

SUPPLEMENTARY DATA

TABLE S1. Marker sequences used for comparative mapping between *B. napus* and *Arabidopsis* and between *B. napus* and *B. rapa*

> S10T2-90-Rs1046A

TCGAGATGAAGCAAATAAACGAAGGAGGAGATATTGACTTAACGGACGAGGACTTGAGTGAGCT
C

> SCD2-Rs1046A

TTAAGCTCCCTAAAACCTGGACAATCAAACCTGCCTACAGTGAGCTATGTAAGGGAGAGAGATCTAC
AGGAAAGTAAGACGTTACGTACCATTGTTCAATATTGGTTAGTCGTTTCTTCTTCAATGATGA
CAAGTGAAGGAGATCCCCTTTTTGGGACATTTTCCCACAGTATAGTGACGTGTTACGCAAGAAAC
CTATAGAATCTGTAGATTTTCGAGACAAACAGACACACCCGGAGAGGGATTTCGGACAAAACGATTAC
AGTTTCCGACGAAACAAAATCAAATCACCGATATATTACCACAATCTAAAGACGTTTCAGAGGAAT
AAGATCACCCACAGAGAACAAAAAAAATGATGGGATCCACCATAAACTGAAATAGAACAAT
GAAACTGGGAGGAAGCGAGATCGGAAAAAAAATAAGGAGAGAGAAGAAGAAAAGGAGCGAAGGAG
CGACTGTAGGGATGAGTAAACAAAAAAAATAAGAGAGAGAGAGAGAGAGAGTGTGACATTGTT
GTTTCATCCTTCGACTTCGGAGGGTTTCTTCTTTGATCCCCGTGGAATTC

> E4M9-150- Rs1046A, including the flanking sequences

AGCTCATGTCTTCTCCTGCTCAGGTTGAACTCATCTCTTCCCAATCCGATTCTTAGGCTTCTTGCCA
CGTGTAGGTTAAGATCGTTTAAAGTATTACGCCTCTAGTTCTTGCTGATTGAATCTGTTGGTTTGAGA
TTAGGTTGAAAGATCAGTGGCGTATAACGAGCACAGGCCAAGGACTCCTCCACCAGACTTGCCAT
CTATGCTTCTTGACGGGAGAATTGTTTACATTGGCATGCCTGTAAGTGATTCTTGGTGGAGAGACT
GTTGATTGAGAGTAGTGTTGTGGTGCTTACTGTAATTTTGTGTTTGTGATTCAGCTGGTGCCGGCGG
TTACGGAGCTGATTGTGGCCGAGCTGATGTATCTTCAGTGGCTGGATCCCAAGGAGCCTATTTACA
TTTACATCAACTCCACTGGGACTACTCGTGACGATGGCGAGACTGTGAGTTCTTGAACACTTCTT
GAATGATTTAGACTCTTTTTCTGAGTGTATCTAATTTTGGACTCTTGCAGGTTGGAATGGAATCAG
AAGGTTTTGCGATATATGATTCTCTGATGCAACTTAAAACGAGGTAACGTTTATCTTTAAACTAAT
CGTGAAATGCAAAAAATATAAGTAATAAGCCGTGAAAAAAGGAATCTTGAACAGTTGTGTATATAT
TGTCTTCGGAGTGTTTTTGTGTGAGCAGGTTGGTGGTTCTGACTTGTGCAGGTACATACAGTGTGT
GTGGGAGCAGCCATAGGTCATGCATGTTTGTACTTTCAGCGGGAACAAAGGGTAAACGGTTTAT
GATGCCACACTCCAAAGGTATGTATATATGAGTGCATGCTGGTTGACTGGATTGCTCATTCTTGATA
ACAAGAGATTCTCATATGTTTTAACCAATATGTTGCAGCGATGATCCAGCAGCCTCGTGTTCCCTT
CTTCTGGGTTGATGCCAGCCAGTGATGTCTGATTCGTGCCAAAGAGGTTTGATGTTTCTACACTA
CGTATCCTGGAATCAAATCTAATTTCAACTGAGATATTTTCATGATGTTTTGCTTAAACGTTTCTCT
TTTGAGAATTTGGCTCGGAATACTAACCTTGAGGTGAAGGAAATTGAGTTATAGTACATCTCTCAC
GTTCTGTTGCAATTGCAGGTTATAACAAACAGGGATATACTTGTGGGACTACTAGCAAAGCAC
ACTGGGAATGTGAGTGGATAACATTTCTCTGGCTTTATAACTTTGAATGGAGAACTTTTTGGCTG
ATTAATAATCGTTATAATTTGTTATTTAGTCCGTGGAGACTGTGGCTAACGTGATGAGAAGGCCGT
ATTACATGGATGCACTAAAAGCTAAAGAATTTGGAGTCATTGACAAGGTAAAGTTTATGTGCTGTA
AAGTACTATGTAGGACTGTCTATTTGTTCTTAATTAGAATGTTAGTCTTTGATATTCAGTAATCGTTA
AGAAATTTTGTAACTTGGTCTCACAAAAGTTTGTAAATTTTGTACCAGGTTCTTTGGCGTGG
TCAAGAAAAGATTATTGCAGACGTGGTTCCTTCAGATGAATT

