

STUDENT SHEET 4d

Copepod survival Excel and question sheet

The Excel worksheets show the survival rate of the adult copepods and copepod nauplii (larvae) when exposed to current seawater pH (8.1) and then with a second set exposed to seawater pH (7.6) predicted for the future.

For the adult copepods, 15 *Calanus* copepods were counted into each exposure at the start. Experiments ran for 7 days and alive adults were counted at the end of the experiment to see how many survived.

For the copepod nauplii (larvae) 30-50 *Calanus* copepods were counted into each exposure at the start. Experiments ran for 7 days and alive nauplii were counted to see how many survived.

Step 1: Viewing the data

Open the spreadsheet containing the data. Have a look at all the data. There are two sheets in the workbook listed in the tabs at the bottom of the page:

- **Adult Data**
simplified data set showing survival for adult copepods
- **Nauplii Data**
simplified data set showing survival for copepod nauplii (larvae)

Step 2: Performing calculations using Excel for Adult Data

Make sure that you have selected the 'Adult Data' tab. You will see the experimental data relating to adult copepod survival. You will need to make the following calculations, completing all the grey boxes.

1. Calculate the survival percentage for adult copepods exposed to current levels of seawater pH.
2. Calculate the average survival rate for adult copepods exposed to current levels of seawater pH.
3. Calculate the survival percentage for adult copepods exposed to future levels of seawater pH.
4. Calculate the average survival rate for adult copepods exposed to future levels of seawater pH.
5. Input the average survival figures into the chart data boxes.

Step 3: Performing calculations using Excel for Nauplii Data

Make sure that you have selected the 'Nauplii Data' tab. You will see the experimental data relating to copepod nauplii survival. You will need to make the following calculations, completing all the grey boxes.

1. Calculate the survival percentage for copepod nauplii exposed to current levels of seawater pH.
2. Calculate the average survival rate for copepod nauplii exposed to current levels of seawater pH.
3. Calculate the survival percentage for copepod nauplii exposed to future levels of seawater pH.
4. Calculate the average survival rate for copepod nauplii exposed to future levels of seawater pH.
5. Input the average survival figures into the chart data boxes.

Step 4: Analysing the data

Answer the following questions:

1. Compare your graph showing the survival rate for nauplii to the graph showing the survival rate for adult copepods. What differences can you see?
2. Based on this data explain what you think might happen to the copepod population if the pH of the ocean continues to decrease.
3. Given that copepods are primary consumers, what impact might this have on the arctic ecosystem as a whole?