The First Fishes:

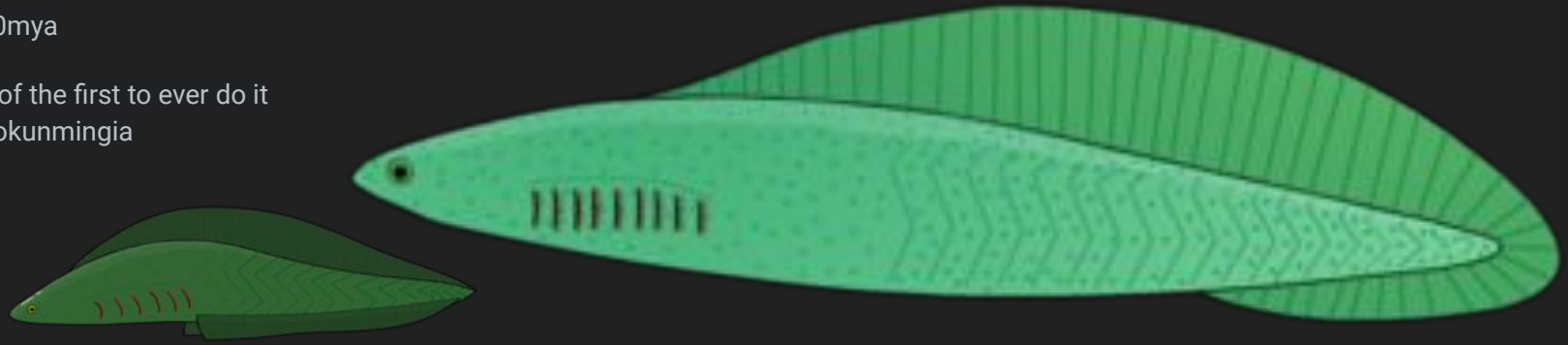
How they used to do it to em

The legend themself

Jawless

~550mya

One of the first to ever do it
Myllokunmingia

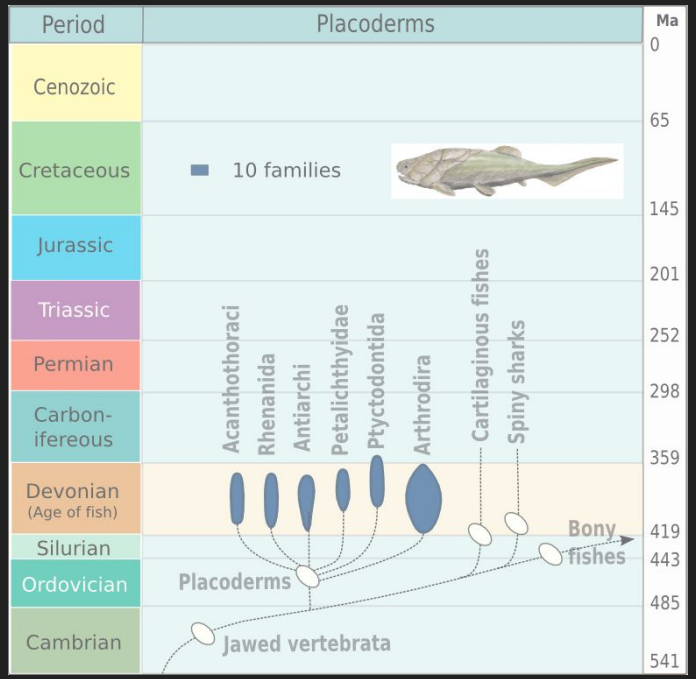


Repeat my life ~19,000,000 times

Thelodont

Credit...
Nobumichi Tamura

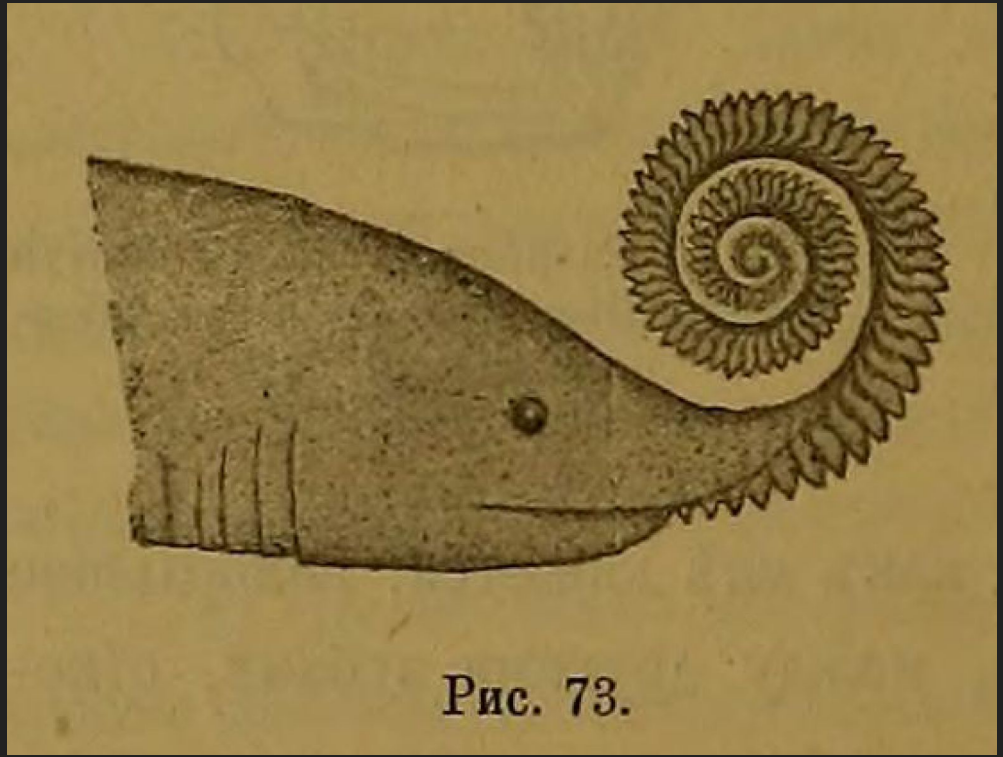
First bony fish: 440mya
First cartilaginous fish: ~about the same



Helicoprion 280 mya

Helicoprion bessonowi was first described in an 1899 monograph by Alexander Karpinsky. Although it was not the first *Helicoprion* species to be described, it was the first known from complete tooth whorls, demonstrating that *Helicoprion* was distinct from *Edestus*.[1]

"The first specimen of *Helicoprion* to be described was WAMAG 9080,[2] a 15-tooth fragment of a tooth whorl found along a tributary of the Gascoyne River in Western Australia. Henry Woodward described the fossil in 1886 and named it as the species *Edestus davisii,* commemorating the man who discovered it"



Alexander Karpinsky's 1899 hypothesis of the placement of the tooth whorl on *H. bessonowi*.

