

Fossils

What is a fossil?

A fossil is any evidence of life (plant or animal) preserved in the earth's crust; the word itself comes from the Latin *fossilis*, which means dug up. The **fossil record** is the information gathered from the millions of fossils on Earth and provides clues into the history of life on Earth. Scientists use the abbreviation **mya** as shorthand for millions of years ago.



Ammonite 250 million years old

How are fossils created?



Trilobite -- 300 million years old

The process began when a plant or animal died and sank into the sediments at the bottom of a body of water. The loose sediments protected the remains from the elements, bacteria and other forces that cause weathering and decay - slowing the decay process. Some of the remains (usually hard material like bone or shell) survived. Sediment layers continued to collect above the bone, eventually becoming hard, solid rock. Water percolated down through the rock, washing the preserved remains away. This empty space formed a natural mold of the animal, perfectly preserving the shape of the original remains. Sometimes, the water carried minerals into the mold, which

hardened to make a natural cast of the form. All the original organic material disappeared, but nature left a precise mineral reproduction of the plant or animal remains. In cases where minerals did not fill the mold, paleontologists may fill it themselves, creating an artificial cast. Many prehistoric insects, caught in the sap of a tree, were fossilized along with the sap itself, forming amber. Fossils are also found in tar pits, bogs, quicksand and volcanic ash.

Other kinds of fossils

Petrified wood forms when trees fall into water, become saturated and then buried in mud, ash, silt and other materials. Minerals seep into the tree and fill in tiny pores in wood's cells, turning the wood into stone while preserving its original

structure. In addition to fossilized plant and animal bodily remains, paleontologists study fossilized animal footprints and trails, and even fossilized animal dung (called coprolite). These fossils reveal something about how prehistoric animals moved and what they ate.

Short Geological history of Missouri

The oldest rocks in Missouri are approximately 1.8 billion years old - but these rocks don't contain fossils.

Warm, shallow seas covered Missouri through much of the Paleozoic (286 to 550 mya). Fossils of trilobites, brachiopods, mollusks, echinoderms, corals, and bryozoans are common; sharks and various fish have also left remains. Late in the Paleozoic, erosion of great mountains along the eastern part of the United States (their remains are the Allegheny Mountains) dumped vast quantities of sediments westward into this shallow sea, creating huge deltas with swampy lowlands. By the end of the Paleozoic, most of the state was above sea level and erosion outpaced deposition.

In Late Mesozoic rocks (Cretaceous - 75 mya), fossils of mollusks and marine reptiles indicate that the sea flooded the southeastern part of the state, in an area known as the Mississippi Embayment. The only known dinosaur fossils from Missouri come from a Cretaceous clay in this area. Fossil leaves from some of the first flowering plants also show up in the state's Cretaceous rocks.



Hypsibema missouriense

During the early Cenozoic (60 mya to the present), what became the Gulf of Mexico flooded the region. Plant fossils indicate that this was a time with a relatively mild climate. During the Late Cenozoic (about 15 mya), glaciers covered parts of the state north of the Missouri River, leaving behind deposits of sand, rock, clay, gravel, and loess (wind-blown silt). Fossils of Missouri's ice age mammals, particularly mastodons, are famous.

Where can you find fossils?

Most Kansas City fossils occur in limestone. The exposed rock along I-435, US 71, and I-70 is prime fossil hunting territory.