

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: Statistics of Nanopore sequencing data.

File Name: Supplementary Data 2

Description: Summary statistics of ZS11 and Westar genomes.

File Name: Supplementary Data 3

Description: The centromeric region in ZS11 v1 genome.

File Name: Supplementary Data 4

Description: The centromeric region in Westar v1 genome.

File Name: Supplementary Data 5

Description: Primer sequences used to validate the corrected chromosome junctions identified in Westar v1.

File Name: Supplementary Data 6

Description: The result of BUSCO (Genome mode) in ZS11 and Westar genomes.

File Name: Supplementary Data 7

Description: Summary statistics of the 6 assembled *B. napus* genomes.

File Name: Supplementary Data 8

Description: Summary of evaluation results for the newly annotated 14 genomes.

File Name: Supplementary Data 9

Description: Gene Ontology (GO) analysis for gene families in 22 *B. napus* genomes.

File Name: Supplementary Data 10

Description: Number of different types of structural variants within each genome compared to the ZS11 v1 genome.

File Name: Supplementary Data 11

Description: Summary of PCR Primers and Validation Results for SVs.

File Name: Supplementary Data 12

Description: Number of SVs in each chromosome of *B. napus* graph pan-genome.

File Name: Supplementary Data 13

Description: Number of SVs in each sample of *B. napus* graph pan-genome.

File Name: Supplementary Data 14

Description: The list of HGPs in *B. napus*.

File Name: Supplementary Data 15

Description: Proportion comparisons between TEMSV genes and non TEMSV genes with different expression fold change in ZS11.