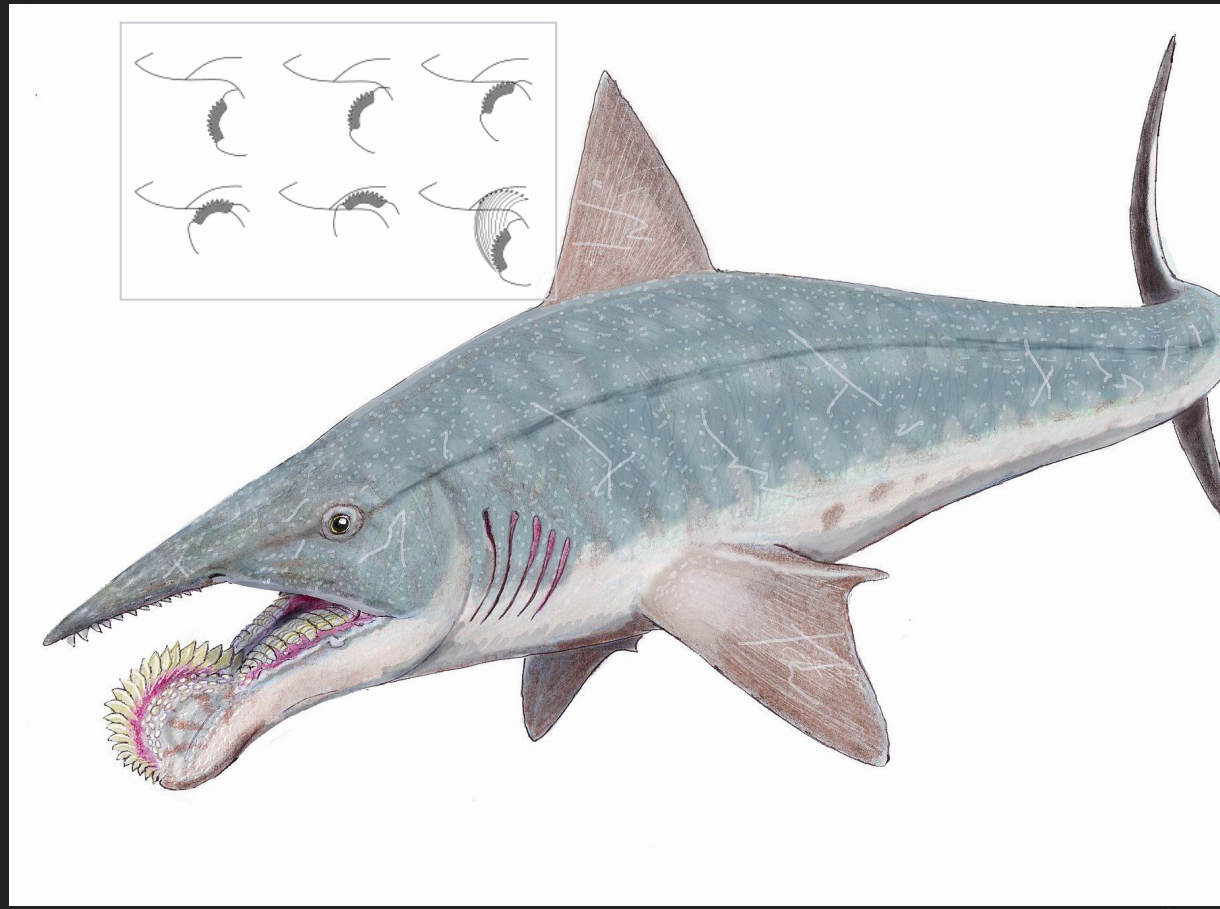
From wiki: “Hypotheses for the placement and identity of *Helicoprion*'s tooth whorls were controversial from the moment it was discovered [in1886]. Woodward (1886), who referred the first known *Helicoprion* fossils to *Edestus*, discussed the various hypotheses concerning the nature of *Edestus* fossils. Joseph Leidy, who originally described *Edestus vorax*, argued that they represented the jaws of "plagiostomous" (chondrichthyan) fish…. On the other hand, J.S. Newberry suggested that the jaw-like fossils were defensive spines of a stringray-like fish. Woodward eventually settled on E.D. Cope's argument that they represented pectoral fin spines from fish similar to "*Pelecopterus*" (now known as *Protosphyraena*).[13]

Karpinsky's 1899 monograph on *Helicoprion* noted that the bizarre nature of the tooth whorl made it difficult to reach precise conclusions on its function. He tentatively suggested that it curled up from the upper jaw for defensive or offensive purposes. This was justified by comparison to the upper tooth blades of *Edestus*, which by 1899 had been re-evaluated as structures belonging to the jaw.[14]

