Structure

They are planoconvex lens- like structures about 5micrometere in diameter and 2 to 3 micrometer thick.

The chorlopast comprises of

A double layered envelope

A granular stroma or matrix

Thylakoid

A lamellar system

The Osmophilic globules called plastoglobuli

Chloroplast DNA

Envelope

It is composed of a system of double membranes, each of which is 50 to 80 micrometer thick and has a unit membrane structure.

The outer membrance is separated from the inner membrane by an interpermeable space of about 10 nanometer.

Stroma

The stroma fills most of the volume of the chloroplast.

It contains about 50% of the protein of chloroplast.

It contains Ribosomes, proteins and DNA molecule.

It is the site of dark reactions/ calvin cycle.

Thylakoid

It consist of flattened and closed vesicles arranged as membranous network.

IT may be stacked like a neat pile of coins forming GRANA.

There may be 40-80 grana in the matrix of a chloroplast.

Thylakoids includes light-absorbing pigments, a complex chain of electron carriers, and an ATP-synthesizing apparatus.

Plastoglobuli

These are osmophilic bodies, lipid rich granules in stroma.

Chloroplast DNA

Chloroplast DNA- also known as plastid DNA (ptDNA).

Circular double stranded DNA molecule.

Chloroplast genome size 102-217 kb.

Majority of plants fall into 120-160kb. (Pelargonium has chloroplast genome size 217kb).

Contain about 100 genes to synthesize proteins.

CpDNA regions includes large single-copy (LSC) and small single-copy (SSC) regions, and inverted repeats (IRA & IRB)

Conifers and a group of legumes lack inverted repeats.

It show heterogenous structure under light microscope and shows main components under electron microscope.

Diagram of chloroplast and it’s description is given by Nehemiah Grew and Antonic Van Leeuwenhoek in early seventeenth century. The term plastids originate from greek word “plastikas” that means somethings that can be formed or mould. They are classified into 2 types (Leucoplasts and chromoplasts) according to the presence of pigment. Chloroplast occur mainly in green plants and algae. It comprises of pigment like chlorophyll a and b, DNA and RNA. Scientist Meyer, Schmitz, and F.W Schimper showed that they arises from pre-existing chloroplast.