2.24 | 3.0 | 12.6% | Significant |
| Pod number | X11F2:3m | A01 | 104.7 | 104.2-105.8 | -5.48 | 2.79 | 3.0 | 12.5% | Significant |
| Pod number | W11F2:3b | A03 | 33.5 | 31.9-39.3 | -7.75 | 7.52 | 2.8 | 2.8% | Suggestive |
| Pod number | W11F2:3w | A03 | 61.5 | 57.5-61.9 | -9.65 | 7.90 | 3.6 | 3.0% | Significant |
| Pod number | W11F2:3m | A03 | 81.6 | 64.6-98 | -1.73 | -6.23 | 3.8 | 3.4% | Significant |
| Pod number | W09F2m | A05 | 10.8 | 4-13.8 | -4.67 | 9.17 | 3.4 | 12.6% | Significant |
| Pod number | W10F2:3m | A06 | 86.3 | 82.8-92.6 | -7.40 | -2.70 | 9.9 | 23.9% | Significant |
| Pod number | W11F2:3m | A06 | 86.3 | 82.8-92.4 | -6.70 | -2.50 | 6.9 | 20.5% | Significant |
| Pod number | X11F2:3m | A06 | 86.3 | 82.6-93.0 | -3.96 | -1.48 | 7.7 | 24.0% | Significant |
| Pod number | X11F2:4m | A06 | 86.3 | 82.6-92.5 | -6.09 | -3.28 | 8.0 | 22.6% | Significant |
| Pod number | X11F2:3w | A09 | 44 | 34.5-46.4 | 4.02 | -7.55 | 2.6 | 2.0% | Suggestive |
| Pod number | X11F2:3b | A09 | 44 | 37.8-46.1 | 4.09 | -6.84 | 2.7 | 2.6% | Suggestive |
| Pod number | W11F2:3m | C02 | 5.1 | 3.2-17.4 | -2.34 | 3.02 | 4.0 | 17.8% | Significant |
| Pod number | X11F2:3m | C02 | 9.8 | 5.5-21.5 | -6.25 | 3.19 | 4.6 | 19.0% | Significant |
| Pod number | W10F2:3m | C02 | 9.8 | 5.8-18.2 | -6.82 | 2.51 | 4.4 | 18.6% | Significant |
| Pod number | W09F2m | C02 | 107.6 | 100.4-113.6 | -0.83 | 7.51 | 2.9 | 2.0% | Suggestive |
| Pod number | W11F2:3b | C03 | 11.4 | 5.9-12.6 | -2.56 | -8.49 | 2.7 | 2.1% | Suggestive |
| Pod number | X11F2:3w | C03 | 128.4 | 112-132.2 | -6.34 | -8.78 | 2.6 | 2.0% | Suggestive |
| Pod number | W10F2:3m | C06 | 51.2 | 49.1-53 | 5.78 | -6.20 | 4.2 | 11.8% | Significant |
| Pod number | W11F2:3m | C06 | 51.2 | 49.4-53 | 8.80 | -8.75 | 4.6 | 18.2% | Significant |
| Seed number per pod | X11F2:3b | A01 | 17.3 | 12.4-23.2 | -1.01 | -1.05 | 4.2 | 8.8% | Significant |
| Seed number per pod | X11F2:4b | A01 | 113.9 | 109.7-116.2 | -0.83 | 1.03 | 4.1 | 3.1% | Significant |
| Seed number per pod | X11F2:4m | A01 | 113.9 | 106.6-117.7 | -0.94 | 1.13 | 3.1 | 2.2% | Suggestive |
| Seed number per pod | X11F2:4w | A01 | 113.9 | 108.1-116.6 | -0.89 | 1.09 | 4.0 | 2.9% | Significant |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Seed number per pod | W10F2:3b | A02 | 6.1 | 0.4-12.8 | 0.28 | 0.77 | 4.2 | 3.7% | Suggestive |
| Seed number per pod | W10F2:3w | A02 | 6.1 | 0.7-17.6 | 0.44 | 0.75 | 5.2 | 6.9% | Significant |
| Seed number per pod | X11F2:4m | A02 | 21.1 | 19.9-23.3 | -0.34 | 0.88 | 3.6 | 2.3% | Suggestive |
| Seed number per pod | X11F2:4b | A02 | 43.1 | 36.2-45.9 | 0.94 | -0.59 | 4.4 | 6.5% | Significant |
| Seed number per pod | X11F2:4m | A02 | 43.1 | 37.8-45.2 | 1.27 | -0.64 | 7.2 | 6.9% | Significant |
| Seed number per pod | X11F2:4w | A02 | 43.1 | 36.2-45.5 | 1.13 | -0.68 | 5.9 | 7.7% | Significant |
| Seed number per pod | X11F2:4m | A02 | 81.6 | 79.7-82.9 | 0.24 | 0.08 | 3.9 | 3.9% | Significant |
| Seed number per pod | X11F2:4w | A02 | 81.6 | 80.2-82.9 | 0.40 | 0.04 | 4.6 | 4.6% | Significant |
| Seed number per pod | X11F2:3m | A03 | 14.1 | 12-20.1 | -1.73 | 1.33 | 4.3 | 6.3% | Significant |
| Seed number per pod | X11F2:3b | A03 | 118 | 116-123.7 | -0.92 | 1.67 | 3.3 | 5.6% | Suggestive |
| Seed number per pod | X11F2:3w | A03 | 118 | 116-121.9 | -0.71 | 1.51 | 3.0 | 3.0% | Suggestive |
| Seed number per pod | X11F2:3m | A05 | 0 | 0-1.8 | 0.69 | -1.59 | 3.9 | 3.5% | Suggestive |
| Seed number per pod | X11F2:4b | A05 | 8.8 | 4.2-13.7 | -0.89 | 1.32 | 4.1 | 4.8% | Significant |
| Seed number per pod | X11F2:4w | A05 | 8.8 | 4.1-13.5 | -1.04 | 1.48 | 4.4 | 5.3% | Significant |
| Seed number per pod | X11F2:4m | A05 | 10.8 | 6.8-14 | -1.15 | 1.60 | 4.0 | 4.2% | Significant |
| Seed number per pod | W10F2:3b | A06 | 89.9 | 85.3-97.5 | 1.56 | 0.40 | 8.0 | 28.1% | Significant |
| Seed number per pod | W11F2:3b | A06 | 89.9 | 85.4-97.6 | 1.36 | 0.69 | 7.7 | 22.4% | Significant |
| Seed number per pod | X11F2:3b | A06 | 89.9 | 85.0-96.9 | 1.88 | 0.55 | 4.7 | 31.5% | Significant |
| Seed number per pod | X11F2:4b | A06 | 89.9 | 85.3-96.3 | 2.29 | 0.53 | 16.4 | 39.4% | Significant |
| Seed number per pod | W09F2m | A06 | 89.9 | 85.2-96.3 | 2.15 | 0.86 | 10.0 | 25.6% | Significant |
| Seed number per pod | W10F2:3m | A06 | 89.9 | 85.5-96.3 | 1.97 | 0.51 | 10.4 | 28.1% | Significant |
| Seed number per pod | W11F2:3m | A06 | 89.9 | 85.3-96.3 | 1.84 | 0.69 | 13.4 | 34.6% | Significant |
| Seed number per pod | X11F2:3m | A06 | 89.9 | 85.4-96.3 | 2.40 | 0.31 | 11.3 | 44.7% | Significant |
| Seed number per pod | X11F2:4m | A06 | 89.9 | 85.3-96.3 | 2.49 | 0.56 | 21.8 | 43.6% | Significant |
| Seed number per pod | W10F2:3w | A06 | 89.9 | 85.4-97.0 | 1.66 | 0.56 | 9.8 | 24.0% | Significant |
| Seed number per pod | W11F2:3w | A06 | 89.9 | 85.3-97.1 | 1.54 | 0.64 | 10.3 | 27.7% | Significant |
| Seed number per pod | X11F2:3w | A06 | 89.9 | 85.1-97.4 | 2.17 | 0.63 | 7.2 | 37.4% | Significant |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Seed number per pod | X11F2:4w | A06 | 89.9 | 85.3-96.8 | 2.24 | 0.73 | 11.9 | 29.6% | Significant |
| Seed number per pod | W11F2:3b | A07 | 5.7 | 3.7-15.9 | 0.76 | 0.48 | 5.4 | 6.8% | Significant |
| Seed number per pod | W11F2:3w | A07 | 7.7 | 3.7-15.8 | 0.74 | 0.57 | 6.3 | 7.1% | Significant |
| Seed number per pod | X11F2:4b | A07 | 50.9 | 35.8-53.7 | 0.72 | 0.23 | 6.3 | 15.0% | Suggestive |
| Seed number per pod | W10F2:3b | A07 | 53.7 | 48.1-59.1 | 0.73 | 0.94 | 10.2 | 16.2% | Significant |
| Seed number per pod | W10F2:3w | A07 | 55.7 | 47.9-61.2 | 0.75 | 0.61 | 7.2 | 17.7% | Significant |
| Seed number per pod | W11F2:3b | A07 | 57.2 | 45.4-59.6 | 1.25 | 0.69 | 6.4 | 14.2% | Suggestive |
| Seed number per pod | W11F2:3m | A07 | 73.6 | 69.6-77.8 | 0.27 | 0.75 | 4.2 | 3.9% | Significant |
| Seed number per pod | W11F2:3w | A07 | 75.8 | 69.6-78.7 | 0.39 | 0.18 | 2.9 | 2.7% | Suggestive |
| Seed number per pod | W10F2:3m | A07 | 77.8 | 73.6-78.8 | 0.78 | 0.62 | 4.5 | 4.9% | Significant |
| Seed number per pod | X11F2:3b | A09 | 52 | 42.3-54.1 | 1.09 | -0.50 | 3.6 | 3.4% | Suggestive |
| Seed number per pod | W11F2:3b | A09 | 68.5 | 62.5-74 | 0.66 | 0.17 | 3.9 | 5.8% | Significant |
| Seed number per pod | W11F2:3w | A09 | 68.9 | 62.5-76.2 | 0.52 | 0.13 | 3.2 | 4.0% | Suggestive |
| Seed number per pod | W11F2:3w | C02 | 5.8 | 2-18.1 | -0.71 | -0.13 | 3.8 | 6.7% | Significant |
| Seed number per pod | W11F2:3b | C06 | 49.6 | 47.8-58.2 | 0.75 | 0.73 | 3.6 | 3.9% | Suggestive |
| Seed number per pod | W11F2:3w | C06 | 57.2 | 48-58.2 | 0.68 | 0.04 | 3.8 | 5.5% | Significant |
| Seed number per pod | W10F2:3w | C06 | 13.5 | 11.5-17.5 | 0.98 | -1.00 | 4.5 | 7.0% | Significant |
| Seed number per pod | W10F2:3b | C06 | 19.7 | 16.9-21.7 | 1.09 | -1.04 | 4.7 | 10.2% | Significant |

**Table S6B** List of identified QTLs after deleting non-reproducible suggestive QTLs for pod number and seed number per pod.