> SCE3-Rs1046A, including the flanking sequences

ATCTTCTCCAGTTGAAAACAGCAGACCACGAACTCGGAGCTGGACATTTGGAAGTGTGTGTGTG
TTGATCCCTGTTCTTCGTATCTCTTTCTGCATATGAAAATGAAACGCTCTTTGAACTTTTTATTTTG
TGTATGTATGAATTTGAAAACCAGATCATTGTGTGTTGCCTGTGTAAATTTGTAATCAAACAGTCG
AAATCCTTTTCTGAAATGTACAAATAATATATCACTGCTTTGATTTGTATACCAAAGTGTACAAATA
ACTTTATACCAAATTTTTACTCACCACGCAAATCATAACAGCATCACACAACAATTTTATTTAATTT
TGGTACAAAGTGTTTTGAGGTATCACTCACACTTGTGTCTATAAAGCCTCAGAAAGAAGAAAAGA
AAAACACACAAGTTTCTTCACACCAAATTTCAAACAATCATAACATGAGAAAAGATAATACGAT
ACAATTGAAGATNAACGCACCGTTTGCTGAAANGGGGATTCTGAANGCGATTGCGACTAAGGTT
TGAGATGGATTCGGCGCANC GCGGACTATCTGGGACGGTCCCGCTACANTAAGGTCAGGAAGGT
CAGGCATGATTCGCAGCTCTGANACGGTTGATGCGGAAGAAGATTCACCCAAGCCTTAACGCTGA
TCTCTCGAAAGAACTACCGAGTAAATCAACTTCACCAAGAACGGGAAGTCTTCACTTGTGTAAT
TC

> SCD7-19514A

GAATTCAAACGATCCATAAAAAGACAAATATATACTTTGCCGCGCGATCCAGTCAAAGCCGAAGG
CCGAAGCAAACATTTGCTTGTTCCTCTGTCTCTTTCCTCTGGAGAAATCACAAGTTTACTTTCT
CTCTTTGTAAATTAGATTTATAAGCCCAATAGATAAAACAATTATACGGCCAATAAGCTGAGCCCA
TTATGACCTCCTTAA

> SC9-H-Rs1046A, including the flanking sequences

TCCGAGCTTGAGCCCTTGTCTAAAGCACAAGCATGTCCCCTTTCAACAGCAAGCGTGCTTAGACA
CGGACAATAAAAGATGTTAACCCGAGAGATGATCAAAGTTCAAATGGCATGGTCGTGTGGTGGGC
AAGAGAAAAGGCTCTCTATGCATTGCTCTTATCTATCTGGGAGGTGACAATGTTCTAATTAACGTT
TGAGACTCTTCAATTAATTTTTTTTCCATGTCATTAAGTTTATTCTTTATTTTGTGTAACATTTTTGTT
GGCTAGCAGAGATGACGATTAACCACTGCGTAATAAACTTAATAAATGGTGTTTTTTATGAAATGT
AATCTCTTTCTGAATCATGTACTTCAAACAATAATTTCAATTCGAGTCTTTGGAGTTGAATGAATCT
ATTTATCTTACATGTAACACAAACAATAACTAAAGGCATTGTGTTGACAAATAGTATGTTTTTGT
TTTTTAATCTCGAAGGCCTAATTC AACCTCCAGTTCATCATCTTCCTCAAAGAGCTTCAAGAGTCG
AGCATACTGCTCGTCTCTTTTCTTCTTCTGCCATAGCTTGTATAGGAAAAAGGAGAACATAGCTAC
AGCCACTAATCCAACCAAGTACGAGGATTACTTTTTGTCCCTGTTCTGCTTGAAGTAGTGTGAGACTC
TGCCTTAGCTCCTGTATTTGCATTCTTGGAGTCACCAGATAGACCTGGACAAAGACAATAGATGCC
ATCTTAGCTTTTTTAAACGAGGAGAAATAACTCCACGCATAGAAAACAGAGAACATCAATTGCAAC
AATCATTATAACATGGGCTACACATCAAAAAGATTATAACTTTACCATATCATTACAGACATAAATTT
TGCAGACAAGCTATTCAAATTAGCAGAACCAACCCATGAACTGAACGGTAACATGTTCTCCTCAC
TAACATCATGTTAAAGAAAGCAACTTTACTGTTTTAGTAAGTATTATGTATGGCGTAGTTTCTTAGC
TGCTCAAGATCTAGTAAGACATGTAAACGGTTCTCTCTATCTCTATATGTTTCAATCCTGATCGCTA
AAGAGCAAAGACGTAACCTTTATGCCTAGAGATCACACAAAACGAAATCTACAAAGAGCTTCAG
CTAAAATTAGACATAAATCTAAGGCCTTTGAGAACCAAATCAGATAGATCTGGAGAAAGACAAAC
CTACGACGAAGTGCAGAGCAATCGAAGAGAAGAATACAACGCGCCGC

> E14M1-Rs1046A, including the flanking sequences

TTTAAAAAAGAGTTTTTTAGCCGAATATAAAGAATCTTCTTTTAAATTTTTTAACTAAATAAACTAAGAA
CAAGTTAAAGTCTCATGTGTATACATTTAGAGATACATACAGATATGTA AAAACAATGTAATAAAATA
TCAACACAAAGGTACTTAAGTAGTTTGATAAAAAAAAATTCAGCAAAAAAATACAATGTATACAT
AAAAACAGTTACATTATAAATGTC ACTTTATATTTGTACACACATATTA AAAAAAACAATTTTGTGTA
TACTTTTTATATAAAAACATCATTATCCATACACATAACTATATTTGACCAATAAAAATTA AACTGAA
AAATAAATTTAATAAATATGCATTGAAACAGTTCGGTGAGCTTAGTCCAATCTAATTGATCCATGGG

