Descriptions of Additional Supplementary Files

Supplementary Data 1: Genomic features and metadata associated with the Cybanobacteriota dataset.

Supplementary Data 2: Two sets of phylogenetic markers (UNI56 and PLASTID54) used for all phylogenomic analyses in the study.

Supplementary Data 3: All ptMAGs, and their associated metadata used to infer plastid relationships among photosynthetic eukaryotes.

Supplementary Data 4: Summary statistics for ptMAGs dereplicated at 99% identity and the NCBI reference plastomes used to estimate core orthogroups for the ptMAGs.

Supplementary Data 5: Summary statistics for novel ptMAGs identified in this study.

Supplementary Data 6: Annotation of the novel ptMAGs that shares a common ancestor with cryptophytes and haptophytes.

Supplementary Data 7: Protein IDs for Streptophyta core orthogroups (present in 90% of reference plastids) in NCBI reference plastids and ptMAGs. HOG indicates phylogenetic hierarchical orthogroup number from OrthoFinder.

Supplementary Data 8: Protein IDs for Chlorphyta core orthogroups (present in 90% of reference plastids) in NCBI reference plastids and ptMAGs. HOG indicates phylogenetic hierarchical orthogroup number from OrthoFinder.

Supplementary Data 9: Protein IDs for Euglenozoa core orthogroups (present in 90% of reference plastids) in NCBI reference plastids and ptMAGs. HOG indicates phylogenetic hierarchical orthogroup number from OrthoFinder.

Supplementary Data 10: Protein IDs for Rhodophyta core orthogroups (present in 90%of reference plastids) in NCBI reference plastids and ptMAGs. HOG indicates phylogenetic hierarchical orthogroup number from OrthoFinder.

Supplementary Data 11: Protein IDs for Cryptophyta core orthogroups (present in 90% of reference plastids) in NCBI reference plastids and ptMAGs. HOG indicates phylogenetic hierarchical orthogroup number from OrthoFinder.

Supplementary Data 12: Protein IDs for Haptophyta core orthogroups (present in 90% of reference plastids) in NCBI reference plastids and ptMAGs. HOG indicates phylogenetic hierarchical orthogroup number from OrthoFinder.

Supplementary Data 13: Protein IDs for Ochrophyta core orthogroups (present in 90% of reference plastids) in NCBI reference plastids and ptMAGs. HOG indicates phylogenetic hierarchical orthogroup number from OrthoFinder.

Supplementary Data 14: The supplementary dataset includes concatenated protein alignments used for phylogenetic inferences, phylogenetic trees, annotations of plastid MAGs in GenBank format, and novel plastid MAGs in FASTA format.