BIOLOGY. ***STD-X***

Date- 20/05/2020

INSTRUCTIONS -Read the chapter and then go through the notes given below. Solve the exercise A,B,C and D in your book with pencil and exercise E in your copy.

Topic- Experiments on photosynthesis.

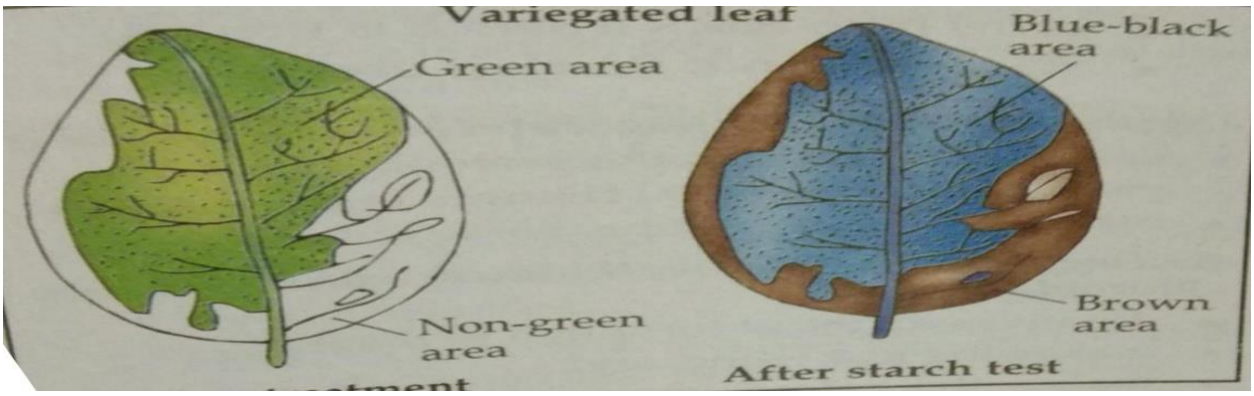
Before performing the experiments the plant has to be destarched. A plant which is to be used for experiments is placed in a dark room for 24- 48 hours. During this time the pre existing starch will be translocated and no new starch will be produced.

Iodine test This test is performed to ensure photosynthesis. If starch is present photosynthesis occurred. Otherwise not.

- An experimental leaf is dip in boiling water for a minute to kill the cells.
- Boil the leaf in methylated spirit over a water bath to remove the chlorophyll.
- Place it in hot water to soften it.
- Spread the leaf in a petridish and pour a few drops of iodine. If the leaf turns blue black colour , then starch is present . If the leaf turns brown , then starch is absent.

Experiment 1—To show that chlorophyll is necessary for photosynthesis.

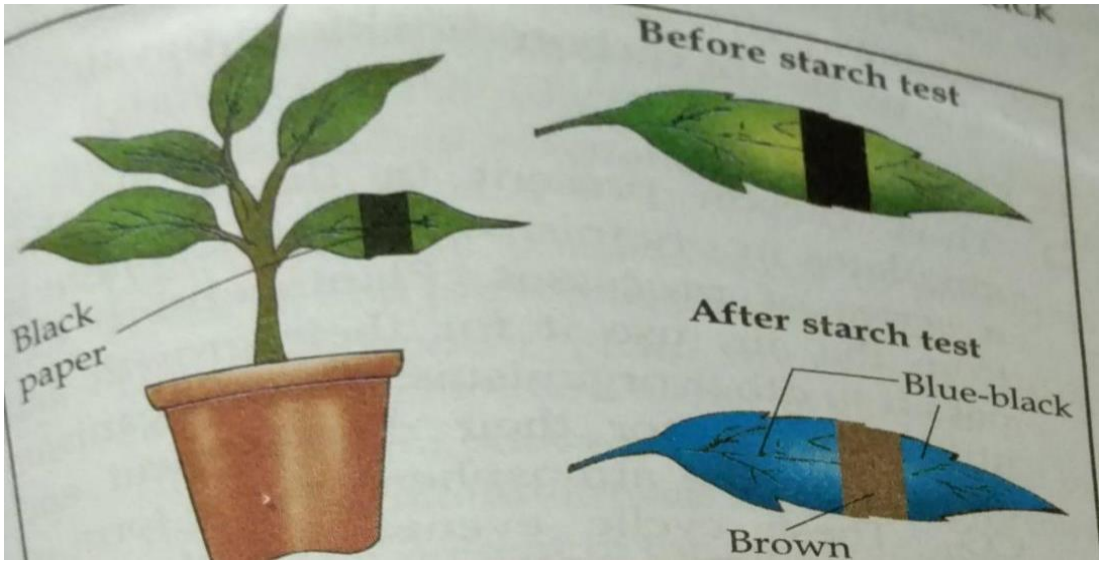
- A coleus plant is destarched.
- Expose to sunlight for few hours.
- Pluck a leaf , make a sketch of the leaf and perform starch test.