| Identified_QTL | Trait_name | Experiments | Linkage_group | Position | Interval | Additive_effect | Dominant effect | LOD_value | *R* ^2 | Level |
|---|---|---|---|---|---|---|---|---|---|---|
| qPN01 | Pod number | W10F2:3m | A01 | 104.1 | 94.3-104.5 | -4.31 | 2.24 | 3.0 | 12.6% | Significant |
| qPN02 | Pod number | X11F2:3m | A01 | 104.7 | 104.2-105.8 | -5.48 | 2.79 | 3.0 | 12.5% | Significant |
| Delelte | Pod number | W11F2:3b | A03 | 33.5 | 31.9-39.3 | -7.75 | 7.52 | 2.8 | 2.8% | Suggestive |
| qPN03 | Pod number | W11F2:3w | A03 | 61.5 | 57.5-61.9 | -9.65 | 7.90 | 3.6 | 3.0% | Significant |
| qPN04 | Pod number | W11F2:3m | A03 | 81.6 | 64.6-98 | -1.73 | -6.23 | 3.8 | 3.4% | Significant |
| qPN05 | Pod number | W09F2m | A05 | 10.8 | 4-13.8 | -4.67 | 9.17 | 3.4 | 12.6% | Significant |
| qPN06 | Pod number | W10F2:3m | A06 | 86.3 | 82.8-92.6 | -7.40 | -2.70 | 9.9 | 23.9% | Significant |
| qPN07 | Pod number | W11F2:3m | A06 | 86.3 | 82.8-92.4 | -6.70 | -2.50 | 6.9 | 20.5% | Significant |
| qPN08 | Pod number | X11F2:3m | A06 | 86.3 | 82.6-93.0 | -3.96 | -1.48 | 7.7 | 24.0% | Significant |
| qPN09 | Pod number | X11F2:4m | A06 | 86.3 | 82.6-92.5 | -6.09 | -3.28 | 8.0 | 22.6% | Significant |
| qPN10 | Pod number | X11F2:3w | A09 | 44 | 34.5-46.4 | 4.02 | -7.55 | 2.6 | 2.0% | Suggestive |
| qPN11 | Pod number | X11F2:3b | A09 | 44 | 37.8-46.1 | 4.09 | -6.84 | 2.7 | 2.6% | Suggestive |
| qPN12 | Pod number | W11F2:3m | C02 | 5.1 | 3.2-17.4 | -2.34 | 3.02 | 4.0 | 17.8% | Significant |
| qPN13 | Pod number | X11F2:3m | C02 | 9.8 | 5.5-21.5 | -6.25 | 3.19 | 4.6 | 19.0% | Significant |
| qPN14 | Pod number | W10F2:3m | C02 | 9.8 | 5.8-18.2 | -6.82 | 2.51 | 4.4 | 18.6% | Significant |
| Delelte | Pod number | W09F2m | C02 | 107.6 | 100.4-113.6 | -0.83 | 7.51 | 2.9 | 2.0% | Suggestive |
| Delelte | Pod number | W11F2:3b | C03 | 11.4 | 5.9-12.6 | -2.56 | -8.49 | 2.7 | 2.1% | Suggestive |
| Delelte | Pod number | X11F2:3w | C03 | 128.4 | 112-132.2 | -6.34 | -8.78 | 2.6 | 2.0% | Suggestive |
| qPN15 | Pod number | W10F2:3m | C06 | 51.2 | 49.1-53 | 5.78 | -6.20 | 4.2 | 11.8% | Significant |
| qPN16 | Pod number | W11F2:3m | C06 | 51.2 | 49.4-53 | 8.80 | -8.75 | 4.6 | 18.2% | Significant |
| qSN01 | Seed number per pod | X11F2:3b | A01 | 17.3 | 12.4-23.2 | -1.01 | -1.05 | 4.2 | 8.8% | Significant |
| qSN02 | Seed number per pod | X11F2:4b | A01 | 113.9 | 109.7-116.2 | -0.83 | 1.03 | 4.1 | 3.1% | Significant |
| qSN03 | Seed number per pod | X11F2:4m | A01 | 113.9 | 106.6-117.7 | -0.94 | 1.13 | 3.1 | 2.2% | Suggestive |
| qSN04 | Seed number per pod | X11F2:4w | A01 | 113.9 | 108.1-116.6 | -0.89 | 1.09 | 4.0 | 2.9% | Significant |
| qSN05 | Seed number per pod | W10F2:3b | A02 | 6.1 | 0.4-12.8 | 0.28 | 0.77 | 4.2 | 3.7% | Suggestive |
| qSN06 | Seed number per pod | W10F2:3w | A02 | 6.1 | 0.7-17.6 | 0.44 | 0.75 | 5.2 | 6.9% | Significant |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Delelte | Seed number per pod | X11F2:4m | A02 | 21.1 | 19.9-23.3 | -0.34 | 0.88 | 3.6 | 2.3% | Suggestive |
| qSN07 | Seed number per pod | X11F2:4b | A02 | 43.1 | 36.2-45.9 | 0.94 | -0.59 | 4.4 | 6.5% | Significant |
| qSN08 | Seed number per pod | X11F2:4m | A02 | 43.1 | 37.8-45.2 | 1.27 | -0.64 | 7.2 | 6.9% | Significant |
| qSN09 | Seed number per pod | X11F2:4w | A02 | 43.1 | 36.2-45.5 | 1.13 | -0.68 | 5.9 | 7.7% | Significant |
| qSN10 | Seed number per pod | X11F2:4m | A02 | 81.6 | 79.7-82.9 | 0.24 | 0.08 | 3.9 | 3.9% | Significant |
| qSN11 | Seed number per pod | X11F2:4w | A02 | 81.6 | 80.2-82.9 | 0.40 | 0.04 | 4.6 | 4.6% | Significant |
| qSN12 | Seed number per pod | X11F2:3m | A03 | 14.1 | 12-20.1 | -1.73 | 1.33 | 4.3 | 6.3% | Significant |
| qSN13 | Seed number per pod | X11F2:3b | A03 | 118 | 116-123.7 | -0.92 | 1.67 | 3.3 | 5.6% | Suggestive |
| qSN14 | Seed number per pod | X11F2:3w | A03 | 118 | 116-121.9 | -0.71 | 1.51 | 3.0 | 3.0% | Suggestive |
| Delelte | Seed number per pod | X11F2:3m | A05 | 0 | 0-1.8 | 0.69 | -1.59 | 3.9 | 3.5% | Suggestive |
| qSN15 | Seed number per pod | X11F2:4b | A05 | 8.8 | 4.2-13.7 | -0.89 | 1.32 | 4.1 | 4.8% | Significant |
| qSN16 | Seed number per pod | X11F2:4w | A05 | 8.8 | 4.1-13.5 | -1.04 | 1.48 | 4.4 | 5.3% | Significant |
| qSN17 | Seed number per pod | X11F2:4m | A05 | 10.8 | 6.8-14 | -1.15 | 1.60 | 4.0 | 4.2% | Significant |
| qSN18 | Seed number per pod | W10F2:3b | A06 | 88.9 | 85.3-97.5 | 1.56 | 0.40 | 8.0 | 28.1% | Significant |
| qSN19 | Seed number per pod | W11F2:3b | A06 | 88.9 | 85.4-97.6 | 1.36 | 0.69 | 7.7 | 22.4% | Significant |
| qSN20 | Seed number per pod | X11F2:3b | A06 | 88.9 | 85.0-96.9 | 1.88 | 0.55 | 4.7 | 31.5% | Significant |
| qSN21 | Seed number per pod | X11F2:4b | A06 | 88.9 | 85.3-96.3 | 2.29 | 0.53 | 16.4 | 39.4% | Significant |
| qSN22 | Seed number per pod | W09F2m | A06 | 88.9 | 85.2-96.3 | 2.15 | 0.86 | 10.0 | 25.6% | Significant |
| qSN23 | Seed number per pod | W10F2:3m | A06 | 88.9 | 85.5-96.3 | 1.97 | 0.51 | 10.4 | 28.1% | Significant |
| qSN24 | Seed number per pod | W11F2:3m | A06 | 88.9 | 85.3-96.3 | 1.84 | 0.69 | 13.4 | 34.6% | Significant |
| qSN25 | Seed number per pod | X11F2:3m | A06 | 88.9 | 85.4-96.3 | 2.40 | 0.31 | 11.3 | 44.7% | Significant |
| qSN26 | Seed number per pod | X11F2:4m | A06 | 88.9 | 85.3-96.3 | 2.49 | 0.56 | 21.8 | 43.6% | Significant |
| qSN27 | Seed number per pod | W10F2:3w | A06 | 88.9 | 85.4-97 | 1.66 | 0.56 | 9.8 | 24.0% | Significant |
| qSN28 | Seed number per pod | W11F2:3w | A06 | 88.9 | 85.3-97.1 | 1.54 | 0.64 | 10.3 | 27.7% | Significant |
| qSN29 | Seed number per pod | X11F2:3w | A06 | 88.9 | 85.1-97.4 | 2.17 | 0.63 | 7.2 | 37.4% | Significant |
| qSN30 | Seed number per pod | X11F2:4w | A06 | 88.9 | 85.3-96.8 | 2.24 | 0.73 | 11.9 | 29.6% | Significant |
| qSN31 | Seed number per pod | W11F2:3b | A07 | 5.7 | 3.7-15.9 | 0.76 | 0.48 | 5.4 | 6.8% | Significant |
| qSN32 | Seed number per pod | W11F2:3w | A07 | 7.7 | 3.7-15.8 | 0.74 | 0.57 | 6.3 | 7.1% | Significant |
| qSN33 | Seed number per pod | X11F2:4b | A07 | 50.9 | 35.8-53.7 | 0.72 | 0.23 | 6.3 | 15.0% | Suggestive |
| qSN34 | Seed number per pod | W10F2:3b | A07 | 53.7 | 48.1-59.1 | 0.73 | 0.94 | 10.2 | 16.2% | Significant |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| qSN35 | Seed number per pod | W10F2:3w | A07 | 55.7 | 47.9-61.2 | 0.75 | 0.61 | 7.2 | 17.7% | Significant |
| qSN36 | Seed number per pod | W11F2:3b | A07 | 57.2 | 45.4-59.6 | 1.25 | 0.69 | 6.4 | 14.2% | Suggestive |
| qSN37 | Seed number per pod | W11F2:3m | A07 | 73.6 | 69.6-77.8 | 0.27 | 0.75 | 4.2 | 3.9% | Significant |
| qSN38 | Seed number per pod | W11F2:3w | A07 | 75.8 | 69.6-78.7 | 0.39 | 0.18 | 2.9 | 2.7% | Suggestive |
| qSN39 | Seed number per pod | W10F2:3m | A07 | 77.8 | 73.6-78.8 | 0.78 | 0.62 | 4.5 | 4.9% | Significant |
| Delelte | Seed number per pod | X11F2:3b | A09 | 52 | 42.3-54.1 | 1.09 | -0.50 | 3.6 | 3.4% | Suggestive |
| qSN40 | Seed number per pod | W11F2:3b | A09 | 68.5 | 62.5-74 | 0.66 | 0.17 | 3.9 | 5.8% | Significant |
| qSN41 | Seed number per pod | W11F2:3w | A09 | 68.9 | 62.5-76.2 | 0.52 | 0.13 | 3.2 | 4.0% | Suggestive |
| qSN42 | Seed number per pod | W11F2:3w | C02 | 5.8 | 2-18.1 | -0.71 | -0.13 | 3.8 | 6.7% | Significant |
| qSN43 | Seed number per pod | W11F2:3b | C06 | 49.6 | 47.8-58.2 | 0.75 | 0.73 | 3.6 | 3.9% | Suggestive |
| qSN44 | Seed number per pod | W11F2:3w | C06 | 57.2 | 48-58.2 | 0.68 | 0.04 | 3.8 | 5.5% | Significant |
| qSN45 | Seed number per pod | W10F2:3w | C06 | 13.5 | 11.5-17.5 | 0.98 | -1.00 | 4.5 | 7.0% | Significant |
| qSN46 | Seed number per pod | W10F2:3b | C06 | 19.7 | 16.9-21.7 | 1.09 | -1.04 | 4.7 | 10.2% | Significant |