ATTAATAATCATCTTATCACTAGAAAGCTATAATTTTCATTTTGTTTTTTACCATTAAAAGAAAATAAA
ATAAAATCAGGGATGACAGCATTTCAAAAAGGAATAAAAATAAAAACAAGAAAGAGCGCATCTGA
AGATCAAATCACAAAGTAACGAAGCAAACGAGGAGGAAGATGAAGGGGTAGGGTATTGGCTAA
TGGTGGTTGGTTCACTGAGACTAGCTTCGGTTTGGTTTGGTTTCTCCAACATTTGGGCTCTTCGTC
TCGCCGTCTTCTCTCAGACCACCAGTTCTGTTCTTCTCCTCCCTCCTCTTTTTTCTTTTTAATATCCA
TTTTACAATTGTTCTATTAATGGTGCTTAAAATTCGTTACTTTCGTTGTTACTTGAGAAAATTATT
CTATCCAATTGACTTCCTTAGTCTCTGAGATCCTCCTAGTCATACATTTGTCAGTGCATGTAAGTGTG
TTTTGTGTAAATGATAATGCCACGTTTCAGAGGAAGTACTAGTTCTTAGTTTTCCGTGACTTCATTGAG
TTATGGATCCAATTTGGGATCCCTAAGCAGTATGAGATGTAGAACATGGGGCTTTCTGGATTGATA
TTGATTTTTTGTAGTCCATTGAATCTGTAAGGTCAATGGTTTTGTGAATTCAGTTCTTTGAACATA
CATATCCATGCTCTTTCTAGTTGCTTATTTTTTTTTGGTTCTTAATGTTCTCTAATTGCAAAGTTGAG
CTAGTTGGTATTTTTTTTTCTTGATCATTATGGCTTTTTTTTTGTTTATCTCTCCAAGATTAGTCTTTCTTG
CAAGTTGAGATTATTAATTTACAGATTATCTTTTGTGTTGCGTCCCCGGAGTAGTTGTTCAAAGTTTC
TTCAAAGTTATAATGATGTGAACGTTTGGGAATATTAGAACTTTTTAATTGCTCGTAATAACAAGTCA
CATGACTGGCTATTGTGCATGATCCTCCCTAAGTTCAACTTAGGCAGTTACTTTTCATTGAGGACAA
TGTTTGTCTTGGTCTGACATTTTTCTCAGTGGATCCCTGTTCTTTGAATCAACATACATGATATGT
AGGAGAAAGAGACTAGCTAGTACCATAAGAACAGCAGACCGAAGCAACACATCCAAGAAAGATA
TGAAATCTTAGTAATTCTTATACAGTTCATTGGTGAAGGAAGTACTTTTAGGAAGTGGACCACCAT
TCGCTAGATTTTAGGAAGGGGGAAAGTATTTGGATCTAGAATTGGTTACAGTTTACAGAGTCCAAT
GCATAACCTTTTTTCTTGTTGATACAATACTGTTGAAGTAAGTCAATGACCAGCTG

> SCD8-195A14

GAGCTCATAAAACCTTTAACTAAATGGTTAGGACATATATTTTGGTTTGGTTCCTTTTTTCCCCTCA
CCCCTAGTGAAAACACTAGTGTTAAAAGAGCTGACTTACTTGACAAATTTGCATGAACCGAATGC
TACAATCCGTCATCGTCGTGTCGGAAGCGATTGCAAACCTCAGATAACACCGCCACAAACTCAGAA
GACGACTCCAACCCCTCGTCAGCTTCGTTCAAGTCAAAGACAACCTTTCTCGCCCGTCTAAAATT
CAGCTCCAACACTTCCTCAACGTAAGGCCGGAACAGCACCAAGAACAGCTTAGACAAAATCAAC
CCCTGCGGCTCCAACGCTTTGCAGTAGTTAAGACAGTCTTGCAGACACACACTCGCCGCACGCA
ACGCGTAAACCGTCTCGGAAGGAGCCGCGTTCTCTTTAACCAAACGGACCAAGTACTCGA

