Carcharodon megalodon: IS THIS THE ANTEDILUVIAN GREAT WHITE SHARK?

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Abstract

Sharks represent an interesting problem for uniformitarian paleontologists. They suddenly appear fully formed in the Devonian Period with no apparent ancestors. One shark species in particular, ***Carcharodon megalodon,*** *is known from its abundant teeth found in rocks which "date" to the uniformitarian Miocene. Some scientists have suggested that the "modern" great white shark (i.e.,* ***Carcharodon carcharias)*** *might represent the same shark species as* ***C. megalodon.*** *However, serious questions remain regarding whether these were the same species of shark. While* ***C. megalodon*** *and* ***C. carcharias*** *are clearly within the same genus, they likely should remain as separate species. Many young earth creationists believe that during the Antediluvian timeframe* **both** *mankind and animals had longer lifespans than present.* ***Carcharodon megalodon,*** *like the dinosaurs, are believed to have continually grown until they were killed, either during the catastrophic conditions associated with the Flood event or they eventually died from old age (possibly Post-Flood). Longer periods of growth, proposed for the antediluvian timeframe, could have allowed* ***C. megalodon*** *to grow to its maximum size potential. Other environmental factors might still allow for the possibility that a living* ***C. megalodon*** *might be found in the oceans of the planet.*

Introduction

Shark teeth represent some of the most popular fossils to be found by both amateur and professional paleontologists, because they are easily recognized and do not require specialized identification. Fossilized shark teeth, found in various strata around the world, range in size from one-quarter of an inch to six inches in height.

This paper addresses the age and size relationship of the antediluvian (now extinct?) *Carcharodon megalodon* shark to its modern day relative (same genus) *Carcharodon carcharias,* otherwise known as the great white shark (Figure 1). Some uniformitarian scientists have suggested that *C. carcharias,* the modern great white shark, might be a direct descendent of *C. megalodon* or have a common ancestry (See Cousteau and Richards, 1992, pp. 24, 27; Maisey, 1987, p. 16). However, others would suggest that *C. megalodon* was just an overgrown version of the modern great white shark (Brown, 1973, p. 79; Springer and Gold, 1989, p. 49; Case, 1982, pp. 264-265).

Sharks In General

Today there are approximately 368 shark species recognized with new species described every year (Springer and Gold, 1989, p. 52). Not surprisingly, most of the sharks represented by the fossilized shark teeth have living relatives, at least at the genus level. However, there are a number of fossilized shark genera which have no modern representatives. There are several *Carcharodon* species which are currently recognized by their teeth, but not as a living species. One of these species of shark is *C. megalodon.*

Sharks comprise an infraclass of the Class Chondrichthyes which characterize fish whose skeletal material is entirely composed of cartilage. Sharks have no bone in their skeleton. According to Case (1982, p. 222), they are a part of the infraclass Elasmobranchii Selachii sensu lato (sharks, skates, rays and sawfishes) which includes ancient and modern sharks and their relatives.

The earliest sharks identified in the uniformitarian fossil record come from the Late Middle Devonian Period (Springer and Gold, 1989, p. 30; Radinsky, 1987, p. 56; Case 1982, p. 222). However, many paleontologists speculate that, due to the evolutionary "precursor" requirements, sharks probably evolved in the Silurian (Stahl, 1985, p. 127). Sharks "appear" fully formed with no apparent ancestors and evolutionists still know little about their origin (Stahl, 1985, p. 176). The "earliest" sharks are considered primitive. However, Romer (1966) has suggested that sharks are more advanced than generally believed. He states:

> . . . sharks are degenerate rather than primitive in their skeletal characteristics; that their evolution has paralleled that of various other fish types in a trend toward bone reduction; and that their ancestry is to be sought among primitive bony, jaw-bearing fishes of the general placoderm type (Romer, 1966, p. 38).

According to Radinsky (1987, pp. 59-65), sharks are much more complex, both in skeletal design and behavior, than previously thought and they have larger brain sizes, in relationship to body mass, than do the bony fish. Evolutionary paleontologists continue to seek ancestors for the sharks; however, the mystery of their origin remains unresolved.