**Table S6C** List of consensus-QTL after the integration of reproducible identified-QTLs for pod number and seed number per pod, respectively.

| **Consensus QTL** | **Identified QTL** | **Experiment code** | **Linkage group** | **Peak Position** | **Confidence Interval** | **Additive effect** | **Dominant effect** | **LOD value** | ***R*** **^2** |
|---|---|---|---|---|---|---|---|---|---|
| | qPN01 | W10F2:3m | A01 | 104.1 | 94.3-104.5 | -4.31 | 2.24 | 3.0 | 12.6% |
| | qPN02 | X11F2:3m | A01 | 104.7 | 104.2-105.8 | -5.48 | 2.79 | 3.0 | 12.5% |
| ***qPN.A01-1*** | | **W10F2:3m/X11F2:3m** | **A01** | **104.4** | **94.3-105.8** | **-4.90** | **2.52** | **3.0** | **12.5%** |
| ***qPN.A03-1*** | **qPN03** | **W11F2:3w** | **A03** | **61.5** | **57.5-61.9** | **-9.65** | **7.90** | **3.6** | **3.0%** |
| ***qPN.A03-2*** | **qPN04** | **W11F2:3m** | **A03** | **81.6** | **64.6-98** | **-1.73** | **-6.23** | **3.8** | **3.4%** |
| ***qPN.A05-1*** | **qPN05** | **W09F2m** | **A05** | **10.8** | **4-13.8** | **-4.67** | **9.17** | **3.4** | **12.6%** |
| | qPN06 | W10F2:3m | A06 | 86.3 | 82.8-92.6 | -7.40 | -2.70 | 9.9 | 23.9% |
| | qPN07 | W11F2:3m | A06 | 86.3 | 82.8-92.4 | -6.70 | -2.50 | 6.9 | 20.5% |
| | qPN08 | X11F2:3m | A06 | 86.3 | 82.6-93.0 | -3.96 | -1.48 | 7.7 | 24.0% |
| | qPN09 | X11F2:4m | A07 | 86.3 | 82.6-92.5 | -6.09 | -3.28 | 8.0 | 22.6% |
| ***qPN.A06-1*** | | **W10F2:3m/W11F2:3m/X11F2:3m/X11F2:4m** | **A06** | **86.3** | **82.6-93.0** | **-6.04** | **-2.49** | **8.1** | **22.8%** |
| | qPN10 | X11F2:3w | A09 | 44.0 | 34.5-46.4 | 4.02 | -7.55 | 2.6 | 2.0% |
| | qPN11 | X11F2:3b | A09 | 44.0 | 37.8-46.1 | 4.09 | -6.84 | 2.7 | 2.6% |
| ***qPN.A09-1*** | | **X11F2:3bw** | **A09** | **44.0** | **42.5-54.4** | **4.05** | **-7.20** | **2.7** | **2.3%** |
| | qPN12 | W11F2:3m | C02 | 5.1 | 3.2-17.4 | -2.34 | 3.02 | 4.0 | 17.8% |
| | qPN13 | X11F2:3m | C02 | 9.8 | 5.5-21.5 | -6.25 | 3.19 | 4.6 | 19.0% |
| | qPN14 | W10F2:3m | C02 | 9.8 | 5.8-18.2 | -6.82 | 2.51 | 4.4 | 18.6% |
| ***qPN.C02-1*** | | **W10F2:3m/W11F2:3m/X11F2:3m** | **C02** | **8.2** | **3.2-21.5** | **-5.14** | **2.91** | **4.3** | **18.5%** |
| | qPN15 | W10F2:3m | C06 | 51.2 | 49.1-53 | 5.78 | -6.20 | 4.2 | 11.8% |
| | qPN16 | W11F2:3m | C06 | 51.2 | 49.4-53 | 8.80 | -8.75 | 4.6 | 18.2% |
| ***qPN.C06-1*** | | **W10F2:3m/W11F2:3m** | **C06** | **51.2** | **49.1-53.0** | **7.29** | **-7.48** | **4.4** | **15.0%** |
| ***qSN.A01-1*** | **qSN01** | **X11F2:3b** | **A01** | **17.3** | **12.4-23.2** | **-1.01** | **-1.05** | **4.2** | **8.8%** |
| | qSN02 | X11F2:4b | A01 | 113.9 | 109.7-116.2 | -0.83 | 1.03 | 4.1 | 3.1% |
| | qSN03 | X11F2:4m | A01 | 113.9 | 106.6-117.7 | -0.94 | 1.13 | 3.1 | 2.2% |
| | qSN04 | X11F2:4w | A01 | 113.9 | 108.1-116.6 | -0.89 | 1.09 | 4.0 | 2.9% |

|  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|
| ***qSN.A01-2*** |  | **X11F2:4bmw** | **A01** | **113.9** | **106.6-117.7** | **-0.89** | **1.09** | **3.7** | **2.7%** |
|  | qSN05 | W10F2:3b | A02 | 6.1 | 0.4-12.8 | 0.28 | 0.77 | 4.2 | 3.7% |
|  | qSN06 | W10F2:3w | A02 | 6.1 | 0.7-17.6 | 0.44 | 0.75 | 5.2 | 6.9% |
| ***qSN.A02-1*** |  | **W10F2:3bw** | **A02** | **6.1** | **0.4-17.6** | **0.36** | **0.76** | **4.7** | **5.3%** |
|  | qSN07 | X11F2:4b | A02 | 43.1 | 36.2-45.9 | 0.94 | -0.59 | 4.4 | 6.5% |
|  | qSN08 | X11F2:4m | A02 | 43.1 | 37.8-45.2 | 1.27 | -0.64 | 7.2 | 6.9% |
|  | qSN09 | X11F2:4w | A02 | 43.1 | 36.2-45.5 | 1.13 | -0.68 | 5.9 | 7.7% |
| ***qSN.A02-2*** |  | **X11F2:4bmw** | **A02** | **43.1** | **36.2-45.9** | **1.11** | **-0.64** | **5.8** | **7.0%** |
|  | qSN10 | X11F2:4m | A02 | 81.6 | 79.7-82.9 | 0.24 | 0.08 | 3.9 | 3.9% |
|  | qSN11 | X11F2:4w | A02 | 81.6 | 80.2-82.9 | 0.40 | 0.04 | 4.6 | 4.6% |
| ***qSN.A02-3*** |  | **X11F2:4mw** | **A02** | **81.6** | **79.7-82.9** | **0.32** | **0.06** | **4.2** | **4.3%** |
| ***qSN.A03-1*** | **qSN12** | **X11F2:3m** | **A03** | **14.1** | **12-20.1** | **-1.73** | **1.33** | **4.3** | **6.3%** |
|  | qSN13 | X11F2:3b | A03 | 118.0 | 116.0-123.7 | -0.92 | 1.67 | 3.3 | 5.6% |
|  | qSN14 | X11F2:3w | A03 | 118.0 | 116.0-121.9 | -0.71 | 1.51 | 3.0 | 3.0% |
| ***qSN.A03-2*** |  | **X11F2:3bw** | **A03** | **118.0** | **116.0-123.7** | **-0.82** | **1.59** | **3.1** | **4.3%** |
|  | qSN15 | X11F2:4b | A05 | 8.8 | 4.2-13.7 | -0.89 | 1.32 | 4.1 | 4.8% |
|  | qSN16 | X11F2:4w | A05 | 8.8 | 4.1-13.5 | -1.04 | 1.48 | 4.4 | 5.3% |
|  | qSN17 | X11F2:4m | A05 | 10.8 | 6.8-14 | -1.15 | 1.60 | 4.0 | 4.2% |
| ***qSN.A05-1*** |  | **X11F2:4bmw** | **A05** | **9.5** | **4.1-13.7** | **-1.03** | **1.47** | **4.1** | **4.7%** |
|  | qSN18 | W10F2:3b | A06 | 88.9 | 85.3-97.5 | 1.56 | 0.40 | 8.0 | 28.1% |
|  | qSN19 | W11F2:3b | A06 | 88.9 | 85.4-97.6 | 1.36 | 0.69 | 7.7 | 22.4% |
|  | qSN20 | X11F2:3b | A06 | 88.9 | 85.0-96.9 | 1.88 | 0.55 | 4.7 | 31.5% |
|  | qSN21 | X11F2:4b | A06 | 88.9 | 85.3-96.3 | 2.29 | 0.53 | 16.4 | 39.4% |
|  | qSN22 | W09F2m | A06 | 88.9 | 85.2-96.3 | 2.15 | 0.86 | 10.0 | 25.6% |
|  | qSN23 | W10F2:3m | A06 | 88.9 | 85.5-96.3 | 1.97 | 0.51 | 10.4 | 28.1% |
|  | qSN24 | W11F2:3m | A06 | 88.9 | 85.3-96.3 | 1.84 | 0.69 | 13.4 | 34.6% |
|  | qSN25 | X11F2:3m | A06 | 88.9 | 85.4-96.3 | 2.40 | 0.31 | 11.3 | 44.7% |
|  | qSN26 | X11F2:4m | A06 | 88.9 | 85.3-96.3 | 2.49 | 0.56 | 21.8 | 43.6% |
|  | qSN27 | W10F2:3w | A06 | 88.9 | 85.4-97 | 1.66 | 0.56 | 9.8 | 24.0% |
|  | qSN28 | W11F2:3w | A06 | 88.9 | 85.3-97.1 | 1.54 | 0.64 | 10.3 | 27.7% |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | qSN29 | X11F2:3w | A06 | 88.9 | 85.1-97.4 | 2.17 | 0.63 | 7.2 | 37.4% |
| | qSN30 | X11F2:4w | A06 | 88.9 | 85.3-96.8 | 2.24 | 0.73 | 11.9 | 29.6% |
| ***qSN.A06-1*** | | **W09F2m/W10F2:3bmw/W11F2:3bmw/X11F2:3bmw/X11F2:4bn** | **A06** | **88.9** | **85.0-97.6** | **2.00** | **0.60** | **11.2** | **32.4%** |
| | qSN31 | W11F2:3b | A07 | 5.7 | 3.7-15.9 | 0.76 | 0.48 | 5.4 | 6.8% |
| | qSN32 | W11F2:3w | A07 | 7.7 | 3.7-15.8 | 0.74 | 0.57 | 6.3 | 7.1% |
| ***qSN.A07-1*** | | **W11F2:3bw** | **A07** | **6.7** | **3.7-15.9** | **0.75** | **0.53** | **5.9** | **6.9%** |
| | qSN33 | X11F2:4b | A07 | 50.9 | 35.8-53.7 | 0.72 | 0.23 | 6.3 | 15.0% |
| | qSN34 | W10F2:3b | A07 | 53.7 | 48.1-59.1 | 0.73 | 0.94 | 10.2 | 16.2% |
| | qSN35 | W10F2:3w | A07 | 55.7 | 47.9-61.2 | 0.75 | 0.61 | 7.2 | 17.7% |
| | qSN36 | W11F2:3b | A07 | 57.2 | 45.4-59.6 | 1.25 | 0.69 | 6.4 | 14.2% |
| ***qSN.A07-2*** | | **W10F2:3bw/W11F2:3b/X11F2:4b** | **A07** | **54.4** | **35.8-61.1** | **0.86** | **0.62** | **7.5** | **15.8%** |
| | qSN37 | W11F2:3m | A07 | 73.6 | 69.6-77.8 | 0.27 | 0.75 | 4.2 | 3.9% |
| | qSN38 | W11F2:3w | A07 | 75.8 | 69.6-78.7 | 0.39 | 0.18 | 2.9 | 2.7% |
| | qSN39 | W10F2:3m | A07 | 77.8 | 73.6-78.8 | 0.78 | 0.62 | 4.5 | 4.9% |
| ***qSN.A07-3*** | | **W10F2:3m/W11F2:3mw** | **A07** | **75.7** | **69.6-78.8** | **0.48** | **0.52** | **3.9** | **3.8%** |
| | qSN40 | W11F2:3b | A09 | 68.5 | 62.5-74 | 0.66 | 0.17 | 3.9 | 5.8% |
| | qSN41 | W11F2:3w | A09 | 68.9 | 62.5-76.2 | 0.52 | 0.13 | 3.2 | 4.0% |
| ***qSN.A09-1*** | | **W11F2:3bw** | **A09** | **68.7** | **68.5-82.2** | **0.59** | **0.15** | **3.6** | **4.9%** |
| ***qSN.C02-1*** | **qSN42** | **W11F2:3w** | **C02** | **5.8** | **2-18.1** | **-0.71** | **-0.13** | **3.8** | **6.7%** |
| | qSN43 | W11F2:3b | C06 | 49.6 | 47.8-58.2 | 0.75 | 0.73 | 3.6 | 3.9% |
| | qSN44 | W11F2:3w | C06 | 57.2 | 48-58.2 | 0.68 | 0.04 | 3.8 | 5.5% |
| ***qSN.C06-1*** | | **W11F2:3bw** | **C06** | **53.4** | **47.8-58.2** | **0.72** | **0.39** | **3.7** | **4.7%** |
| | qSN45 | W10F2:3w | C06 | 13.5 | 11.5-17.5 | 0.98 | -1.00 | 4.5 | 7.0% |
| | qSN46 | W10F2:3b | C06 | 19.7 | 16.9-21.7 | 1.09 | -1.04 | 4.7 | 10.2% |
| ***qSN.C06-2*** | | **W10F2:3bw** | **C06** | **16.6** | **82.9-97.7** | **1.03** | **-1.02** | **4.6** | **8.6%** |