> SC6-a-19514A, including the flanking sequences

ACCTTCCTCCAAAGCCTTCTTCGCCTTCTTGCCATATACTTCAACATTCCTCCTCAGCTCTTTCCCT
TTCTCTCCCTCCATCAACTCCTTCACTTTCTCTGCAACCTCTCCTCTCCTCGCAACTCCATCACTCG
CCGCCACCACTCTCTCCGCCACTCTCAGCTCTTCCACCACCAACATCGCATTCAAAGGTTGCTCG
GCTGCTACAGGAAACGCCAAGATTGGAACCTCGGCGCAAATGCTCTCCATCAGAGAGTTCCACC
CACAGTGGCTCAAGAACCCTCTTACACTCTCGTGCTCTAGTATCTTCCCTTTGATCAACCCATTCAT
CTTTCACCACCATTCCTCTCTCTCCCACTCTCTCTTCAAACCCTTTCCCTATTTCACTTCCTTTAC
CACCCAAAGAAAGTTCACCTTTGATTCTTCCAACCCTAGCGCAATCTCCTCTACTTGTTCTCTAGA
GATCTCGGATTGTGACCCAAAAGCCACGTAGAGAACGTAGCATCCCTTGTCTCGCTTTTTCATCAA
GCCATTTTCATCCAAACAGATTTGACCTTCTCTTCTCCCTCATCCTCCAAGCTGAAAGAAACAACA
AGGTACGCATTCATAATCATATTTTCTGCATTTTCTTATTGATTAGTACTAGACTTATGAGCAAATCT
CATAAATAACACTTTTTAGTTTTATCACAAAAATAGCATTTAAAAAACATTTTTCTTTACATCATA
AACCTTTTATATCTCTAAATACTAAAAAAAATTTGTTCAAACCTAAATACTAAACTTTTAAGTT
TGAACCTACTACTAAAAAATATATTTTACCCTTTTTGATAAATGGTAATTTTGAAGATTTT
TTTTTGTATGCTATTTTTGAACAAAAAAAATGATTTAGTGAGATTGAAGAATATTTCTCTAAAGAC
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TTGAATATGATACCTTCACTCTGACTCATAGATGCGCATTGATCTAGTATAAGCTCGAATCCAGGAT

CCGTGGTGGGTTTTGTATCAAACATATCTTCAACAAAATCACATTTTCTAACCTTAATCCACGGAA
ACTCCGGTACAGCAACAGCCTCCGTCTCCGACTTAACATTAGACAGAAGCTGGTTTTTAAAAACA
CTGTCCAATATAGAAGGGGACATGCAGTTCATGCCCAAGAAAACAAGCCGAGGAAACCCTAGCT
TCAGAGCCGACTCTAGCGTCCACCACAAGAAACCGTCAGAGACCATGAAACTGACGCGTGGCAG
TGACGTGAGCTCCCGCTCGAAGTCGGGCTGCATTGACTTGGTGGCTCT

> E1M2-310-19514A

TTAACATGGTAGTATGCAAGTTTTATGGGTAAAGTAAACTAACTACCTTTTCAGACATGGTTCGTTGT
ATTGATGTTACATTGCTGGATGGGAATACAAATAAATAACAATAGTTGATATATATATCATATGAA
ATATATAAAATATTACGGAAACCAACCCACCCACCTAGTAGCCACCGTAAAGAACTTTCGAAAA
AAGAAAAACACATAATGGGCTAAAACCTATTCCACATCTTATTGGATAAATAAGATTATTGTTGAC
AGCATACTTGTGGGAATTC

> SCHDF-Rs1046BH

TCGACTCCCACTGTGGTCGCAATATTTTTTATTTTTGAGATATTTCTTTTTGAGCTTTC AAGGAA
GTTTGAAGCTATCTCATTGCTTTC AACA AAAACAGTAACTCAAACGAACACTAATCCCTTCTCTAT
TGAGCTTTTTGAAAGATAAAAACA AATCAGGTAAAGATTCATGAAACATGAACAAGGTTGATTGA
TAAGCCCTGTTTGTAGCTTTGGATCTCAATATATTTAGTATTC ACTACTAAAACAGTAGTGTTCCTC
ATCTCATATCTATAAAAAGAACAATGTTATTATTCATTAGGTGCTTATAAAGAAAACA AAGATGTCC
TTGTGCCAGAACTCCACATAACCTTTTATTTGCAATTAAGAACGGTCACATAAGTTTCAGCATC
TTCAGCCTTGCTTCATGCTCTGCATCCAGCTTCGGGGGAGTGTAACAGCCATGAAGATCCTCCAC
AATGTACTCTTTCGTGAGCTC

> HDE-Rs1046BH

GAGCTCATCCAGAGAGGTCCAACCTCCTGAACCTCTCTGTCAAGTCATGCTTCGTGTTGGTGATCT
TGACCGTGCCATCAAGTTCTATGAAAAGGTGATGCAACTCCTTGTATAAGGCAGTTAACATTGCTG
TTTTATGGAAAGCTTCTAGCTTGCTTACCTCAATTTTCAAACCCTGCAGGCCCTAGGGATGAGACT
CTTGAGAAGGATTGAGAGACCTGAATACAAGGTGAAGTAATCAATGATACTTCTTGGACAAGTAG
TTTACCCTTTTGAGATACGTTGCGACTCTTAACGAGTTTTTTGTTTAATGAAACAGTACACCATAGG
CATGATGGGATATGCTGAGGAATACGAGTCGA

