Study no. – 07

Name of the study: Study on demonstration of absorption of O_2 and liberation of CO_2 during the process of respiration

Respiration: It is a complex biological process where complex food compounds are oxidized into simpler compounds and energy is released.

The overall gross chemical reaction of aerobic respiration is as follows:

$$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{Energy}$$

The reaction implies that O_2 is absorbed in respiration and an equal volume of CO_2 is liberated.

Requirement:

1. Dalia flower
2. Glass tube
3. Conical flask
4. Beaker
5. Stand and clamp
6. Small test tube
7. KOH pellet
8. Cork
9. Water
10. Vaseline

Procedure: A Dalia flower was collected and its calyx was removed. The flower was inserted into a conical flask. A small test tube with KOH pellets was also placed into the flask. A cork with a narrow glass tube was fitted with the flask. After that the conical flask was inversely fitted with a stand by clamp in such a way that the open end of the tube remains dipped into the water of the beaker. Then the conical flask was kept under observation.

Observation: The water of the beaker was raised inside the test tube and remained for some time.

Inference: There was respiration inside the conical flask where the flower absorbed the O_2 from the air (21%) and equal amount of CO_2 was released. The CO_2 released was absorbed by KOH pellets ($KOH + CO_2 \rightarrow KHCO_3$) which created a vacuum and water raised to the vacuum.

Precautions:

1. Green parts (calyx, sepals, epicalyx) should be removed completely from the flower.
2. The cork and the test tube joint should be made air tight with the help of Vaseline.
3. The experiment should be kept undisturbed.

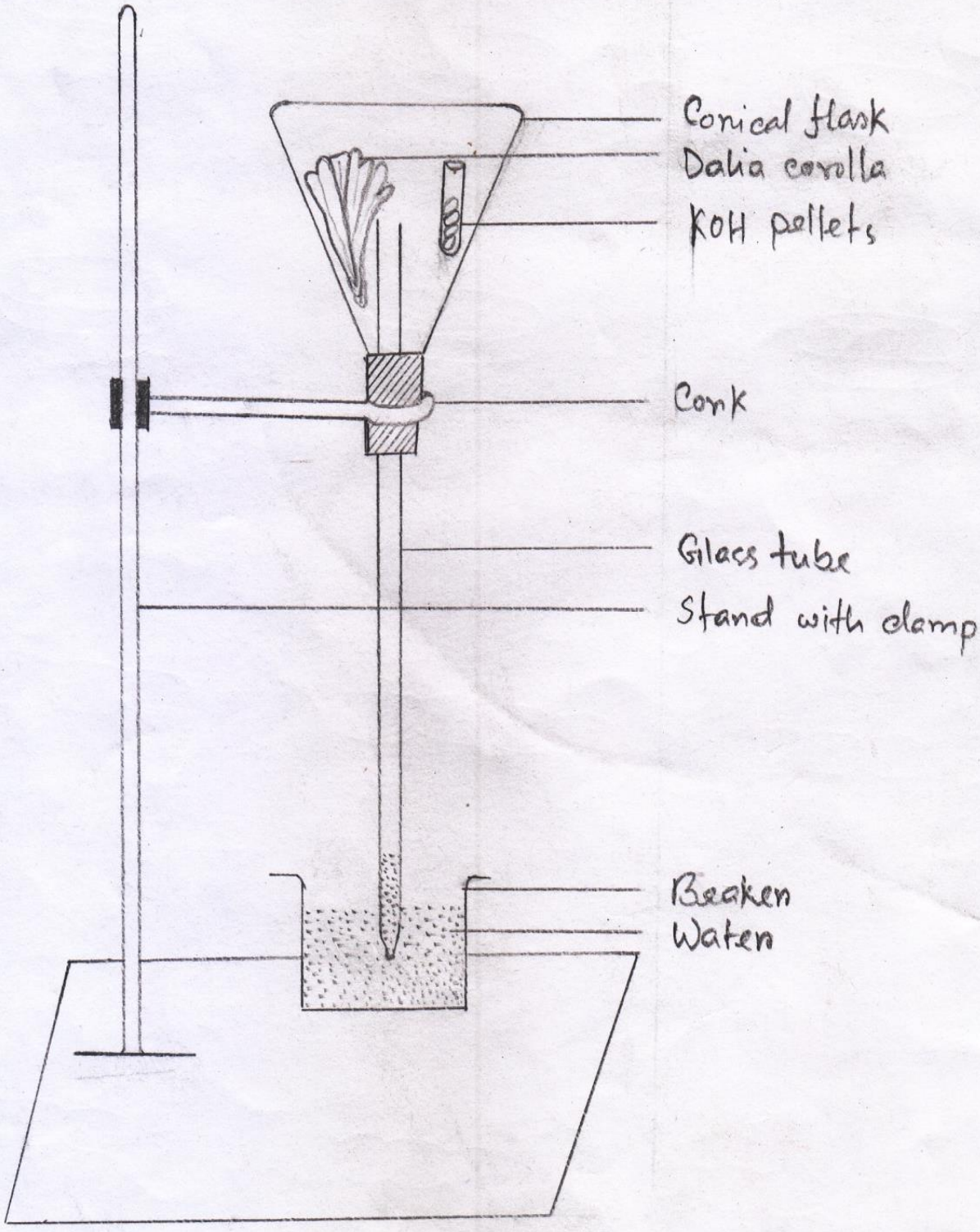

Fig: Absorption of O_2 and liberation of CO_2 during respiration process