

02: Amylase activity in germinating seeds

Time: 2 h

Evaluated criteria: OPD and CE

Objective: Determine the amylase activity by measuring the diameter of a circle created on a petri dish with agar and starch.

Background information: Amylase is an enzyme which reduces the polysaccharide starch to disaccharides of maltose. When seeds are germinating they produce amylase. By adding the indicator of starch, Lugol, to the agar you will be able to observe the breaking down of the starch as the dark red to black colour will disappear when germinating seeds are added.

Materials:

Petri dishes

25g of agar

10 g of starch

Lugol solution

Mortar and pestle

2 types of seeds (lentils and chickpeas)

A scale

Method:

1. Seeds have been added to beakers with water and left to germinate for a few days. The water has been changed every now and then to prevent fungi from growing.
2. Mash some seeds with the mortar until they are completely liquefied
3. Make a hole in the agar with starch in the middle of the plate of about 1cm in diameter. Write the name of the seed on the dish
4. Fill the hole with 0.5g of the liquefied seed.
5. Repeat step 2-4 four times and place the 5 petri dishes in the stove at 35°C during 24h.
6. Take the dishes from the stove, add 5mL of lugol and wait for 10 min.
7. Eliminate the excess of lugol and measure with a ruler the diameter of the decoloured circle.
8. Add all your data to a table and share them with the others.

Data process:

Represent your data, both the raw and processed in a table and graph. Don't forget the proper units and uncertainties of your measuring materials.

Conclusion and evaluation:

Conclude and justify, after analysing your processed data, is the activity of the amylase is different between the species of seeds. Compare the values with information in the bibliography on the topic. Evaluate the method and focus on the strong and weak points. Propose improvements.