

Description of Additional Supplementary Files

Supplementary Data 1: *D. catenulata* strains used in the study. Also includes accession numbers for sequencing and assembled genome data.

Supplementary Data 2: Genetic diversity and differentiation statistics measured in *D. catenulata*.

Supplementary Data 3: Assembly and annotation statistics of *D. catenulata* assembled genomes.

Supplementary Data 4: Genes associated with drug resistance and virulence detected in *D. catenulata*.

Supplementary Data 5: Characteristics and chromosomal positions of the retrotransposons discovered in *D. catenulata* genomes.

Supplementary Data 6: Characteristics and chromosomal positions of the *Dici* transposons discovered in *D. catenulata* genomes.

Supplementary Data 7: Synteny blocks detected between the *D. catenulata* genomes.

Supplementary Data 8: Characteristics of the *Dici* transposons newly identified in Fungi. Also contains the list of the *IS630-Tc1-mariner* transposase sequences used to generate the phylogenetic tree shown in Supplementary Figure 9.

Supplementary Data 9: Sequencing statistics for the five assembled *D. catenulata* genomes, and experimentally evolved populations. Includes short-read mapping metrics for the 61 *D. catenulata* strains.