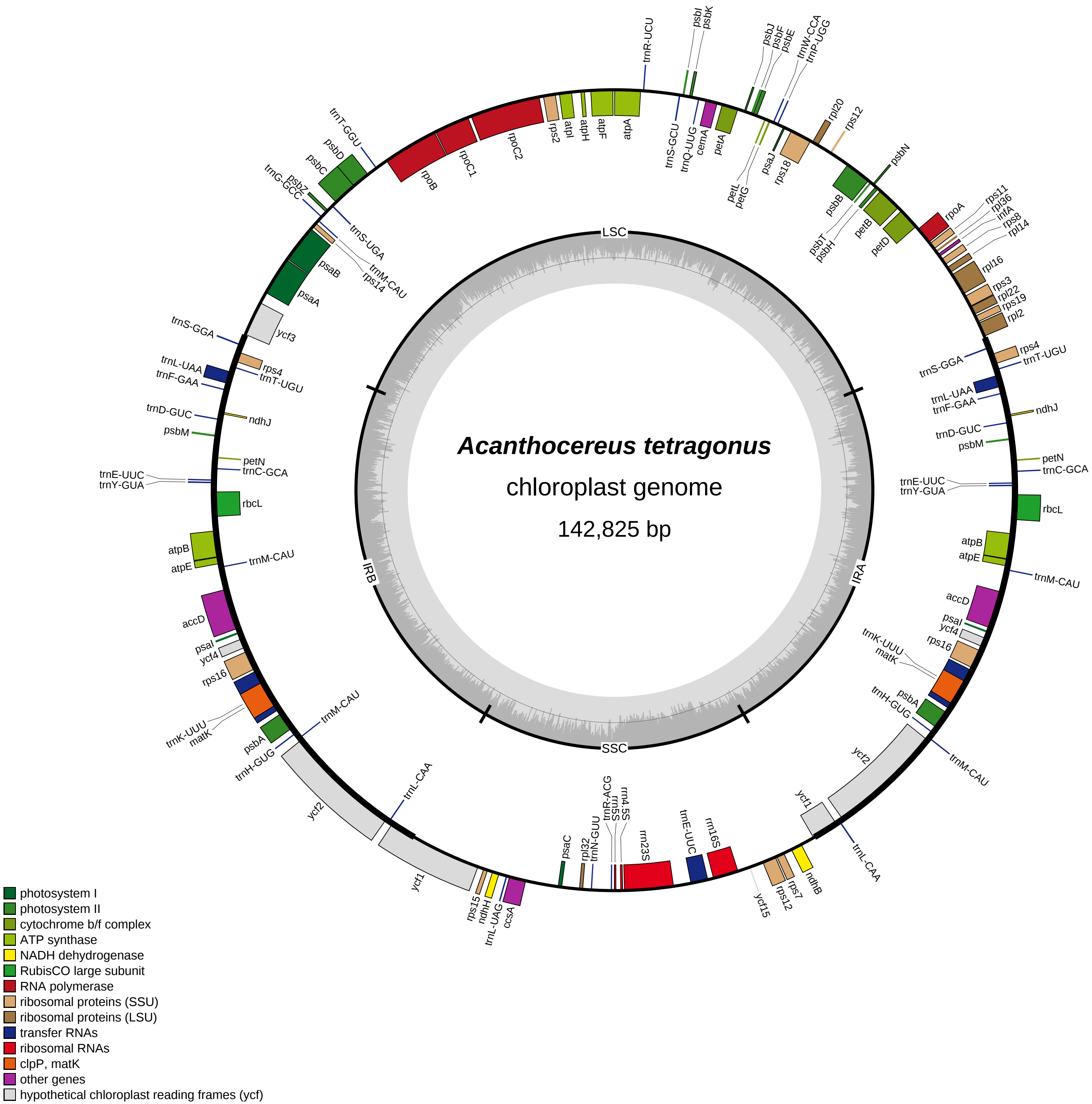
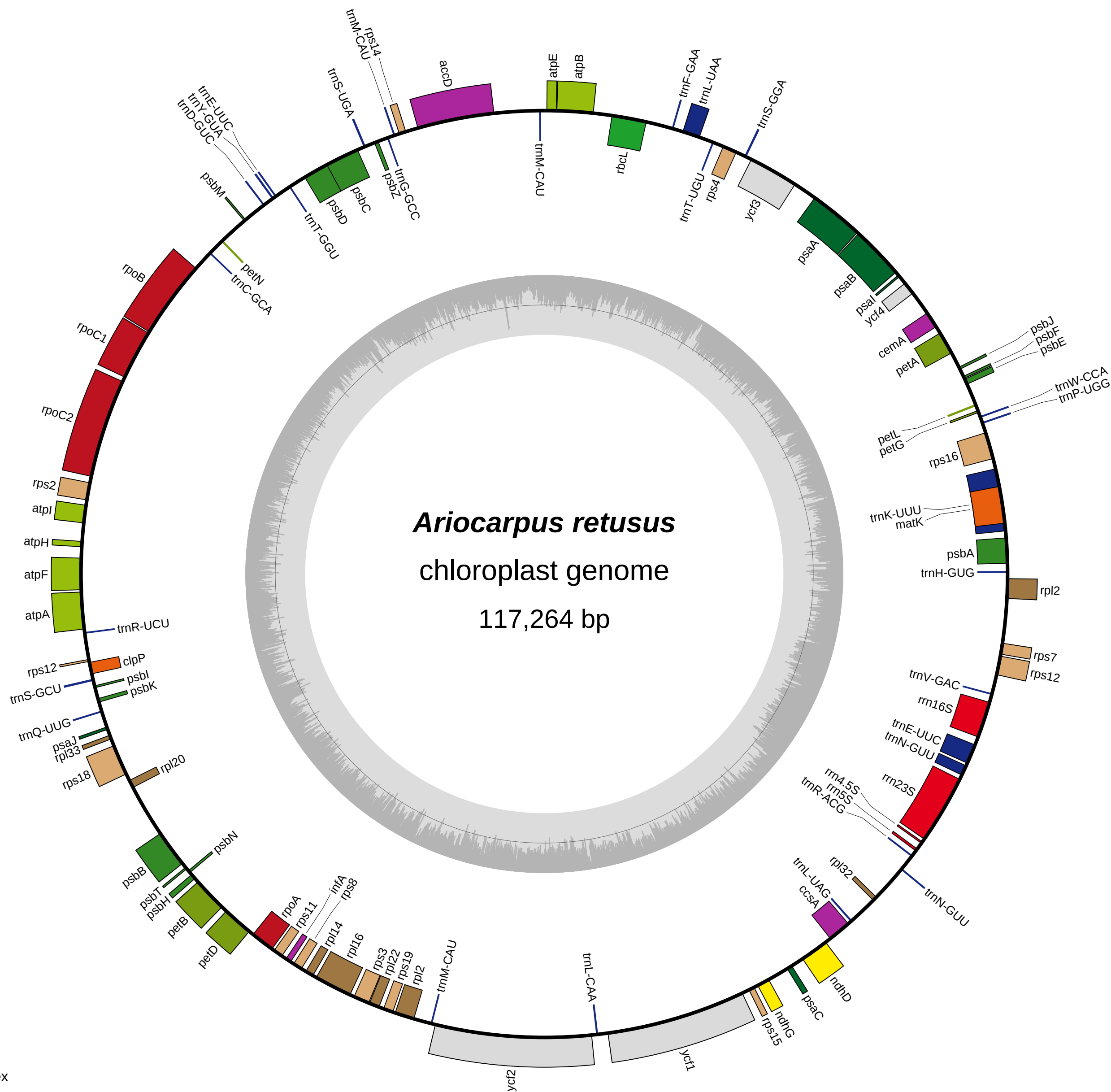


Figure S1.Plastid genome map of 35 cacti species. The genes outside the circle are transcribed in the counterclockwise direction, and the genes inside the circle are transcribed in the clockwise direction. Different colors in genes represent different functions. The dark gray area and light gray area of the inner circle represent the ratio of GC content to AT content in the genome, respectively.



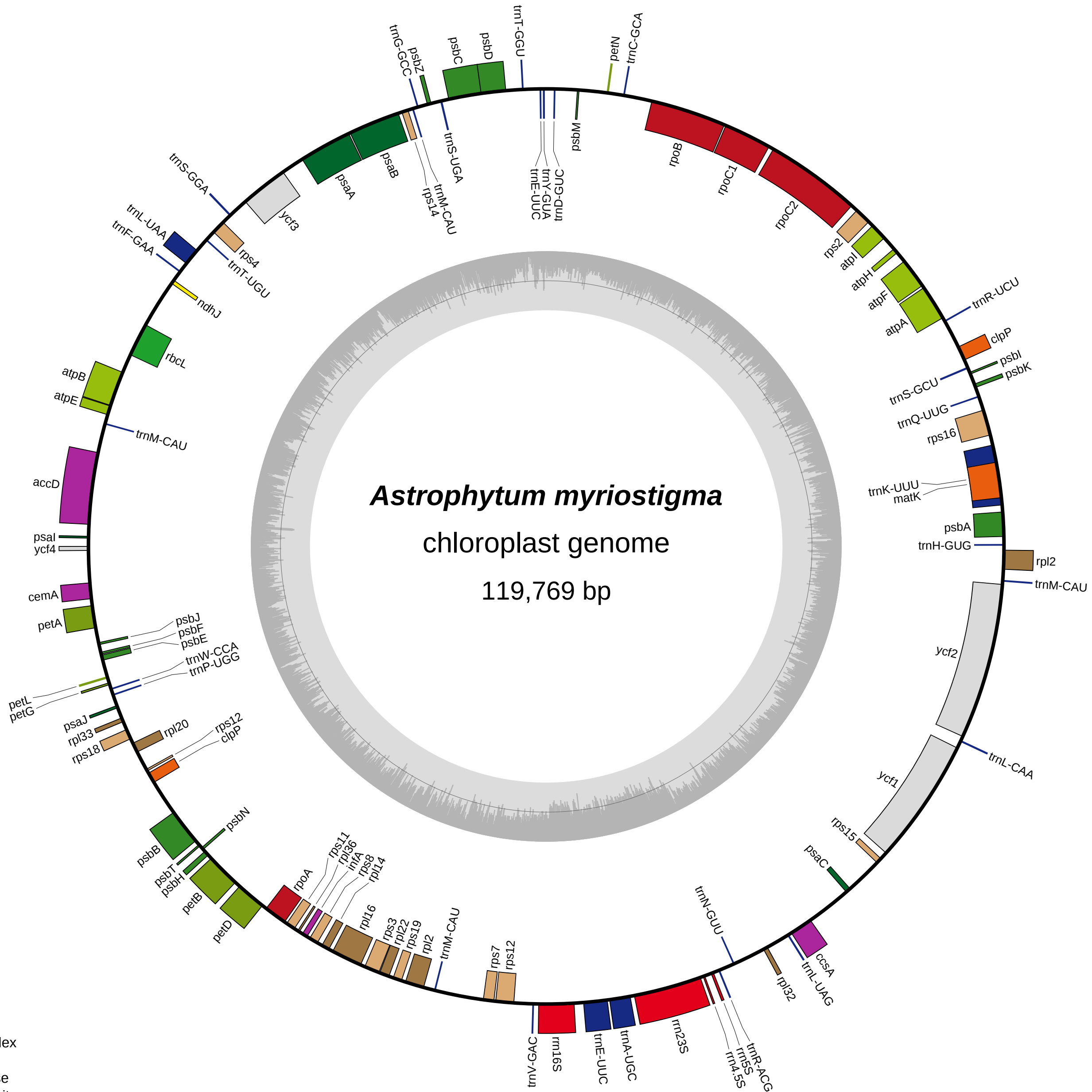


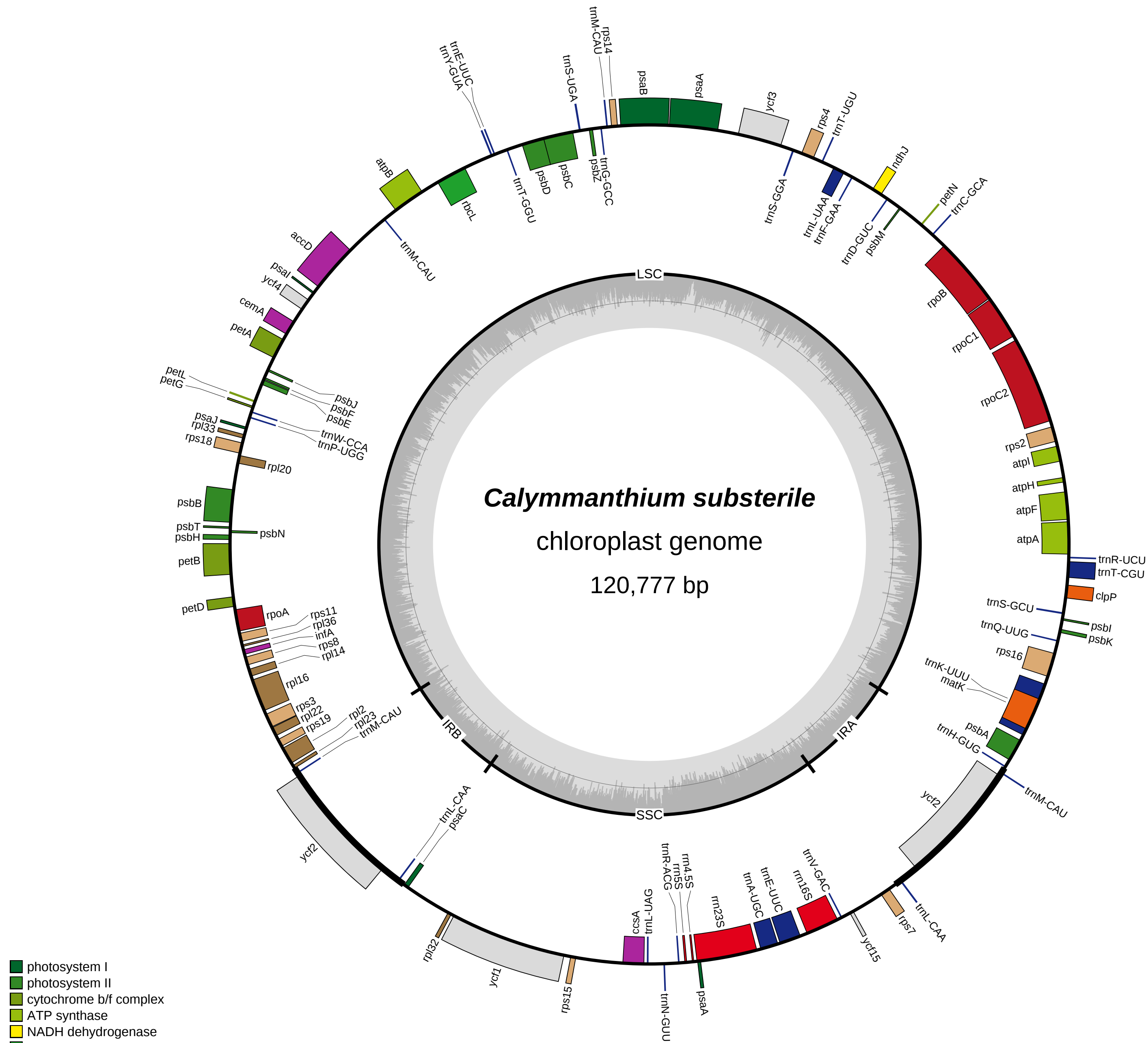
Ariocarpus retusus
chloroplast genome
117,264 bp

