

## EXPERIMENT NO: 11

### STUDY OF RATE OF PHOTOSYNTHESIS

#### PRINCIPLE

Photosynthesis is a combination of biophysical and biochemical processes during which solar energy is captured and converted into chemical energy which is contained in the molecules of organic compounds. The central role of this process is in the energy cycle of life. Chemically, this process involves the uptake of  $\text{CO}_2$  which, in turn, gets converted into organic compounds, and oxygen is evolved.

The process can be measured usually by measuring the volume of  $\text{CO}_2$  consumed, or influence of  $\text{CO}_2$  conc. on the rate of photosynthesis, or volume of  $\text{O}_2$  evolved, or total amount of dry mass/grain formed. The whole process is principally dependent on light,  $\text{O}_2$ , temperature and water supply from the surrounding environment.

#### MATERIALS REQUIRED

1. Beaker (1L), graduated test tube, funnel fitted with jet etc.
2. 0.1%  $\text{KHCO}_3$  solution, dist. water
3. Hydrilla plants
4. Thread, blade, stand with clamp, etc.

#### PROCEDURE

1. Fill the beaker with distilled water up to 2/3 mark.
2. Take some fresh and healthy Hydrilla plants and cut their ends and tie them loosely with a thread.
3. Insert the cut ends inside the neck of the funnel with a jet.
4. Place the funnel inside the beaker in such a manner that all plants remain inside the funnel.
5. Add a few ml of 0.1%  $\text{KHCO}_3$  soln. for dissolved  $\text{CO}_2$  source.
6. Invert a graduated test tube filled with water over the neck of the funnel so that the jet of the funnel remains inside the tube in vertical position.
7. Place the whole set-up under bright light and keep the graduated tube erect with stand and clamp, if necessary.
8. Allow the experiment to continue for about 20 minutes. Then record the evolution of air bubble ( $\text{O}_2$  gas) inside the tube after passing through jet for 5 or 10 minutes.

## **OBSERVATION**

It is observed that evolution of bubbles from the cut ends of the plants takes place in the set-up exposed to light.

Observation	No. of bubbles formed per 5 min	Mean value
1		
2		
3		
4		
5		

## **RESULT**

## **CONCLUSION**