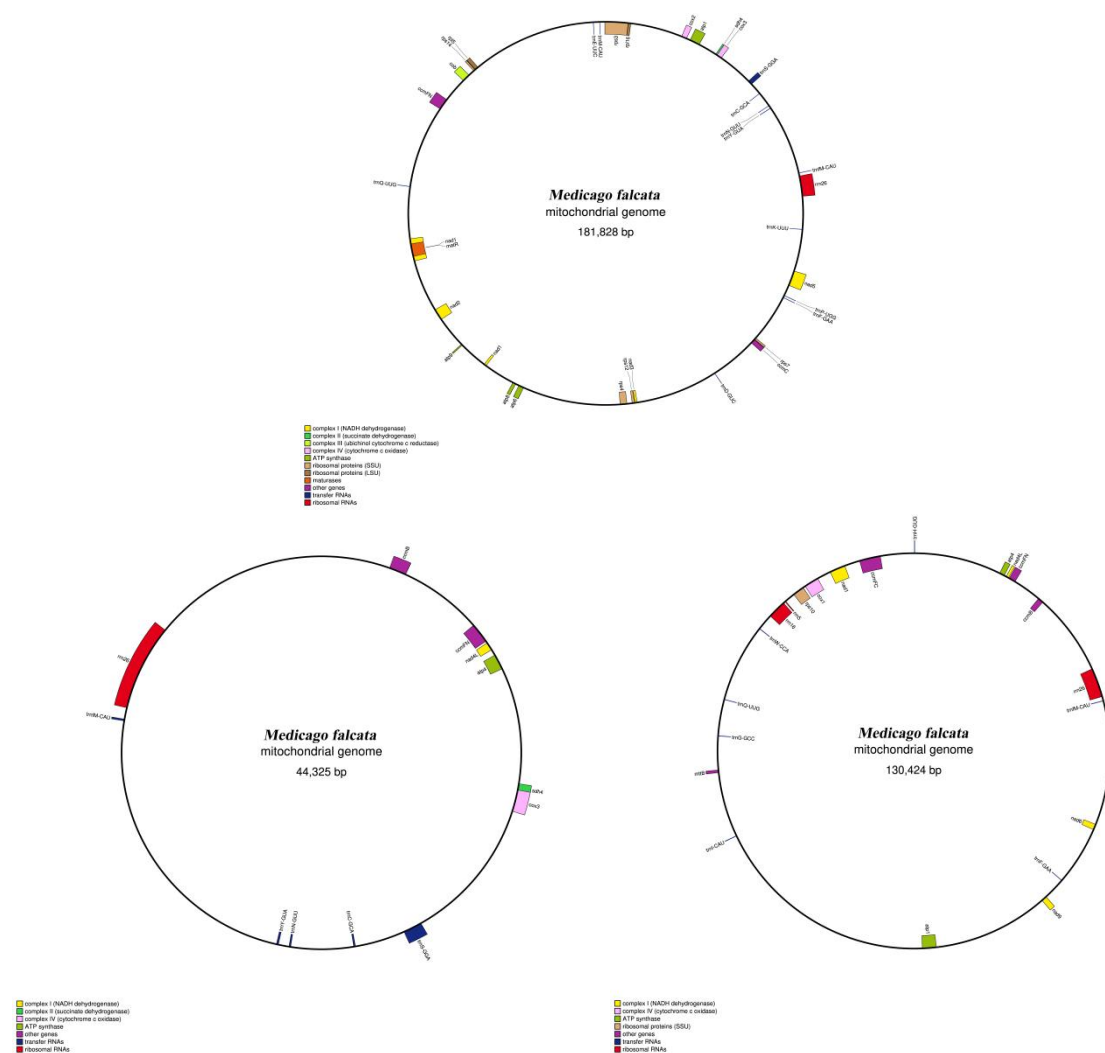


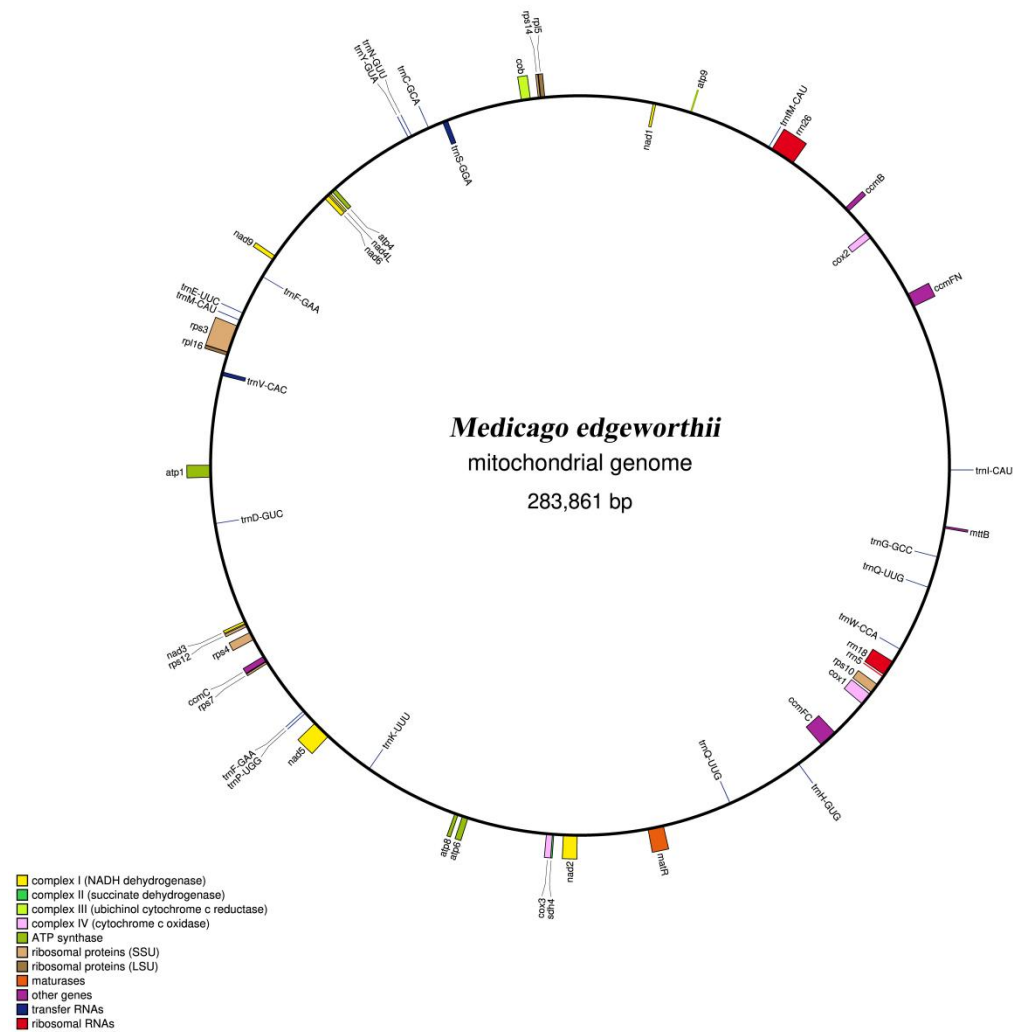
Supplementary Figure 1. Circular map of the mitochondrial genome of *Medicago lupulina*