In addition to not having any bone in their skeleton, sharks lack an air or swim bladder. Bony fish use their air bladders to maintain a specific depth within water. Because sharks do not have an air bladder, they are forced to swim to maintain their depth position in seawater. If a shark were to discontinue swimming, it would simply sink to the bottom.

The bony fish can remain motionless and force water through their gills to respirate. However, most sharks lack the means of forcing water over their gills and are

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forced into constant forward movement in order to respirate. Constant movement, therefore, maintains the shark's depth within the water and its ability to respirate. It should be noted that not all sharks require movement to force water over their gills and breath. A few species can actually remain motionless and force water over their gills (e.g., the nurse shark). However, the vast majority of sharks, including the great white, must move constantly in order to force water through their gills to exchange oxygen to survive.

Sharks are usually identified by their dermal denticles and their teeth. Ellis (1976, p. 31) described the dermal denticles as:

> "Skin-teeth" is a good translation, and this is exactly what they are. They have the same basic construction as the teeth of the shark, in that they are covered with dentine and they have a central pulp canal. The denticles are not the skin of the shark, but are embedded in it. They have a wide base, a narrow "neck," and then the platelike outer surface. In some species the denticles are closely spaced and overlapping, while in others they are spaced more widely apart. Even the distance between them can serve as a species determinant . . .

Shark teeth are also believed to be species specific and serve as a means of species identification. These teeth are continuously lost and replaced by underlying rows of teeth (usually in a few days!). This tooth replacement process continues throughout the shark lifetime. In several instances, shark teeth have been found embedded in various objects (wooden boats, attack victims bones, dinosaur bones, etc.) and the species in question was quickly identified based on the lost tooth. What leads many scientists to believe that C. *megalodon* and C. *carcharias* are the same shark species is their similar tooth morphology.

Carcharodon megalodon

Teeth from the genus Carcharodon are found in deposits which "date" to the uniformitarian Upper Cretaceous Period (Randall, 1973, p. 170). However, the *Carcharodon megalodon* shark teeth are first identified in strata dated to the uniformitarian Miocene Epoch (Case, 1982, p. 272; Maisey, 1987, p. 16) [Figure 2]. Based on tooth size, C. *megalodon* has been estimated to range up to 100 ft. in length. However, recent and more reliable studies have concluded that this species probably did not exceed 43 to 45 ft. in length

