

PHOTOSYNTHESIS: UNIT-III

Study Material for

B.Sc. Part III

Botany Hons.

Paper VI

and

B.Sc Part II (subsi)

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PHOTOSYNTHESIS: UNIT-III

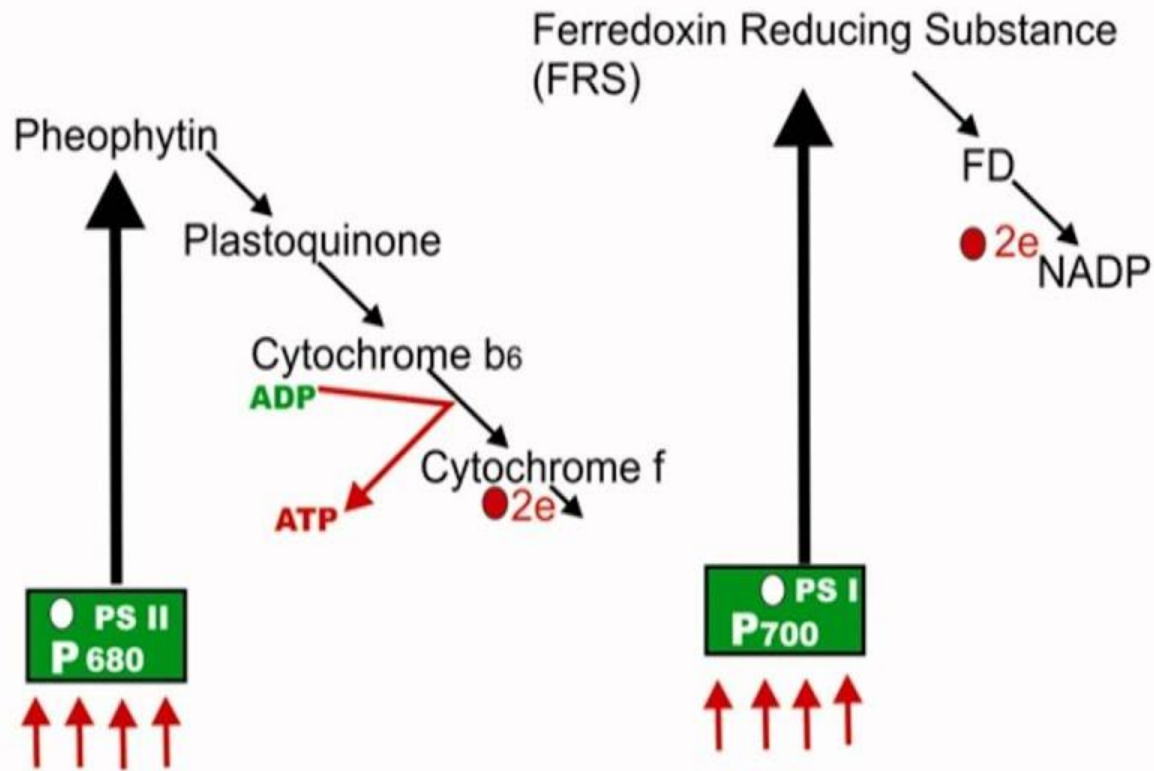
- PHOTOPHOSPHORYLATION
OR
 - LIGHT REACTION

PHOTOPHOSPHORYLATION

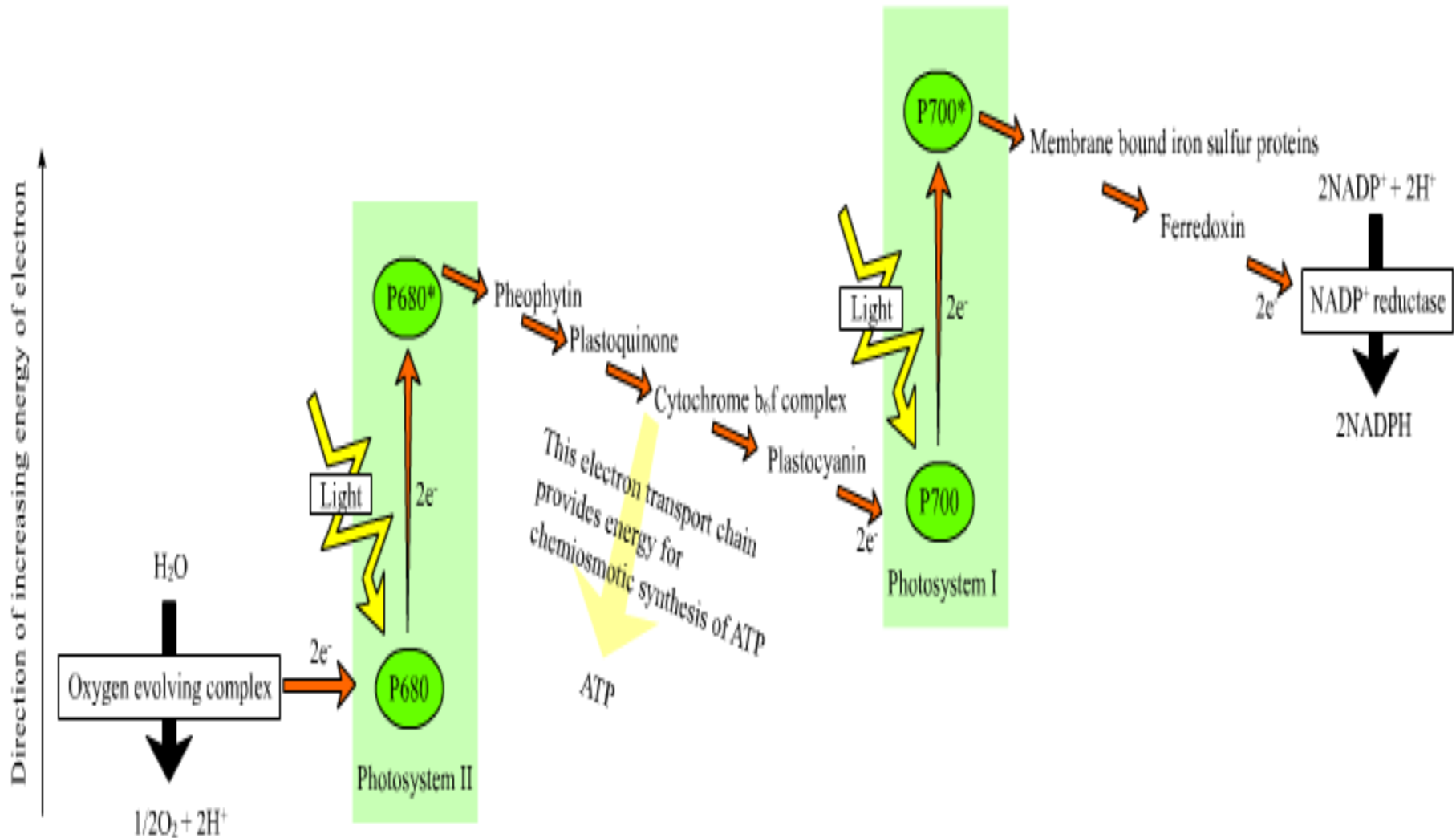
- Photophosphorylation is a process in which light energy is converted in to chemical energy
- Arnon and his co-workers studied in detail the production of ATP in the chloroplast in presence of light with the help of enzymes
- ATP is the only requirement for conversion of carbon di oxide into carbohydrate level
- The photochemical reaction and an enzyme system is capable of forming Reduction reaction which reduces ADP to ATP and NADP to NADPH₂
- ATP and NADPH₂ provide the energy requirement of CO₂ assimilation
- ATP and NADPH₂ are together known as **ASSIMILATORY POWER**
- There are two types of Photophosphorylation; **Non-cyclic** and **cyclic photophosphorylation**

