Video Transcript - How Paleontologists Identify Dinosaur Teeth

How scientists identify isolated fossil teeth

Matthew Carrano: This drawer holds just some of the hundreds of Cretaceous fossils from the Washington, D.C. area here in the National Museum of Natural History collections. And it provides a really great example of one of the common problems that paleontologists face. That is that most of the fossils that we find are isolated.

Matthew Carrano: We get individual bones or teeth and the challenge is to identify them. It's a really simple process of observation and comparison. It ultimately allows [00:00:30] us to figure out both what part of the animal we have and how many animals together we have represented.

How do scientists tell what part of the animal it is?

Matthew Carrano: Here's a tooth. Here's a claw. So a bone that has a somewhat tooth-like shape. They both curve, they're both pointed, but we can still tell them apart. The tooth has an enamel covering so it's relatively shiny. This is a meat-eating dinosaur tooth, which means it has sharp edges and they are serrated like a steak knife.

Matthew Carrano: [00:01:00] In contrast, the claw, because it is made of bone, has a somewhat spongy texture. And it has these grooves on the side. It would have been covered in a sheath which would have been made of keratin, like your fingernails. It has a flat bottom and an area here where it would have touched the finger that it was attached to. So even though they're very generally similar, the basic shapes, we can look at the details and figure out that these are two different fossils.

What kinds of dinosaurs lived in Washington, D.C.?

Matthew Carrano: Here in the Washington, D.C. area we find [00:01:30] teeth as the most common dinosaur fossils. And these are four examples, four different kinds of dinosaurs. You can see how the shapes are really quite different from one to the next. We can look at them and make comparisons to figure out which kinds of dinosaurs these are.

Matthew Carrano: These two fossil teeth represent two different meat-eating dinosaurs. They are obviously quite different in shape, but there are also many other features about them that allow us to distinguish them. For example, under the microscope, we can look at the serrations on the edges of these teeth. [00:02:00] They are themselves very differently shaped. The teeth have different proportions and different curvatures. So it's unlikely that these come simply from older and younger individuals or bigger and smaller ones. More likely they are from different species.

Matthew Carrano: We also have several species of plant eating dinosaurs. These two teeth come from two different species. This is from an armored dinosaur called the Nodosaur. It has a triangular tooth with these very large points on it, which would have been quite useful for chopping [00:02:30] plant material.

Matthew Carrano: This tooth is from a Sauropod dinosaur called Pleurocoelus. It would have had a mouthful of these very blunt teeth for stripping leaves off trees and other larger plants. We can tell that they're not meat eating dinosaurs from the shapes overall. And we can tell, of course, they're two different species because the teeth themselves are very different from one another.

Can we always identify dinosaur species from teeth? [2:50]

Matthew Carrano: Some people believe that it's possible to identify the actual species of dinosaur from this particular tooth. [00:03:00] However, we know that different species of Dromaeosaurus have very similar teeth. Without having more fossils of the animal, it's really not possible to be specific about the kind of Dromaeosaur we have.

Matthew Carrano: Event though we don't get complete dinosaur skeletons here in Washington, D.C., a collection like this is very important. By making these kinds of observations and comparisons, we can tell we have almost a dozen species of dinosaurs ranging from the size of a chicken to almost the size of a house. And that's actually really important in understanding what life [00:03:30] was like here 110 million years ago.