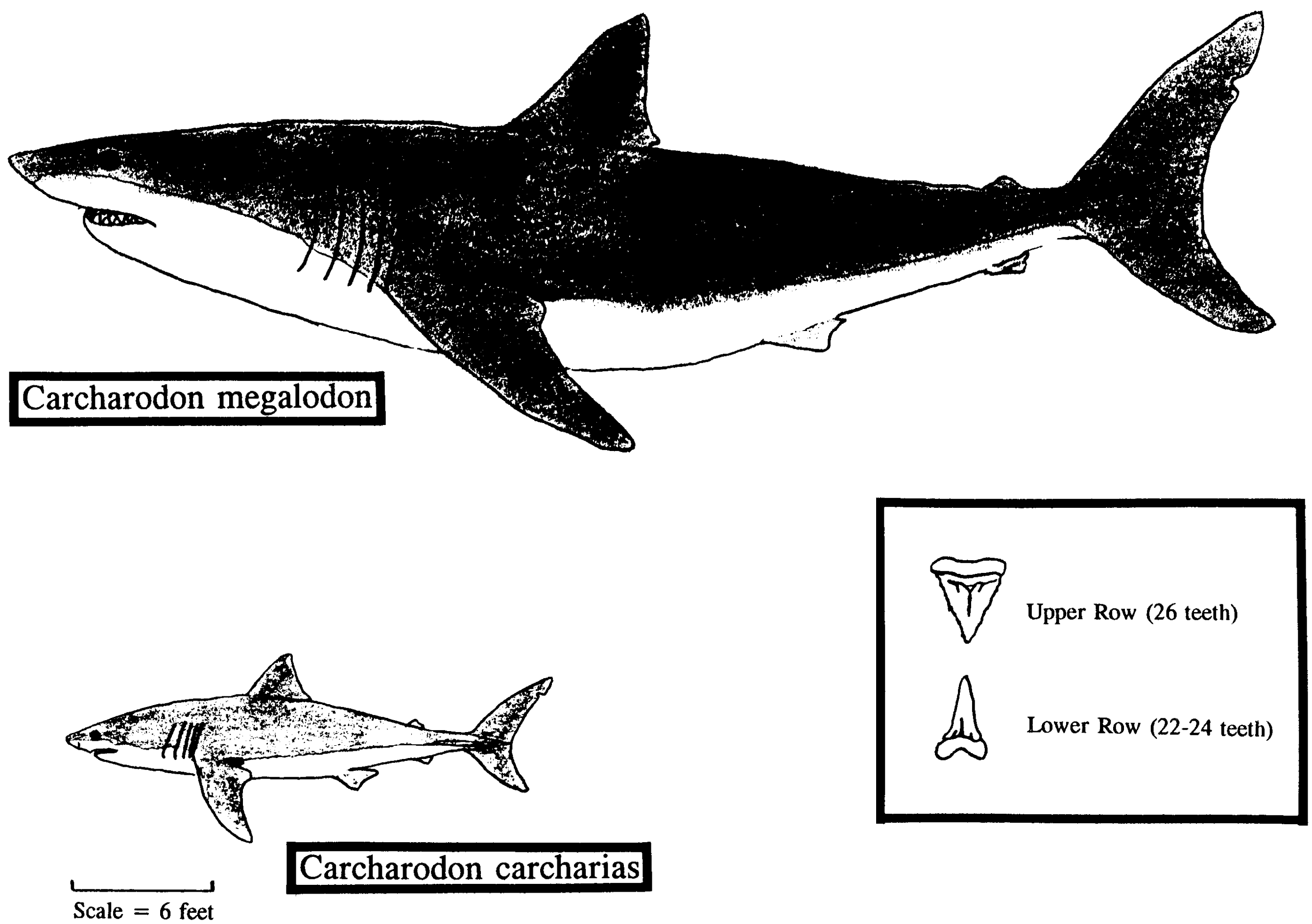

Figure 1. A comparison between *Carcharodon megalodon* and *Carcharodon carcharias*. The scale is the same for both sharks, with the *C. carcharias* being approximately 19.5 ft. long and *C. megalodon* being approximately 45 ft. long. Teeth in both species are very similar, with the major difference being one of size. Modified after Ellis (1976, p. 89), and Castro and Stone (1983, p. 89).

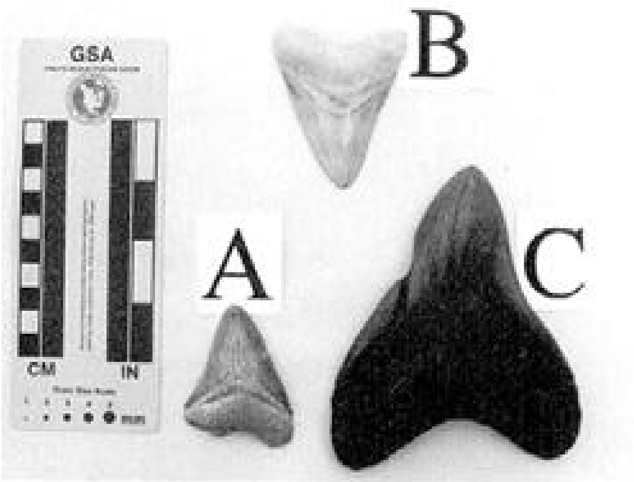

Figure 2. A comparison between the fossilized teeth of *Carcharodon megalodon.* If the three teeth shown represent the center and largest teeth in the shark then these teeth represent: (A) a *C. megalodon* shark approximately 14-15 ft. long, (B) a *C. megalodon* shark 18-19 ft. long, and (C) a *C. megalodon* shark approximately 36-40 ft. long (all based on Randall, 1973). Tooth (B) is approximately the same size as would be found in the largest great white ever captured (Western Australia) [Springer and Gold, 1989, p. 107]. Tooth (C) is from the Cooper River in South Carolina and teeth (A) and (B) are from Polk County, Florida. All three are from the uniformitarian Miocene Epoch.

