'Walking' sharks: evolution in action?

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Scientists have recently discovered over 50 new aquatic species in a coral reef off the coast of Indonesian Papua.[1] This included a new bottom-dwelling epaulette shark species (*Hemiscyllium* sp.) that appears to use its pectoral fins to 'walk' along the seafloor when searching for food. Footage taken of this shark has been paraded in the media as evidence of fish evolving into land-dwellers.[2]

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Scientists have long known before this latest find that *Hemiscyllium* species 'walk' on their fins along the sea floor.[3]

The mechanics of walking

However, scientists have long known that epaulette sharks have the ability to use their pectoral fins for aquatic 'walking' along the sea floor.[3] The problem for using this in evolutionary apologetics is that the underwater 'walking' seen in these sharks is unlike anything that occurs on land. Epaulette sharks studied previously have shown little difference in structure to the pectoral fins of other sharks. Other than size differences in the same muscles in the fins, only one other muscle not found in most other sharks has been observed.[4]

Finding aquatic 'walking' sharks is not the issue; the transition to the rigours of walking on land is the real problem. Recent studies have shown that even creatures that move both on land and underwater using legs have very different styles of locomotion for when they are either in water or on land.[5] Because of water's viscosity and the organism's natural buoyancy, it provides a completely different medium for walking as opposed to air.[6] In air, walking requires both a method of propulsion and a method for the creature to support itself. However, support is less of an issue in water because most organisms have a natural buoyancy. The water substantially supports even epaulette sharks, which are slightly denser than water.[7] This greatly reduces the effect of gravity, and gives them a much smaller effective weight what they would have on land.[8] Water is also more viscous than air, which therefore gives much more resistance to movement. This tends to provide greater stability when walking in water.[8] This requires a very different design for walking on land as opposed to water.

A fish out of water

Another problem is the sort of fish this is: a shark. Sharks are members of the fish class Chondrichthyes, which are *cartilaginous* fish, i.e. their skeletons are made of cartilage. Land dwelling vertebrates, however, are supposed to have evolved from a common ancestor with the class Sarcopterygii, which fall under the superclass Osteichthyes and are therefore fish with *bony* skeletons. Therefore, 'walking' sharks are not good candidates to benefit the evolutionary picture because chondrichthyans possess the wrong skeletal structure to provide any evidence for fish-to-tetrapod evolution. Moreover, fin muscle development in chondrichthyans is very different in comparison to other fish which bear closer developmental similarities to tetrapods.[9] Therefore, they don't possess the required developmental sequences to even produce the musculature needed for terrestrial motion let alone being able to produce the actual muscles required *in the correct context for terrestrial locomotion*. To add further insult to injury, a bony skeleton would be needed to support the body on limbs on land; therefore chondrichthyans don't have the correct context for correct muscle development anyway.

Evolution presents other problems. Considering the amount of new information that would need to be added randomly (filtered by selection) to the shark's genome for it to be able to walk on land, it borders on the ludicrous. No randomly occurring, information-gaining mutations such as would be needed to add this level of functional complexity have ever been observed, which is a must for evolution to work. However, the shark needs them in droves. Of course, this needs to happen more than once *independently*. Invertebrates had to do it, bony fish had to do it, and now sharks are doing it too? There are so many problems with fish-to-tetrapod evolution already[10] without the notion that sharks are heading in the same direction. For instance, the shark could not develop a system that is identical to the supposed 'fish-to-tetrapod' evolution because its skeleton is cartilaginous, which would mean that if this evolution had occurred twice, it would be an example of homoplasy.[11] In any case, evolution is not supposed to have any foresight, direction or purpose.

So what could this fin walking be for? Numerous suggestions have been offered, such as giving them an advantage in catching their bottom-dwelling prey (crabs, snails, small fish)[12] and allowing for easier traversal of their 'structurally complex habitat': coral reefs.[13] There is no need to suppose that they evolved to be like this. Rather, they are well designed to suit their specific environment, which is exactly what one would expect starting from the Bible.

Strolling to a solution

This 'walking' shark episode comes not long after the recently publicized *Tiktaalik* fossil was paraded in *Nature* as the 'missing link' of tetrapod evolution.[14] However, even *Tiktaalik* fails to fill the crucial gap between sea and land locomotion.[15] The conclusions of Azizi and Horton on the differences between aquatic 'walking' in sharks like *Hemiscyllium* and terrestrial locomotion should be well noted:

> 'The functionality of relatively small and unimpressive locomotor structures used during aquatic walking highlights important differences in the mechanical demands on limbs and fins in aquatic versus terrestrial environment.'[16]

Evolution is not needed to explain the existence of this rather peculiar shark, and it adds nothing to our understanding of this shark's biology. Nor does the observation of such underwater 'walking' provide any evidence for fish-to-tetrapod evolution. Even octopuses have been observed 'walking' on two of their 'legs', but this is hardly the precursor of bipedalism on land! Rather, the Word of God provides a sound basis from which to understand more of the epaulette shark's design features, which testify to the intelligence and creativity of the God of the Bible.

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Controversial claim for earliest life on Earth

Tas Walker

Researchers claim to have found 'compelling' new evidence for the 'earliest' forms of life on Earth. Australian and Canadian scientists describe, in a paper in *Nature*,[1] seven varieties of stromatolites along a 10-km strike of a rock formation in the Pilbara region of Western Australia (figure 1). Known as Strelley Pool Chert, the formation is supposedly 3.43 billion years old.

Stromatolites: fossils or formations?

There has been an ongoing controversy about the origin of the Pilbara stromatolites. If, as many have argued, their finely laminated sedimentary structures (figure 2) are the result of non-living chemical processes, then there is nothing particularly remarkable about the find.

But lead author Abigail Allwood, from Sydney's Macquarie University, says that the stromatolites formed a 'reef' and that the reef was built by microbial organisms.[2]

This makes the find highly significant—like finding the 'Holy Grail'[3]—as she describes it. At an age of 3.43 Ga, the stromatolites would represent evidence for some of the oldest life forms on Earth.

'We're seeing evidence not just of life's existence,' Allwood said, 'but that it was probably well established and already biodiverse, which suggests it could have emerged much earlier in Earth's history.'

So why did the team claim that the laminated sedimentary structures were biogenetic stromatolites? Because they say they are similar to younger stromatolites that have been described by others, and because they say that abiotic processes capable of producing such laminated structures are 'unknown and unlikely in the natural world'.

However, even within their