Debates over the identity of *Helicoprion*'s tooth whorl were abundant in the years following Karpinsky's monograph. In 1900, the publication was reviewed by Charles Eastman, who appreciated the paper as a whole but derided the sketch of the supposed life position of the whorl. Though Eastman admitted that the teeth of the whorl were very similar to those of other chondrichthyans, he still supported the idea that the whorl may have been a defensive structure embedded into the body of the animal, rather than the mouth.[25] Shortly after his original monograph, Karpinsky published the argument that the whorl represented a curled, scute-covered tail akin to that of *Hippocampus* (seahorses).[26] This proposal was immediately criticized by various researchers. E. Van den Broeck noted the fragility of the structure and argued that it was most well-protected as a paired feeding apparatus in the cheek of the animal.[27] A.S. Woodward (unrelated to Henry Woodward) followed this suggestion with the hypothesis that each whorl represented a tooth battery from a gigantic shark.[28] G. Simoens illustrated Karpinsky's various proposals and used histological data to adamantly argue that the whorls were toothed structures placed within the mouth.[29] In 1911, Karpinsky illustrated the whorls as components of the dorsal fins.[18] Reconstructions similar to those of Karpinsky (1899) were common in Russian publications as late as 2001.[6] “

HELICOPRION

The unusual saw-like tooth whorl and the lack of wear on the teeth of *Helicoprion* implies a diet of soft bodied prey, as hard shelled prey would simply slip out of the mouth. Due to the narrow nature of the jaw, suction feeding is unlikely to have been effective, and *Helicoprion* is thought to have been a bite feeder. Biomechanical modelling by Ramsay *et al*. (2015) suggests that the teeth in the whorl had distinct functions depending on where they were in the spiral. The frontmost teeth served to snag and pull prey further into the mouth, while the middle teeth spear and the hind teeth served to puncture and bring prey further into the throat, with the prey being squeezed between the whorl and the two halves of the palatoquadrate. The labial cartilage served to buttress and provide support to the whorl.[10]



Jaw motion of *Helicoprion,* after Ramsay and colleagues (2015)

Helicoprion may have started with a large gape during initial prey capture, followed by smaller jaw opening and closing cycles to further transport prey into the mouth, as is done by modern bite-feeding sharks. While modern sharks shake their heads from side to side to facilitate sawing and cutting their prey, the teeth of *Helicoprion* would likely further cuat the prey during the jaw opening, due to the arc-like path of the front teeth, similar to the slashing motion of a knife. *Helicoprion* likely used a series of rapid, forceful jaw closures to initially capture and push prey deeper into the oral cavity, followed by cyclic opening and closing of the jaw to facilitate sawing through prey.[10]

Stethacanthus

“Stethacanthus is one of the most bizarre-looking **Chondrichthys** ever. Its most notable feature is the anvil-like dorsal fin, the purpose of which is still the subject of debate. Fossils ascribed to *Stethacanthus* have been found in Asia, Europe, and North America. Not only was this genus’ geographic distribution wide, its temporal distribution was too. Earlier fossils hail from the Late Devonian, and Stethacanthus species appear to have survived into the later stages of the Carboniferous. “

