OCR (A) Biology GCSE

PAG 03: Sampling Techniques

Practical notes

Sampling techniques

Aim

To use sampling methods of biotic and abiotic factors in a non-laboratory situation to compare two different habitats.

Equipment

- Frame quadrat (25 cm by 25 cm)
- Tape measures
- Clipboard
- Pen
- Paper
- Key
- Thermometer
- Soil pH testing kit
- Random number generator
- Umbrella

Method 1

1. Use a random number generator to obtain 2 numbers, which are to be used as coordinates to find a location on the 2 tape measures set up.
2. Set down the quadrat at the coordinates.
3. Count and record the number of the required plant species in the quadrat.
4. Repeat steps 1-3 to take 9 more samples.
5. Estimate the population size using this formula:

   total area / area of quadrat x mean number of individuals in a quadrat
6. Repeat steps 1-5 at another site with different abiotic factors eg. mown vs unmown.

Method 2

1. Write down a hypothesis of the effect of a change in an abiotic factor (eg. light intensity) on the distribution of the plant species.
2. Lay down a tape measure from the base of a tree to an open area of ground/ along a location with an ecological gradient.
3. Place the quadrat along the '0' end of the tape measure, with one corner touching the '0' mark.
4. Count the number of each species of plant using a key and record it in a table as seen below.
5. Test the abiotic factor that changes along the transect. For example:

- Light intensity
- Compacting (how far a nail can be pushed into the soil)
- Temperature
- Moisture content
- Soil pH

6. Place the quadrat 5 m up the tape measure and repeat steps 4-5.
7. Repeat step 4 at 5 m intervals until you reach the end of the transect line.

8. Gather data from your class to find the mean number of plants at each point along the transect.
9. Plot a graph of 'number of plants' against the ecological gradient that is observed as the distance along the transect line increases. Compare your results to your hypothesis.

Distance along the transect line in m	Number of plants	Light intensity (or other factor)

Method 3

1. Place an inverted umbrella under a branch.
2. Shake the branch so that insects fall into the umbrella.
3. Count and identify the different species of insects.
4. Carefully release the insects.

Sources of error

Without repetitions, the results from only one belt transect may be anomalous and not reliable.
Some organisms may be too small or difficult to identify.

Risk assessment

Wash hands thoroughly after the experiment.
Be aware of any allergies to plants that students may have.
Be careful when handling plants and insects as they may have sharp edges/sting.