Prehistoric Pollination

using fossils to solve a million years old mystery

Until time travel is invented, it is difficult to know what the world was like millions of years ago. Without evidence, scientists are left to make hypotheses, or educated guesses. Fossils are one type of evidence that may be used to learn about past life.

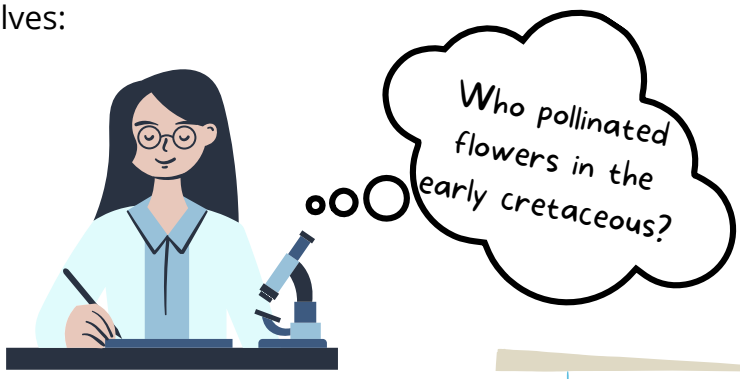
There are three main types of fossils. **Body fossils (1)** are the mineralized bodies of animals. **Mold fossils (2)** are the imprint of an animal's body which has since decomposed. **Trace fossils (3)** are left from an animal, such as footprints, nests and burrows.

1. Bryozoan by Kenneth C. Gass

2. Mold of a bivalve by Mark A. Wilson

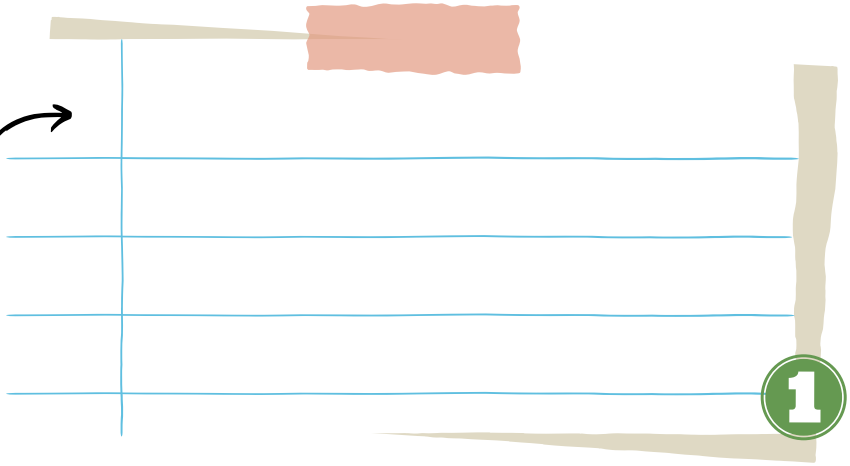
3. A dinosaur footprint by Mark A. Wilson

Prior to the cretaceous period, the landscape was filled with wind-pollinated **gymnosperms**, or plants with “naked seeds” such as pine trees with pine cones. Meaning, the wind acted as the pollinator for plant life. But then during the cretaceous period (145 MYA), **angiosperms** appeared; plants with flowers containing seeds. With this information, scientists asked themselves:



You might think Bees since they are the most important pollinator today. But Bees didn’t evolve until 80 million years ago. So it could not have been them!

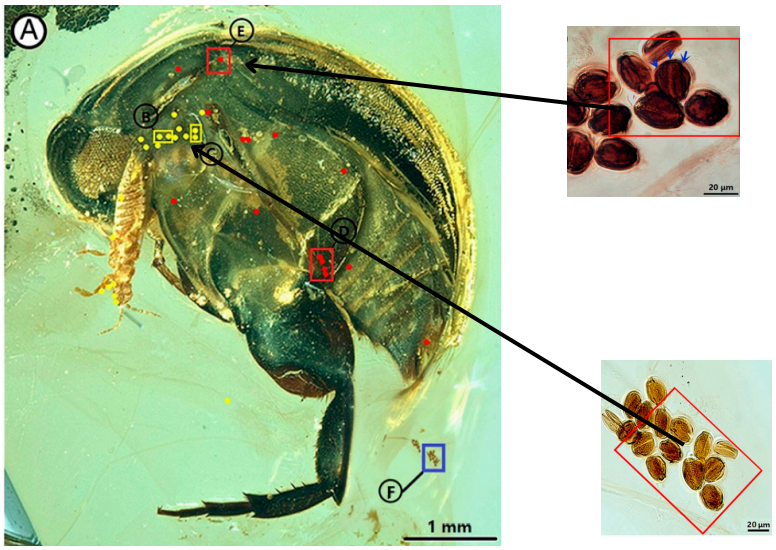
Ask: what features could scientists look for when examining fossils of potential pollinators?



Part of this mystery was solved when a unique **body fossil** was discovered! unfortunately, sometimes animals are trapped in tree resin. Resin fossilizes into amber and preserves the bodies of animals for millions of years.

A piece of amber containing a prehistoric beetle was found in an amber mine near Noije Bum Village, Danai Town in northern Myanmar. It dates back 99 million years ago. Scientists examined the specimen using microscopes and made discoveries too small to see with the naked eye.

The piece of amber contained grains of pollen. As seen in figure A, pollen grains attached to the body are colored red and unattached pollen grains are colored yellow.



This beetle was identified as *Angimordella burmitina*, a species of flower tumbling beetle. There are about 1,500 species of beetle in this family alive today, and they eat pollen. **This single specimen is the first fossil to provide evidence that insects pollinated flowers during the cretaceous period.**

Scientists also found body features similar to those of modern-day pollinators. The **mouth** is similar to those of pollen-eating insects. The **head** and **body** are positioned to increase flexibility, a characteristic that helps insects move in and out of flowers. The upper **hind legs** are enlarged, and the lower hind legs are spiny- these features aid in walking on uneven surfaces such as flowers. Finally, **long fine hairs** on the beetle's thorax and abdomen are spaced at a width ideal for catching pollen grains.

After fossils are studied, artists use scientific data to create an image depicting what the animal may have looked like when it was alive.

What do you think *Angimordella burmitina* looked like?

Draw *Angimordella burmitina!*

2

Think like a paleontologists!

Examine this "mystery species" fossil. **Predict** and answer the following questions using **evidence** you see in the resin fossil.

A **paleontologist** is a scientist who studies the history of life on Earth through types of fossils.

1.How do you think this animal was able to move?

2. What do you think this animal ate:

3. Was this animal a predator or a prey?

4. What species does this animal look like?

Now use the sketch box to draw what you think this animal looked like when it was alive!

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