(Springer and Gold, 1989, p. 50; Ellis, 1976, p. 17; Randall, 1973, p. 170; Maisey, 1987, p. 161.

Megalodon is thought to have "evolved" during the uniformitarian Cretaceous to Eocene and to have become extinct sometime between 30 million to 50 thousand years ago (Ellis, 1976, pp. 26, 102). This extreme range in time for both evolution and extinction is the result of subjective "dating," which is based on "first" and "last" appearance of teeth found in strata dated within those timespans.

The Great White Shark

Great white sharks (i.e.. *Carcharodon carcharias)* are believed to live for approximately 25 to 30 years (Cousteau and Richards, 1992, p. 109) and will vary in length depending upon the ocean in which they live (Springer and Gold, 1989, p. 107). According to Springer and Gold (1989, pp. 106-107):

> Slower growth is reported for the species in Atlantic waters, 20 cm (7.9 in.) per year, compared with estimates of 25 cm (9.8 in.) to 30 cm (11.8 in.) per year for younger, and 21.8 cm (8.6 in.) per year for older individuals from the Pacific. (Parentheses mine)

White sharks in Australian waters are generally believed to grow a foot a year with males reaching maturity when they are 10 ft. long and females when they are 13 to 14 ft. long (Cousteau and Richards, 1992, p. 103).

The largest great white shark ever captured, measured, and weighed was taken off Cuba, and it reportedly measured 21 ft. and weighed 7,302 lbs. (Lineaweaver and Backus, 1970, p. 107). However, photographs of this shark were reevaluated in 1987 and show conclusively that the shark was no more than 16.4 ft. long (Springer and Gold, 1989, p. 107). Other reported sightings of larger great whites have been made, but no one has captured a white shark larger than one from Western Australia measuring 19.5 ft. long (Springer and Gold, 1989, p. 107).

Giantism in the Past

Uniformitarian scientists have suggested that many different reptilian life forms reached tremendous sizes during the uniformitarian Mesozoic Period. Ellis (1976, p. 101) states:

> . . . many living creatures can number among their ancestors gigantic versions of themselves. Some that come to mind immediately are *Deinosuchus,* a fifty-foot crocodilian of the Cretaceous Period, and *Archelon*, a twelve-foot-long turtle. There are many other examples of giant ancestors of smaller descendants, but the progression from larger to smaller does not automatically obtain.

The fact that they grew to such large sizes and are no longer found on earth presents a mystery for paleontologists, biologists, and zoologists.

Evolutionary paleontologists now recognize that the dinosaurs, being reptiles, continued to grow until their death (Horner, 1988, p. 84; McGowan, 1991, p. 127). A difference of opinion still exists on whether the dinosaurs were warm-blooded, cold-blooded or both at different stages in their life. This difference, whether they were warm or cold-blooded, affects the amount of time that it would take to "grow" a big dinosaur (Bakker, 1986, p. 349). If the dinosaurs were cold-blooded, like their modern reptilian counterparts, they could subsist on less food and would grow at very slow rates; hence a very large reptile would require many years of growth. Long periods of time (i.e., from 100 to 200 years) have been proposed for a baby dinosaur to grow to adult size (see Case, 1978, pp. 320-328; McGowan, 1991, p. 128). It has also been suggested that cold-blooded dinosaurs could initially grow rapidly and still live for very long periods of time (Lessem, 1992, pp. 157-158). Many dinosaur bones exhibit "growth rings" which can be used to approximate their age (Monastersky, 1994, p. 312). This author suggests that total dinosaur size development required long periods of time, which are reflected in the bone "growth rings" and are reinforced by their large size. This is based on the author's belief that the dinosaurian "kind" were ectothermic (i.e., cold-blooded). While growth would continue throughout the dinosaur lifetime, it would be limited by the genetic code which would set its maximum growth potential. Hence, the "growth" rate would slow with age to the point where very little growth would continue to occur and this would limit the size of the animal.

