**Reminder: All post labs need to be 1- typed (not handwritten) , 2- original (not copied from a classmate), 3- answered using complete statements and 4- turned in at the beginning of the lab.**

**Post-lab questions for Topic 9 – Photosynthesis**

**Name: Moreno , Melissa Date: 3-9-14 Group: R**

**9.2. Effect of Light and Carbon dioxide on starch production**

|  |  |  |  |
| --- | --- | --- | --- |
| Plant Growth Conditions | Appearance | Prediction/ Hypothesis | Starch Presence and Location |
| A- Normal conditions with both light and carbon dioxide | Strong, leafy, very green | I predict there are large quantities of starch in this plant | On the leaves, slightly on the stem |
| B- In dark, with normal carbon dioxide | Yellowy, not so many leaves, | I predict there is very little starch located in this plants | No starch detected |
| c- In light but without carbon dioxide | Dying, flimsy, lightish green | I predict there is no starch in this plant | No starch detected |

Distribution of Starch on Plants

Condition A Condition B Condition C

What conclusion can you draw about the effect of light on the presence of starch?

The conclusion that I gathered from seeing that only the plant that was exposed to light had starch present was that in order for plants to produce starch in large quantities, in order to make a structural starch, the plant must have light in order to do light reactions If the plants in only exposed to the dark, the dark reactions will only be able to make enough glucose to sustain its life.

What conclusion can you draw about the effect of carbon dioxide on the presence of starch?

The plant that was exposed to CO2 did not show any signs of starch production. I can conclude that CO2 is not needed to produce starch.

Can you tell which is more important of the two factors tested during this experiment?

The more important of the two factors would be the light. Light reactions is needed to produce ATP and NADPH which then is used in the Calvin Cycle to make glucose. This glucose is used to “feed” the plant and create starch, which can be used as an energy storage or for structural purposes.

**9.3 Distribution of Photosynthetic products**

Relationship between light and starch presence

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Plant growth conditions | Prediction/hypothesis  Masked area Unmasked area | | Prediction/hypothesis  Masked area Unmasked area | |
| With light | No | Yes | No | Yes |
| Without light (last 48 h) | No | No | No | No |

Were your hypotheses correct? What is your conclusion from this experiment?

Yes my hypothesis was correct. This experiment confirmed that light is necessary for the production of starch. Starch can only be created from the products of light reactions.

**9.4 Necessity of Photosynthetic pigments for Photosynthesis**

Make a prediction regarding the presence and photosynthetic activity for each pigmentation area (green, pink, purple, white, etc).

I predict that starch will be formed in areas of the plant that are mostly green and sturdy. The areas that are green with have more chloroplasts and thereby having more photosynthetic activity. The pink areas should have very little starch because they do not contain chloroplasts.

How does the patter of starch presence to the distribution of chlorophyll? Was your prediction support or not?

The patter of starch relates to the distribution of chlorophyll because starch was only present where the leaf was green. The pigmented part did not contain any starch, i.e it did not turn black during the Lugol test. This indicates that starch is only present where there are chloroplasts (photosynthesis reactions)/

9.5 Absorption of Light by Chloroplast Extract

Draw the spectrum of white light in your book and then follow the procedure indicated to answer the follow.

|  |  |
| --- | --- |
| Filter used | Colors absorbed |
| red | 600-700 |
| blue | 400-500 |
| green | 500-600 |

What can you conclude concerning the color of any of the filters test and the

corresponding absorption by that filter?

During this experiment we can conclude that certain colors or pigments are absorbed by particular wavelengths. The wavelengths pass through the color and then can be visible using the spectroscope.

**9.6 Separation of photosynthetic pigments by paper chromatography.**

Using colored pencils sketch the results of your chromatogram showing the relative positions and the corresponding labels.

Which pigments were you able to distinguish in

the spinach extract?

I was able to establish green and yellow tones in the spinach extract.

In the coleus sample?

I saw similar colors in the coleus sample. I was more light green colors but more or less the same green and yellow tones.

**Extra Photosynthesis Experiment. Absorption spectrum of spinach extract**

What is an absorption spectrum? What is the predictive value of such a spectrum?

An absorption spectrum is when light enters a sample, the amount of light that depends on the wavelength of the light. The absorbance spectrum could also be displayed using a wavelength graph identifying the colors that are being absorbed at different wavelengths.

After you plot your data, what conclusions can you make about the absorption characteristics of the pigment you used?

Bold = NM Non-Bold = Absorption

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 400 | 410 | 420 | 430 | 440 | 450 | 460 | 470 | 480 | 490 |
| 0.924 | 0.921 | 0.892 | 0.788 | 0.755 | 0.662 | 0.573 | 0.570 | 0.477 | 0.351 |
| 500 | **510** | **520** | **530** | **540** | **550** | **560** | **570** | **580** | **590** |
| 0.290 | **0.272** | **0.253** | **0.248** | **0.254** | **0.239** | **0.232** | **0.228** | **0.225** | **0.211** |
| **600** | **610** | **620** | **630** | **640** | **650** | **660** | **670** | **680** | **690** |
| **0.223** | **0.235** | **0.231** | **0.227** | **0.236** | **0.276** | **0.359** | **0.395** | **0.266** | **0.192** |
| **700** |  |  |  |  |  |  |  |  |  |
| **0.175** |  |  |  |  |  |  |  |  |  |

What is the difference between your absorbance plot and the one in your text book/slides? Can you explain why yours does not look like the one in the recitation slides or textbook?

In the text book it stats that green is absorbed normally through the wavelengths of 500-600 nm. I see on my chart that the sample, which was a very dilute green, had the most absorbancy around 400-500 nm which is the noted in the text book to have the most absorbancy of purple and blue wavelengths. I believe there is a difference because we were testing a very dilute samples that was not rich in green pigments. I’m sure if the sample was very green we would have gotten results closer to the spectrum wavelength graph in the book.