> SCHDB-Rs1046BH, including the flanking sequences

GATATCTGTGATCAGAAGTCATGCAGAGGTCATTGTTAATGATGGTATCGTATTCCCAGTTTTTAAG
AAATTTTGCAAGGTAGAGATCAGGCTTTTATGTGGATTCAGTTTCGTTACTGCTTGCAATCACACT
ATTAAGCGAAACCTCAGAGTATCTATTATTGTTTTCAATGCCACTCTTGATTCTTTTTTGTCTGAAG
AAACAACAAATGATTTGGTGATTTCTCTTTC AATTTGCAGAGAGCTCCACCTTTAGGTTCTCAAGA
GGCATGGTTGGTTTTTTGTAAGTGATGCTTCCACATTGGCATTTCATTAAATATCAACAGCTTGAAA
AAAAAGTTTCAGTGATGTTAAACCTGTGTCTGTTTTGTGAACTCAGAGACAGAACCGGCCGCAACT
GCATCCCTGATGAACACTATGTGCAAACATTGCTTACGGTAATCACATATCTTAGAAACATCTCTTC
AGTTTGTGTTCTTTTTCTCCATGTAAAAAGTTTCGTATTAATTACGTTACTATAACCATTTTTTATTTT
CAGATGCGTGGACTAGAGAGTGAAATGGAACGAAGAACTGACATATACTGTATGGAACGTTTTT
GGGTTCAAAGTATGAAACCCAAACTTGGCATCCCGTCACTTTCACATTTGAGA ACTCTGGCCCTG
GCCAGATAAAGGAAATAAAGGTACATTATATCTTTGTAAATGATATGCATCACAACCATTGGATCTA
TACTTTTGAGTAATCATTAAATTTTTTTTTCTTGGAAACAGAGAATAGACCATGTCTATTACGAGACTG
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CTTTATAAGTGATATATTTAACTCAGGAACAGTGTAAGCAAAGTGTTTTAGGTGACAAACTGAGAA
AGGGGTGCGTATCTTCTAGGTCAAGCAACAGAGAGTTCACATAGATTAGGTAATAGCATTGATAAC

ATCACTCATGAGGTCAAGCAACTACTTTTCGAATTTTGTGGTAAACATTTTCTATTAATATGTCTG
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TTCAATTTTCTTAGGATACTCTCTCGCCCCGAAGATCGTCGATCCTATTCTCACATTTGTGCTTCC
CAGTTCAATCTGCAAATCAAAAAAACAAGAAAACCTTTTTTAGCATTTTGAGTAGAACTCAGTG
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CATCCCATGGATAGCTCACATTGCTCCTCAGGTATTCCAAGCGCCTCACACACTTCACTTCTGCA
TTTTGCAAGCATCTACACATACAATGTGATACAAAAGAGAGCCTTTTTTGGTTAGTGTTCCCGTG
ATATTACCAAACGTTTCTTTAGATTTCCATTCAGATTATATAAACCTTGAAGTTCTCTGGGGTTGAA
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ATGCTTTGCTAGTCCACGCATCCAGAGGGCTCCACGCCGAATTTGCTGCAAGTATCAGTGAGAT
GATCATGTAAAGAACCGTGGAAATGGAAACATCTGAGCTGGATAAGAAGAAAAAGTTGGAGACT
TCAAGATTCTTACACTCTTCGCCACTGGTATTCACTTGAACCAAGACCTTCAGAGGCTTTCTTCCG
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CAGATGCATGTTCCCTGACGTTTCTCTAGTTTACTGACAGGCATAACAATAAGAAACAAGTAA
CAAGGTCGCTTTCAAAGAGCTCTCATATGATCCGAGACTCTAAAGACCCGCGTGTTTTACTACTA
AGTAGCTGTAAACAAATCTATAATGTAACGTGGTTAAGTTGAAGGAATTCCAATACCAAAAACCA
GCAATATCTTTGTATGTTACAGATGATTTTTATATGATTTGATCTTAA

