Collecting climatic data that is millions of years old

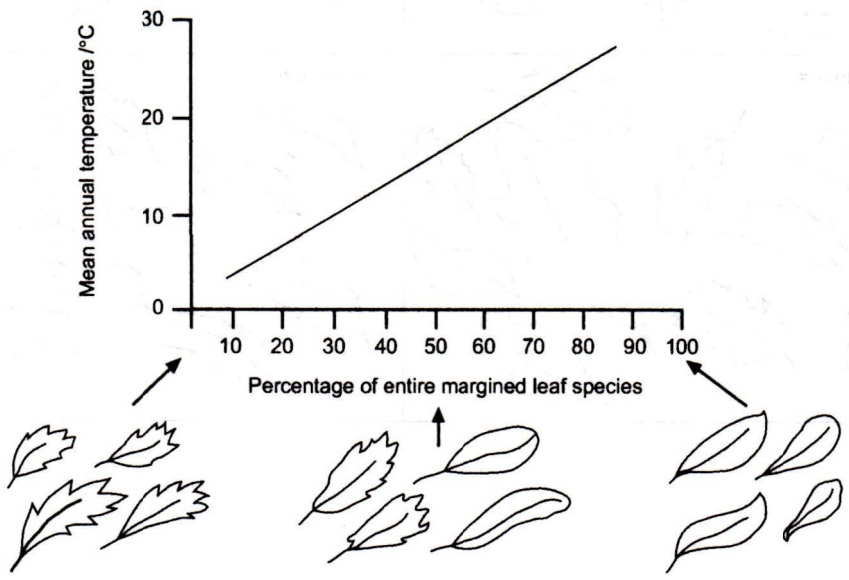
To investigate what the climate was like millions of years ago, geologists look to fossilised plants. By studying different types of plants they can gather climatic information, such as annual temperature range and water availability that corresponds to the time when the plant was living. This data can then be fed into computer climate models. Fossilised animals and pollen found in the same area, together with the position in the rock layer where the plants are found, are often used to age the fossilised plants.

Several different techniques are used to gather temperature information. Here are three methods that are used.

1. **Fossil flora** are compared to the nearest living plants today and the temperature is extrapolated back.

Question 1. **What do you think is the main problem with this method?**

2. **Leaves as thermometers.** The shape of the leaves, the nature of the leaf margin and the feature of the leaf cuticle can all be used to provide estimates of mean annual temperature, temperature range and water availability. The graph shows the relationship between temperature and the percentage of smooth leaves found together in an assemblage.



A plot of mean annual temperature (MAT) against the percentage of leaf margin
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The main problem with this method is that lots of samples are needed to get a good picture of the past climate.