**Table S7** List of QTLs identified in the current and previous studies for pod number and seed number per pod in rapeseed.

| Referecne | Trait name | QTL name | Linkage group | Marker interval | Genomic region (Mb) | LOD value | $R^2$ | Additive effect | Repeat number |
|---|---|---|---|---|---|---|---|---|---|
| Shi et al. 2009 | PNw | *qPN.A1-1* | A01 | CB10097 / niab096 | 1.6-2.0 | 5.0 | 7.7 | -23.60 | 1 |
| Shi et al. 2009 | PNw | *qPN.A1-2* | A01 | pW145 / S15M04-2-330 | 2.2-2.9 | 5.5 | 8.6 | -24.8 | 1 |
| Shi et al. 2009 | PNw | *qPN.A1-3* | A01 | sR11990a / RA2G09 | 3.0-5.5 | 4.4 | 7 | -22.3 | 1 |
| Shi et al. 2009 | PNw | *qPN.A1-4* | A01 | CB10095 / CNU235 | 5.9-6.8 | 2.7-7.9 | 4.7-12.2 | - | 2 |
| Current study | PN | *qPN.A01-1* | A01 | BrSF0706 / TFZIP23 | 15.3-18.3 | 3.0 | 12.5 | -4.90 | 2 |
| Ding et al. 2012 | PNw | *PNLP-A1* | A01 | MR38 / niab056 | 22.2-24.5 | / | 13.7 | + | 2 |
| Shi et al. 2009 | PNw | *qPN.A2-1* | A02 | HUA133 / P10M8-130 | 0.1-/ | 2.9-3.8 | 4.6-6 | - | 2 |
| Ding et al. 2012 | PNw | *PNLP-A2* | A02 | B070J05 / Na14H11 | 2.4-4.5 | / | 10.4 | - | 1 |
| Wang et al. 2010 | PNw | *qSNP2* | A02 | ME6EM4b / ME14EM5b | /-/ | 2.5 | 35.64 | 171.89 | 1 |
| Shi et al. 2009 | PNw | *qPN.A3-1* | A03 | FLC3 / pw189 | 1.3-2.7 | 2.4-3.8 | 3.4-6.2 | ± | 2 |
| Ding et al. 2012 | PNw | *PNLP-A3* | A03 | BoGMS0230 / BnGMS257 | 5.1-6.1 | / | 9.2 | - | 1 |
| Shi et al. 2013 | PNw | *qPN-LP2-A3b* | A03 | MR123 / BRMS043 | 5.1-7.4 | 4.5 | 8.6 | + | 1 |
| Radoev et al. 2008 | PNw | *Sil/dm*$^{2}$*_N3* | A03 | E32M51_283E / MR12 | 10.8-13.2 | 10.7 | 12 | 2.88 | 1 |
| Current study | PN | *qPN.A03-1* | A03 | BrSF0295 / CNU098 | 11.4-13.5 | 3.6 | 3.0 | -9.65 | 1 |
| Current study | PN | *qPN.A03-2* | A03 | FITO285 / BoSF2828 | 14.2-15.4 | 3.8 | 3.4 | -1.73 | 1 |
| Shi et al. 2009 | PNw | *qPN.A3-2* | A03 | SA29 / CNU276 | 14.0-15.2 | 3.4 | 6.4 | 25.10 | 1 |
| Shi et al. 2013 | PNw | *qPN-LP1-A3/qPN-LP2-A3c/qPN-OP1-A3a* | A03 | CNU002 / CNU370 | 16.1-20.4 | 3.6 | 7.3 | + | 3 |
| Shi et al. 2013 | PNw | *qPN-OP1-A3b* | A03 | B072K21-4 / CNU371 | 18.7-20.8 | 3.8 | 8.0 | + | 1 |
| Shi et al. 2013 | PNw | *qPN-OP2-A3* | A03 | HBr033 / BnSQD1-A3 | 23.7-27.3 | 3.7 | 7.8 | + | 1 |
| Shi et al. 2013 | PNw | *qPN-LP2-A3a* | A03 | pw189 / HBr061 | 43.5-45.0 | 3.4 | 6.6 | + | 1 |
| Shi et al. 2009 | PNw | *qPN.A5-1* | A05 | sNRD03 / P01M22-200 | 0.0-0.8 | 4.1 | 4.4 | 12.90 | 1 |
| Ding et al. 2012 | PNw | *PNNP-A5* | A05 | BnPHT1 / BoGMS1565c | 3.3-4.0 | / | 8.9 | - | 1 |
| Shi et al. 2009 | PNw | *qPN.A5-2* | A05 | E1HM31-130 / CNU344 | 3.6-4.6 | 4.5 | 8 | 38.30 | 1 |
| Current study | PN | *qPN.A05-1* | A05 | BrSF0712 / BoSF2141 | 6.0-8.0 | 3.4 | 12.6 | -4.67 | 1 |
| Shi et al. 2009 | PNw | *qPN.A5-3* | A05 | sR9222 / Na10B08 | 10.4-11.2 | 4.6 | 6.7 | 35.30 | 1 |

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|---|---|---|---|---|---|---|---|---|---|
| Shi et al. 2009 | PNw | *qPN.A5-4* | A05 | CNU206 / pW161-2b | 12.5-13.2 | 3.7 | 6.2 | 33.00 | 1 |
| Shi et al. 2009 | PNw | *qPN.A5-5* | A05 | Na10E02 / CNU268 | 19.1-20.1 | 3.3 | 4.9 | 18.30 | 1 |
| Shi et al. 2009 | PNw | *qPN.A6-1* | A06 | IGF1075d / niab37 | 7.3-11.1 | 3.2-3.4 | 3.5-5 | ± | 2 |
| Ding et al. 2012 | PNw | *PNLP-A6* | A06 | H001J23 / BnGMS531 | 8.5-12.5 | / | 13.3 | - | 1 |
| Current study | PN | *qPN.A06-1* | A06 | BrSF47-234 / BrSF0166 | 22.0-23.1 | 5.1 | 22.8 | -6.02 | 4 |
| Radoev et al. 2008 | PNw | *Sil/dm*$^{2}$*_N7* | A07 | CB10439 / MR153b | 10.5-13.5 | 7.3 | 8.8 | 2.64 | 1 |
| Shi et al. 2009 | PNw | *qPN.A7-1* | A07 | E1HM34-220 / 35RXTRAP10-4 | 11.0-12.9 | 2.6-3.3 | 4.6-6.2 | ± | 2 |
| Yi et al. 2006 | PNw | *NPP1-LG4* | A07 | M9E12750 / Ra2A01 | /-14.5 | 4.3 | 17.42 | 19.95 | 1 |
| Shi et al. 2009 | PNw | *qPN.A7-2* | A07 | niab063 / sR7223 | 14.1-14.4 | 2.5-2.7 | 4.9-5.4 | ± | 2 |
| Shi et al. 2009 | PNw | *qPN.A7-3* | A07 | IGF3309b / P2M8-110 | 20.1-21.3 | 2.9 | 5.6 | -17.70 | 1 |
| Shi et al. 2009 | PNw | *qPN.A7-4* | A07 | WRI1-2 / CNU168 | 21.1-22.0 | 3.5-6.9 | 6.5-13.7 | - | 2 |
| Shi et al. 2009 | PNw | *qPN.A7-5* | A07 | FTin1-a / IGF1226a | 23.3-23.8 | 2.8-3.8 | 5.2-8 | - | 2 |
| Wang et al. 2010 | PNw | *qSNP8* | A08 | ME17EM8c / Na12B05a | /-15.4 | 2.7 | 12.96 | −8.18 | 1 |
| Ding et al. 2012 | PNw | *PNLP-A8* | A08 | em15me1b / em8me2 | /-/ | / | 11.5 | - | 1 |
| Radoev et al. 2008 | PNw | *Sil/dm*$^{2}$*_LG10* | A08 | E34M47_185R / E45M60_234E | /-/ | 7.7 | 4.4 | 1.75 | 1 |
| Ding et al. 2012 | PNw | *PNNP-A9b* | A09 | HBr304 / MR13 | 3.0-4.2 | / | 10.7 | + | 1 |
| Ding et al. 2012 | PNw | *PNNP-A9a* | A09 | HBr303 / BnPAP11 | 3.3-4.8 | / | 18.4 | + | 1 |
| Shi et al. 2009 | PNw | *qPN.A9-1* | A09 | FTin1-b / E8HM40-510 | 20.9-21.8 | 4.2 | 5.8 | -24.80 | 1 |
| Current study | PN | *qPN.A09-1* | A09 | BrSF0998 / BrSF6-104 | 22.8-24.2 | 2.7 | 2.3 | 4.05 | 2 |
| Shi et al. 2009 | PNw | *qPN.A9-2* | A09 | niab131 / CNU008 | 29.8-30 | 3.1 | 4.7 | 17.90 | 1 |
| Shi et al. 2013 | PNw | *qPN-LP2-A9* | A09 | H091P21-4 / pW123aH | 31.2-32.5 | 4.9 | 9.5 | + | 1 |
| Shi et al. 2013 | PNw | *qPN-LP1-A9* | A09 | HBr075 / H091P21-4 | 32.5-32.8 | 4.2 | 9.1 | + | 1 |
| Radoev et al. 2008 | PNw | *Sil/dm*$^{2}$*_N9* | A09 | CB10533a / MR230 | 32.7-33.0 | 6.4 | 1.9 | -1.15 | 1 |
| Shi et al. 2009 | PNw | *qPN.A10-2* | A10 | E5HM31-490 / IGF5108e | 16.2-17.7 | 2.6-7.7 | 5.9-12.2 | ± | 3 |
| Ding et al. 2012 | PNw | *PNNP-C1* | C01 | CB10369 / BoGMS0806 | 6.3-8.3 | / | 9.2 | - | 1 |
| Wang et al. 2010 | PNw | *qSNP11a* | C01 | Me9EM10c / Ol12F11a | /-11.1 | 2.8 | 28.71 | 159.25 | 1 |
| Wang et al. 2010 | PNw | *qSNP11b* | C01 | Na12C08 / ME16EM2a | 21.9-/ | 2.6 | 34.02 | 141.05 | 1 |
| Radoev et al. 2008 | PNw | *Sil/dm*$^{2}$*_N11* | C01 | MD60a / Ol10E12 | 25.0-18.5 | 4.7 | 2.9 | 1.40 | 1 |
| Shi et al. 2009 | PNw | *qPN.C1-1* | C01 | E1HM34-150 / P13M6-90 | /-/ | 4.3 | 8.1 | 33.50 | 1 |