> HDD-Rs1046BH, including the flanking sequences

TTTAAAGATTTTGTAGTGAAAAAACCCCTCAACTATTTTCAATCGTAAAAAACCCCTCAACTAAG
TTTTCAACATTATACAACTTACAACTGTTAACGTATGTCACCCTCCGTCACGGTTTTTTAGACGG
AGGGTAACATATGTTAACGGAATTGAAGTTGAGGGTTTATTTACATGATTTTTAGTTGAGGGTTTA
TTTTACGATTCATCTTTAGTTGAGGGGTTTAACTACTAAAAACCAACTAAATATAAAGCTCTCTAC
TTTTCTATCGAATTTGCCAATTTTTCTCATAAGGTCATAGTTCTGATTTGACCCATTTAGATTAAGGA
CCGAACAAAACAAGTTGCAGGCTTTGTGTTTCTGGTTTAACTTGAACTATAGTTTTATGTTCTTGC
CGCATGATTGTAATAGAAAGTTTCCATTTTTGGAAATGTTATAGGTTCAAACCTAAGTTTTTGATGT
CGGATTGTGTTTATGTTGTAATGAGCTCCACTATAGCGCAATGGAGTCTATCGTTTATGTTT
CTAAGTTTACTATGATCATAAGATTAAGAGGAGTCACTGAGTTTGATAAGCTAGCAAACCGAAT
AACTTCATGCTGATCAATAAACCGAAGACTTACTACATTGTTTGTTCATTTGGGCAGCTTGTATG
CTTAGCGGATCTTGAGTTTGATTACATCAACCCTTACGACTCTGCATCGAGGATAAACTCCGTGGT
TTTACCTGAATTCATTATCCAAGGAGTTCTATGTGATTCTATCTCCTAACAGGACACTGGTTCATG
TCACTCTTATGTCTCCCTTATCTCTACTACAACCTCCAAGTCTGTTTTTTTTTCTTACAA
CTTATCAACATGGGTGATTGTCTTGATTATATCTCATTCGGTGTCTCTGTTGTTTCAAGTACTCGAAG
CGACAGCACTTGGTAGATGTCACGGAGATATTTAACTTGCTTAACTGGGAAAAGAAGAAACGGCT
GTTCAAGCTTGCTTACATAATCCTTAACTCTTTCTCACTATCTTCTGGTAAATAAAGATGAACCTG
TGCTTTTTTCAATATTGATCAGACAGCTAACATAGGCTTCTGTCTGCAACTTTTTTGTAGGATGATT
TACTCGGCGATGGATGATTACGAGGACTGACTGATGAAAAGGCGATCTAGCTTTTTTTGGTTTTTC
ATCGGTGGCGCCGGTGGTGGTGGACATGAGACAGATGAAAGAACAAGTGTGTTGCTTGTGGTAC
AAGTTTAAATGTTGTTTGTAAAATTACTAGCAGAAAGATTTGTGTAGTTTTGTTTCTTTCTTAGTAAC
ATTTTTTTCAGATCCTGATATCTGACAGAAACATTACAACCTTAAAAAAGTTCAATGTTAGAAAAA
GTTTCGGTAATTCAGGCGAATATTCGTCCTGTAATAAAAAAATAATAATTCTGAAGTTAAAAAT
TCGGTTTAAAGTTACGTAATTAAGGGTTATTAATGGTATAAACCTAGTCCAATCCTTATTTTGTGCG
TGCTATAGTCATCGTTGTGAAGCCGGAGTGATCTCGTTTATCACGGTGCTTCCTGCCTCTCTCTTT
CGCTCGAAACAACCTCCATCTTCTATATAGCTTTGATAGATCTAATTGCTTTCGTTACACTGTAGAA
ACTTGACCTAGATATGCCTGGAATGTTAGATTTGGAATCGAAATATGTTGTGATGCTTAGGTAGCTC
AAAACAAGTTACGGCAATTAGGGTCATTGTTGTAACAAGAAGGCTAATGATATGGTCAGAGTTTT
AAA

> P6M6-410-Rs1046A, including the flanking sequences

AGGCCTACCGTACTTGTATTAGCCCAATAGTAAAGGCCCATTAGCCTTGCTCGAATTATTAACGAC
GTATCTAGAGTTCAAATTGCGTCTGTTTCATACTAGCGGACGACGGTTCTCGGCTTGGATCGTCGT
CGCGGTTTAGTTTCCGTTAGCGATCCGGCTTCTCCTCGGTACCTGATCTCTCCCTGTCGTATTCTCC
CTCTGTCTACTCTACTCATAAGTCCATCACCGTCGTCTCTCTTTCAAGCTTCTCTGAGTTGCGAGCT
GGTCAACAGCAGGTAACCTTCGAATCCTTCGCCTTCTTTTCAAGTTATTCTCTTAGATCTATAGTAAG
AATACGTCGAAATCAACGATCTGATCTTCTCGATGCAAATTTCAACGAGTTTATGCGGGTAGAAATC
GGGAAGATGATATGCGTAGTAGTAGTAGTATTACGAGTTTCGATTTAGTCTAGTTCTCGAGG
CTTGATCACGATCTGGAGATGATCAGTTTGTGGAAGTCTTGTTACGCTGAAACTATAGGGCTTTTAT
TTTCTGAGAGATGAATTTTGCAGGATACTGTAGAGATTATTGATTCTTTGAGTTGAATAAGCTTAAC
TTGAACACGATGGATCATCAAATGGATTCGGTGGTGGGAAGTCACTGGGCTATCTCCAGCTGTTA
CTGAGAAAGATCTCATCGACTTCTTCTCCTTCTCTGGCGCAATCGAAGATATTGATATTGTCAGGT
GAGTGAGTCTTACTTTCCACCAAATGTGATATCTTGCAATTGATTACAGAGGTTAAAACTATGTTAT
GTTGTTAACGAGGTAAGATCGGGTGAGCAAGCGCGCACTGCTTATGTGATGTTTAAAGATTCTTAC
TCTCAGGAAACTGCAGTCTTACTCAGTGTAAGTTTGTGTTTGAATTTGATTCCACCCTTTTTTATT
GGAGAATGAATCACTAGGTTCTTTGACTTAACTTCAGGGGGCAACCATATTGGAGCAGCGAGTTT
GCATCACTCGTTGGGGACAGCATCACGAGGAGTTGACTTCTGGAACGCGACTCAGCGCGGTTTT
GAAGATGACACATACTCACATGTATGAATCAATCTCTTGCTTTTATCTTTCTACAATTGACTATGTTT
ATGTTGAGAAGTTTATCAAAGATTTTTTTTTTTCTTTGTTTGGTTGCTCTCATGTAGCCTCATCCTCA
ACGAGGCGAGTTCAACGCCGGAGAAGCAGTGACAAAAGCTCAAGAAGTGGTGAAGTCAATGCT
AGCCACGGGATTCGTGCTGGGCAAAGACGCATTAGCCAAAGCCAAAGGCTTTGACGAATCCCAC
GGTGTGTCAGCTGCAG