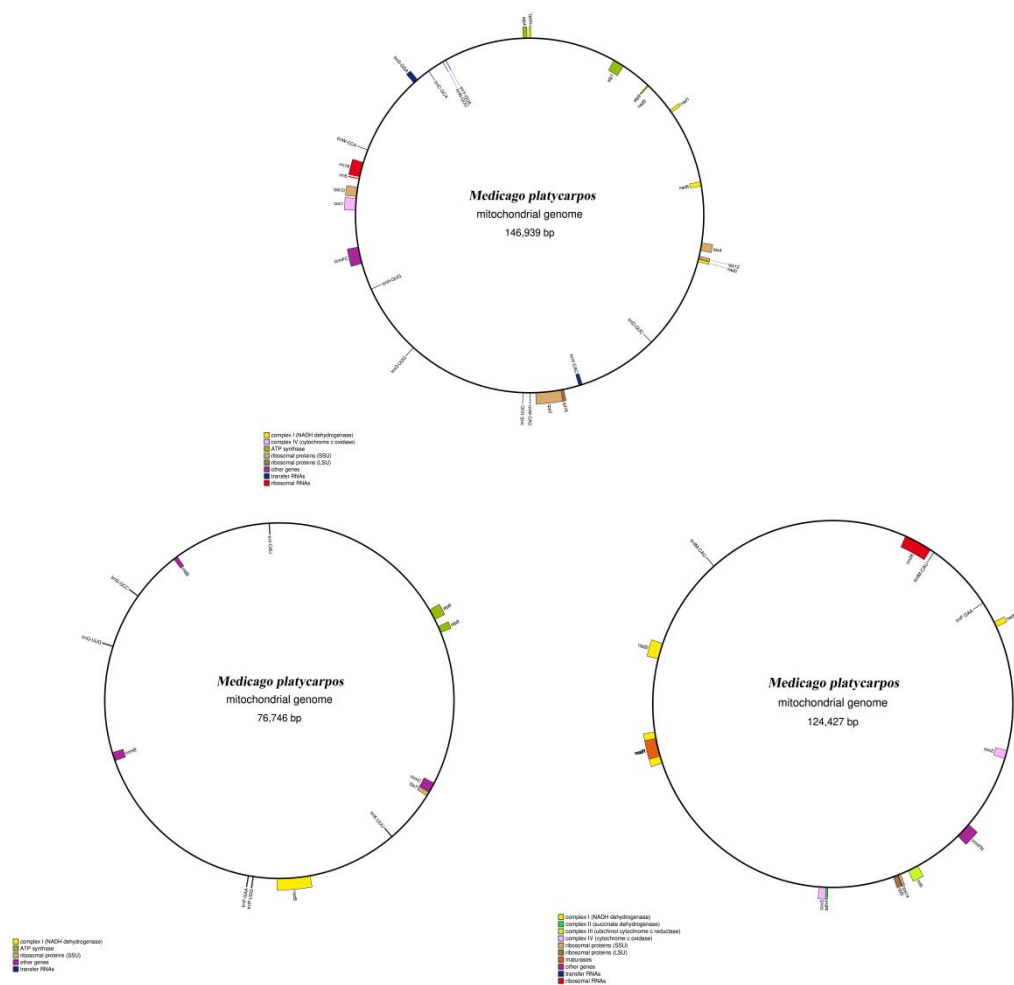
Genomic features are mapped on the inner and outer sides of the circular genome according to functional categories, with different colors used to distinguish gene functions.

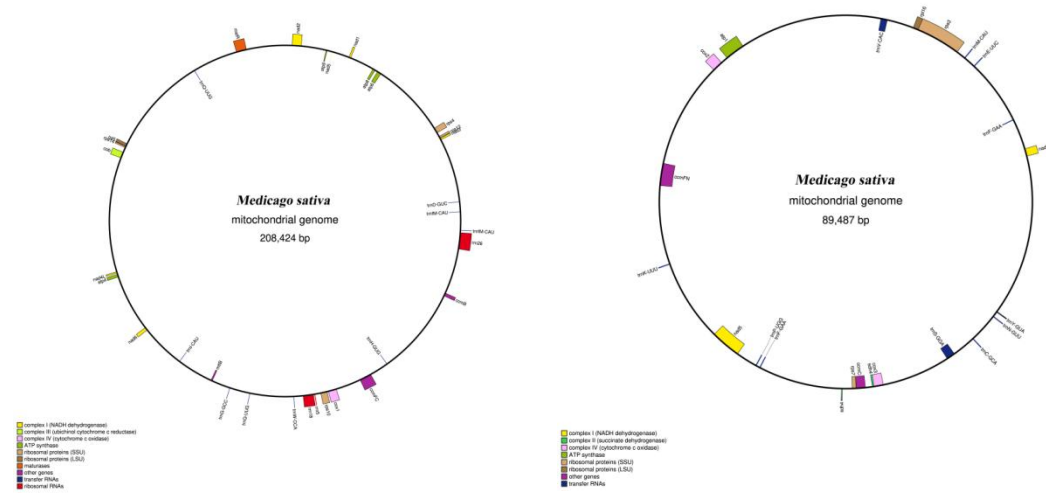


Supplementary Figure 2. Circular map of the mitochondrial genome of *Medicago falcata*

Genomic features are mapped on the inner and outer sides of the circular genome according to functional categories, with different colors used to distinguish gene functions.