-  photosystem I
-  photosystem II
-  cytochrome b/f complex
-  ATP synthase
-  NADH dehydrogenase
-  RubisCO large subunit
-  RNA polymerase
-  ribosomal proteins (SSU)
-  ribosomal proteins (LSU)
-  transfer RNAs
-  ribosomal RNAs
-  clpP, matK
-  other genes
-  hypothetical chloroplast reading frames (ycf)

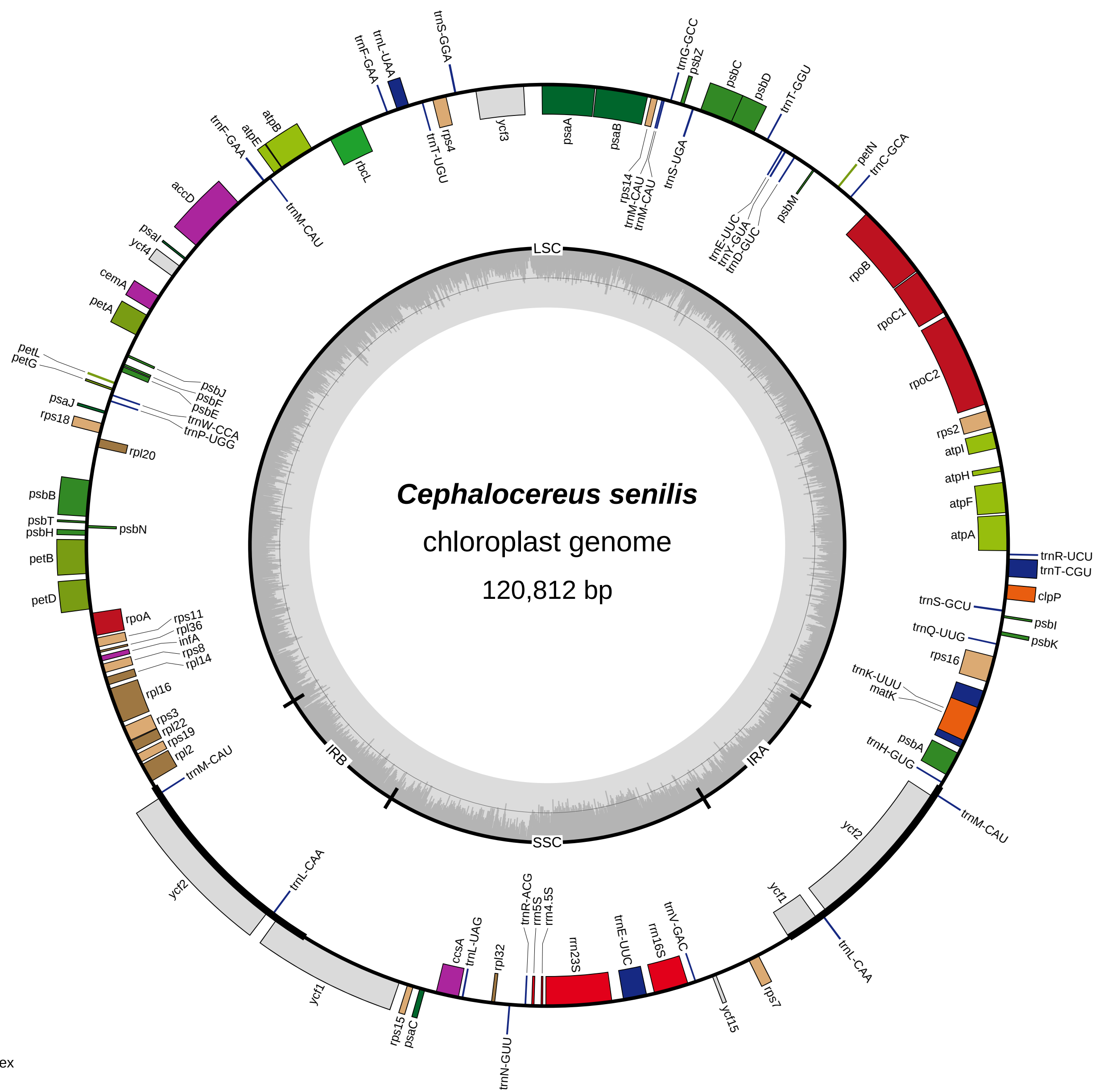
Astrophytum myriostigma
chloroplast genome
119,769 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)





- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)



Cephalocereus senilis

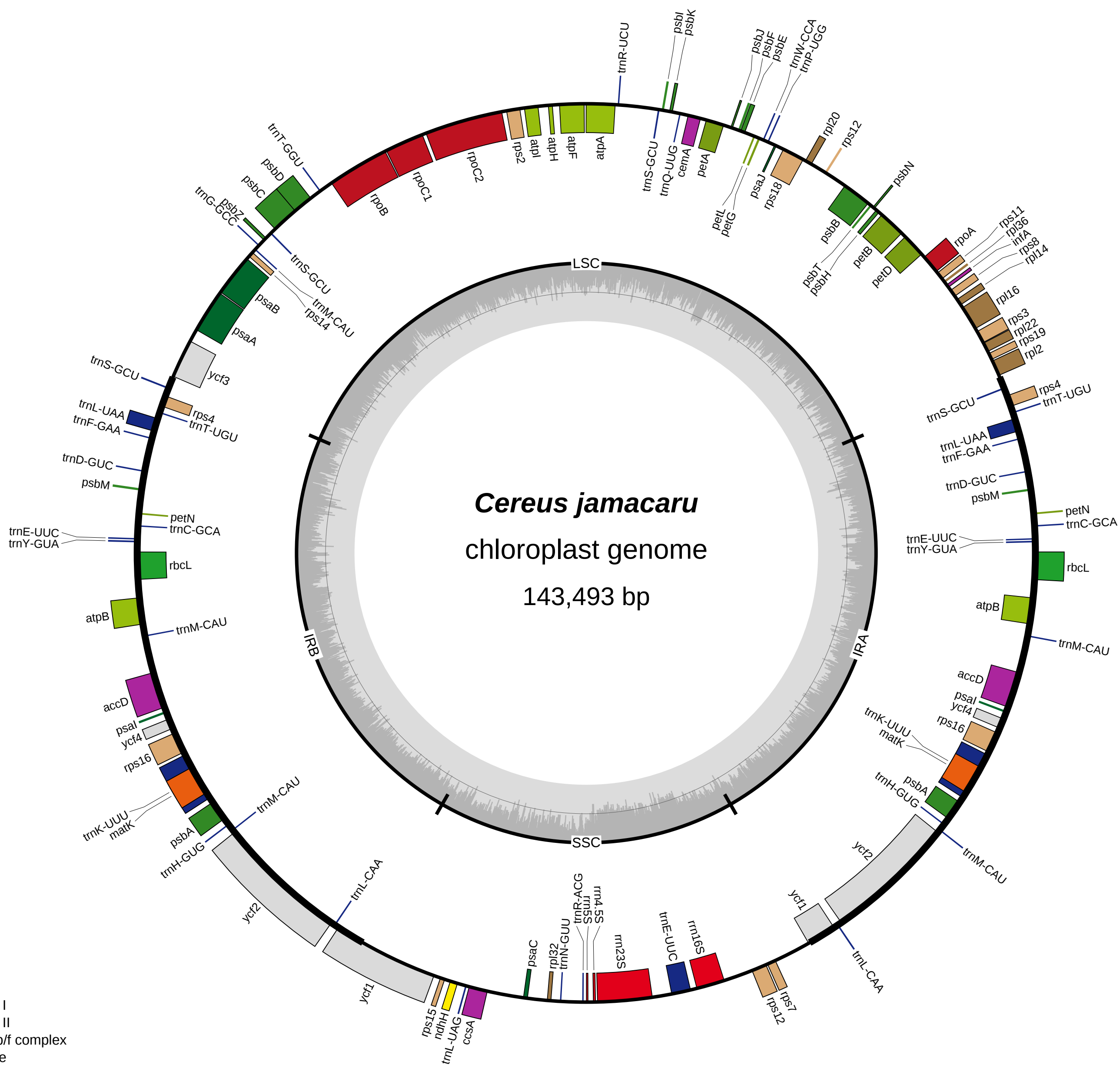
chloroplast genome

120,812 bp

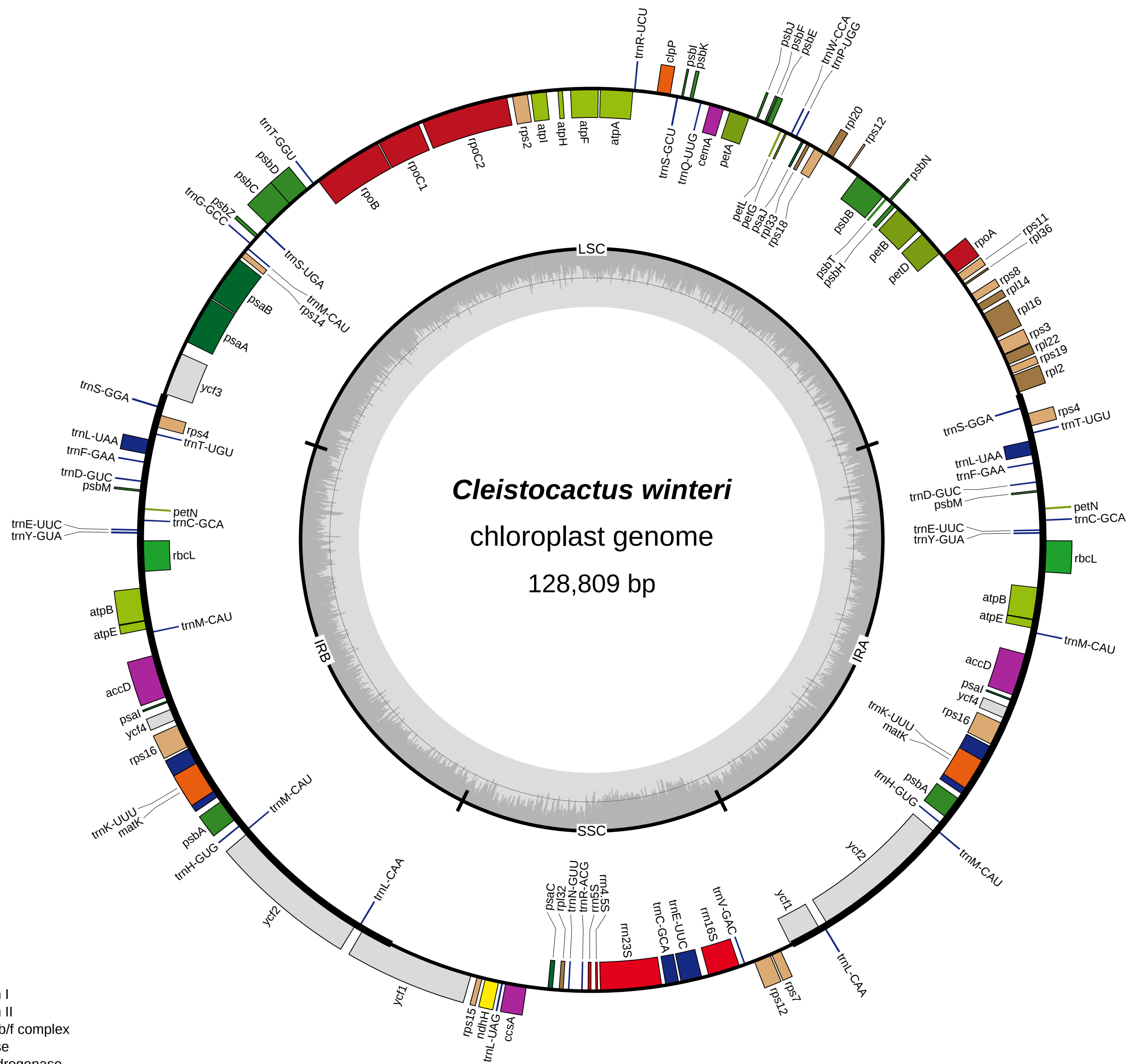
- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)

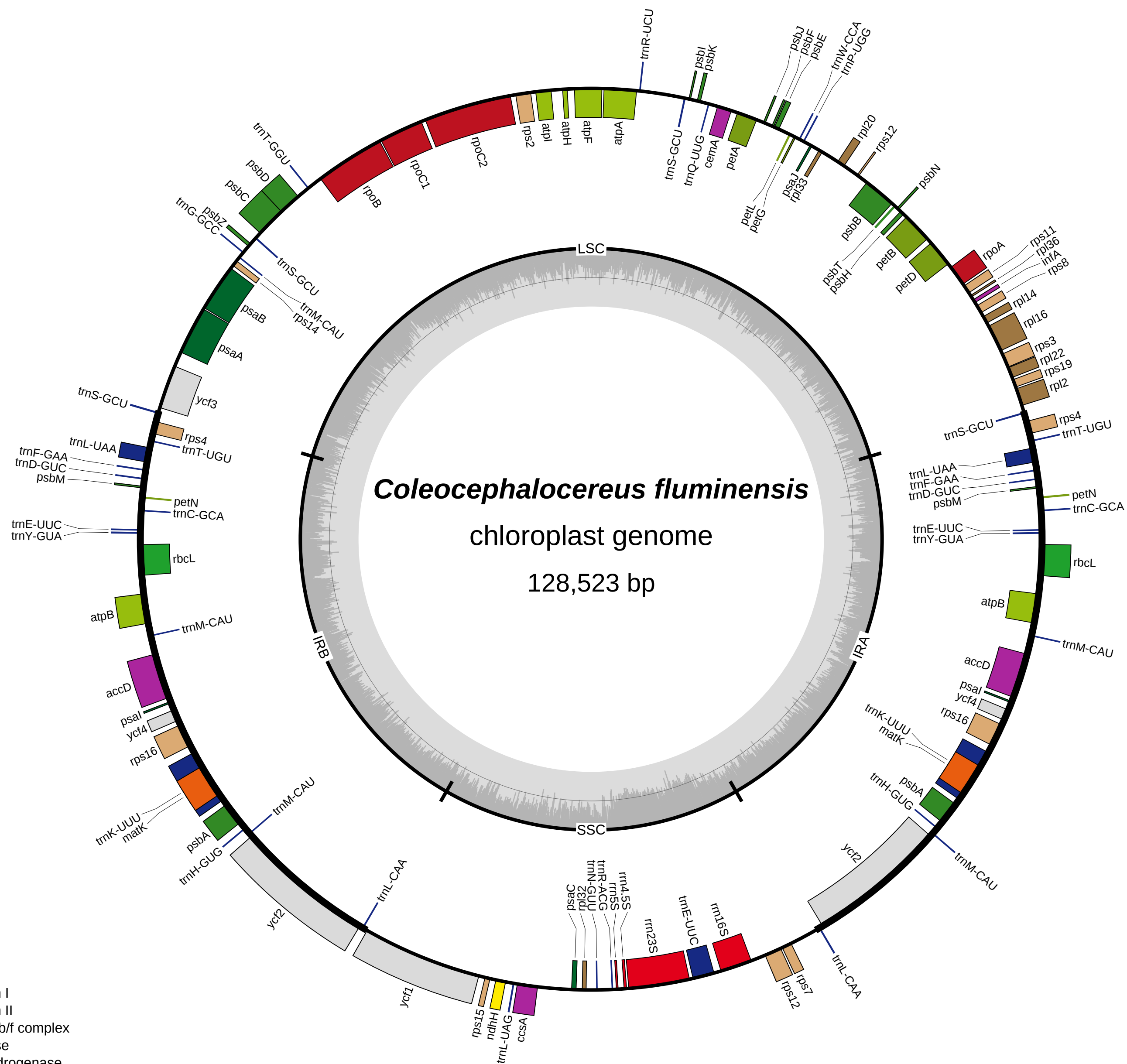
Cereus jamacaru
chloroplast genome
143,493 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)



- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)





Coleocephalocereus fluminensis

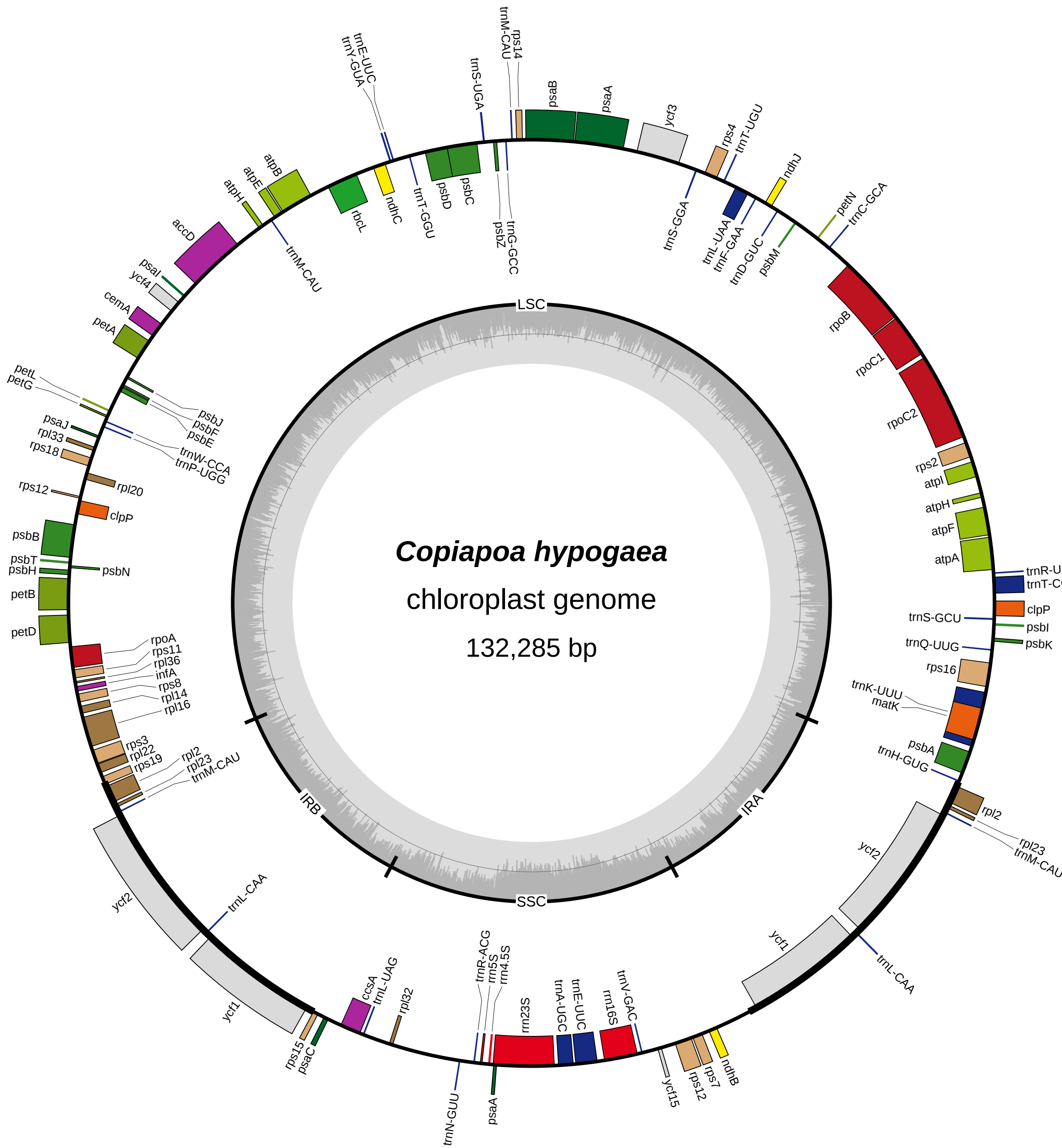
chloroplast genome

128,523 bp

-  photosystem I
-  photosystem II
-  cytochrome b/f complex
-  ATP synthase
-  NADH dehydrogenase
-  RubisCO large subunit
-  RNA polymerase
-  ribosomal proteins (SSU)
-  ribosomal proteins (LSU)
-  transfer RNAs
-  ribosomal RNAs
-  clpP, matK
-  other genes
-  hypothetical chloroplast reading frames (ycf)

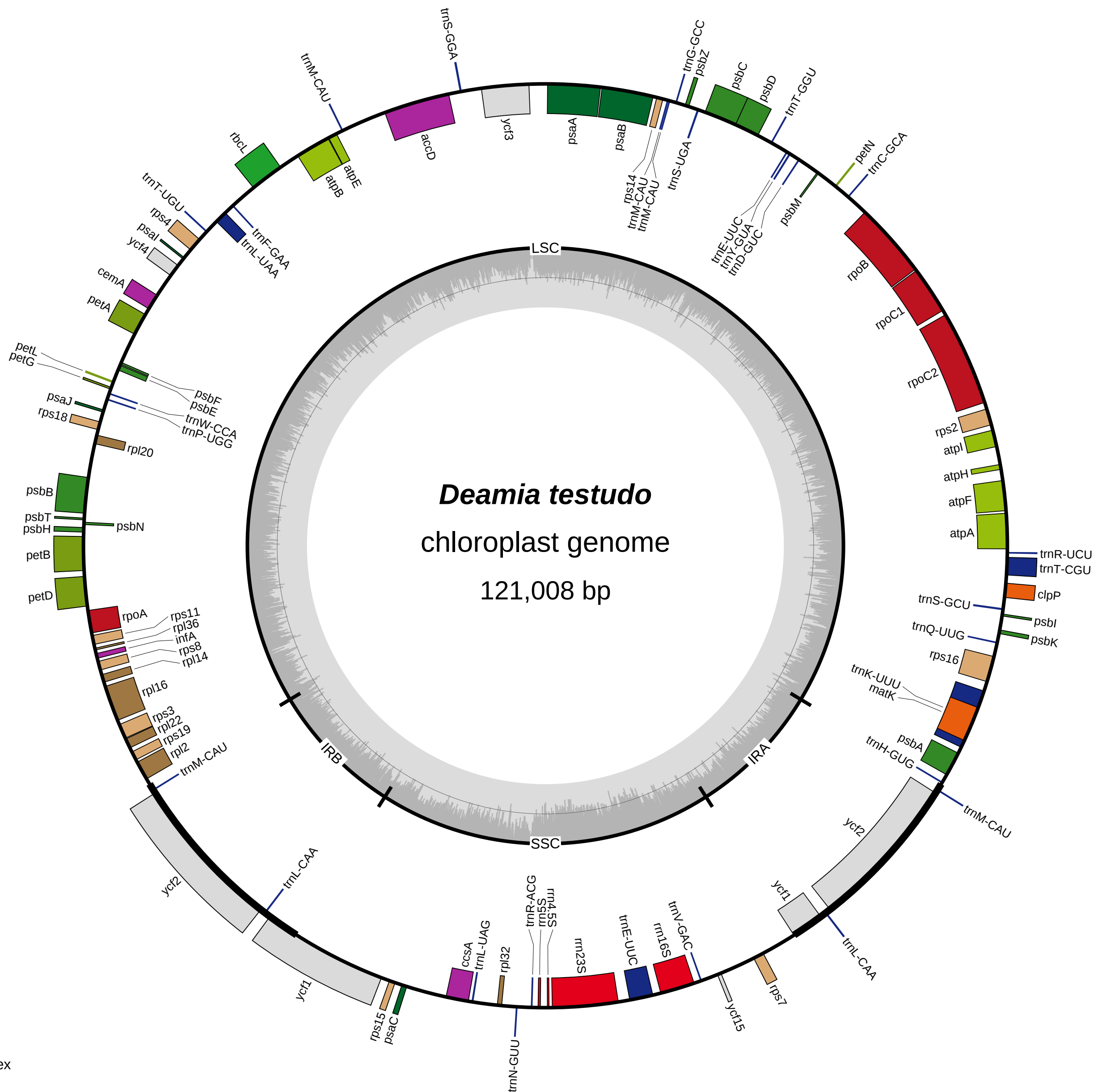
Copiapoa hypogaea
chloroplast genome
132,285 bp

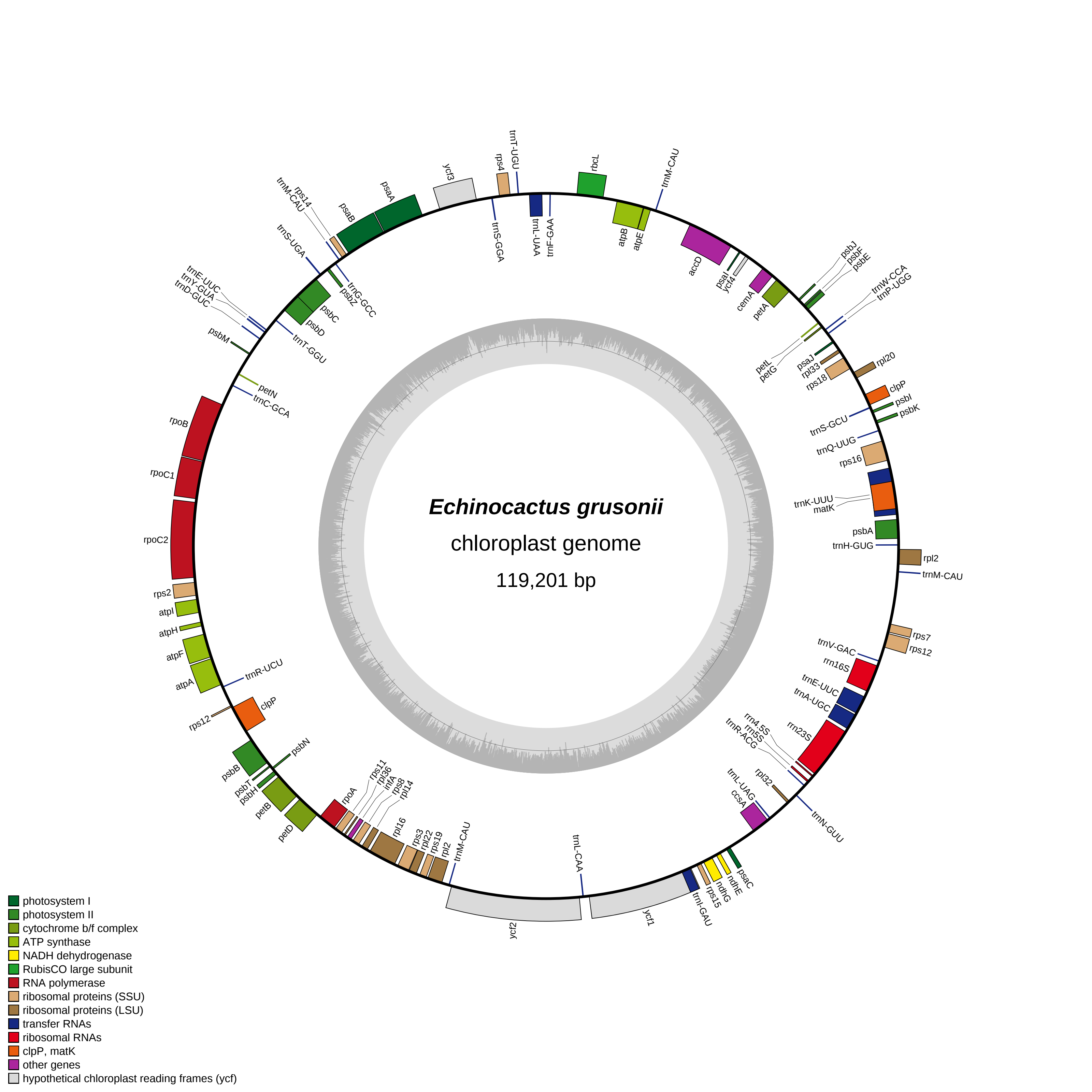
- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)

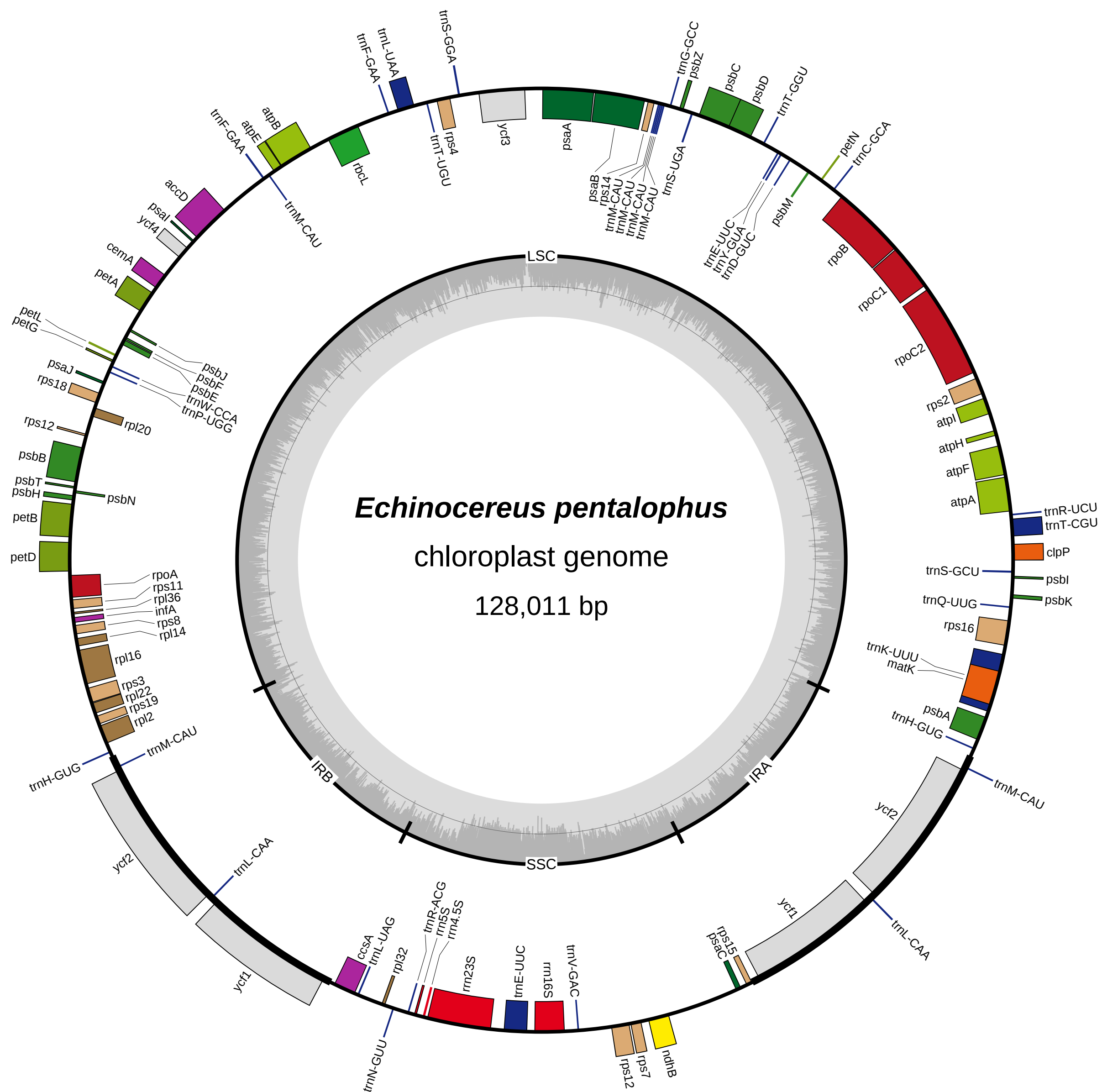


Deamia testudo
chloroplast genome
121,008 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)