375 million years ago - 360 million years ago

Dunkleosteus and the armored fishes

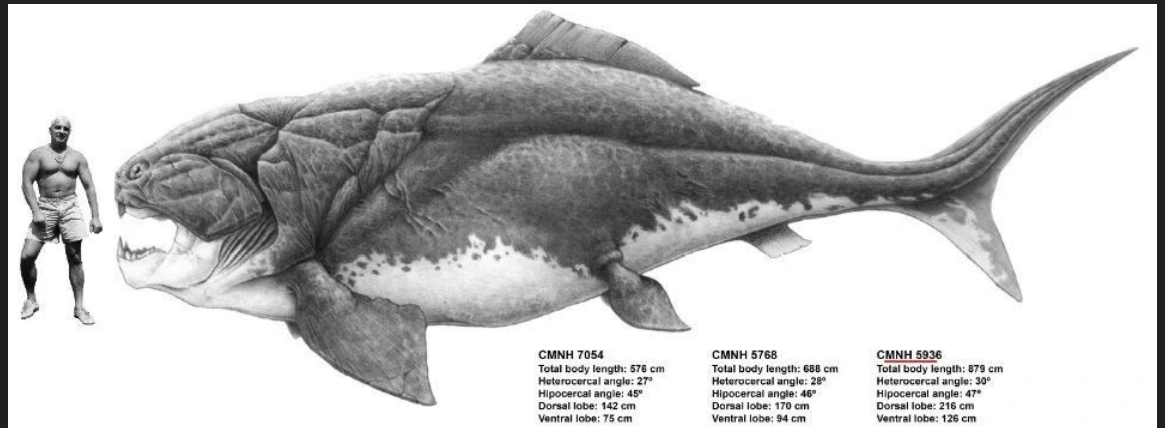
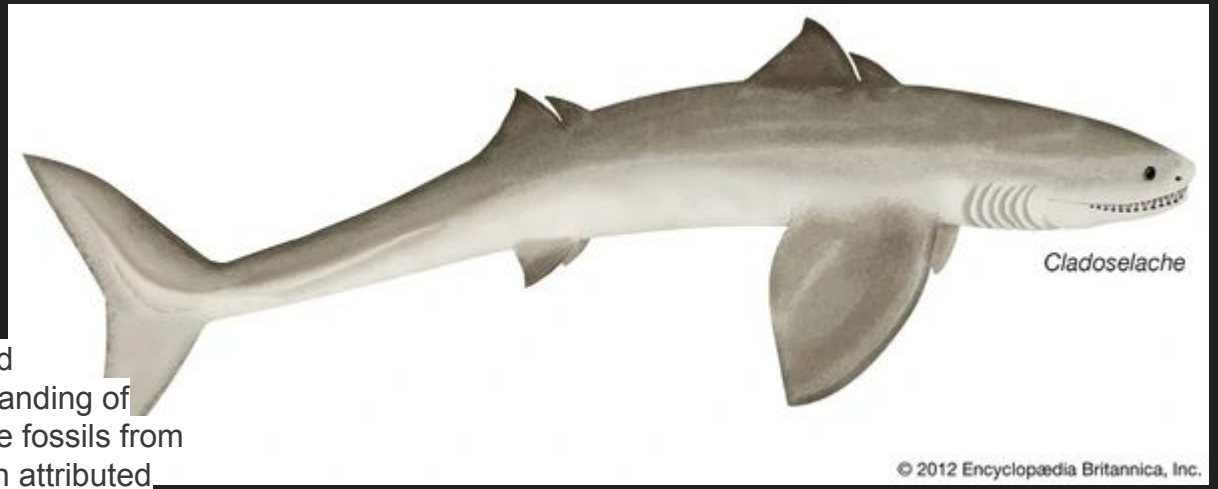


Figure 4 **Caudal fin shape inferences in *Dunkleosteus terrelli*.** (A) Predicted caudal fin shape of each specimen of *D. terrelli* (in black), showing the upper and lower 90% individual confidence interval boundaries (in red and blue respectively). (B) Palaeoartistic reconstruction of a 8.79 meters *D. terrelli* (courtesy of Hugo Salais, HS Scientific Illustration).

All the armored fishes went extinct ~350mya in the **Hangenberg event**

https://prehistoric-life.fandom.com/wiki/Top_10_Prehistoric_Fish?file=169a67180b86375afc88e0a562f55d54.jpg

Cladoselache



Cladoselache has contributed phenomenally to our understanding of early shark evolution. Multiple fossils from the Late Devonian have been attributed to this genus, and, just as importantly, some are excellently preserved. *Cladoselache* demonstrates some characteristics similar to those of modern sharks, specifically the mackerel sharks, probably the most famous extant shark family. Analysis of its teeth and stomach contents has revealed that this shark's primary means of consuming prey was probably by swallowing them.

Fin part 1

References:

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