NON-CYCLIC PHOTOPHOSPHORYLATION

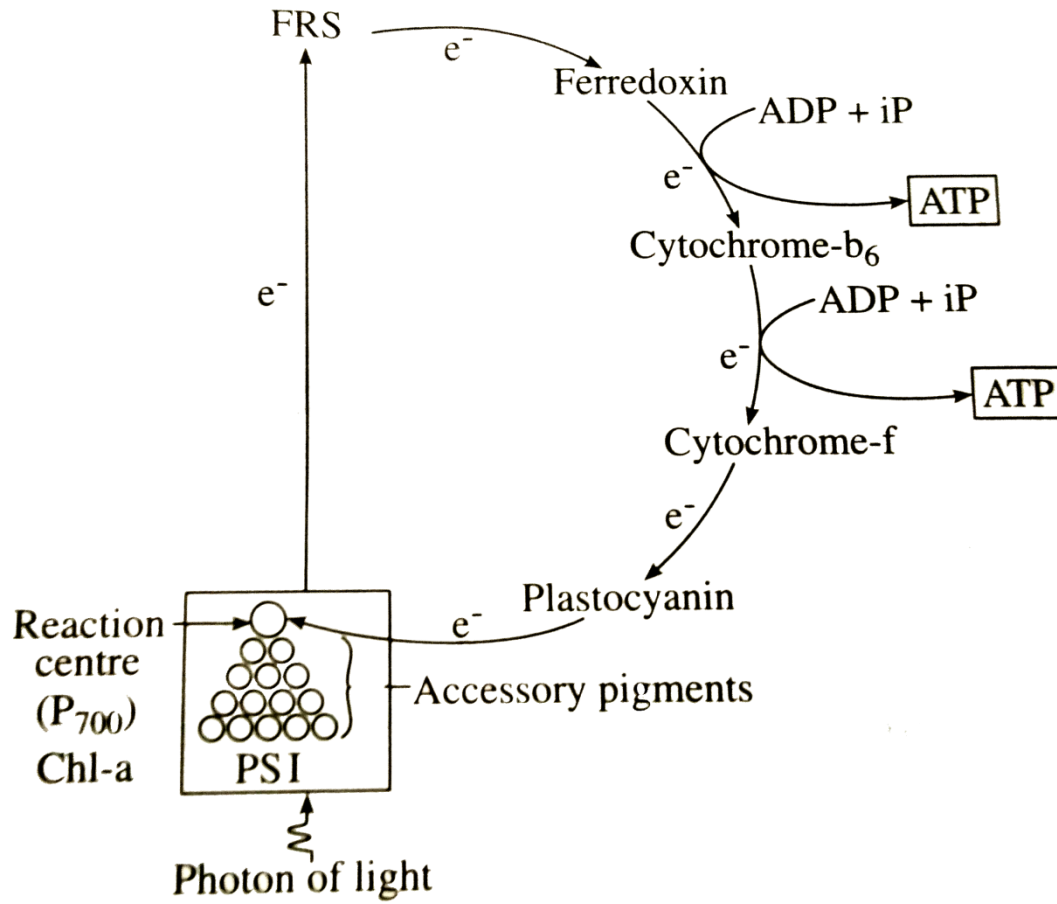
Non-Cyclic Photophosphorylation



NON-CYCLIC PHOTOPHOSPHORYLATION



CYCLIC PHOTOPHOSPHORYLATION



ELECTRON TRANSPORT SYSTEM: ETS

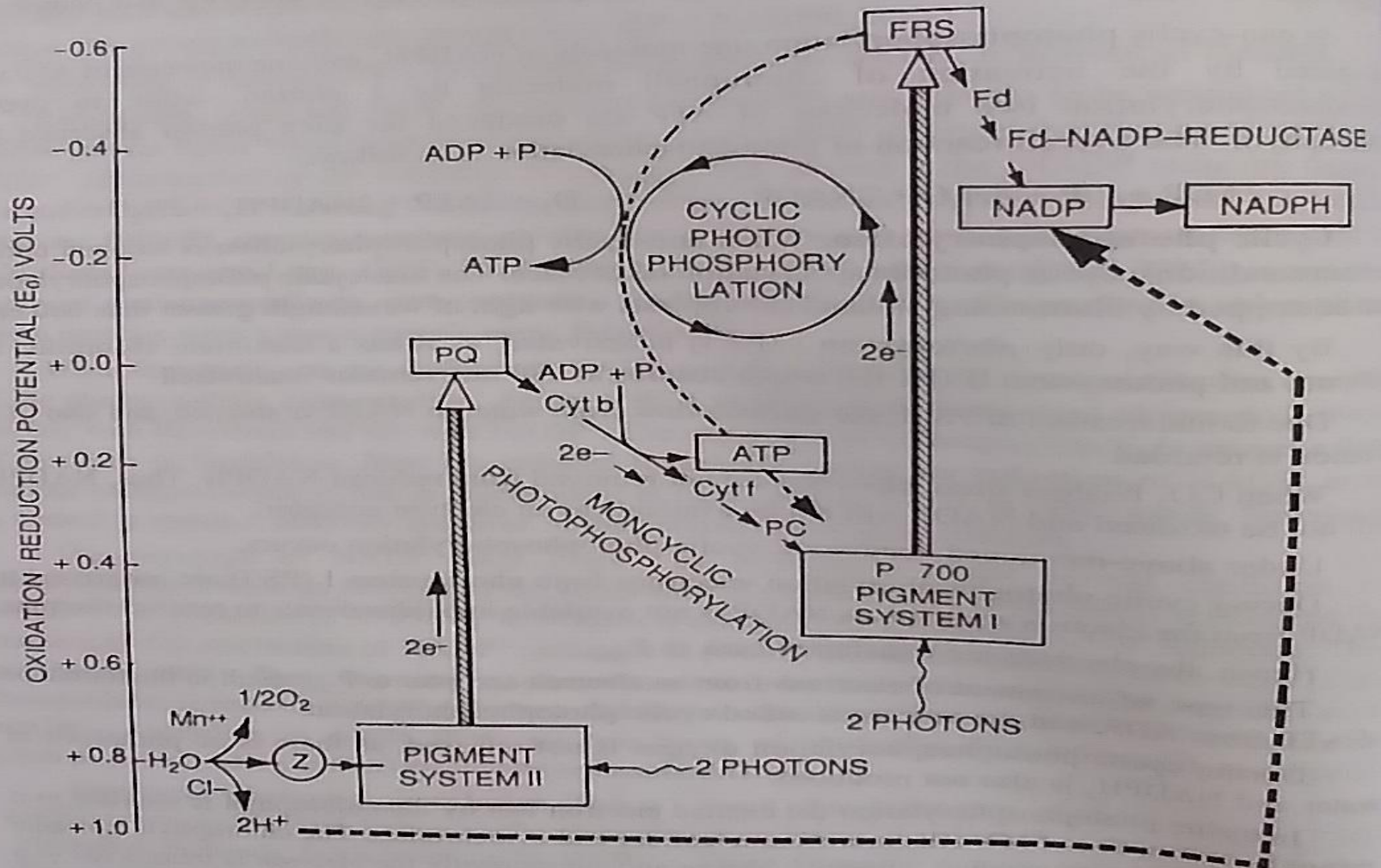


Fig. 5.8. Schematic representation of the electron transport and photophosphorylation in photosynthesis.

RESULT OF PHOTOPHOSPHORYLATION

- In Photophosphorylation; during light reaction of photosynthesis following biochemical activities take place:
- Photolysis of water & release of Oxygen
- Conversion of radiant energy into chemical energy
- Chemical energy is in the form of ATP and NADPH₂
- ATP and NADPH₂ are known as “ASSIMILATORY POWER”

***Apart from all these activities; Fluorescence and Phosphorescence takes place**

- **The whole pathway of photophosphorylation is known as “Z-Scheme”**

PHOTOSYNTHESIS

To be continued in Unit-IV.....