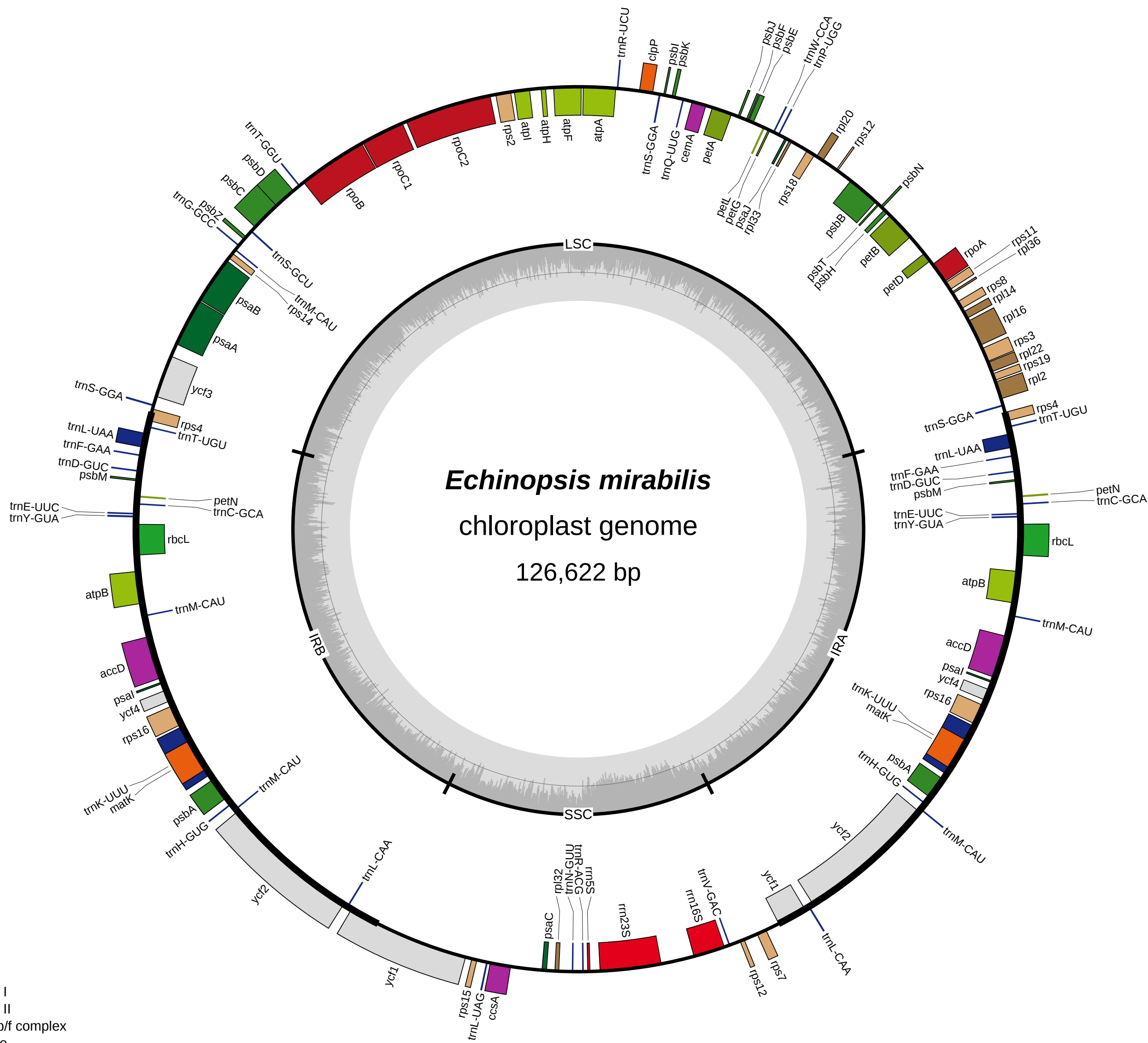




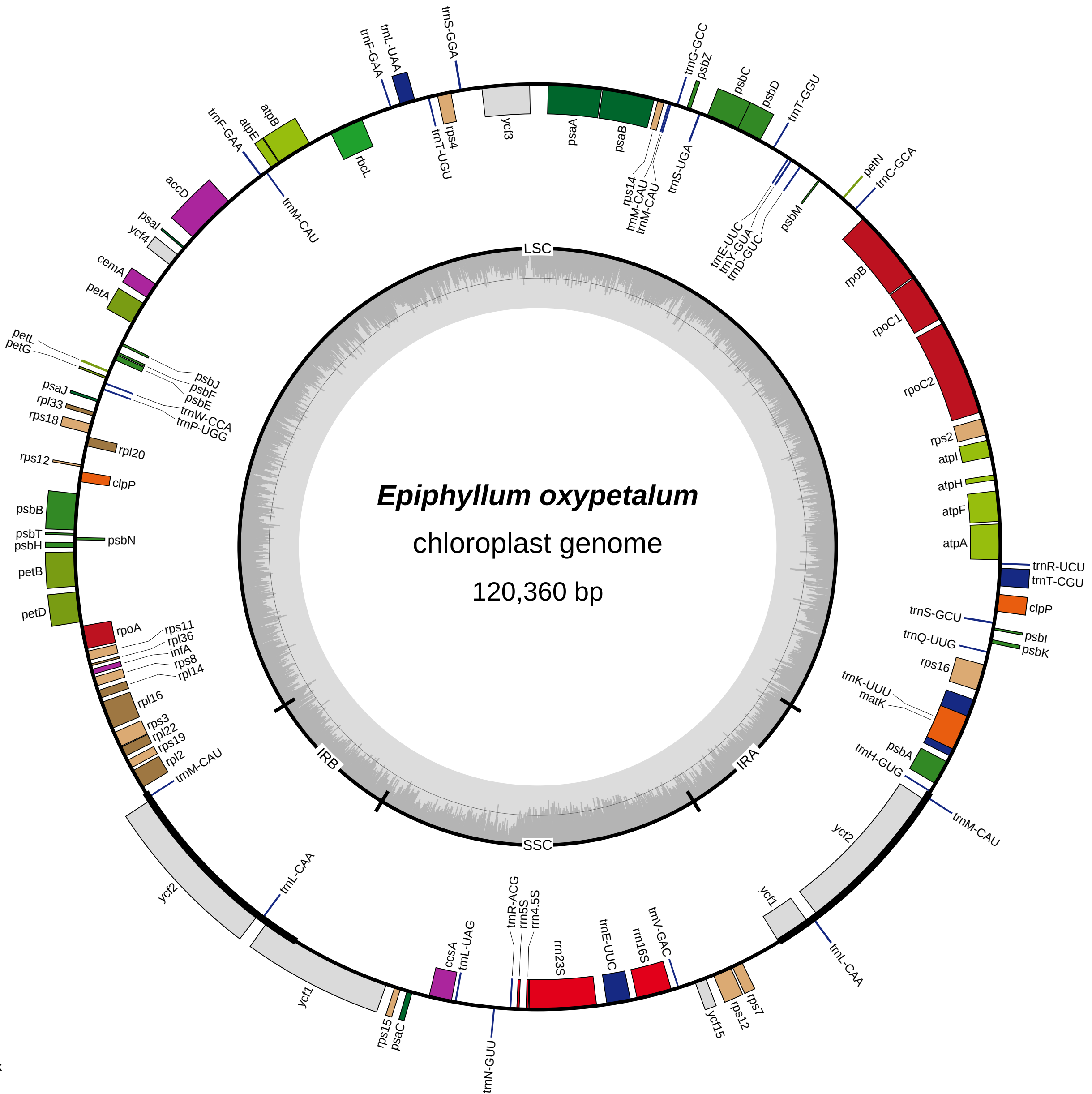


- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)

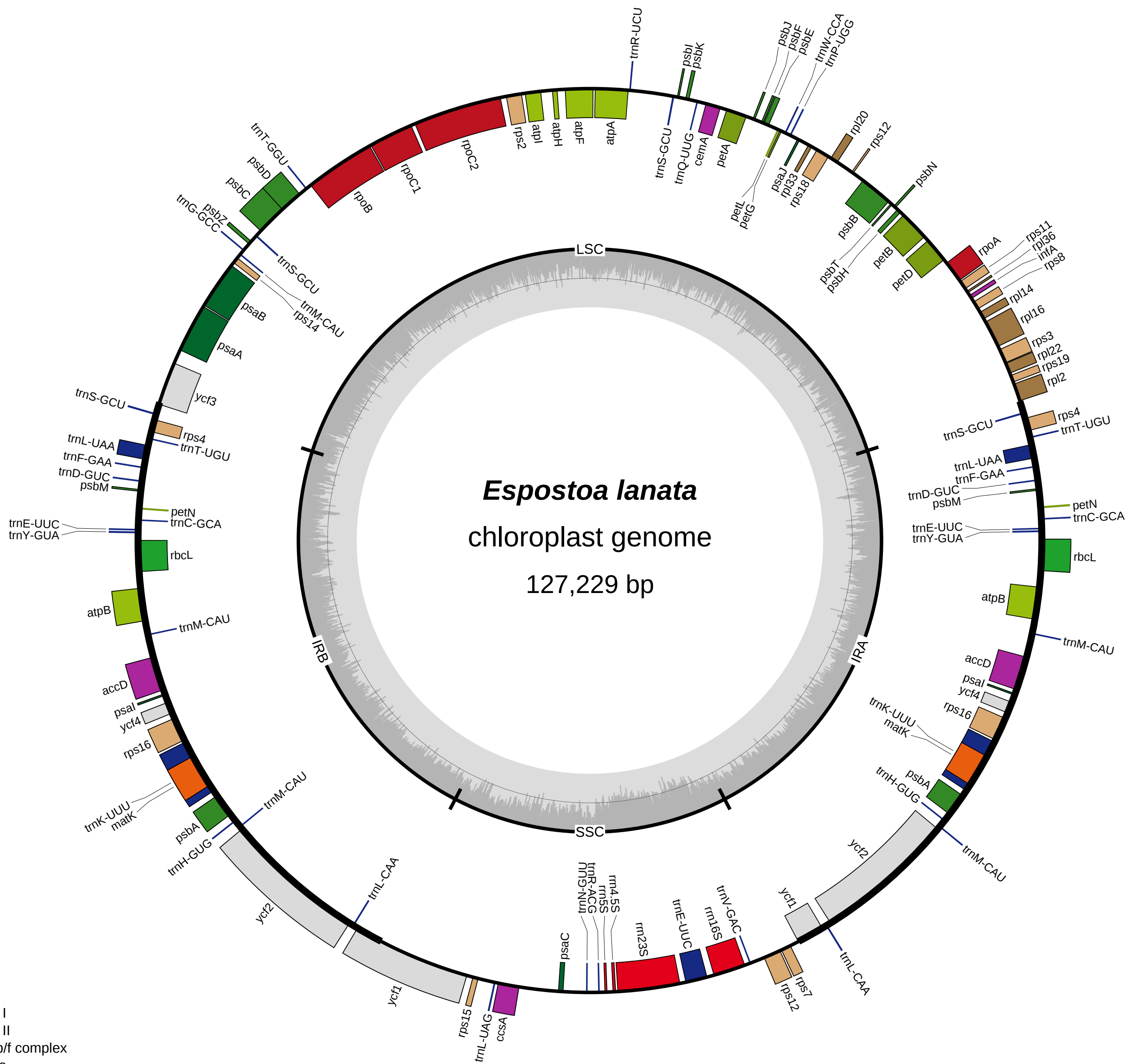


- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)