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|---|---|---|---|---|---|---|---|---|---|
| Current study | PN | *qPN.C02-1* | C02 | BoSF1539 / CNU461 | 1.3-2.5 | 4.3 | 13.5 | -5.14 | 3 |
| Radoev et al. 2008 | PNw | *Sil/dm*$^2$*_N12b* | C02 | E35M62_117E / Na12E04b | /-4.5 | 14.3 | 15 | 3.22 | 1 |
| Shi et al. 2009 | PNw | *qPN.C2-2* | C02 | sR6293b / CB10530b | 9.2-11.2 | 3.4-4.7 | 6.4-8.5 | + | 2 |
| Radoev et al. 2008 | PNw | *Sil/dm*$^2$*_N12a* | C02 | CB10022a / MR104 | 41.8-45.4 | 7.7 | 6.1 | -1.79 | 1 |
| Shi et al. 2009 | PNw | *qPN.C2-1* | C02 | S13-50 / P04M21-490 | /-/ | 4.9 | 10.3 | 15.80 | 1 |
| Shi et al. 2009 | PNw | *qPN.C2-3* | C02 | Na12C12 / 21FXTRAP10-1 | /-/ | 4.0 | 9.3 | -22.40 | 1 |
| Ding et al. 2012 | PNw | *PNNP-C3* | C03 | niab115 / BoGMS1288 | 2.2-3.3 | / | 9.5 | - | 1 |
| Shi et al. 2013 | PNw | *qPN-LP3-C3a* | C03 | BRMS106 / pX141aE | 3.9-6.7 | 3.4 | 7.4 | - | 1 |
| Shi et al. 2009 | PNw | *qPN.C3-1* | C03 | STS01 / pX141bE | /-6.0 | 3.7 | 4.3 | -19.20 | 1 |
| Shi et al. 2013 | PNw | *qPN-LP3-C3b* | C03 | HG-FLC-C3b / HBr056 | 14.1-20.0 | 5.5 | 12.3 | + | 1 |
| Shi et al. 2009 | PNw | *qPN.C3-2* | C03 | Ol11G11b / pW143 | 21.4-23.7 | 2.4-3.3 | 4.9-6.1 | + | 2 |
| Shi et al. 2009 | PNw | *qPN.C3-3* | C03 | IGF3165b / CNU099 | 24.1-28.8 | 7.0 | 12 | 28.30 | 1 |
| Shi et al. 2009 | PNw | *qPN.C3-4* | C03 | IGF1141f / E7HM31-450 | 30.3-/ | 5.7 | 9.3 | 25.10 | 1 |
| Shi et al. 2009 | PNw | *qPN.C5-1* | C05 | P10M10-330 / CB10124 | 0.4-1.0 | 2.9-2.9 | 4.4-4.8 | + | 2 |
| Shi et al. 2009 | PNw | *qPN.A10-1* | C05 | Na10D11 / P11M10-140 | /-24.4 | 3.1-3.9 | 6.5-6.9 | + | 2 |
| Current study | PN | *qPN.C06-1* | C06 | BoSF1254 / BoSF2507 | 17.9-18.8 | 4.4 | 15.0 | 7.29 | 2 |
| Ding et al. 2012 | PNw | *PNNP-C6* | C06 | BnGMS118 / MR133.1 | 18.1-18.9 | / | 13.2 | - | 2 |
| Shi et al. 2009 | PNw | *qPN.C6-1* | C06 | PA28 / rFT2-a | 28.6-30.8 | 2.9 | 5.8 | -11.90 | 1 |
| Radoev et al. 2008 | PNw | *Sil/dm*$^2$*_N16* | C06 | CB10211b / CB10632 | 33.7-36.3 | 6.6 | 5.7 | 1.98 | 1 |
| Ding et al. 2012 | PNw | *PNNP-C8* | C08 | BnGMS319 / HBr150 | 27.7-28.5 | / | 8.1 | + | 1 |
| Ding et al. 2012 | PNw | *PNLP-C8* | C08 | CNU296 / HBr123 | 29-30.4 | / | 9 | + | 1 |
| Ding et al. 2012 | PNw | *PNLP-C9* | C09 | BoGMS0989 / e3m9a | 2.3-/ | / | 12 | + | 1 |
| Shi et al. 2009 | PNw | *qPN.C9-1* | C09 | SA30 / S15M04-2-92 | 28.0-/ | 7.5 | 11.6 | 28.90 | 1 |
| Shi et al. 2009 | PNw | *qPN.C9-2* | C09 | E2HM34-260 / Na12G04 | /-33.5 | 5.9 | 9.4 | 31.20 | 1 |
| Shi et al. 2009 | PNw | *qPN.C9-3* | C09 | Na10D07b / S05M05-130 | 39.4-41.7 | 3.0-3.0 | 5.4-5.5 | + | 2 |
| Shi et al. 2013 | PNw | *qPN-OP3-C9* | C09 | HR-Sp1-170 / pw155a | 41.7-43.6 | 4.3 | 10.0 | - | 1 |
| Current study | SNPP | *qSN.A01-1* | A01 | BoSF2770 / niab106 | 0.5-1.5 | 4.2 | 8.8 | -1.01 | 1 |
| Shi et al. 2009 | SNPPw | *qSN.A1-1* | A01 | niab71 / CNU142 | 0.7-1.5 | 2.4-3.9 | 4-6.1 | ± | 2 |
| Shi et al. 2009 | SNPPw | *qSN.A1-2* | A01 | niab096 / EST156a | 2.0-2.1 | 2.7-8.1 | 4.7-12.2 | + | 2 |

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|---|---|---|---|---|---|---|---|---|---|
| Shi et al. 2009 | SNPPw | *qSN.A1-3* | A01 | sR11990a / RA2G09 | 4.0-5.5 | 2.5-2.8 | 5.5-5.8 | + | 2 |
| Shi et al. 2009 | SNPPw | *qSN.A1-4* | A01 | E5HM31-505 / S10M16-2-130 | /-/ | 4.9-6.7 | 8.8-11.4 | + | 2 |
| Shi et al. 2009 | SNPPw | *qSN.A1-5* | A01 | CNU235 / Ol12F11 | 6.6-7.0 | 5.5-7.1 | 9.5-10 | + | 2 |
| Shi et al. 2009 | SNPPw | *qSN.A1-7* | A01 | E10HM34-230 / EST165 | /-8.7-/ | 4.3-5.5 | 4.2-9.7 | + | 2 |
| Qi et al. 2014 | SNPPm | *qSNA1* | A01 | Na14G06 / CB10189 | 8.2-8.9 | / | 23.54 | 1.93 | 3 |
| Shi et al. 2009 | SNPPw | *qSN.A1-6* | A01 | IGF2071e / EST98b | /-17.5 | 3-9.1 | 4.3-12.4 | + | 5 |
| Current study | SNPP | *qSN.A01-2* | A01 | TFZIP23 / BrSF0982 | 18.3-19.6 | 3.7 | 2.7 | -0.89 | 2 |
| Wang et al. 2010 | SNPPw | *qSS1* | A01 | ME6EM8d / ME3EM8a | /-/ | 2.9 | 8.41 | −3.6 | 1 |
| Current study | SNPP | *qSN.A02-1* | A02 | niab025 / MR052 | 0.1-1.8 | 4.7 | 5.3 | 0.36 | 1 |
| Shi et al. 2013 | SNPPw | *qSN-OP1-A2b/qSN-OP2-A2* | A02 | BnSIZ1-A2 / BnMGD2-A2b | 2.0-3.0 | 7.9 | 14.5 | - | 2 |
| Shi et al. 2013 | SNPPw | *qSN-OP3-A2/qSN-OP1-A2a/qSN-LP3-A2* | A02 | sR6293a / BnSIZ1-A2 | 3.0-4.7 | 4.5 | 9.4 | - | 3 |
| Ding et al. 2012 | SNPPw | *SNLP-A2* | A02 | Na14H11 / B049H14 | 4.2-4.5 | / | 11.2 | - | 1 |
| Current study | SNPP | *qSN.A02-2* | A02 | BrSF0755 / BoSF2100 | 6.0-8.3 | 5.8 | 7.0 | 1.11 | 3 |
| Shi et al. 2009 | SNPPw | *qSN.A2-1* | A02 | pX154 / pX155 | 10.2-10.3 | 10.2 | 15.5 | -1.81 | 1 |
| Shi et al. 2013 | SNPPw | *qSN-LP1-A2a/qSN-LP1-A2b/qSN-LP2-A2* | A02 | ZAAS113 / B084M08a | 10.3-13.1 | 3.7 | 6.8 | - | 3 |
| Current study | SNPP | *qSN.A02-3* | A02 | BoSF2214 / Na14B05 | 22.4-22.7 | 4.2 | 4.3 | 0.32 | 2 |
| Shi et al. 2009 | SNPPw | *qSN.A2-2* | A02 | S10M16-2-210 / S10M03-1-280 | /-/ | 3.0 | 5.5 | -0.98 | 1 |
| Current study | SNPP | *qSN.A03-1* | A03 | BrSF0427 / BoSF2392a | 1.5-4.1 | 4.3 | 16.3 | -1.73 | 1 |
| Shi et al. 2013 | SNPPw | *qSN-LP3-A3b* | A03 | HBr049 / CNU098 | 12.8-13.5 | 4.2 | 8.0 | + | 1 |
| Shi et al. 2009 | SNPPw | *qSN.A3-1* | A03 | CNU210 / S13M08-1-157 | 15.3-15.7 | 2.3-3.9 | 4.5-5.6 | ± | 2 |
| Ding et al. 2012 | SNPPw | *SNLP-A3* | A03 | CNU270 / HBr131 | 15.4-16.2 | / | 11.4 | - | 1 |
| Current study | SNPP | *qSN.A03-2* | A03 | BrSF0708 / CB10425 | 23.3-24.6 | 3.1 | 4.3 | -0.82 | 1 |
| Ding et al. 2012 | SNPPw | *SNNP-A3* | A03 | BoGMS1539 / BoGMS0408 | 25.5-27.3 | / | 16.1 | + | 1 |
| Shi et al. 2009 | SNPPw | *qSN.A4-2* | A04 | IGF3395d / IGF3391a | 0.0-0.5 | 6.7-7.5 | 8.5-12.1 | - | 2 |
| Shi et al. 2013 | PNw | *qPN-LP3-A4* | A04 | BnLPR2-A4 / znS13M26-220 | 4.3-8.7 | 3.5 | 7.5 | + | 1 |
| Shi et al. 2009 | SNPPw | *qSN.A4-3* | A04 | HUA39 / CNU360 | 15.9-16.2 | 2.7-3 | 5.6-6.1 | + | 2 |
| Shi et al. 2009 | SNPPw | *qSN.A4-4* | A04 | CNU256 / E9HM31-80 | 16.2-17.2 | 4.5-8.1 | 7.7-13.2 | + | 2 |
| Shi et al. 2009 | SNPPw | *qSN.A4-5* | A04 | E10HM34-180 / S14M08-2-270 | /-/ | 3-3.3 | 3.7-4.1 | ± | 2 |
| Shi et al. 2009 | SNPPw | *qSN.A4-1* | A04 | E6HM31-400 / P7M1-275 | /-/ | 3.3-7 | 6.1-14 | + | 2 |
| Shi et al. 2009 | SNPPw | *qSN.A5-1* | A05 | CNU257 / BRAS063 | 3.2-3.3 | 3.9 | 7.6 | -0.54 | 1 |