> BE10-Rs1046A

TTGGGTATGGTGTGGGTTTGCTCATGTGCTGAGGGAGTTTATCATAGAGACGTTTGAGAAAGCA
GGACGTCGTGAGGAGATTGAGAAAACCTTGAATACGGTTAACCGTCCGGTTAGAAACTCTGTGC
AGTCTGGTAAGACTCCACCTAGTGTATCCTCAGTGTTAGGAGCCAATGGAAGTGCAGGTCAAACG
GCGGGAGGAACTTACAAGGCTAATAATGGTCAGAATCCATCTAGGTCCAACACCTCTGTTAACCA
GCAGCAGCAACCGTGGTCTAGTCCTTCAGGTCATCAGCAATCATGG

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TTGGGTATGGTGTGGGTTTGCTCATGTGCTGAGGGAGTTTATCATAGAGACGTTTGAGAAAGCA
GGACGTCGTGAGGAGATTGAGAAAACCTTGAATACGGTTAACCGTCCGGTTAGAAACTCTGTGC
AGTCTGGTAAGACTCCACCTAGTGTATCCTCAGTGTTAGGAGCCAATGGAAGTGCAGGTCAAACG
GCGGGAGGAACTTACAAGGCTAATAATGGTCAGAATCCATCTAGGTCCAACACCTCTGTTAACCA
GCAGCAGCAACCGTGGTCTAGTCAGACGGCAGGGAAGCAACCACCATCATGGTCGAGTCAGCCA
CCAGGATATCAACAGCAGCAATATTGGTCTCAGAAACCAGGGTGGTCAAGTCCTTCAGGTCATCA
GCAATCATGG

> BE10-Tapidor

TTGGGTATGGTGTGGGTTTGCTCATGTGCTGAGGGAGTTTATCATAGAGACGTTTGAGAAAGCA
GGACGTCGTGAGGAGATTGAGAAAACCTTGAATACGGTTAACCGTCCGGTTAGAAACTCTGTGC
AGTCTGGTAAGACTCCACCTAGTGTATCCTCAGTGTTAGGAGCCAATGGAAGTGCAGGTCAAACG
GCGGGAGGAACTTACAAGGCTAATAATGGTCAGAATCCATCTAGGTCCAACACCTCTGTTAACCA
GCAGCAGCAACCGTGGTCTAGTCAGACGGCAGGGAAGCAACCACCATCATGGTCGAGTCAGCCA
CCAGGATATCAACAGCAGCAATATTGGTCTCAGAAACCAGGGTGGTCAAGTCCTTCAGGTCATCA
GCAATCATGG

TABLE S2. Syntenic genes from *At1g10180* to *At1g10400* between *Arabidopsis* and the three subgenomes in *B. rapa* and *B. oleracea*

<i>Arabidopsis</i> gene	Orthologues in <i>B. rapa</i> genome			Orthologues in <i>B. oleracea</i> genome		
	MF1	MF2	LF	Subgenome I (MF1)	Subgenome II (MF2)	Subgenome III (LF)
<i>At1g10180</i>	N	Bra018457 (A5) ^a	N	N	Bol022073 (C8)	N
<i>At1g10190</i>	N	N	N	N	N	N
<i>At1g10200</i>	N	Bra018454 (A5)	Bra019956 (A6)	N	Bol022065 (C8)	Bol036761 (C5)
<i>At1g10210</i>	N	N	Bra019955 (A6)	N	N	Bol036760 (C5)
<i>At1g10220</i>	Bra031705 (A9)	Bra018453 (A5)	Bra019954 (A6)	Bol031241 (C08)	Bol022064 (C8)	Bol036759 (C5)
<i>At1g10230</i>	N	N	N	N	N	N
<i>At1g10240</i>	N	N	N	N	N	Bol036756 (C05)
<i>At1g10250</i>	N	N	N	N	N	N
<i>At1g10260</i>	N	N	N	N	N	N
<i>At1g10270</i>	Bra031706 (A9)	Bra018451 (A5)	Bra019952 (A6)	Bol031243 (C08)	Bol022062 (C08)	Bol036755 (C05)
<i>At1g10280</i>	N	Bra018450 (A5)	Bra019951 (A6)	Bol031244 (C08)	Bol022061 (C08)	Bol036754 (C05)
<i>At1g10290</i>	Bra031707 (A9)	Bra018449 (A5)	Bra019950 (A6)	Bol031248 (C08)	Bol022060 (C08)	Bol036753 (C05)
<i>At1g10300</i>	N	N	Bra019949 (A6)	N	N	Bol036752 (C05)
<i>At1g10310</i>	N	Bra018447 (A5)	N	N	Bol022059 (C08)	N
<i>At1g10320</i>	N	Bra018446 (A5)	Bra019944 (A6)	N	Bol022058 (C08)	Bol036748 (C05)

At1g10330	N	Bra018445 (A5)	Bra019943(A6)	N	Bol022057 (C08)	Bol036746 (C05)
At1g10340	N	Bra018444 (A5)	N	N	Bol022056 (C08)	N
At1g10350	N	Bra018443 (A5)	Bra019942 (A6)	N	Bol022055 (C08)	Bol036745 (C05)
At1g10360	Bra031708 (A9)	N	N	Bol031251 (C08)	N	N
At1g10370	N	N	Bra019940 (A6)	N	N	Bol036742 (C5)
At1g10380	N	N	Bra019939 (A6)	N	N	Bol036739 (C5)
At1g10385	N	Bra018442 (A5)	N	N	Bol022052 (C8)	N
At1g10390	N	Bra018441 (A5)	Bra019938 (A6)	N	Bol022051 (C8)	Bol036738 (C5)
At1g10400	N	Bra018440 (A5)	N	N	Bol022050 (C8)	N

Note: ^aThe chromosome localization of the *B. rapa* and *B. oleracea* orthologues is listed in brackets. *N* indicates that no orthologue is detected in the *B. rapa* or *B. oleracea* subgenomes (MF1, MF2 and MF3) for a given *Arabidopsis* gene. The shading of two columns emphasizes the best syntenic subgenomes in *B. rapa* or *B. oleracea*. PCR primers used for grouping the BAC clones were designed from the *bold B. rapa* and *B. oleracea* genes.