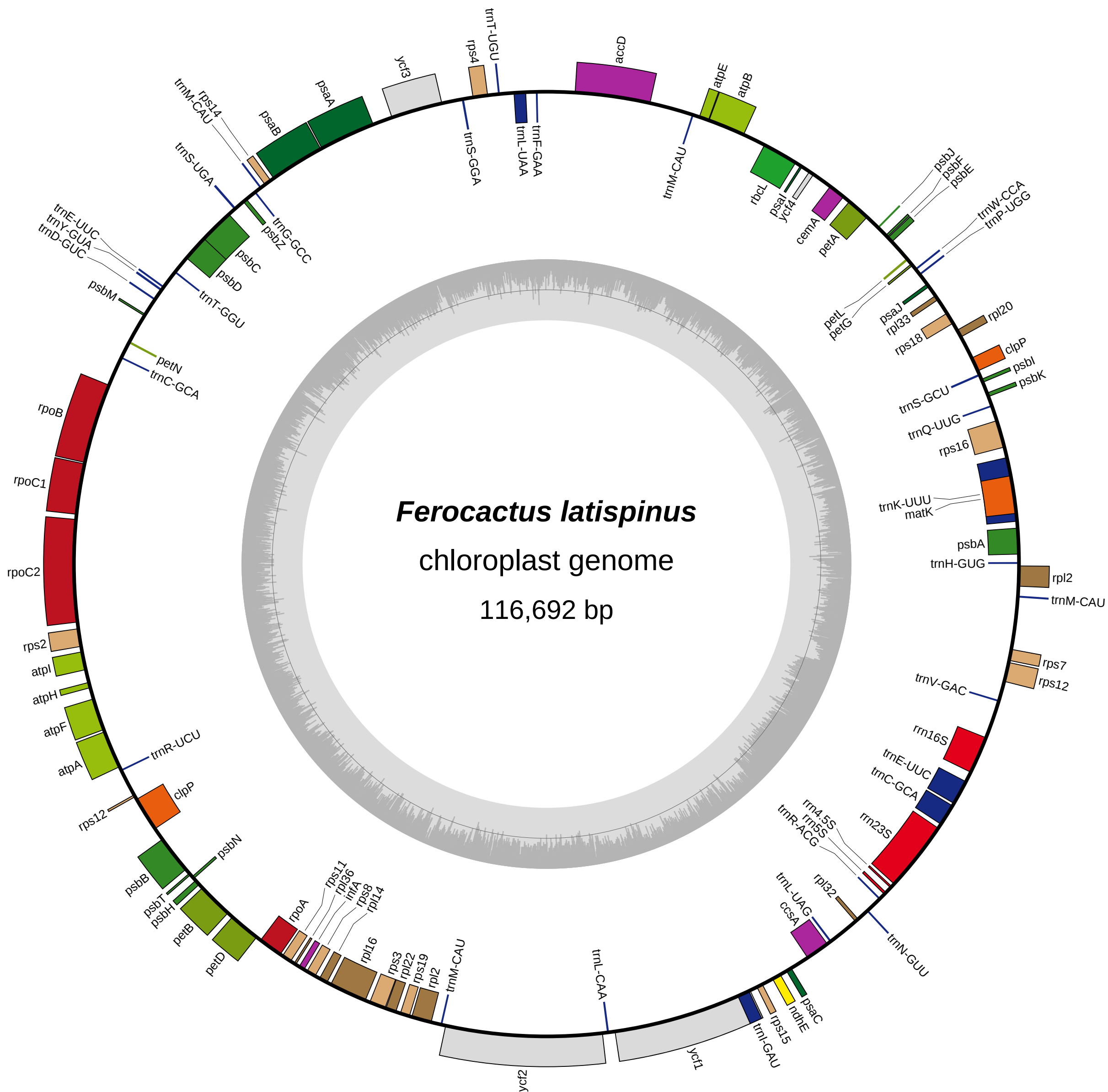
Espostoa lanata
chloroplast genome
127,229 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)



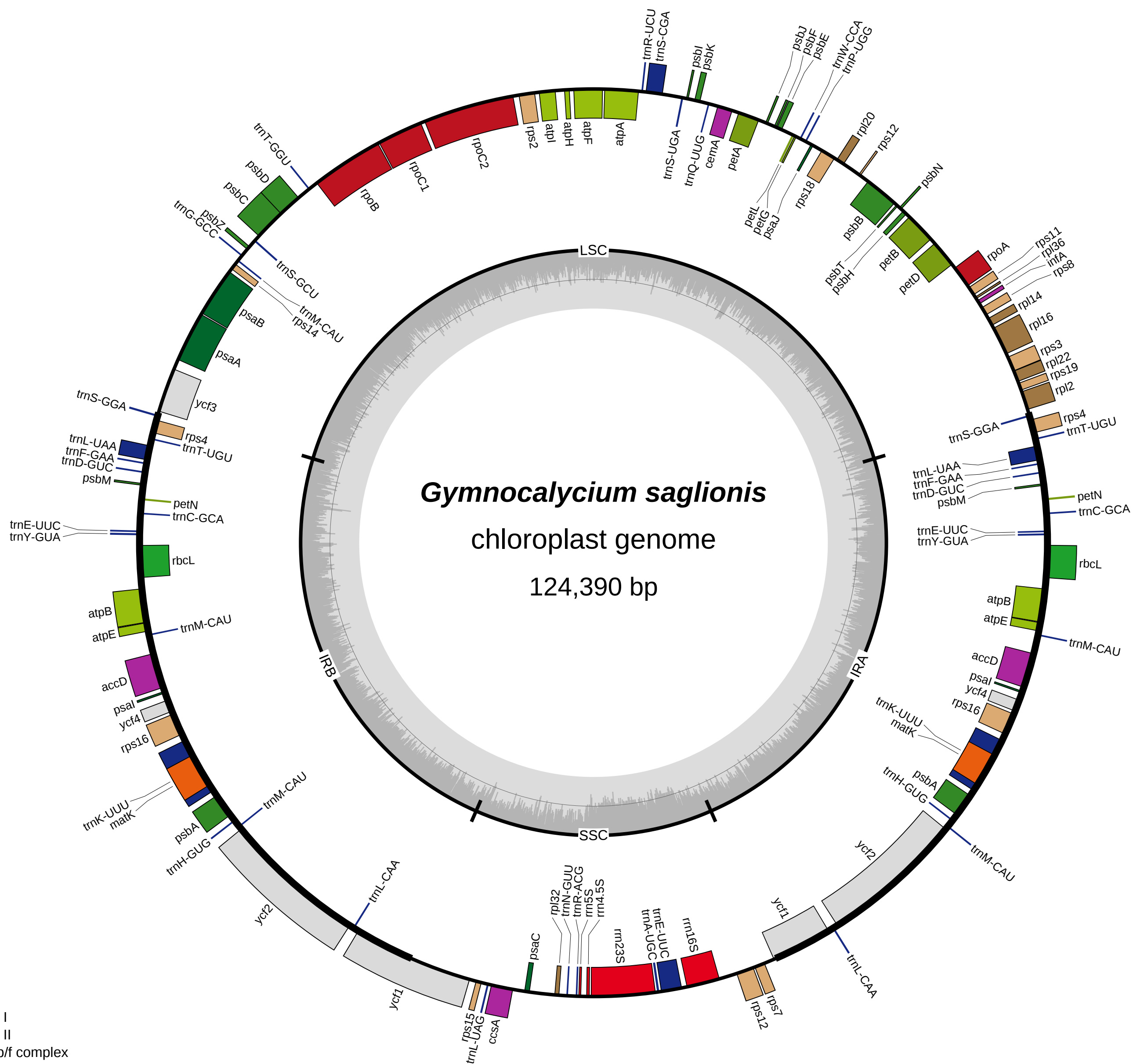
Ferocactus latispinus
chloroplast genome
116,692 bp

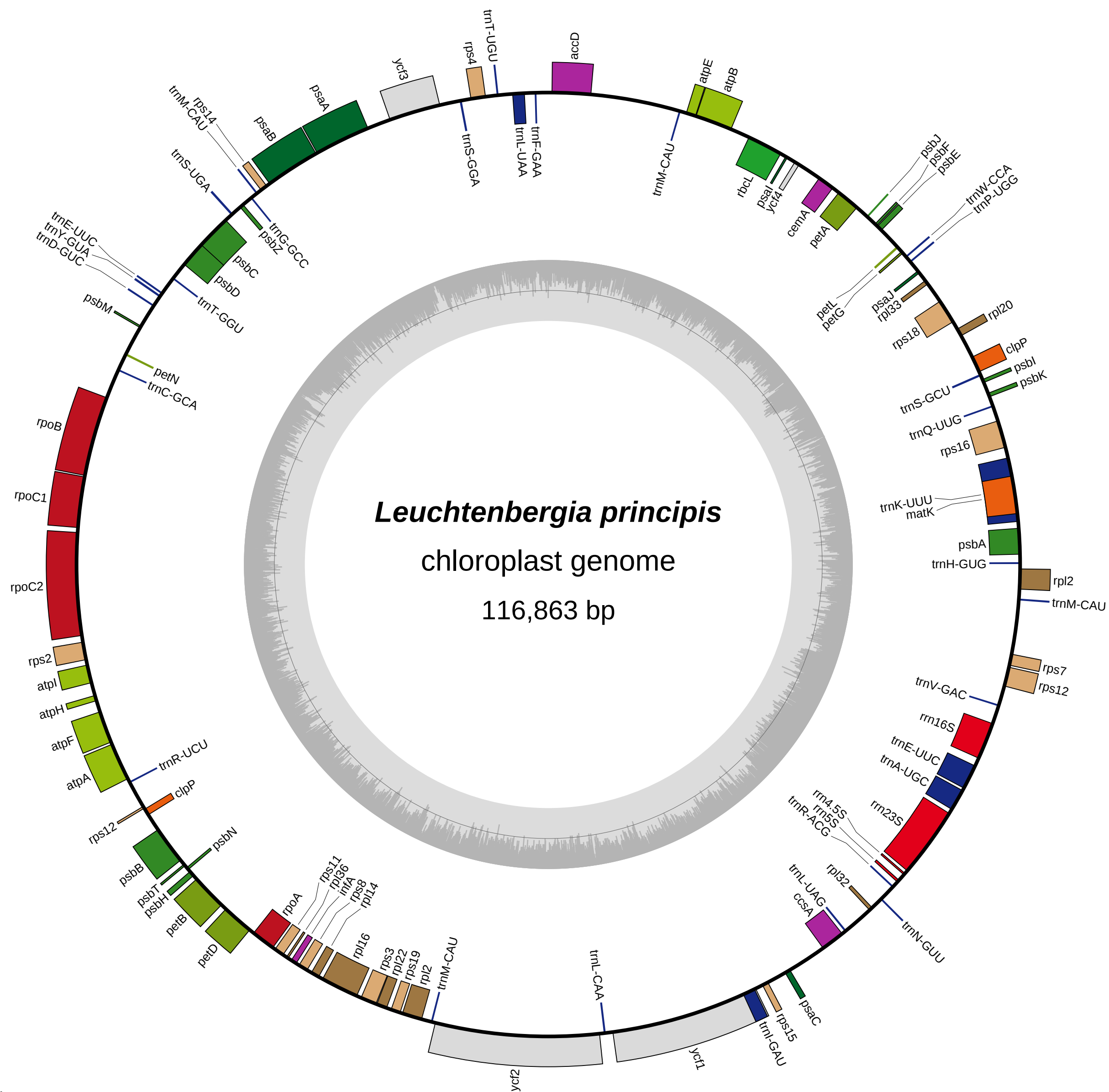
- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)



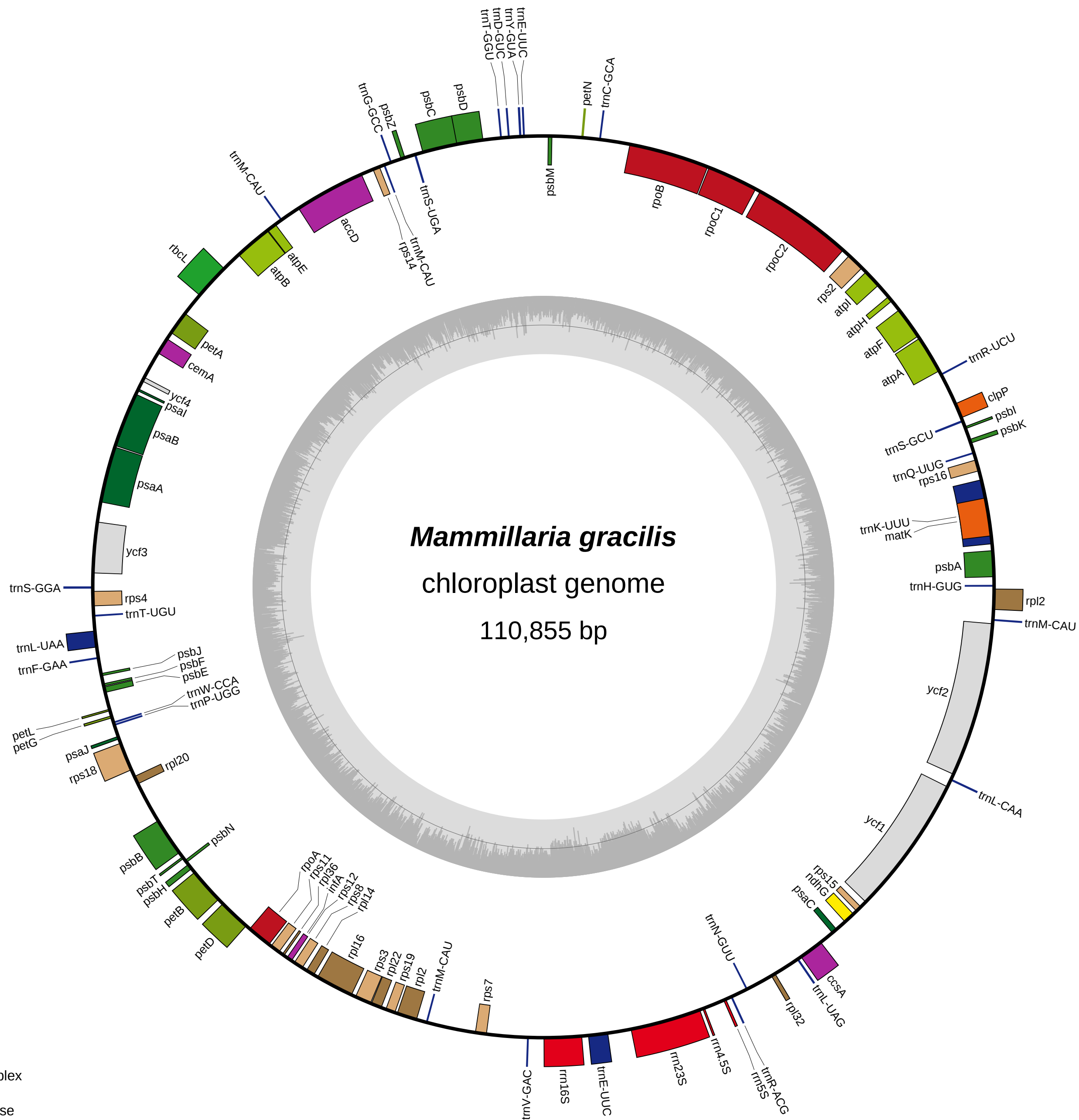


- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)





- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)