This principle of a genetic limit to size along with the slowing of the growth rate with age, also appears to hold true for sharks. Springer and gold (1989, p. 60) reported that sharks never stop growing throughout their lifespans. The approximate age of any shark can be determined by counting the growth rings found in its cartilaginous skeleton (Pike, 1991, pp. 109-111;

Springer and Gold, 1989, p. 45; Parsons, 1993). Great white sharks also exhibit growth rings in their vertebral cartilage, and the rings can be used to determine the approximate age of the shark (Cousteau and Richards, 1992, p. 109; Welden, Cailliet, and Flegal, 1987; Cailliet, Natanson, Welden, and Ebert, 1985). Sharks are known for their initial rapid growth rate while still juveniles and a slower rate after reaching maturity (Pike, 1991, pp. 109-111), and great whites are no exception. The larger and more mature the shark, the lower its metabolism and the smaller its food intake (Lineaweaver and Backus, 1970, p. 112; Wetherbee, 1991, p. 76). While mature great whites feed on large animals (e.g., dolphins, seals, tuna, and other sharks), they do not appear to feed often. Great white sharks are not warm-blooded, and their metabolism and growth rate reflect this fact. Hence, it takes a long time for a big great white shark to develop (see Welden, et al., 1987, p. 309, Figure 2).

The fact that no C. *megalodon* skeletons have been found is believed to be due to its cartilaginous composition. Hence, any attempt to determine the age of *C. megalodon* by counting growth rings in its vertebra is not possible. All that remains in any attempt to understand the size and age of the *C. megalodon* shark rests squarely on extrapolating information (e.g., age, growth rate, and tooth size) from the modern C. *carcharias* shark and estimating it with that of the extinct(?) C. *megalodon,* based soley on tooth size.

Present studies raise serious questions regarding the growth potential of *C. carcharias* to that of *C. megalodon*. Work performed by Welden et al., (1987) and Randall (1973) suggests the maximum size attainable for *C. carcharias* as being approximately 24.6 to 26 ft. in length. This raises serious questions about whether these are in fact the same **species** of shark.

Other Influences

Many factors potentially affect the growth rates observed in sharks. Some of these factors include: water temperature as a function of both depth and latitude, destructive mutations (genetics), diet, sex, species, and seasonal variations in temperature. All of these factors affect the age and growth potential of any shark in the wild. Some of these factors could result in the actual demise of a species.

In addressing the disappearance of *C. megalodon,* Ellis (1976, p. 101) states:

> Any solution to the problem of *megalodon's* disappearance is speculatory at best, but we can assume that it had to do with the availability of prey, climatic changes, continental drift, evolutionary variation, probably some still undiscovered factors, and undoubtedly a combination of all these elements.

Sharks are known to grow to larger sizes in the northern latitudes (Parsons, 1993, p. 27) and / or at great depth due to the colder water temperatures. For example, large (up to 23 ft. long, which is larger than the normal length of 13 ft. [Pope, 1973, p. 60]) Pacific Sleeper sharks have been recorded on camera at depths of 4,000 to 6,000 ft. off of Baja California (Clark and Kristof, 1991, p. 79).

Much of the deep waters of the Earths oceans remain to be explored. Hence, it should not be ruled out that *C. megalodon* might still exist in its deep and dark waters. The reader is reminded that in 1977, a Japanese fishing boat hauled aboard what many believe were the rotting remains of a plesiosaur (see Taylor, 1990, pp. 225-226; 1991, pp. 106-107). These creatures are believed to have become extinct many millions of years ago. Man continues to find creatures once deemed "extinct" based solely on the lack of fossils found in strata exposed at the earths surface (e.g., the coelacanth fish, the *Lingula* brachiopod, etc.)

Discussion

Sharks appear fully formed in the fossil record with no likely candidates for ancestors. They are similar in form and function to "modern" species. As creationists, we accept the fact that these sea creatures were created on Day 5 (Genesis 1:20-23).

Sharks as a group are well suited to their environment despite the fact that they have no air bladder or bone in their skeleton. They constantly cruise both fresh and marine waters (some species live in fresh water and several species can live in brackish water) and generally feed on the sick and injured. Many species live or long periods of time while maintaining a constant supply of teeth.