Observation—green parts turned to blue black and non green parts turned to brown.

Experiment 2 – To show that sunlight is necessary for photosynthesis.

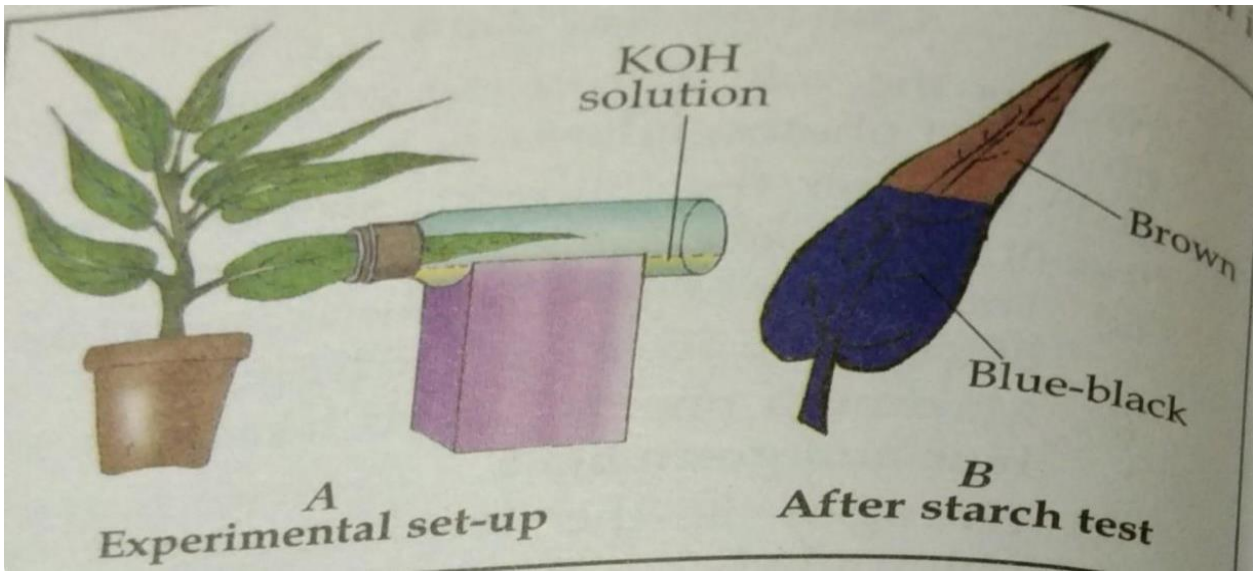
- A destarched plant is taken and one of its leaves is covered with black paper.
- Exposed to sunlight for few hours.
- Pluck the leaf and perform iodine test



Observation – the covered part of leaf turned brown whereas the exposed part turn to blue black.

Experiment 3 – To show CO_2 is necessary for photosynthesis.

- A destarched plant is taken and half portion of a leaf is inserted in a flask containing KOH solution with the help of a split cork.
- Expose to sunlight.
- Pluck the leaf and perform iodine test.