Mammillaria gracilis

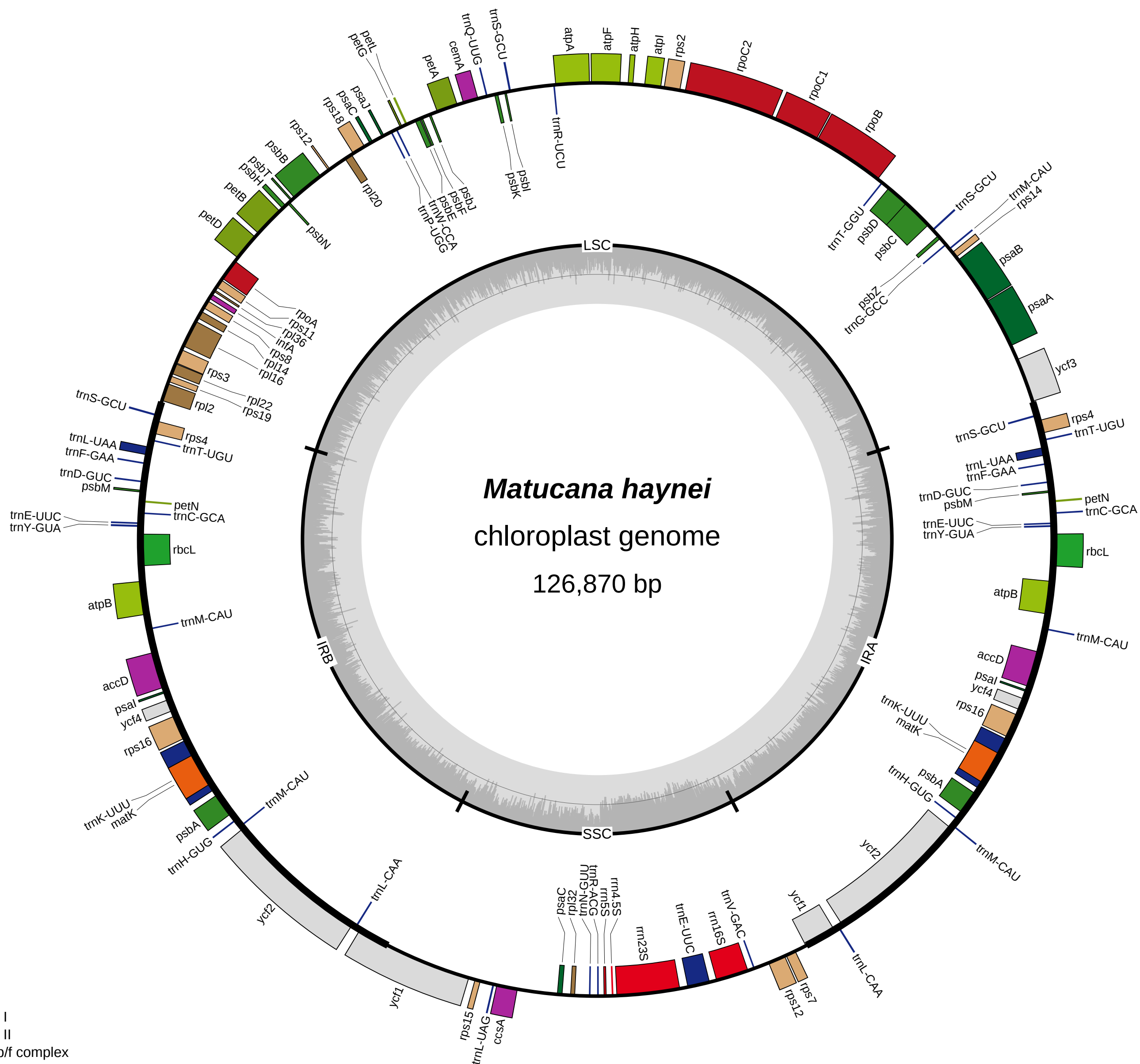
chloroplast genome

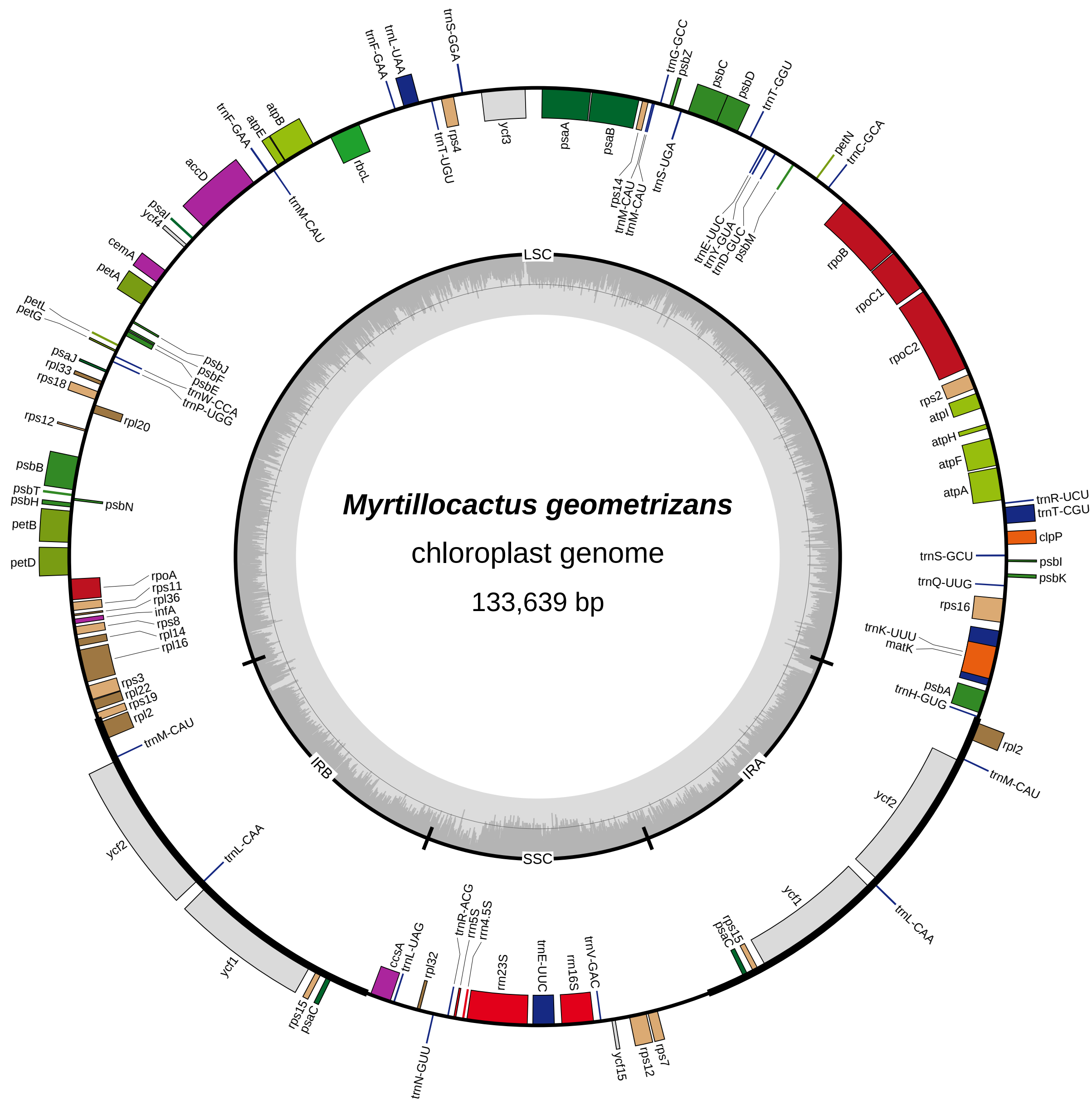
110,855 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)

Matucana haynei
chloroplast genome
126,870 bp

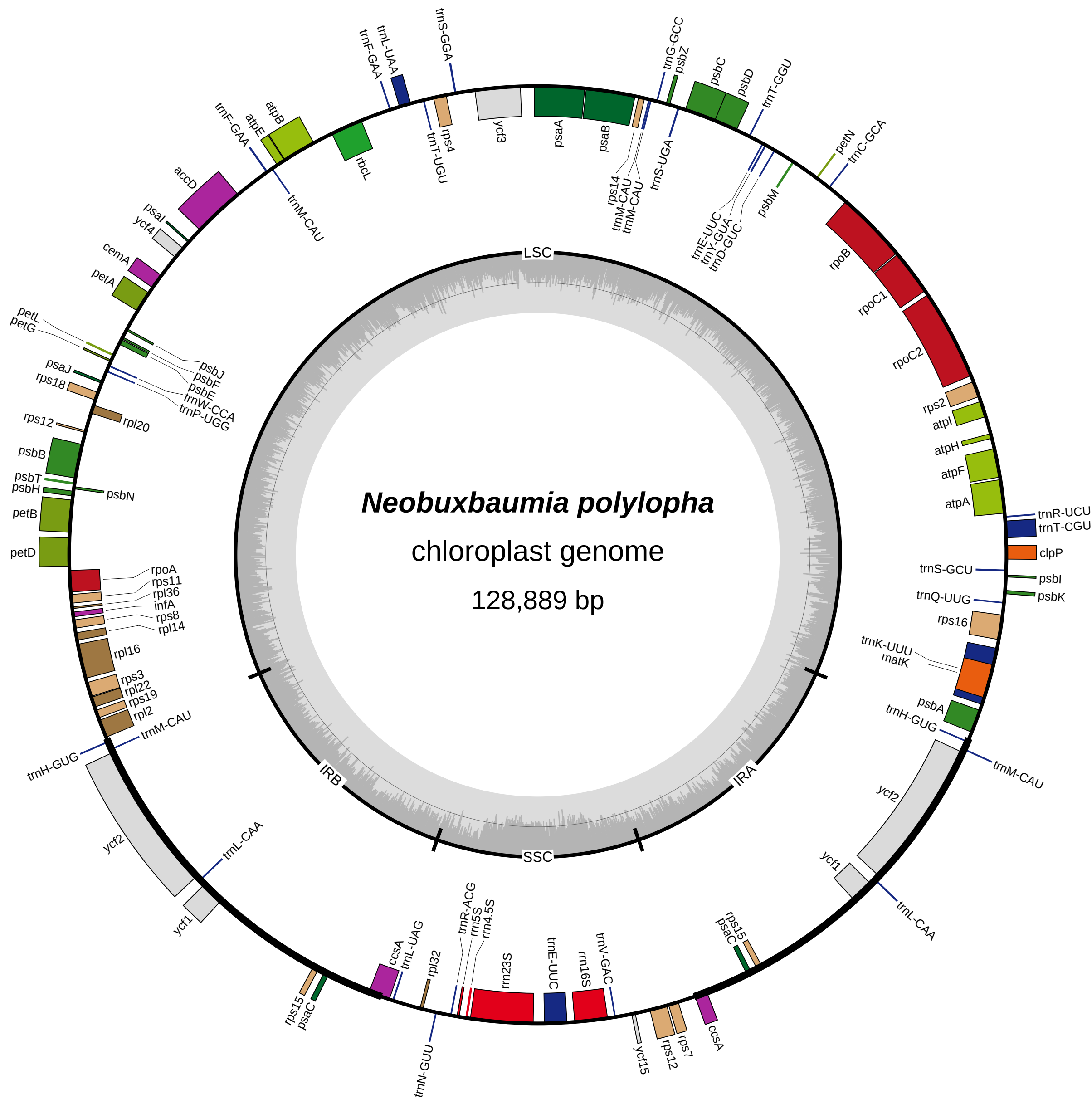
- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)

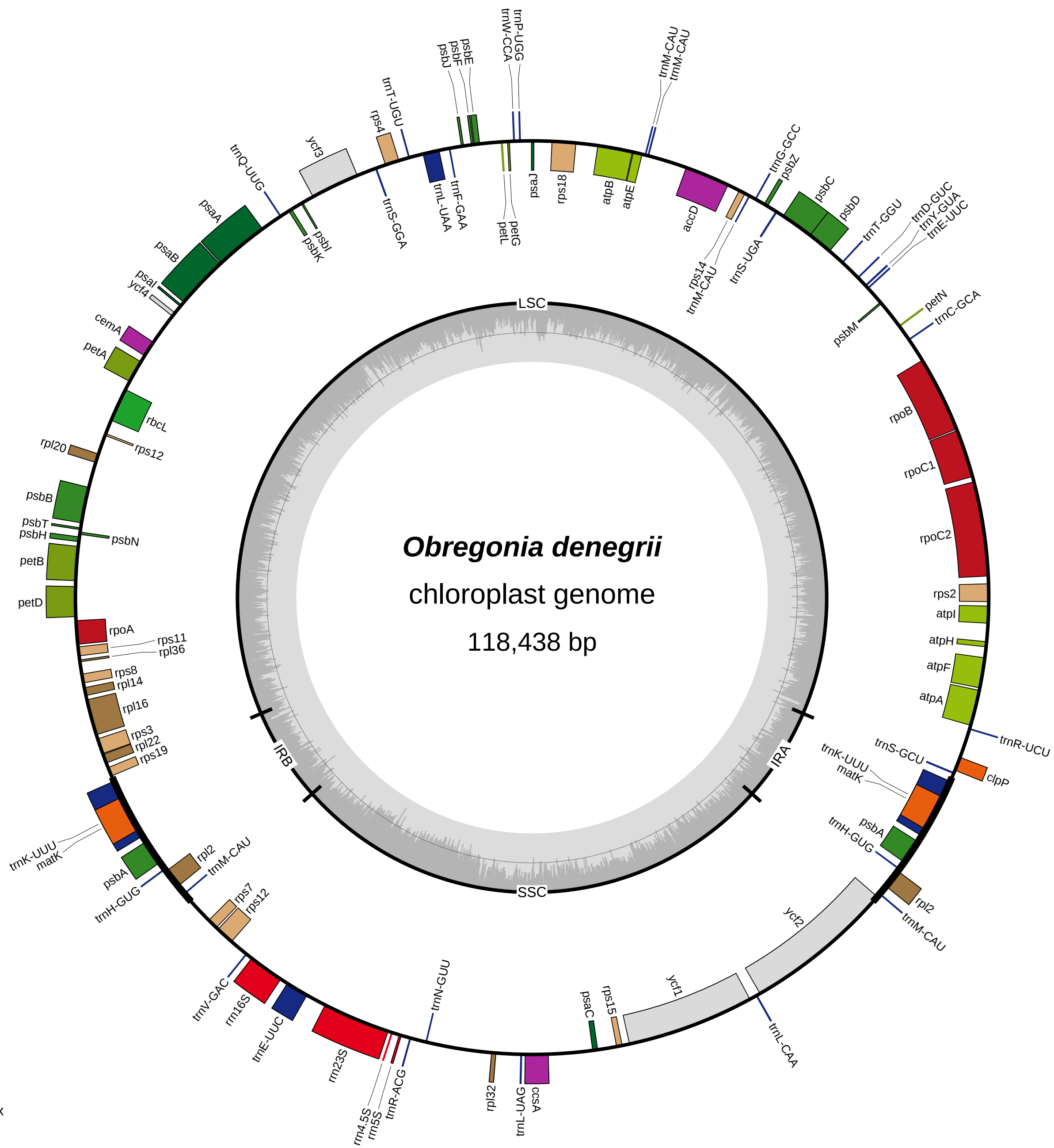




Neobuxbaumia polylopha
chloroplast genome
128,889 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)