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|---|---|---|---|---|---|---|---|---|---|
| Shi et al. 2013 | PNw | *qPN-OP1-A5* | A05 | BnPHT1-A5 / sN12353b | 3.2-4.4 | 3.4 | 6.6 | + | 1 |
| Current study | SNPP | *qSN.A05-1* | A05 | BrSF0712 / BoSF2141 | 5.8-7.8 | 4.1 | 4.7 | -1.03 | 3 |
| Radoev et al. 2008 | SNPPm | *S/Sil_N5* | A05 | MD21 / MR113 | 8.0-12.4 | 14.1 | 11.8 | -1.55 | 1 |
| Shi et al. 2009 | SNPPw | *qSN.A5-2* | A05 | CNU206 / pW161-2b | 11.2-12.8 | 3.9 | 6 | -0.78 | 1 |
| Wang et al. 2010 | SNPPw | *qSS5* | A05 | ME1EM6b / ME7EM6c | /-/ | 2.4 | 7.87 | −5.38 | 1 |
| Cai et al. 2014 | SNPPm | *UN* | A06 | BnGMS583 | /-16.8-/ | 3.6 | 4.8 | 0.7 | 1 |
| Current study | SNPP | *qSN.A06-1* | A06 | BrSF0819 / BrSF0144 | 22.6-23.7 | 11.0 | 32.1 | 1.97 | 13 |
| Ding et al. 2012 | SNPPw | *SNLP-A6* | A06 | BnGS1 / em13me5 | /-/ | / | 13 | + | 2 |
| Shi et al. 2009 | SNPPw | *qSN.A7-1* | A07 | CNU063 / RA2G08 | 0.8-5.2 | 3.3 | 5.6 | 0.62 | 1 |
| Current study | SNPP | *qSN.A07-1* | A07 | BoSF2344 / AT1G27050 | 5.0-8.9 | 5.9 | 6.9 | 0.75 | 2 |
| Cai et al. 2014 | SNPPm | *UN* | A07 | BrGMS4507 | /-10.3-/ | 3.1 | 5.2 | 1.38 | 1 |
| Current study | SNPP | *qSN.A07-2* | A07 | CN64 / CNU339 | 15.0-20.1 | 6.0 | 10.8 | 0.86 | 4 |
| Current study | SNPP | *qSN.A07-3* | A07 | BoGMS2110 / CNU053 | 20.8-22.5 | 3.9 | 3.8 | 0.48 | 3 |
| Qi et al. 2014 | SNPPm | *qSNA7* | A07 | T10 / EA2MG2a | /-/ | / | 3.75 | 0.77 | 3 |
| Zhang et al. 2011 | SNPPm | *qSS.N8-1* | A08 | EA02MG05-210 / CB10026 | 7.2-9.2 | 4.4 | 12.23 | -3.10 | 3 |
| Ding et al. 2012 | SNPPw | *SNLP-A8* | A08 | H012K23 / BnPAP25 | 12.0-12.7 | / | 9.4 | + | 1 |
| Qi et al. 2014 | SNPPm | *qSNA8* | A08 | niab050 / Lat21-2 | 16.5-17.6 | / | 5.51 | -0.93 | 3 |
| Shi et al. 2009 | SNPPw | *qSN.A8-1* | A08 | CNU489 / P7M5-170 | /-/ | 2.6-3.3 | 4.4-5.2 | - | 2 |
| Zhang et al. 2011 | SNPPm | *qSS.N8-3* | A08 | SA06TC14-270 / S77096 | /-/ | 2.9 | 9.63 | 2.73 | 1 |
| Zhang et al. 2011 | SNPPm | *qSS.N8-4* | A08 | SA06TC14-270 / S77096 | /-/ | 2.5 | 8.35 | 2.83 | 2 |
| Zhang et al. 2011 | SNPPm | *qSS.N8-2* | A08 | SA10TC11-100 / SA03TC09-370 | /-/ | 2.9 | 10.6 | 4.07 | 3 |
| Shi et al. 2009 | SNPPw | *qSN.A9-1* | A09 | P04M21-130 / IGF5222b | 1.0-1.8 | 4.1 | 6.5 | 0.77 | 1 |
| Ding et al. 2012 | SNPPw | *SNNP-A9* | A09 | HBr199c / HBr097c | 1.2-1.8 | / | 10.5 | - | 2 |
| Shi et al. 2013 | SNPPw | *qSN-LP1-A9b* | A09 | IGF5385f / IGF5222b | 1.8-2.0 | 4.7 | 8.4 | + | 1 |
| Shi et al. 2009 | SNPPw | *qSN.A9-2* | A09 | CB10311 / pW203b | 7.2-8.6 | 4.1 | 5.4 | 0.76 | 1 |
| Shi et al. 2013 | SNPPw | *qSN-LP1-A9a/qSN-OP2-A9* | A09 | H055O17-4 / HBr096 | 25.1-29.8 | 3.9 | 6.9 | + | 2 |
| Current study | SNPP | *qSN.A09-1* | A09 | BnSF2342-39 / BnID082 | 28.1-29.1 | 3.6 | 4.9 | 0.59 | 2 |
| Shi et al. 2009 | SNPPw | *qSN.A9-3* | A09 | niab33 / pW123aH | 30.0-31.2 | 3.0 | 5.6 | -0.47 | 1 |
| Qi et al. 2014 | SNPPm | *qSNA9* | A09 | CNU034 / niab038 | /-/ | / | 2.73 | -0.66 | 3 |
| Ding et al. 2012 | SNPPw | *SNLP-A10* | A10 | Na10D07 / S002B15-1 | 10.5-11.5 | / | 12.8 | + | 1 |

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| Ding et al. 2012 | SNPPw | *SNLP-C1* | C01 | CB10369 / BoGMS0806 | 6.3-8.3 | / | 11.9 | + | 1 |
| Wang et al. 2010 | SNPPw | *qSS11* | C01 | Ol12F11a / ME5EM9c | 10.1-12.1 | 3.0 | 24.37 | −5.51 | 1 |
| Shi et al. 2013 | SNPPw | *qSN-LP2-C1* | C01 | ZAAS156b / znS08M15-80 | 19.1-22.0 | 3.6 | 7.1 | - | 1 |
| Shi et al. 2013 | SNPPw | *qSN-OP2-C1* | C01 | BnGPT2-C1 / pW190b | 28.3-29.3 | 3.5 | 7.5 | - | 1 |
| Shi et al. 2013 | SNPPw | *qSN-OP1-C1* | C01 | HR-Sp2-170 / BRMS175 | 36.5-38.8 | 3.7 | 6.3 | - | 1 |
| Radoev et al. 2008 | SNPPm | *S/Sil_N11* | C01 | CB10536 / CB10357b | 35.3-37.7 | 15.6 | 8.2 | -1.49 | 1 |
| Current study | SNPP | *qSN.C02-1* | C02 | BoSF1425 / CNU461 | 0.8-2.2 | 3.8 | 6.7 | -0.71 | 1 |
| Shi et al. 2009 | SNPPw | *qSN.C2-1* | C02 | pW119 / sR12095 | 1.4-1.7 | 2.6-3.4 | 3.3-4.7 | + | 2 |
| Ding et al. 2012 | SNPPw | *SNNP-C3* | C03 | BoGMS0576 / MR123 | 9.1-10.0 | / | 17.3 | + | 1 |
| Qi et al. 2014 | SNPPm | *qSNC3* | C03 | t8_at_3 / CNU270 | 23.2-/ | / | 5.12 | 0.90 | 3 |
| Shi et al. 2009 | SNPPw | *qSN.C3-1* | C03 | IGF1141f / E7HM31-450 | 30.3-/ | 8.6 | 10.8 | -1.43 | 1 |
| Zhang et al. 2011 | SNPPm | *qSS.N13-2* | C03 | EA02MC05-160 / EA13MC01-160 | /-/ | 3.4 | 9.7 | -2.31 | 2 |
| Zhang et al. 2011 | SNPPm | *qSS.N13-1* | C03 | EA02MC05-160 / EA13MC01-160 | /-/ | 5.8 | 15.21 | -3.21 | 2 |
| Ding et al. 2012 | SNPPw | *SNNP-C5* | C05 | BnGMS352 / BnGMS309 | 15.3-16.0 | / | 11.5 | - | 1 |
| Ding et al. 2012 | SNPPw | *SNLP-C5* | C05 | Ol10A10 / sS2129 | 24.5-25.7 | / | 14.7 | + | 1 |
| Shi et al. 2009 | SNPPw | *qSN.C6-4* | C06 | HUA64-2 / Na12E01a | 16.9-18.1 | 4.3 | 6.9 | 0.88 | 1 |
| Current study | SNPP | *qSN.C06-1* | C06 | BoSF1254 / BoSF1126 | 17.8-19.0 | 3.7 | 4.7 | 0.72 | 2 |
| Shi et al. 2009 | SNPPw | *qSN.C6-3* | C06 | CB10010 / IGF3380b | 20.2-20.5 | 4.1-4.2 | 3.6-7.7 | + | 2 |
| Shi et al. 2009 | SNPPw | *qSN.C6-2* | C06 | E5HM40-205 / BRMS015 | 20.6-21.1 | 3.9 | 6.8 | 0.62 | 1 |
| Shi et al. 2009 | SNPPw | *qSN.C6-1* | C06 | pW134 / AP1a | 29.6-32.0 | 3.9 | 6.8 | 0.71 | 1 |
| Current study | SNPP | *qSN.C06-2* | C06 | BoSF1951 / CNU331a | 30.6-34.2 | 4.6 | 8.6 | 1.03 | 2 |
| Shi et al. 2013 | SNPPw | *qSN-OP3-C6b/qSN-LP1-C6* | C06 | BnPHT1-C6 / PA28 | 34.4-36.0 | 4.2 | 8.6 | + | 2 |
| Qi et al. 2014 | SNPPm | *qSNC6* | C06 | CNU182 / CNU052 | 34.8-35.9 | / | 0.78 | 0.35 | 3 |
| Shi et al. 2013 | SNPPw | *qSN-LP3-C6/qSN-OP3-C6a* | C06 | IGF1226b / BnPHT1-C6 | 36.1-36.9 | 4.0 | 9.2 | + | 2 |
| Wang et al. 2010 | SNPPw | *qSS16a* | C06 | ME6EM4d / ME3EM4b | /-/ | 2.6 | 8.57 | −5.85 | 1 |
| Wang et al. 2010 | SNPPw | *qSS16b* | C06 | ME6EM4d / ME3EM4b | /-/ | 3.7 | 14.31 | −6.15 | 1 |
| Shi et al. 2009 | SNPPw | *qSN.C8-2* | C08 | IGF3369a / MR64 | 28.8-31.4 | 5.5 | 5.1 | 0.73 | 1 |
| Shi et al. 2009 | SNPPw | *qSN.C8-3* | C08 | sN11670a / IGF2529z | 31.8-33.6 | 5.3-7.4 | 5.4-7.8 | + | 2 |
| Shi et al. 2009 | SNPPw | *qSN.C8-4* | C08 | IGF2529z / pW123cE | 33.6-35.3 | 4.6 | 4.3 | 0.39 | 1 |
| Shi et al. 2009 | SNPPw | *qSN.C8-1* | C08 | S15M04-2-100 / Ol12G04 | /-/ | 3.4-5.4 | 5.1-5.2 | - | 2 |

