

A Level Biology A
H420/01 Biological Processes

Question Set 17

17 (a)

Gibberellin causes stem elongation in plants.

Fig. 17.1 shows the effect of gibberellin on cabbage plants.



Fig. 17.1

Gibberellin causes an increase in the distance between the leaves on the stem, which is known as the internodal length.

Explain why gibberellin is classed as a plant hormone.

[3]

Gibberellin acts as a chemical messenger. It is synthesised in one area of the plant but is transported to and used in other regions. Gibberellin has widespread, long lasting effects.

17 (b) (i)

A scientist carried out an investigation into the effect of gibberellin on cabbage plants.

The scientist applied a range of volumes of gibberellin and measured the rate of increase of internodal length over 30 days.

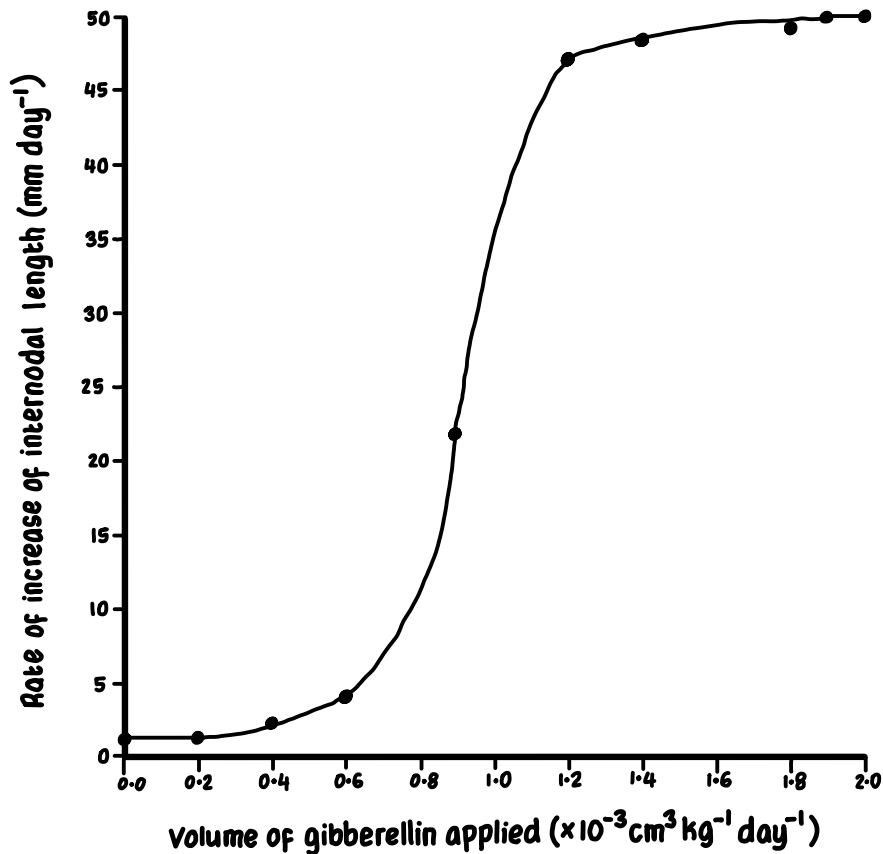
Table 17 shows the scientist's results.

Volume of gibberellin applied ($\times 10^{-3} \text{ cm}^3 \text{ kg}^{-1} \text{ day}^{-1}$)	Rate of increase of internodal length (mm day^{-1})
0.0	1
0.2	1
0.4	2
0.6	4
0.9	22
1.2	47
1.4	48
1.8	49
1.9	50
2.0	50

Table 17

Plot the results from Table 17 as a suitable graph.

[4]



- 17 (b) (ii) Gibberellin causes an increase in internodal length.

State one **other** role of gibberellin in plants. **Seed germination**

[1]

- 17 (c) (i) A student carried out chemical tests on cabbage leaves to investigate which molecules were present.

The student's method was as follows:

- Add 50 cm^3 of distilled water to 2 large cabbage leaves and blend into a smooth liquid using a food mixer.
- Place 1 cm^3 of the blended cabbage leaf liquid into 5 test tubes:
 - Tube **1**: Add 5 drops of biuret reagent and mix.
 - Tube **2**: Add 2 cm^3 of Benedict's solution, mix, then place tube into a water bath for 5 min. Remove and cool.
 - Tube **3**: Add 2 drops of iodine solution and mix.
 - Tube **4**: Add 2 cm^3 of ethanol and mix. Then add 2 cm^3 of distilled water and mix.
 - Tube **5**: Insert a glucose test strip into the liquid then compare the colour to the colour chart provided (see Fig. 17.2).

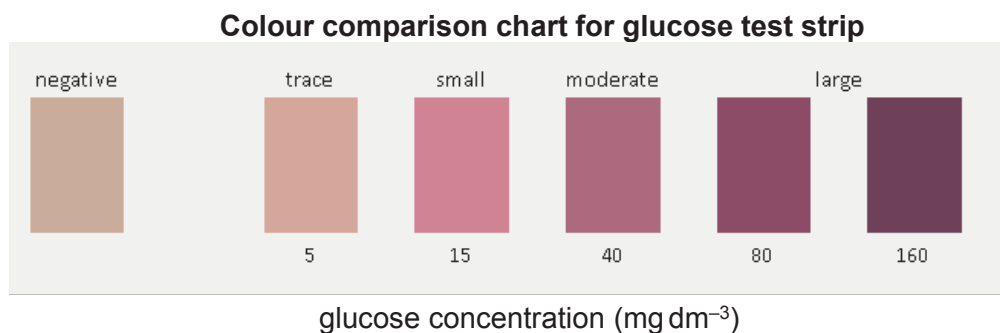


Fig. 17.2

Name a **type** of food molecule that the student will **not** be able to detect using these chemical tests. **Non-reducing sugar** [1]

17 (c) (ii) The table below is a summary of some of the student's findings.

Tube	Observation	Conclusion
1	Purple colour	Protein present
2	Yellow colour	Small quantity of reducing sugar present
3	Pale brown colour	No starch present
4	White cloudy emulsion	Fat present
5	Pink colour	Glucose concentration small (15 mg dm^{-3})

Complete the table by writing in the missing observations and conclusions. [2]

17 (c) (iii) The student then used a colorimeter to measure the absorbance of the contents of Tube 2.

Explain how the use of a colorimeter could improve the student's conclusion.

Use of a colorimeter provides quantitative non-subjective data. [1]

Total Marks for Question Set 17: 12

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