Carcharodon megalodon represents a species of shark that some suggest is alive today in the form of *C. carcharias.* Because shark classification is based on limited morphology (i.e., dermal denticles, and teeth), it is somewhat difficult to imagine an animal with two different sizes of teeth being classified as distinct species. However, others see differences between the teeth as clearly reflecting a difference in species. Ellis (1976, p. 102) has addressed this as:

> The teeth of megalodon (and of other extinct members of the genus *Carcharodon)* are oversized replicas of the teeth of the only living member of the genus— *Carcharodon carcharias,* the great white shark. The differences mentioned earlier (smaller serrations, the dark triangular area between the base and the blade, and the size of the fish), are enough to differentiate the sharks on the species level, but gross morphological characteristics (larger serrations, triangular shape) are sufficient to suggest a very strong relationship between the extinct *megalodon* and the recent *carcharias.*

However, if these two sharks were in fact different species, how did *C. megalodon* then grow so large?

Many creationists believe that both mankind and creatures lived for longer periods of time during the Antediluvian timeframe than today (see human lifespans in Genesis 5). If man lived for several hundred years, it should not be inconceivable to believe that creatures also lived a longer proportional lifespan. For example, if man lived to be 500 years old, a dog could live a proportional length of time of approximately 107 years (500 divided by 70 [average human lifespan] times 15 [average dog lifespan]). A great white (i.e., *C. carcharias)* could have lived for 214 years and *C. megalodon* possibly even longer.

Based on current growth curves for great white sharks (see Welden, et al., 1987, p. 309, Figure 2), it is not likely that *C. carcharias* could grow to the sizes estimated for *C. megalodon*, even if it lived for 214 years. Hence, this would suggest that *C. megalodon* is indeed a separate and distinct species of shark. Being a separate shark species capable of growing to such a large size, the next issue would be how it achieved such great size.

The Antediluvian timeframe of 1000 to 2000 years before the Flood would have allowed *C. megalodon* to continue to grow for very long periods of time and reach its maximum size potential of 44 to 46 ft. Similarly, dinosaurs could also grow to be very large in the Antediluvian over the hundreds of years in which they lived. The longer growth periods proposed for the Antediluvian timeframe could solve the "giantism" issue currently debated by paleontologists.

Conclusion

This author proposes that the prehistoric (i.e., Antediluvian) shark *C. megalodon* is apparently not the same shark species as the modern *C. carcharias* (white shark). This belief is based on the differences of estimated sizes which the *C. carcharias* can achieve. The fact that C. *megalodon* is estimated to have grown up to 20 ft. longer than C. *carcharias* tends to support this concept. The author suggests that C. *megalodon* simply lived longer during the Antediluvian timeframe and grew to its maximum size potential, much like the dinosauria.

Ellis (1976, p. 102) has suggested:

> We can therefore assume that the considerably enlarged body of *megalodon* was close in form to that of *carcharias. Megalodon* probably had the same fusiform, tapering body, the same flattened caudal keels, and the same homocercal tail lobes. Extrapolating from the proportions of a large white shark, we can deduce that a 45-foot *megalodon* would have had a tail that was almost 15 feet high, pectoral fins 8 feet long, and a dorsal fin that stood 6 feet tall.

Because the world's oceans remain for the most part unexplored, it would be unfair to assume that *C. carcharias* do not grow to their maximum attainable size (approximately 24 to 26 ft.). Researchers working around the world have reported seeing great white sharks 20 ft. long and longer (Cousteau and Richards, 1992, p. 123; Ellis, 1976, p. 97; Randall, 1973, p. 170). However, present studies seem to indicate that C. *carcharias* cannot grow to the size (i.e., 45 ft.) suggested for that of *C. megalodon*. This leaves us with the realization that *C. megalodon* apparently was a separate and distinct species of shark. However, would it be true to say that *C. megalodon* does not exist just because we do not find its teeth in rocks "dated" to the "recent?" Probably not. Many "living fossils" have been found within the last 100 years and this author suggests the possibility that many remain to be found. Perhaps *Carcharodon megalodon* still exists within the depths of the oceans.

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