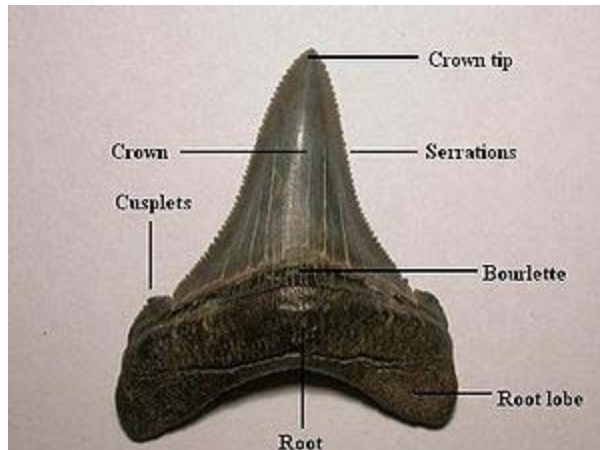


Shark Teeth

Shark teeth are relics of shark evolution and biology. Shark skeletons are composed entirely of cartilage. Often the only parts of the shark to survive as fossils are teeth. Fossil shark teeth have been dated back hundreds of millions of years. The most ancient types of sharks date back to 450 million years ago during the Late Ordovician period, and they are mostly known from their fossilized teeth. The most common, however, are from the Cenozoic Era (65 million years ago).



Sharks and rays both have a polyphyodont dentition, in which old teeth are shed continually throughout the fish's lifetime, and new ones are rotated into place on a conveyor belt-like structure. Shark teeth develop along the inner surface of the jaw cartilage, and are attached to the dental membrane. When the tooth forms in the gum tissue, the crown cap develops first, followed by the root.

Shark teeth are commonly found fossils for two reasons. Sharks continually shed their teeth, and some Carchariniformes can shed approximately

35,000 teeth in a lifetime. Secondly, the environment in which the teeth are deposited after falling from a shark's jaws has a high concentration of phosphate.

The teeth of sharks are not attached to the jaw, but embedded in the flesh, and in many species are constantly replaced throughout the shark's life. When they lose a working tooth it will be replaced by the next tooth behind it. All sharks have multiple rows of teeth along the edges of their upper and lower jaws. New teeth grow continuously in a groove just inside the mouth and move forward from inside the mouth on a "conveyor belt" formed by the skin in which they are anchored. Typically a shark has two to three working rows of teeth with 20 to 30 teeth in each row, e.g. a whale shark has about 300 teeth in each row. The replacement rate has not been measured in most sharks but normally the teeth seem to be replaced every two weeks. The lower teeth are primarily used for holding prey, while the upper ones are used for cutting into it. The teeth range from thin, needle-like teeth for gripping fish to large, flat teeth adapted for crushing shellfish.

Modern Shark Teeth

Great White Shark

The modern-day Great White shark is a protected species under CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), and has been protected for

over 10 years. The Great White was given Appendix II status, which means a permit is required to be able to trade its parts, however teeth that are on the market are still legal to own. Due to the protected status, large, modern teeth can reach prices over over \$800–1000 USD.

Fossil shark Teeth

Megalodon Teeth

Carcharocles megalodon teeth are among the most sought after types of shark teeth in the world.



These teeth are in extremely high demand by collectors and private investors, and they can fetch steep prices. This shark lived during the Miocene and Pliocene eras, roughly about 16 to 1.5 million years ago. Its teeth on average range between 1.5 to 6.5 inch in length. The largest examples can reach a length of more than 7 inches. These huge teeth indicate that the *Megalodon* could grow up to more than 16 m (52.5 ft) long, growing bigger than the largest fish alive in the world today, the whale shark.

Large numbers of *Megalodon* teeth have been discovered across both coasts of the United States. The most plentiful locations within the U.S. are the Carolinas, Georgia, and parts of Florida and Virginia.

These large sharks disappeared relatively close to the rise of modern man, however, there have been many unconfirmed reports of large carnivorous fish resembling Megalodon sharks in recent times. Megalodon teeth have been discovered that some may argue date as recently as 10,000 to 15,000 years ago. This claim is based on the discovery of two teeth by the HMS Challenger scientific expedition. These teeth were dated by estimating the amount of time it took for manganese to accumulate on them, although it is quite possible the teeth were fossilized before being encrusted.

Transitional teeth

Identifying shark teeth is tedious work, especially with all of the damaged, worn, and different teeth. It is even more difficult because of the so-called "In-between teeth". These are teeth that are from a shark species that was evolving into another, different species. An example of this can be seen with *Carcharocles auriculatus* teeth that were in the state of evolving into *Carcharocles angustidens*. These are teeth that are no longer *auriculatus*, but not yet *angustidens* either.

Great White/Mako Transitional Teeth

The most common and most referred to transitional shark teeth are the ones coming from what is believed by some to be an unusual form of great white shark. Great white shark transitional teeth are often characterized for their wide crowns. These teeth can also be identified by the way the serrations fade, being more pronounced near the root, and disappearing close to the tip of the tooth.

Many paleontologists now believe that these transitional teeth represent the evolutionary path between *Isurus hastalis* and the Great White shark. The evolutionary history of the great white shark and its relation to *Megalodon* are hotly debated.

Because of their transitional state, these teeth are rare. These teeth are prized by collectors, hobbyists, and museums.