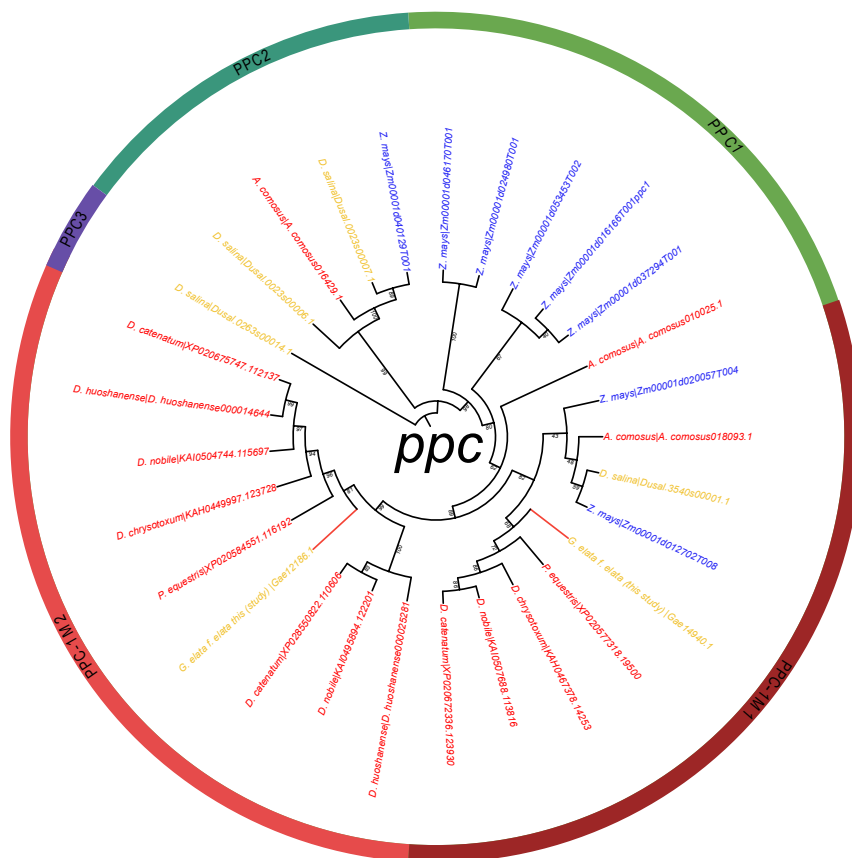




Supplementary figure 12. Phylogenetic analysis of the phosphoenolpyruvate carboxylase (*PPC*) gene family across nine representative plant genomes. The phylogenetic tree was inferred from *PPC* homologs identified in nine plant species, including *Gastrodia elata*. Major *PPC* subclades are indicated by the outer colored ring and labeled as *PPC1*, *PPC1-M1*, *PPC1-M2*, *PPC2*, and *PPC3*. Gene labels are colored according to the photosynthetic type of the corresponding species: yellow, C3/CAM plants; blue, C4 plants; and red, CAM plants. *G. elata* *PPC* genes are highlighted in dark red.