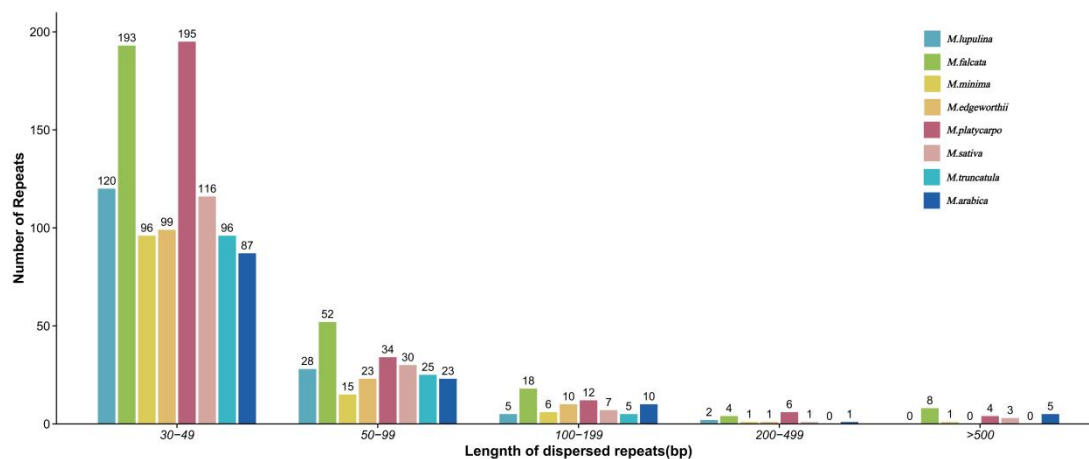






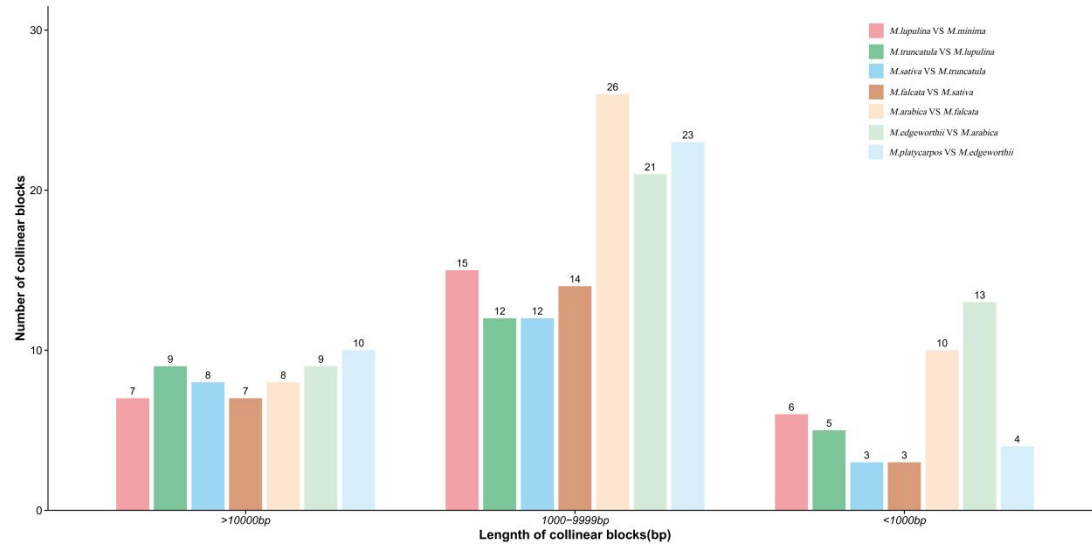
Supplementary Figure 6. Circular map of the mitochondrial genome of *Medicago sativa*

Genomic features are mapped on the inner and outer sides of the circular genome according to functional categories, with different colors used to distinguish gene functions.



Supplementary Figure 7. Length distribution of dispersed repeats in the mitochondrial genomes of *Medicago* species

The figure shows the classification and abundance of dispersed repeats by length across different species. The x-axis represents repeat length intervals, the y-axis indicates the corresponding number of repeats, and different colors denote different species. Exact counts are labeled above each bar. Teal Blue: *M. lupulina*; Olive Green: *M. falcata*; Golden Yellow: *M. minima*; Honey Gold: *M. edgeworthii*; Rosewood: *M. platycarpos*; Rose Beige: *M. sativa*; Turquoise Blue: *M. truncatula*; Royal Blue: *M. arabica*.



Supplementary Figure 8. Statistics of the length and number of syntenic blocks

The figure displays the length distribution and quantity of syntenic blocks among *Medicago* species. Different colors represent homologous regions between specific species pairs. Soft Rose: *M. lupulina* VS *M. minima*; Mint Green: *M. truncatula* VS *M. lupulina*; Sky Blue: *M. sativa* VS *M. truncatula*; Warm Apricot: *M. falcata* VS *M. sativa*; Light Apricot: *M. arabica* VS *M. falcata*; Pastel Green: *M. edgeworthii* VS *M. arabica*; Pale Sky Blue: *M. platycarpus* VS *M. edgeworthii*.