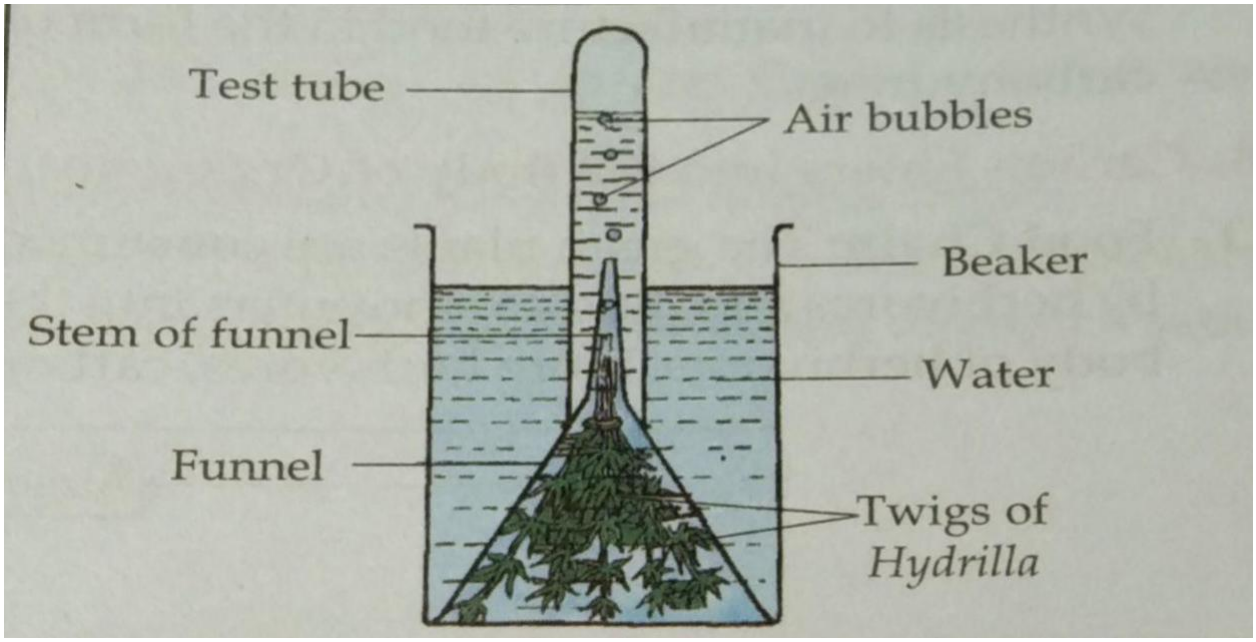


Observation—The portion of leaf exposed to atmospheric air turned to blue black but the portion inserted in the flask turned brown.

Experiment 4—To demonstrate that O_2 is evolved during photosynthesis.

- Take a beaker and fill it with pond water.
- Place some aquatic plants (hydrilla) in the beaker and invert a short stemmed funnel over the plants.
- Invert a test tube full of water over the stem of the funnel.
- Place the set up in sunlight.

Observation—Bubbles of the gas will collect in the test tube. The gas collected is oxygen.



