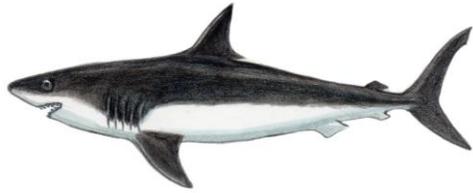




Reading Handout: How Megalodon Worked



Carcharodon megalodon, the megatooth shark, isn't just a favorite topic among science fiction fans and cryptozoologists (who study evidence of the existence of unverified species) -- it was a real, living shark that roamed the oceans around 1.5 to 20 million years ago. *Carcharodon megalodon* was discovered in the 1600s when naturalist Nicolaus Steno identified large fossils -- previously thought to be tongues of dragons or snakes -- as giant shark teeth. Since then, biologists and scientists have unearthed hundreds of fossilized megalodon teeth and **centra** (boney, vertebrae-like spinal segments), allowing us to learn more about this mysterious creature of the ancient seas.

Mega Anatomy

Since the skeleton of a shark is primarily made up of cartilage, which decomposes over time, the only megalodon remains we've discovered are serrated teeth and vertebrae-like centra. This has left experts with the arduous task of reconstructing megalodon's anatomy based on limited knowledge. But, just as human dental records can be examined postmortem to identify remains, shark teeth can also tell experts enough to identify the species and its size, possible prey, and prey size. Hundreds of megalodon tooth fossils have been found, and they average 6 inches in length -- about the size of a human hand. By comparison, great white sharks' teeth average around 2 inches long.

Using fossilized teeth, scientists have reconstructed the jaws of the megalodon and discovered that this shark's mouth was a staggering 7 feet in diameter. Based on this reconstruction and additional research, experts believe that this ancient shark had a broad, domed head with a short snout and massive jaws. If the latest reconstruction is accurate, paleontologists believe megalodon was wider than the great white with larger pectoral fins, and could have grown up to 45 to 60 feet in length -- about the size of a Greyhound bus.

In addition to the knowledge gained from megalodon teeth, the centra tell their own story. Because sharks are cold-blooded, each year they get growth rings on their vertebrae with the changing of the seasons, just as a living tree does. Experts can easily determine a megalodon's age at death by examining the centra and counting how many rings appear. The color and width of the rings also help determine growth rate; wide, light rings indicate a faster growth than narrow, dark rings. By studying megalodon's tendencies in growth rate and age at death, scientists are able to understand more about sharks' evolution and how to conserve today's shark populations, too.

Life of a Megalodon

What could life have been like for such a monolith of the sea? Many theories float around about the megalodon's habitat and prey. Megalodon fossils have been discovered far and wide, from Japan to the United States, so researchers conclude that megalodon was an intercontinental species, living all over the world's ancient oceans. Due to the coastal locations where the most fossils have been discovered, experts believe the megatooth shark had similar habitats as the great white of today -- living offshore in more temperate climates and setting up nurseries in warm, shallow water closer to coastlines [source: Renz].

In 2009, a group of paleontologists from the University of Florida in Gainesville discovered the fossilized remains of a megalodon nursery in Panama that was made up almost entirely of juvenile megalodon tooth fossils. Between this new discovery and a breeding ground found in South Carolina, scientists believe that an infant megalodon could have been an average 20 feet long, the same size as an adult great white.

Life at the top of the food chain meant the megalodon could eat whatever it wanted and, with its supersized, serrated teeth and a wide mouth, it could disable whales and seals easily before gulping them down. A team of researchers in Australia determined the megalodon's bite force was so strong, it could crush the skull of a whale as easily as a human can eat a grape. So what happened to the megatooth shark that knocked it from the top of the food chain to complete extinction?

Extinct Legend or Living Myth?

Most scientists, paleontologists and other experts believe from the fossil evidence that megalodon became extinct over 2 million years ago during the Plio-Pleistocene period. One theory puts changes in climate and shifts in the continents as the cause. Another suggests that large predators like orcas and great whites could have preyed on juvenile megalodons, decreasing their chance for survival to adulthood. Megalodon expert Gordon Hubbell theorizes that the megalodon's diminishing food sources could have also been responsible for its demise -- as whale populations disappeared from tropical waters, the megalodon began to disappear, too.

The Modern Megalodon

Despite the fact that scientists believe megalodon has been extinct for 1.5 to 2 million years, this mysterious megabeast continues to fascinate and educate people today. It is important to understand megalodon's history, because it provides clues about the evolution of sharks and can help with today's shark conservation efforts. Since several shark species are showing signs of population decline, scientists look to megalodon to help them understand how a top marine predator can become extinct. Sharks may have a reputation for being killers, but they provide a vital service for the future of healthy ocean ecosystems.

Reference:

<http://science.howstuffworks.com>

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