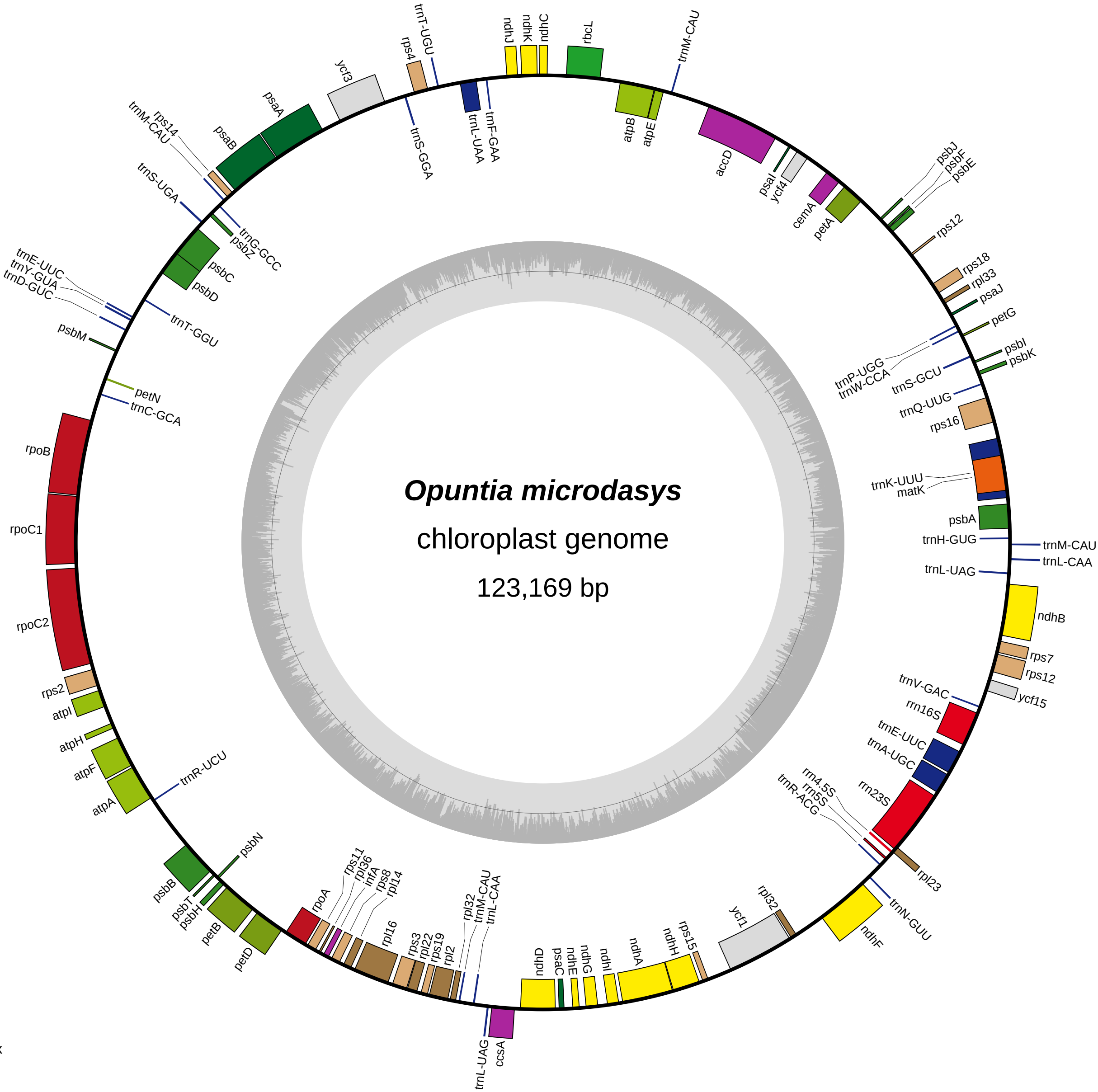


Obregonia denegrii
chloroplast genome
118,438 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)

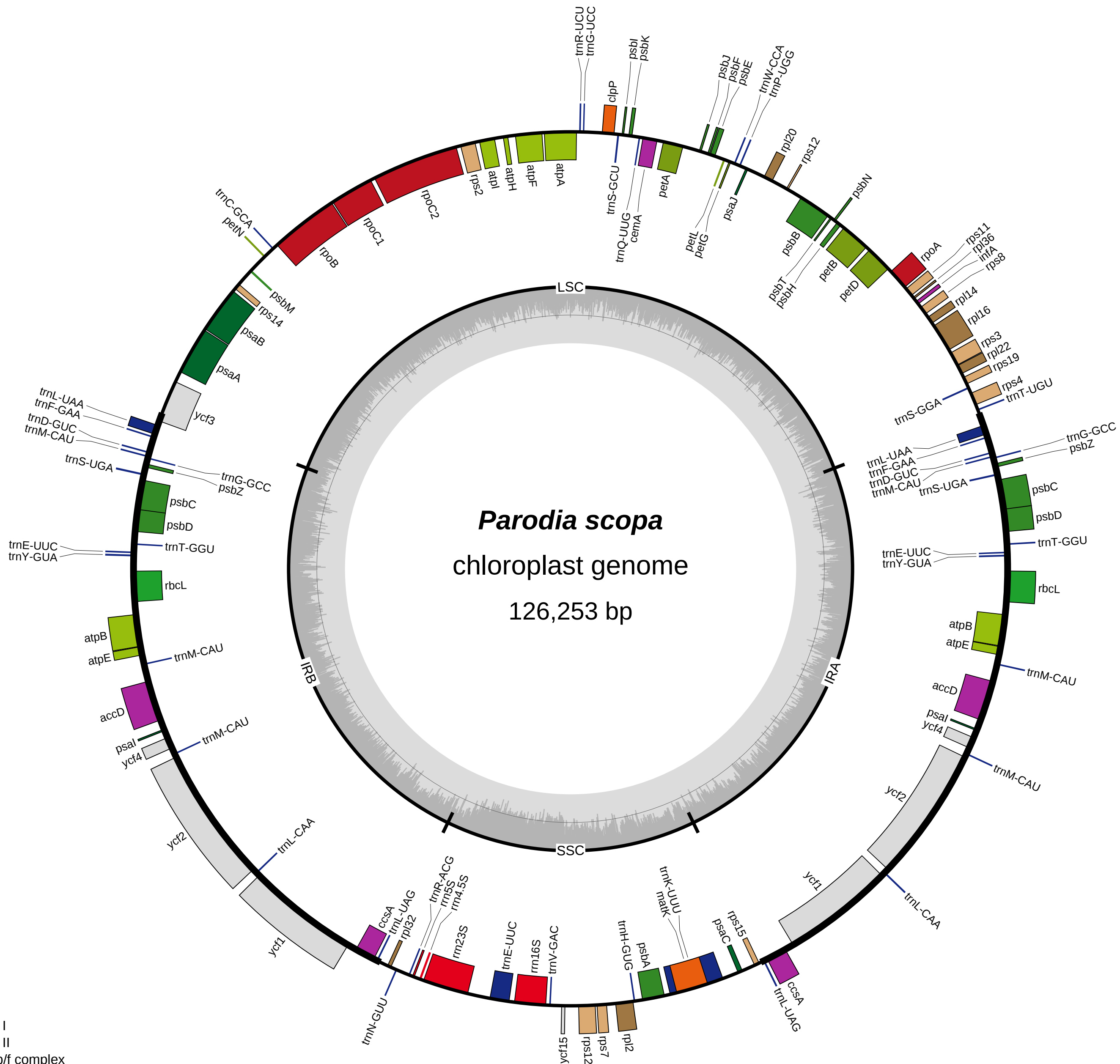
Opuntia microdasys
chloroplast genome
123,169 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)



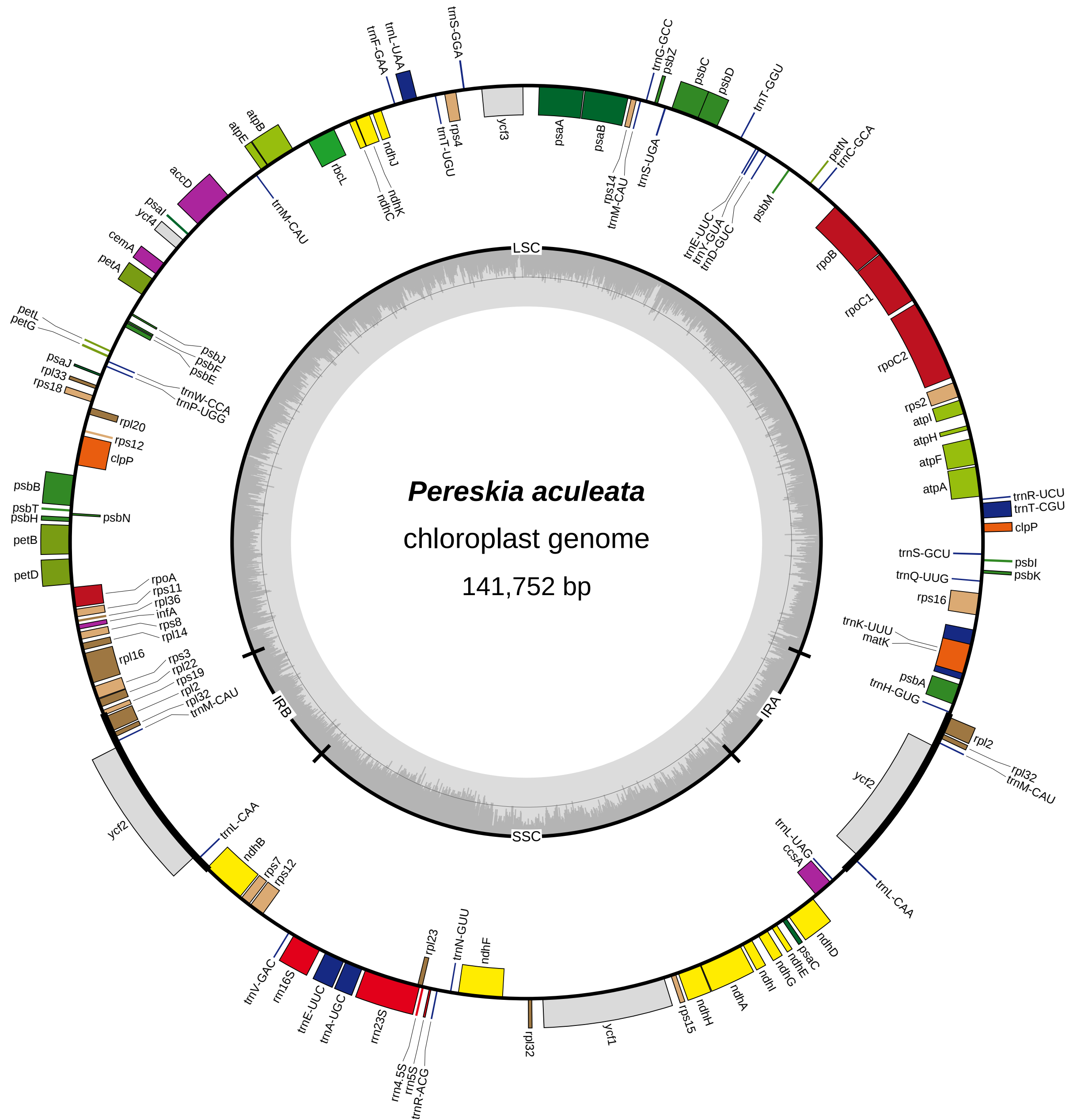
Parodia scopa
chloroplast genome
126,253 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)

