Aerobic respiration of germinating and non-germinating peas - lab report example

Science, Biology

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Aerobic Respiration of Germinating and Non-Germinating Peas Introduction

Germination refers to the scientific transition of a plant seed into a seedling. Naturally it requires certain basic environmental conditions in order to occur (Bewley 1985). Some of the conditions include air, warmth, and moisture. Generally studies have shown that there are two main types of seed germination that naturally occur that is aerobic and anaerobic germination. For aerobic germination the three elements are essential while for anaerobic air is not necessary (Bewley 1985).

The experiment was aimed at determining the amount of CO2 gas produced during the germination of peas seeds under a room temperature. It entailed the use of 25 germinating seeds and 25 non-germinating seeds of peas. The non-germinating seeds were used as a control experiment in the study. Its aim was to prove that respiration is a major process in the germination of seeds with CO2 as its byproduct.

Method

25 germinating peas were obtained and dried between two pieces of paper towel. A thermometer was used to measure room temperature which was recorded in table1. The germinating peas were placed in the respiration chamber and a shaft of CO2 gas sensor placed in the opening of the chamber. After one minute carbon dioxide concentration was measured continuously for 5 minutes and results recorded.

After 5 minutes, the CO2 gas sensor was removed and the peas placed in a 100 ml beaker full of cold water and an ice cube. Air was then channeled into

the CO2 gas sensor for one minute through the probe shaft openings. The respiration chamber was then filled with water then emptied and dried thoroughly on the inside with a paper towel. The rate of respiration was then determined by moving the mouse pointer to the point where data values began to increase. The mouse pointer was then drugged with the left mouse button held down to the end of the data then released.

The linear fit button was then clicked to perform a linear regression. The slope of the line was then recorded in table 2as m which is the rate of respiration for germinating peas at room temperature. The data was then moved to a stored run by choosing the store latest run from the experiment menu. There after 25 non-germinating peas were obtained and placed in the respiration chamber and the procedure repeated for the non-germinating peas.

Discussion

From the beginning before one minute elapsed immediately germinating peas placed in the respiration chamber and CO2 sensor placed, it was noted that the concentration of CO2 began to increase in smaller margin. After the one count, Co2 concentration increased with bigger margins at a point above 1000ppm but below 2000ppm. This continued all through to the fifth minute, as CO2 concentration continued to increase into higher levels but did not exceed 2000ppm mark. Using the formula y= mt+b, on the slope of the line linear regression was performed and the rate of respiration was found to be 85. 43 ppm/min denoted as the value of m.

Conclusion

It is true to conclude that respiration is an important process in an aerobic

that facilitates the germination of seeds (Bewley 1985. As such, it is the source of carbon dioxide which is considered as a byproduct of germination. Carbon dioxide concentration levels increases with the increase in the rate of respiration up to the level at which respiration within the seed stops after germination. Germination of seeds is therefore a biological process as it entails a biological process of respiration (Bewley 1985).

Work Cited

Bewley, J. D., and M. Black. 1985. Seeds: Physiology of Development and Germination.

Plenum Press, New York.