TABLE S3. Primers used for differentiation of the BAC clones and RT-PCR analysis

Primer	Sequence (5'→3')	Annealing Temp. (°C)
B1	R: GAACTAACCGATCCAAAGTCC	61
	C: ATGCAGATGAGTCAGAAGAG	61
	O: GAACTAACCGATCCAAACTCT	61
	F: TGCTACAATCCGTCATCGTC	
B2	R: GTTCTTCTTCTTCTTTACATCTTC	60
	C: TGTTTCCGCTGTCACCATTG	60
	O: GTTCTTCTTCTTCTTTACATCTGA	60
	F: CATCCTCCAIGTGTACTACTTG	
B3	R: GGAGTTTATCATAGAGACGT	60
	C: AGAAAGCAGGACGTCGTGA	60
	O: GGAATTTATCGTAGAGAGTT	60
	F: ATTCTCAGAGTTTGACCATGG	
B4	R: TTAGTGGCAAGCCTATCTTCT	61
	C: GGAAGAATCGTGATGAGAT	61
	O: TTAGTGGCAAGCCTATCTACC	61
	F: TCAGACAAGAAAGCAGCTCGG	
B5	R: ATGTCTAGCTCCCTTTGATAG	60
	C: GTTGAGAAAGCTTGAGGTAGT	60
	O: ATGTCGAGCTCCTATTGTATC	60
	F: TGAAGGGAATCCATCAATGTC	
B6	R: TCTCAAGAAGTCTTACCGGCGT	60
	C: AGACGTCAGATCTACGATCA	60
	O: TCTCAAGAAGTCTTACCGAAGA	60
	F: TTGTTGAGACCTAGTTTGCG	
B7	R: AACCAGCTTCTGTCTAATG	60
	C: GATCCTGGATTCGAGCTTATC	60
	O: AAACAAGCTTTTATCTGAGG	60
	F: CACGTAGAGAACGTAGCAT	
RT-ORF1	F: CACTTGAGGCAATAGATACC	58
	R: AAGACAGTCTTGCAGACAC	
RT-ORF4	F: CCGAACCAGTTCTTCGATGC	58
	R: GACAAACGCAGTGAGTTGTC	
RT-ORF5	F: AACCACCATGAGTTGGATC	57
	R: ACGGAATCGAGAGACCGTAC	
RT-ORF6	F: CCTGCTGGTACTAAAGTGTC	58

	R: TCCTCCTTCAAGCTGGCTC	
RT-ORF7	F: TCAGTGCAAAGGGTTCAC	58
	R: GTTCTCCAATGGATGAGCA	
RT-ORF8	F: ATCATGGTCGAGTCAGCCAC	58
	R: TCCTGGCTCCTGTTGTTGAG	
β -actin	F: CTAGGATCCAAAATGGCCGATGGTGAGG	58
	R:GAAACTCACCACCACGAACCAG	

R and *O* represent that the forward primers are specific to the genes located in the MF2 subgenomes of *B. rapa* and *B. oleracea*, respectively. *C* represents that the forward primers are specific to the conservation region in the MF2 subgenomes between the two species. *F* indicates the forward primer.

TABLE S4. F_2 sterile plants carrying recombination events between the *BnMs5* locus and markers

Plant code	Genotype of the marker				
	SCD7	SC9H	SCD8	BE10	SC6-a
9J20	<i>BnMs5^a</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
8D57	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
8G24	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
8M77	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
8O83	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
8U03	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
8P95	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
8V54	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
8Y11	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
9F26	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
9J69	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
9A84	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
8K12	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
8U27	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
8I36	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
9J93	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
8P29	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^a</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
9E27	<i>BnMs5^a</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^a</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>
9G51	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^aBnMs5^b</i>	<i>BnMs5^a</i>
8A36	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^a</i>
8K74	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^a</i>
8N46	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^a</i>
8R32	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^a</i>
8S94	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^a</i>
8W47	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^a</i>
8Y91	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^a</i>
9D48	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^a</i>
9G43	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^b</i>	<i>BnMs5^bBnMs5^b</i>	<i>BnMs5^a</i>

Marker genotypes in **bold** indicates a recombination event between the corresponding marker and plant.

FIG. S1. Semi-quantitative RT-PCR of the candidate genes. Floral buds with length (1) less than 1 mm, (2) from 1 to 2 mm, (3) from 2 to 3.5 mm and (4) from 3.5 to 5 mm, were collected from the temporary maintainer line 7-5 for total RNA extraction. *B. napus* β -actin gene was used as an internal positive control.