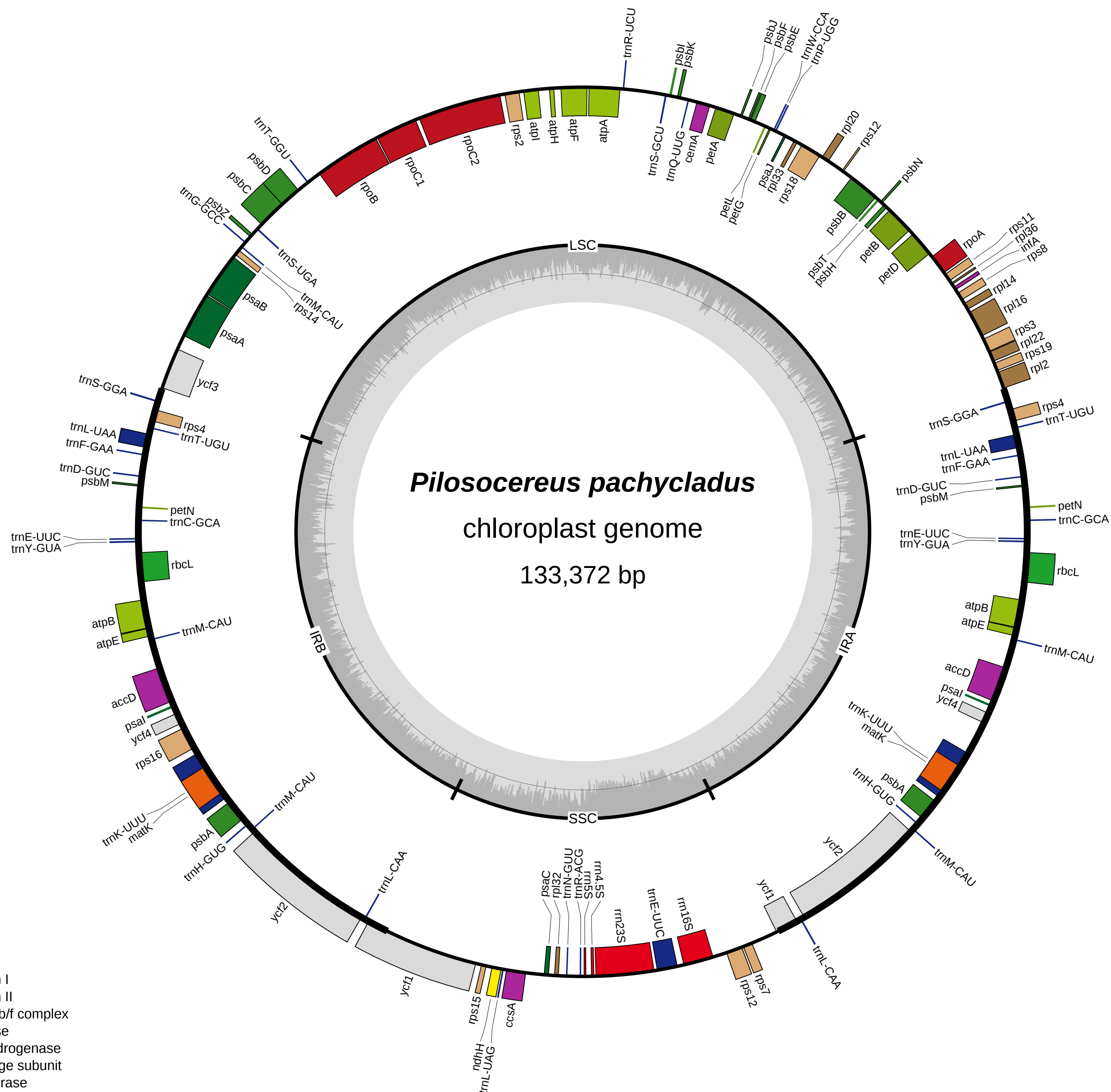


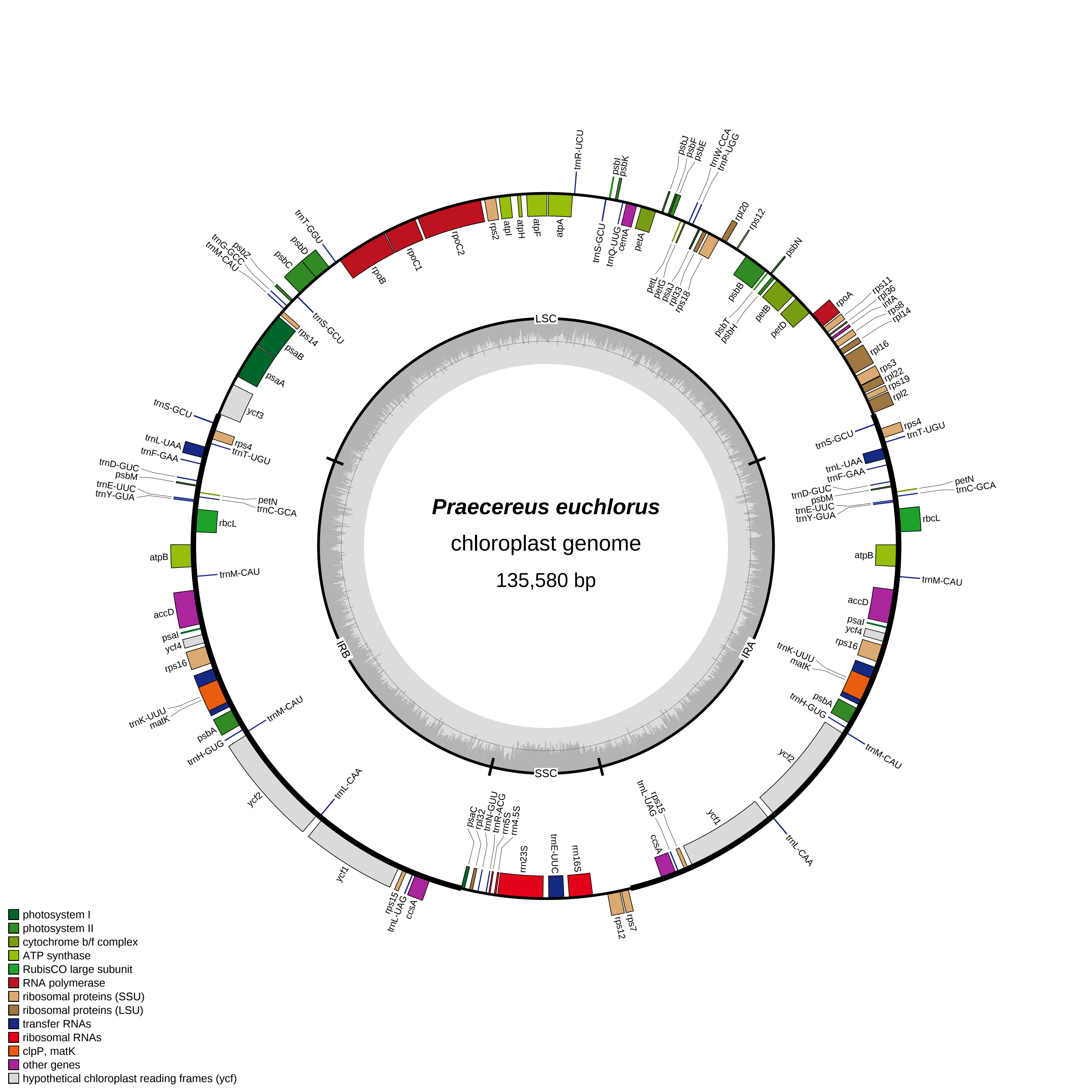
Pereskia aculeata
chloroplast genome
141,752 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)



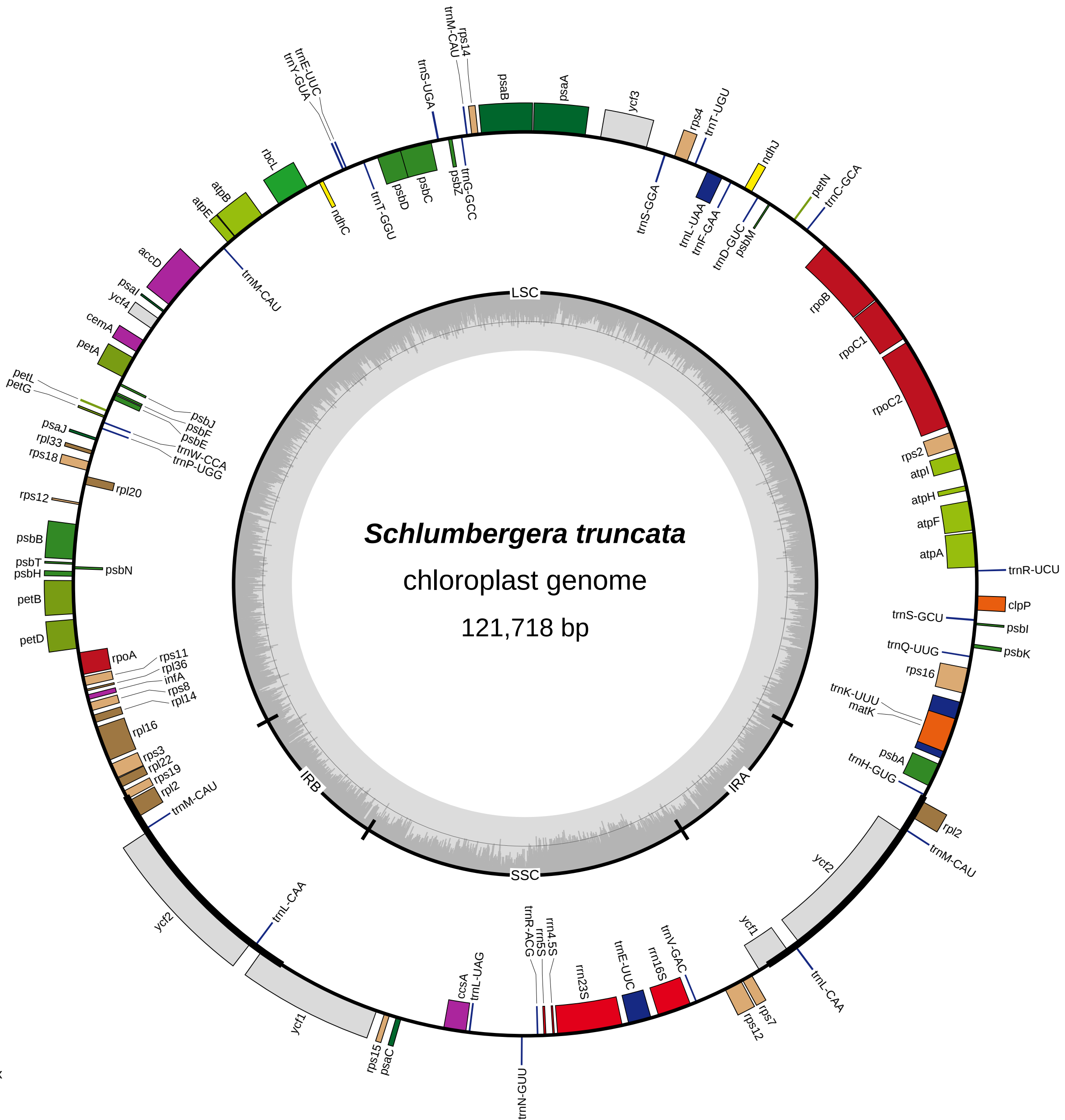
- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)



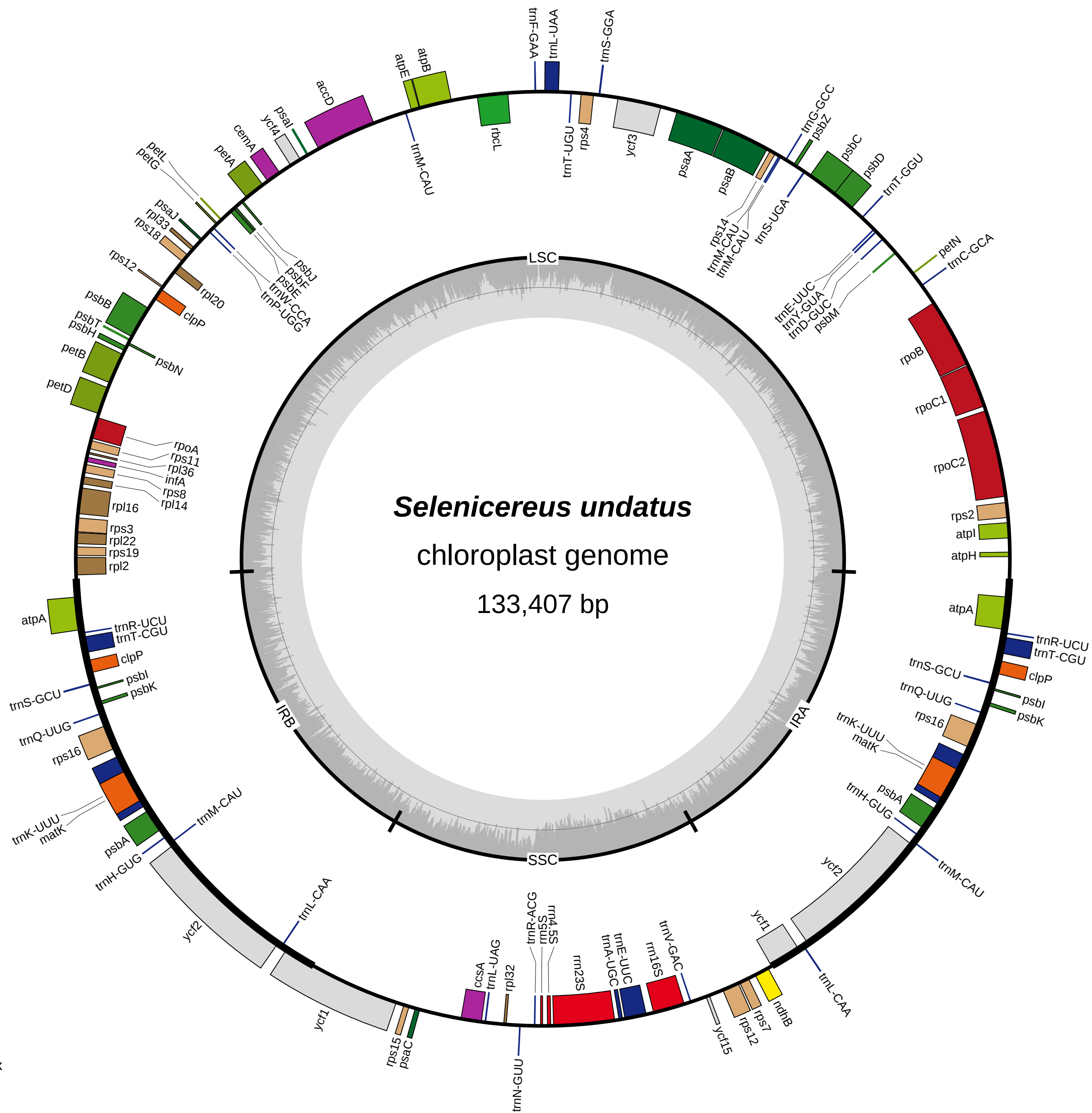


Schlumbergera truncata
chloroplast genome
121,718 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)

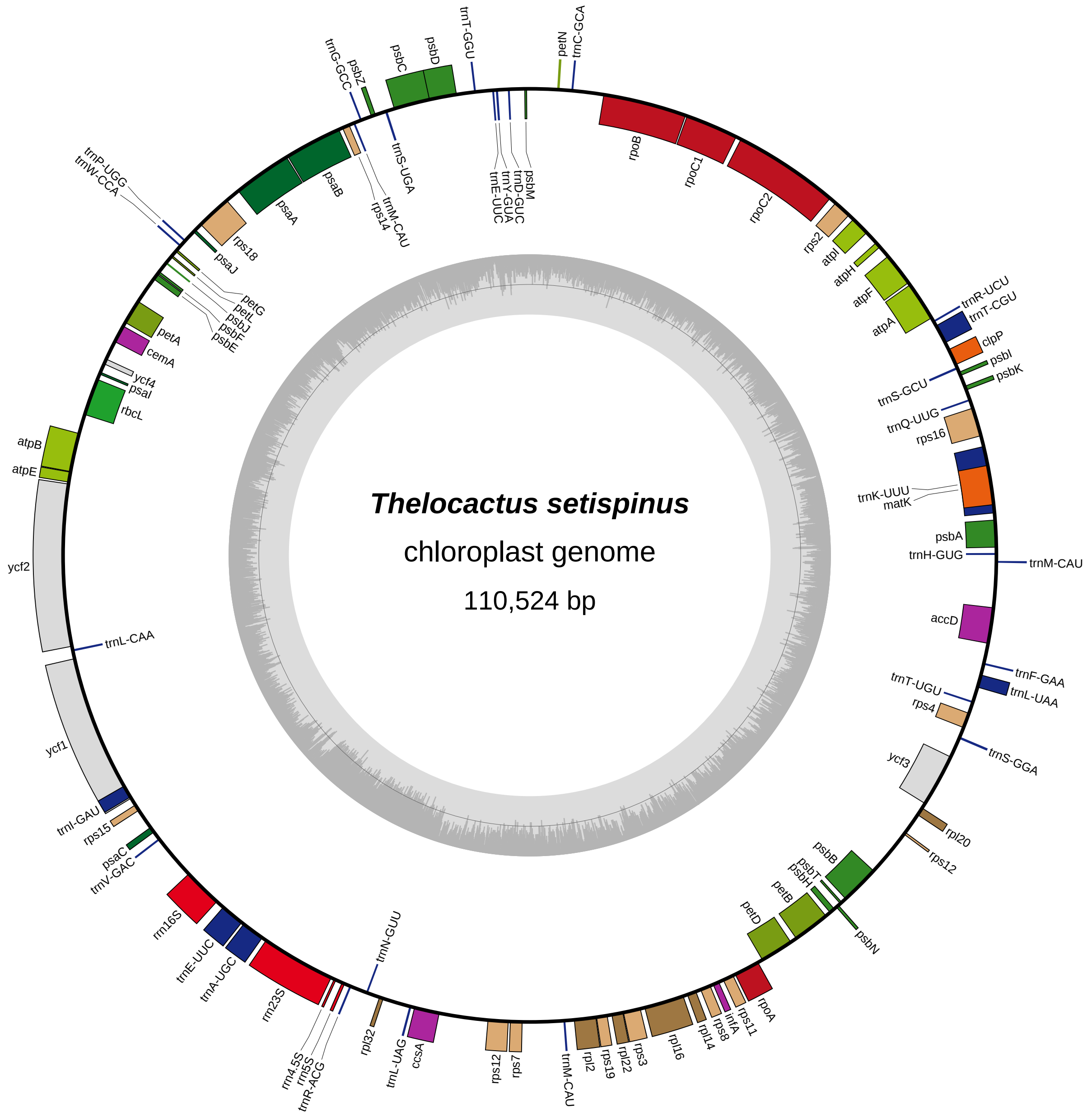


- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- NADH dehydrogenase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)



Thelocactus setispinus
chloroplast genome
110,524 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)



Yavia cryptocarpa
chloroplast genome
143,783 bp

- photosystem I
- photosystem II
- cytochrome b/f complex
- ATP synthase
- RubisCO large subunit
- RNA polymerase
- ribosomal proteins (SSU)
- ribosomal proteins (LSU)
- transfer RNAs
- ribosomal RNAs
- clpP, matK
- other genes
- hypothetical chloroplast reading frames (ycf)