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|---|---|---|---|---|---|---|---|---|---|
| Shi et al. 2009 | SNPPw | *qSN.C9-2* | C09 | E2HM34-260 / Na12G04 | 33.2-34.0 | 2.6-6.4 | 4.3-8.6 | - | 6 |
| Zhang et al. 2011 | SNPPm | *qSS.N19* | C09 | EA13MC03-150 / Na10D07 | 39.4-/ | 2.5 | 6.11 | 2.07 | 1 |
| Shi et al. 2009 | SNPPw | *qSN.C9-3* | C09 | IGF5193b / CB10288 | 39.0-40.0 | 2.3-5.9 | 3.2-8.1 | - | 6 |
| Zhang et al. 2012 | SNPPm | *qSS.C9* | C09 | SRC9-022 / SA09MC04 | 44.6-46.0 | 22.5 | 57 | 5.40 | 3 |
| Radoev et al. 2008 | SNPPm | *S/Sil_N19* | C09 | CB10345 / Na10B11b | 11.1-12.4 | 6.1 | 3.6 | 0.99 | 1 |
| Shi et al. 2009 | SNPPw | *qSN.C9-1* | C09 | SA30 / S15M04-2-92 | /-/ | 2.7-5.8 | 3.4-7.9 | - | 4 |
| Cai et al. 2014 | SNPPm | / | / | EA05MC08_8 | /-/ | 3.07 | 3.96 | 0.8 | 1 |
| Cai et al. 2014 | SNPPm | / | / | EA06MC09_10 | /-/ | 3.45 | 4.44 | 1.4 | 1 |
| Cai et al. 2014 | SNPPm | / | / | EA06MG08_9 | /-/ | 3.02 | 3.85 | 2.1 | 1 |
| Cai et al. 2014 | SNPPm | / | / | EA06MG10_5 | /-/ | 3.63 | 4.7 | 1.5 | 1 |
| Cai et al. 2014 | SNPPm | / | / | EA08MC10_5 | /-/ | 3.45 | 4.4 | 1.1 | 1 |

**Table S8** Information of the putative single-locus SSR markers chosen from the target major QTL region for use in regional association analysis.

| **Marker name** | **Scaffold start (bp)** | **Scaffold end (bp)** | **Forward_primer (5'-3')** | **Reverse_primer (5'-3')** | **Tm (°C) forward** | **Tm (°C) reverse** | **Product size** | **Polymorphism & single-locus** |
|---|---|---|---|---|---|---|---|---|
| BrSF47-179 | 373,862 | 373,877 | TTGGATGAGCGTAGTTGTGG | TTTTGGATGCCCTAAGCAAT | 60 | 60 | 152 | √ |
| BrSF47-175 | 371,407 | 371,420 | TCCATCAATAATGAACATGCG | ATATCCGCGTAATAATTTAGCAA | 59 | 57 | 264 | |
| BrSF47-163 | 342,625 | 342,646 | AACGCGAGCAATTAGGAGAA | CAAGCCCACCTCAATAATCG | 60 | 60 | 250 | √ |
| BrSF47-127 | 268,155 | 268,170 | TTTGAATACAATATTATCCATTGTTCA | TGCTGATTGTCACATTCTCCAT | 58 | 61 | 218 | |
| BrSF47-78 | 171,249 | 171,262 | TTCCTAAACATTCTTTAATTTTGTGC | TTTTACGTGACGTGGTGGAG | 59 | 60 | 261 | √ |
| BrSF47-71 | 156,414 | 156,427 | CAAATATTTCCTGGCGTCGT | CCGGATCAGTCGATAGGTCT | 60 | 59 | 131 | |
| BrSF47-54 | 114,543 | 114,686 | GAGTTGAAACCCCAAGCAAG | GCGAAACAGAGGCAATAAGG | 60 | 60 | 219 | √ |
| BrSF47-23 | 44,651 | 44,677 | GATCTATAAGGGCGCTGCAA | ATTGGCCCAAAATCTCTTGA | 60 | 60 | 235 | √ |
| BrSF47-10 | 25,879 | 25,898 | ATCAATTTTTCCGAGACCCC | AAGCTGGTGAACTCGTTTCG | 60 | 60 | 264 | √ |
| BrSF46-1 | 1,253 | 1,267 | TCCCCATTAAGTAGGAGAGGC | CGGTGAGGAAATCCATGTTT | 60 | 60 | 185 | |
| BrSF46-3 | 8,690 | 8,703 | TTGTTCTCAGAAACCATGAGAGA | TGGCCAAACATTATGGTCATT | 59 | 60 | 151 | |
| BrSF46-7 | 15,318 | 15,330 | CTGGTTCGAGACAGAAACACA | TTCCGATTTGGAAACACAAA | 59 | 59 | 276 | √ |
| BrSF46-15 | 33,566 | 33,581 | GTGGGGAAGTACCGAGCTTT | CCACATCATTTGTTTTGCCA | 60 | 60 | 267 | |
| BrSF46-20 | 37,841 | 37,858 | AAGGTCAGGATTATGGGGCT | AAAACTTTGCATGATCGGCT | 60 | 60 | 212 | |
| BrSF46-22 | 44,114 | 44,245 | TCGTGTAAGTGAGAGGAGAGTAAAGA | AGCTGGTGCAGTATGTCAGC | 60 | 59 | 229 | |
| BrSF46-27 | 53,797 | 53,813 | ATCTTGACATTTCGAGGCGT | TTCATGAATCCATTAGGCTCC | 60 | 59 | 252 | |
| BrSF46-28 | 54,246 | 54,257 | CGTGGCGACATGTCTGAATA | AGGTAGGGAGGGGATTTGAA | 61 | 60 | 171 | √ |
| BrSF46-49 | 94,698 | 94,709 | TGCATTTCATTTTCATGCCA | AATGATTGAAATACGGTGGGA | 61 | 59 | 275 | √ |
| BrSF46-75 | 145,365 | 145,382 | GTGACAGCTGTTGGCTGTTG | CTCATGCACGCTCTCCCTAT | 61 | 60 | 247 | |
| BrSF46-78 | 148,450 | 148,574 | TGCATAATCACCTAATACTAGTTTGC | GCACAGCCAACGTTTTGAA | 58 | 61 | 280 | √ |
| BrSF46-117 | 210,176 | 210,224 | CCATTCTGCCTCTCTCCTTG | GGCCTTATTGGAAGCATGAA | 60 | 60 | 184 | √ |
| BrSF46-136 | 246,805 | 246,818 | GTCAGGAGGTAAGAGCGGTG | ATCCGATTCTCTTGCCATCA | 60 | 61 | 166 | √ |
| BrSF46-141 | 249,690 | 249,745 | GCTAGTCAAGCTTCGTCGGT | TCGATATTCCAGAAGGCAGG | 60 | 60 | 245 | |
| BrSF46-142 | 249,860 | 249,943 | TTTGATAGCCTGCCTTCTGG | TCCGAGGATTCGTTGGTTAG | 60 | 60 | 237 | |
| BrSF46-160 | 291,338 | 291,352 | CAGATCGTTGCCACATCAGT | ACTCCCAAGCCTCTGTGCTA | 60 | 60 | 217 | |
| BrSF46-161 | 291,761 | 291,776 | CCCAAAAATAATACTCCCTCCG | ATCTGTTACACCGCAATCCG | 61 | 61 | 276 | √ |

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|---|---|---|---|---|---|---|---|---|
| BrSF46-162 | 293,215 | 293,234 | TCTTCACTCCTACCCCTCCC | GAAAAGCGAAGACGGAAATG | 60 | 60 | 208 | |
| BrSF46-166 | 299,780 | 299,793 | TTACGTTTTTGGGCTTGGTC | TGGCTTGACCCCAGTCTTTA | 60 | 61 | 164 | |
| BrSF46-167 | 303,352 | 303,389 | TCGGCTAGAATGGCTACAAGA | TGCCCATTCGTGTATGTTTG | 60 | 60 | 273 | √ |
| BrSF46-176 | 315,522 | 315,543 | ATCACCATTGTGTTATTTCTTCAG | GGATCAAATGGATTTAGCGG | 57 | 59 | 256 | |
| BrSF46-177 | 316,223 | 316,240 | AGCTGGTACATGATTGCGTG | CAACTCTGCCATTCACATGC | 60 | 60 | 268 | √ |
| BrSF46-186 | 324,357 | 324,370 | GCCAAAGTGCATCCCATCTA | CCTTTGGAAAGTCGAGAGACC | 61 | 60 | 161 | √ |
| BrSF46-204 | 345,157 | 345,170 | TCCAACCGATTCAACCAAAT | TGTATGCCAAAATAACATTCATCT | 60 | 58 | 206 | |
| BrSF46-211 | 353,809 | 353,823 | GCCTTTAGTTTGCAACCATTC | AAAACACTTTGCGATTTGGG | 59 | 60 | 251 | |
| BrSF46-213 | 358,746 | 358,760 | GGAGATAGCTTTACGGTGCG | TCATGGGTCCACACATACATTT | 60 | 60 | 220 | |
| BrSF46-220 | 371,686 | 371,756 | CGCTGTCTCTTCGCTTCTCT | ATCGACGCCAAATCTAAACC | 60 | 59 | 246 | |
| BrSF46-223 | 385,268 | 385,303 | GGGTTTAGAGATAAAGAATGGAGTTT | TGAAAATAATGAACAATTCTCTCAAA | 59 | 58 | 255 | |
| BrSF46-230 | 407,280 | 407,354 | TGAGGTACAAACTTCACAATCTTACA | GTACCATCGGATTTTGGTGG | 59 | 60 | 258 | |
| BrSF46-232 | 407,786 | 407,799 | TTGAGAAGAATTAGAAGAAAAGACGA | CAGCTATTACTCCTTCCGTTTCA | 59 | 60 | 278 | |
| BrSF46-235 | 416,782 | 416,893 | TGAATTGGGAACAGCTAGGG | GGTGAGTTCGAGTCGGGTTA | 60 | 60 | 209 | |
| BrSF46-238 | 422,781 | 422,806 | TTGCGAGATTATTTTTAGATATGTGC | GAAAGCGTGAATCAAAAACG | 60 | 58 | 146 | √ |
| BrSF46-240 | 429,763 | 429,776 | TGAAAAAGGAGTTCAGAGTAAAACAA | TGTGAAAGGATTGAACATTGC | 60 | 59 | 280 | |
| BrSF46-256 | 459,725 | 459,850 | TGAATGCAACCACCTCACAT | GTCTTGAGGAGCAGCGAAAT | 60 | 60 | 236 | |
| BrSF46-259 | 467,296 | 467,321 | GGGCAGGCTAACCCCTAGTA | GAAGACGACGACATCGGTTTA | 60 | 60 | 276 | √ |
| BrSF46-265 | 477,163 | 477,177 | TGTGAGGTGACCATTGTTTTTA | CGTGGTCAATGAAACACACA | 58 | 59 | 249 | √ |
| BrSF46-267 | 483,948 | 484,041 | TATTATCTTCTCCCGGCGAC | AAGTATTAAAGGACGGCGGA | 59 | 59 | 278 | |
| BrSF46-269 | 485,062 | 485,079 | TCAATGTTTCCCTCTTCTTTGA | CCCAAGGATTTAGGATTTAGGG | 59 | 60 | 256 | |
| BrSF46-276 | 490,198 | 490,213 | AACCATGTTACACCGTTCCG | CAGTTTTGAATTTTATTTTGGGG | 61 | 59 | 264 | |
| BrSF46-286 | 508,142 | 508,159 | TGCTCTGCATAATCACATTTCA | ATTTGATTGTCCGCTTCATT | 59 | 57 | 260 | |
| BrSF46-288 | 516,227 | 516,242 | ACTGGTCAAGTGGTCCTTGG | CACTGATGATCGTTGCTGCT | 60 | 60 | 223 | |
| BrSF46-291 | 523,348 | 523,362 | CCACGTCTGAGGTGAGGTTT | CTTTTCTTCAATGCCACCGT | 60 | 60 | 183 | √ |
| BrSF46-292 | 523,613 | 523,640 | ACGGTGGCATTGAAGAAAAG | TTCTCTCTCCCACACACAACA | 60 | 59 | 237 | |
| BrSF46-306 | 557,446 | 557,469 | ATGATCATGTGGACCGTTGA | TGATTGTTATTCCCAACTTTTTAGG | 60 | 60 | 233 | √ |
| BrSF46-314 | 573,510 | 573,524 | TTGGGCCTCACTGATAGTCC | TCAAAACAAAGCCCAAAACC | 60 | 60 | 237 | |
| BrSF46-319 | 578,293 | 578,349 | TTTTTGGGCTTGGTCTACGA | CCTCTGTCTTCGGAGCAAGT | 61 | 60 | 248 | |
| BrSF46-325 | 589,391 | 589,420 | TTTCAAGCTGACGTGGACAG | AACATTGGTGCTTGATTGTGA | 60 | 59 | 202 | |

