

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: Statistics of PacBio data.

File Name: Supplementary Data 2

Description: Statistics of Illumina data.

File Name: Supplementary Data 3

Description: Comparison of *B. napus* assemblies.

File Name: Supplementary Data 4

Description: Statistics of structural variations between ZY821 and GH06.

File Name: Supplementary Data 5

Description: General statistics of repeats in the GH06 and ZY821 genomes.

File Name: Supplementary Data 6

Description: Transposable element (TE, interspersed repeat) contents in the assembled GH06 and ZY821 genomes.

File Name: Supplementary Data 7

Description: Number of functional annotations for predicted genes of the *B. napus* assemblies.

File Name: Supplementary Data 8

Description: General statistics of the predicted protein-coding genes.

File Name: Supplementary Data 9

Description: Non-coding RNAs in the GH06 and ZY821 assemblies.

File Name: Supplementary Data 10

Description: Phenotypic analysis of seed coat colors of *B. napus* in different environments for the recombinant inbred lines and the parents.

File Name: Supplementary Data 11

Description: Sequencing data statistics of the QTL-seq experiment.

File Name: Supplementary Data 12

Description: Mapping rates with different reference genomes.

File Name: Supplementary Data 13

Description: SNP and InDel annotation results of the QTL-seq experiment.

File Name: Supplementary Data 14

Description: Results of mapping the QTL for seed coat color as detected by the CIM method in different environments.

File Name: Supplementary Data 15

Description: Locations of the QTL markers in the Darmor-bzh (v4.1), GH06 and ZY821 genomes.

File Name: Supplementary Data 16

Description: Locations of the InDel markers in the Darmor-bzh (v4.1), GH06 and ZY821 genomes.

File Name: Supplementary Data 17

Description: Candidate genes and annotations in the Darmor-bzh (v4.1), ZY821 and GH06 genomes.

File Name: Supplementary Data 18

Description: Organism name and gene accession numbers for phylogenetic analysis.

File Name: Supplementary Data 19

Description: The main differential flavonoid metabolites identified by UPLC-HESI-MS/MS in developing *B. napus* seed coats.

File Name: Supplementary Data 20

Description: Comparisons of the differentially accumulated flavonoid metabolites ($\mu\text{g/g}$ FW) between ZY821 and RNAi-BnA09myb47a lines during different developmental stages.

File Name: Supplementary Data 21

Description: Comparisons of differentially accumulated flavonoid metabolites ($\mu\text{g/g}$ FW) between GH06 and BnA09MYB47a^{ZY821}-overexpression lines during different developmental stages.

File Name: Supplementary Data 22

Description: Primers used in this study.