February 2019

Wk	S	M	T	W	T	F	S
05						1	2
06	3	4	5	6	7	8	9
07	10	11	12	13	14	15	16
08	17	18	19	20	21	22	23
09	24	25	26	27	28		

March 2019

Wk	S	M	T	W	T	F	S
05	31					1	2
06	3	4	5	6	7	8	9
07	10	11	12	13	14	15	16
08	17	18	19	20	21	22	23
09	24	25	26	27	28	29	30

FEBRUARY 07 2019

Thursday Week 06

5th Sem Hons.

Dipanwita Pal Class - B 18/09/2020

Crassulacean Acid Metabolism (CAM)

* Crassulaceae, Cactaceae, Orchidaceae, Liliaceae

* diurnal pattern of organic Acid formation
  night → (+) Day → (−)

* CAM Plant.

* 1st discovered Crassulaceae plant
  Bryophyllum sp.

* Types →
  ① Obligate → Behave like CAM
  abundant H_2O supply e.g- Opuntia sp.

  ② Facultative → Shift from CAM to C_3
  abundant H_2O supply
  e.g- Kalanchoe sp.

* Character → 1) CO_2 uptake → night
  2) Stomata open → night
  closed → Day

Discipline like surgery, is not painless, but it is worth practicing anyway. - Shiv Khera

Notes :	Appointment :

3) Malate accumulate → night
∴ Dark acidification

4) Decarboxylation of malate → Day
∴ Light de acidification

* **Process** →

Dark Acidification (Stomata open)

① Formation of malate →

$CO_2 + H_2O \xrightarrow{\text{Carbonic Anhydrase}} HCO_3^-$ (Carbonic Acid)

$CO_2 + PEP \xrightarrow{\text{PEP- Carboxylase}} OAA + H_3PO_4$

$OAA + NADPH + H^+ \xrightarrow{\text{Malate dehydrogenase}}$ Malic Acid + NADP+

Malic Acid → (store) → Vacuole

Acidity content is high in protoplasm ∴ pH → Less

Education is the transmission of civilization. - Ariel and Will Durant

Notes :	Appointment :

Light-deAcidification (stomata closed)

① Decarboxylation of malate →

Vacuole → Malic Acid + NADP+

Acidity content low in protoplasm
∴ pH → high

NAD-malic enzyme (mitochondriat)
or
NADP-malic enzyme (cytoplasmic)

Pyruvate + CO_2 + NADPH + H+

Pyruvate + ATP —(Pyruvate dikinase)→ PEP + AMP + PPi

Sunday 10

CO_2 → C_3 cycle → Carbohydrate
+
RuBP

Education is the movement from darkness to light. - Allan Bloom

Notes :	Appointment :

C_4	CAM
1) OAA → Day	2) OAA → Night
2) Korantz → Present	2) Kraintz → Absent
3) Stomata open → Day	3) Stomata → Night

Photorespiration

Korotov etal (1963)

In presence of light & high conc. of O_2

↓ Chlorophyllous tissue

Respiration → CO_2 released

↓

2C compound Phosphoglycolic Acid

i. e. C_2 cycle

Pisum, Nicotiana, Oryza

Don't Judge each day by the harvest you reap, but the seeds you plant. - Robert Louis Stevenson

Notes :	Appointment :

* Oraganells → Chloroplast
Peroxisome
Mitochondria

Process →

* **reaction in Chloroplast** →

1) RuBP + O_2 —(RUBP Oxygenase)→ 2 phosphoglycolic Acid + 3Phosphoglyceric Acid

2) 2-phosphoglycolic Acid —(Phosphoglycolate phosphatase)→ Glycolic Acid

↓

enter into peroxisome

Creation is a drug I can't do without. - Cecil B. De Mille

Notes :

Appointment :

* **Reaction in Peroxisome** →

1) Glycolic Acid + O_2 —(Glycolate Oxydase)→ Glyoxylic Acid + H_2O_2

Glyoxylic Acid → (Peroxisomal transaminase) → Glycine (2mol.)

Glycine (2mol.) → enter into mitochondria

H_2O_2 → (catalase) → $H_2O + 1/2\ O_2$

* **Reaction in mitochondria** →

1) Glycine + Glycine —(Synthetase)→ Serine + CO_2 + NH_3

(CO_2: primary source of CO_2 in photorespiration)

Serine → enter into peroxisome.

Education is a progressive discovery of our own ignorance. - Will Durant

Notes :	Appointment :

February 2019 March 2019

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Wk	S	M	T	W	T	F	S
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FEBRUARY 14 2019
Thursday Week 07

* **Reaction in Peroxisome** ->

1) Serine ⟶ Hydroxy pyruvate

Hydroxy Pyruvate reductase

$NADH + H^+$

NAD^+

Glycerate

↓

enter into Chloroplast

* **Reaction in Chloroplast** ->

1) Glycerate + ATP ⟶ (Glycerate Kinase) 3PGA

2) ~~3PGA + CO_2~~ (Glycerate Kinase) ~~RUBP~~

2) 3PGA ⟶ enters into Calvin Cycle

↓

Produce RUBP

Education is an ornament in prosperity and a refuge in adversity. - Aristotle

Notes :	Appointment :

FEBRUARY

2019

15

Week 07 Friday

January 2019

Wk	S	M	T	W	T	F	S
01			1	2	3	4	5
02	6	7	8	9	10	11	12
03	13	14	15	16	17	18	19
04	20	21	22	23	24	25	26
05	27	28	29	30	31		

February 2019

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* Fate of NH_3 →

1) ~~NH_3 + Glutamate~~

Mitochodria $\xrightarrow{out}$ NH_3 $\xrightarrow{in}$ cytoplasm

1) NH_3 + Glutamate + ATP → Glutamine synthetase (GS)

Glutamine + ADP + Pi

↓

enter chloroplast

↓

Glutamine + α-Ketoglutarate → GOGAT

Glutamate (2mol.)

GOGAT – Glutamine oxoglutarate amino transferase

Cowards die many times before their deaths; The valiant never taste of death but once. - William Shakespeare

Notes :	Appointment :

Glutamate (2mol.)

1mol. 1mol.

Continue GS reaction

enter peroxisome

↓

Amino group donate to Glyoxylic Acid

↓

Produce Glycine

Sunday 17