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|---|---|---|---|---|---|---|---|---|
| BrSF46-353 | 651,753 | 651,776 | GCCACTGGGTCAAAATGTCT | TTGGTGAGACGACTTGTGATTT | 60 | 60 | 251 | √ |
| BrSF46-367 | 680,283 | 680,308 | TCAAGGTAAATTCCCATCCA | CATTGTGCTTGGAGATGGTG | 58 | 60 | 224 | |
| BrSF46-383 | 706,218 | 706,260 | CCATTTTTCATCTTACCTTATTTTGC | CCTAGCCAAAACCATTCTATGT | 60 | 57 | 280 | √ |
| BrSF46-386 | 712,186 | 712,220 | TTGGTAAGAAAATGAATCTTGGG | GCGGGTCAAAGGCTAGTTCT | 59 | 61 | 263 | |
| BrSF46-407 | 765,285 | 765,304 | TGGGACAGAAATCAAATCCC | GTGGCGGAGAAAAGAAACTG | 60 | 60 | 143 | √ |
| BrSF46-415 | 779,110 | 779,134 | TTCTTCCTCTCGGCTTCGTA | CATGCATTTTCTGCTTTTGC | 60 | 59 | 239 | |
| BrSF46-432 | 810,447 | 810,528 | TTGGGGTTGTTTCATGTTTG | CGGTAGTCCACGGGAAATTA | 59 | 60 | 191 | √ |
| BrSF46-439 | 828,748 | 828,779 | CCAGTCGTTCTCTCTGAGGC | GGGCGTATGGATTTGCTAGA | 60 | 60 | 277 | |
| BrSF46-454 | 864,942 | 865,005 | CGGTTCAGTTACGGCAAAGT | CACCTTTCGCTTTTGTTCTTTT | 60 | 60 | 280 | √ |
| BrSF46-467 | 903,409 | 903,441 | TGCTCTGCACAAACTCCATC | TGGAAGCTTGGAGGAAGAAA | 60 | 60 | 272 | √ |
| BrSF46-485 | 945,845 | 945,866 | TCCCCCAAAATAAATATCCACA | GGCCTCAGAGGAGACAAGAA | 60 | 60 | 279 | |
| BrSF46-509 | 976,750 | 976,783 | AGCCACTAGGAGCAAGATGA | TTTGTTTGTCTTTTTGGGGG | 58 | 60 | 237 | √ |
| BrSF46-533 | 1,019,716 | 1,019,824 | TGACCAATTACAGAGCGTCG | GGCCTTAACGGTTCCTCAAT | 60 | 60 | 244 | |
| BrSF46-541 | 1,041,232 | 1,041,258 | CCAACAGTGGAGCCTAAAGC | CTCGTTTGTCGCTGGTGTTA | 60 | 60 | 232 | |
| BrSF46-551 | 1,050,185 | 1,050,292 | TTCACGTACGTACTCGATTTCTTC | TGAGAAAGGGAGTTTCCTGG | 60 | 59 | 241 | √ |
| BrSF46-552 | 1,050,924 | 1,050,943 | CCTTCTCCGCGAAGTATCAG | GCAGAAACAGAGGCAAGACC | 60 | 60 | 276 | |
| BrSF46-554 | 1,053,021 | 1,053,042 | GCGCTCTATTTTGGTTGCTC | GAGGCAAACCACTTGGAAAT | 60 | 59 | 222 | |
| BrSF46-557 | 1,061,135 | 1,061,154 | GCGAGTAACTTTGGGCAGAC | GAGTTGCAACCACAACTTGG | 60 | 59 | 248 | |
| BrSF46-574 | 1,099,671 | 1,099,697 | TGAGTGTATGTGTTGATGTGGC | ACAGAAAAGTTTTGGTTATTGCTT | 59 | 58 | 256 | √ |
| BrSF46-576 | 1,103,028 | 1,103,049 | CCCGCTATGCAGGCTTAAAT | TGTTGTTTTCTTTTGTAACTGGGA | 61 | 60 | 272 | |
| BrSF46-583 | 1,118,083 | 1,118,123 | CACAGACCAGGGATGTAAGGA | CATTTAGCAAGCGATGACCA | 60 | 60 | 213 | |
| BrSF46-586 | 1,121,623 | 1,121,646 | GTGAAGCCCATCGTCATCTT | CGAAGACTTTGGAGGAGCAG | 60 | 60 | 239 | √ |
| BrSF46-610 | 1,185,437 | 1,185,540 | TTTTTGTTTGTTTCTCACTCAACA | CATCCATTAATTGGGAACTATGA | 59 | 58 | 164 | |
| BrSF46-614 | 1,198,103 | 1,198,124 | TGTTGTTGTACCCGTAATGAAGA | TTTTTCATGTTTCATCTTTCTCTCT | 59 | 58 | 270 | |
| BrSF46-619 | 1,204,669 | 1,204,692 | AAAAGATTTGTTTGGAGTTGGAA | TTGAGGTTTGGTTTGGAAGAA | 59 | 60 | 215 | |
| BrSF46-626 | 1,220,435 | 1,220,547 | TTTTGAAGTTACACCAATTTTCAGA | ACAAAGCATGCCATCATCAA | 59 | 60 | 261 | √ |
| BrSF46-648 | 1,256,758 | 1,256,783 | GACTTCACTGTTCCCACGGT | CCCTCTCACCCATTTCTCAA | 60 | 60 | 277 | |
| BrSF46-661 | 1,287,088 | 1,287,111 | CAACGAATTTTAAAGACGCAAC | TCTTTAAATCGTCTTTTCCATGC | 59 | 60 | 211 | √ |
| BrSF46-673 | 1,309,908 | 1,309,980 | TAAGGGCGTTCACAAACGAT | AGAAGCTCATCTCTGATGCGT | 61 | 59 | 234 | |
| BrSF46-687 | 1,345,821 | 1,345,891 | TATTTTCCCCCGTTTCACAA | TTTTGCTCGCTTTCGATTTT | 60 | 60 | 203 | √ |

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|---|---|---|---|---|---|---|---|---|
| BrSF46-700 | 1,379,320 | 1,379,433 | AATTTGGGTTAAAACCCTTAAACT | CTCTTCCATAGGTCCGGGAT | 58 | 60 | 206 | √ |
| BrSF46-711 | 1,411,875 | 1,411,910 | AAAGTAGGAATGAAAAATTTTGGG | CAAAGCTGAAAGCACGAGTT | 59 | 58 | 235 | |
| BrSF46-744 | 1,459,489 | 1,459,620 | AACAAAATTTTCATTGTGGGA | CAAAATCATATCAGTCGAACGTC | 57 | 59 | 246 | |
| BrSF46-791 | 1,558,134 | 1,558,266 | TGGAAAATTTAGCAAAGTATAGCAAA | TTTTTGCGACCGATAAAATTAAA | 60 | 60 | 248 | |
| BrSF46-796 | 1,562,809 | 1,562,905 | GCAAAAGCAACAAGAGGGAG | CTCGTTTCGGTTTCAATTCC | 60 | 60 | 155 | |
| BrSF46-799 | 1,564,189 | 1,564,210 | AACCGCTTTATTTGGCAATG | GCGAGGGACAGAGTGATTTC | 60 | 60 | 182 | |
| BrSF46-812 | 1,595,044 | 1,595,075 | TGCATTTAGGGCCCAGTATT | TGGCTTCGTCGAGAAAATCT | 59 | 60 | 256 | |
| BrSF46-827 | 1,622,834 | 1,622,853 | TGTCACGCGTCATTCATAGA | TGCATGATTTTTGACAGGCT | 59 | 59 | 268 | |
| BrSF46-836 | 1,639,161 | 1,639,251 | TCGATCTACAGGAATCTTGAAAAA | CCAAAACAAGAAAGGTTGGTT | 59 | 58 | 280 | |
| BrSF46-837 | 1,641,718 | 1,641,827 | CTGCGATGGAATTGGAATCT | AGAGTAGCTAGCATCACCAAAAA | 60 | 57 | 245 | |
| BrSF46-854 | 1,674,049 | 1,674,070 | GGTGGCAGAACCGTAAACAT | TCTGATGGGTCTTTCGTGTG | 60 | 60 | 257 | |
| BrSF46-880 | 1,731,797 | 1,731,856 | GCAGCTTCCACAACAAACAA | CGAAGTGCGTATTCACAAGC | 60 | 59 | 137 | |
| BrSF46-887 | 1,753,395 | 1,753,453 | GCGATCAAAGGATTCAAAGC | CCTGTCTCCAACAAGTTCCC | 60 | 60 | 225 | |
| BrSF46-895 | 1,774,150 | 1,774,183 | CCTCTTCTTCTTGGTCTCGC | AGGGCATTGTTAAGTCCCTG | 59 | 59 | 246 | |
| BrSF46-910 | 1,801,928 | 1,801,997 | GGCTAGTGAAGTAAACGGCG | AATCTCGGACCGGAGACAT | 60 | 59 | 280 | |
| BrSF46-913 | 1,817,946 | 1,818,030 | TGCCAAACCAAACACTTTCA | GGGAACAGTGGGAGTAGCAA | 60 | 60 | 219 | |
| BrSF46-920 | 1,829,662 | 1,829,694 | CTGGTGTAACCTGGTGCAAA | CCCCCTTAATGAGTTTGTGC | 60 | 59 | 238 | |