Carbon cycle

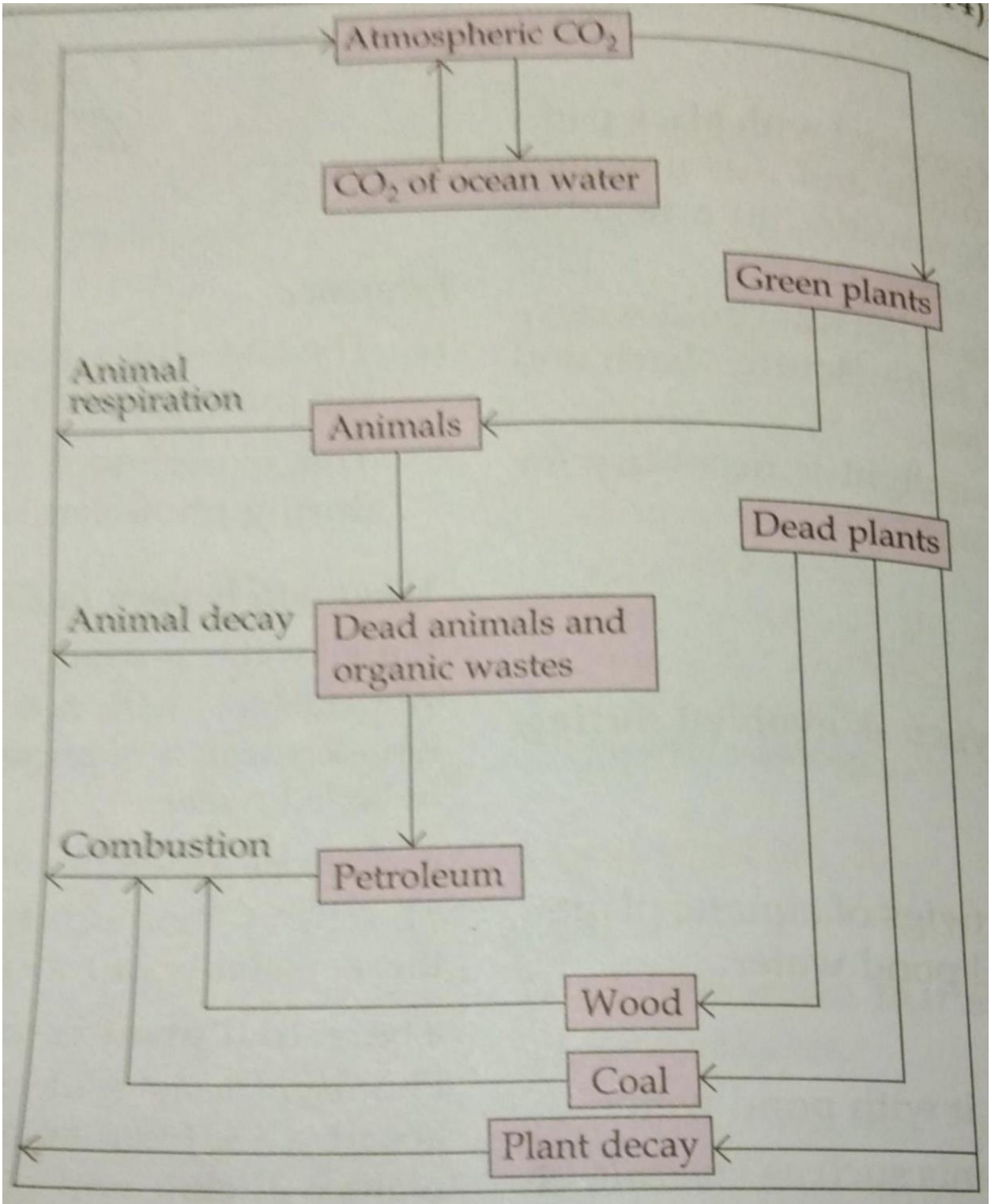


Fig. 6.14: Carbon Cycle

Chemical coordination in plants

Plants respond to stimuli by producing chemical compounds called phytohormones that work as messengers. Functions of some phytohormones are given below.

Auxins-They are present in actively growing regions such as root apex, shoot apex and lateral meristems.

Functions-

- Auxins promote growth by cell elongation.
- Delay senescence.
- Promotes apical dominance.
- Induces rooting.
- Induces parthenocarpy.

Gibberellins-- Distributed in meristematic regions.

Functions-

- Stimulate stem elongation and cause an increase in length.
- Break seed dormancy.
- Delay senescence.
- Promote bolting (internode elongation just before flowering).

Cytokinins—Synthesised in regions where rapid cell division occurs.

Functions—

- Stimulates cell division and initiates shoot elongation.
- Inhibits apical dominance.
- Produce new leaves.
- Enlarges leaf cells and expansion of cotyledons.
- Break seed dormancy.
- Delay leaf senescence.

Ethylene—Produced in fruits.

Functions—

- Ripening of fruits.
- Initiates germination.
- Initiates flowering in mango.
- Promotes root growth and root hair formation.

Abscisic acid— Found in the chloroplasts of leaves.

- Plant growth inhibitor.
- Makes the plant tolerant to various kinds of stresses (stress hormone).

- Inhibits seed germination.
- Accelerates senescence.

Tropic movements in plants

The movement of a plant part in the direction of the stimulus is known as tropism or tropic movement.

Geotropism—movement of the plant parts in response to the gravitational force.

- If the plant part moves in the direction of gravity , it is called positive geotropism. Example roots.
- If the plant part moves opposite or against the direction of gravity , it is called negative geotropism. Example shoot.

Phototropism—The movement of plant parts in the direction of the light source is phototropism. Shoots are positively phototropic and roots are negatively phototropic.

Thigmotropism—The growth movement of plant parts in response to touch stimulus is called thigmotropism. It is seen in tendrils that help the weak stems to climb.

Hydrotropism—The movement of plant parts in response to water or moisture is called hydrotropism. Roots are positively hydrotropic and shoots are negatively hydrotroic.

Chemotropism—Plant movement in response to chemical stimuli are called chemotropism. For example, the pollen tube moves through the style and reaches the ovules in the ovary under the influence of chemicals secreted by them.

Assignment—

Chapter 6

Exercise A,B,C and D in book with pencil. Exercise E in copy.

Chapter 7

Exercise A, B and C in book with pencil. Exercise D in copy.